

MANAGEMENT OF THE CALIFORNIA STATE WATER PROJECT

BULLETIN 132-2021 | JULY 2024



GAVIN NEWSOM
Governor, State of California

WADE CROWFOOT
*Secretary for Natural Resources
California Natural Resources Agency*

KARLA A. NEMETH
*Director
Department of Water Resources*



Publishing Information

Cover photo shows a drone view of Antelope Lake, located on Upper Indian Creek, in Plumas County in May 2020. On this date, the lake's storage was at 101 percent of total capacity.

Photo provided by the Public Affairs Office Photography Unit.

Copies of this document are available for \$25.00 per book from:

California Department of Water Resources
Attn: Publications Office
P.O. Box 942836
Sacramento, CA 94236-0001
(916) 653-1097

If you need this publication in alternate form, contact the Public Affairs Office, 1-800-272-8869.

Printed on recycled paper 

Bulletin 132-21

Management of the California State Water Project

Covers Calendar Year 2020 Activities



Published July 2024

Gavin Newsom *Governor*
State of California

Wade Crowfoot *Secretary for Natural Resources*
California Natural Resources Agency

Karla A. Nemeth *Director*
Department of Water Resources

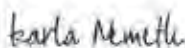
Foreword

*B*ulletin 132-21, Management of the California State Water Project, continues the Bulletin 132 annual series begun in 1963. Bulletin 132-21 reports water supply planning, construction, financing, management, and operation activities of the State Water Project (SWP). It also discusses water supply and delivery, Delta resources and environmental issues, power resources, recreation, and financial analysis of the SWP.

Appendix B of Bulletin 132 contains data and computations used by the State of California to determine the SWP Contractors' Statements of Charges. Appendix B was previously printed and distributed to SWP Contractors to document and support calculation of contractors' annual charges.

The Bulletin discusses significant events and issues that affected SWP management and operations from January 1, 2020, through December 31, 2020. Appendix B includes data used to document the redetermination of water charges to be paid by SWP water contractors during calendar year 2022; the information is based on established data about the SWP, both known and projected, as of June 2021.

Please note that the water delivery figures listed are accurate at the time of this 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 information than was available at the time of publication, please consult the most recent edition of Bulletin 132, or contact Department of Water Resources staff in the State Water Project Analysis Office.



Karla A. Nemeth
Director

Contents

Foreword	iii
Organization and Acknowledgements	xxiii
Divisions, Offices, and Contributors	xxiv
California Water Commission	xxviii
Acronyms and Abbreviations	xxix
State Water Project Contractors	xxxiii

State Water Project Highlights xxxv

SWP Allocations	xxxvii
Yearly Activities Summary	xxxvii
2020 Precipitation and Water Storage	xxxvii
2020 Water Deliveries	xxxviii
Power Resources	xxxviii
Hydropower License Planning and Compliance	xxxix
Financial Analysis	xl
Engineering, Construction, and Real Estate	xl
Delta Resources and Environmental Issues	xli
Recreation	xlili
SWP Milestones through the Decades	xlili
50 Years Ago—1970	xlili
40 Years Ago—1980	xlili
30 Years Ago—1990	xlili
20 Years Ago—2000	xlili
10 Years Ago—2010	xliv

Chapter 1 The State Water Project 1

The State Water Project	3
Project Facilities	3
Project Design	4
Methods of Financing	6
SWP Contractors	7
Future Planning and Construction	8
Climate Change	11

Chapter 2 Delta Resources 15

Delta Water Management Programs	17
Delta Plan	17
State Water Project Delta Compliance Program	17
Predation, Release, and Efficiency Program	17
Salmon Survival Engineering Solutions Program	22
South Delta Improvements Program	23
Program Status	24
Temporary Barriers Project Facilities	24
Delta Flood Control	26
Delta Flood Emergency Preparedness, Response, and Recovery Program ..	26
Delta Levees Maintenance Subventions Program	27
Delta Levees Special Flood Control Projects Program	27
North Delta Flood Control and Ecosystem Restoration Project	27
Project Status	28
Dutch Slough Tidal Marsh Restoration Project	28
Project Status	29
West Delta Program/Delta Islands	29

Chapter 3 Environmental Programs 31

Operations for Species of Concern	33
---	----

San Joaquin River Restoration Program	33
Lower Yuba River Accord	34
Oroville Facilities	34
Existing FERC License Activities for 2020	34
Lake Oroville Elevation	36
FERC Relicensing Activities	36
Devil Canyon Project and South SWP Hydropower Facilities	37
Relicensing Protection, Mitigation, and Enhancement Measures	37
Relicensing Cultural and Tribal Resources Studies	38
Agency Consultation	38
Invasive Species	39
Quagga and Zebra Mussel Monitoring and Assessment	39
Delta Conveyance Project	40
California Environmental Quality Act and National Environmental Policy Act Environmental Compliance Process	41
Clean Water Act and Rivers and Harbors Act	41
Tribal Consultation and Engagement	42
Delta Conveyance Design and Construction Authority	42
Soils Investigation	42
Biological Opinions for CVP/SWP Operations	43
USFWS and NOAA Fisheries Biological Opinions	43
SWP Incidental Take Authorization	44
Delta Operations for Delta Smelt and Longfin Smelt	44
Fish Restoration Program	44
Decisions on Endangered Species	49
Trends in Fish Abundance	49
Scientific Efforts in the Upper San Francisco Estuary	52
Feather River Fish Studies	52
Rotary Screw Traps	54
Salmon Escapement Survey	56
Spawning Surveys	57
FRFH Spring-run Chinook Salmon Tagging	58

Snorkel Surveys	58
Beach Seining	59
Sturgeon Studies	59
<i>Ceratonova shasta</i> Sampling	60
Steelhead Mark-Recapture Study	61
Fish-related Mitigation Projects	62
Climate Change	62
Completed in 2020	63
Ongoing During 2020	63
 Chapter 4 Water Quality Programs	 67
Delta Water Quality	69
Water Quality Standards	69
2019–2020 Water Year Hydrologic Classifications	69
Bay-Delta Plan Review	71
SWP Operations to Meet Delta Water Quality Requirements	71
Delta Cross Channel Gates	73
Municipal and Industrial Objectives	73
Agricultural Salinity Objectives	73
Estuarine Habitat Protection Standard	73
Net Delta Outflow Index Standard	74
River Flow Standards	74
Export Standards	75
South Delta Temporary Barriers Project	75
Delta Mercury Control Program and Mercury Monitoring and Evaluation	76
Tidal Wetlands	76
Open Water	77
Delta Mercury Exposure Reduction Program	78
Statewide Mercury Control Policy and Mercury Control Program for Reservoirs	78
Special Studies and Biological Surveys	78

Stockton Deep Water Ship Channel and Lower San Joaquin River Low Dissolved Oxygen	79
Benthic Survey	79
Phytoplankton and Chlorophyll <i>a</i> Survey	80
Activities Outside the Delta	82
Water Quality Monitoring in the SWP	82
Non-SWP Water	87
San Joaquin Valley Agricultural Water Quality Programs	88
Municipal Water Quality Program Branch	88
Municipal Water Quality Investigations Program	88
Quality Assurance Program	89
Bryte Chemical Laboratory	91
Suisun Marsh Program Activities	92
Facility Operations, Maintenance, and Related Activities	92
Suisun Marsh Expenditure History	94

Chapter 5 Legislation and Litigation 97

Legislation	99
Litigation	99
SWP Contracting and Authority	99
Sacramento-San Joaquin Delta	101
Hydropower	109
Oroville Spillways Litigation	110
Other Cases and Proceedings	113

Chapter 6 Water Supply Development and Reliability . 115

Supply Development and Reliability	117
Water Conveyance Through the SWP	117
SWP Delivery Capability Report	120
SWP Future Water Supply Program	120
SWP Water Rights Activities	120

Water Right Permits and Licenses	120
--	-----

Chapter 7 Water Supply 123

California's Hydrology	125
Water Year 2019–2020	125
Autumn and Winter	125
Spring and Summer	126
Precipitation	126
Mountain Snowpack	128
River Runoff	130
Water Supply Indices	130
Water Year 2020–2021 October through December Water Conditions	130
Storage	130
Statewide Storage	130
State Water Project Storage	131
Diversions from the Delta	136

Chapter 8 Water Contracts and Deliveries 141

SWP Water Supply Contracts	143
Contract Extension	143
Amendments to SWP Water Supply Contracts	144
2020 Amendments to SWP Water Supply Contracts	145
Miscellaneous Agreements with SWP Contractors	145
2020 Water Conveyance and Exchange Agreements	145
Water Conveyance and Exchange Agreements Prior to 2020	151
Introduction of Local Water Agreements	158
Turnout Agreements	158
Activities Related to the Monterey Amendments	158
2020 Water Transfers	161
Lower Yuba River Accord	161
Component 1, 2, 3, and 4 Water Deliveries	161

Agreements with Non-SWP Contractors	161
Reclamation and Cross Valley Canal Contractors	161
County of Fresno	161
County of Tulare	162
Hills Valley Irrigation District	162
Kern-Tulare Water District	163
Kern-Tulare Water District/Rag Gulch Water District	163
Lower Tule River Irrigation District	163
Pixley Irrigation District	163
Tri-Valley Water District	163
Reclamation—Joint Point of Diversion	163
Reclamation and Kern National Wildlife Refuge— U.S. Fish and Wildlife Services	165
Reclamation and San Joaquin Valley National Cemetery— U.S. Department of Veterans Affairs	166
Reclamation and Byron-Bethany Irrigation District— Musco Family Olive Company	166
Delta Settlement Agreements	166
North Delta Water Agency	167
Del Puerto	167
Water Deliveries	168
Summary of 2020 Water Deliveries	168
Allocation of Table A Water	170
Specific Water Delivery Information	170

Chapter 9 Power Resources 191

Power Resources Program	193
Major Electric Utility Industry Developments	193
DWR Participation in Electric Utility Industry Activities	193
North American Electric Reliability Corporation Reliability Compliance ..	195
Greenhouse Gas Management	196
Hydropower License Planning and Compliance	196

Existing SWP Power Facilities	198
DWR Power Planning Activities	198
Contractual Resource Arrangements	198
Load Management	201
Contractual Transmission Agreements	201
SWP Power Operations in 2020	202
Energy Consumed	202
Energy Generated and Purchased	202
Contractual Resource Arrangements in 2020	202
Contractual Sales of Excess Power	203
Forecasting Power Operations	203

Chapter 10 Facilities Maintenance 209

Dam Safety Inspections and Reports	211
Routine Inspections	212
Independent Reviews Director's Safety Review Board	212
FERC Reviews	212
Canal Condition Assessment Program Inspections	214
Pipeline Condition Assessment Program Inspections	214
Spillway Inspection Program	215
Arroyo Pasajero Program	215
Repairs, Modifications, and Inspections by Field Division	215
Oroville Field Division	215
Delta Field Division	216
San Luis Field Division	216
San Joaquin Field Division	217
Southern Field Division	217
Other Inspections	218
Bridges and Overchutes	218
Outages for Maintenance and Repair of Facilities	218

Chapter 11 Engineering, Construction, and Real Estate 227

Study and Design Activities	229
New or Continuing Activities	230
Completed Activities	230
Construction Activities	230
SWP—General	230
Oroville Division	231
Delta Facilities	232
North San Joaquin Division	232
San Luis Division	232
South San Joaquin Division	233
Mojave Division	233
Santa Ana Division	233
Construction Activities in Multiple Divisions	233
Environmental Activities	233
Perris Dam Emergency Release Facility Efforts	233
Subsidence Program	234
Castaic Dam Modernization Program	234
Real Estate Activities	234
SWP Acquisitions	234
SWP Property Management	237
SWP Appraisals	237

Chapter 12 Recreation 241

Recreation Areas	243
Recreation Use	243
The COVID-19 Pandemic	243
Recreation Days	245
SWP Educational Visitors Centers	245
Upper Feather River Lakes Recreation Studies	245

Oroville Recreation Plan Amendment	247
Recreation Facilities	247
Planning	247
New Facilities	249
Improvements to Facilities	249
Recreation Activities	250
Lake Oroville State Recreation Area	250
Lake Del Valle State Recreation Area	252
San Luis Reservoir State Recreation Area	252
Castaic Lake State Recreation Area	252
Silverwood Lake State Recreation Area	252
Lake Perris State Recreation Area	252
Fish Planting	253
SWP Deliveries for Recreation	253
Recreation Financing	254
Capital Cost Allocations	254

Chapter 13 Financial Analysis 257

Capital Requirements and Financing	259
Capital Requirements	260
Capital Financing	264
Capital Financing Sources	265
Annual Revenues and Expenditures	269
Project Revenues	269
Project Expenses	276
Future Costs of Water Service	280

Chapter 14 SWP Education and Information 285

News Topics	287
Oroville Spillways Recovery	287
Oroville-Thermalito Complex	287

Sustainable Groundwater Management Act	287
Snow Surveys	288
SWP Allocations	288
Algal Blooms at SWP Reservoirs	288
News Media	288
Publications	288
Digital Resources	288
E-News	288
DWR Updates	289
Social Media	289
Photography and Videos	289
Website	290
Community Relations and Outreach	290
DWR Tours Program	290
SWP Visitors Centers	290
SWP Recreation Outreach Events	290
School Education Program	290
School Events and Educator Outreach	290
Supplementary Teaching Materials	292
Water Wednesdays	292
Professional Development for Teachers	292
Collaboration and Partnerships	292

Glossary 293

Appendix B Data and Computations Used to Determine 2022 Water Charges 317

Tables

Table 1-1	Physical Characteristics of Primary Storage Facilities	7
Table 1-2	Physical Characteristics of Primary Dams	8
Table 1-3	Pumping Plant Characteristics	9
Table 1-4	Power Plant Characteristics, By Facility	10
Table 1-5	Total Miles of Aqueducts.....	10
Table 1-6	SWP Contractors, by Area, as of December 31, 2020	13
Table 3-1	Special Status Delta Fish Species	49
Table 4-1	Mean Water Quality at Selected SWP Grab Sample Locations in 2020	84
Table 4-2	Pesticides, Herbicides, and Other Organic Substances Detected in the SWP in 2020	85
Table 4-3	Inflows to the California Aqueduct in 2020	87
Table 4-4	Suisun Marsh Expenditures and Reimbursements Administered by DWR, Calendar Years 1968–2020	94
Table 7-1	Monthly Precipitation Totals at Various Locations in California, Water Year 2019–2020	128
Table 7-2	Regional Monthly Precipitation for Water Year 2019–2020 .	130
Table 7-3	Statewide Mountain Snowpack for Water Year 2019–2020	131
Table 7-4	Unimpaired Runoff for Water Year 2019–2020	131
Table 7-5	Monthly Reservoir Storage for Water Year 2019–2020	135
Table 8-1	Storage of Water Outside SWP Water Contractor Service Areas in 2020	160
Table 8-2	Article 21 Water Deliveries	161
Table 8-3	2020 Water Transfers Seller Activities	162
Table 8-4	2020 Water Transfer Buyer Activities	163
Table 8-5	2020 Allocated Table A Amounts	170
Table 8-6	Water Delivered to SWP Contractors in 2020, by Service Area	174
Table 8-7	Total Amounts of Water Delivered in 2020, by Month	175

Tables, continued

Table 8-8	Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2020	185
Table 8-9	SWP Water Delivered by Category, 1962–2020	188
Table 9-1	Energy Used at Pumping Plants and Power Plants in 2020, by Month	205
Table 9-2	Energy Generated and Purchased in 2020, by Month	206
Table 9-3	Energy, Transmission, and Related Costs in 2020	207
Table 9-4	Energy and Energy-related Revenue in 2020 per Contract Agreements	207
Table 10-1	Condition Assessments	212
Table 10-2	State Water Project Dam Inspections in 2020	213
Table 10-3	Outages for Maintenance and Repair of Facilities in 2020, by Month	219
Table 11-1	Study and Design Activities, 2020	238
Table 11-2	Construction Activities, 2020	239
Table 12-1	Estimated Recreation Days in 2020, by Field Division Facility	246
Table 12-2	Fish Planted by the Department of Fish and Wildlife in 2020	253
Table 12-3	Recreation and Enhancement Capital Costs of the State Water Project	255
Table 13-1	Capital Requirements and Financing, December 31, 2020 ..	281
Table 13-2	State Water Project Revenues and Expenditures, December 31, 2020	282
Table 13-3	Allocation of Capital Expenditures	261
Table 13-4	East Branch Enlargement Capital Costs by Facility	262
Table 13-5	Estimated Capital Costs for Power Generation and Transmission Facilities	263

Tables, continued

Table 13-6	Estimated Future Costs for Planning Additional Conservation Facilities	263
Table 13-7	Application of Revenue Bond Proceeds	266
Table 13-8	Revenue Bond Proceeds Affecting Project Interest Rate	271
Table 13-9	Actual Bond Sales and Project Interest Rates by Date of Sale	272
Table 13-10	Operations, Maintenance, Power, and Replacement Costs by Facility, Composition, and Purpose	278
Table 13-11	Annual Debt Service on Bonds Sold through December 31, 2020	283
Table 13-12	Estimated Unit Water Charges for 2022 and 2027, by Service Area	280

Figures

Figure 1-1	Names and Locations of Primary SWP Storage and Water Delivery Facilities, December 31, 2020	5
Figure 1-2	Names, Locations, and First Year of Service of SWP Contractors, December 31, 2020	12
Figure 2-1	The Sacramento-San Joaquin Delta	18
Figure 2-2	Temporary Barrier Locations in the South Delta	25
Figure 2-3	Selected West Delta Program Projects	30
Figure 3-1	Longfin Smelt Fall Midwater Trawl Abundance Index, 1967–2020	50
Figure 3-2	Delta Smelt Fall Midwater Trawl Abundance Index, 1967–2020	51
Figure 3-3	Estimated Total Adult Winter-run Chinook Salmon Escapement, 1970–2020	53
Figure 3-4	Estimated Total Adult Spring-run Chinook Salmon Escapement, 1985–2020	54
Figure 3-5	The Lower Feather River	55
Figure 4-1	D-1641 Water Quality Compliance and Monitoring Stations in the Sacramento-San Joaquin Delta	72
Figure 4-2	Compliance and Monitoring Stations and Water Management Facilities in Suisun Marsh	93
Figure 7-1	Statewide Precipitation by Hydrologic Region, 2019–2020 Water Year, as Percent of Average	127
Figure 7-2	Monthly Inflow into Lake Oroville from the Feather River, 2018–2020	136
Figure 7-3	Lake Oroville Cumulative Inflow over the Last 30 Years—Current and Historical Maximum and Minimum	137
Figure 7-4	Daily Storage in Lake Oroville, 2019 and 2020	137
Figure 7-5	SWP Share of Storage and Total Storage in San Luis Reservoir, 2019 and 2020	138
Figure 7-6	Water Pumped at Banks Pumping Plant, 2020	139

Figures, continued

Figure 7-7	Sacramento-San Joaquin Delta Exports by State Water Project and Central Valley Project, 2020	139
Figure 7-8	Water Pumped at Dos Amigos Pumping Plant, 2020	140
Figure 7-9	Water Pumped at Edmonston Pumping Plant, 2020	140
Figure 8-1	Water Delivered in 2020 and Delivery Locations of SWP Contractors and Feather River Area Districts with Water Rights Agreements with DWR	169
Figure 9-1	Names, Locations, and Nameplate Capacities of Primary State Water Project Power Facilities	199
Figure 12-1	Names and Locations of SWP Recreation Areas	244
Figure 12-2	Types of Recreation along the SWP	251
Figure 14-1	Visitors Centers on the SWP	291

Sidebars

State Water Project Power Generation and Consumption in 2020 xl

2020 Income Statement for the State Water Project xlii

Delta Stewardship Council 19

Endangered Species and Biological Opinions 43

State Water Resources Control Board 70

Transfer and Exchange Evaluations 118

Precipitation Indices 129

Runoff Estimates 132

Water Supply Indices 133

SWP Water Supply Contracts 144

Lower Yuba River Accord 164

Appendix A Annual Financial Report
 (discontinued)

Appendix B Data and Computations Used to Determine 2019 Water
 Charges (included in this bulletin)

Appendix C The California State Water Project Summary
 (discontinued)

Appendix D Costs of Recreation and Fish and Wildlife Enhancement
 (discontinued)

Appendix E Water Operations in the Sacramento-San Joaquin Delta
 (discontinued)

Appendix F San Joaquin Valley Post-Project Economic Impact
 (discontinued)

State of California

Gavin Newsom, Governor

California Natural Resources Agency

Wade Crowfoot, Secretary for Natural Resources

Department of Water Resources

Karla A. Nemeth, Director

Cindy Messer, Lead Deputy Director

Vacant, Assistant Lead Deputy Director

Ann Carroll, General Counsel

Kasey D. Schimke, Deputy Director, Legislative Affairs

Margaret Mohr, Deputy Director, Public Affairs

Ted Craddock, Deputy Director, State Water Project

Gary Lippner, Deputy Director, Flood Management and Dam Safety

Kristopher Tjernell, Deputy Director, Integrated Watershed Management

Stephanie Varrelman, Deputy Director, Business Operations

State Water Project Executive Management Team

John Yarbrough, Assistant Deputy Director

Anthony Meyers, Principal Operating Officer

Hong Lin, Financial Manager

Prepared under the supervision of

State Water Project Analysis Office

Dave Paulson, Division Manager

Avery Estrada, Principal Engineer

Greg Clawson, Supervising Engineer

And under the direction of

Mohammed Seyar Musazay, Senior Engineer, Bulletin 132 Project Lead

By

La Tresce Brown, Research Writer

Josh Kendrix, Research Writer

Adrienne Starkey, Research Writer

Divisions, Offices, and Contributors

Office of the General Counsel

Ann Carroll, General Counsel

Robin Brewer	Spencer Kenner	James Mizell
Katherine Deaver	Laurence Kerckhoff	Michelle Morrow
Valentina German-Gerstein	Katherine Killeen	David Steffenson
Bruce Kaminski	Kirsti Larson	

Division of Engineering

Dale Brown, Manager

Brenda Albert	Peter Hegyes	Marie Putnam
Roxanne Boone	Jeanne Kuttel	
Nova Clemenza	Phil LeCocq	

Division of Integrated Science and Engineering

Dean Messer, Manager

Mark Bettencourt	Kyle Hartwigsen	Rachel Pisor
Casey Campos	Farida Islam	Kristina Reese
You Chen Chao	Kristopher Jones	Ryan Reeves
Amy Chase	Joy (Manisay) Khamphanh	Dan Riordan
Marile Colindres	Jason Kindopp	Steven San Julian
Christopher Cook	Anthony Linarez	Brian Schreier
Nicole Darby	Catherine McCalvin	Bijaya Shrestha
Laura Flourney	Leah McNearny	Nadine Small
Ted Flynn	James Newcomb	Hoan Tang
Sid Fong	Lee Petra	Elizabeth Vasquez
Christopher Geach	Shaun Philippart	Elizabeth Wells
Karen Gehrts	Catarina Pien	Chris Wilkinson

Division of Fiscal Services

Vinay Behl, Manager

Rachel Corbett	Lisa Toms
----------------	-----------

Division of Flood Management

Jeremy Arrich, Manager

Bindra Amarjot	Jon Ericson	Andrew Reising
Elizabeth Bryson	John King	Kristin Richmond
Michelle Campbell	Stephen Nemeth	Michelle Ridgway
Patricia Clark	Amelia Nye	
Sean DeGuzman	John Paasch	

Divisions, Offices, and Contributors

Hydropower License Planning and Compliance Office

Gwen Knittweis, Manager

Cassandra Evenson
James Gleim
Lisa Lee

Kryssy Mache
Jeremiah McNeil
Aaron Miller

Joseph Muradyan
Jeff Parsons

Division of Regional Assistance

Arthur Hinojosa, Manager

Joshua Bannister
Chris Bonds
Teresa Connor
Steve Doe
Karen Dulik

Omar Erekat
Kevin Faulkenberry
Kamyar Guivetchi
Jennifer Morales
William Odaly

Alejandro Perez
Alexis Phillips-Dowell
Paul Romero
Bill Samuels
Dan Yamanaka

Division of Operations and Maintenance

David Duval, Manager

Anthony Agustin
Pramod Amatyia
Rodrigo Avalos
Donna Azar
Andy Bambauer
Thomas Banks
Rebecca Barron
Sabrina Bell
Domingo Cardoza
Shicha Chander
Jessie Cheng
Robin Cheng
Andy Chu
Jonathan Conuela
Moranda Dahl
Coyle Dane
Priscilla Delamare
Tasmin Eusuff
James Francia
Dan Garcia
Nicholas George

Haley Hattendorf
Brian Heiland
Trong Hoang
Eric Holland
En-Ching Hsu
Nazrul Islam
Tim Kennelly
Lisa Larsen
Truc Le
John Leahigh
Norman Lee
Patrick Luzuriaga
Mahmoud Mabrouk
Andrew Mangney
Ryan Martin
Jacob McQuirk
Bryant Giorgi
Tracy Pettit
Parm Randhawa
Erik Reyes
Mark Risney

Eric See
Ajeshni Doreen
Edna Smith
Gerald Snow
Behzad Soltanzadeh
Ellen Tam
Sharon Tapia
Mark Thompson
Karen Tolentino
Loi Tran
Robert Trang
Joshua Urias
Mary Valdez
Tanya Veldhuizen
Olivia Virgadamo
Molly White
Brienne Sakata
David Sarkisian
Daniel Wisheropp
Tariq Yusefzai
Arian Zamanian

Divisions, Offices, and Contributors

Public Affairs Office

Margaret Mohr, Assistant Director

Ryan Endean

Maggie Macias

Division of Safety of Dams

Sharon Tapia, Manager

Eric Holland

Shawn Jones

Andrew Mangney

State Water Project Analysis Office

Dave Paulson, Manager

David Barth

Erik Goodman

Jacque Tozer

Bonnie Crissman

Oswaldo Solorzano

Shaw Yalda

State Water Project Power and Risk Office

Ghassan Alqaser, Manager

David Brown

Maifny Foley

Masoud Shafa

Trong Bui

Tony Lam

Ram Verma

Deane Burk

Keith Louie

John Yarbrough

Chi Doan

Mike Ramsey

Larry Yu

Division of Planning

Kamyar Guivetchi, Manager

Ajay Goyal

Sean Sou

James Wicking

Elissa Lynn

Division of Multibenefit Initiatives

Steve Rothert, Manager

Sean Bagheban

Molly Ferrell

Sandra Maxwell

Katherine Bandy

David Julian

Anitra Pawley

Bryan Brock

Andrea Lobato

Angels Calderaro

Randall Mager

Legislative Affairs Office

Kasey D. Schimke, Assistant Director

Michelle Cobian

Tara Moritz

Trisha Swanson

Divisions, Offices, and Contributors

Executive

Patricia Clark
Janiene Friend

Bill Harrell
Russ Stein

Marcus Yee

Delta Conveyance Office

Carolyn Buckman

Darryl Hayes

Kathryn Icelow

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).

The California Water Commission's Executive Officer is Joseph Yun, and the Commission members at the time of publication are the following:

Matthew Swanson, Chair

Fern Steiner, Vice-Chair

Tyrone Bland

Daniel Curtin

Kimberly Gallagher

Alexandre Makler

Sandra Matsumoto

Katerine Moulène

Jose Solorio

Acronyms and Abbreviations

Symbols

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

A

af acre-feet Acre-feet acre-feet
AVEK Antelope Valley-East Kern

B

Bay-Delta San Francisco Bay/Sacramento-San Joaquin Delta
Bay-Delta Plan Water Quality Control Plan for the San Francisco Bay/
 Sacramento-San Joaquin Delta Estuary
BiOp Biological Opinion

C

CAISO California Independent System Operator
California State Parks California Department of Parks and Recreation
C.A.S.T. Catch A Special Thrill
CDPH California Department of Public Health
Central Valley Water Board Central Valley Regional Water Quality Control
 Board
CEQA California Environmental Quality Act
CESA California Endangered Species Act
cfs cubic feet per second
Contra Costa Contra Costa Water District
CVP Central Valley Project
CWC California Water Code
CWF California WaterFix

D

D-1641 State Water Resources Control Board, Water Right Decision 1641
DCA Delta Conveyance Design and Construction Authority
Delta Sacramento-San Joaquin Delta
Delta Fish Agreement Delta Pumping Plant Fish Protection Agreement
DFW Department of Fish and Wildlife California
DMCP Delta Mercury Control Program
DO dissolved oxygen
DOE Division of Engineering

DSC Delta Stewardship Council
DSOD Division of Safety of Dams
DSRB Director's Safety Review Board
DSS Dam Safety Services
DWR Department of Water Resources

E

EBRPD East Bay Regional Park District
EC electrical conductivity
EIR environmental impact report
EPA U.S. Environmental Protection Agency
ESA Endangered Species Act

F

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

G

GHG greenhouse gas

L

LADPR Los Angeles County Department of Parks and Recreation
LADWP Los Angeles Department of Water and Power
LiDAR Light Detection and Ranging

M

maf million acre-feet
MeHg methylmercury
Metropolitan Metropolitan Water District of Southern California
mg/L milligrams per liter
MIDS Morrow Island Distribution System
mS/cm millisiemens per centimeter
MW megawatts
MWh megawatt hours
MWQI Municipal Water Quality Investigations
MWT McCormack-Williamson Tract

N

NDOI Net Delta Outflow Index
NEPA National Environmental Policy Act
NERC North American Electric Reliability Corporation
NOAA Fisheries National Marine Fisheries Service

North Delta North Delta Water Agency
NTU nephelometric turbidity units

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
PFAS per- and polyfluoroalkyl substances
PFBA perfluorobutanoic acid
PFHxA perfluorohexanoic acid
PFPeA perfluoropentanoic acid
PG&E Pacific Gas & Electric Company
PM&Es protection, mitigation, and enhancement measures

R

Reclamation U.S. Bureau of Reclamation
RFWE recreation and fish and wildlife enhancement
RM River Mile

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
SBA South Bay Aqueduct
SCE Southern California Edison
SDIP South Delta Improvements Program
SJR San Joaquin 4 Rivers
SRR Sacramento River Region
State Water Board State Water Resources Control Board
Subventions Program Delta Levee Maintenance Subventions Program
SWP State Water Project
SWPAO State Water Project Analysis Office

T

TLR Tulare Lake Region

U

USACE U.S. Army Corps of Engineers
USFWS U.S. Fish and Wildlife Service

W

WECC Western Electricity Coordinating Council

WSPP Western Systems Power Pool

State Water Project Contractors

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

Full Name	Abbreviation
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
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
Littlerock Creek Irrigation District	Littlerock
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
Santa Clarita Valley Water Agency	Santa Clarita
Solano County Water Agency	Solano
Tulare Lake Basin Water Storage District	Tulare
Ventura County Watershed Protection District	Ventura



State Water Project Highlights

Geese swim through the habitat surrounding the future location of the Lookout Slough tidal restoration project in the Cache Slough Complex within the Yolo Bypass.



The annual Bulletin 132 series began in 1963 and reported the first deliveries of water by the new State Water Project (SWP). Bulletin 132-21, Management of the California State Water Project, continues this series as the fifty-ninth edition. It reports on SWP planning, construction, finance, management, and operations during calendar year 2020. 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.

SWP Allocations

On October 1, 2019, SWP Contractors submitted initial requests for 2020 totaling 4.17 maf. DWR approved delivery of 0.42 maf on November 27, 2019, resulting in initial Table A amounts of 10 percent of SWP Contractor requests. DWR increased the 2020 Table A amounts to 0.83 maf, for a final allocation of 20 percent, on May 22, 2020.

Yearly Activities Summary

2020 Precipitation and Water Storage

Precipitation and Mountain Snowpack in Water Year 2019–2020

California experienced below average rainfall (71 percent of average) for the water year. The largest amounts of precipitation, measured by percent of average, fell in the South Lahontan and Colorado Desert watersheds. The three Sierra watersheds ranged from 58 percent (Sacramento) to 69 percent of average (San Joaquin).

Snow accumulation was well below normal as of April 1. 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 16.0 inches or 54 percent of average. This was a dramatic change relative to 2019, which was 161 percent of average. April 1 is typically the average annual date of peak snow accumulation. On May 1, 2020, the snowpack was only 36 percent of average.

River Runoff

Statewide river runoff totaled 47 percent of average in the 2019–2020 water year. The monthly runoff totals for the Sacramento River Region, the San Joaquin 4 Rivers, the Tulare Lake Region, and the Feather River are shown in Table 7-4. As shown, the water year runoff totals for these areas ranged from 51 to 55 percent of average.

Water Supply Indices

The Sacramento Valley 40-30-30 Index and the San Joaquin Valley 60-20-20 Index were both “dry,” based on observed data for water year 2019–2020.

Water Year 2019–2020 Statewide Storage Totals

Monthly storage totals for the major Sierra Nevada reservoirs are shown in Table 7-5. Water year 2019–2020 began at 118 percent of average reservoir storage. Storage, as a percent of average, was never higher for the remaining water year. The percent of average reached the lowest level at the

end of July (92 percent). In September, the 2019–2020 water year ended at 93 percent of average.

2020 Storage Totals in Major SWP Reservoirs

End-of-year storage on December 31, 2020, in major SWP reservoirs and the State's share of joint-use reservoirs was 2.4 maf or 45.71 percent of maximum storage, compared to 3.5 maf or 67 percent of maximum storage at the end of 2019. The average end-of-month total storage in major SWP reservoirs for 2020 was 3.3 maf.

Diversions from the Delta

In 2020, the North Bay Aqueduct received 50,712 acre-feet (af) of water from the Barker Slough Pumping Plant.

Figure 7-6 shows the amounts of water pumped each month for 2020 at Banks Pumping Plant, totaling 1,047,562 af. Of this amount, the SWP diverted 982,994 af. There was 3,477 af of water pumped for the Cross Valley Canal, and 61,092 af was wheeled for the CVP.

The CVP diverted 1,909,863 af at Jones Pumping Plant and 104,672 af at Contra Costa Pumping Plant in 2020.

Maximum daily Sacramento-San Joaquin Delta (Delta) exports occurred on August 23 at 19,936 af. Combined SWP and CVP monthly Delta exports in 2020 varied from a low of 99,964 af in May, to a high of 435,146 af in August. Delta exports totaled approximately 3.1 maf in 2020.

For more information, see Chapter 7, Water Supply.

2020 Water Deliveries

In 2020, a total of 2,686,537 af of SWP and non-SWP water was delivered to 29 SWP Contractors and 24 non-SWP agencies. The

SWP portion totaled 1,462,314 af, and the non-SWP portion totaled 1,224,223 af.

SWP

The 2,686,537 af delivered to SWP Contractors was categorized as follows:

- 552,968 af of Table A water
- 55,076 af of transfers and exchanges of Table A water among SWP Contractors
- 379,135 af of 2019 carryover water
- 944 af of Article 21 water
- 209,191 af of water bank recovery
- 21,589 af of delivery of backup water
- 5,497 af of settlement water
- 786 af for parks and recreation
- 17,775 af of local water
- 16,559 af of permit water
- 196,158 af of other non-SWP programs

Non-SWP

The 1,224,223 af portion delivered to 24 non-SWP agencies was categorized accordingly:

- 7,372 af of SWP contracted supply
- No delivery under Article 21 transfer
- 55,854 af other non-SWP programs
- 1,132,846 af of regulated delivery of local supply
- 6 af for parks and recreation
- 421 af for fish and wildlife
- 11,922 af of Cross Valley Canal Contractors
- 21,447 af for Kern National Wildlife Refuge
- 941 af for annual contracts

For more information, see Chapter 8, Water Contracts and Deliveries.

Power Resources

Energy used at the 29 SWP pumping and generating plants—excluding Castaic Powerplant, which is owned and operated by Los Angeles Department of Water and Power

(LADWP)—totaled 6.54 million megawatt hours (MWh). To meet SWP energy needs, DWR purchased 0.99 million MWh of energy at a cost of \$30.49 million. This included 0.41 million MWh from four renewable energy electric utilities at a cost of \$17.26 million and 0.58 million MWh of long-term energy at a cost of \$13.24 million. Additional associated energy costs totaled \$129.10 million, including transmission costs. The total cost of energy-related costs for 2020 was \$159.60 million.

Greenhouse Gas Management

In 2020, DWR reported its calendar year 2019 pump load, generation, energy imports, and sulfur hexafluoride emissions to the California Air Resources Board. DWR's sulfur hexafluoride emissions were below the maximum allowable limit; however, because the allowable limit will be lower in future years, DWR continued to implement plans to further reduce its sulfur hexafluoride emissions. DWR continued to work with the California Air Resources Board to ensure that the new greenhouse gas regulations will not have significant impacts on SWP operation. DWR also reported its 2019 greenhouse gas emissions to The Climate Registry.

DWR procured compliance instruments to meet its contractual obligation for the Lodi Energy Center's Cap-and-Trade Program compliance cost.

For more information regarding DWR's management of greenhouse gas emissions, and its efforts to add renewable, greenhouse gas emission-free energy to the SWP's energy portfolio, see Chapter 9, Power Resources.

Hydropower License Planning and Compliance

DWR holds three hydropower licenses and two conduit exemptions issued by the Federal Energy Regulatory Commission (FERC): Oroville Facilities, FERC

Project No. 2100; South SWP Hydropower, FERC Project No. 2426; Pine Flat Transmission Line, FERC Project No. 2876; Alamo Powerplant Project, FERC Project No. 14579; and Mojave Siphon Powerplant Project, FERC Project No. 14580.

South SWP Hydropower

On August 1, 2016, DWR filed two preliminary application documents and notices of intent with FERC for the relicensing of South SWP Hydropower and requested the Devil Canyon Powerplant (i.e., Devil Canyon Project) be relicensed separately from Warne and Castaic power plants. The first preliminary application document and notice of intent were submitted by DWR and LADWP for the relicensing of Warne and Castaic power plants. (LADWP operates and maintains the Castaic Powerplant and is a joint licensee with DWR on FERC Project No. 2426.) Warne and Castaic power plants will continue to be referred to as South SWP Hydropower. The second preliminary application document and notice of intent were filed solely on behalf of DWR for the relicensing of the Devil Canyon Project.

With the August 1, 2016, submission of the Devil Canyon Project preliminary action document, DWR also requested FERC's approval to use the Traditional License Process in lieu of the Integrated Licensing Process, which is FERC's default relicensing process. DWR and LADWP will use the Integrated License Process for South SWP Hydropower relicensing.

On September 30, 2016, FERC issued a notice to proceed and approved DWR's request to use the Traditional License Process for the Devil Canyon Project. Upon completion of the relicensing effort, FERC will issue one new license to DWR and LADWP as co-licensees for the Warne and Castaic power plants, which will retain the name and number South SWP Hydropower,

State Water Project Power Generation and Consumption in 2020

Power Generation and Consumption	Megawatt Hours
Energy generation by SWP facilities	2,083,371
Energy sources and firm purchases under agreements and exchanges	2,031,523
Total Energy Available to the SWP	4,114,893
Energy sales	(236,543)
Net SWP Power Consumption¹	3,878,530

¹ Totals may not sum as expected due to rounding.

FERC Project No. 2426, and one new license to DWR for the Devil Canyon Powerplant, to be assigned the name and number Devil Canyon Project, FERC Project No. 14797.

For more information about hydropower relicensing activities, see Chapter 9, Power Resources.

Long-term Purchase Agreements

DWR contracts for the energy output of five hydroelectric plants totaling 30 megawatts owned and operated by The Metropolitan Water District of Southern California. The contract was effective on November 1, 2017, and terminated September 30, 2019. On September 9, 2019, DWR and Metropolitan executed a new agreement under which DWR receives the output of four small hydroelectric plants totaling 29 MW starting on October 1, 2019. DWR also receives renewable energy credits from these four hydroelectric

plants. The agreement's termination date is September 30, 2022.

Financial Analysis

In 2020, DWR continued to pay bondholders as scheduled. The SWP was financially viable and was indirectly paid for by the approximately 27 million water users served by the project. Direct payment was through the 29 SWP Contractors. In 2020, the SWP handled approximately \$1.08 billion in revenues and \$1.1 billion in expenses. The 2020 Income Statement for the SWP sidebar presents a summary of the year's revenues and expenses. For detailed information, see Chapter 13, Financial Analysis.

Engineering, Construction, and Real Estate

In 2020, engineering, construction, and real estate work continued to enhance, expand, repair, and protect the SWP and other facilities within the State. Significant projects included the seismic remediation

of Perris Dam; emergency and recovery efforts of Oroville Dam service and emergency spillways; canal liner raise and instrumentation between Mileposts 175 and 213; and habitat restoration projects.

DWR worked on 21 construction contracts in various SWP construction divisions in 2020. Contract projects included levee repairs, a new setback levee for the Yolo Bypass, radial gate repairs for SWP facilities, and concrete repairs for the California Aqueduct.

In 2020, DWR processed a net total of \$3.42 million in payments 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 entry permits, licenses, leases, and relocation expenses.

The COVID-19 pandemic disrupted supply chains and availability of resources. Most DWR employees changed from working at DWR locations to exclusively working remotely (telework). For jobs in which telework was not an option, safety considerations such as masking and social distancing were implemented. These two factors directly affected the amount of work performed in 2020.

For more information, see Chapter 11, Engineering, Construction, and Real Estate.

Delta Resources and Environmental Issues

Invasive Species

In 2020, DWR and two collaborating water agencies, Santa Clara Valley Water District and The Metropolitan Water District of Southern California, sampled for veligers at 16 locations in the SWP (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. Mussel inspections also occurred when facilities were dewatered for maintenance and inspection purposes. A mussel inspection was conducted in the San Bernardino Tunnel, which conveys water from Silverwood Lake to Devil Canyon Powerplant in the SWP East Branch. In the SWP West Branch, the Peace Valley Pipeline that conveys water from Quail Canal to Warne Powerplant and Pyramid Lake was inspected. No mussels were observed during the inspections.

Delta Conveyance Project

Because the SWP relies on the Delta's natural channels to convey water, it is vulnerable to earthquakes and sea level rise. Upgrading SWP infrastructure protects against these threats and secures the longevity of the SWP and the future reliability of SWP water supplies. The purpose of the proposed Delta Conveyance Project is to modernize the aging SWP infrastructure in the Delta to restore and protect the reliability of SWP water deliveries in a cost-effective manner, consistent with the State's Water Resilience Portfolio, and in doing so, allow DWR to address sea level rise and climate change, minimize water supply disruption caused by seismic risk, and provide operational flexibility to improve aquatic conditions in the Delta.

Delta Conveyance Design and Construction Authority

The Delta Conveyance Design and Construction Authority continued to develop engineering and design information to help inform the Delta Conveyance Project environmental review process. This included the presentation of data to the authority's Stakeholder Engagement Committee to generate input and ideas that can help avoid or minimize potential local effects of the project. The Delta Conveyance Design and Construction Authority reached out to various members of the Delta community to ensure the Delta Conveyance Design and

2020 Income Statement for the State Water Project

Revenues	Thousands of Dollars
Water Contract Payments	1,274,497
Revenue Bond Cover Adjustments	(62,159)
Rate Management Adjustments	(40,479)
Other Revenues	35,237
Total Operating Revenues	1,207,173
Expenses	
Project Operations, Maintenance, Power, and Replacement	824,382
Deposits to Reserves	(485)
Water Bond Principal	164,519
Water Bond Interest	124,511
Total Operating Expenses and Debt Service	1,202,673
Net System Revenues	4,500

Construction Authority was using current and relevant data and information in its work.

The Delta Conveyance Design and Construction Authority joint exercise of powers agreement was amended and reconstituted on December 31, 2020, to expand the Board of Directors to seven members, including additional public water agencies that had since voted to support project planning.

San Joaquin River Restoration Program

The 2020 water year was classified as dry, as near-average precipitation early in the water year was followed by a very dry January and

February. A total of 202,200 af of water was released from Friant Dam to support fish and their habitat in the San Joaquin River, marking the fourth straight year Friant Dam flows were connected to the Delta. However, flow constraints due to seepage restrictions continue to limit flows, and over 63,500 af of unreleased restoration flows were sold back to federal water contractors for mostly irrigation uses.

Spring-run Chinook salmon returned to the San Joaquin River for the second straight year. As with 2019's historic returns, the pattern indicates that hatchery-raised juveniles released into the system are returning as adults after several years to spawn and continue the cycle of life. A total

of 57 returning adult spring-run Chinook salmon were trapped in fyke nets in the lower San Joaquin River Restoration Program Restoration Area in 2020.

More information is available on the San Joaquin River Restoration Program's website.

Recreation

Overall, 2020 was an anomalous year for SWP recreation because of safety concerns. With no treatment for or vaccine to prevent COVID-19 (coronavirus disease 2019, a highly contagious respiratory disease caused by the SARS-CoV-2 virus), and in response to the State of Emergency declared March 4, 2020, the Governor issued Executive Order N-33-30 on March 19, 2020. The executive order required all Californians—except for those who worked in certain federally-defined critical infrastructure sectors—to stay home indefinitely. The California Department of Parks and Recreation closed visitors centers and eliminated almost all recreation events and campfire programs. People were required to practice “social distancing,” physical distance maintained between individuals in order to avoid catching or transmitting an infectious disease. As a result, recreation activities largely shut down except in cases where people could get completely away from crowds, such as on uncrowded trail systems.

Once sites were allowed to reopen later in 2020, safety measures varied by facility. Some remained open to a limited number of guests, while others required an advance reservation. Most SWP recreational facilities required all guests to use a face mask except outdoors and reduced campground attendance to 50 percent capacity, which created a one-site safety zone between each campsite.

SWP Milestones through the Decades

50 Years Ago—1970

SWP construction continued on schedule. At the end of 1970, 96 percent of the facilities required to fulfill initial water delivery commitments were either completed or under construction. A contract for the construction of Perris Dam, the southernmost facility of the SWP, was awarded in 1970.

40 Years Ago—1980

The most important SWP court decision in nearly 20 years was handed down by the Sacramento Superior Court in *Tulare Lake Basin Water Storage District v. State of California*. The action was brought by Tulare and other SWP contractors. The decision, which was in favor of DWR on all counts, held that DWR did not breach its water supply contracts in 1976–1977, when it released stored water for salinity control in the Delta in compliance with the State Water Resources Control Board Basin Plans.

30 Years Ago—1990

In 1990 California experienced its fourth consecutive year of drought—a drought that critically affected the SWP's operations. In fact, January 1990 was preceded by the driest December on record in the Feather River drainage area, the primary source of SWP's water supply. In March 1990, the annual maximum storage in Lake Oroville was at the lowest it has been since 1977—2,101,924 af. Because of diminished water supplies, DWR was forced to make drastic cuts in deliveries for the first time since 1977. Out of original requests for 1,243,786 af of entitlement water for agricultural use, the SWP delivered only 612,621 af.

20 Years Ago—2000

Construction of Phase I of the East Branch Extension for San Bernardino and Riverside

counties continued with work on the Crafton Hills Reservoir and Dam, pipeline Reach 3, and Greenspot, Crafton Hills, and Cherry Valley pump stations. The project, when completed, will convey water to the San Geronio Pass Water Agency service area.

In 2000, the CALFED Bay-Delta program published a plan to fix Delta water problems (ecosystem health, water quality, levee system integrity, and water supply reliability) and address its major water challenges over the next 30 years. DWR vigorously supported CALFED, seeing it as a means of developing and managing the State's water resources to benefit the public and the environment, as well as meet the water requirements of the SWP.

Agreement on the plan was jointly announced by State and federal authorities on June 9, 2000, and the plan was formalized in a Record of Decision issued on August 28, 2000. DWR assumed a leading role in implementation of the plan, including programs related to water storage, Delta conveyance, Delta levee system integrity, watershed management water use efficiency, and water quality.

10 Years Ago—2010

A special exhibit honoring California's State Water Project began in September 2010 at The California Museum. Entitled "Extreme Engineering: The California State Water Project Past, Present and Future," the exhibit showcased the SWP's delivery system and explored its many benefits.

The final California Drought Contingency Plan, released in November 2010, represents the first State drought plan and was developed following the Governor's executive orders and drought proclamations in 2008 and 2009. It is a planning and implementation document that may be used to assist agencies in preparing for, responding to, and recovering from drought.

The Drought Contingency Plan was prepared in conjunction with the California Water Plan and will be updated every five years.



Chapter 1

The State Water Project

Western grebes (Aechmophorus occidentalis), one of which is on a nest, are seen in Thermalito Afterbay in Butte County.

*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, water deliveries, 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 14 provide more detail on significant events and specific topics related to the management of the SWP in calendar year 2020. At the end of the Bulletin, Appendix B presents data and computations used to determine the SWP Contractors' Statements of Charges for 2022.

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 two 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 six 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 the issuance 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 SWP Contractors 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 27 million of California's estimated 39 million residents benefit from SWP water.

The water stored and delivered by the SWP originates as rainfall and snowmelt runoff in Northern and Central California's watersheds, where most of the state's precipitation occurs. The amounts of precipitation and snowpack, as well as the rate and amount of water from rainfall and snowmelt runoff, are used to determine how much water the SWP can deliver in any given year.

Since 1968, DWR has monitored and recorded annual precipitation and runoff for each water year, which begins on October 1 and ends on the following September 30.

Project Facilities

The SWP depends on a complex system of dams, reservoirs, power plants, pumping plants, canals, pipelines, 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), 21 reservoirs,

30 pumping and generating plants, and approximately 700 miles of aqueducts and pipelines. Figure 1-1 shows the names and locations of primary SWP storage and water delivery facilities.

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 acre-feet (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 and San Joaquin rivers flow into the Sacramento-San Joaquin Delta (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, 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 443-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 U.S. Bureau of Reclamation. DWR's share of gross storage in the reservoir is 1,062,183 af. Generally, water is pumped into San Luis Reservoir from late fall through early spring, where it is temporarily stored for release back to the California Aqueduct to meet summertime demands of SWP and Central Valley Project 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 the U.S. Bureau of Reclamation.

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



Figure 1-1 Names and Locations of Primary SWP Storage and Water Delivery Facilities, December 31, 2020

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 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 expands deliveries in these service areas and includes two new

SWP facilities, Citrus Reservoir and Citrus Pump Station.

Water in the West Branch flows through Oso Pumping Plant, Quail Lake, Peace Valley Pipeline, and 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 generating plants and power purchased from and exchanged with other utilities. 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.

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 operation, maintenance, power, and replacement costs associated with water supply, are paid by the 29 SWP Contractors that have contracts with DWR for the delivery of SWP water.

For more information on financing, see Chapter 13, Financial Analysis.

Table 1-1 Physical Characteristics of Primary Storage Facilities

Facility	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 Diversion Pool	13,400	320	10
Thermalito Forebay	11,800	630	10
Thermalito Afterbay	57,000	4,300	26
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 ¹	2,027,800	12,520	65
O'Neill Forebay ²	56,400	2,700	12
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
Crafton Hills Reservoir	307	13	0
Citrus Reservoir	560	17	0

¹ DWR's share of storage in San Luis Reservoir, jointly owned with the U.S. Bureau of Reclamation, is 1,062,183 acre-feet.

² DWR's share of storage in O'Neill Forebay is 29,500 acre-feet.

SWP Contractors

From 1963 through 1967, 32 agencies or districts signed 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 Water Supply Contract; Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018. Therefore, only 29 SWP

Contractors have contracts with DWR as of December 31, 2020.

The contracts are in effect for the longest of the following periods:

- the project repayment period, which extends to December 31, 2035;
- 75 years from the effective 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.

The contracts initially provided for a combined maximum annual Table A amount of 4,230,000 af of the water supply. As a result of contract amendments in the 1980s

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	544	385	18,600	77,664
O'Neill Forebay	233	88	14,300	2,877
Los Banos Detention	384	167	1,370	2,100
Little Panoche Detention	676	152	1,440	1,210
Pyramid	2,606	400	1,090	6,860
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
Crafton Hills Reservoir Enlargement	2,932	95	565	152

and the Monterey Amendment, the current combined maximum annual Table A amount by 2021 totals 4,172,786 af (see Appendix B, Table B-4 for details).

Figure 1-2 (located at the end of the chapter) shows the name and location of each SWP Contractor and the first year of SWP delivery service for each. Table 1-6 (also at the end of the chapter) presents information about each SWP Contractor.

For more information about existing SWP Water Supply Contracts and annual water deliveries, see Chapter 8, Water Contracts and Deliveries.

Future Planning and Construction

The planning, design, and construction of SWP facilities were based on studies and analyses that projected SWP Contractors' annual water delivery needs. To meet these projected needs, water conservation reservoirs, storage facilities, and delivery facilities were planned to be constructed in stages as demands for water increased. Lake Oroville and San Luis Reservoir 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

Table 1-3 Pumping Plant Characteristics

Facility	Number of Units	Normal Static Head (feet)	Total Flow at Design Head (cubic feet per second)	Total Motor Rating (horsepower)
Hyatt	3 (p-g) ¹	500–625	5,610	519,000
Robie Thermalito	3 (p-g) ¹	85–102	9,120	120,000
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) ¹	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 ²	6	521	134	10,500
Bluestone ²	6	484	134	10,500
Polonio Pass ²	6	533	134	10,500
Buena Vista ²	10	205	5,405	144,500
Teerink ²	9	233	5,445	150,000
Chrisman ²	9	518	4,995	330,000
Edmonston ²	14	1,926	4,480	1,120,000
Oso	8	231	3,252	93,800
Pearblossom	9	540	2,575	203,200
Greenspot	5	382	70	5,400
Citrus	8	665	160	18,000
Crafton Hills	7	613	135	13,500
Cherry Valley	4	75	52	1,000

¹ The term p-g indicates pumping-generating units.

² These plants have one unit in reserve.

of origin would influence the final schedule for SWP facilities.

Demands for SWP water are expected to increase as California's population continues to grow and as the effects of climate change affect the State's water resources. Increasingly, issues such as escalating costs, environmental concerns, and increased non-SWP demand for limited water supplies have become important factors affecting the planning and construction of new facilities.

In response to changes brought about by population growth, environmental concerns, climate change, differences in local water use, local water conservation programs, conjunctive-use programs, and other factors, DWR continues to plan, design, and construct transportation and power-producing facilities for the SWP.

Because of changes in water management policy, DWR continues to reassess plans for additional facilities that will incorporate increased environmental safeguards, while also increasing SWP delivery

Table 1-4 Power Plant Characteristics, By Facility

Hydroelectric Facility	Number of Units	Normal Static Head (feet)	Total Flow at Design Head (cubic feet per second)	Net Dependable Capacity (megawatts)	Nameplate Capacity (megawatts)
Hyatt	6 (3 p-g) ¹	410–676	16,950	645	645
Thermalito Diversion Dam	1	63–77	615	3	3
Robie Thermalito	4 (3 p-g) ¹	85–102	17,400	114	114
Gianelli (total)	8 p-g ¹	99–327	16,960	363	424
Warne	2	719–739	1,600	67	74
Castaic ²	7 (6 p-g) ¹	900–1,050	20,820	1,128	1,254
Alamo	1	115–141	1,740	15	17
Mojave Siphon	3	81–136	2,880	29	30
Devil Canyon	4	1,406	2,940	235	276

¹ The term p-g indicates pumping-generating units.

² 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 Pump Station	0.0	0.0	16.2	0.0	16.2
Greenspot Pump 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

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.

For more information about current SWP planning and construction, see Chapter 11, Engineering, Construction, and Real Estate. Information about prior construction activities can be found in previous issues of Bulletin 132.

For more information on climate change, see Chapter 3, Environmental Programs.

Climate Change

Climate change has 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; the volume and timing of runoff; the water quality in the Delta due to sea-level rise; and the amount of irrigation water needed due to modified evapotranspiration rates.

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

To address these concerns, DWR and the U.S. Bureau of Reclamation are coordinating with federal, State, and local agencies and nongovernmental organizations to provide qualitative and quantitative assessments of the potential risks and effects of climate change on California's water resources. This multiagency coordination effort will also update decision makers on climate change impacts, the ability of existing facilities to accommodate these impacts, and available mitigation measures.

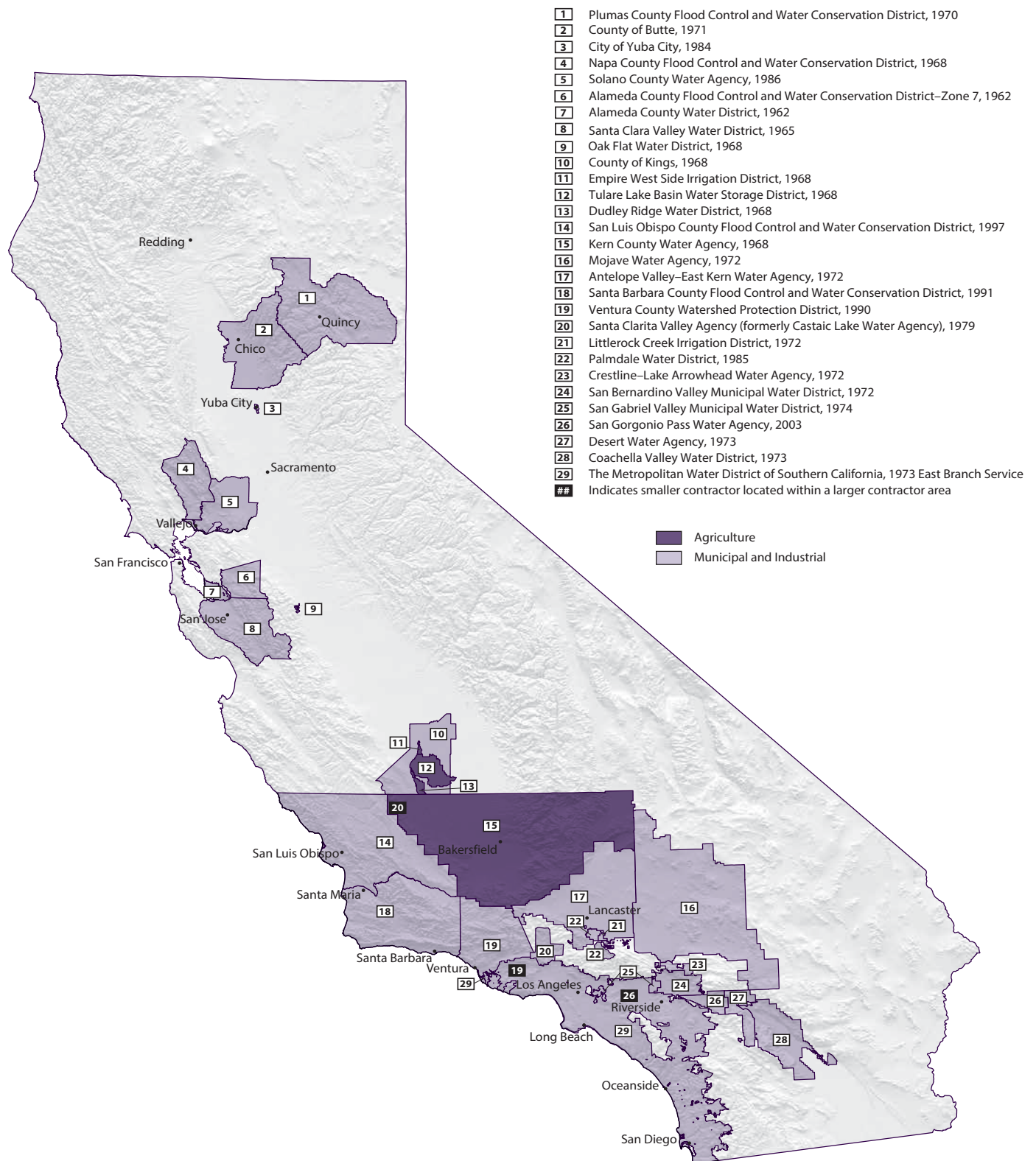


Figure 1-2 Names, Locations, and First Year of Service of SWP Contractors, December 31, 2020

Table 1-6 SWP Contractors, by Area, as of December 31, 2020

Contractor	Cumulative Deliveries (acre-feet) ¹	Annual Table A (acre-feet)	Payments (in dollars) ³	Gross Area (acres)	Assessed Valuation (in dollars) ²	Estimated Population
Upper Feather River Area						
City of Yuba City	56,435	9,600	11,588,270	10,133	4,713,051,974	71,070
County of Butte	154,889	27,500	19,692,714	1,049,280	22,836,641	210,291
Plumas County Flood Control and WCD	14,337	2,700	3,596,692	1,676,056 ^a	2,401,991,425	19,517
<i>Subtotal</i>	<i>225,661</i>	<i>39,800</i>	<i>34,877,676</i>	<i>2,735,469</i>	<i>7,137,880,040</i>	<i>300,878</i>
North Bay Area						
Napa County Flood Control and WCD	401,069	29,025	176,646,114	510,010	41,712,637,219	139,099
Solano County Water Agency	1,025,759	47,756	234,631,094	581,760	58,204,368,619	447,643
<i>Subtotal</i>	<i>1,426,828</i>	<i>76,781</i>	<i>411,277,208</i>	<i>1,091,770</i>	<i>99,917,005,838</i>	<i>586,742</i>
South Bay Area						
Alameda County Flood Control and WCD—Zone 7	1,888,646	80,619	519,255,535	275,900	61,116,475,735	261,261
Alameda County Water District	1,469,144	42,000	188,934,803	66,943	75,529,575,914	356,160
Santa Clara Valley Water District	4,734,549	100,000	573,606,782	835,098	516,068,803,614	1,954,286
<i>Subtotal</i>	<i>8,092,339</i>	<i>222,619</i>	<i>1,281,797,120</i>	<i>1,177,941</i>	<i>652,714,855,263</i>	<i>2,571,707</i>
San Joaquin Valley Area						
County of Kings	182,791	9,305	16,303,378	893,300	9,125,193,927	149,942
Dudley Ridge Water District	2,584,865	45,350	130,209,341	37,600	119,761,915	36
Empire West Side Irrigation District	131,756	3,000	6,699,960	7,500	^b	12
Kern County Water Agency	41,329,377	982,730	2,956,775,999	5,224,000	93,370,000,000	900,202
Oak Flat Water District	225,526	5,700	11,202,014	4,500	^b	10
Santa Clarita Valley Water Agency ⁴	409,606		511,383,444	8,700 ^c	4,532,936	0
Tulare Lake Basin Water Storage District	5,215,740	87,471	249,290,519	189,519	206,000,000	24
<i>Subtotal</i>	<i>50,079,661</i>	<i>1,133,556</i>	<i>3,370,481,211</i>	<i>6,365,119</i>	<i>102,825,488,778</i>	<i>1,050,226</i>
Central Coastal Area						
San Luis Obispo County Flood Control and WCD	96,767	25,000	136,867,235	2,122,240	45,457,307,011	279,083
Santa Barbara County Flood Control and WCD	510,161	45,486	931,727,378	193,391	36,056,569,190	390,066
<i>Subtotal</i>	<i>606,928</i>	<i>70,486</i>	<i>1,068,594,613</i>	<i>2,315,631</i>	<i>81,264,371,858</i>	<i>669,149</i>
Southern California Area						
Antelope Valley-East Kern Water Agency	2,469,459	144,844	759,704,344	1,525,120	35,844,529,505	470,543
Coachella Valley Water District	1,867,851	138,350	857,022,426	639,857	61,209,789,634	290,000
Crestline-Lake Arrowhead Water Agency	69,427	5,800	38,554,562	54,900	3,221,001,908	29,000
Desert Water Agency	1,436,575	55,750	429,032,121	208,000	16,075,753,025	89,317
Littlerock Creek Irrigation District	23,232	2,300	9,771,243	10,355	420,413,000	3,405
The Metropolitan WD of Southern California	41,756,489	1,911,500	14,684,647,647	3,316,072 ^d	2,901,129,926,343	18,963,000
Mojave Water Agency	554,733	85,800	441,584,871	3,136,000	35,761,893,294	480,941
Palmdale Water District	326,440	21,300	120,737,963	119,680	1,414,494,581	114,533
San Bernardino Valley Municipal Water District	1,256,847	102,600	999,897,735	225,577	48,717,699,229	661,546
San Gabriel Valley Municipal Water District	516,328	28,800	232,437,655	18,297	16,850,589,307	197,636
San Geronio Pass Water Agency	96,621	17,300	292,878,623	140,800	10,241,085,146	91,981
Santa Clarita Valley Water Agency ⁴	1,367,758	95,200	511,383,444	125,057 ^c	47,807,594,493	286,300
Ventura County Watershed Protection District	124,689	20,000	98,126,277	308,252	50,463,927,012	472,776
<i>Subtotal</i>	<i>51,891,863</i>	<i>2,629,544</i>	<i>34,877,676</i>	<i>9,827,067</i>	<i>3,229,158,696,477</i>	<i>22,150,978</i>
Total	112,323,280	4,172,786	25,652,806,739	23,512,997^e	4,173,267,802,597	27,329,680

¹ All water delivered to SWP Contractors, including carryover, Article 21, surplus, unscheduled, exchange, permit, purchased, local, and non-SWP water.

² Statutes of 1978, Chapter 1207, added Section 135 to the Revenue and Taxation Code, requiring assessment at 100 percent of full value for the 1981–1982 fiscal year and fiscal years thereafter.

³ Includes all payments pursuant to the repayment provisions of the Water Supply Contracts. Transportation and Conservation Replacement Accounting System payments are also included in this table.

⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

^a Total of all Plumas County Flood Control and Water Conservation District, including Last Chance Creek Water District.

^b Assessed valuation not available on an agency area breakdown.

^c Santa Clarita Valley Water Agency (Southern California Area) includes land in the San Joaquin Valley Area formerly known as Devil's Den Water District.

^d Acreage for Metropolitan includes Calleguas Municipal Water District, which is common to Metropolitan and Ventura County Watershed Protection District.

^e Includes duplicate values. Portions of some contractors' gross acreage fall within two contractors' geographic areas and are included in each contractor's total.

WD = Water District; WCD = Water Conservation District.

Dudley, Empire, Oak Flat, and Tulare are agricultural contractors. Kern is an agricultural and a municipal and industrial contractor.



Chapter 2

Delta Resources

Aerial view of the Dutch Slough.

Significant Events in 2020

In May, the Department of Water Resources (DWR), under the South Delta Temporary Barriers Project, installed three agricultural barriers at Middle River, Old River near Tracy, and Grant Line Canal.

In October 2019, the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries) released a new biological opinion (BiOp) where the installation of a barrier at Georgiana Slough is not required but recommended to be installed.

Information for this chapter was contributed by the Division of Regional Assistance, the Bay-Delta Office, the Division of Flood Management, and the Division of Operations and Maintenance.

The Sacramento-San Joaquin Delta (Delta) and Suisun Marsh encompass about 840,000 acres of tidal-influenced land at the confluence of the Sacramento and San Joaquin rivers (see Figure 2-1). Collectively, the Delta and Suisun Marsh are part of the largest estuary on the West Coast of the United States. The Delta is a major source of water for millions of Californians. Since the 1950s, the Department of Water Resources (DWR) and other State and federal agencies have developed and implemented numerous programs to manage the Delta.

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. Ongoing planning activities and regulatory actions continue to influence DWR activities in the Delta. These include the Delta Conveyance Project (see Chapter 3, Environmental Programs) and California EcoRestore, the Delta Stewardship Council's (DSC) *Delta Plan*, the State Water Resources Control Board's water rights decisions, and federal biological opinions (BiOps).

Delta Plan

The *Delta Plan*, adopted by the DSC in May 2013 in compliance with the Delta Reform Act of 2009, is a comprehensive, long-term management plan for the Delta. For more information, see the sidebar, Delta Stewardship Council. Additional information about the *Delta Plan* is also available on the DSC's website.

State Water Project Delta Compliance Program

The State Water Project (SWP) and Central Valley Project (CVP) obtained take authorization for the federal Endangered Species Act- and California Endangered Species Act-listed fish species

for coordinated operations in the Delta through a U.S. Fish and Wildlife Service (USFWS) BiOp for delta smelt (*Hypomesus transpacificus*) in December 2008; a Department of Fish and Wildlife (DFW) incidental take permit for longfin smelt (*Spirinchus thaleichthys*) in February 2009; and a National Marine Fisheries Service (NOAA Fisheries) BiOp for steelhead (*Oncorhynchus mykiss*), Chinook salmon (*Oncorhynchus tshawytscha*), and green sturgeon (*Acipenser medirostris*) in June 2009. Some of the requirements in these documents were implemented immediately, while others needed development of studies and projects before being implemented.

In 2020, efforts continued under the SWP Delta Compliance Program to develop and implement studies and construct projects to address regulatory requirements under the USFWS and NOAA Fisheries BiOps and the DFW incidental take permit.

Predation, Release, and Efficiency Program

The predation, release, and efficiency program includes improving existing fish salvage release sites, developing additional fish salvage release sites, assessing predation reduction alternatives, continuing the associated predation study for Clifton Court Forebay, and evaluating the screening efficiency of the Skinner Fish Facility to comply with the requirements under the

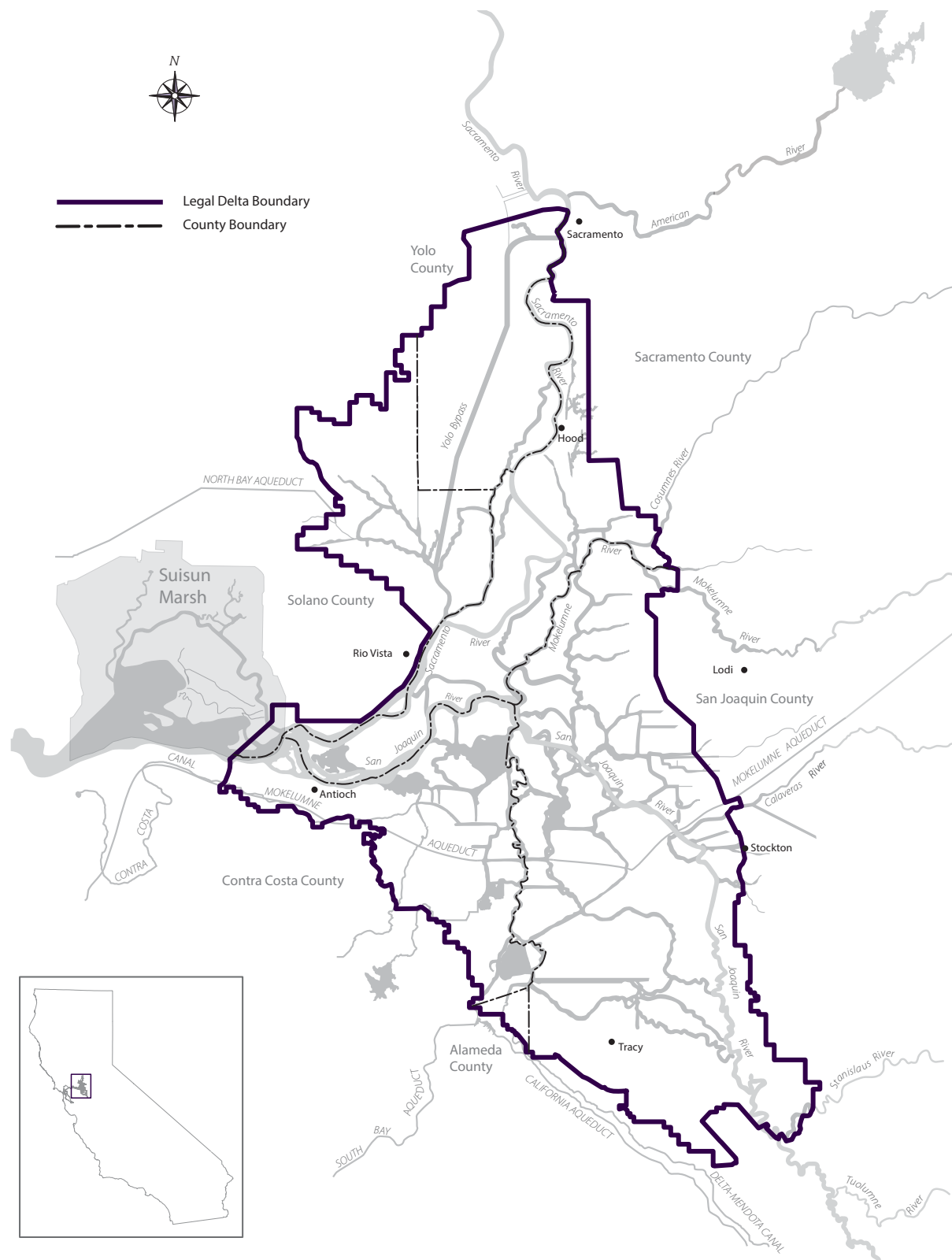


Figure 2-1 The Sacramento-San Joaquin Delta

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 is appointed by the Senate and by the 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 *Delta Plan* was adopted by the DSC on May 16, 2013. It became effective with legally enforceable regulations on September 1, 2013. The *Delta Plan* is a comprehensive, long-term management plan for the Sacramento-San Joaquin Delta. It establishes a set of integrated policies, strategies, and actions to guide State and local agencies to help achieve the 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 plan was amended in September 2016.

The Delta Reform Act specifies eight policy objectives that are “inherent” in the coequal goals (see California Water Code Section 85020). It also specifies a statewide policy to reduce reliance on the Delta in meeting the State’s future water supply needs through improved regional water self-reliance (California Water Code Section 85021) and identifies specific subjects and strategies that must be included in the *Delta Plan* (see generally, California 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. The Delta Science Program replaces the CALFED Bay-Delta Program Science Program, and the Delta ISB replaces the CALFED Bay-Delta Program ISB.

The Delta Science Program will develop scientific information and synthesis on issues critical to 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 Science Plan*, released by the DSC in December 2013 and updated in 2016, provides a guide for organizing, conducting, and integrating science in the Delta. A Science Action Agenda will be a key component of implementing the *Delta Science Plan*.

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 review 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.

BiOps and incidental take permit. The requirements include the following:

- reduce prescreen loss of federal Endangered Species Act-protected Chinook salmon and steelhead in the Clifton Court Forebay to no more than 40 percent (prescreen loss is the loss of fish as they move across the forebay that presumably results from predation by fish and birds)
- reduce predation by 50 percent at the fish release sites
- implement fish release site studies to develop methods to reduce predation following release of salvaged fish
- identify salvage deficiencies and recommend actions to improve salvage efficiency in order to meet a required efficiency goal of 75 percent for salmonids

Fish Science Building

The addition of the Fish Science Building at the Skinner Fish Facility was essential to improve DWR's ability to conduct fish studies to meet regulatory requirements for operation of the SWP. The existing collection, handling, transport, and release building was too small and lacked the necessary equipment to hold and rear fish to carry out various studies and projects. The Fish Science Building includes a small laboratory, fish rearing tanks, an office, and an area to store study gear and equipment. In 2020, the building continued to provide critical support for numerous fishery studies related to the BiOps.

Fish Salvage Release Sites

The predation reduction strategy for the release sites includes designing and constructing the Curtis Landing fish release site with minimal in-water structure to reduce predation and improve survival of released salvaged fish. In addition, two new fish release sites, Little Baja and Manzo Ranch, approximately a half-mile apart, were

completed on Sherman Island. This will allow more time between releases at each site. Coordinated interagency use will occur at a total of six release sites.

Construction of the major components of the Curtis Landing fish release site was completed in 2014, and the facility became fully operational in 2015. Design of Little Baja and Manzo Ranch was completed in 2014, all permits were obtained, and construction was initiated in fall 2015 and completed in 2018. The construction of the new fish release sites included a fish release system, as well as levee improvements and county road realignment by the local reclamation district.

Following the project's site restoration plan, the restored areas associated with the project were required to be monitored by a DWR-approved biologist for three years (2018–2020) following implementation. In 2020, DWR met the obligations laid out in the project's restoration plan.

In compliance with NOAA Fisheries BiOp Reasonable and Prudent Alternative Action IV.4.3(3), monitoring continued to evaluate the effectiveness of reducing predation through modified rotational use of release sites. In 2020, analysis of data collected in 2019 was completed in collaboration with U.S. Bureau of Reclamation (Reclamation), and a final report was completed. The results of the 2019 full-scale study were submitted for review and publication in the Tracy Fish Facility Improvement Program *Tracy Technical Bulletin 2019-2* and titled "Release Site Predation Monitoring."

The levee reclamation district issued DWR a fully executed encroachment permit in 2020. DWR began instituting a maintenance program in preparation for operating both fish release facilities the following year and to ensure the new fish haul trucks are compatible with the hookups.

Clifton Court Forebay Predation Reduction Studies

The predation reduction strategy for Clifton Court Forebay was to increase public fishing opportunities in the forebay to reduce the number of predatory fish and the prescreen loss of federal Endangered Species Act-protected Chinook salmon and steelhead. This strategy involved constructing a fishing pier to provide improved access to anglers.

Because of changes made to Bay Delta Conservation Plan Conservation Measure 1 in 2014, the proposed fishing pier project was indefinitely suspended. The related companion predator study initiated in 2013 continued in 2019. The study was to establish a baseline for the demographics and behavior of predatory fish in Clifton Court Forebay, to provide information to help refine proposed predator management efforts in the forebay, and to identify other potential management actions for limiting predation on listed fish species. The study included predatory fish sampling, biotelemetry, gut content genetics, creel surveys, avian studies, and bioenergetics modeling. Data collection efforts as part of the study ended in December 2018. Data analysis and drafting of the final technical memo was conducted throughout 2019. DWR analysis and drafting of the final technical memo was conducted throughout 2019, and the final technical report was completed in July 2020.

Predator Reduction Alternatives

Subsequent to the suspension of the fishing pier project, DWR, in close coordination with NOAA Fisheries, analyzed other predator reduction alternatives in 2015. NOAA Fisheries identified six preferred alternatives and provided a ranking of these alternatives. The result of this effort was agreement to study several possible options for predator reduction in Clifton Court Forebay. In addition, NOAA Fisheries approved an extension for compliance with

the BiOp requirement conditioned on DWR implementing four interim measures to reduce predation in Clifton Court Forebay. In 2018, DWR completed electrofishing in Clifton Court Forebay. The predatory fish relocation study conducted in 2019 continued in 2020 with improvements learned during the first year. The objective of the study was to determine the effectiveness of several commercial-type fishing methods and gears, and identify any improvements needed to maximize predatory fish capture. Three gear types were used: beach seine, hoop traps, and fyke traps. A kodiak trawl was planned, but could not be implemented because of delays in modifications recommended in 2019. DWR also continued work on the other two interim measures:

- (1) controlling aquatic weeds
- (2) implementing operational changes to limit take of listed fish species

Additional information about CVP/SWP operations related to the BiOps can be found in Chapter 3, Environmental Programs.

Skinner Fish Facility Salvage Efficiency and Loss Monitoring

The Skinner Fish Facility, formally known as the John E. Skinner Delta Fish Protective Facility (named for a former DFW biologist who was a national authority on protective fish facilities), is a fish collection and diversion facility located along the Clifton Court Forebay two miles upstream from the Banks Pumping Plant. The Skinner Evaluation and Improvement Study monitors salvage efficiency and fish losses associated with operating the Clifton Court Forebay and the Skinner Fish Facility. The study evaluates the following factors:

- fish losses through Clifton Court Forebay
- fish losses through the primary louvers, secondary louvers, and holding tanks

at the Skinner Fish Facility, as well as hydraulics within the Skinner Fish Facility

- fish behavior and movement patterns as the fish are entrained and guided through the forebay and facility

During 2020, the study team conducted mark-recapture investigations using tagged Chinook salmon to evaluate losses in Clifton Court Forebay and salvage efficiency at the Skinner Fish Facility. These data were also used, in part, to evaluate the performance of predator relocation efforts in Clifton Court Forebay. Implementation of field activities during 2020 was interrupted by the onset of the COVID-19 pandemic in March. Draft annual reports were completed documenting the results of the 2018 and 2019 field evaluations, and data analysis was completed for the 2020 field season.

Furthermore, DWR worked with the University of California, Davis, to develop fish culture methods for longfin smelt with the aim of establishing a source of fish for use in experiments to determine salvage effectiveness at the Skinner Fish Facility for this species as required in the 2009 incidental take permit from DFW. DWR also worked with the University of California, Davis, to conduct a green sturgeon laboratory study to develop surrogate estimates for salvage efficiency using a physical model of a louver guidance system at three flow rates, two bypass ratios, and two water temperatures, and to examine the risk of predation on juvenile green sturgeon by three common predatory species in the Delta. The final report was completed in November 2020. The results suggested declining and low salvage of sturgeon at the fish protection facilities was most likely due to low sturgeon abundances in the region and not from predation.

Salmon Survival Engineering Solutions Program

The salmon survival engineering solutions program includes completed work required by the 2009 NOAA Fisheries BiOp. To comply with Reasonable and Prudent Alternative Action IV.1.3, DWR and Reclamation are required to consider engineering solutions to further reduce the diversion of emigrating juvenile salmonids to the interior and southern Delta and reduce their exposure to CVP and SWP export facilities. In October 2019, the USFWS and NOAA Fisheries released a new BiOp where the installation of a barrier at Georgiana Slough is not required but recommended to be installed. On March 31, 2020, DFW released the incidental take permit for Long-Term Operations of the SWP in the Delta. The permit included Minimization Measure 8.9.1—Construct and Operate a Salmonid Migratory Barrier at Georgiana Slough and Minimization Measure 8.9.2—Evaluate Benefits of Salmonid Guidance Structures at Sutter and Steamboat Sloughs.

Georgiana Slough Salmonid Migratory Barrier Project

The 2020 incidental take permit, Minimization Measure 8.9.1—Construct and Operate a Salmonid Migratory Barrier at Georgiana Slough, consist of the installation and annual operation of a salmonid migratory barrier at Georgiana Slough set to begin in 2023 through 2030. The migratory barrier at Georgiana Slough is expected to provide a higher probability of survival for emigrating juvenile winter-run and spring-run Chinook salmon that encounter the Sacramento River–Georgiana Slough junction and reduce entrainment into the central and south Delta. The salmonid migratory barrier that was selected for this project uses sounds, lights, and bubbles as stimuli to alter salmonid behavior as interaction occurs. Georgiana Slough salmonid migratory barrier work in 2020

included planning, permitting, and designing to install the salmonid migratory barrier at Georgiana Slough for operation as soon as 2023.

Guidance Structure Benefits Evaluation of Salmonid Guidance Structures at Sutter and Steamboat Sloughs

The 2020 incidental take permit, Minimization Measure 8.9.2—Evaluate Benefits of Salmonid Guidance Structures at Sutter and Steamboat Sloughs, was included with work beginning this year. Fish guidance structures near the junction between the Sacramento River and Sutter and Steamboat sloughs are expected to provide a higher probability of survival for emigrating juvenile winter-run and spring-run Chinook salmon by increasing proportions of juveniles that enter Sutter and Steamboat sloughs and minimizing the proportion of juveniles that migrate into the central and south Delta.

Planning efforts to evaluate potential approaches to designing and operating fish guidance structures in collaboration with DFW, NOAA Fisheries, and USFWS began in 2020. Structured decision making, an approach for careful and organized analysis of natural resource management decisions, will be used, and a draft report documenting the results of the structures decisions making process and associated implementation recommendations is expected by March 31, 2023.

South Delta Improvements Program

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

South Delta Improvements Program (SDIP) elements in the CALFED Bay-Delta Program record of decision included increasing diversions through Clifton Court Forebay (first to 8,500 cubic feet per second and then

to 10,300 cubic feet per second), dredging and installing operable tidal barriers in the South Delta, installing a fish barrier at the 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.

DWR and Reclamation identified the following SDIP project objectives and purposes:

- reduce 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)
- maintain adequate water levels and water quality through improved circulation for agricultural diversions in the South Delta, downstream of the Head of Old River (SDIP Stage 1)
- increase water deliveries and delivery reliability to SWP and CVP water contractors south of the Delta (SDIP Stage 2)
- provide 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 cubic feet per second (SDIP Stage 2)

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

- construct and operate a fish-control gate at the 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
- construct and operate 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 levels and circulation patterns in South Delta water channels

- dredge various channels in the South Delta, including Middle and Old rivers, to improve conveyance; and dredge areas surrounding agricultural diversions to improve their function
- extend up to 24 agricultural diversion intake facilities to improve their function

The SDIP final environmental impact report/environmental impact statement (2006) evaluated alternatives and proposed continuing with SDIP Stage 1 as the preferred alternative.

Reclamation and DWR's 2008 biological assessment for the CVP and SWP Long-Term Operations criteria and plan included operation of the SDIP permanent operable gates.

The USFWS BiOp, issued in December 2008, concluded that coordinated operations of the CVP and SWP would jeopardize delta smelt. The USFWS provided a reasonable and prudent alternative under which SDIP could move forward.

The NOAA Fisheries BiOp, 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.

Program Status

Due to DWR requirements included in the NOAA Fisheries BiOp and conference opinions on the Long-Term Operations of the CVP and SWP issued June 4, 2009, all SDIP related work was delayed until completion

of the temporary barriers salmonid effects study. This study report, *Effects of South Delta Agricultural Barriers on Emigrating Juvenile Salmonids*, was released November 2018. The report recommended permanent operable barriers as a preferred alternative over the temporary rock barriers. Permanent operable barriers would provide improved fish passage and reduce yearly on-going construction impacts.

DWR completed a reconnaissance-level assessment of previous SDIP work in 2019 and developed the *SDIP Overview and the South Delta Proposal (SDP)* report in August 2020 to identify a path forward for planning improvements in the South Delta. The report summarized the history of the SDIP planning effort, changes likely to affect future planning efforts, and provided an assessment of which SDP projects could move forward. The report concluded the Permanent Agricultural Operable Stage Control Gates Project would most likely garner the decision-makers' interest. Furthermore, it has independent utility from the other SDP projects and therefore is most ready to proceed to the next steps in the project planning phase.

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 Delta near the cities of Tracy and Lathrop in San Joaquin County. The barriers are usually installed during the irrigation season from April to November at four sites (see Figure 2-2):

- (1) Head of Old River, in Old River where it splits from the San Joaquin River
- (2) Old River near Tracy, one half-mile east of the Jones Pumping Plant intake and about eight miles northwest of Tracy
- (3) Middle River near Victoria Canal, just southeast of the confluence of Middle River, Trapper Slough, and North Canal

- (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. These are referred to as the agricultural barriers. The Head of Old River barrier is designed to improve migration conditions for Central Valley fall-run Chinook salmon and steelhead in the spring and fall. In the spring, the barrier blocks migratory movements of juvenile salmon into Old River from the San Joaquin River. This barrier is referred to as the fish barrier. In the fall, the barrier increases the volume of San Joaquin River flow passing downstream through the Port of Stockton, improving dissolved oxygen levels and increasing attraction flows for

returning adult San Joaquin River salmon and steelhead.

In 2020, all three agricultural barriers at Middle River, Old River near Tracy and Grant Line Canal were installed in May. The Head of Old River barrier was not installed in the spring or fall as it is not included in the project description of the SWP in the 2019 BiOp issued by NOAA Fisheries and USFWS on the Long-Term Operations of the CVP and SWP or the 2020 incidental take permit of the SWP Long-Term Operations issued by DFW.

The Middle River barrier weir crest was not raised by one foot as it was not requested by local diverters. By September 15, a notch was excavated in the weirs of both the Middle River and the Old River near Tracy barriers and the flashboard structure at the

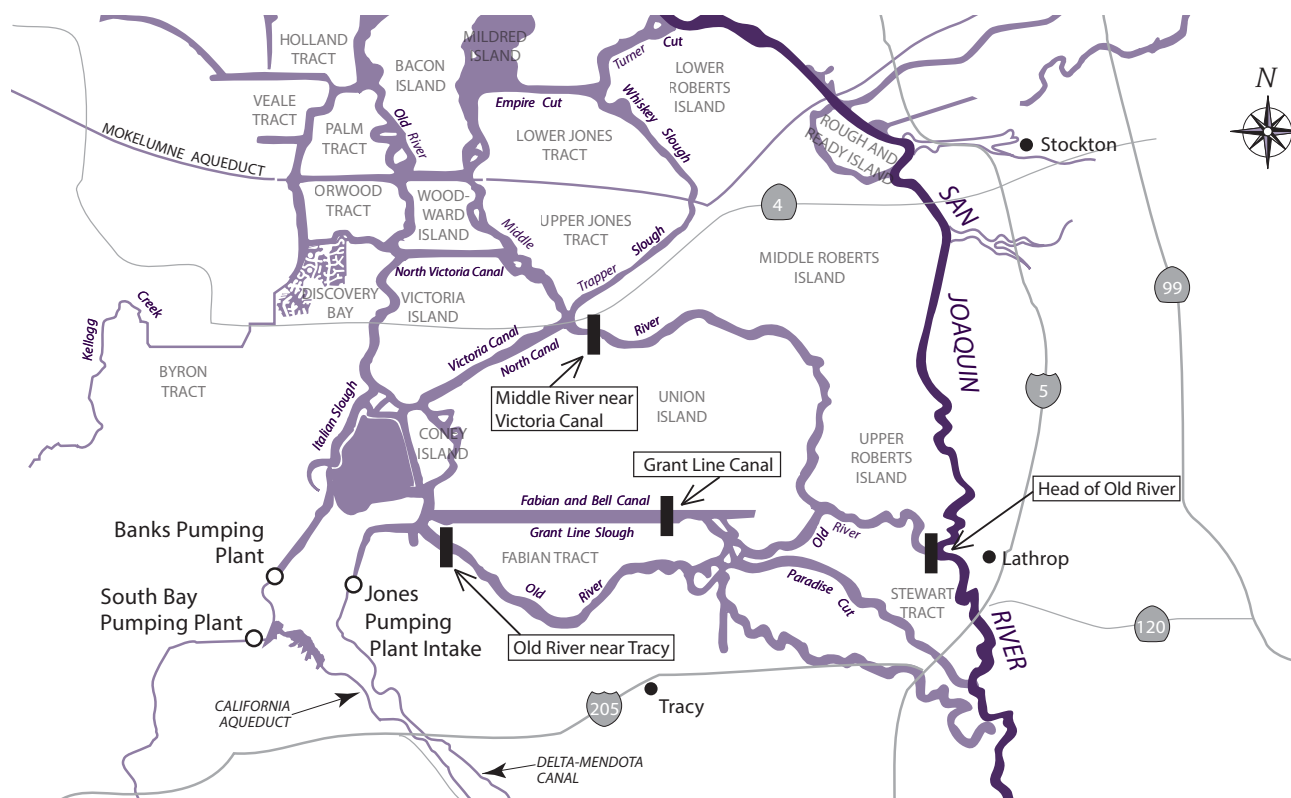


Figure 2-2 Temporary Barrier Locations in the South Delta

Grant Line Canal barrier was adjusted to allow for passage of salmon migration.

Barrier removal started with the breaching of the Middle River and Old River near the Tracy barriers on November 2, followed by the Grant Line Canal barrier on November 11. All barriers were completely removed from the channels by November 24.

Delta Flood Control

Levees in the Delta protect valuable wildlife habitat, farms, homes, urban areas, recreational developments, highways, railroads, natural gas infrastructure, utility lines, a major aqueduct, and other public developments. Delta levees influence and protect critical water quality parameters in Delta waterways. Some levees also protect water quality for approximately 27 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, declaring that “. . . the Delta is endowed with many invaluable and unique resources and that these resources are of major statewide significance” (California Water Code Sections 12300 et seq.).

Since 1988, the Delta Levees Program has provided more than \$310 million in State-appropriated funds. These monies are combined with local cost-share funding to provide flood protection and environmental benefits in the Delta.

In Senate Bill 34 (Boatwright; Chapter 28, Statutes of 1988), the Legislature declared its intent to appropriate \$6 million for local assistance under the Delta Levee Maintenance Subventions Program and \$6 million for 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 (Hannigan; Chapter 601, Statutes of 1996) expanded the area covered by the Delta Levees Program to include the remainder of the legal Delta and northern Suisun Bay.

Additional funding sources for the Delta Levees Program are listed below:

- Proposition 204 enacted in 1996 (\$25 million)
- Proposition 13 enacted in 2000 (\$30 million)
- Proposition 50 enacted in 2002 (\$70 million)
- Proposition 84 enacted in 2006 (\$275 million)
- Proposition 1E enacted in 2006
- Proposition 1 enacted in 2014

Delta Flood Emergency Preparedness, Response, and Recovery Program

The Delta Flood Emergency Preparedness, Response, and Recovery Program was initiated within the Division of Flood Management in response to the passing of the Disaster Preparedness and Flood Prevention Bond Act of 2006 (Proposition 1E). 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 main components of the program are the *Delta Flood Emergency Management Plan*; local agency coordination and support, including flood emergency response grant funding; and emergency materials transfer facilities in Stockton and Rio Vista.

To enhance the State's emergency preparedness capabilities within the Delta Region, Division of Flood Management initiated procurement of approximately \$18 million (Proposition 1E Funds) of 100-foot-long steel sheet piles, 54-inch-diameter pipe piles with welded

connectors, and plate covers. These materials are required to support emergency response and recovery actions described in the *Delta Flood Emergency Management Plan*, including levee breach closures or channel barriers. The materials will be stored at the DWR Emergency Material Transfer Facilities located in Rio Vista and Stockton.

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 Delta for the maintenance and rehabilitation of 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 reimbursement funding to local levee-maintaining agencies for improving, maintaining, and enhancing nearly 700 miles of project and non-project levees. Since its inception in 1973, the Subventions Program has provided more than \$230 million of State funding to more than 70 islands in the Delta. In fiscal year 2020–2021, the program expects to reimburse up to \$12 million to local agencies for eligible levee maintenance and rehabilitation work. The local levee-maintaining agencies' activities help 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 Levees Special Flood Control Projects Program

The Delta Levees Special Flood Control Projects Program assists eligible local agencies in the Delta with flood protection and levee stability repairs. In 1990, the California Water Commission approved actions and priorities that serve as guides for DWR to determine the best use of appropriations to protect Delta islands. This includes the following long-term actions and current priorities:

- rehabilitating threatened levees through the beneficial reuse of dredged material
- improving water supply reliability, levee integrity, and habitat enhancement by soliciting multi-benefit projects through the projects solicitation process
- upgrading levees to the standards discussed in Bulletin 192-82 (*Delta Levees Investigation*)
- considering projects that will help achieve net long-term habitat improvement for fish and wildlife

While DWR seeks cost-sharing for all program projects, it may provide up to 100 percent of the cost in some cases.

Levee restoration projects, habitat projects, and other special projects are expected to be conducted on various Delta islands and tracts in fiscal year 2020–2021. The program plans to release a multi-benefit projects solicitation package once Proposition 1 funds are available.

North Delta Flood Control and Ecosystem Restoration Project

The North Delta Flood Control and Ecosystem Restoration Project will provide flood control improvements and ecosystem restoration in the North Delta. The project will implement important flood control

improvements in the North Delta where the Mokelumne River, Cosumnes River, Dry Creek, and Morrison Creek converge. 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 North Delta Flood Control and Ecosystem Restoration Project environmental impact report was certified in November 2010 and recommended the implementation of a preferred alternative (Alternative 1-A for the Group I actions and the No Action Alternative for the Group II actions [for details, see Bulletin 132-11]). The project will create tidal, subtidal aquatic, and floodplain riparian terrestrial habitats benefiting a number of special status species such as Sacramento splittail (*Pogonichthys macrolepidotus*) and Chinook salmon. The project, as proposed, will provide a nearly contiguous riparian corridor from the downstream portion of the Cosumnes River Preserve to the Delta. The project is consistent with the objectives put forth in the *California Water Action Plan*, the *Delta Plan*, and California EcoRestore.

Two project elements are proposed for implementation: MWT and Grizzly Slough. The MWT element, being constructed and permitted in two phases, 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 Bay-Delta Program grant, is currently owned and managed by The Nature Conservancy. (For background on the CALFED Bay-Delta Program, see Bulletins 132-95 through 132-11.) The Grizzly Slough element consists of breaching the Grizzly Slough levee upstream of MWT to help

attenuate peak flood flows and maximize nearly 500 acres of floodplain habitat on the DWR-owned property.

Project Status

In 2020, with the MWT Phase A Project (tower levee and re-sloped levees) construction completed, the project team commenced mitigation project planning to satisfy requirements associated with riparian and shrub scrub impacts. Twenty-four acres were planted on landside riparian benches and irrigated to ensure planting success during drought conditions. The MWT Phase B Project (levee modification and habitat restoration project, which includes breaches and weirs) planning and design work continued. Models were finalized and the project team evaluated and elicited stakeholder input to decide on appropriate beach widths for the Phase B Project design.

The Grizzly Slough grant agreement was negotiated and finalized in 2020 to ensure Delta Conservancy's Ecosystem Restoration and Water Quality Grant Program (Proposition 1; Water Quality, Supply, and Infrastructure Improvement Act of 2014) grant funds were available to support the Grizzly Slough Project. Accounts and project agreements were prepared to facilitate construction. One-hundred percent levee design plans were prepared, and the Central Valley Flood Protection Program encroachment permit was submitted. The vegetation planting and irrigation plan designs were prepared to a 90 percent design completion level. Permitting agencies were updated on project design changes that required no alterations to permits or approvals.

Dutch Slough Tidal Marsh Restoration Project

The Dutch Slough Tidal Marsh Restoration Project will restore a 1,187-acre site in the western Delta city of Oakley. The project site

consists of three leveed parcels that will be restored to tidal marsh, riparian woodland, open water, managed marsh, and upland habitats. See Bulletin 132-18 for additional background information.

Project Status

Dutch Slough currently sits along a high-grade slope, with site elevations ranging from six feet above sea level to six feet below sea level. In 2018, DWR began smoothing the grade of that slope by excavating soil from higher elevations and moving it to lower elevations. Grading and channel excavation were completed in 2020. There were also 50,000 tule plugs and riparian plantings planted. A new flood protection levee was constructed along the project's southern border.

In 2020, construction continued for two of the three project parcels. Activities included final grading, revegetation, and levee construction. Tidal Marsh restoration on the Burroughs parcel is in the planning phase and is estimated to start construction in 2024.

West Delta Program/Delta Islands

DWR owns approximately 13,000 acres on Sherman and Twitchell islands, located in the western Delta. One of DWR's program objectives is mitigation of subsidence through various wetland restoration projects. DWR's program objectives are supported by active research and application of land management activities used for subsidence reversal, carbon sequestration, and habitat development. Since 2008, DWR has constructed approximately 2,300 acres of subsidence mitigation projects on Sherman and Twitchell islands and constructed approximately 6,000 lineal feet of "fish friendly" habitat setback levees (see Figure 2-3).

In 2020, work continued in partnership with the Sherman Island Reclamation District (Reclamation District 341) under a \$10.5 million grant from DFW's Wetlands Restoration for Greenhouse Gas Reduction Program. In 2020, Phase 1 of 3 of the Whale's Belly Wetland Restorations Project went to bid in early spring and construction was completed in July. Phase 2 of 3 was bid in mid-July and awarded in August, but not much construction was completed during the second phase because of COVID-19 delays and the giant garter snake (*Thamnophis gigas*) work window. Construction will commence again in May 2021, and Phase 3 of 3 will likely be bid in June 2021, with potential completion in fall 2021 or summer 2022.

Additionally, the West Delta Program and Ducks Unlimited received a grant from the Delta Conservancy, which provided for a topographical survey of approximately 1500 acres on the west side of Sherman Island between Highway 160 and the Sacramento River. The grant also funded a 60 percent design concept for +/-1,000 acre wetland (Whale's Spout) in this area.

A continued partnership with the University of California, Berkeley, allowed for the collection of greenhouse gas data in support of the American Carbon Registry Protocol. The West Delta Program also continued to provide operation and maintenance of all wetland restoration facilities, which is now approximately 1700 acres of wetlands and 600 acres of rice cultivation.

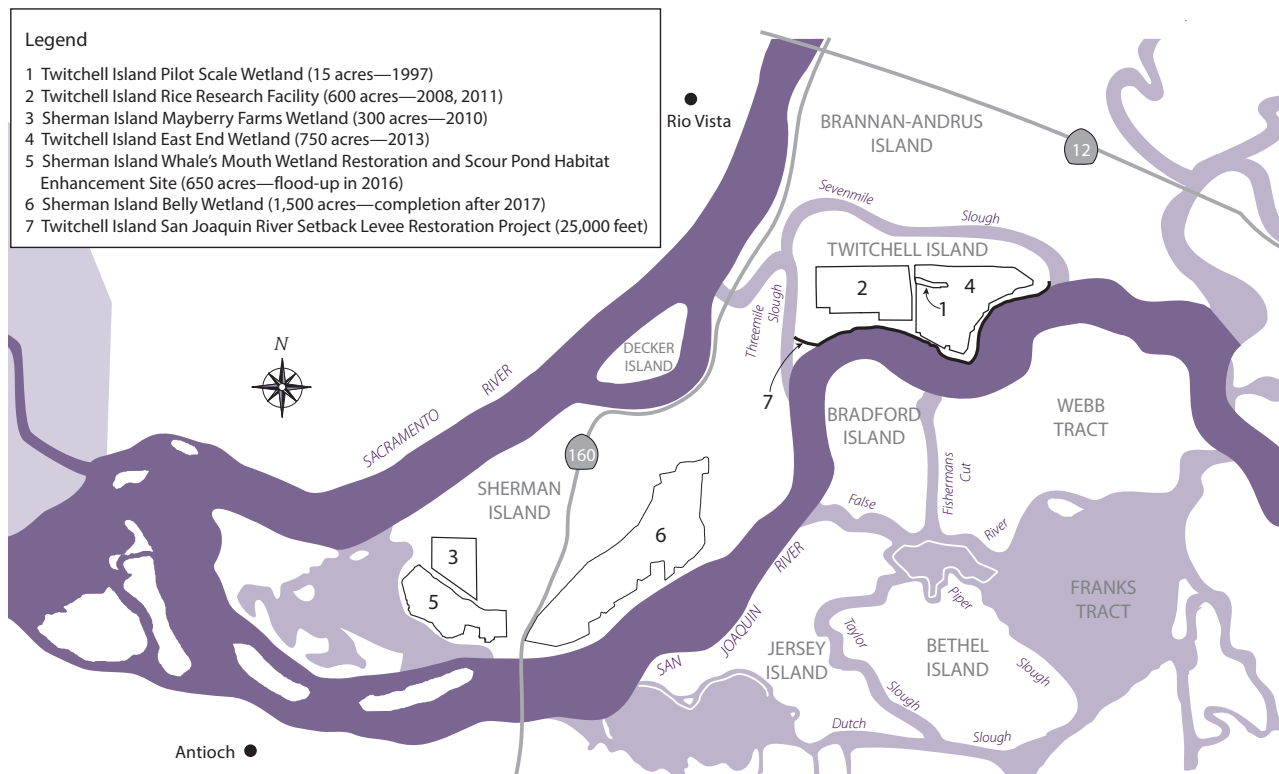


Figure 2-3 Selected West Delta Program Projects



Chapter 3

Environmental Programs

Fish scales are collected during a salmon carcass survey in the Feather River in Oroville, located in Butte County.

Significant Events in 2020

On January 15, 2020, the Department of Water Resources (DWR) released a notice of preparation, which began the California Environmental Quality Act (CEQA) scoping period and announced the preparation of an environmental impact report (EIR) for the proposed Delta Conveyance Project. On June 18, 2020, DWR submitted a (revised) Department of the Army permit application pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 to the U.S. Army Corps of Engineers (USACE). On August 20, 2020, USACE released a notice of intent, which began the National Environmental Policy Act (NEPA) scoping period and announced the preparation of an environmental impact statement.

On February 18, 2020, the U.S. Bureau of Reclamation (Reclamation) approved a Record of Decision that completed its environmental review for the 2019 long-term water operations for the Central Valley Project (CVP) and State Water Project (SWP) biological opinion (BiOp), which incorporated new science to optimize water deliveries and power production while protecting endangered species and their critical habitats.

On March 31, 2020, DWR received from California Department of Fish and Wildlife (DFW) an incidental take permit for delta smelt, longfin smelt, spring-run Chinook salmon, and winter-run Chinook salmon for SWP operations. Conditions of approval included pumping restrictions and operational measures to minimize impacts, as well as habitat restoration measures to mitigate losses that cannot be avoided. This permit will expire March 31, 2030.

DWR achieved its target emissions reductions for 2020 in 2015, five years ahead of schedule.

DWR completed construction work on the Lower Yolo Ranch and Wings Landing projects. The projects enhanced an estimated 1,957 acres of tidal wetlands in Solano and Yolo counties creditable toward DWR's mitigation requirements for delta smelt.

Information in this chapter was contributed by the Division of Integrated Science and Engineering, the Division of Operations and Maintenance, the Division of Regional Assistance, and the State Water Project Analysis Office.

The Department of Water Resources (DWR) has developed and implemented several programs to avoid, minimize, and/or mitigate adverse environmental impacts resulting from construction and operation of State Water Project (SWP) facilities. DWR has also established other environmental programs and partnered with other agencies to restore and enhance the natural environment.

Operations for Species of Concern

A primary consideration in the operation of the SWP is avoiding, minimizing, and/or mitigating 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 (BiOps) issued under the federal Endangered Species Act (ESA) and 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.

San Joaquin River Restoration Program

The San Joaquin River Restoration Program is a comprehensive long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of the Merced River and to restore a naturally reproducing, self-sustaining Chinook salmon (*Oncorhynchus tshawytscha*) fishery in the river, while reducing or avoiding adverse water supply impacts from restoration flows.

The 2020 water year was classified as dry, as near-average precipitation early in the water year was followed by a very dry January

and February. A total of 202,200 acre-feet of water was released from Friant Dam to support fish and their habitat in the San Joaquin River, marking the fourth straight year Friant Dam flows were connected to the Sacramento-San Joaquin Delta (Delta). However, flow constraints because of seepage restrictions continued to limit flows, and over 63,500 acre-feet of unreleased restoration flows were sold back to federal water contractors for mostly irrigation uses.

Spring-run Chinook salmon returned to the San Joaquin River for the second straight year. As with 2019's historic returns, the pattern indicates that hatchery-raised juveniles released into the system are returning as adults after several years to spawn and continue the cycle of life. A total of 57 returning adult spring-run Chinook salmon were trapped in fyke nets in the lower San Joaquin River Restoration Program Restoration Area in 2020. The trapped fish were released in the river reach below Friant Dam. Also, a total of 285 adult spring-run Chinook salmon brood stock cultivated at the Interim Salmon Conservation and Research Facility were released into the river. In 2020, 73 redds (fish nests) were identified in the river from the translocated and released fish. Actual redd construction may have been greater than what was observed because COVID-19 restrictions partially limited survey work.

Early in 2020, yearling and juvenile fish were released into the San Joaquin River. Some of these fish were released in the upper reaches of the river to test the efficacy of rotary screw traps, but most were released in the river

above the Merced River confluence to allow them to migrate out to the ocean. A total of 10,541 yearlings and 233,761 juveniles were released.

To reestablish Chinook salmon in the San Joaquin River, the San Joaquin River Restoration Program continued taking actions to provide volitional fish passage and sufficient flows. Preliminary design began of two projects that will provide improved fish passage and fish habitat: (1) the Mendota Pool Bypass and Reach 2B Improvements Project and (2) the Arroyo Canal Fish Screen and Sack Dam Fish Passage Project. In April 2020, construction began on the levee improvement element of the Eastside Bypass Improvements Project. The project, which will improve flow capacity in the Eastside Bypass for conveying restoration flows, was completed at the end of 2020.

More information is available on the San Joaquin River Restoration Program's website.

Lower Yuba River Accord

The Lower Yuba River Accord's purpose is to resolve instream flow issues and protect and enhance lower Yuba River fisheries and local water supply reliability. The Lower Yuba River Accord provides revenues for local flood control and water supply projects; water to enhance SWP and Central Valley Project (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 Lower Yuba River Accord is based on three agreements: (1) a water purchase agreement between Yuba County Water Agency and DWR; (2) conjunctive use agreements between Yuba County Water Agency and its member units; and (3) a fisheries agreement between DWR, California Department of Fish and Wildlife (DFW), and

several environmental groups, with U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NOAA Fisheries) signing a letter of support (but not signatory to the Agreement).

In 2020, the Sacramento Valley Water Year Hydrologic Classification was dry. The total quantity of Component 1 water was 43,538 acre-feet; there was no Component 2 or Component 3 water; and Component 4 water was 77,000 acre-feet.

For more information about the Lower Yuba River Accord, see Chapter 8, Water Contracts and Deliveries.

Oroville Facilities

The Federal Energy Regulatory Commission (FERC) is the United States federal agency that, among other things, licenses non-federal hydropower projects. This section covers environmental activities related to licensing and relicensing of the Oroville Facilities. For more information about other aspects of FERC licensing and Oroville Facilities relicensing in particular, see Chapter 9, Power Resources.

Existing FERC License Activities for 2020

Invasive Plant Management

During 2020, DWR removed all the red sesbania (*Sesbania punicea*) along the Thermalito Power Canal, Thermalito Forebay, and Thermalito Diversion Pool as part of an annual maintenance effort, which started in 2007. These areas are the upstream extent of the red sesbania population on the Feather River and are considered a high priority management area.

Feather River Fish Hatchery

DWR's Oroville Field Division provides funding to DFW for the fish production of approximately 2 million spring-run Chinook

salmon, 6 million fall-run Chinook salmon, and 400,000 steelhead (*Oncorhynchus mykiss*) each year at the Feather River Fish Hatchery (FRFH) in Oroville. This fish production is mitigation for the loss of spawning habitat resulting from the construction of Oroville Dam and its associated facilities, and it contributes to major sport and commercial fisheries in ocean and inland areas. In addition, DWR funds the fish production of approximately 50,000 steelhead for the Delta Pumping Plant Fish Protection Agreement (Delta Fish Agreement) and up to a maximum of approximately 150,000 inland Chinook salmon for the Lake Oroville recreational fishery.

Spring-Run Chinook Salmon. During March and April, a total of 1,771,534 spring-run Chinook salmon were released in the Feather River at Boyd's Pump Boat Launch (River Mile [RM] 22.3) and Gridley Boat Ramp (RM 50).

Fall-Run Chinook Salmon. From April through May, a total of 6,400,000 juvenile fall-run Chinook salmon were planted in the Feather River at Boyd's Pump Boat Launch (RM 22.3) and San Pablo Bay.

Inland Chinook Salmon. A portion of eggs collected during the fall-run Chinook salmon spawning period were triploid, which is a naturally occurring genetic anomaly that results in a fish with three sets of chromosomes instead of the usual two (a diploid fish). Triploid fish are sterile and unable to reproduce. The triploid eggs were retained for the DFW Inland Chinook Salmon Program as well as the DWR Lake Oroville cold water fishery. Using triploid fish allows the fish to grow larger in size as they are not putting energy into reproduction; it also mitigates for potential escapement. A total of 132,500 fingerlings were released in Lake Oroville on May 11 at the Bidwell Canyon boat launch. Early release of these fish in May, rather than between the months of

September and November at yearling size, occurred because repairs were needed on the water treatment system and because of discontinued use of the Feather River Fish Hatchery, Thermalito Facility.

Central Valley Steelhead. During February, 531,648 steelhead were released into the Feather River and Thermalito Afterbay at yearling size. Of those fish, 490,098 were planted in the Feather River at Boyd's Pump Boat Launch (RM 22.3) to meet mitigation requirements, and 41,550 surplus juvenile steelhead were planted in the Thermalito Afterbay at the Wilbur Road boat ramp to support the recreational fishery. Additionally, 80 male adult steelhead (kelts) were planted in the Thermalito Afterbay to contribute to the recreational fishery.

Lake Oroville and Thermalito Afterbay Habitat Improvement Program

In 2020, the habitat improvement program continued at Lake Oroville and Thermalito Afterbay. Approximately 1,150 recycled Christmas trees were collected by the Boy Scouts and delivered to DWR by a local waste management company. The California Conservation Corps bundled the trees together to create 80 habitat structures and anchored them in the lake bed near the Bidwell Canyon boat ramp and Thermalito Afterbay. Approximately 270 willow trees were also planted within the fluctuation zone at Lake Oroville and along the shoreline of Thermalito Afterbay.

Additionally, to mitigate the loss of oak woodland habitat caused by DWR's construction of two new boat ramps and associated parking facilities, including a new access road, DWR hired the California Conservation Corps to construct 42 habitat structures within the fluctuation zone of Lake Oroville near the new boat launch facilities. The habitat structures were constructed from brush and tree material that had been cut down during construction of the project.

Unfortunately, the North Complex West Zone wildfire (initially referred to as the Bear Fire, which became part of the North Complex Fire) burned through the Loafer Creek Day Use Area in fall 2020 and burned up many of the brush structures.

This habitat improvement program is designed to increase micro-cover for young-of-year and juvenile fish. It also provides fish with shade, spawning areas, and places to rest; creates places for fish to escape from predators; and can increase productivity, all of which can help improve the recreational fishery. The structures also provide food for fish and other aquatic species by creating a home for larval aquatic insects. This cover can additionally serve as cover for wildlife—such as avian species, reptiles, and amphibians—when the reservoir’s water levels fall below the location of the structures.

Lake Oroville Elevation

Lake surface elevation can affect the following aspects of Oroville Facilities:

- habitat
- flora and fauna of the lakeshore area and upstream tributaries
- recreation
- water quality
- water temperature
- shoreline and lake bed stability and erosion
- flood storage capacity
- power generation
- streamflow requirements (downstream of the lake)

The 2020 low point for the Lake Oroville reservoir surface elevation was reached on December 30 and 31 at 697.79 feet, and the high point of 825.30 feet was reached on May 1. The full pool elevation of Lake Oroville is approximately 900 feet.

FERC Relicensing Activities

Oroville FERC USFWS BiOp

Various species conservation measures identified in the USFWS 2007 BiOp for the Oroville Facilities relicensing project continued to be implemented on SWP lands within the FERC project boundary. Monitoring associated with these measures includes an annual vernal pool survey (644 mapped vernal pools and/or other vernal 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. From the seven active bald eagle nesting territories in the area, a total of nine young bald eagles were successfully fledged in 2020. In addition, habitat management activities within the Oroville Wildlife Area were coordinated through DFW. These activities included providing nesting and foraging 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 2020 was compiled by DWR and submitted to USFWS.

Fuel Load Management Plan

In 2012, DWR’s Oroville Field Division developed a fuel load management plan to increase public safety and reduce wildfire risk by decreasing hazardous fuel loads within the FERC project boundary. Hazardous fuel loading refers to dead and overgrown live vegetation that has accumulated over time within a wildland area. When fire enters these areas, it can burn these surface and ladder fuels at a rapid rate, turning a ground fire into a crown fire, which can cause extreme fire behavior. Reducing fuel loads can modify fire behavior, which can reduce fire intensity and duration, giving firefighters a better chance of suppressing a fire.

The fuel load management plan was developed in coordination with federal and State agencies as well as local fire management and land and resource management agencies. It identifies fuel load reduction treatments to provide land and resource managers with a strategic approach to minimize the severity of wildfire within the FERC project boundary. Fuel load reduction treatment types include mechanical and manual thinning, prescribed and pile burning, lop and scatter, chipping, disking, mowing, weed eating, grazing, and herbicide application. The plan identifies 10 treatment zones within the FERC project boundary, which encompasses approximately 2,925 acres. Recommended treatment metrics and target levels were given for each treatment zone. Monitoring of treatments is tracked, compared against performance criteria, and used in the adaptive management of the treatment zones.

Since 2012, DWR has treated or re-treated approximately 1,010 acres using the various treatment methods mentioned above. In 2020, DWR—with local partners California Department of Forestry and Fire Protection, Butte County Fire Safe Council, California Department of Parks and Recreation, California Conservation Corps, and Butte County Sheriff's Office—treated or re-treated approximately 130 acres.

In 2020, the Potters Ravine Fire (part of the Butte Lightning Complex Fire, a series of 29 fires burning northeast of Oroville), North Complex Fire, Loyalton Fire, and Sheep Fire burned through portions of Butte County and the Upper Feather River watershed. Combined, the four fires burned approximately 400,000 acres and burned over 14 percent of the watershed.

Over the last three years, California has experienced five of the deadliest wildfires and seven of the most destructive wildfires in state history. Federal and State government is allocating funding toward forest

management and changing forest practices with the goal of making forest lands more resilient and fire adaptive. DWR, with help from local partners, will continue treating areas identified in the fuel load management plan and will use adaptive management strategies to improve treatment techniques. DWR, in partnership with the California Department of Forestry and Fire Protection and the California Department of Parks and Recreation, will also focus treatments within the North Complex Fire and Potter Ravine Fire burn scars (the burned land surfaces caused by a wildfire). These treatments will involve removing hazardous trees, removing burnt underbrush, and minimizing regrowth that occurs after a wildfire.

Devil Canyon Project and South SWP Hydropower Facilities

This section covers environmental activities related to licensing and relicensing of the Devil Canyon Project and South SWP Hydropower facilities. For more information about other aspects of FERC licensing, and Devil Canyon Project and South SWP Hydropower facilities relicensing in particular, see Chapter 9, Power Resources.

Relicensing Protection, Mitigation, and Enhancement Measures

Protection, mitigation, and enhancement measures (PM&Es) are operations and maintenance activities that DWR proposes to undertake as conditions of the new licenses for the Devil Canyon Project and South SWP Hydropower. The purposes of the PM&Es are to (1) protect resources against impacts from continued operations and maintenance activities, (2) mitigate any such impacts that would otherwise result from the proposed new licenses, and (3) enhance resources that could be affected by operations and maintenance of the proposed new licenses.

During 2020, DWR drafted numerous proposed PM&Es for the South SWP Hydropower relicensing application. The PM&Es were conceptualized and drafted with input from local, State, and federal resource agencies, Native American tribes, and other entities. The following PM&Es were drafted for the South SWP Hydropower project:

- erosion and sediment control plan
- fire prevention and response plan
- hazardous materials management plan
- historic properties management plan
- integrated vegetation management plan
- project safety plan
- Pyramid Lake fish stocking measure
- Pyramid Lake water surface elevations
- Pyramid Reach flow releases
- recreation management plan
- sensitive aquatic and terrestrial wildlife management plan
- visual resources management plan

In addition to the PM&Es for South SWP Hydropower, DWR successfully negotiated two off-license agreements with the resource agencies. These agreements will result in improved recreational experiences for the public.

Proposed PM&Es for the Devil Canyon Project were drafted during 2019 and addressed in Bulletin 132-20.

Relicensing Cultural and Tribal Resources Studies

As part of the relicensing of the Devil Canyon Project and South SWP Hydropower, DWR completed cultural and tribal resources studies and filed reports with FERC. The reports document efforts to inventory and evaluate historic properties within the areas of potential effects. Some additional research under the tribal resources study is ongoing. DWR continued to conduct outreach and consultation with 36 Native American tribes

and tribal interests. DWR also consulted with the State Historic Preservation Officer regarding the cultural and tribal resources reports, Historic Properties Management Plans, and potential eligibility status of aging DWR facilities that are licensed by FERC. Those consultations are a continuation of an effort that began in 2017 under Section 106 of the National Historic Preservation Act of 1966. Consultation with the State Historic Preservation Officer is ongoing until FERC issues a programmatic agreement for each project with the State Historic Preservation Officer that will include provisions to implement the Historic Properties Management Plans under the new licenses.

Agency Consultation

In compliance with Section 7 of the ESA, the USFWS was informally consulted regarding the Devil Canyon Project and South SWP Hydropower as described in the final license applications. DWR performed these consultations as FERC's designated non-federal representative for informal consultation. For the Devil Canyon Project, the USFWS issued a concurrence determination, concluding that the project is "not likely to adversely affect" listed species. For South SWP Hydropower, the USFWS similarly issued a concurrence determination, concluding that the project "may affect, but [is] not likely to adversely affect" listed species and their designated critical habitat.

Information related to studies, PM&Es, and relicensing applications for the Devil Canyon Project and South SWP Hydropower can be found on the DWR website by searching for "Devil Canyon Project relicensing" and "South SWP Hydropower relicensing," respectively.

Invasive Species

Quagga and Zebra Mussel Monitoring and Assessment

The quagga mussel, *Dreissena rostriformis*, 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. Both species are currently present in California.

The Aquatic Nuisance Species Program, under the Division of Operations and Maintenance, has conducted mussel surveillance monitoring, implemented management and prevention measures, and conducted public outreach. See Bulletin 132-18 for more information.

Applied Studies

Early Detection Monitoring. DWR routinely monitors the California Aqueduct, SWP reservoirs, and the Delta for the presence of quagga and zebra mussels. DWR uses two methods to monitor for mussels: zooplankton tows (with DNA and microscopic analyses) for veligers (the free floating larval stage) and settlement plates (see Bulletin 132-10).

In 2020, DWR and two collaborating water agencies, Santa Clara Valley Water District and The Metropolitan Water District of Southern California, sampled 16 locations in the SWP for veligers (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. Mussel inspections also occurred when facilities were dewatered for maintenance and inspection purposes.

A mussel inspection was conducted in the San Bernardino Tunnel, which conveys water from Silverwood Lake to Devil Canyon Powerplant in the SWP East Branch. In the SWP West Branch, the Peace Valley Pipeline that conveys water from Quail Canal to Warne Powerplant and Pyramid Lake was inspected. No mussels were observed during the inspections.

Prevention and Response Planning

To protect against and prepare for mussels in the SWP, the Aquatic Nuisance Species Program developed several planning documents to guide actions and identify vulnerabilities, including the *Quagga and Zebra Mussel Vector Management Plan for the State Water Project*, the *Quagga and Zebra Mussel Rapid Response Plan for the State Water Project*, and SWP facility vulnerability assessments and management plans.

To prevent the introduction of quagga and zebra mussels from infested watercraft, DWR contracted with the California Department of Parks and Recreation and the Los Angeles County Department of Parks and Recreation to implement vessel inspection and outreach programs at San Luis State Recreation Area (San Luis Reservoir, O'Neill Forebay, and Los Banos Creek Reservoir) and Pyramid and Castaic lakes (see Bulletin 132-12). Inspection programs at other SWP reservoirs at risk for mussel infestation are funded and conducted by other agencies.

During the vessel inspection, watercraft are inspected for attached mussels and for the presence of standing water that could harbor mussel veligers. Watercraft must be 100 percent dry to launch; otherwise, they fail inspection and must wait seven to eight days before returning. At San Luis Reservoir State Recreation Area, 19,286 vessels were inspected during 2020. Of those vessels, 556 failed the inspection because of the presence of water. At Pyramid Lake, 10,653 vessels were inspected, with 673 failures. At Castaic Lake, 39,540 vessels

were inspected, and 1,580 failed the inspection. One of these failures was because of the presence of adult quagga mussel shells on watercraft at Castaic Lake. The remaining failures were the result of the presence of wet equipment or standing water.

Quagga Mussels in the SWP

West Branch. In December 2016, quagga mussels were discovered in the West Branch of the SWP (see Bulletin 132-17). DFW classified Pyramid Lake and Elderberry Forebay as “infested” with quagga mussels, and Castaic Lake was initially declared as “presumed infested” because it is downstream of Pyramid Lake and Elderberry Forebay. This designation was removed from Castaic Lake in 2018 because there continued to be no evidence of quagga mussels in the lake.

DFW requires managers of infested water bodies to submit mussel containment and eradication plans. From 2017–2018, the Aquatic Nuisance Species Program submitted five versions of a quagga mussel control plan, all of which DFW determined were not in compliance, the last rejection being in 2019 (see Bulletin 132-20). Version six of the control plan is being drafted and will address requested shear stress analysis for Pyramid Dam spillway releases.

Monitoring for adult and veliger mussels continued in Castaic and Pyramid lakes throughout 2020 to determine if any mussels were present in Castaic Lake and to delineate the mussel population and determine if a viable population was present in Pyramid Lake. Veliger samples were collected twice monthly and analyzed by two separate labs. No veligers were detected in either lake during 2020. Additionally, adult mussels were not found on any of the settlement plates deployed in the lakes. On January 28, 2020, a quagga mussel surface survey of Pyramid Lake was conducted while

the lake was at its low winter elevation, which allowed for the search of shoreline and docks that are normally underwater. No mussels were found during the survey.

Calcium concentrations in Pyramid Lake have historically been suitable to support a quagga mussel population. However, during 2017, calcium concentrations declined to levels marginally able to support adult mussels and unable to support mussel reproduction and veliger development (see Bulletin 132-18). Inadequate calcium may be the reason no further mussels were discovered in Pyramid Lake and no veligers have been detected. From 2018–2019, calcium concentrations were suitable to support adult quagga mussels but ranged from suitable to unsuitable for veliger development (see Bulletin 132-20). During 2020, calcium concentrations were adequate to support both adult and veliger quagga mussels. DWR will continue to monitor calcium concentrations in the lake.

Delta Conveyance Project

Because the SWP relies on the Delta’s natural channels to convey water, it is vulnerable to earthquakes and sea level rise. Upgrading SWP infrastructure protects against these threats and secures the longevity of the SWP and the future reliability of SWP water supplies. The purpose of the proposed Delta Conveyance Project is to modernize the aging SWP infrastructure in the Delta to restore and protect the reliability of SWP water deliveries in a cost-effective manner, consistent with the State’s Water Resilience Portfolio, and in doing so, allow DWR to address sea level rise and climate change, minimize water supply disruption caused by seismic risk, and provide operational flexibility to improve aquatic conditions in the Delta.

California Environmental Quality Act and National Environmental Policy Act Environmental Compliance Process

On January 15, 2020, DWR released a notice of preparation for a proposal to modernize water infrastructure in the Delta, initiating environmental review in compliance with the California Environmental Quality Act (CEQA). The notice of preparation, which announced the preparation of an environmental impact report (EIR) for the proposed Delta Conveyance Project, marked the first step under the CEQA process.

The proposed project described in the notice of preparation was a single underground tunnel with two intakes that together have a total diversion capacity of 6,000 cubic feet per second. The notice of preparation noted that there will likely be alternatives identified that evaluate a range of capacities from 3,000 to 7,500 cubic feet per second. The notice of preparation signaled the start of the scoping process for the EIR and provided an opportunity for members of the public and agencies to provide input on the scope and content of the EIR, including information needs, potential project effects and mitigation measures, and possible alternatives to the proposed project.

To facilitate public input during this process, DWR also held eight scoping meetings throughout the state. The CEQA scoping period concluded on April 17, 2020, and the scoping summary report was released in July 2020, which described the scoping period, meetings conducted, and public comments received. A scoping summary report addendum was released in December 2020, which included a summary of comments received after the close of the CEQA scoping period (April 18–December 14, 2020).

The National Environmental Policy Act (NEPA) was initiated by the U.S. Army Corps of Engineers (USACE) as the

federal lead agency on August 20, 2020, with the issuance of a notice of intent, which announced the preparation of an environmental impact statement and began a comment period during which agencies and members of the public had an opportunity to comment on the contents of the permit application (described below) and scope and content of the environmental impact statement. The NEPA scoping period ended on October 20, 2020.

Clean Water Act and Rivers and Harbors Act

On January 15, 2020, DWR submitted a Department of the Army permit application to USACE to request authorization for the proposed Delta Conveyance Project activities in waters of the United States. On June 18, 2020, DWR submitted a revised permit application to meet USACE requirements for a complete application pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. (Under Section 404, a permit is required for the discharge of dredged or fill material into waters of the United States. Under Section 10, a permit is required for work or for structures in, over, or under navigable waters of the United States.)

Additionally, on June 15, 2020, DWR submitted a revised Aquatic Resources Delineation Report for the proposed Delta Conveyance Project and requested that the USACE issue a preliminary jurisdictional determination based on this delineation (which superseded previously submitted Aquatic Resources Delineation Reports for the proposed Delta Conveyance Project sent to USACE on March 31, 2020, and April 27, 2020). On June 18, 2020, USACE verified this aquatic resources delineation.

DWR submitted its Section 404 permit application for the Delta Conveyance Project in order to formally engage USACE in early coordination with DWR's CEQA process

regarding environmental review under USACE's process for compliance with NEPA, as well as the Clean Water Act and Rivers and Harbors Act. The USACE permit process will not be concluded until NEPA and all other relevant environmental compliance efforts are complete.

Separately, DWR also initiated USACE (and Central Valley Flood Protection Board) review of the Delta Conveyance Project under Section 14 of the Rivers and Harbors Act as an activity that may affect the federal-State flood control system. On May 22, 2020, the Central Valley Flood Protection Board submitted to the USACE a letter with the Central Valley Flood Protection Board's "Statement of No Objection" pursuant to Title 33, U.S. Code Section 408, documenting that the Central Valley Flood Protection Board, as the non-federal sponsor to the USACE, had no objection to USACE review of the Delta Conveyance Project.

Tribal Consultation and Engagement

In early 2020, project notification letters were sent to 121 tribes within the statutory Delta, CVP, and SWP service areas, as well as upstream of the Delta, regarding the availability of the notice of preparation and an invitation to consult with DWR under either Assembly Bill 52 (Gatto et al.; Chapter 532, Statutes of 2014) or DWR's Tribal Engagement Policy. Thirteen tribes responded to DWR requesting consultation, and government-to-government consultation meetings occurred with many of these tribes in 2020.

DWR hosted an informational meeting on October 27, 2020, for the California tribal community to discuss the status and next steps related to the Delta Conveyance Project and associated environmental planning efforts. DWR also participated in other

tribal informational meetings as requested by tribes.

Delta Conveyance Design and Construction Authority

The Delta Conveyance Design and Construction Authority (DCA) continued to develop engineering and design information to help inform the Delta Conveyance Project environmental review process. This included the presentation of data to the DCA's Stakeholder Engagement Committee to generate input and ideas that can help avoid or minimize potential local effects of the project. The DCA reached out to various members of the Delta community to ensure DCA was using current and relevant data and information in its work.

The DCA joint exercise of powers agreement was amended and reconstituted on December 31, 2020, to expand the Board of Directors to seven members, including additional public water agencies that had since voted to support project planning.

Soils Investigation

Consistent with the requirements of CEQA, on July 9, 2020, DWR adopted the final initial study and mitigated negative declaration for soil investigations in the Delta. As part of the CEQA process, DWR also formally approved the action and adopted a Mitigation Monitoring and Reporting Plan. Field work covered under the initial study and mitigated negative declaration began in October 2020. Soil investigations included data collection, soil samples, and surveys in support of DWR's efforts to better understand the region's geology to support the future evaluation of potential activities, including the proposed Delta Conveyance Project. As identified in the final initial study and mitigated negative declaration, any potential significant impact will be avoided or otherwise mitigated with implementation of mitigation adopted as part of the project approval process.

Biological Opinions for CVP/SWP Operations

See the sidebar, Endangered Species and Biological Opinions, for introductory background information.

USFWS and NOAA Fisheries Biological Opinions

In August 2016, DWR and Reclamation requested reinitiation of ESA Section 7 consultation with the USFWS and NOAA Fisheries on the coordinated long-term

operation of the CVP and SWP. On October 21, 2019, the USFWS and NOAA Fisheries issued separate BiOps (*Biological Opinion for the Reinitiation of Consultation on the Coordinated Operations of the Central Valley Project and State Water Project* and *Biological Opinion on Long-Term Operation of the Central Valley Project and the State Water Project*, respectively). The BiOps incorporated new science to optimize water deliveries, reliability, and power production while protecting listed species and their critical habitats. They also included incidental take statements for delta smelt (*Hypomesus transpacificus*), winter-run Chinook salmon,

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 federal Endangered Species Act (ESA; Title 16, United States Code Sections 1531–1544 [1973]) and the California Endangered Species Act (CESA; California Fish and Game Code Sections 2050–2100 [1984]) 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 (BiOps) 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 BiOp 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 specify reasonable and prudent alternatives that the "action agency" may take to avoid the likely jeopardy or adverse modification. In the BiOp, the wildlife agency includes an incidental take statement that estimates the amount or extent of incidental take likely to result from the action and specifies terms and conditions to implement to minimize the impacts of the incidental take.

CESA is substantially similar to ESA in all aspects. 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.

spring-run Chinook salmon, green sturgeon (*Acipenser medirostris*), and steelhead, as well as reasonable and prudent measures to minimize the effects of incidental take. Reclamation signed the Record of Decision adopting the findings in its NEPA document on February 18, 2020.

SWP Incidental Take Authorization

On March 31, 2020, DWR received from DFW an incidental take permit for delta smelt, longfin smelt (*Spirinchus thaleichthys*), spring-run Chinook salmon, and winter-run Chinook salmon for SWP operations. Conditions of approval included pumping restrictions and operational measures to minimize impacts, as well as habitat restoration measures to mitigate losses that cannot be avoided.

This permit will expire March 31, 2030.

Delta Operations for Delta Smelt and Longfin Smelt

The Smelt Monitoring Team (formerly the Smelt Working Group) is an interagency team of experts on delta smelt and longfin smelt biology that meets regularly from December through June to assess the risk to delta smelt and longfin smelt from operations at the CVP and SWP export facilities. Based on near real-time technical information, such as fish distribution, salvage, and physical water conditions, the Smelt Monitoring Team makes recommendations on export operations to the USFWS and DFW with the goal of reducing entrainment of the two species. Recommendations are based on guidelines outlined in the 2019 USFWS BiOp and the 2020 DFW incidental take permit for long-term operation of the SWP.

The 2020 water year (October 1, 2019, through September 30, 2020) was a dry year. The Turbidity Bridge Avoidance action was in place from February 18 to April 1. This action seeks to avoid the formation of a turbidity bridge from the San Joaquin River shipping

channel to the south Delta fish facilities, which historically has been associated with elevated salvage of pre-spawning adult delta smelt. No additional recommendation by the Smelt Monitoring Team was necessary as the SWP and CVP were already operating at the most positive Old Middle River flow range possible. No Old Middle River flow management concerns were elevated to the Water Operations Management Team during water year 2020.

Fish Restoration Program

Pursuant to the USFWS and NOAA Fisheries BiOps (see Bulletins 132-11 and 132-20) and the DFW longfin smelt incidental take permit, DWR and DFW's Fish Restoration Program (FRP) continued to make progress toward fulfilling its restoration requirements. See Bulletins 132-17 through 132-19 for additional information about the projects summarized below.

Prospect Island

Prospect Island is in the Cache Slough Complex immediately east of the southern end of the Yolo Bypass in the Delta. This tidal restoration project will convert roughly 1,609 acres of flooded uncultivated land to fully tidal habitat.

The draft EIR was released for public comment in August 2016. DWR's response to comments and finalization of the EIR had been delayed while DWR negotiated with Local Agencies of the North Delta (a coalition of reclamation and water districts in the northern geographic area of the Delta) and Reclamation. In the process of negotiations and further design refinement, additional information related to some of the impacts were added, resulting in the need to partially recirculate the draft EIR. DWR did a partial recirculation for public review in early 2019 and certified the final EIR in August 2019. The final EIR was challenged by Reclamation District 501. DWR and Reclamation

District 501 reached a settlement agreement in 2020.

DWR submitted all permit applications and received all but two permits. A Statement of Consistency has not yet been submitted to the Delta Stewardship Council.

At the end of 2019, work on Prospect Island was paused. The project remained on hold through 2020. DWR North Central Region Office continued to conduct hydrologic monitoring from an existing network of 29 monitoring wells (20 on Prospect Island and nine on Ryer Island), three surface water stations, two Ryer Island drainage ditch stations, and the Hastings Tract East Station (for local precipitation).

DWR continued to clear vegetation on the Miner Slough levee, using a combination of boom mowers and goat herds, to facilitate levee inspections. Priority levee repair sites were monitored to ensure they not become critical, and small repairs were conducted as needed.

Decker Island

Decker Island is located in the Delta along the Sacramento River at Horseshoe Bend. The project site was an established emergent wetland with muted tidal connectivity to Horseshoe Bend to the south that transitioned to upland habitat in the north. The project enhanced up to 140 acres of tidal wetland, associated high marsh, and riparian habitats. Construction of the restoration project was completed in 2018. The FRP monitoring program began post-project monitoring in 2019, and because of the COVID-19 pandemic, conducted a modified year of monitoring in 2020.

Bradmoor Island

Located within Suisun Marsh, Bradmoor Island includes 730 acres of managed wetlands, tidal berms, and associated uplands in three parcels. DWR purchased

the 245-acre Overlook Club (Property 332) in February 2013, the 257-acre Flying D Club (Property 329) in February 2016, and the 253-acre Wildwing Club (Property 330) in March 2017. Prior to tidal restoration in 2022, Bradmoor Island will be managed to control *Phragmites australis*, an invasive tall emergent plant. Ponds on-site may be flooded to encourage native species growth or drawn down to spray and mow *P. australis* as needed.

Arnold Slough

Arnold Slough (Property 604) is located in eastern Suisun Marsh, adjacent to the Blacklock restoration project and across Nurse Slough from the Bradmoor Island tidal habitat restoration project. DWR acquired the 260-acre property in April 2017. Restoration will result in conversion of managed seasonal wetlands to tidal wetlands at intertidal and subtidal elevations, as well as enhancement of adjacent tidal wetlands. Restoration is anticipated to be completed by fall 2021.

Chipps Island

Chipps Island is at the western boundary of the Delta and is the southernmost portion of Suisun Marsh. Chipps Island comprises three main parcels: north, east, and west. In September 2017, DWR acquired the north and east parcels. The western parcel is owned by The Metropolitan Water District of Southern California. DWR began surveys for restoration planning in 2017. A digital elevation model was created in the summer and a preliminary wetland delineation report was completed in December 2018. Five restoration designs were modeled for hydrodynamics and particle tracking in September and October 2018; two additional designs were modeled in 2020.

As part of the acquisition negotiation, DWR agreed to remediate three notices of violations issued to the previous landowner. Remediation includes removal of floating

docks, removal of a shipping container, and mitigation for construction of an internal levee. The floating docks were removed in December 2017. Removal of the shipping container was incorporated into the restoration construction design. Mitigation for construction of the internal levee is being incorporated into restoration designs.

Winter Island

Winter Island is in the Delta at the confluence of the Sacramento and San Joaquin rivers. DWR acquired approximately 589 acres on Winter Island in 2016 for tidal wetland restoration. Work at the site is ongoing to monitor and manage the rare plant populations as required by the project incidental take permit.

Tule Red

Tule Red is adjacent to Grizzly Bay within the Suisun Marsh. The project converted roughly 420 acres of existing managed wetlands to tidal habitat. Construction began in 2016 and was completed in October 2019. The first year of monitoring was conducted in 2020.

Lookout Slough

The FRP is partnering with an environmental restoration contractor to restore approximately 3,000 acres of managed wetland and cattle grazing land to tidal and subtidal marsh to benefit delta smelt and other native fish species. The project site is located within the Cache Slough Complex and Yolo Bypass near Liberty Island in Solano County. In addition to ecosystem benefits, the project will also provide flood benefits by expanding flood conveyance and storage for the Yolo Bypass. This will be accomplished by building a new protective levee along the west and north edges of the site, allowing for breaching of the existing levee along the Yolo Bypass.

The CEQA notice of preparation was released in April 2019, and the draft EIR was released on December 16, 2019. DWR

certified the final EIR in November 2020. All permit applications were submitted by the summer of 2020.

Lower Yolo Ranch

Lower Yolo Ranch is located within the Cache Slough Complex at the southern end of the Yolo Bypass floodway. The Lower Yolo Ranch restoration project is expected to yield approximately 1,713 acres of delta smelt habitat credit toward the USFWS BiOp and the DFW incidental take permit and 1,873 acres toward the NOAA Fisheries BiOp. The newly created tidal marsh habitat is connected to adjacent tidal marshes and open water to create greater food web productivity for the benefit of listed fish species as well as other native fish and wildlife. Westlands Water District initiated construction in August 2020 and completed activities in November 2020. Construction included excavating channels in the south and east portions of the site, including one that extends from west to east into the Yolo Flyway Farms restoration project site. Two culvert crossings were removed, and minor grading was conducted throughout the site. A perimeter berm was constructed along the west and north borders of the upland tidal area, and tules were planted in three plots in the east.

Yolo Bypass Program

Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project (“Big Notch Project”). The goal of this project is to improve fish passage and increase juvenile fisheries rearing habitat in the Yolo Bypass (the largest contiguous floodplain remaining in the Central Valley) and lower Sacramento River basin.

In 2020, DWR received a Clean Water Act Section 401 Water Quality Certification from the Central Valley Regional Water Quality Control Board. DWR also developed and began initial implementation of

the landowner outreach and real estate easement acquisition plans.

Design continued throughout the year on Alternative 1, an east side gated notch with an operational period of November 1 to March 15. Alternative 1 would allow flows up to 6,000 cubic feet per second, depending on Sacramento River elevation, through the gated notch to provide open channel flow for adult fish passage, juvenile emigration, and floodplain inundation. One key design milestone was reaching the 35 percent level of design in July 2020.

Wallace Weir Fish Rescue Facility. This facility rescued 46 salmonids from being lost to agricultural drainage canals. Special-status fishes recovered at this facility included six threatened Central Valley spring-run Chinook salmon, four endangered Sacramento River winter-run Chinook salmon, and 11 threatened Central Valley steelhead trout. Facility maintenance needs were also identified and remediated, specifically to address concrete spalling, repair vertical slide gates, and install a fish chute for improved fish rescues.

Agricultural Road Crossing 4 Fish Passage Project. A privately-owned water delivery system in the Yolo Bypass posed a partial barrier to migration for special status fish considered in the BiOp and incidental take permit for the coordinated operations of the CVP and SWP. DWR negotiated with the landowners to renovate their private water delivery system in a more fish-friendly manner that did not include impounding water in the Tule Canal. Removing this constraint allowed DWR to redesign the road crossing from an operable dam to an open-channel bridge, which maximized fish passage. This design marked a significant improvement from the original Concept 2 design by eliminating the water impoundment feature.

Fish Restoration Program (FRP) Requests for Proposals

The FRP continued efforts to acquire more restoration properties. In an effort to reach its BiOp restoration requirements, DWR developed a process to solicit proposals for restoration projects in which private and nonprofit entities would acquire property and develop and implement tidal habitat restoration projects that meet DWR criteria. The solicitation period ended in February 2017, at which time the FRP evaluated submitted proposals. Two proposals, Yolo Flyway Farms tidal habitat restoration project and Wings Landing tidal habitat restoration project, were selected and entered into habitat restoration project agreements as of August 1, 2017. Each contract has a specified number of deliverables that will be paid through the duration of the contract. Successful completion of the tidal habitat restoration projects will ultimately result in creditable acres that will be applied to DWR's mitigation requirement.

Yolo Flyway Farms. The Yolo Flyway Farms tidal habitat restoration project was acquired through the request for proposals FRP issued in 2016. The project will restore approximately 294 acres of seasonal wetland and cattle grazing land to tidal and subtidal marsh. The project site is located within the Cache Slough Complex near Little Holland Tract, Liberty Island, and Prospect Island, and is directly adjacent to the Lower Yolo Ranch property. Construction was completed in 2018, and site management and maintenance is ongoing.

Wings Landing. DWR entered into an agreement with a contractor in 2017 to complete the Wings Landing tidal habitat restoration project, which was designed to restore a managed duck club to a tidally influenced marsh system in Solano County. The project site is located in north-central Suisun Marsh, a mile south of Suisun City,

within the Suisun Marsh Plan Region 1. The entire 267-acre site will be permanently protected and is expected to achieve approximately 257 acres of credit from the regulatory agencies for delta smelt, longfin smelt, and salmonids. Restoration of the project site will benefit listed species and native California tidal marsh ecosystems through habitat protection, creation, and enhancement, as well as support food web productivity.

The contractor began construction on September 18, 2020, and completed construction on November 13, 2020. Construction consisted of breaching five levees, creating tidal depressions, inserting channel plugs, removing five water control structures, improving the cross levee between Wings Landing and Walnut Creek Gun Club, and restoring the borrow ditch habitat adjacent to the cross levee. Prior to construction, some populations of Mason's lilaeopsis (*Lilaeopsis masonii*) were transferred from construction areas to other parts of the property as per the project inspection test plan.

Monitoring and Research

With the support of and in collaboration with DWR, the DFW FRP Monitoring Team is committed to the objective of science-based monitoring of fishes and their food web in sites restored through the FRP. Monitoring is guided by each individual project's adaptive management and monitoring plan, which can be obtained by contacting the appropriate DWR project manager. The DFW FRP Monitoring Team was able to modify field operations to achieve the most critical sampling and complete processing of 2019 data for incorporation in individual annual reports for restoration projects at Decker Island, Yolo Flyway Farms, Winter Island, and Tule Red.

The DFW FRP Monitoring Team led the Interagency Ecological Program Tidal

Wetland Monitoring Project Work Team, a forum for collaboration and sharing new scientific techniques and studies that may be useful for restoration monitoring.

In 2020, the DFW FRP Monitoring Team continued pre-project monitoring at Lookout Slough and Wings Landing. It also collected the second year of post-construction monitoring data at Decker Island and North Delta Berms, as well as at Yolo Flyway Farms and Liberty Island. Winter Island, Browns Island, Tule Red, and Ryer Island were sampled for the first post-construction data. Both pre- and post-construction monitoring consisted of extensive lower trophic level sampling at all sites in the late spring or early summer. Sites in the Cache Slough Complex and the confluence of the Sacramento and San Joaquin rivers were sampled for the same metrics in the fall. Sondees were also installed in April inside Decker Island and Yolo Flyway Farms to record post-restoration water quality conditions.

In addition to the ongoing monitoring efforts, FRP is conducting research in Suisun Marsh and the Delta investigating the effectiveness of restoration techniques to deter invasive plant establishment. The following projects were awarded grants through the Delta Conservancy's Ecosystem Restoration and Water Quality Grant Program (Proposition 1; Water Quality, Supply, and Infrastructure Improvement Act of 2014):

- The Blacklock Restoration: Phragmites Control Project was awarded a grant in May 2019 and received all necessary permits to begin study actions in October 2019. Monitoring continued through 2020 and is expected for one more year.
- The revegetation studies that compare methods of active revegetation of native plant species moved forward at the Dutch Slough and Bradmoor Island restoration sites. Installation of the experimental treatments was completed at Bradmoor

Island in September 2018 and at Dutch Slough in October 2018. Monitoring began in December 2018 at Dutch Slough and in early 2019 at Bradmoor Island. Monitoring concluded in October 2020, and data is being processed by DWR and the University of California, Davis.

Decisions on Endangered Species

Table 3-1 lists fish species of concern found in the Delta. No status changes were made in 2020.

Trends in Fish Abundance

Abundance indices for longfin smelt and delta smelt are computed using the DFW's 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. The fall abundance index serves as an indicator for adult longfin and delta smelt populations over a long period of time.

The fall midwater trawl abundance index for longfin smelt is shown on Figure 3-1. The index for 2020 was 28, lower than the index in 2019 and consistent with the low abundances that have persisted since the early 2000s.

Figure 3-2 shows the fall midwater trawl abundance index for delta smelt. In 2020 the index remained at zero, continuing the declining catch observed in the past few years.

Table 3-1 Special Status Delta Fish Species

Common Name	Scientific Name	ESA Listing	CESA Listing
delta smelt	<i>Hypomesus transpacificus</i>	threatened ¹ (3/5/1993)	endangered (1/20/2010)
longfin smelt (San Francisco Bay-Delta DPS)	<i>Spirinchus thaleichthys</i>	candidate ² (4/2/2012)	threatened (4/5/2009)
Chinook salmon (Sacramento River winter-run ESU)	<i>Oncorhynchus tshawytscha</i>	endangered (2/3/1994)	endangered (9/22/1989)
Chinook salmon (Central Valley spring-run ESU)	<i>Oncorhynchus tshawytscha</i>	threatened (11/15/1999)	threatened (2/5/1999)
Chinook salmon (Central Valley fall-/late fall-run ESU)	<i>Oncorhynchus tshawytscha</i>	none	none
steelhead (Central Valley DPS)	<i>Oncorhynchus mykiss</i>	threatened (5/18/1998)	none
green sturgeon (southern DPS)	<i>Acipenser medirostris</i>	threatened (6/6/2006)	none
Sacramento splittail	<i>Pogonichthys macrolepidotus</i>	none	species of concern
Pacific lamprey	<i>Entosphenus tridentata</i>	none	species of concern
river lamprey	<i>Lampetra ayresii</i>	none	species of concern

ESA = federal Endangered Species Act
CESA = California Endangered Species Act
DPS = distinct population segment
ESU = evolutionarily significant unit

¹ In April 2010, the USFWS found that reclassification of delta smelt from threatened to endangered was warranted but precluded by other higher priority listing actions.

² On April 2, 2012, the USFWS found that listing the San Francisco Bay-Delta DPS as threatened or endangered was warranted but precluded by other higher priority listing actions and has added the San Francisco Bay-Delta DPS of longfin smelt to its list of candidate species.

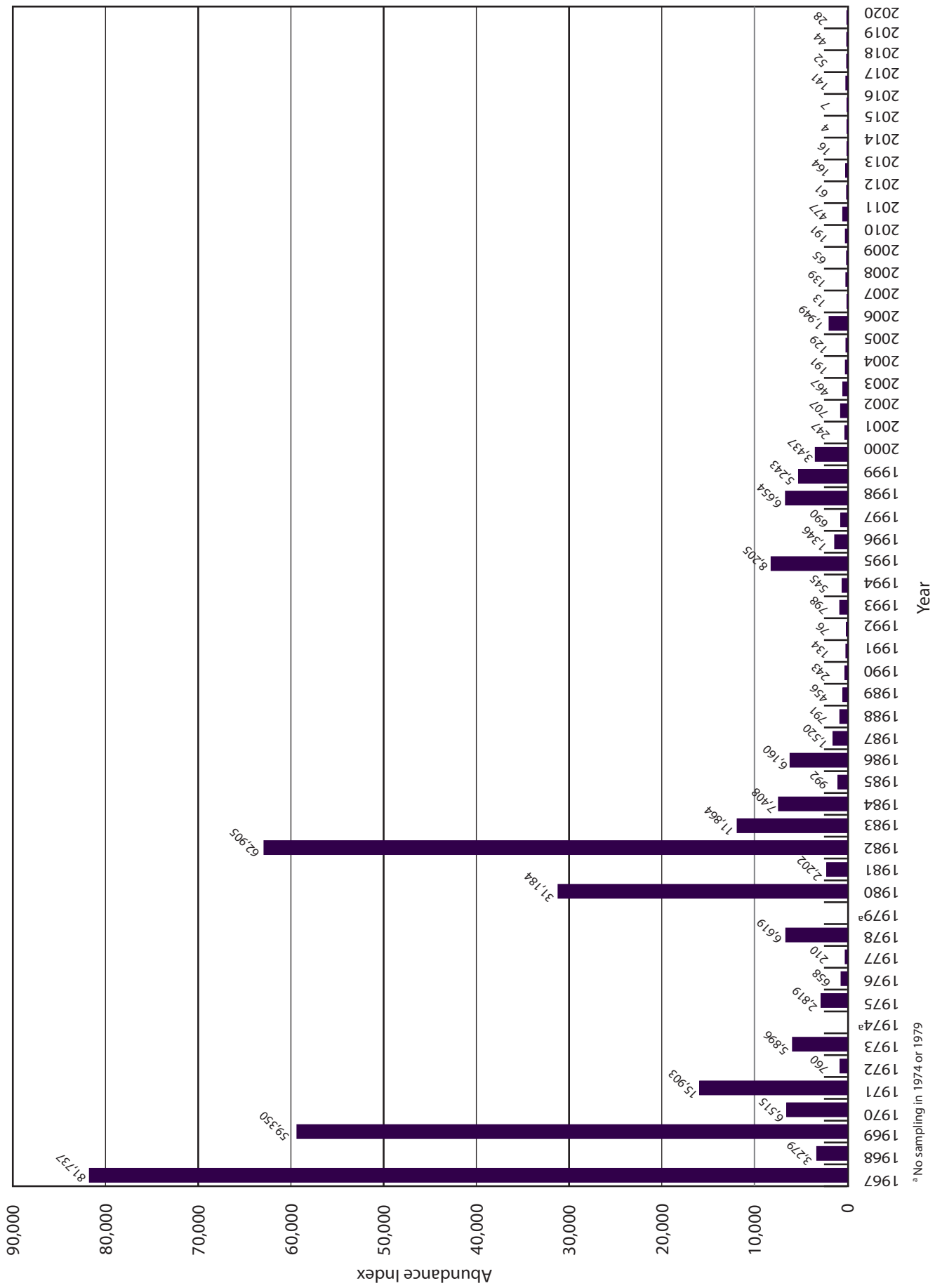


Figure 3-1 Longfin Smelt Fall Midwater Trawl Abundance Index, 1967–2020

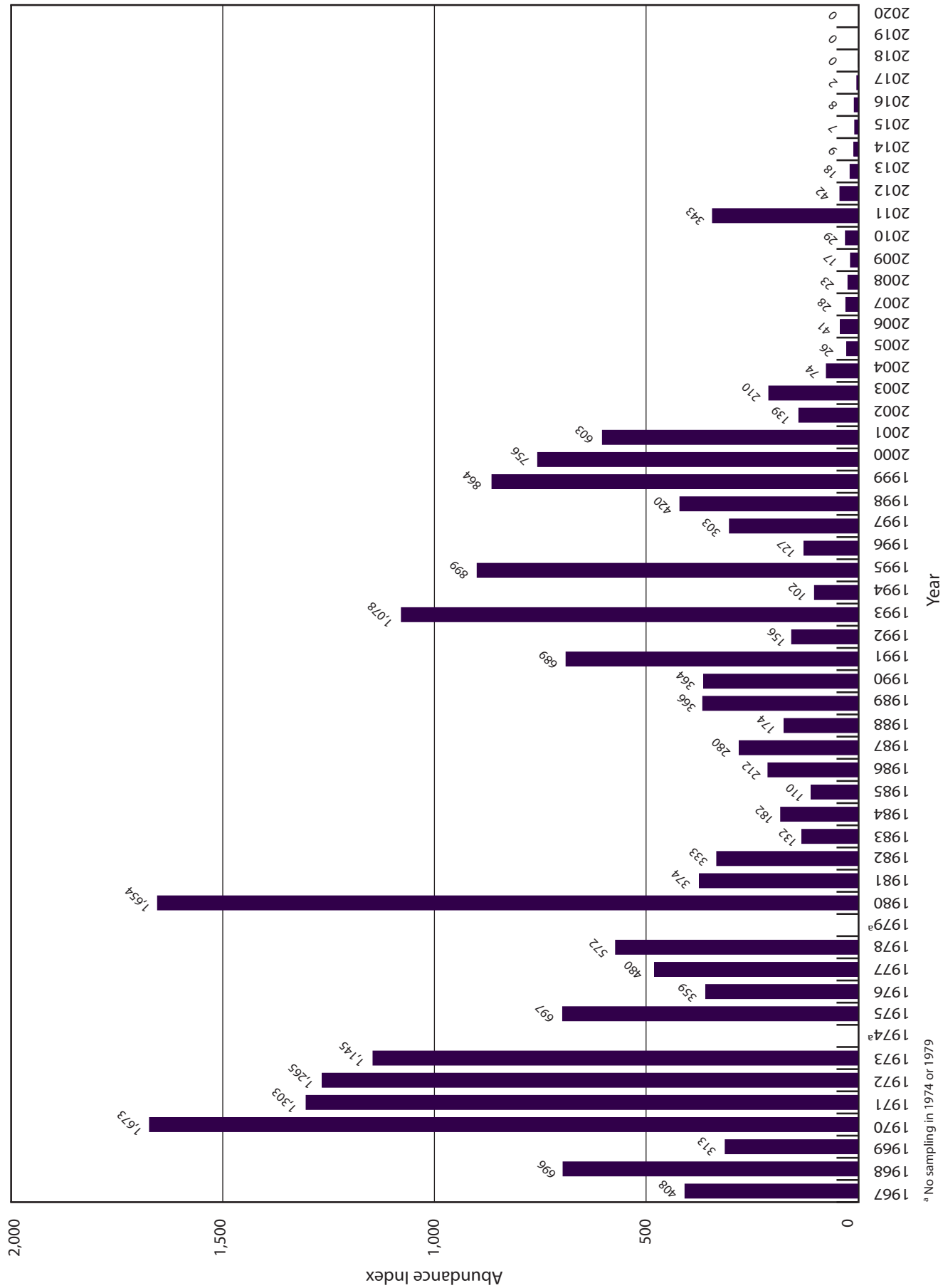


Figure 3-2 Delta Smelt Fall Midwater Trawl Abundance Index, 1967–2020

Figure 3-3 shows estimates of returning adult winter-run Chinook salmon from 1970 through 2020. 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 from the DFW carcass survey. DFW has been using the carcass survey data to generate escapement estimates since 2001, prior to which Red Bluff Diversion Dam counts were used. The estimated winter-run Chinook salmon escapement for 2020 was 7,428, which was an 8.6 percent decrease from the 2019 escapement estimate.

Figure 3-4 shows estimates of returning adult spring-run Chinook salmon from 1985 through 2020. Individual estimates are shown for the FRFH and the principal spring-run spawning streams: Battle Creek, Clear Creek, 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 2020 was 1,554 for the FRFH and 1,948 for the other streams combined. The 2020 escapement estimate was 2.2 times higher than the 2017 parent stock estimate for the FRFH. For naturally spawned fish in Battle, Clear, Mill, Deer, and Butte creeks, the 2020 estimate was 1.9 times higher than the 2017 parent stock estimate.

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

Scientific Efforts in the Upper San Francisco Estuary

Some of the scientific studies and synthesis efforts conducted in 2020 to enhance DWR's knowledge of fish abundance, distribution,

and response to management actions are listed below:

- pilot effort to evaluate elements of long-term monitoring surveys in the system, including program mandates, effectiveness, and usefulness
- research synthesis and directed study evaluating the effects of fall and/or spring outflow actions on delta smelt habitat, condition, and survival
- research synthesis on the status of native cypriniform fishes in the Delta and their associations with environmental factors
- research synthesis on spatial and temporal community patterns for early life stage fishes in the upper San Francisco estuary (the Delta and Suisun Bay)
- research synthesis on changes in fish community diversity and potential biotic homogenization in the estuary
- continuation of a study examining the effect of Suisun Marsh Salinity Control Gates operation on delta smelt habitat

Feather River Fish Studies

In the early 1990s, the 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 program has progressively expanded since the mid-1990s, in preparation for the FERC relicensing of the Oroville Facilities and then to satisfy the NOAA Fisheries BiOp for CVP and SWP long-term operations. More recently, efforts have been focused on satisfying the NOAA Fisheries BiOp with the Oroville Facilities license issuance in mind by developing baseline information that satisfies current requirements and will also directly benefit planning and implementation of license requirements. Field program elements have included operation of rotary screw traps, acoustic and radiotelemetry, salmon and steelhead spawning surveys, salmon

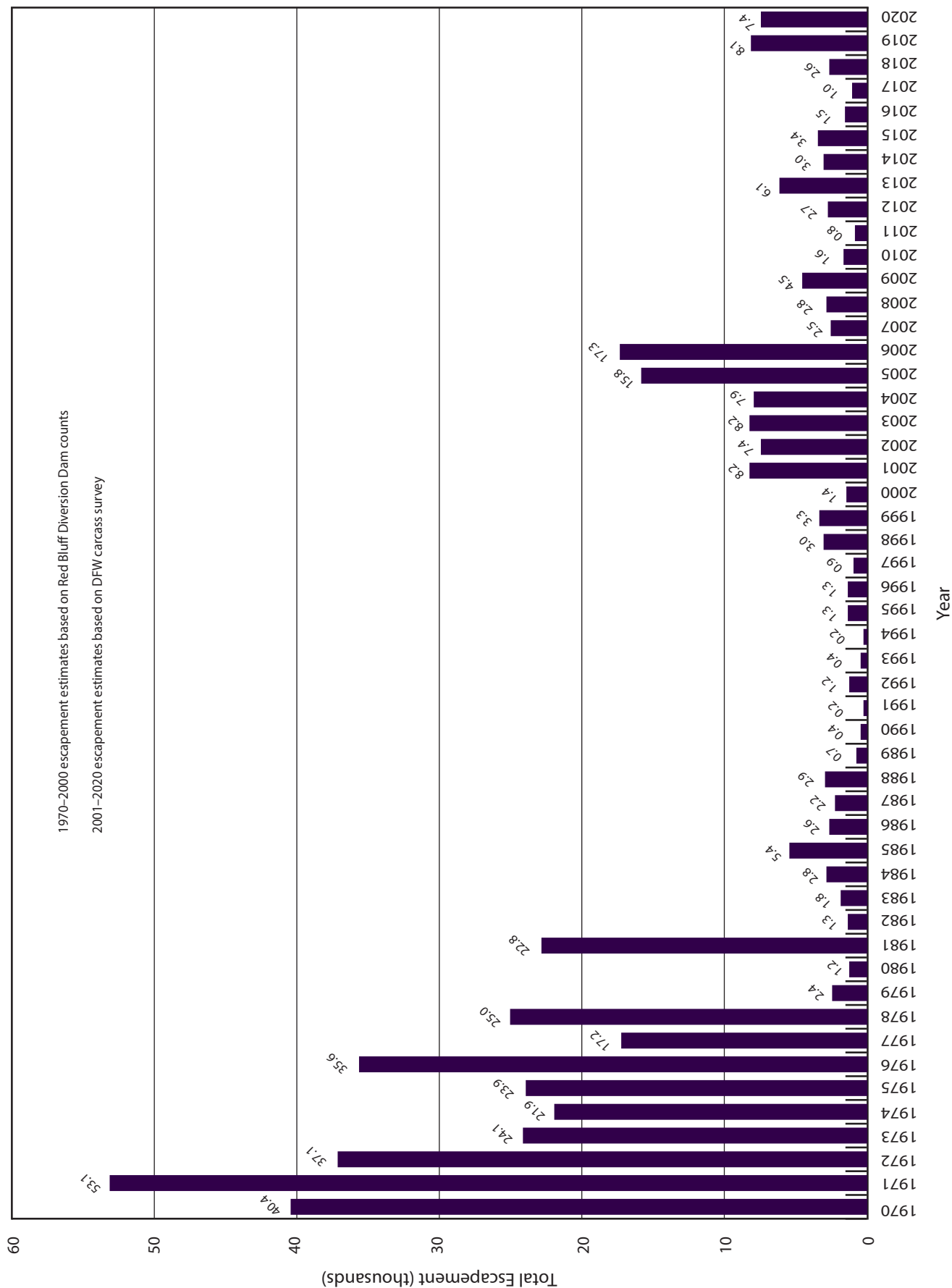


Figure 3-3 Estimated Total Adult Winter-run Chinook Salmon Escapement, 1970–2020

escapement surveys, spring-run Chinook salmon tagging, snorkel and beach seining surveys, green sturgeon studies, steelhead passive integrated transponder and acoustic tagging, and hatchery juvenile Chinook salmon movement and survival studies.

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 (see Figure 3-5).

Rotary Screw Traps

During the 2020 trapping season, rotary screw traps were used at two locations to assess the timing and general abundance of juvenile Chinook salmon, steelhead, and other fishes emigrating from the Feather River. Within the low-flow channel, one rotary screw trap was stationed at the bottom of Eye Side Channel at RM 60.2, one mile above the Thermalito Afterbay Outlet. Within the high-flow channel, two rotary screw traps were stationed in tandem at Herringer Riffle, RM 45.7. The rotary screw trap in the low-flow channel was fished for a total of 215 days during the emigration

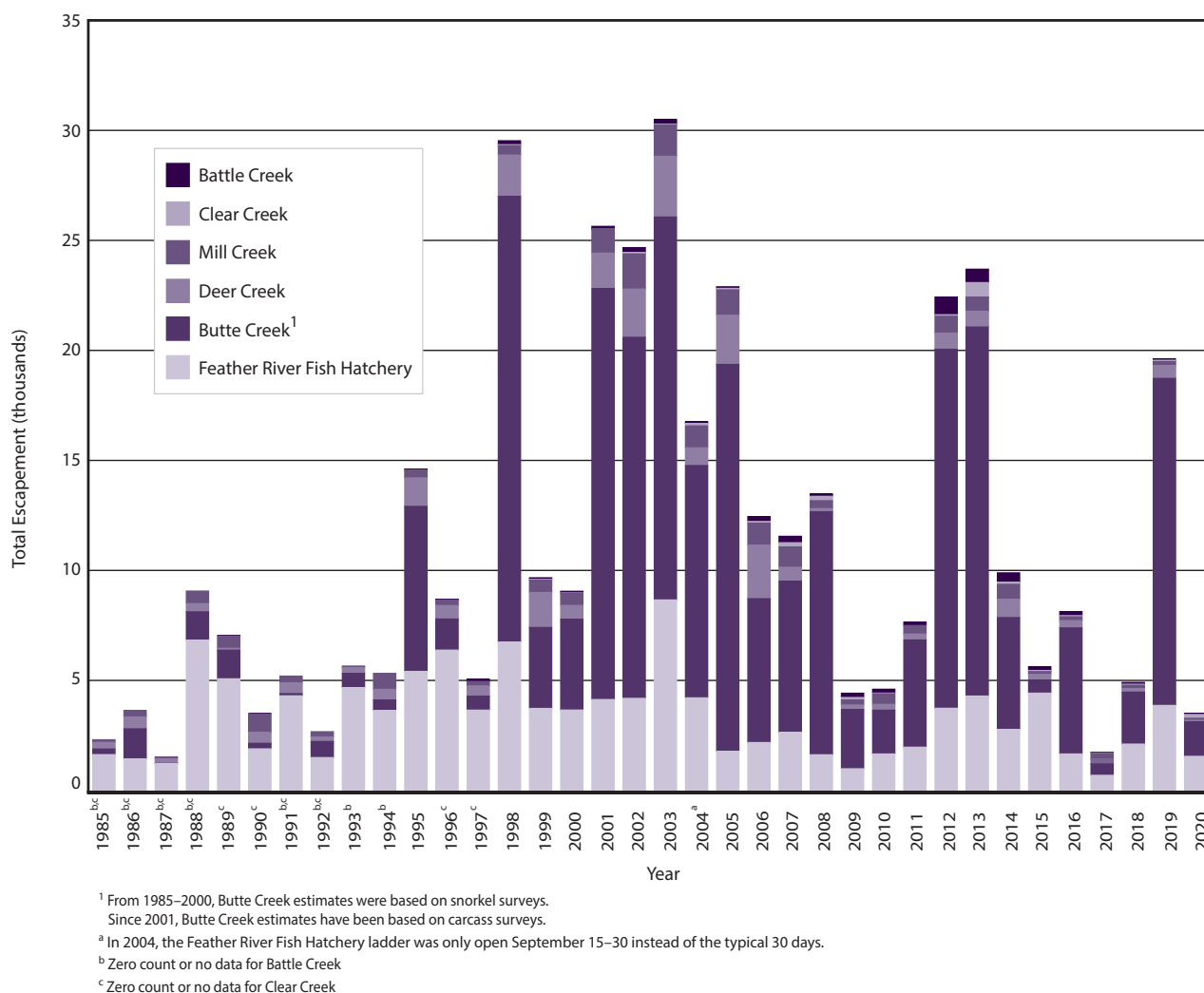


Figure 3-4 Estimated Total Adult Spring-run Chinook Salmon Escapement, 1985–2020

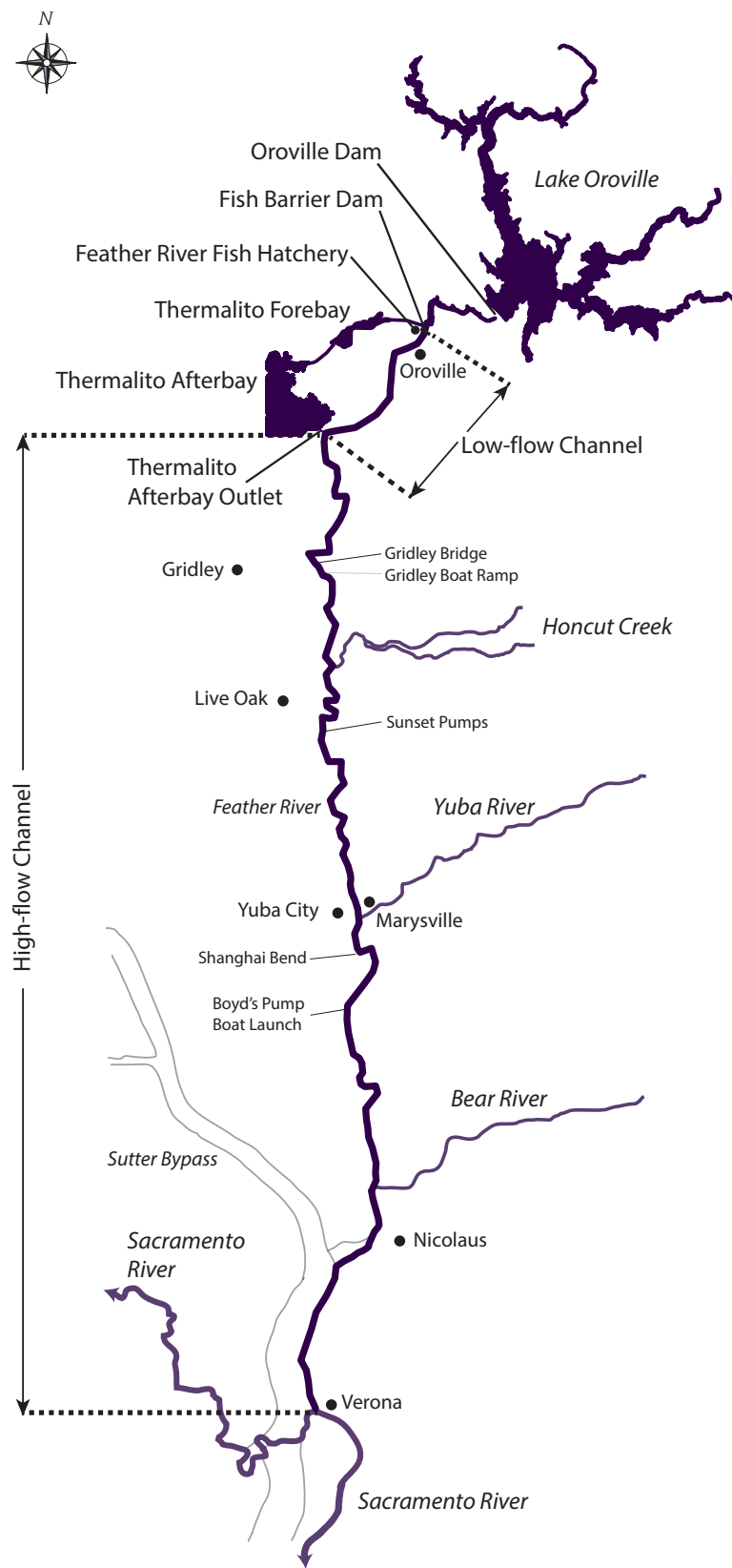


Figure 3-5 The Lower Feather River

period from the beginning of December 2019 through the end of August 2020, and the rotary screw traps in the high-flow channel were fished for a total of 181 days from the middle of December 2019 to the end of June 2020.

Although Chinook salmon and steelhead were the primary targets of trapping efforts, records were kept on all fish species caught. Nineteen species were caught during the 2020 trapping season; 17 were non-salmonid species. Chinook salmon constituted 96 percent of the total catch. Of the total natural-origin Chinook salmon captured during the 2020 trapping season, 274,957 (86.1 percent) were caught in the low-flow channel, and 44,223 (13.9 percent) were caught in the high-flow channel. A total of 2,920 hatchery-origin spring-run salmon were also caught in the high-flow channel during April and May following in-river Feather River Fish Hatchery releases at the Gridley Boat Ramp (RM 50). A total of 143 wild young-of-the-year, one yearling, and two adult steelhead were captured in the low-flow channel, and nine wild young-of-the-year and two adult steelhead were captured in the high-flow channel. Additionally, four hatchery-origin adult steelhead were captured in the low-flow channel, and one hatchery-origin adult and two yearling steelhead were captured in the high-flow channel.

During the 2020 trapping season, approximately 54.5 percent and 63.3 percent of the natural-origin salmon captured and measured in the low-flow channel and high-flow channel, respectively, had fork lengths of less than 50 millimeters. These percentages are much lower compared to previous years, which may indicate that juvenile Chinook salmon reared in the river system longer than seen in previous years before emigrating. Chinook salmon were captured as soon as both the low-flow channel and high-flow channel traps were deployed in December, peaking in February,

and continuing into August with low numbers. Separate fall-run Chinook salmon passage estimates were developed for the low-flow channel and high-flow channel locations. The 2020 passage estimate was 9,565,000 in the low-flow channel and 2,741,000 in the high-flow channel.

Based on 2019 adult escapement data, average fecundity, and the 2020 low-flow channel passage estimate, the egg-to-fry survival rate for fall-run Chinook juveniles in the low-flow channel was 5.6 percent in 2020. The emigration index (per capita production) of juveniles was 288.

Salmon Escapement Survey

The Chinook salmon escapement survey provides information critical to the management and conservation of Feather River salmon populations. The primary purpose of the salmon escapement survey is to determine the abundance of Chinook salmon spawning in the lower Feather River by mark-recapture methods using salmon carcasses. Other important objectives are to (1) catalog the distribution and success of spawning, (2) estimate the number of hatchery salmon spawning in the river, and (3) collect biological samples (scale, tissues, and otolith) for later analysis. The survey area covers 16 river miles of the lower Feather River from the Table Mountain Bridge in downtown Oroville to the East Gridley Road Bridge, near Gridley. The population estimate includes both naturally spawning fall- and spring-run Chinook salmon.

The 2020 escapement survey was conducted from August 31 through December 10. The survey ended one week early because of a mandated stay-at-home order issued for Butte County during the COVID-19 pandemic. Tissue samples were collected from early-spawning salmon to test the efficacy of genetics to determine the proportion of spring- and fall-run salmon spawning in the first several weeks of the

survey. The 2020 escapement survey resulted in an in-river spawning population estimate of 42,969 Chinook salmon—40,499 adults and 2,470 grilse (presumably two-year-old salmon).

Spawning Surveys

To better understand Feather River salmon and steelhead spawning distribution and response to restoration actions, redd surveys (a redd is a shallow depression in a streambed, excavated by a salmonid and containing deposited fish eggs) are performed to identify the location, timing, magnitude, and physical characteristics of natural spawning sites in the lower Feather River. The surveys are generally performed weekly, and, depending on the survey type, much of the available spawning area between the Fish Barrier Dam and Gridley Bridge is searched.

Chinook Salmon

Operation of the Oroville Facilities for the last 50 years has resulted in the lack of recruitment of bed load material to the lower Feather River, resulting in degraded spawning habitat and increased competition for the remaining suitable spawning gravels on riffles by anadromous fish, particularly between spring-run and fall-run Chinook salmon. In 2014, the B105 Gravel Supplementation and Improvement Project was constructed to address this problem. In June and July 2014, 8,300 cubic yards of clean spawning gravel were added to the Feather River near the FRFH.

In early 2017, a series of high-flow events in the low-flow channel removed much of the spawning gravel placed during the B105 Gravel Supplementation and Improvement Project in 2014. Additionally, the high flows filled in a small side channel below the FRFH known as Moe's Side Channel. In June 2017, DWR initiated the 2017 Gravel Supplementation Project to replace 5,000 cubic yards of displaced

spawning gravel in certain locations of the 2014 gravel project area and remove approximately 3,000 cubic yards of gravel from Moe's Side Channel.

In 2020, redd mapping was performed in the gravel supplementation project area as well as other spawning sites in the low-flow channel and high-flow channel to document use and provide information for future gravel projects in the lower Feather River.

Ground surveys for the 2020 Chinook salmon redd survey began on September 22 and continued until November 20. The redd survey consisted of a total of 31 days over nine survey weeks. Survey locations from Table Mountain Riffle (RM 66.9) to Lower Auditorium Riffle (RM 66.4) were inspected for newly completed redds once a week by foot and boat. Survey locations downstream of the gravel supplementation area from RM 66.1 to RM 59.4 were surveyed every other week.

Spawning in the high-flow channel typically occurs later than in the low-flow channel. Therefore, redd surveys in the high-flow channel were conducted later than surveys conducted in the low-flow channel. Redd surveys were performed on five days in the high-flow channel, beginning on October 29 and ending on November 20.

During the nine weekly surveys, 5,432 redds were found within the Feather River survey areas. A total of 5,022 redds were mapped in the low-flow channel, and 410 redds were mapped in the high-flow channel. Within the low-flow channel, 2,725 redds (54 percent) were discovered inside the gravel supplementation project area.

The week five survey (October 19–23), which covered the area from Table Mountain Riffle to Steep Riffle, revealed the highest number of redds ($n=1,252$). The locations within the low-flow channel with the largest number of redds were Lower

Auditorium with 694 (14 percent) and Top of Auditorium with 468 (9 percent). The average depth for all salmon redds was 0.45 meters (1.48 feet), and the average water velocity was 0.54 meters (1.77 feet) per second. The average redd length and width was 2.6 meters (8.5 feet) by 1.4 meters (4.6 feet), respectively.

Steelhead

Beginning in 2003, DWR began collecting information on steelhead redds in the lower Feather River below Oroville Dam. This information is collected to better understand natural steelhead spawning and production in conjunction with FRFH steelhead spawning. The primary objectives of the project were to

- (1) obtain detailed information on the relative abundance and distribution of spawning steelhead;
- (2) provide baseline data on the physical characteristics of steelhead redds for modeling exercises and inform future restoration projects; and
- (3) comply with requirements regarding steelhead abundance in the NOAA Fisheries 2004 operation criteria and plan BiOp.

In 2020, the steelhead redd survey was conducted for 13 weeks from January 8 to March 5. Steelhead redd surveyors observed 516 steelhead redds and 96 adult steelhead associated with redds during sampling. A total of seven steelhead redds were found in the high-flow channel; all other redds were found in the low-flow channel. Average redd length was 1.44 meters (4.72 feet), and average redd width was 0.68 meters (2.23 feet).

FRFH Spring-run Chinook Salmon Tagging

To better manage brood stock selection at the FRFH, a program was developed in 2003 to mark spring-run Chinook salmon

entering the FRFH in the spring. The spring-run Chinook salmon tagging program allows DFW to segregate the spawning of spring- and fall-run Chinook salmon in the hatchery in the fall when the populations are mixed together in the fish ladder. The program also investigates potential differences in spawning distribution and timing of the early arriving spring-run Chinook salmon in the river.

Early arriving spring-run Chinook salmon entering the hatchery in May and June were marked with individually numbered dart tags for identification. Once marked, the fish were released back into the river. During the hatchery spawning season, the tags enabled hatchery staff to distinguish the early arriving spring-run fish from fall-run, allowing segregated spawning for each run. The tags also enabled the escapement survey crew to differentiate spring- and fall-run salmon, so that any potential differences in spawning success, distribution, or behavior of the two runs can be analyzed.

In 2020, 2,746 Central Valley spring-run Chinook salmon were tagged at the FRFH. Tagging began on May 6 and ended on June 28. Hatchery spawning began in late September, and a total of 1,865 tagged fish were recaptured: 1,544 at the FRFH and 881 in the river escapement survey.

Snorkel Surveys

From 1999 to 2007, DWR conducted snorkel surveys focused on juvenile steelhead, while other species were also counted in the process. In 2010, DWR reinstituted the lower Feather River snorkeling surveys with the following objectives:

- (1) Determine the relative abundance and distributions of juvenile Chinook salmon and steelhead prior to habitat improvements.
- (2) Identify habitat conditions (depth, substrate, and cover) where juvenile Chinook salmon and steelhead occur.

- (3) Identify potential sites for channel improvement and structural habitat restoration.
- (4) Determine the spatial and temporal distribution of other non-salmonid fishes.
- (5) Collect information related to the fish community of the lower Feather River.

In 2020, snorkel surveys were not completed from March through May because of the Governor's stay-at-home order during the COVID-19 pandemic. Snorkel surveys conducted from June through September identified a total of 535,550 age-0 juvenile Chinook salmon. A total of 955 juvenile steelhead (fork length ≤ 200 millimeters) were identified as well as 147 sub-adult and adult steelhead. Only six adult Chinook salmon and nine adult steelhead were observed in the high-flow channel downstream of the Thermalito Afterbay Outlet from June through September. The low abundance of salmonids in the high-flow channel in the summer months is consistent with observations from previous years.

Beach Seining

DWR conducted beach seining surveys in the lower Feather River between January 1997 and August 2001 to document fish distribution throughout the lower Feather River. Since 2008, beach seining has occurred in all years but 2010 through 2012 to further document the distribution and condition of steelhead and salmon in both the low-flow and high-flow channels during the primary emigration and rearing period (roughly December through July).

Although targeted at steelhead and salmon, beach seining is useful to augment rotary screw trap data for documenting the distribution and relative abundance of all fish species found in the lower Feather River.

Beginning in 2015, the objectives for beach seining included two new components:

- (1) capturing spring-run smolts released from the FRFH to augment survival and emigration rate data collected via acoustic tagging studies
- (2) collecting random samples of juvenile Chinook salmon for an ongoing *Ceratonova shasta* study

This study is looking at the rate of infection and disease from the parasite *C. shasta* experienced by juvenile Chinook salmon rearing in or emigrating from the lower Feather River.

Beach seining surveys were conducted from January through August 2020. A total of 167 seine hauls were conducted and 14,532 individual fishes were sampled during the 2020 survey. Native fishes dominated the beach seine catch ($n=14,473$) and represented nearly 99 percent of the overall catch. Juvenile fall-run Chinook salmon ($n=4,999$), Sacramento sucker (*Catostomus occidentalis*, $n=3,795$), Sacramento pikeminnow (*Ptychocheilus grandis*, $n=1,756$), and juvenile cypriniforms (minnows, $n=3,052$) were the most abundant species captured. Other salmonids captured included juvenile steelhead ($n=89$), juvenile spring-run Chinook salmon ($n=243$), and hatchery-origin juvenile Chinook salmon ($n=188$). The high-flow channel accounted for 77 percent of the overall catch.

Sturgeon Studies

Green Sturgeon

The data collected during green sturgeon studies in the lower Feather River relates to potential adult migration barriers, migration patterns, distribution, habitat preferences, annual abundance of adults, and identification of spawning and rearing areas. The data will assist DWR in making long-term management decisions concerning future monitoring programs, operational

changes to the facilities, and/or habitat enhancement within the lower Feather River. This SWP project scope has not changed since the prior reporting year. Green sturgeon studies will expand once the FERC license is accepted and the new BiOp is in effect.

2020 Sonar Surveys

A total of 62 sonar surveys were completed from January 13 to December 1, 2020. Surveys were conducted at six locations from Oswald (RM 23.5) to the Fish Barrier Dam (RM 67). A total of 52 sturgeon detections occurred in the Feather River. Green sturgeon overwintering from 2019 at the Thermalito Afterbay Outlet accounted for the bulk of these detections (n=32) during the first half of the 2020 survey season. Surveys suggested an estimated 2–3 sturgeon were present at the Thermalito Afterbay Outlet. Sunset Pumps Rock Weir (RM 38.5) had the second most detections (n=17) and an estimate of 1–2 sturgeon, which immigrated into the river during 2020.

2020 Egg and Larval Surveys

No egg or larval surveys were conducted in 2020 because of the COVID-19 pandemic.

2020 Sturgeon Angling/Telemetry

Six adult green sturgeon were acoustically tagged at Daguerre Point Dam (RM 11.4) on the lower Yuba River. The sturgeon overwintered into 2021.

A total of nine previously acoustically tagged sturgeon entered the lower Feather River. Of those, seven were identified as white sturgeon (*Acipenser transmontanus*) and two as green sturgeon:

- The seven white sturgeon entered the Feather River between March 23 and April 14 with an average entry date of April 4. Their length of stay ranged from 0.5 to 17.9 days with an average stay of 5.6 days. Four of these white

sturgeon were detected inside the Bear River (RM 12.6), and the farthest upriver detection was Dana Farms (RM 14).

- The two green sturgeon were both tagged in the lower Feather River. The first green sturgeon was originally tagged below Shanghai Bend (RM 24.5) in 2013. It entered the Feather River on March 30 and was detected at Star Bend (RM 19). The tag was never detected leaving the Feather River system and was last detected at Beer Can Beach (RM 7) continuously for two months. The second green sturgeon was originally tagged in 2017 at the Fish Barrier Dam. It entered the Feather River on April 11 and was detected as far upriver as Dana Farms. It was then detected leaving the Feather River and migrated up the Sacramento River on April 15.

Ceratonova shasta Sampling

Ceratonova (synonym *Ceratomyxa*) *shasta* is a myxozoan parasite that infects salmonid fishes and is native to anadromous fish tributaries of the Pacific Northwest in North America, including the Feather River. *C. shasta* has a complex life cycle involving an invertebrate polychaete worm host (*Manayunkia speciosa*) as well as the vertebrate salmon host. Infected worms release actinospores into the water that infect fish by attaching to the gills. The parasite spreads through the blood into the intestine and other organs and tissues. Myospores are released into the water when the fish dies and infect the worms, completing the life cycle.

Surveys conducted between 2012–2016 have documented a highly infectious zone for *C. shasta* that begins at the top of the high-flow channel and extends approximately 14 river miles downstream. While infection can occur as early as January, peak prevalence of infection and disease severity tend to occur in March. Juveniles collected in the low-flow channel are far less

likely to be infected (<10 percent prevalence of infection).

2020 Observations and Trends

The following was observed:

- Prevalence of *C. shasta* infection was 48 percent by histology and 52 percent by quantitative real-time polymerase chain reaction (qPCR) in natural Chinook salmon fry captured at the Herringer (RM 46) rotary screw trap in the high-flow channel.
- The prevalence and severity of *C. shasta* infection increased in 2020 compared to the 2015–2019 sample years.
- *C. shasta* detection occurred earlier (January 27, 2020) than the March peak in disease and at higher prevalence in the gill tissue compared to the intestine.
- *C. shasta* spore concentration from water samples collected at the Herringer trap site peaked at 54 spores per liter on March 9, 2020. Flow increases resulted in a drop in spore concentration, which then rebounded the following week despite flows remaining high. River flow had little effect on actinospore concentrations within the historic “infectious zone.”
- Previously, Herringer and Gridley (~RM 45) had the highest spore concentrations in March, but in 2020, the peak spore concentrations were seen directly above the mouth of the Yuba River (RM 29) at 183 spores per liter. This downstream shift may indicate the polychaete abundance below Gridley has changed. Ceratomyxosis may result in reduced survival of FRFH spring-run salmon smolts, as both the prevalence and severity of infection was high in smolts captured in the Delta 1–4 weeks post-release.

Steelhead Mark-Recapture Study

An abundance estimate of wild steelhead spawning in the Feather River is currently lacking. Although the FRFH has useful

long-term data on abundance and origin, it is only half of the information necessary to understand population size and structure in the Feather River (hatchery versus natural origin, size, etc.). Furthermore, FRFH data suggest that nearly all steelhead are of hatchery origin, potentially biasing critical population data. However, redd survey, snorkeling, and angling data demonstrate that steelhead also spawn in the upper river, but abundance data is difficult to gather. Additional methods are needed to better understand the size and structure of the steelhead population spawning in the river.

Passive integrated transponder tags allow for all steelhead encountered during any sampling activity (electrofishing, seining, weir operations, or hatchery operations) to be individually identified. This allows movement and growth patterns of both juveniles and adults to be monitored for years instead of weeks or months. It also allows DWR to more closely monitor when juvenile and adult steelhead are present in the system and how operations may affect their behavior. Furthermore, because each fish is individually marked, a mark-recapture study can be performed to estimate abundance. Details can also be learned about short- and long-term growth and overall life-history behavior.

In 2020, a mark-recapture study was continued to estimate both the population size and the ratio of natural to hatchery origin steelhead in the mile-long section between the Highway 70 Bridge and Table Mountain Bridge in Oroville (RM 67). Between November 23 and December 10, steelhead caught by hook and line were tagged with passive integrated transponder tags and then released back into the river. A total of 88 fish were captured, nine of which were subsequently recaptured. Of those 88 fish, 60 were of hatchery origin (68.2 percent), and 28 were of natural origin (31.8 percent). Average size of steelhead captured in 2020 was 51.7 centimeters

(20.3 inches). A population estimate using a modified Cormack-Jolly-Seber model was originally planned for completion by the fall of 2020; however, it will be completed in a few more years after additional data has been collected.

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 (*Morone saxatilis*) 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, DWR and DFW 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 agreement formalized the Delta Pumping Plant Fish Advisory Committee consisting of representatives from interest groups concerned with fish resources affected by the SWP, including, but not limited to, representatives of the SWP Contractors, sport and commercial fishing groups, and environmental groups. 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 at Banks Pumping Plant.

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.

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 and is funded annually. The second was a \$15 million Lump Sum Account provided by DWR for additional projects to compensate for post-1986 fish loss. This account was closed on December 31, 2016, per the Delta Fish Agreement, Amendment 4. Total expenditures were \$14.59 million for the Lump Sum Account.

Since 1986, DWR has spent \$88.58 million on mitigation projects developed under the Delta Fish Agreement. Mitigation fund expenditures through December 31, 2020, were \$73.99 million for the Annual Mitigation Account.

Climate Change

California continued experiencing the effects of a changing climate, with more extreme weather, a reduced snowpack, and changes in runoff patterns, all affecting the management of the State's water resources. Models project more precipitation falling as rain instead of snow, which will increase flood risk and create additional challenges for water supply reliability. These hydrologic changes will continue to challenge current and future operation of the SWP.

Throughout 2020, DWR continued conducting research on potential future impacts of climate change; reducing, monitoring, and reporting greenhouse gas (GHG) emissions; developing plans, strategies, and actions to improve the resiliency of SWP facilities and operations; reviewing and consulting with external experts; and providing climate data and resources. DWR remains committed to these actions and continues to contribute to statewide, national, and international efforts to mitigate the impacts of climate change by reducing GHG emissions from its operations and adapting to unavoidable climate change impacts. More information can be found in DWR's Climate Action Plan, available on DWR's website.

Completed in 2020

Data Development and Distribution

2020 Hydroclimate Report. DWR monitors statewide precipitation and temperatures for both near-term programmatic SWP decision-making and for long-term trends. This data is summarized into an annual hydroclimate report available on DWR's website (*Hydroclimate Report Water Year 2020*). For a summary of the 2020 water year, see Chapter 7, Water Supply.

Ongoing During 2020

Research

Atmospheric Rivers and Climate Change.

Atmospheric rivers are key physical drivers in year-to-year outcomes for California's water year. Examining past and present atmospheric river events can contribute to better monitoring and prediction that can inform management practices. During 2020, DWR continued its partnership with the National Oceanic and Atmospheric Administration Physical Sciences Laboratory (formerly the National Oceanic and Atmospheric Administration Earth System Research Laboratory) and the Center for Western Weather and Water Extremes to

continue collecting atmospheric river event data and developing decision-support materials. This project aimed to increase understanding of the role of atmospheric river events in the development of annual water supply and flood events and how they may differ under climate change. The research was published in 2020 by Springer Publications in a book titled *Atmospheric Rivers*.

Precipitation-phase Partitioning. Partnering with the Desert Research Institute, research on estimating trends in precipitation partitioning between rain and snow over elevations across major water supply basins was completed and published as a technical note. This research will be used to support water management strategies because the amounts of precipitation, whether snow or rain, determine the amount of water that can be stored and delivered by the SWP.

Planning

Statewide Flood Management Planning. In support of the 2022 update for the *Central Valley Flood Protection Plan*, projected climate scenarios continued to be developed and used for climate change impact analysis and adaptation planning.

Data Collection and Climate Services. In 2020, DWR continued developing tools and partnerships related to California water management:

- ongoing collaboration with University of California, Merced, on rain-snow transition zone study
- ongoing collaboration with National Oceanic and Atmospheric Administration Physical Sciences Laboratory and 10 Bay Area counties on observations, forecasts, and development of a decision-support framework for Advanced Quantitative Precipitation Information system
- continued collaboration with National Oceanic and Atmospheric Administration's Physical Sciences

Laboratory and Climate Prediction Center on sub-seasonal and seasonal forecast improvements

- ongoing collaboration with University of California, Irvine, on a study about abrupt water year transitions diagnosis and forecast potential
- working with the California-Nevada Climate Applications Program on fall precipitation onset and extremes exercises under the impacts of climate change

Policy

Development of Internal DWR Policies on Climate Change Mitigation, Analysis, and Adaptation. In 2010, DWR began a three-phase process to develop a comprehensive DWR Climate Action Plan of internal policies to address climate change mitigation, effects analysis, and adaptation.

Climate Action Plan Phase I. Completed in 2012 and updated in 2020, Climate Action Plan Phase I is the comprehensive DWR-wide *Greenhouse Gas Emissions Reduction Plan* that covers mitigation of GHG emissions. The updated plan lays out steps to cut DWR's GHG emissions by 65 percent below 1990 levels by 2030 and achieve net carbon neutrality by 2045, in line with legislative and executive order reduction requirements.

DWR's five-year average of GHG emissions spanning years 2014–2018 was 76 percent below 1990 levels and 67 percent below 2010 levels. DWR is already well ahead of schedule for achieving its GHG emissions reduction goals. The *Greenhouse Gas Emissions Reduction Plan* projected that 2017 emissions should be approximately 1.7 million metric tons of carbon dioxide equivalent to be on track to achieve the reduction goals by 2020. DWR achieved its target emissions reductions for 2020 in 2015, five years ahead of schedule.

Climate Action Plan Phase II. Started in 2012, Phase II is a framework and data toolbox to guide analysis of the effects of climate change on DWR projects and activities.

Phase II will ensure all DWR projects meet standards for consistency, quality, and adequacy in climate change analysis for planning activities. This guidance may also provide assistance to local water managers.

The final guidance document, titled *Climate Action Plan Phase II: Climate Change Analysis Guidance*, was adopted in September 2018. *Water Resources Engineering Memorandum No. 75*, codifying the guidance as a DWR planning policy, was signed by the Director in May 2020. A climate change vulnerability assessment and adaptation analysis specifically focused on the SWP was completed in 2019. The assessment results and final report are titled *Decision Scaling Climate Vulnerability Assessment for the California Department of Water Resources*.

Lastly, the Climate Change Program conducted an alignment analysis of DWR climate change guidance. The analysis examined climate change requirements, resources, and guidance issued by DWR with a goal of creating climate change planning consistency among projects and programs. An inventory of programs and projects that include climate change planning has been conducted. The next step will be creation of a draft summary of results and development of an alignment plan. This is expected to be completed in early 2021.

Climate Action Plan Phase III. Phase III of the Climate Action Plan evaluates the vulnerability of DWR facilities and operations to key climate change impacts and develops adaptation strategies to improve DWR's resiliency to climate change.

During 2019, the DWR vulnerability assessment was released.

In 2020, the DWR Climate Change Adaptation Plan was released. An Adaptation Plan Progress Report is being drafted, with an expected release date of 2022.

Reporting

Emissions Reports to The Climate 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. In 2020, DWR reported its 2019 GHG emissions to The Climate Registry. The reported emissions were verified by The Climate Registry and DWR received Climate Registered status.

In 2020, DWR submitted its annual report to the California Air Resources Board for emission year 2019. The report included energy generated and consumed by the SWP and sulfur hexafluoride emissions associated with the SWP's switchyard circuit breakers. DWR complied with the reporting deadlines as well as the emission limits required by the regulations. Additionally, DWR participated in the second year of emissions reporting as part of the Water-Energy Nexus Registry. Reporting emissions for year 2019, DWR reported the emissions per acre-foot of water delivered as part of this performance metric.



Chapter 4

Water Quality Programs

The Department of Water Resources' research vessel, the Sentinel, contains specialized netting and water collection containers for taking water samples.

Significant Events in 2020

The COVID-19 pandemic and its accompanying physical distancing restrictions caused major changes for both office and field operations. For instance, from March through December 2020, the Quality Assurance Program shifted all of its activities from in-person to virtual, and less samples were taken than usual overall throughout the year.

Nonetheless, major milestones were met for mercury studies in 2020:

- (1) The Department of Water Resources (DWR) completed a compliance report concerning tidal wetlands. DWR studied four tidal wetlands over six years, measuring mercury imports and exports, and analyzed the data from all four wetlands for the report. DWR initially expected to submit the report to the Central Valley Regional Water Quality Control Board (Central Valley Water Board) by December 2019; it was submitted by April 3, 2020, during the early portion of the COVID-19 pandemic. The report will be reviewed by an independent science review panel convened by the Central Valley Water Board and Delta Stewardship Council, and the panel's comments will be used to inform Phase 2 of the Delta Mercury Control Program.
- (2) DWR completed a compliance report for open water mercury studies and submitted it to the Central Valley Water Board on August 31, 2020. The report comprised results from field and laboratory studies as well as mercury models.
- (3) Mercury models were completed for the Yolo Bypass and the Delta.

DWR also switched to a new laboratory for analyzing certain water sample constituents, which allowed analysis of a new group of compounds not previously sampled in the State Water Project (SWP). These compounds are referred to as per- and polyfluoroalkyl substances (PFAS) and are an emerging concern in drinking water supplies.

The Bryte Chemical Laboratory upgraded its capability and capacity to detect and analyze trace levels of chlorophyll and pheophytin with the purchase of an ultraviolet-visible spectrometer in 2020. The computer-controlled analytical instrument generates highly stable, accurate, and reproducible data.

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

The Department of Water Resources' (DWR) Division of Operations and Maintenance currently maintains 16 automated water quality monitoring stations at key locations along the State Water Project (SWP). This network of automated stations continuously monitors a variety of water quality parameters throughout the system and provides real-time data to SWP 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 (State Water Board) establishes water quality objectives to protect a variety of beneficial uses of water within the Bay-Delta. The objectives are contained in the water quality control plans adopted by the State Water Board. In July 2014, the Drinking Water Program transitioned from the California Department of Public Health (CDPH) to the State Water Board. The State Water Board is now the primary enforcement authority for federal and State safe drinking water acts and is responsible for the regulatory oversight of public water systems throughout the state.

Water delivered through SWP facilities is subject to water quality objectives contained in Article 19 of the Water Supply Contracts. (See Chapter 8, Water Contracts and Deliveries.)

The State Water Board adopted the current *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) on December 12, 2018 (Resolution No. 2018-0059).

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

implements the objectives of the Bay-Delta Plan. 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 Bay-Delta Plan objectives.

For additional background information about the State Water Board's activities and the Bay-Delta Plan, see the sidebar, State Water Resources Control Board, and Chapter 6, Water Supply Development and Reliability.

Water Quality Standards

Water quality objectives in the Bay-Delta Plan 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 Sacramento-San Joaquin Delta (Delta) exports to meet D-1641 operational requirements for meeting water quality and flow standards.

2019–2020 Water Year Hydrologic Classifications

The Bay-Delta Plan 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 and snowmelt runoff and rates of groundwater accretion. Water year types are classified as "wet," "above normal," "below normal," "dry," or "critical."

State Water Resources Control Board

The State Water Resources Control Board (State Water Board), established by the California Legislature in 1967, oversees water rights and protects water quality by setting and implementing statewide policy, administering appropriative water rights, coordinating with and supporting Regional Water Quality Control Board (Regional Water Board) efforts, and reviewing petitions that contest Regional Water Board actions. The five State Water Board members are appointed by the Governor and confirmed by the Senate. The State Water Board 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 State Water Board and Regional Water Boards adopt water quality control plans. The water quality control plans contain water quality objectives necessary for the protection of designated beneficial uses, such as municipal and industrial, agricultural, and fish and wildlife. The State Water Board and Regional Water Boards implement these objectives in a number of ways, depending on the circumstances.

Current water quality objectives for the Sacramento-San Joaquin Delta and Suisun Marsh are contained in the *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan), adopted December 12, 2018. The State Water Board is required to conduct periodic updates of the Bay-Delta Plan. As part of the update process, the State Water Board 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. Recent issues of concern related to the water quality control plan include drought, pelagic organism decline, special status fish species, Delta inflow, San Joaquin River flows, and southern Delta salinity.

Water Right Decision 1641 (D-1641), adopted by the State Water Board in December 1999 and amended in March 2000, implemented the objectives in the 1995 Bay-Delta Plan and continues to implement the objectives in the 2018 Bay-Delta Plan. D-1641 places terms and conditions on a number of water rights, primarily those for the State Water Project (SWP) and Central Valley Project (CVP). The Department of Water Resources and the U.S. 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.

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 the Bay-Delta Plan.

The Sacramento Valley 40-30-30 Index was dry, and the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) was dry, based on observed data for water year 2019–2020.

For a detailed discussion of water year 2019–2020, see Chapter 7, Water Supply.

Bay-Delta Plan Review

California Water Code Section 13240 requires that the water quality control plan 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 water quality control plan review and amendment process consists of reviewing the Bay-Delta Plan to identify elements that may need to be amended or added. The review includes both the review and update of water quality objectives (including flow objectives) and the program of implementation in the Bay-Delta Plan, as well as changes to water rights and water quality regulation consistent with the program of implementation.

The process of updating the Bay-Delta Plan is currently managed through two amendments administered by the State Water Board.

The first amendment is from State Water Board Resolution No. 2018-0059, in which the State Water Board adopted the amendments and final substitute environmental document finalizing the Lower San Joaquin River flow objectives and the revised southern Delta salinity objectives. The Office of Administrative Law approved

the amendments on February 25, 2019, and they are now in effect.

A second amendment is under consideration that focuses on the Sacramento River and its tributaries, Delta outflows, Delta eastside tributaries (including the Calaveras, Cosumnes, and Mokelumne rivers), and interior Delta flows.

SWP Operations to Meet Delta Water Quality Requirements

In 2020, DWR and the U.S. 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 (BiOps) for listed species, as well as other regulatory requirements. Fish species currently listed under the Endangered Species Act of 1973 and the California Endangered Species Act of 1970 include delta smelt, steelhead, green sturgeon, and the winter and spring runs of Chinook salmon.

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.

The Bay-Delta Plan 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 Suisun Marsh. Figure 4-1 shows water quality compliance and monitoring stations throughout the Delta specified in the Bay-Delta Plan.

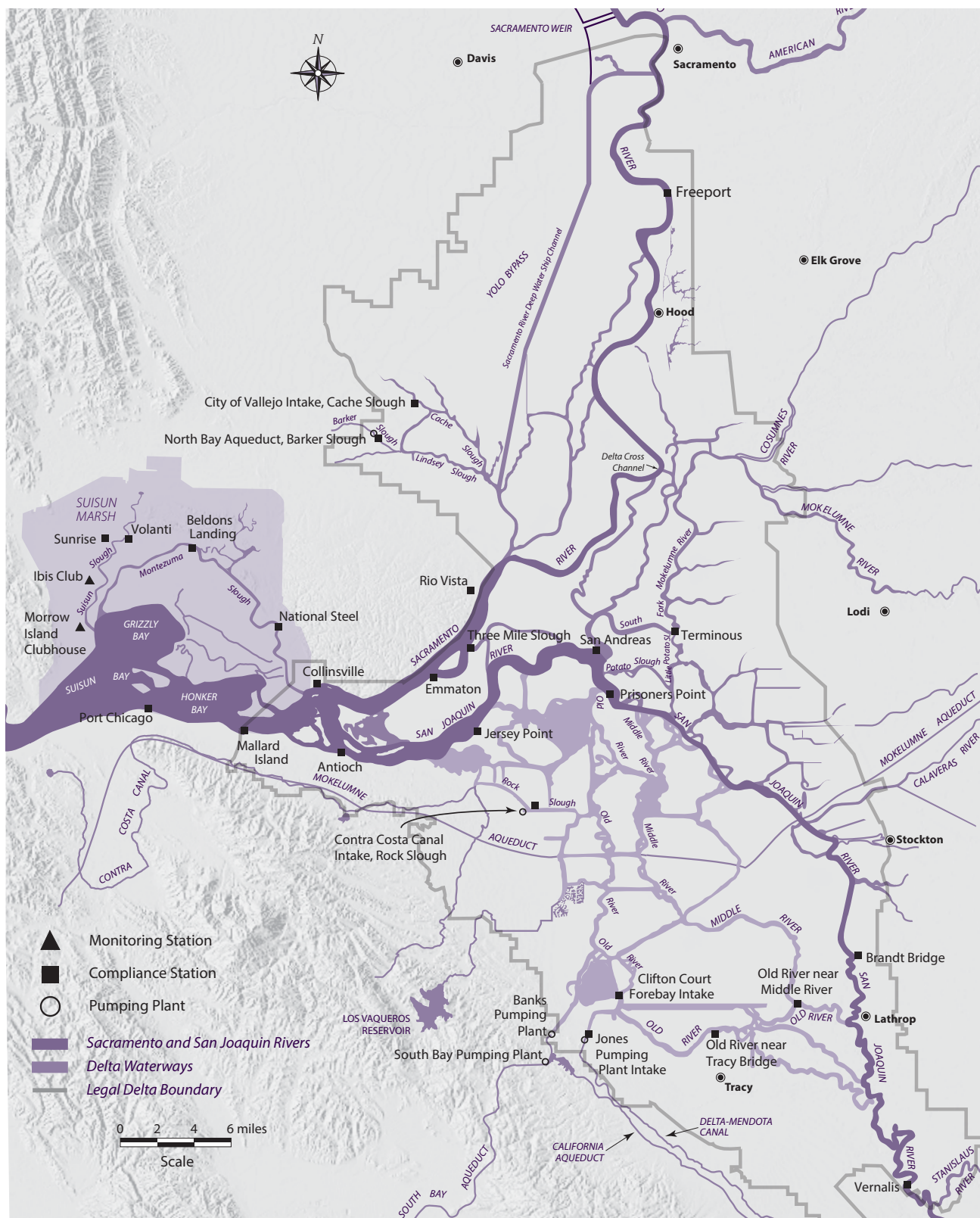


Figure 4-1 D-1641 Water Quality Compliance and Monitoring Stations in the Sacramento-San Joaquin Delta

Delta Cross Channel Gates

The Delta Cross Channel gates are operated in accordance with the Bay-Delta Plan/D-1641 and other regulatory requirements. In 2020, the gates were open for 146 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), National Marine Fisheries Service, and Department of Fish and Wildlife (DFW).

Municipal and Industrial Objectives

The Bay-Delta Plan includes a year-round 250 milligrams per liter (mg/L) (maximum mean daily) chloride objective that is in effect at Delta export locations (Contra Costa Canal Pumping Plant No. 1, Clifton Court Forebay, Jones Pumping Plant, and Barker Slough). Chloride levels remained below the objective for all days in 2020.

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 (maximum mean daily) for a minimum number of days during the year, dependent upon the water year forecast. For calendar year 2020, the objective of 165 days for a dry water year was met.

Agricultural Salinity Objectives

The Bay-Delta Plan contains agricultural salinity objectives (specified as electrical conductivity, or EC—see the Specific

Conductance section later in this chapter for more information on EC). The salinity objectives, which vary by location, are based on both water year type and a 14-day running average during the irrigation season, from April to mid-August, at established compliance stations 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. The Terminous, San Andreas, Emmaton, and Jersey Point water year objectives were met for calendar year 2020.

In the South Delta, salinity may be influenced by San Joaquin River flows, in-Delta diversions, and SWP exports. Water circulation may be influenced by the annual placement of South Delta barriers. South Delta salinity objectives are based on a 30-day running average. The 1.0 millisiemens per centimeter (mS/cm) objective for the South Delta was met at Old River near Tracy Road Bridge, Vernalis, Old River near Middle River, and San Joaquin River at Brandt Bridge. The 0.7 mS/cm objective for the South Delta (April through August) and was not met for 40 days at Old River near Tracy Road Bridge. The SWP and CVP share responsibility for meeting the agricultural EC objectives imposed at these South Delta compliance locations.

For a summary of State Water Board actions related to South Delta salinity objectives, see Bulletin 132-18.

Estuarine Habitat Protection Standard

The estuarine habitat protection standard incorporates modified X2 criteria (geographic isohaline) first established in the 1994 delta smelt BiOp. The upstream movement of two parts per thousand isohaline (two 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 from 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. (The Eight River Index is the sum of the estimated unimpaired runoff from eight rivers—four in the Sacramento Valley [Sacramento River Region runoff] and four in the San Joaquin Valley [San Joaquin 4 Rivers runoff]. For more about runoff estimates, see Chapter 7, Water Supply.) This requirement 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 three-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. As allowed by D-1641, the May and June X2 flow objective is reduced to a 14-day running average flow of 4,000 cfs when the best available estimate for the Sacramento River Index is less than 8.1 million acre-feet at the 90 percent exceedance level. 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 the months of January through May 2020, in million acre-feet, was 1.22, 0.90, 1.16, 2.5, and 2.36, respectively. The X2 habitat protection objective at Chipps Island was 28 days in February, seven days in March, five days in April, and 11 days in May.

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/D-1641 and remains the same in the 2018 Bay-Delta Plan. 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.

Specific minimum monthly NDOI standards for the protection of fish and wildlife are based on water year type. In 2020, the monthly mean NDOI was highest in April, averaging 12,712 cfs. The lowest monthly mean NDOI occurred in August with 3,732 cfs, which was above the objective of 3,500 cfs. All monthly NDOI objectives were met in 2020.

River Flow Standards

Water quality objectives include minimum flow requirements measured in the Sacramento River at Rio Vista. These flow standards, incorporated from the winter-run salmon BiOp, set flow requirements based on the Sacramento Valley 40-30-30 Index. Water year 2019–2020 was dry, requiring mean monthly flows of 3,000 cfs for September, 4,000 cfs for October, and 4,500 cfs for November and December. During these periods, the seven-day running average could not be more than 1,000 cfs below the monthly standard. The actual mean monthly flows were 5,789 cfs in September; 4,389 cfs in October; 4,925 cfs in November; and 6,562 cfs in December. The monthly and seven-day average Rio Vista flow requirements were met for calendar year 2020.

Water quality objectives also specify minimum flow requirements measured in the San Joaquin River at Vernalis. These

flow standards are based on the San Joaquin Valley 60-20-20 Index, which was dry for water year 2019–2020. If the position of X2 is required to be at or west of Chipps Island, the required minimum monthly average Vernalis flow is 2,280 cfs from February to April 14 and May 16 to June. Otherwise, the Vernalis base-flow objective is 1,420 cfs.

A San Joaquin River spring pulse flow (a short-term increase in stream flow) is required from 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. (For background on the CALFED Bay-Delta Program, see Bulletins 132-95 through 132-11.)

Export Standards

Water quality objectives and D-1641 include an export limitation for the SWP and CVP. It limits Delta exports based on a ratio of combined water project exports to Delta inflow (export/inflow ratio) and is expressed as a maximum export rate as a percentage of Delta inflow.

The actual export amount is calculated using the three-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 three-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 three-day average of inflows is used. For 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.

The 2008 USFWS and the 2009 National Marine Fisheries Service BiOps typically control the export rate for most of the winter and spring. Under these conditions, the Delta can be pushed into excess conditions more often. Additional information about the BiOps can be found in Chapter 3, Environmental Programs.

During 2020, the Delta was in excess conditions from January 1 to February 7 and from March 15 to May 10 for a total of 95 days. Within this period, the 14-day export/inflow ratio averaged 27.5 percent, meeting both the 35 percent and 65 percent export limitations for the year.

The Delta was in balanced conditions from February 8 to March 14, from May 11 to November 17, and from December 9 to December 31 for a total of 250 days. Within this period, the three-day export/inflow ratio averaged about 27.2 percent. However, the export/inflow ratio met the 35 percent limitation within the months from February to June, accounting for higher ratios in other months when the limitation is 65 percent.

South Delta Temporary Barriers Project

The South Delta Temporary Barriers Project began as a test project in 1991. 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 the Head of Old River.

For more information about the temporary barriers, see Chapter 2, Delta Resources, and previous bulletins.

Delta Mercury Control Program and Mercury Monitoring and Evaluation

DWR's Mercury Monitoring and Evaluation Section was established in 2012 in the Division of Environmental Services, now called the Division of Integrated Science and Engineering, to assist DWR in complying with the Central Valley Regional Water Quality Control Board's (Central Valley Water Board) Delta Mercury Control Program (DMCP). The DMCP was adopted in 2010 to address mercury and methylmercury (MeHg) water quality impairments in the Delta. Responsibilities include conducting wetlands, open water, and dredging studies required by regulation, as well as providing funds for a Mercury Exposure Reduction Program. For more background information about the program, see Bulletin 132-14.

Completed and continuing work in 2020 included the following:

- submitted a compliance report to the Central Valley Water Board for DWR's completed tidal wetland study
- completed Delta mercury model using DWR's Delta Simulation Model 2 hydrodynamic model
- completed Yolo Bypass Dynamic Mercury Cycling Model using flood simulation software hydrodynamic data for a mercury model
- submitted a final compliance report for DWR's open water obligations, including appendices and model outputs
- presented tidal wetlands and open water studies at two of DWR's Environmental Coordinating Committee meetings
- presented tidal wetland and open water field studies and model development at

the Central Valley Water Board's DMCP's Workshop for Control Study Entities

- provided a series of informational and training sessions on the Yolo Bypass and Delta mercury models for DWR Bay-Delta Office
- presented the Delta mercury model at the California Water and Environmental Modeling Forum
- met with Central Valley Water Board to clarify and discuss the tidal wetland study
- provided DWR support and mercury expertise for various tidal marsh restoration projects
- uploaded tidal wetlands data to a publicly accessible database
- made the tidal wetlands and open water compliance reports accessible for users with disabilities
- continued work on the Statewide Mercury Control Policy and Mercury Control Program for Reservoirs

Tidal Wetlands

In 2020, DWR completed a compliance report for the DMCP concerning tidal wetlands. DWR studied four tidal wetlands over six years, measuring mercury imports and exports, and analyzed the data from all four wetlands for the report. DWR initially expected to submit the report to the Central Valley Water Board by December 2019; it was submitted by April 3, 2020, during the early portion of the COVID-19 pandemic. The report will be reviewed by an independent science review panel convened by the Central Valley Water Board and Delta Stewardship Council, and the panel's comments will be used to inform Phase 2 of the DMCP.

After the report was submitted, DWR processed the data and submitted it to the Environmental Data Initiative to provide the data to the public. DWR then continued analyzing data and began working on a manuscript for publication. The manuscript

will support tidal wetland science, which is increasingly important as DWR increases tidal restorations.

The Mercury Monitoring and Evaluation Section presented to DWR's Environmental Coordinating Committee and the Central Valley Water Board, which included meeting the Central Valley Water Board to discuss the study.

Open Water

In 2020, DWR met a major milestone for open water mercury studies when it submitted a compliance report to the Central Valley Water Board on August 31, 2020. The report, *Mercury Open Water Final Report for Compliance with the Delta Mercury Control Program*, comprised results from field and laboratory studies as well as mercury models:

- Field and laboratory studies were completed and included in the compliance report. The work included several vegetation senescence studies, an erosion study, a mass balance study, various sediment sampling, and other modeling studies.
- Model analyses for the Yolo Bypass and Delta were completed and included in the compliance report. Two models were applied to simulate mercury in these areas: Yolo Bypass Dynamic Mercury Cycling Model in the Yolo Bypass and Delta Simulation Model 2 in the Delta. Outputs from the Yolo Bypass mercury model were fed into simulations for the downstream Delta mercury model, and in this way, they were linked.

Lastly, DWR presented open water studies internally and externally, including a training to DWR's Bay-Delta Office, to DWR's Environmental Coordinating Committee, at the California Water and Environmental Modeling Forum, and to the Central Valley Water Board.

Yolo Bypass Mercury Model

For the Yolo Bypass, the Dynamic Mercury Cycling Model was developed and completed. To reduce model error, parameter estimation software was used, a project led by the U.S. Geological Survey. Parameter estimation software optimized the model fit to observations. (Model fit in statistics measures the differences between observed data and model-implied data.) Relative to manual calibration, parameter estimation software reduced the model error by 50 percent. The analysis indicated that the Yolo Bypass is an important source of MeHg to waters being exported downstream and that vegetation is likely an important contributor to enhanced MeHg production in the Yolo Bypass via the supply of organic matter. These findings were compared to and consistent with previous studies.

Hydrology was also shown to be important, and the magnitude of simulated MeHg supply and export from the Yolo Bypass varied widely among years because of different water years; this has implications for monitoring programs.

Delta Mercury Model

For the Delta, DWR's Delta Simulation Model 2 hydrodynamic and water quality model was extended to include sediment transport and mercury cycling in Delta waters and the sediment bed. The Delta is a net sink (more comes in than goes out) for MeHg, inorganic mercury, and suspended sediments. Simulations indicated that flow and sediment transport have a strong influence on mercury cycling in the Delta. MeHg production within the Delta itself, based on flux between the sediment bed and water column, was minor. The Sacramento River was the largest estimated source of total mercury and MeHg to the Delta for the simulation period from October 1999 through July 2006, greater than 50 percent for both. However, when tributary flows are high enough for the Yolo Bypass to be flowing,

the Yolo Bypass is also a major source of inorganic mercury and MeHg to the Delta. Annual estimated inflow loads of inorganic mercury and MeHg to the Delta varied by six-fold during the simulated period.

Some snapshots of spatial patterns generated by the model showed lower simulated concentrations of suspended sediments and inorganic mercury in the Central Delta, but not lower simulated concentrations of MeHg. Available data were insufficient to support or refute simulated spatial patterns; however, the pattern of lower total mercury concentrations in the Central Delta is consistent with observed mercury concentrations in fish tissue samples.

Supporting Data and Reports

The open water compliance report was submitted to the Central Valley Water Board and consisted of seven chapters and 10 technical appendices. The report was also submitted to the Delta Stewardship Council, which will convene an independent science review panel for peer review. The report and panel's comments will be used to develop Phase 2 of the DMCP.

Various chapters and technical appendices were completed and included: Yolo Bypass mercury scientific and modeling studies, Delta modeling studies, climate change impacts, management implications, the Yolo Bypass mass balance study, sediment-water exchange by land use within the Yolo Bypass, the Gust chamber erosion study, multiple vegetation senescence studies, Yolo Bypass sediment collection studies, parameter estimation studies, and Delta suspended and bed sediment modules. Each of these chapters and appendices included extensive background and research.

The Open Water Technical Workgroup included DWR, Moss Landing Marine Laboratories, the U.S. Geological Survey,

Pacific Northwest National Laboratory, and Reed Harris Environmental. All entities contributed to the study, including writing the final reports and completing the models. Mercury analyses were all done by DWR's Bryte Chemical Laboratory and San Jose State University's Moss Landing Marine Laboratories, which included water and sediment samples.

Delta Mercury Exposure Reduction Program

DWR's regulatory obligation was completed in 2019. See Bulletin 132-20.

Statewide Mercury Control Policy and Mercury Control Program for Reservoirs

The State Water Board is developing a statewide mercury policy to control mercury in California's waters, including California reservoirs. Regulatory delays originally pushed back the adoption date for this regulation from 2016 to 2017; however, in 2018, regional groups and the State Water Board indicated that the development of this regulation was in "controlled delay" as the State Water Board works through other issues on its agenda. The regulation remained on hold in 2020.

When the State Water Board begins to work on the regulation once more, DWR will track developments, attend all reservoir owner/operator meetings convened by the State Water Board, and take appropriate action on any documents presented to interested parties.

Special Studies 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 during the late summer and early fall to monitor the occurrence of low

dissolved oxygen (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 Delta, Suisun Bay, and San Pablo Bay.

Stockton Deep Water Ship Channel and Lower San Joaquin River Low Dissolved Oxygen

Historically, during the late summer and early fall, DO levels in the eastern and central portions of the Stockton Deep Water Ship Channel have dropped below both the 5.0 mg/L and 6.0 mg/L water quality objectives set by the State Water Board and the Central Valley Water Board, respectively. These low DO levels are a result of several factors, including low San Joaquin River inflows, high 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 has historically installed a temporary rock barrier across the Head of Old River during periods of projected low fall flows in the San Joaquin River.

The spring and fall Head of Old River barriers were not installed in 2020, however, as it was no longer required in the National Marine Fisheries Service's BiOp on the long-term operations of the CVP and SWP.

Methods

In 2020, continuous DO concentration monitoring in the Stockton Deep Water Ship Channel was conducted remotely at Rough and Ready Island near the Port of Stockton aeration facility. Additional discrete monitoring conducted by boat was triggered if the daily mean DO concentration remained below 5.5 mg/L (December–August) or

6.5 mg/L (September–November) for three consecutive days. During discrete sampling, DO was measured at five stations along the San Joaquin River above and below the aeration facility.

Results

In 2020, daily mean DO concentrations did not fall below objectives. Concentrations fell below trigger levels for a total of five days in early September, but because they did not remain low for three consecutive days, discrete sampling by boat was not conducted. The overall daily mean range was 5.62 to 11.24 mg/L at the surface and 5.62 to 11.52 mg/L at the bottom. The daily mean range from September through November was 6.25 to 9.96 mg/L at the surface and 6.05 to 10.07 mg/L at the bottom.

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
- 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
- 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 2020; sampling was conducted for only nine months of the year because of COVID-19 restrictions. 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 180 species of benthic macrofauna were collected in 2020 at the 10 sampling sites. Of the 180 species, 10 represented more than 85 percent of all organisms collected:

- amphipods: *Americorophium spinicorne*, *Sinocorophium alienense*, *Ampelisca abdita*, and *Gammarus daiberi*
- Asian clams: *Corbicula fluminea* and *Potamocorbula amurensis*
- sabellid polychaetes: *Manayunkia speciosa* and *Laonome calida*
- tubificid worms: *Limnodrilus hoffmeisteri* and *Varichaetadrilus angustipenis*

Of the 10 dominant species, *Potamocorbula amurensis*, *Sinocorophium alienense*, and

Ampelisca abdita represent macrofauna that inhabit a typically high saline environment and were found in San Pablo Bay, Suisun Bay, and Grizzly Bay. The remaining seven species, *Gammarus daiberi*, *Manayunkia speciosa*, *Limnodrilus hoffmeisteri*, *Varichaetadrilus angustipenis*, *Laonome calida*, *Americorophium spinicorne*, and *Corbicula fluminea* are predominantly brackish or fresh water species and were collected mostly 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 five 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 2020 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
- Franks 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
- San Pablo Bay near Pinole Point and near the mouth of the Petaluma River

Sampling did not occur in April, May, and most of December 2020 because of COVID-19 restrictions.

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 121 samples taken in 2020, 95.0 percent (115 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 six samples with chlorophyll *a* concentrations above 10 $\mu\text{g/L}$, five were from the San Joaquin River at Vernalis from June through October, and one was from the San Joaquin River at Buckley Cove in August. The mean chlorophyll *a* concentration for all samples in 2020 was 3.09 $\mu\text{g/L}$; the median value was 1.88 $\mu\text{g/L}$. In 2019, the mean was slightly lower (2.40 $\mu\text{g/L}$), but the median was similar (1.69 $\mu\text{g/L}$). The maximum chlorophyll *a* concentration in 2020 was 32.50 $\mu\text{g/L}$, recorded in July on the San Joaquin River at Vernalis. It was similar to the maximum in 2019 (38.10 $\mu\text{g/L}$). The minimum chlorophyll *a* concentration was 0.53 $\mu\text{g/L}$, recorded in November on the Sacramento River at Greene's Landing.

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 2020 was 1.70 $\mu\text{g/L}$, and the median value was 1.15 $\mu\text{g/L}$. The maximum pheophytin *a* concentration was 7.72 $\mu\text{g/L}$, recorded in San Pablo Bay at the mouth of the Petaluma River in October. The minimum pheophytin *a* concentration was 0.52 $\mu\text{g/L}$, recorded in both the Sacramento River at Greene's Landing in December and Suisun Bay at Bull's Head Point near Martinez in February.

Cyanobacteria and centric diatoms constituted 98.6 percent of the organisms collected in 2020. Cyanobacteria alone constituted 97.5 percent because of the presence of small-celled but numerically dominant genera such as *Chroococcus* and *Eucapsis*.

All organisms collected fell into the following categories (in order of abundance):

- (1) cyanobacteria (class Cyanophyceae)
- (2) centric diatoms
(class Coscinodiscophyceae)
- (3) green algae (class Chlorophyceae)
- (4) pennate diatoms
(classes Bacillariophyceae and Fragilariophyceae)
- (5) cryptophyte flagellates
(class Cryptophyceae)
- (6) chrysophyte flagellates
(class Chrysophyceae)
- (7) haptophyte flagellates
(class Prymnesiophyceae)
- (8) euglenoid flagellates
(class Euglenophyceae)

- (9) synurophyte flagellates (class Synurophyceae)
- (10) dinoflagellates (class Dinophyceae)

The 10 most common genera collected were

- (1) *Eucapsis* (cyanobacterium);
- (2) *Chroococcus* (cyanobacterium);
- (3) *Cyclotella* (centric diatom);
- (4) *Chlorella* (green alga);
- (5) *Plagioselmis* (cryptophyte flagellate);
- (6) *Skeletonema* (centric diatom);
- (7) *Cocconeis* (pennate diatom);
- (8) *Nitzschia* (pennate diatom);
- (9) *Aulacoseira* (centric diatom); and
- (10) *Monoraphidium* (green alga).

One species of *Chroococcus*, *C. microscopicus*, was moved to a new genus, *Eucapsis*, in 2018. Other species of *Chroococcus* are retained in the genus, hence they are not combined with *Eucapsis*. The high numbers of *Eucapsis* compared to *Chroococcus* are due to this name change.

Activities Outside the Delta

Routine SWP water quality monitoring activities and special studies are conducted outside the Delta. The special studies are in response to regulations facing water purveyors who rely on DWR to deliver high-quality raw water.

Water Quality Monitoring in the SWP

DWR's Division of Operations and Maintenance monitors water quality throughout the SWP. This monitoring program has more than 30 sampling stations and analyzes more than 200 chemical, biological, and physical constituents.

The Division of Operations and Maintenance operates monitoring stations at SWP storage and conveyance facilities located throughout the state, 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, Coastal Branch Aqueduct, and the San Luis Joint-Use Complex. DWR collects and analyzes samples monthly at most stations, although the frequency can vary from weekly to annually depending on location, time of year, or special events. DWR sends the water samples to its Bryce Chemical Laboratory in West Sacramento for analysis. Constituents analyzed include nutrients, herbicides, pesticides, trace metals, dissolved solids, organic substances, and minerals. For additional constituents like pesticides, herbicides, and organic compounds, samples are sent to a third-party laboratory.

The Division of Operations and Maintenance 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 EC (a measurement of water's capability to pass electrical flow), turbidity (a measurement of suspended particles), pH (a measurement of how acidic or basic water is), and fluorometry (a measurement of algal biomass). SWP Contractors rely on these essential data to assess the quality of water delivered by the SWP.

The water quality monitoring program is an important operational component of the SWP. DWR uses the program's data to evaluate water quality changes in the SWP, short- and long-term trends, and impacts from emergencies such as spills and pipe ruptures. DWR also uses the data to influence operations and to determine the quality of drinking water as defined by the State Water Board's Division of Drinking Water. DWR periodically conducts special studies to investigate the impacts of specific incidents affecting SWP water quality. The special studies include non-SWP water

turn-ins, floodwater inflows, hydrology, and Delta hydrodynamics.

Table 4-1 provides mean concentrations for 27 water quality parameters assessed at several SWP facilities and at the CVP's Delta-Mendota Canal in 2020. In contrast to previous years, data were not collected at Barker Slough Pumping Plant or Banks Pumping Plant from April through July because of staffing issues, nor were data collected at Devil Canyon Powerplant Second Afterbay in July because of maintenance work at the afterbay. The averages for these sites in Table 4-1 exclude data for these months, which may alter the annual average when compared to other years. Data for selected constituents are summarized below.

Specific Conductance

Specific conductance (also referred to as EC) is an important water quality measurement that estimates the amount of total dissolved salts in a water body. Examples of typical EC concentrations include a range of 30 to 1,500 microsiemens per centimeter ($\mu\text{S}/\text{cm}$) for potable water and over 50,000 $\mu\text{S}/\text{cm}$ for sea water. Mean annual EC was 94 $\mu\text{S}/\text{cm}$ at Thermalito Afterbay; 276 $\mu\text{S}/\text{cm}$ at the North Bay Aqueduct, Barker Slough Pumping Plant; and 515 $\mu\text{S}/\text{cm}$ at the Delta-Mendota Canal. Mean EC ranged from 430 to 512 $\mu\text{S}/\text{cm}$ in the California Aqueduct.

Dissolved Organic Carbon

Dissolved organic carbon measures the amount of organic matter in water. Monitoring of dissolved organic carbon is important to water treatment facility operators as dissolved organic carbon has the potential to facilitate the formation of trihalomethanes (potential toxins) during the chlorination process. Dissolved organic carbon was highest at the North Bay Aqueduct, Barker Slough Pumping Plant at 3.7 mg/L, while concentrations in the California Aqueduct and Delta-Mendota Canal ranged from 2.7 to 3.6 mg/L.

Bromide

Bromide is another parameter that has the potential to form trihalomethanes during water treatment. Bromide concentrations ranged from less than 0.05 mg/L at Thermalito Afterbay to 0.27 mg/L at Banks Pumping Plant.

Turbidity

Turbidity monitoring is important because of the potential for elevated turbidity to increase the cost of water treatment. The North Bay Aqueduct, Barker Slough Pumping Plant exhibited the highest level of turbidity with an annual mean of 7.4 nephelometric turbidity units (NTU). Other locations had mean turbidity values ranging from 1.9 to 6.5 NTU.

Arsenic

Mean arsenic concentrations ranged from less than 0.001 mg/L at Thermalito Afterbay to 0.003 mg/L at Teerink Pumping Plant and Tehachapi Afterbay (Check 41) (see Table 4-1). These surface water values fall below the 0.010 mg/L maximum contaminant level for arsenic in drinking water. (The maximum contaminant level is the maximum level of a contaminant in drinking water at which no known or anticipated adverse effect on human health would occur.)

Pesticides, Herbicides, and Other Organic Compounds

In 2020, DWR sampled for pesticides, herbicides, and other organic compounds in March, June, and September at several SWP facilities and the Delta-Mendota Canal (see Table 4-2). The sampled SWP facilities include those shown on Table 4-1, excluding Thermalito Afterbay but including the East Branch Aqueduct at Check 66.

There were no detections above the minimum reporting limit for any pesticides or herbicides in 2020. This is in contrast to prior

Table 4-1 Mean Water Quality at Selected SWP Grab Sample¹ Locations in 2020

California Aqueduct												
Constituent	Units ²	Reporting Limit	Thermalito	North Bay	Delta-	Banks	O'Neill	Kettleman	Teerink	Tehachapi	Devil	
			Afterbay	Aqueduct,	Mendota							Forebay
			at Outlet	Barker	Canal	Pumping	Outlet	(Check 21)	Plant	(Check 41)	Second	
				Pumping	Upstream	Plant ³	(Check 13)				Afterbay ⁴	
				Plant ³	of McCabe							
					Road							
Antimony	mg/L	0.001	<RL	<RL	<RL	<RL	<RL	0.003	<RL	<RL	<RL	
Arsenic	mg/L	0.001	<RL	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.002	
Beryllium	mg/L	0.001	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	
Boron	mg/L	0.1	<RL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Bromide	mg/L	0.01 or 0.05	<RL	0.02	0.23	0.27	0.21	0.21	0.19	0.2	0.18	
Calcium	mg/L	1	9	16	21	19	20	20	21	21	21	
Chloride	mg/L	1 to 10	1	16	77	87	73	73	61	64	57	
Chromium	mg/L	0.001	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	
Copper	mg/L	0.001	0.001	0.001	0.002	0.004	0.002	0.002	0.005	0.002	0.003	
Hardness	mg/L as CaCO ₃	1	38	86	108	102	101	99	91	90	90	
Iron	mg/L	0.005	0.022	0.02	0.026	0.028	0.017	0.011	0.014	0.011	0.017	
Lead	mg/L	0.001	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	
Magnesium	mg/L	1	4	11	13	13	13	12	9	9	9	
Manganese	mg/L	0.005	<RL	0.037	0.001	0.012	0.004	0.001	<RL	<RL	0.002	
Nitrate + Nitrite	mg/L as N	0.05	<RL	0.12	0.78	0.42	0.43	0.36	0.47	0.42	0.41	
Dissolved Organic Carbon	mg/L as C	0.5	NR	3.7	3.6	3.6	3.4	3.5	2.7	2.7	3.3	
Ortho-Phosphate	mg/L as P	0.05	<RL	0.11	0.13	0.07	0.1	0.09	0.05	0.04	0.04	
Selenium	mg/L	0.001	<RL	<RL	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Sodium	mg/L	1	4	20	58	61	54	52	51	51	45	
Sulfate	mg/L	1 to 10	2	16	41	29	34	32	35	33	35	
Zinc	mg/L	0.005	<RL	<RL	<RL	<RL	<RL	<RL	<RL	<RL	0.002	
Turbidity	NTU	0.1	2.1	7.4	6.5	4.9	4.1	4.7	4	4.4	1.9	
Specific Conductance	µS/cm	1	94	276	515	512	484	471	436	444	430	
Alkalinity	mg/L as CaCO ₃	1	44	83	82	68	79	78	78	72	72	
Total Dissolved Solids	mg/L	1 or 2.5	62.8	151.1	286.7	282.6	271.7	261.4	249.2	254.7	236.8	
Total Organic Carbon	mg/L as C	0.5	NR	3.7	3.4	3.5	3.3	3.4	2.7	2.7	3.2	
Total Phosphorous	mg/L as P	0.01	<RL	0.13	0.14	0.09	0.11	0.09	0.07	0.07	0.06	

¹ 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 annual mean of laboratory analytical values of water sampled monthly from January through December. When an analytical result for a constituent is a "non-detect," the annual mean for the constituent is calculated using "0" for the non-detect result, which accounts for some mean values that are less than the reporting limit. Unless noted otherwise, data in the table represents the dissolved (filtered) fraction for each analyte.

² mg/L = milligrams per liter; mg/L as CaCO₃ = milligrams per liter as calcium carbonate; mg/L as C = milligrams per liter as carbon; mg/L as N = milligrams per liter as nitrogen; mg/L as P = milligrams per liter as phosphorous;

³ µS/cm = microsiemens per centimeter; NTU = nephelometric turbidity unit; NR = No data recorded at this location; <RL = Value is less than lab's reporting limit.

⁴ Samples not collected in April through July because of staffing issues.

Samples not collected in July because of forebay outage.

Table 4-2 Pesticides, Herbicides, and Other Organic Substances Detected in the SWP in 2020

Sampling Location ¹	Sampling Station ID Number	Sample Date	Chemical Detected ^{2,3}	Concentration (micrograms per liter)
California Aqueduct at Banks Pumping Plant	KA000331	3/17/2020	none	--
		6/25/2020	PFBA	0.0021
			PFPeA	0.0021
			PFHxA	0.0028
		9/16/2020	PFHxA	0.0022
California Aqueduct at O'Neill Forebay Outlet (Check 13)	KA007089	3/17/2020	PFPeA	0.0018
			PFHxA	0.0027
		6/16/2020	PFBA	0.0021
			PFPeA	0.0021
			PFHxA	0.0042
		9/15/2020	PFBA	0.0018
			PFHxA	0.0024
California Aqueduct near Kettleman City (Check 21)	KA017226	3/17/2020	none	--
		6/16/2020	none	--
		9/15/2020	none	--
Teerink Pumping Plant	KA027813	3/17/2020	none	--
		6/16/2020	none	--
		9/15/2020	none	--
California Aqueduct at Tehachapi Afterbay (Check 41)	KA030341	3/25/2020	none	--
		6/17/2020	none	--
		9/16/2020	none	--
East Branch Aqueduct at Check 66	KA040341	3/18/2020	none	--
		6/29/2020	none	--
		9/16/2020	none	--
California Aqueduct at Devil Canyon Powerplant Second Afterbay	KA041323	3/18/2020	none	--
		6/29/2020	none	--
		9/16/2020	none	--
North Bay Aqueduct, Barker Slough Pumping Plant	KG000000	3/17/2020	none	--
		6/25/2020	DEP	1.0000
			PFBA	0.0020
			PFPeA	0.0018
			PFHxA	0.0025
Delta–Mendota Canal upstream of McCabe Road	DMC06716	9/16/2020	PFHxA	0.0026
		3/17/2020	none	--
		6/16/2020	none	--
		9/15/2020	none	--

¹ Water at these locations was sampled in March, June, and September 2020.² Only chemicals found in detectable amounts at the sampling stations are included in this table.³ DEP = diethyl phthalate; PFBA = perfluorobutanoic acid; PFHxA = perfluorohexanoic acid; PFPeA = perfluoropentanoic acid

years in which pesticides and herbicides were reported. The lack of detections in 2020 is partially because of the switch to a new analytical laboratory where the minimum reporting limits were higher.

The switch to the new laboratory also ushered in the analysis of a new group of compounds not previously sampled in the SWP. These compounds are referred to as per- and polyfluoroalkyl substances (PFAS) and are an emerging concern in drinking water supplies. The State Water Board's Division of Drinking Water has issued several notification levels and response levels for various PFAS found in drinking water supplies. Sampling in the SWP began as an early warning system for drinking water contractors and as a means to locate sources of PFAS in the SWP. In the 2020 samples, the PFAS compounds perfluorobutanoic acid (PFBA), perfluoropentanoic acid (PFPeA), and perfluorohexanoic acid (PFHxA) were detected above their minimum reporting limits at several locations throughout the year. Concentrations ranged from 1.5 to 4.2 nanograms per liter.

Another change to the sampling schedule made in 2020 was the elimination of monthly volatile organic compound sampling at Barker Slough Pumping Plant, Clifton Court Forebay, Banks Pumping Plant, and the South Bay Aqueduct at Check 7. The vast majority of these samples for many years resulted in non-detectable concentrations for all compounds. Volatile organic compounds were still sampled for in March, June, and September at Barker Slough Pumping Plant and in March, June, September, and December at Banks Pumping Plant. As is typical for these samples, there were no detections for any volatile organic compounds in 2020. There was, however, the reportable detection of one semi-volatile organic compound, diethyl phthalate, at Barker Slough Pumping Plant (1 µg/L).

Taste and Odor

DWR routinely monitors taste and odor compounds produced by algae. Chemical substances in water that are often associated with earthy, musty smelling or tasting water include geosmin and 2-methylisoborneol, which are produced in water bodies by cyanobacteria. Geosmin and methylisoborneol are natural by-products of algal chlorophyll production.

DWR's evaluation of a taste and odor event is based on microscopic examination of samples, and most importantly, the chemical analysis of methylisoborneol and geosmin.

When sampling results indicate that concentrations of these compounds in SWP waters are increasing within the 10 nanograms per liter range, DWR responds by searching for the location of the source of the geosmin or methylisoborneol. To do this, water quality samples are collected and analyzed to ascertain the presence of possible algal sources. If an algal source is identified, DWR develops an aquatic herbicide application plan to control the specific algae associated with the elevated geosmin and/or methylisoborneol concentrations. In 2020, DWR applied aquatic algaecides to control taste- and odor-producing cyanobacteria in the South Bay Aqueduct, Clifton Court Forebay, and Silverwood Lake.

Cyanotoxin Monitoring

DWR routinely monitors cyanotoxins at SWP water quality monitoring stations. Samples are analyzed by microscopy for the presence of potentially toxigenic cyanobacteria, followed by cyanotoxin analysis if recommended based on the microscopy results. Monitoring results are shared with water contractors so that they may proactively make water treatment adjustments to remove cyanotoxins in their source water. During 2020, cyanotoxins were detected at water quality monitoring stations

in Clifton Court Forebay, Dyer Reservoir, the South Bay Aqueduct, O'Neill Forebay, San Luis Reservoir, Pyramid Lake, and Castaic Lake.

Non-SWP Water

Non-SWP water is considered to be any input to the SWP that is not directly diverted from the Delta. Most non-SWP water originates as groundwater pumped into the California Aqueduct through turn-in structures in the southern San Joaquin Valley. Non-SWP water, including groundwater turn-ins, can be admitted to the California Aqueduct for conveyance and redistribution provided it does not result in the degradation of SWP water quality, cause toxicity to fish and wildlife, or adversely affect beneficial users. Turn-in water is used for local redistribution or in transfers to other water contractors. Participants of an approved turn-in program can use available aqueduct capacity to move candidate waters from a point of availability to a point of need.

Turn-in Volumes

A total of 244,412 acre-feet of non-SWP turn-in water was admitted to the California Aqueduct during 2020 (Table 4-3). This water originated as groundwater from several agencies in the San Joaquin Field Division and amounts to 17 percent of the total water conveyed through the field division. The Kern Water Bank Authority contributed 43 percent of the total turn-in volume through the Kern Water Bank Canal. The Kern County Water Agency contributed 46 percent of the total volume through the Cross Valley Canal. Wheeler Ridge-Maricopa Water Storage District contributed 6 percent through its various turn-ins. Semitropic Water Storage District contributed 3.5 percent, and West Kern Water District contributed water totaling 1.1 percent of the total volume.

Turn-in Water Quality

The turn-in waters were typically higher in concentration for arsenic, chromium,

nitrate, and uranium compared to the California Aqueduct. Others such as salinity, sulfate, and gross alpha tended to have mixed results compared to the California Aqueduct, while bromide, chloride, and organic carbon tended to be lower than the California Aqueduct.

Monitoring in the California Aqueduct upstream and downstream of the turn-ins showed water quality was affected, both positively and negatively, but the effects were sometimes inconsistent and depended on a variety of factors such as water quality parameter, upstream concentration, turn-in source, and relative flows. Yet, those parameters with prevailing higher-than-California-Aqueduct concentrations in the turn-in water (namely arsenic and nitrate) primarily showed increases in the California Aqueduct while those with prevailing lower-than-California-Aqueduct concentrations (bromide, chloride, and organic carbon) primarily showed decreases in the California Aqueduct. The former trend is a concern because increases in these constituents are a potential threat to human health. However, the latter trend provided a net benefit to SWP Contractors because the lowering of some of these constituents, including disinfection by-product precursors such as dissolved organic carbon, lowers both the cost of producing drinking water and the potential for creating harmful trihalomethanes during the treatment process.

Table 4-3 Inflows to the California Aqueduct in 2020

Water Agency	Amount (acre-feet)
Kern County Water Agency	104,858
Kern Water Bank Authority	113,556
Semitropic Water Storage District	8,453
West Kern Water District	2,611
Wheeler Ridge-Maricopa Water Storage District	14,934
Total	244,412

San Joaquin Valley Agricultural Water Quality Programs

A number of programs conduct or support monitoring, research, training, or demonstration projects related to San Joaquin Valley agricultural water quality. For information about these programs, including the Agricultural Drainage Program and San Joaquin River Water Quality Grant Program, see the chapters about Local Assistance in Bulletins 132-94 through 132-18. (For a complete history, the phrase “local assistance” first appears in Bulletin 132-88, Chapter 3, SWP Administration Activities. Bulletins 132-90 and 132-91 also contain information about local assistance—see Assisting Local Water Supply Projects sections. Finally, Bulletins 132-92 and 132-93 each contain a chapter called Assisting Local Water Supply Projects.)

Municipal Water Quality Program Branch

The Municipal Water Quality Program Branch includes the Municipal Water Quality Investigations (MWQI) Program and the Quality Assurance/Quality Control Program (Quality Assurance Program).

Municipal Water Quality Investigations Program

The MWQI Program conducts water quality monitoring in the Delta for municipal and industrial uses. Since its inception in 1983, the program has provided information and expertise to the SWP Contractors and other agencies delivering Delta-sourced drinking water. The program’s data are used to identify long-term trends in water quality, to develop research and mitigation measures to reduce drinking water contaminants, and to provide advance notice to Delta water users of possible drinking water source problems.

Municipal Water Quality Investigations Discrete Monitoring and Special Studies

During 2020, the MWQI Program continued collecting monthly discrete samples at key locations in the Delta region. Monthly monitoring occurred for the routine Delta Monitoring Program, the Delta Boundary Improvement Monitoring Project, and the Cache Slough Complex (Stage 2) Monitoring Project. Because of COVID-19 concerns, data were not collected for these projects during four months of the year.

MWQI began two new projects to monitor constituents of emerging concern (i.e., pharmaceuticals, personal care products). For the first study, sampling occurred in the Sacramento-San Joaquin River system in conjunction with the Delta Regional Monitoring Program. The second study was supported by the urban SWP Contractors and occurred on the Delta-Mendota Canal.

A new special study was initiated in 2020 to assess whether new algal probe technologies, measuring chlorophyll and phycocyanin, can be used to estimate the level of harmful algal blooms present in SWP waterways. Discrete samples measuring algal speciation and enumeration will be collected to aid in the assessment. Project monitoring is expected to continue through 2021.

Real Time Data and Forecasting Comprehensive Program

The Real Time Data and Forecasting Comprehensive Program is a central element of the MWQI Program. The program provides real-time water quality monitoring data and associated modeled (predictive and non-predictive) water quality data to urban SWP Contractors. This data informs contractors of Delta and SWP water quality prior to it reaching their treatment facilities. The program continually works to further develop real-time system capabilities and improve Delta and SWP forecast modeling.

Measured constituents at the real-time monitoring stations include organic carbon and bromide, which can contribute to the formation of disinfection by-products during treatment at drinking water facilities. Other constituents reported are by-products of bromide analysis and include chloride, nitrate, and sulfate.

The Real Time Data and Forecasting Comprehensive Program entails the following elements:

- real-time water quality monitoring at key locations, providing stakeholders and interested parties with timely data
- field operations that ensure proper operation of all automated sampling equipment
- consistent modeling to provide the best forecasts possible
- data quality assurance/quality control
- centralized information management and dissemination

The real-time monitoring network includes stations located at Banks Pumping Plant, Jones Pumping Plant, the Sacramento River at Hood, the San Joaquin River near Vernalis (McCune Station), and the Gianelli Pumping-Generating Plant at San Luis Reservoir. During 2020, the forecasting program accomplished the following:

- continuous operation of five real-time water quality stations
- continuous data dissemination of water quality reports
- weekly distribution of short-term water quality forecasts
- monthly distribution of volumetric, specific conductance, and organic carbon source fingerprints

Quality Assurance Program

The Quality Assurance Program is responsible for ensuring all DWR water-related data are collected in a way

that is scientifically sound, legally defensible, and are of known and documented quality. The guiding policy for the program is the Quality Assurance/Control Policy for Water-Related Monitoring Programs (Water Resources Engineering Memorandum No. 60, September 18, 1992). DWR collaborates with monitoring programs to engage and support them in implementing quality assurance and quality control procedures in their projects. The Quality Assurance Program also collaborates with the implementation team for the Open and Transparent Water Data Act (Dodd; Chapter 506, Statutes of 2016 [Assembly Bill 1755]) to ensure quality control of data sets shared with the public.

This program identifies quality assurance processes and quality control practices necessary to ensure valid data from the time a project is planned through the final stages of data interpretation, dissemination, and reporting. The program also provides quality assurance/quality control documentation support, guidance, and training to employees who conduct environmental measurements. From March through December 2020, the Quality Assurance Program shifted all of its activities from in-person to virtual because of the COVID-19 pandemic. The strategic objectives of the program are to

- provide training on quality assurance and quality control topics;
- provide quality assurance tools for project managers to use in developing and implementing projects;
- act as quality assurance subject matter experts and issue guidance on technical quality issues;
- review and approve enterprise and programmatic quality documents;
- collaborate with other agencies and partners to work toward consistencies in data collection and dissemination; and
- support comparability of data quality and data management processes between agencies and partnerships.

Collaboration and Outreach

Internal Collaboration. The Quality Assurance Program's activities are primarily driven by the Quality Assurance Committee, which is an Environmental Coordination Committee Informational Working Group. The Quality Assurance Committee meets monthly and is open to staff across DWR to engage and discuss quality assurance issues, help guide the direction for the Quality Assurance Program, and to collaborate in the development of quality assurance processes and procedures. In 2020, Quality Assurance Committee meetings included discussion of general quality assurance topics, troubleshooting, and discussion of updated guidance in the areas of sample collection, data review, and data management.

Accomplishments by the Quality Assurance Program as a result of internal collaboration included the following:

- implemented consensus-based voting for quality assurance-issued guidance
- published the *Document Control Standard Operating Procedure*
- implemented a web-based, collaborative document management and storage system
- Environmental Coordination Committee executive approved the *Temperature Accuracy Verification Standard Operating Procedure*
- at Bryte Chemical Laboratory, in preparation for the upcoming State Water Board's Environmental Laboratory Accreditation Program requirement, began implementing the 2016 TNI Standard, which is a quality-based laboratory standard that requires detailed quality systems and procedures for environmental labs and is administered by a national non-profit called The NELAC Institute (TNI), which was formed by the National Environmental Laboratory Accreditation Conference (NELAC) and the Institute for National

Environmental Laboratory Accreditation (INELA)

- supported Bryte Chemical Laboratory with implementing acidification of water samples for nutrients analysis
- established the Discrete Water Quality Subcommittee for more in-depth discussion and guidance related to discrete water quality sampling
- established working groups focused on metadata standards, quality assurance training processes, and outlier detection in data review

External Collaboration. The Quality Assurance Program engages external partners to advocate for and engage in quality assurance across multiple agencies involved in water-related data collection in California in an effort to support comparability and compatibility between data sets. In 2020, external partners included the State Water Board's Quality Assurance Program and Environmental Laboratory Accreditation Program, as well as the Interagency Ecological Program Data Utilization Working Group.

The program began leading the Data Utilization Working Group Quality Assurance Subcommittee. The focus of this group is to provide guidance, tools, and technical assistance on quality assurance to the broader Interagency Ecological Program community. In 2020, the focus of the group was developing a standard operating procedures template to help support consistency in field procedures among the Interagency Ecological Program agencies. Additionally, the Quality Assurance Program presented a poster virtually at the Interagency Ecological Program Workshop to engage interagency staff in quality assurance.

Guidance and Training. A major effort of the Quality Assurance Program is to provide

guidance and training for DWR staff. Some of the guidance is through discussions at Quality Assurance Committee or other formal or informal meetings. In 2020, guidance was issued virtually through these venues, but also included programmatic standard operating procedure review for DWR monitoring.

The Quality Assurance Program also sponsored the Basic Environmental Statistics class, held in January 2020 before the shift to virtual trainings was necessary because of the COVID-19 pandemic. Other trainings were postponed until they could be delivered in a virtual format.

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 groundwater for the various water quality programs within DWR. Since 1990, the laboratory has been certified biennially by the State Water Board's Environmental Laboratory Accreditation Program to perform water quality analyses following U.S. Environmental Protection Agency or Standard Methods for the Examination of Water and Wastewater procedures and analytical methods. This certification allows the laboratory to perform analyses that generate legally defensible data that can be used for regulatory or 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 2020, the laboratory upgraded its capability and capacity to detect and analyze trace levels of chlorophyll and pheophytin with the purchase of an ultraviolet-visible spectrometer. It is a computer-controlled analytical instrument that generates highly stable, accurate, and reproducible data. The instrument's detection limit has been established at 0.5 parts per billion.

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 beyond the capability and capacity of the laboratory, such as solids and fish tissues. The laboratory works in conjunction with the DWR Quality Assurance/Quality Control Section to replace these contracts as they expire each fiscal year.

With SWP security and protection as an ongoing priority, Bryte Chemical 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 the CDPH in the analysis of chemical agents in water quality samples should a natural disaster or terrorist event occur in California. The assistance is only required should the analytical capacity of the 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 California Association of Mutual Aid Laboratories Network organization. Level II only allows the laboratory to receive samples that are prescreened and determined nonhazardous to laboratory personnel.

Suisun Marsh Program Activities

Suisun Marsh is the largest contiguous brackish marsh remaining in the United States, consisting of approximately 59,000 acres of tidal and managed brackish water wetlands and 30,000 acres of bays and sloughs. DWR became involved in Suisun Marsh in response to State Water Board Water Right Decision 1485, which required DWR and Reclamation to operate the SWP and CVP to meet salinity standards as specified in the State Water Board's 1978 *Water Quality Control Plan for the Delta and Suisun Marsh*, which established revised water quality objectives for flow and salinity in the Delta and Suisun Marsh. Through agreements and plans, DWR has been working in coordination with Reclamation, DFW, Suisun Resource Conservation District, USFWS, and other agencies, on habitat management, preservation, and restoration of Suisun Marsh. For more background information, see Bulletin 132-19.

Facility Operations, Maintenance, and Related Activities

Morrow Island Distribution System

The Morrow Island Distribution System (MIDS) is an interior ditch bordered by levees that was created to distribute water to managed wetlands on the western edge of Suisun Marsh. 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 (see Figure 4-2). Routine maintenance in 2020 was suspended due to a use of bridge issue.

Fish Screen and Alternatives. Based on previous study results, a fish screen

at MIDS would likely have negligible benefits to sensitive fish populations (see Bulletin 132-07, Chapter 4, Water Quality). DWR and Reclamation are proposing to fulfill the outstanding terms and conditions of the USFWS 1997 BiOp for the MIDS maintenance project by acquiring and protecting, in perpetuity, aquatic habitat in Suisun Marsh. (For additional information about the BiOp, see Bulletin 132-08.) This proposal is ongoing.

Longfin Smelt Incidental Take Permit. On February 23, 2009, DFW issued an incidental take permit for the ongoing and long-term operation of existing SWP facilities in the 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 to adequately protect these fish. Also, as a requirement of the incidental take permit, DWR is developing a study to confirm the aforementioned operation prevents or substantially reduces the entrainment of longfin smelt at MIDS.

Reclamation and DWR continue to coordinate with USFWS, National Marine Fisheries Service, and DFW regarding fish entrainment and annual flow restrictions at MIDS.

Suisun Marsh Salinity Control Gates

The Suisun Marsh Salinity Control Gates 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. Installation or removal of the flashboards and operation of the gates vary depending on salinity conditions, fisheries agencies' requests for sensitive species concerns, or repairs.

Status of Suisun Marsh Salinity Control Gates in 2019–2020. The control season

(generally October through May) started in October 2019. The flashboards were installed and the boat locks became operational on October 1, 2019. The Suisun Marsh Salinity Control Gates were tidally operated to respond to rising salinities beginning November 15, 2019. Salinity was within the 12–14 mS/cm range for the compliance stations, so operations ceased. The flashboards were removed on May 28, 2020, and the gates were set to the open position the previous day in preparation for flashboard removal.

Roaring River Slough Distribution System

The Roaring River Slough Distribution System is operated and maintained as needed to provide lower-salinity water to managed wetland properties. In 2020, DWR's Delta Field Division added 416 cubic yards of aggregate base for road maintenance, five cubic yards for existing exterior levee repair, 295 cubic yards of material for existing interior levee repair, and replaced five cubic yards of riprap on existing interior levees.

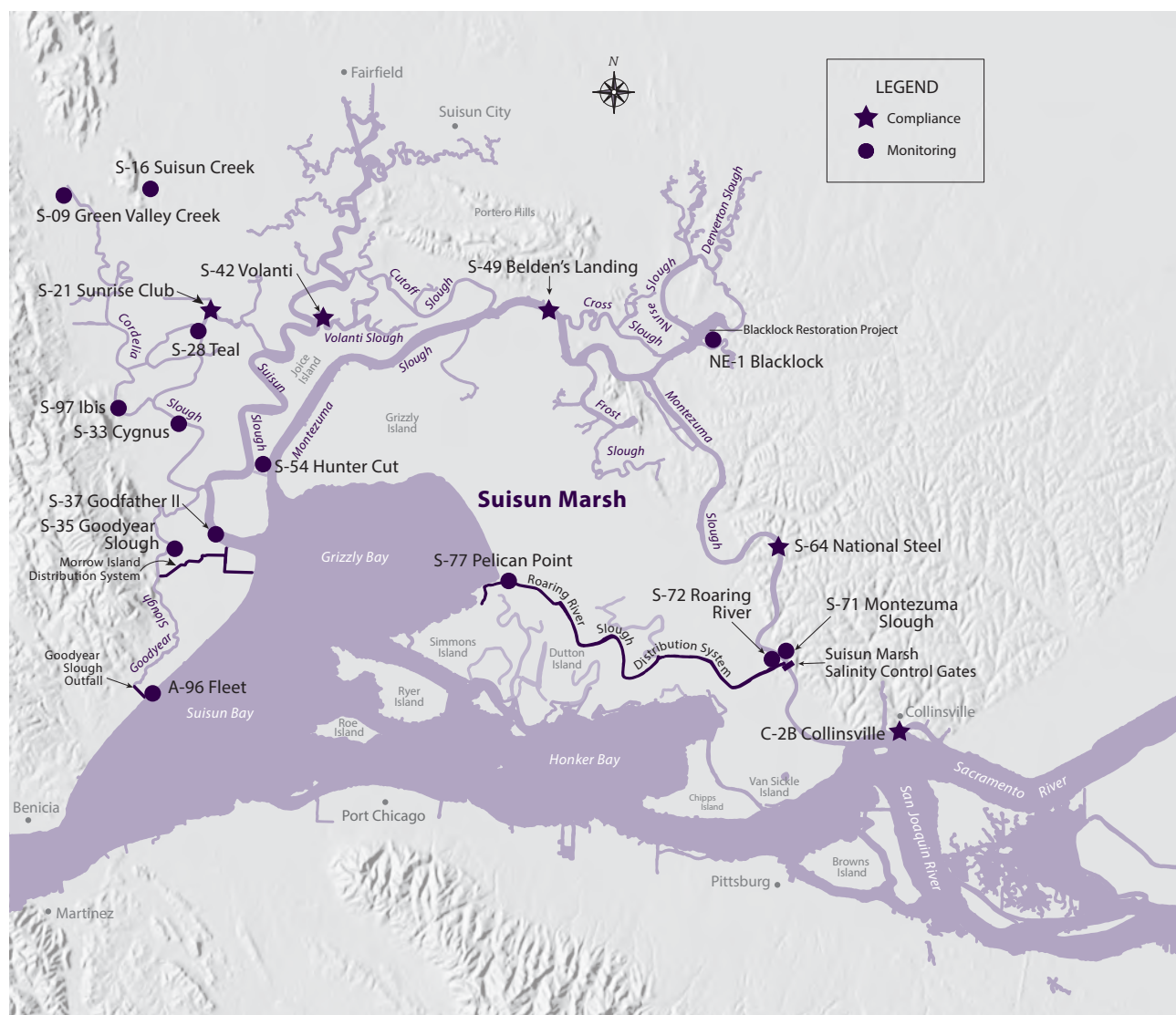


Figure 4-2 Compliance and Monitoring Stations and Water Management Facilities in Suisun Marsh

Goodyear Slough Outfall

The Goodyear Slough Outfall is operated and maintained as needed to provide lower-salinity water to managed wetland properties. In 2020, maintenance activities included mowing, spraying, ditch clearing, and road maintenance. DWR's Delta Field Division added 400 cubic yards of aggregate base for road maintenance and removed 50 cubic yards of materials from drain pipes.

Water Quality and Compliance

Salinity levels for the 2019–2020 control season were below monthly standards for all five compliance stations.

Details about salinity levels in the marsh are available in a monthly report titled *Suisun Marsh Monitoring Program Channel Water Salinity Report*.

Suisun Marsh Expenditure History

Suisun Marsh expenditures and reimbursements administered by DWR

for calendar years 1968 through 2020 are summarized in Table 4-4. From 1968 through December 31, 2020, DWR disbursed more than \$206.3 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 Suisun Marsh Preservation Agreement and for meeting standards set by the State Water Board. Reclamation has reimbursed DWR about \$67.4 million (33 percent), and the State's General Fund has reimbursed about \$9.5 million (4.6 percent). These figures do not include up-front payments made by Reclamation for DWR and other direct costs, as well as about \$5.7 million in Reclamation interest payments during 1988 and 1989.

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

Table 4-4 Suisun Marsh Expenditures and Reimbursements Administered by DWR, Calendar Years 1968–2020 (in dollars)

Year [1]	Reach 305 Costs [2]	General Fund Payment [3]	Adjustment for General Fund Payment ¹ [4]	Reclamation Invoice Payment ³ [5]	Interest Payment Credited Back to Contractors [6]	Net SWP Costs [2] through [6] [7]	Recreation Costs ² [8]	SWP 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

Table 4-4 Suisun Marsh Expenditures and Reimbursements Administered by DWR, Calendar Years 1968–2020 (in dollars)

Year [1]	Reach 305 Costs [2]	General Fund Payment [3]	Adjustment for General Fund Payment ¹ [4]	Reclamation Invoice Payment ³ [5]	Interest Payment Credited Back to Contractors [6]	Net SWP Costs [2] through [6] [7]	Recreation Costs ² [8]	SWP Contractors' Costs [7] minus [8] [9]
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) ^a	(2,039,752)	(11,952,113)	253,516	(12,205,629)
1989	2,341,960	(9,478,000)	6,634,600	(1,219,691) ^a	(283,857)	(2,004,988)	79,643	(2,084,631)
1990	3,030,010			(695,450)		2,334,560	101,460	2,233,100
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)	98,146	(540,665)
2001	2,621,301			(444,009)		2,177,292	89,431	2,087,861
2002	3,752,486			(791,319)		2,961,167	124,387	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	3,940,876			(1,409,296)		2,531,580	130,049	2,401,531
2006	5,796,008			(868,449)		4,927,559	193,478	4,734,081
2007	4,115,061			(939,879)		3,175,182	135,804	3,039,378
2008	3,829,742			(1,670,278)		2,159,464	125,867	2,033,597
2009	4,696,688			(1,123,705)		3,572,983	154,991	3,417,991
2010	1,266,203			(1,663,530)		(397,327)	41,784	(439,111)
2011	2,410,978			(1,748,136)		662,842	79,240	583,602
2012	4,043,657			(1,860,585)		2,183,072	133,635	2,049,437
2013	3,617,675			0		3,617,675	119,383	3,498,292
2014	3,401,520			0		3,401,520	112,250	3,289,270
2015	3,996,728			(6,431,161)		(2,434,433)	131,892	(2,566,325)
2016	6,383,128			(388,253)		5,994,875	210,671	5,784,204
2017	13,231,219			(2,136,908)		11,094,311	436,650	10,657,661
2018	12,679,281			(1,204,000)		11,475,281	418,458	11,056,824
2019	11,584,825			0		11,584,825	382,716	11,202,109
2020	11,328,854			(2,508,205)		8,820,649	375,803	8,444,846
Total	206,286,507	(9,478,000)	6,634,600	(67,368,768)	(2,323,609)	133,750,731	6,898,747	126,851,983

¹ Under California Water Code section 12912.5 (Chapter 716, Statutes of 1989 [Assembly Bill 1442, Baker]), the General Fund paid 20 percent of the Suisun Marsh costs through June 1988, which totaled \$9,478,000. This \$9,478,000 payment included \$2,843,400, which represents 4.6 percent of the Suisun Marsh costs through June 1988 paid by the General Fund. The Suisun Marsh costs billed to the SWP Contractors have been reduced by \$2,843,400. The remaining \$6,634,600 received from the General Fund represents DWR's recreation project purpose share of 14 percent.

² 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.

³ No payments were made by Reclamation in 2013 and 2014 due to disputed invoices. All disputed charges were resolved and paid in July 2015. No payments were made in 2019 under the Suisun Marsh Preservation Agreement (SMPA) because of the execution of the new Federal Assistant Agreement (FAA) R19AC000884. Reclamation made a partial payment for July 2018 through December 2019 under FAA R19AC000884, which also includes costs incurred in calendar year 2020 under the new FAA terms.

^a Excludes interest payments made by Reclamation.



Chapter 5

Legislation and Litigation

American white pelicans (Pelecanus erythrorhynchos) fly over Antelope Lake, a section of the State Water Project located on Upper Indian Creek in Plumas County.

Significant Events in 2020

*D*uring 2020, there was no significant State or federal legislation affecting management of the State Water Project (SWP).

Information for this chapter was provided by the Legislative Affairs Office and the Office of the General 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 General Counsel tracks State and federal litigation that impacts management of the SWP. The DWR General Counsel also manages legal cases that involve SWP operations.

Legislation

There was no State legislation affecting the SWP in 2020.

Litigation

As of December 31, 2020, DWR was involved in, or closely monitored, a number of court cases and other actions related to the management of the SWP.

SWP Contracting and Authority

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) (C078249 and C080572, app. pending); Central Delta Water Agency et al. v. Kern County Water Agency et al., California Department of Water Resources 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. California Department of Water Resources (Super. Ct. Kern County, No. S-1500-CV-270635-KCT/Super. Ct. Sacramento County, No. 34-2010-80000703) (Rosedale-Rio Bravo).

After lengthy negotiations conducted in Monterey, the Monterey Agreement was signed in December 1994 by DWR, five SWP Contractors, and the Central Coast Water Authority. The agreement contained principles to guide the amendment of Water Supply Contracts to address water allocation

and issues related to SWP management and financing.

From 1995 to 1999, 27 of the 29 SWP Contractors executed Monterey Amendments. The Monterey Agreement Environmental Impact Report (EIR) was certified in October 1995, and in December 1995, a lawsuit was filed (*Planning and Conservation League v. DWR*) challenging the EIR. A new “Monterey Plus EIR” was prepared, certified in 2010, and challenged in court (*Central Delta I*, *Central Delta II*, and *Rosedale-Rio Bravo*).

In November 2014, the court ordered DWR to decertify the Monterey Plus EIR and revise and certify it by December 31, 2015 (*Central Delta I* and *Rosedale-Rio Bravo*). In October and December 2014, appeals were filed as part of *Central Delta I*. On August 10, 2015, the court granted DWR’s request for an extension and set a new deadline of June 30, 2016, for completion of a revised Monterey Plus EIR. (For more information about the Monterey Agreement, the Monterey amendments, and related litigation, see Bulletins 132-95 through 132-04 and 132-10 through 132-17.)

In April 2016, a draft revised Monterey Plus EIR was released, and in May 2016, at DWR’s request, the court extended the deadline for completion of the revised Monterey Plus EIR to September 28, 2016. In September 2016, DWR certified the revised Monterey Plus EIR, filed a notice of decision, and returned the

writ to the court. In 2017, the Central Delta plaintiffs appealed the lower court's ruling to the Third District Court of Appeal.

In 2020, there were no updates on this case.

This case was consolidated with the Food Safety case below and entered for *Biological Diversity v. Department of Water Resources* (Case No. C080572).

For more information about the revised Monterey Plus EIR, see Chapter 8, Water Contracts and Deliveries.

***City of Antioch v. California Department of Water Resources* (Case No. 34-2017-00218154).** On August 28, 2017, the City of Antioch (Antioch) filed a complaint against DWR for breach of contract. A provision of the 1968 water supply agreement between Antioch and DWR provides that the State will not grant compensation for damages caused by the SWP to other Delta entities that would be "substantially more favorable" than the terms of the 1968 agreement with Antioch. In 2016, DWR entered into an agreement with Contra Costa Water District that Antioch alleges violates this provision.

DWR filed a demurrer on December 15, 2017, arguing that Antioch failed to state facts sufficient to constitute a cause of action.

This suit and its claims were ultimately resolved, and the case was dismissed in April 2020.

Delta Revenue Bond Validation

***Sierra Club v. California Department of Water Resources v. All Persons Interested et al.* (Sacramento County Super. Ct., Case No. 34-2020-80003517).** DWR filed its Delta Program Revenue Bond validation complaint on August 6, 2020. At issue is DWR's authority to finance and construct a Delta conveyance project. Answers were filed by public water agencies and public interest groups. In addition to filing

an answer in the validation case, Sierra Club et al. also filed a related CEQA petition. The two cases were consolidated in Sacramento County Superior Court. Sierra Club et al. filed a motion for summary judgment on its petition asserting various violations of CEQA associated with DWR's adoption of the bond resolutions that are the subject of DWR's validation suit. The court denied the motions of the defendants and petitioners. DWR's own cross-motion for summary judgment as to the CEQA claims was granted. As a result, CEQA claims asserted by petitioner Sierra Club and by multiple answering defendants are removed from the case. No trial date has been set.

Water Supply Contract Extension Litigation

***California Department of Water Resources v. All Persons Interested* (Sacramento County Super. Ct., Case No. 34-2018-0246183); *North Coast Rivers Alliance v. California Department of Water Resources* (Sacramento County Superior Court, Case No. 34-2019-80003047); *Planning and Conservation League v. California Department of Water Resources* (Sacramento County Sup. Ct., Case No. 34-2019-80003053).** In January 2019, two separate CEQA actions were filed against DWR regarding its determination extending the term on DWR's 29 State Water Contracts (Long Term Contract Extension) in Sacramento County Superior Court. DWR also filed a validation action. The matters have been coordinated and assigned to one judge. DWR reached an agreement with the petitioners allowing DWR to prepare the CEQA administrative record. A stipulated order establishing the record preparation process and timeline was signed by the court on January 16, 2020. DWR certified the CEQA administrative record on August 28, 2020. The validation action is awaiting certification of its administrative record.

Water Management Amendments Litigation

North Coast Rivers Alliance et al. v. California Department of Water Resources (Case No. 34-2020-80003491); California Water Impact Network et al. v. California Department of Water Resources (Case No. 34-2020-80003492). In September 2020, two petitioner groups filed petitions for writ of mandate in Sacramento County Superior Court challenging DWR's approval of the *State Water Project Water Supply Contract Amendments for Water Management*, based on alleged noncompliance with CEQA, the Delta Reform Act of 2009, and the public trust doctrine.

North Coast Rivers Alliance v. California Department of Water Resources (Case No. 34-2017-80002667). On January 16, 2019, the North Coast Rivers Alliance, the Institute for Fisheries Resources, Pacific Coast Federation of Fishermen's Association, and the Winnemem Wintu Tribe filed a lawsuit. The lawsuit alleges DWR's entry into the addendum to the agreement between the U.S. Bureau of Reclamation (Reclamation) and DWR for the coordinated operation of the Central Valley Project and the SWP and the hold harmless agreement to address the effects of the California WaterFix (CWF) on Central Valley Project operations between Reclamation and DWR violated CEQA, the Delta Reform Act, Water Code Section 85000 et seq., and the public trust doctrine.

This case remains in the pre-trial motions phase. The court granted the North Delta Water Agency's motion to intervene. DWR is gathering documents for the administrative record. The stipulated date for completion of the administrative record is January 27, 2021.

Sacramento-San Joaquin Delta (Delta)

State Water Resources Control Board State Water Board Cases (Judicial Council Coordination Proceeding No. 5013). On December 12, 2018, the State Water

Resources Control Board (State Water Board) adopted Resolution 2018-0059, approving amendments to the Bay-Delta Water Quality Control Plan for the San Joaquin River flows and southern Delta salinity. These amendments resulted in several lawsuits filed in State court challenging their validity. These lawsuits have been coordinated as Judicial Council Coordination Proceeding No. 5013 in Sacramento County Superior Court. DWR is not a named party.

State Water Board submitted these amendments to the Office of Administrative Law, which were approved on February 25, 2019. On February 26, 2019, the State Water Board filed its notice of determination. Since the adoption of these amendments, several lawsuits have been filed in State court challenging their validity. The parties are currently working on completing the administrative record, which was originally expected April 1, 2020.

United States of America v. State Water Resources Control Board & State Water Resources Control Board Chair E. Joaquin Esquivel, U.S. District Court, Eastern District of California (Case No 2:19-at-00236). On March 28, 2019, Reclamation, in addition to its State court filing, also filed a complaint for declaratory and injunctive relief in federal court. Reclamation's CEQA claims have been stayed and are pending an appeal of the stay by Reclamation. Reclamation's remaining federal claim is an intergovernmental immunity claim based on the continued requirement of Reclamation to meet seven salinity standards at Vernalis.

As of 2020, briefing on the ripeness of this claim has been completed and parties are awaiting a decision by the court.

California WaterFix/Bay-Delta Conservation Plan

The following litigation cases regarding the CWF filed in State court were coordinated in one proceeding.

California Department of Water Resources Environmental Impact Cases (Super. Ct. Sacramento County, Coordinated Proceedings Special Title (Rule 3.550). Judicial Council Coordination Proceeding No. 4942).

In July 2017, DWR certified the EIR, approved CWF (Alternative 4a), and filed a notice of determination. In August 2017, several different petitioners filed petitions for writ of mandate in four different superior court venues within the State of California challenging DWR's project approval, including its compliance with CEQA, and DFW's issuance of an incidental take permit under the California Endangered Species Act. On the same date that it approved the project, DWR filed a validation action in Sacramento County Superior Court to confirm the validity of a proposed financing approach for CWF. Numerous entities and organizations supporting and opposing the CWF have filed answers to this action. These cases were coordinated in Sacramento County Superior Court and collectively styled the "CDWR Environmental Impact Cases." On May 2, 2019, DWR announced withdrawal of permits and approvals for CWF and rescinded the bond resolutions adopted to finance the CWF. See Bulletin 132-20, Chapter 3, for more information about withdrawing CWF permits. Subsequently, DWR and all other parties voluntarily dismissed their actions, ending the coordinated proceeding. A briefing and hearing schedule was set for defendants' motions seeking for attorney fees and costs. Motions for fees and costs were denied. The moving parties appealed.

After DWR rescinded its project approval and set aside certification, petitioners filed dismissals without prejudice. On August 23, 2019, DWR received nine separate motions for attorney fees seeking approximately \$13.5 million.

On March 11, 2020, the court issued the notice of entry of order denying plaintiff's motions for fees. Thereafter, seven parties

filed notices of appeal with the Third District Court of Appeal: North Coast Rivers Alliance et al.; California Sportfishing Protection Alliance et al.; County of San Joaquin et al.; North Delta Water Agency; City of Stockton; County of Sacramento et al.; and Save the California Delta Alliance.

Central Delta Water Agency, South Delta Water Agency & Local Agencies of the North Delta v. California Department of Water Resources (Case No. 2020-80003457).

On August 10, 2020, a verified petition for writ of mandate was filed in Sacramento Superior Court by Central Delta Water Agency, South Delta Water Agency, and Local Agencies of the North Delta against DWR, challenging the adequacy of the soil investigations/geotechnical explorations initial study/mitigated negative declaration under the requirements of CEQA.

The prayer for relief includes

- to not adopt the mitigated negative declaration;
- to not approve the project;
- to not issue or approve any further permits or entitlements for the project until the proper CEQA lead agency has prepared and certified a legally adequate environmental document for the project and complied with all other requirements of CEQA, as directed by the court pursuant to Public Resources Code Section 21168.9;
- that the court issue a temporary restraining order, a preliminary and permanent injunction barring respondent and anyone working on its behalf from proceeding with any activity which may result in any physical change in the environment in the project area pending completion of this litigation and full compliance with CEQA;
- and that the court issue a peremptory writ of mandate directing DWR to suspend all necessary steps and all activity in furtherance of due 30 days

after the administrative record has been certified.

Plaintiffs requested notice of DWR activities 10 days prior to any soil disturbance occurring under the project approved by the mitigated negative declaration. DWR has provided several rounds of notice for soil disturbance activities extending until December 11, 2020. San Joaquin County gave DWR notice that the previously issued county encroachment permits to perform geotechnical surveys were not authorized unless DWR obtained approval from abutting landowners to perform the work in the road right-of-way.

Geotechnical Explorations Coordinated Cases (Sacramento County Case No. C092087; Judicial Council Coordination Proceeding No. 4594.

Geotechnical work dating back to 2013 (Bay-Delta Conservation Plan) subject to litigation was remanded to San Joaquin Superior Court. (See Bulletin 132-20, *Property Reserve, Inc. v. The Superior Court of San Joaquin County* [C067758]; California Department of Water Resources, Real Party in Interest.) DWR began geotechnical work in 2019 and the counties issued stop orders and filed subsequent litigation. The court denied Sacramento County's request for preliminary injunction and the hearing for coordinated matters was held on December 6, 2019. Sacramento County appealed the denial of the preliminary injunction to the Third District Court of Appeal. The court took DWR's motion for summary of judgement off the calendar based on the legal argument that the decision regarding sovereign immunity had been decided at the preliminary injunction phase so there were no disputed facts. The court set a further date in March 2020 to refile a new motion for summary of judgement based on undisputed facts and encouraged the counties to do the same. On March 13, 2020, the hearing was held on the motion for summary of judgement and the judge ruled DWR has sovereign immunity and is not required to

get a county well permit for geotechnical work on the previously court-approved geotechnical work locations.

On April 23, 2020, DWR filed an ex parte application that the court extend the deadline for DWR to complete its entries pursuant to the June 16, 2017, entry order and its addenda to November 30, 2020. The court granted that request.

California Endangered Species Act: Incidental Take Permit

County of San Joaquin et al. v. California Department of Water Resources and California Department of Fish and Wildlife (Case No. 34-2017-80002677); CWF Bay.Org et al. v. California Department of Fish and Wildlife and California Department of Water Resources (Case No. 34.2017.80002695); North Delta Water Agency v. California Department of Fish and Wildlife, California Department of Water Resources as Real Party in Interest (Case No. 34-2017-80002725).

After the California Department of Fish and Wildlife issued an incidental take permit for CWF to DWR on July 28, 2017, two lawsuits were filed that challenged the adequacy of the incidental take permit. The incidental take permit provided coverage for incidental take to DWR for construction and operation of CWF for several State-listed species found in the Delta.

In November 2017, the cases were ruled to be related, designated complex cases, and assigned in Sacramento County Superior Court. These cases were coordinated with the environmental impact cases and the validation case.

Between April and June 2020, environmental groups and water contractors filed eight lawsuits against DWR challenging the incidental take permit and EIR for the long-term operations of the SWP. Most of the eight lawsuits also named the California Department of Fish and Wildlife.

The eight cases have all been coordinated in Sacramento County Superior Court. DWR and the California Department of Fish and Wildlife are preparing their administrative records. The coordinated cases are in the pretrial phase.

Delta Plan

Delta Stewardship Council Cases (Super. Ct. Sacramento County, Judicial Council Coordination Proceeding No. 4758; C082944, app. pending). The following cases were coordinated into this proceeding: (1) *San Luis and Delta-Mendota Water Authority v. Delta Stewardship Council* (Super. Ct. Sacramento County, No. 34-2013-80001500); (2) *State Water Contractors et al. v. Delta Stewardship Council* (Super. Ct. Sacramento County, No. 34-2013-80001530); (3) *North Coast Rivers Alliance et al. v. Delta Stewardship Council* (Super. Ct. Sacramento County, No. 34-2013-80001534); (4) *California Water Impact Network et al. v. Delta Stewardship Council* (Super. Ct. San Francisco County, No. CPF13513047); (5) *Central Delta Water Agency et al. v. Delta Stewardship Council* (Super. Ct. San Francisco County, No. CPF13513048); (6) *Save the California Delta Alliance v. Delta Stewardship Council* (Super. Ct. San Francisco County, No. CPF13513049); (7) *City of Stockton v. Delta Stewardship Council* (Super. Ct. San Joaquin County, No. 39-2013-00298188).

In May 2013, the Delta Stewardship Council adopted its *Delta Plan* after approving and certifying a programmatic environmental impact report (EIR) for the plan. Subsequently, the Delta Stewardship Council adopted the implementing regulations to make the *Delta Plan*'s 14 policies legally enforceable. The regulations were approved by the Office of Administrative Law (California Code of Regulations, Title 23, Sections 5001–5016) and became legally effective on September 1, 2013. In May and June 2013, several public water agencies, environmental organizations, and the City of Stockton filed seven separate lawsuits

challenging the *Delta Plan*, the programmatic EIR, and the associated regulations. The cases were consolidated in Sacramento County Superior Court.

In June 2016, the court ruled that the *Delta Plan* did not comply with the Delta Reform Act (2009), failed to promote options for conveyance and storage, and failed to include quantified or measurable targets for achieving reduced Delta reliance. The Delta Stewardship Council and the State and federal water contractors filed appeals in November and December 2016 with the Third District Court of Appeal. The filing of the appeals means that the lower court's judgment vacating the *Delta Plan* is automatically stayed pending the outcome of the appeals.

In January 2017, the Third District Court of Appeal approved a settlement between the City of Stockton and the Delta Stewardship Council, meaning that Stockton will not be participating in the case on appeal. The stipulated judgment resolved Stockton's lawsuit in exchange for some assurances regarding the application and meaning of *Delta Plan* Policy WR P1 (Reduce Reliance on the Delta through Improved Regional Water Self-Reliance [California Code of Regulations, Title 23, Section 5003]) related to Stockton General Plan definitions and future public works projects.

The parties in the litigation earlier agreed by stipulation to preserve the petitioners' CEQA claims while the Delta Stewardship Council takes steps to remedy the deficiencies identified in the lower court ruling.

In April 2018, while the appeals were pending, the Delta Stewardship Council adopted amendments to the *Delta Plan* (*Delta Plan Amendments*) and certified the programmatic EIR for the *Delta Plan Amendments*.

The appellate court heard oral arguments in Sacramento on March 17, 2020. DWR filed an amicus brief in coordination with the Delta Stewardship Council. In summary, the three issues argued included the validity of the *Delta Plan* itself; the validity of the Delta Stewardship Council's "reduced reliance" regulation; and the Delta stakeholder group's challenge to the Delta Stewardship Council's best available science policy.

The water contractors argued the plan was beyond the Delta Stewardship Council's authority with a focus on the reduced reliance policy and statewide water conservation directives.

On April 10, 2020, the appellate court released its decision with four main points.

First, the *Delta Plan* is valid; the court reasoned the Legislature's stated purpose in requiring the *Delta Plan* to include performance measures was to enable the Delta Stewardship Council to track progress in meeting the objectives of the *Delta Plan*. This purpose can be met without the adoption of performance measure targets as legally enforceable regulations.

Second, the Delta Stewardship Council's "reduced reliance" regulation is valid; the court found CEQA specifically authorizes the Delta Stewardship Council to adopt and implement a legally enforceable *Delta Plan* that furthers the coequal goal of providing a more reliable water supply for California, which includes reduced reliance on the Delta. To achieve the objective of reduced reliance, CEQA mandates improved regional self-reliance from each region that depends on water from the Delta watershed, which includes regions outside the geographical boundaries of the Delta.

Also, according to the Delta Stewardship Council's best available science policy, CEQA does not require the Delta Stewardship Council, as a matter of law, to include all

the recommendations and advice provided by the Delta Independent Science Board in the original *Delta Plan*. The statute mandates that the *Delta Plan* be built upon principles of adaptive management and be based on the best available scientific information and advice provided by the Delta Independent Science Board.

Finally, the court's finding can sum up SWP Contractors' argument regarding the Delta Stewardship Council's authority; the Legislature delegated broad authority to the Delta Stewardship Council to "adopt regulations or guidelines as needed to carry out the powers and duties identified in this [act]."

The Delta Stewardship Council's motion to publish this case was granted.

North Coast Rivers Alliance v. Delta Stewardship Council (34-2018-80002898-CU-WM-GDS). On March 16, 2017, the Delta Stewardship Council posted a notice of preparation of a draft program EIR concerning the proposed Delta Plan Amendments and, on November 1, 2017, it issued the draft program EIR for public review and comment. On April 26, 2018, the Delta Stewardship Council certified the 2018 program EIR, approved the Delta Plan Amendments, approved the findings and statement of overriding considerations, and filed the notice of determination pertaining to certification of the program EIR.

In the summer of 2018, four sets of petitioners filed petitions for writ of mandate alleging that the Delta Plan Amendments violated CEQA, as well as additional arguments on claims arising from the Delta Reform Act, the public trust doctrine, and the Human Right to Water (Eng; Assembly Bill 685; Chapter 524; 2012).

No briefing or hearing was set in 2019 or 2020.

Staten Island

Wetlands Preservation Foundation v. California Department of Water Resources and The Nature Conservancy (Case No. C092656 and C093416, Third Appellate District). The petition for writ of mandate and violation of the public trust was filed and served on DWR in July 2018. The Wetlands Preservation Foundation claims DWR caused a nuisance and breached its duties under its ownership of the conservation easement and under the California public trust doctrine by allowing The Nature Conservancy to continue to grow corn on Staten Island. The plaintiffs allege that the continued farming of corn causes increased subsidence rates. DWR's evidence will show that it neither owed nor breached any duty enforceable by mandate, including any duty under the public trust doctrine. Trial in this matter began on November 25, 2019. Closing arguments were suspended because of the COVID-19 pandemic and took place on June 15, 2020.

The trial court issued its ruling on July 9, 2020, mandating that DWR conduct a baseline study of Staten Island to enable DWR to exercise its discretion in its oversight and monitoring of Staten Island going forward. Additionally, the court found in favor of the foundation on its claims of public nuisance and violation of public trust. DWR decided to not appeal the trial court's ruling.

Drought-Related Actions

California Sportfishing Protection Alliance et al. v. California State Water Resources Control Board et al., California Department of Water Resources and United States Bureau of Reclamation, Real Parties in Interest (Case No. RG15-780498). On August 4, 2015, the California Sportfishing Protection Alliance filed a petition for writ of mandate challenging the State Water Board's orders granting temporary urgency change petitions to DWR and Reclamation in 2014 and 2015. (For information about the temporary

urgency change petitions, see Bulletin 132-16, Chapter 4, Water Quality Programs.) DWR and Reclamation are named as Real Parties in Interest.

On September 16, 2015, the California Sportfishing Protection Alliance filed a first amended complaint claiming that the State Water Board's orders violate the federal Clean Water Act, the Central Valley Basin Plan, and the public trust doctrine. On October 21, 2015, the State Water Board filed a demurrer to dismiss the action. A hearing on the matter was held in January 2016. In April 2016, a second amended complaint was filed by the California Sportfishing Protection Alliance et al.

On February 6, 2017, the defendants filed a motion for judgment on the pleadings for failure to join Reclamation as an indispensable party; the motion was denied by the court on March 14, 2017. On May 2, 2017, the court issued an order granting in part and denying in part the State Water Board's motion. In part, the trial court specified that "National Audubon states the standard." Cross-motions for summary judgment and summary adjudication were filed by the State Water Board and the plaintiffs, respectively, on July 25 and 27, 2017. A hearing on the cross-motions was held November 11, 2017, and the court issued an order on January 29, 2018, denying both motions. On February 13, 2018, the State Water Board filed a motion for clarification of order denying motions for summary judgment, related to whether triable issues of fact exist and for clarification on the legal standard for trial of the public trust doctrine cause of action.

On January 28, 2019, the parties stipulated to vacate the trial date of February 25, 2019, and set a new trial date of November 12, 2019.

On July 17, 2020, a settlement was reached between the parties. The State Water Board agreed, among other things, to

- request Reclamation develop a Sacramento River Temperature Management Plan annually, including evaluation of operational scenarios that include changes in timing and quantity of water deliveries to Central Valley Project contractors, evaluation of feasibility of meeting Order WR 90-5 temperature compliance at specific Sacramento River control points, and at least one public meeting to receive input on the draft Temperature Management Plan;
- employ staff with modeling or other expertise to evaluate Reclamation's compliance with Order WR 90-5 and to work with Reclamation and fisheries agencies on hydrologic and temperature modeling and other available tools, including options for conserving cold water via reduced deliveries to Central Valley Project contractors;
- make certain express public trust assessments/determinations in any temporary urgency change petition analysis, including "whether protecting public trust resources through conditions of approval would be feasible and in the public interest, taking into consideration all relevant factors . . ."; and
- make an express evaluation in future Bay-Delta Water Quality Control Plan updates on the "extent to which fish and wildlife public trust uses will be protected under different hydrological conditions, including droughts and periods of water supply shortage" and evaluation of "consistency with California Fish and Game Code Section 5937."

San Joaquin River Exchange Contractors Water Authority et al. v. State of California, State Water Resources Control Board et al., California Department of Water Resources and United States Bureau of Reclamation, Real Parties in Interest

(Super. Ct. Sacramento County, Case No. 34-2016-80002277). In 2014 and 2015, due to severe drought, the Governor issued various executive orders, declarations, and emergency proclamations directing State and local agencies to take all necessary actions to conserve water, enhance and protect water supplies, and reduce harmful effects of the drought. In 2015, DWR and Reclamation submitted temporary urgency change petitions to the State Water Board, requesting temporary modification of certain requirements in Water Right Decision 1641 to allow management of reservoir releases on a pattern that would conserve upstream storage for fish and wildlife protection and provide for Delta salinity control later in the year while providing critical water for supply needs.

The State Water Board issued orders in response to the temporary urgency change petitions. The State Water Board received numerous comments and objections to the temporary urgency change petition orders and 10 petitions for reconsideration. In December 2015, the State Water Board issued Order WR 2015-0043 affirming the temporary urgency change petition orders and renewing them for another 180 days. The order also denied in part and granted in part the petitions for reconsideration. A petition for writ of administrative mandamus and complaint for declaratory relief was filed January 14, 2016. A hearing was held on December 2017 and a dismissal to follow. The dismissal was not completed in 2019 or 2020.

California Water Curtailment Cases (Super. Ct. Santa Clara County, No. 1-15-CV-285182, Judicial Council Coordination Proceeding No. 4838). The following cases were coordinated into this proceeding: (1) *Byron-Bethany Irrigation District v. California State Water Resources Control Board et al.* (Super. Ct. Contra Costa County, No. N150967); (2) *West Side Irrigation District, Central Delta Water Agency, South Delta Water Agency, and Woods Irrigation Company v. California State Water*

Resources Control Board et al. (Super. Ct. Sacramento County, No. 34-2015-80002121); (3) *Banta-Carbona Irrigation District v. California State Water Resources Control Board et al.* (Super. Ct. San Joaquin County, No. 39-2015-00326421); (4) *Patterson Irrigation District v. California State Water Resources Control Board et al.* (Super. Ct. Stanislaus County, No. 2015307); (5) *San Joaquin Tributaries Authority, Oakdale Irrigation District, and South San Joaquin Irrigation District v. California State Water Resources Control Board et al.* (Super. Ct. Stanislaus County, No. 2015366). On January 17, 2014, the Governor proclaimed a state of emergency to address the record dry conditions around the state. On the same day, as directed by the proclamation, the State Water Board issued a statewide notice of water shortages and potential for future curtailment of water right diversions. If necessary, the State Water Board would curtail diversions of water on a water right priority basis to prevent unreasonable diversion or use of water so that appropriate minimum amounts of water would be available for public trust needs for minimum flows for State- and federally-listed anadromous fish, to protect senior water rights, and for minimum health and safety needs.

In May 2014, the State Water Board issued curtailment notices. A statewide notice of water shortages and potential for future curtailment of water right diversions was issued again in January 2015, followed by curtailment notices issued in April, May, and June 2015. In July 2015, the State Water Board began rescinding the curtailment notices through dismissal orders and all notices were rescinded by the end of the year.

In June and September 2015, five complaints were filed by different water districts in several different county superior courts. The plaintiffs requested a writ of mandate, declaratory and injunctive relief, and damages. The cases were consolidated in

Santa Clara County Superior Court. After the State Water Board's first round of demurrers, which were partially granted (allowed: issues related to due process violations and the scope of the State Water Board's authority; not allowed: takings claims, claims for declaratory and injunctive relief, and the Delta pool), the plaintiffs amended their complaints, and the State Water Board filed another round of demurrers. These demurrers and motions by plaintiffs were heard on April 28, 2017. On May 4, 2017, the court ruled on all demurrers and motions in favor of the State Water Board. DWR has intervened in the litigation, joining in parts with the State Water Board and the State Water Contractors.

The first phase of the trial was held on January 26, 2018, and the court issued a final statement of decision phase one trial on April 3, 2018. The court rejected petitioners' claims challenging the State Water Board dismissal orders, holding that: (1) petitioners lacked standing to challenge the dismissal orders, as they were not aggrieved by the orders which imposed no consequences on them; (2) petitioners failed to show that the State Water Board failed to conduct enforcement proceeding in the manner required by law; and (3) the curtailment notices were a "final agency action" under Water Code Section 1126.

Although the court found petitioners' substantive claims moot in light of the dismissal orders ending the enforcement actions, it addressed the jurisdictional scope of the State Water Board's authority due to its continued public interest and importance, holding that (1) the State Water Board does not have jurisdiction to curtail pre-1914 appropriators under Water Code Section 1052 based on a general lack of available water under their priorities of right; and (2) the curtailment notices violated due process and, for future droughts, the State Water Board was advised to fashion a curtailment process that gives water users a meaningful opportunity

to challenge the underlying findings before they are ordered to curtail their water use and before fines for noncompliance begin to accrue against them.

DWR is an intervenor in this case, generally aligned with and supportive of State Water Board's position.

On May 9, 2019, the superior court judge issued an order for a proposed judgement. (Parties were able to file objections by May 29, 2019.)

The trial court issued judgments on June 6, 2019, ruling that Water Code Section 1052 does not authorize the State Water Board to curtail pre-1914 appropriators. (State Water Board curtailment powers under other legal authority, such as the public trust doctrine, was not adjudicated.) The plaintiffs filed motions for attorneys' fees and memoranda of costs on June 21, 2019.

In August 2019, the State Water Board appealed the holding limiting its curtailment authority under Water Code Section 1052.

In October 2019, DWR filed a response.

In the superior court, a hearing on motions to strike and/or tax costs and for attorney's fees was scheduled for December 18, 2019. On December 23, 2019, the trial court issued an order awarding no attorneys' fees or costs against DWR and the State Water Contractor intervenors and awarding \$15,372.58 in costs against State Water Board.

A stipulation was filed in March 2020 agreeing on an appellate briefing schedule.

Hydropower

Oroville Facilities Relicensing—Federal Energy Regulatory Commission Project No. 2100

Butte County et al. v. California Department of Water Resources (Case No. CV091258, C071785, application pending). 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 license. (Details of the license renewal negotiations and earlier litigation are described in previous bulletins.)

DWR certified its final EIR in 2008. Butte County et al. sued to challenge the final EIR, but the challenge was unsuccessful, and Butte County et al. appealed. The Third District Court of Appeal found in favor of DWR.

In January 2012, the court denied the petitioners' requests to set aside the EIR prepared by DWR and upheld the award to DWR of \$675,087 in charges for the administrative record required to proceed with the suit. The court found that the EIR was legally adequate and noted that the record preparation complied with CEQA and was reasonable and necessary. The petitioners, Butte and Plumas counties, appealed the judgment in August 2012, and the appellate briefs were filed in 2013 and 2014.

In 2016, the Third District Court of Appeal ordered the parties to file supplemental briefs on the issue of whether federal law (United States Code: Federal Power Act) preempts State law (CEQA). All parties filed briefs, and Friends of the River and the California

Sportfishing Protection Alliance filed amicus curiae briefs. The plaintiffs/appellants and the defendant/respondent filed a response to the amicus curiae briefs. In 2017, appellants filed additional citations for oral arguments and requested oral arguments be scheduled. In 2018, oral arguments were heard. In late December, the court issued its opinion finding that the CEQA suit was preempted by federal law. The Supreme Court of California ordered the lower court to vacate its judgment and dismiss the case for lack of subject matter jurisdiction.

On April 10, 2019, the Supreme Court of California granted review and transferred the case to the Third District Court of Appeal with directions to vacate its decision and reconsider the case in light of *Friends of the Eel River v. North Coast Railroad Authority* (2017) 3 Cal. 5th 677. On September 5, 2019, the appellate court issued a decision finding in favor of DWR. The plaintiffs/appellants petitioned the Supreme Court of California for review on October 15, 2019. The matter was granted review on December 11, 2019, and the court ordered that the appellate court decision not be published.

The counties of Butte and Plumas filed their opening brief on February 10, 2020. DWR filed its answering brief on June 9, 2020. As of December 31, 2020, the matter was waiting for oral argument.

Oroville Spillways Litigation

Eleven total cases were filed after the Oroville Dam spillways incident in 2017. All cases have now been coordinated in Sacramento County and assigned to one trial judge. Plaintiffs moved to certify two class actions: *Bechtel et al. v. California Department of Water Resources* and *Akers et al. v. California Department of Water Resources*. DWR settled one case involving the County of Butte concerning county roads and the damage incurred by South Feather Water

and Power Agency. Several of the cases are expected to go to trial in 2021.

Bechtel et al. v. California Department of Water Resources (Super. Ct. Butte County, Case No. 17 CV. 00298). On August 25, 2017, *Francis Bechtel et al. v. California Department of Water Resources* was filed. This is a class action lawsuit on behalf of the approximately 188,000 residents of Oroville, Marysville, Yuba City, and other areas near the Feather River who were ordered to evacuate their homes on February 12, 2017, in response to the “failing emergency spillway” at the Oroville Dam. Plaintiffs seek damages for loss of use of their property, diminution in value, relocation expenses, and other incidental and consequential damages, including litigation costs and injunctive relief. DWR has filed a petition seeking coordination with other Oroville cases and is currently awaiting a venue decision from the Butte County Superior Court.

Plaintiffs moved to certify this case as a class action, but the coordinated trial judge granted DWR’s motion to defeat class certification. Plaintiffs appealed this decision, and the Third District Court of Appeal ruled in DWR’s favor.

Akers et al. v. California Department of Water Resources (Super. Ct. Butte County, Case No. 18 CV. 00449). This complaint includes an allegation on behalf of three classes of plaintiffs: 1) the “diminution class,” i.e., plaintiffs who allege diminution in property value; 2) the “property loss class,” i.e., plaintiffs who allege property loss; and 3) the “business loss class,” i.e., plaintiffs who allege lost business income.

Plaintiffs moved to certify this case as a class action, but the coordinated trial judge granted DWR’s motion to defeat class certification. Plaintiffs appealed this decision, and the Third District Court of Appeal ruled in DWR’s favor.

City of Oroville v. California Department of Water Resources (Super. Ct. Butte County, Case No. 18 CV. 00163). The City of Oroville is seeking compensation for damage to infrastructure caused by flooding and use during the emergency response and reconstruction; costs to evacuate citizens; salary and benefits paid to impacted city employees; costs for rental equipment; lost sales tax revenue; lost tourism revenue; and costs of law enforcement, administration, and emergency and fire services used to facilitate the evacuation.

DWR filed a motion to strike this complaint that was not granted by the trial judge. Discovery was ongoing in 2019 and 2020.

JEM Farms LP et al. v. California Department of Water Resources (Super. Ct. Butte County, Case No. 18 CV. 00324). Plaintiff farmers allege their respective agricultural lands were damaged because of flooding, seepage, high water, excessive flows, and abrupt and erratic releases of high volumes of water. These plaintiffs also seek double or treble damages pursuant to Civil Code Section 3346 (damage to timber or trees), though not all have specifically alleged they own orchards or trees. The remaining plaintiffs are business owners and property owners who claim lost revenue, cleanup costs, and/or diminution in property value. Some plaintiffs do not allege property damage but claim diminution in value because their residential properties are downstream of the Oroville Dam.

DWR filed a motion to strike that was not granted. DWR has filed summary judgment motions against several of the plaintiffs and is awaiting the court's decision. Discovery was ongoing in 2019 and 2020.

People v. California Department of Water Resources (Super. Ct. Butte County, Case No. 18 CV. 00415). This complaint alleges DWR violated California Fish and Game Code Section 5650.1 by releasing 1.7 million cubic

yards of material deleterious to fish, plant life, mammals, and bird life into the Feather River. The Butte County District Attorney is seeking civil penalties of \$34 billion to \$51 billion. DWR is considering several pre-trial motions. Butte County brought two motions to transfer venue back to Butte County, which were both denied.

Goose Club Farms North, LLC v. California Department of Water Resources (Super. Ct. Sutter County, Case No. 18 CV. 0000545).

Goose Club Farms North, LLC, owns farmland in the Sutter Bypass and is claiming two feet of sediment and sand was deposited in various location on its property, preventing ongoing farming, due to the Oroville Dam spillways emergency. Goose Club Farms North alleges dangerous condition of public property (in violation of California Government Code, Section 835), inverse condemnation, private nuisance, public nuisance, and premises liability.

Limited merits discovery on the case continued in 2019 and 2020.

Bains Brothers Properties, LP et al. v. California Department of Water Resources (Super. Ct. Butte County, Case No. 18 CV. 01562).

Bains Brothers Properties owns farmland along the Feather River and Honcut Creek. The company claims that rapidly changing releases from Lake Oroville caused levees to deteriorate, leading to property loss, slipouts, and other physical damage.

Limited merits discovery continued in 2019 and 2020.

Mary's Gone Crackers, Inc. et al. v. California Department of Water Resources (Super. Ct. Butte County, Case No. 18 CV. 01857). Mary's Gone Crackers, Inc., alleges lost production, lost inventory, and cleanup costs and damage to agricultural lands as a result of the Oroville Dam Spillways incident.

Limited merits discovery continued in 2019 and 2020.

Pacific Gas & Electric Co. v. California Department of Water Resources (Super. Ct. Butte County, Case No. 18 CV. 02014).

Pacific Gas & Electric Company (PG&E) owned powerlines that ran across the base of the main spillway at Oroville Dam. DWR contracts with PG&E for maintenance of DWR's powerlines. DWR called on PG&E to move DWR's powerlines during the spillway incident. PG&E declined on the basis that the work was too dangerous but then proceeded to move its own powerlines.

This suit seeks recovery of PG&E's costs to move its lines. PG&E's bankruptcy filing does not stay the lawsuit against DWR.

Discovery continued in 2019 and 2020.

Mission Springs Water District v. Desert Water Agency (Super. Ct. Riverside County, Case No. PSC 1600676).

In March 2017, Mission Springs Water District amended its petition for writ of mandate and writ of administrative mandate against Desert Water Agency to name DWR as a Real Party in Interest. In the petition, originally filed in February 2016, Mission Springs challenged the decision of Desert Water Agency to elect to become a Groundwater Sustainability Agency in an area that Mission Springs claimed to be outside the statutory boundaries of Desert Water Agency. Under the Sustainable Groundwater Management Act, Desert Water Agency is deemed to be an exclusive Groundwater Sustainability Agency, but only within its statutory boundaries.

There were no updates on this case to report in 2019 or 2020. The trial is set for 2021.

Oroville Dam Cases (Super. Ct. Sacramento County, Judicial Council Coordination Proceeding No. 4974). There are currently seven active complaints for inverse

condemnation involving 27 individual and business entity plaintiffs, in addition to individual and business entity plaintiffs with inverse condemnation claims. Plaintiffs City of Oroville and Pacific Gas & Electric Company have alleged other tort-based claims for damage to property and related monetary harms. The trial is now set for April 5, 2021, and scheduled for 40 court days. The initial trial will be an inverse condemnation liability bench trial involving eight plaintiffs, each represented by liaison counsel: JEM Farms/Chandon Ranch, Tom Miller, Garcia Farms, Yolo Land Trust, Reclamation District 1600, Dyer Trust, and the Lang Family/KA Land (two separate plaintiffs). The initial trial will be followed by a damages trial before a jury, if necessary, and subsequent liability trials.

Fact discovery closed on October 30, 2020, though the parties stipulated to allow several depositions of non-party witnesses to be taken after that date. The expert discovery cutoff is January 21, 2021.

The final filing date for all motions for summary judgment/adjudication, other than those for preemption or immunity was December 4, 2020. On that date, the Attorney General's Office filed a motion for summary adjudication as to private and public nuisance causes of action. On December 23, 2020, plaintiffs filed a motion to strike DWR's nuisance mediated service agreement.

People of California v. California Department of Water Resources (Case No. C093600 Third Appellate District).

Plaintiff People of California, through the Butte County District Attorney's Office, filed a complaint alleging that DWR violated California Fish and Game Code Section 5650 by releasing 1.7 million cubic yards of material deleterious to fish, plant life, mammals, and bird life into the Feather River. The plaintiff was seeking civil penalties of \$34 billion to \$51 billion. The Attorney General's Office filed a motion for summary judgment on September 30, 2020,

which was heard on December 18, 2020. The court granted DWR's motion for summary judgment, finding that Butte County's complaint failed to state a claim because DWR was not a "person" under Fish and Game Code Section 5650.1.

Yolo Bypass Project Litigation

AJK Farms et al. v. California Department of Water Resources (Case No. YOSU-CVPT-2019-1719-1). A complaint filed August 16, 2019, alleges violations of CEQA related to DWR certifying the final EIR/environmental impact statement and approving the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project. The plaintiffs are nut tree growers in the Reclamation District 1600 service area who allege inadequate analysis and mitigation for increased frequency of inundation of the Yolo Bypass, a higher water table, and seepage onto adjacent properties. The parties held a meet and confer on September 9, 2020. To allow time for settlement negotiations, the court approved a stipulation and order on October 15, 2020, to stay work on the administrative record until February 1, 2021, with preparation and certification of the record required by April 2, 2021.

Swanston Ranch Owners Association v. California Department of Water Resources (Case No. YOSU-CVPT-2019-1724-1). A complaint filed August 19, 2019, alleges violations of CEQA related to DWR certifying the final EIR/environmental impact statement and approving the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project. The plaintiffs are agricultural growers with properties located in the Yolo Bypass. They allege failure to adequately analyze impacts to terrestrial resources, existing land uses, and recreational uses. A part of the administrative record was transmitted to the petitioners for review on October 30, 2020, with the remainder transmitted on December 31, 2020. Under a stipulation,

plaintiffs have until March 22, 2021, to review and recommend changes to the administrative record. The next case management conference is set for May 10, 2021.

Other Cases and Proceedings

Center for Food Safety et al. v. California Department of Water Resources (Super. Ct. Sacramento County, No. 34-2016-800002469) (C086215 app. pending). After DWR certified the revised Monterey Plus EIR and returned the writ of mandate to the court in September 2016, the Center for Food Safety, Center for Biological Diversity, California Sportfishing Protection Alliance, California Water Impact Network, Central Delta Water Agency, and South Delta Water Agency filed a new lawsuit on October 21, 2016, challenging the revised Monterey Plus EIR. In October 2017, the court denied petitioners' petition for writ of mandate and discharged the writ against DWR. In December 2017, petitioners filed an appeal at the Third District Court of Appeal.

In May 2018, the matter was fully briefed, and there were no further updates in 2019 or 2020.

Construction Arbitration

D.A. McCosker Construction Co., dba Independent Construction Company v. California Department of Water Resources (OAH/PWCA No. A-0021-2013). This dispute arose out of the construction of Dyer Reservoir under a contract for \$11 million. The work concluded in 2012, nearly two years behind schedule. In September 2013, the contractor brought a binding arbitration action seeking additional compensation in the amount of \$12 million due to alleged defective specifications, differing site conditions, and owner-caused delay. DWR withheld over \$1 million in liquidated damages for late completion. Limited discovery was conducted in 2014, and a mediation that took place in December 2014 was unsuccessful. A 32-day

arbitration commenced on January 11, 2016. The arbitrator issued a final arbitration award on January 9, 2018, awarding Independent Construction Company the sum of \$5.27 million against DWR.

In February 2018, DWR filed a petition with the Sacramento County Superior Court to vacate the arbitration award on the grounds that, among other things, Independent Construction Company was deemed to be an unlicensed contractor due to the failure of its management to fulfill its legal obligations to maintain licensed status. After a lengthy court briefing on August 2, 2019, the Superior Court judge issued a ruling in DWR's favor vacating the arbitration award, denying Independent Construction Company any recovery, and setting the stage for DWR to potentially recoup the approximately \$14 million it had paid Independent Construction Company under the construction contract.

Independent Construction Company immediately appealed the decision to the Third District Court of Appeal. DWR filed a cross-appeal on whether the Sacramento County Superior Court should have granted DWR a judgment/decreed of the \$14 million disgorgement. The parties are presently in the briefing stage.

Upon DWR's motion to stay the proceedings in the Alameda County Superior Court case, on May 20, 2020, the court issued an order staying all proceedings in that case (including a demurrer filed by Independent Construction Company), pending the outcome of the appeal.

Pulice Construction, Inc. v. California Department of Water Resources (OAH No. A-0006-2019).

This case arose out of a \$75 million contract with Pulice Construction, Inc., in 2014 to rehabilitate and strengthen the Perris Lake Dam because of seismic concerns. Pulice Construction filed a complaint in arbitration against DWR on March 19, 2019, seeking

\$16 million in damages, primarily alleging that DWR failed to disclose material site conditions. Pulice Construction's claims assert the differing site conditions caused significant delays dealing with unexpected rock blasting and crushing operations. DWR is withholding approximately \$6 million in liquidated damages for Pulice Construction's late completion of the work.

In December 2019, a mediation was held, but it failed to resolve the dispute.

Numerous depositions and other discovery occurred in 2020. A binding arbitration hearing took place between October 5, 2020, and November 16, 2020, with numerous witnesses called and exhibits admitted into evidence. Thereafter, the parties filed closing briefs. As of the end of 2020, the parties were awaiting a decision by the arbitrator.



Chapter 6

Water Supply Development and Reliability

Auxiliary spillway at Castaic Lake, which is part of the Castaic Lake State Recreation Area in Los Angeles County.

Significant Events in 2020

On May 8, 2020, the Department of Water Resources (DWR) and the U.S. Bureau of Reclamation (Reclamation) submitted a petition for temporary change to consolidated place of use to the State Water Resources Control Board (State Water Board). In the petition, they requested temporary changes to their water rights permits to consolidate the State Water Project (SWP) and Central Valley Project's (CVP) authorized places of use.

On May 1, 2020, DWR and Reclamation submitted a petition for long-term transfer to the State Water Board. In the petition, DWR and Reclamation requested a 15-year modification of their water right permits to make a long-term transfer that requires changes to the authorized place of use of (1) DWR's permit to include the CVP authorized place of use downstream of (i.e., served by water diverted from northern CVP reservoirs) Jones Pumping Plant and (2) Reclamation's permits to include the SWP authorized place of use downstream of Banks Pumping Plant. The maximum total exchange quantity requested is up to 5,616 acre-feet per year.

Information in this chapter was contributed by the State Water Project Analysis Office, the Division of Regional Assistance, the Division of Planning, the Division of Operations and Maintenance, and the Bay-Delta Office.

The Department of Water Resources (DWR) works to improve the reliability of State Water Project (SWP) water supplies and the annual Table A water allocations delivered to SWP Contractors. DWR 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 (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 State and federal governments, local agencies, and public interest stakeholder groups to ensure water supply reliability now and in the future.

Supply Development and Reliability

To meet SWP 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. This includes the following activities:

- facilitating transfers between SWP Contractors and other agencies, including Central Valley Project (CVP) contractors
- funding studies on the giant garter snake (*Thamnophis gigas*), a protected species known to inhabit rice growing regions of the Sacramento Valley, and on rice evapotranspiration, to better understand issues related to the transfer of water made available by crop idling
- supporting the planning and implementation of local and regional

conjunctive use projects in the Sacramento Valley

- constructing, operating, and maintaining groundwater and land subsidence monitoring networks to detect potential impacts caused by groundwater substitution transfers and other groundwater management activities in the Sacramento Valley
- developing analytical tools to improve estimates on the effects of streamflow depletion due to groundwater substitution transfers on the SWP
- developing analytical tools to support and enhance sustainable groundwater management in the Sacramento Valley
- assisting with the development and implementation of restoration projects in the Feather River watershed to reduce sedimentation in Lake Oroville and preserve watershed storage capacity
- investigating and evaluating storage projects

Water Conveyance Through the SWP

DWR encourages and facilitates temporary transfers of water using SWP conveyance facilities for SWP 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 Contractors, between SWP Contractors and non-SWP entities, or between two or more non-SWP

entities. For more information, see the sidebar, Transfer and Exchange Evaluations.

For information about 2020 water transfers, see Chapter 8, Water Contracts and Deliveries.

Transfer and Exchange Evaluations

An important element of any water transfer is to determine 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 actions are taken to make water available, when the water can be made available, and the type of water rights the existing user holds. Several California Water Code (CWC) provisions authorize temporary transfers of water under rights issued by the State Water Resources Control Board (State Water Board) (appropriative water rights issued after 1914) and place conditions on the transfers to protect those not involved in them.

Short-term transfers, of less than one year, are authorized under CWC Sections 1725-1732. Long-term transfers, for periods greater than one year, are authorized by CWC 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 State Water Board jurisdiction 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 legal users from the potential expansion of water use beyond what would have been consumed by the original users 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 otherwise be available to downstream users, regardless of the water right priority of those users.

CWC Section 1810(d) requires the Department of Water Resources (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 the use of any unused available water conveyance capacity for a transfer under this section. DWR reviews each request to transfer water through State Water Project (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 most commonly developed through one of four methods: surplus water release from storage facilities, substituting groundwater for transferred surface water, idling agricultural land, and undertaking conservation activities that reduce consumptive use of water. Because transfers may result in direct impacts and third-party impacts (impacts to parties not involved in the transfer), certain CWC provisions were enacted to limit potential impacts. For example, since additional groundwater pumping from a groundwater substitution project may potentially affect other groundwater users in the area, CWC Section 1745.10 requires that the groundwater substitution project: (1) be consistent with a groundwater management plan adopted pursuant to State law for the affected area or (2) if a management plan has not been adopted, the transfer project proponent determines the transfer would not create or contribute to conditions of long-term overdraft in the affected groundwater basin.

Injury can also occur due to streamflow depletion induced by increased pumping from wells for groundwater substitution transfers. Consequently, to mitigate possible impacts from groundwater substitution transfers, DWR assesses a streamflow depletion factor, which represents an estimate of the potential 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 et seq. (which provides for an expedited process for water transfers based on rights issued by the State Water Board), water transfers are subject to compliance with CEQA and, possibly, NEPA. The CEQA/NEPA and State Water Board processes provide opportunities for public review and comment on water transfer proposals.

Staff in DWR's 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. In 2019, DWR and the U.S. Bureau of Reclamation issued a white paper providing technical information about water transfers requiring use of water project facilities.

SWP Delivery Capability Report

During 2020, there were no updates.

SWP Future Water Supply Program

The Future Water Supply Program's goal is to improve and protect the water supply reliability of the SWP while protecting the environment and other legal users of water. The program consists of two main components: Sacramento Valley groundwater and upper Feather River watershed management.

The Sacramento Valley groundwater component provides technical support for the Lower Yuba River Accord, monitors other groundwater and conjunctive-use projects, and assesses conditions of the Sacramento Valley Groundwater Basin that may affect SWP yield. The four primary objectives of the Sacramento Valley groundwater component are to (1) collect, analyze, and report data to determine the effects of groundwater substitution transfers on the SWP; (2) analyze and report on groundwater substitution transfers that use SWP facilities; (3) monitor groundwater management planning and implementation activities that may affect SWP yield; and (4) develop and utilize analytical tools to support the estimation of streamflow depletion due to groundwater substitution transfers and enhance sustainable groundwater management in the Sacramento Valley.

The upper Feather River watershed management component of the program evaluates the Feather River watershed above Lake Oroville with respect to watershed management and restoration actions being planned or implemented. These actions are intended to improve the ecological and hydrologic functions of watersheds, thus affecting base flow, improving flood attenuation, and reducing erosion and sedimentation. DWR continued collaborative efforts with local stakeholders in 2020 to implement and enhance monitoring

activities for assessing the immediate and long-term hydrologic effects of these actions.

SWP Water Rights Activities

Water Right Permits and Licenses

During 2020, there were two updates to DWR's SWP water rights permits and licenses.

For background information on DWR's water rights permits and licenses, see Bulletin 132-18.

Petition for Temporary Change to Consolidate Place of Use

On May 8, 2020, DWR and the U.S. Bureau of Reclamation (Reclamation) submitted a petition for temporary change under CWC Section 1725, et seq., to the State Water Resources Control Board (State Water Board). In the petition, DWR and Reclamation requested changes to their water right permits that would temporarily consolidate the SWP and CVP authorized places of use.

The consolidated place of use enhanced operational flexibility and reduced energy consumption for both SWP and CVP without increasing Delta exports and injuring other legal water users. The State Water Board issued an order on July 15, 2020, approving the requested changes; the order remains in effect for one year.

For more information about transfers and exchanges, see Chapter 8, Water Contracts and Deliveries.

Petition for North of O'Neill Long-Term Transfers

On May 1, 2020, DWR and Reclamation submitted a petition for long-term transfer under CWC section 1735, et seq., to the State Water Board. In the petition, DWR and Reclamation requested a 15-year

modification of their water right permits to make a long-term transfer that requires changes to the authorized place of use of (1) DWR's permit to include the CVP authorized place of use downstream of (i.e., served by water diverted from northern CVP reservoirs) Jones Pumping Plant and (2) Reclamation's permits to include the SWP authorized place of use downstream of Banks Pumping Plant. The maximum total exchange quantity requested is up to 5,616 acre-feet per year.

The requested changes will facilitate the delivery of available CVP supplies that already have been exported south of the Sacramento-San Joaquin Delta and will maximize the beneficial use of available supplies. The petition indicated that approval of the transfers would not increase the quantity or alter the timing of diversions from the Delta or San Joaquin River. The State Water Board issued an order on December 30, 2020, approving the requested changes; the order remains in effect for 15 years.



Chapter 7

Water Supply

Snow melts on top of a tree stump at Phillips Station during the third snow survey, held on February 27. Phillips Station is approximately 90 miles east of Sacramento off Highway 50 in El Dorado County.

Significant Events in 2020

Water year 2019–2020 was a below average year for precipitation and mountain snowpack. This was a significant change from last year, which had above average precipitation and mountain snowpack. California received precipitation at 71 percent of average in water year 2019–2020 compared to 131, 73, and 164 percent of average in water years 2018–2019, 2017–2018, and 2016–2017, respectively. The Sacramento River Basin received only 58 percent of average for the 12 months ending in September 2020. The Sacramento region experienced the greatest percent of average snowpack (58 percent of average on April 1).

The Northern Sierra 8-Station Precipitation Index had 31.8 inches of precipitation, which represents 60 percent of the index average. Variation was the theme; winter month percents of average ranged from zero in February to about 154 percent in May. The San Joaquin 5-Station and Tulare Basin 6-Station precipitation indices totaled 24.6 inches (62 percent of average) and 18.6 inches (66 percent of average), respectively. The statewide mountain snowpack on April 1 was 50 percent of average based on manual snow course measurements.

Statewide river runoff totaled 47 percent of average in the 2019–2020 water year, which was a dramatic decrease after the previous water year's total of 137 percent of average. The Feather River runoff totaled 52 percent of average. Water year runoff totals for the Sacramento River Region (SRR), San Joaquin 4 Rivers (SJR), and Tulare Lake Region (TLR) were 55, 51, and 53 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 "dry," based on observed data for water year 2019–2020.

A net decrease in average reservoir storage was realized in water year 2019–2020. The year began at 118 percent of average on October 1 and finished at 93 percent of average at the end of September.

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 and mountain snowpack, calculates river runoff, and operates storage facilities during each water year. The official California water year runs from October 1 through September 30.

California's Hydrology

DWR divides California into 10 hydrologic regions. Each hydrologic region corresponds to the state's major water drainage basins. Annual precipitation, mountain snowpack, and runoff data are collected and analyzed for the hydrologic regions and used to determine water year type classifications and forecasts for the state's water supply outlook.

The state's precipitation is measured using three primary indices, the Northern Sierra 8-Station Precipitation Index, the San Joaquin 5-Station Precipitation Index, and the Tulare Basin 6-Station Precipitation Index. For more information, see the sidebar, Precipitation Indices.

Runoff estimates are determined for the Sacramento River Region (SRR), the San Joaquin 4 Rivers (SJR), and the Tulare Lake Region (TLR). For more information, see the sidebar, Runoff Estimates.

The Eight River Index is used to determine the duration of fish and wildlife salinity and flow standards at Chipps Island or Port Chicago from February through June (see Chapter 4, Water Quality Programs). This index is the sum of the unimpaired runoff from the eight rivers in the SRR and SJR.

Two water supply indices, 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), are used to derive the water year classification for the Sacramento Valley and the San Joaquin Valley, respectively. The

water supply indices are used by various water agencies to formulate water supply decisions. For more information, see the sidebar, Water Supply Indices.

DWR continually updates hydrologic data and information. If your research requires more current data than was available at the time of publication, please consult the most recent edition of Bulletin 120, Bulletin 132, and/or contact DWR's Hydrology and Flood Operations Office.

Water Year 2019–2020

California experiences extreme variability in year-to-year outcomes of seasonal precipitation accumulation. Water year 2019–2020 again demonstrated that variability can manifest itself year-to-year, as well as within a season as the water year showed that the accumulation of seasonal precipitation does not have to follow the expectations of averages.

Autumn and Winter

October was very dry, receiving 11 percent of average statewide precipitation. Conditions improved during November, but the month was only slightly more than 70 percent of average precipitation statewide. December was 133 percent of average precipitation statewide. However, the trend of December reversed during January, which experienced less than half of average precipitation. The variability of precipitation during the first four months of the water year resulted in a snowpack on February 1 of 68 percent of average.

On average, December, January, and February typically account for half the annual precipitation accumulation in a water year over the Northern Sierra. This was not the case in water year 2019–2020, because February had less than one inch of precipitation over the three Sierra regions. December, meanwhile, had 10.7 inches over the Northern Sierra 8-Station Precipitation Index area.

Spring and Summer

During the spring months, the snowpack is watched closely as an indicator of spring runoff and provides guidance for water allocations. However, the snowpack for the first of March, April, and May, was only 44, 54, and 36 percent of average, respectively.

Attention has recently turned to storms associated with atmospheric rivers because of their impact on water supply and flooding. Atmospheric rivers are long (approximately 1,000 miles), narrow (less than 100 miles) bands of intense water vapor concentrated in the lower atmosphere that can make landfall over California. An important note about water year 2019–2020 was the lack of strong or greater magnitude atmospheric rivers over California, with only one occurring. The previous water year, which was a wet year, had five.

Precipitation

California experienced below average rainfall (71 percent of average) for the water year. Figure 7-1 presents water year precipitation for the various regions of the state. The largest amounts of precipitation, measured by percent of average, fell in the South Lahontan and Colorado Desert watersheds. The three Sierra watersheds ranged from 58 percent (Sacramento) to 69 percent of average (San Joaquin).

Table 7-1 presents monthly precipitation totals for water year 2019–2020 at various gauges located throughout the state,

listed north to south. December was the first month when stations in Central and Northern California registered above average precipitation. Los Angeles and San Diego measured more than 200 percent of average. During January and February, dry conditions returned. In January, only two stations experienced greater than half of average. February was remarkably dry as every station measured 10 percent or less.

March, April, and May were characterized by a very large variation in the percents of average. For example, Eureka Woodley Island received no precipitation in March while Blue Canyon received almost 12 inches (141 percent of average). Farther south, Yosemite Headquarters received about one tenth of an inch while Fresno, in the valley, received over two inches of precipitation.

In May, the difference in precipitation between Fresno and Yosemite Headquarters was reversed compared to March. Fresno received 43 percent of average in May while Yosemite Headquarters measured 140 percent of average.

The historical dryness of southern California during the summer months is evident by the fact that in June, Los Angeles received less than half an inch of precipitation, yet this was 940 percent of average. Also in June, the 0.14 inches measured in San Diego was 200 percent of normal.

The monthly totals for the Northern Sierra 8-Station, San Joaquin 5-Station, and Tulare Basin 6-Station precipitation indices for the water year are presented in Table 7-2. Precipitation for the three indices totaled 31.8 inches (60 percent of average), 24.6 inches (62 percent of average), and 18.6 inches (66 percent of average), respectively.

The four-month period from December through March is typically the wettest period in the Sierra Nevada.



Figure 7-1 Statewide Precipitation by Hydrologic Region, 2019–2020 Water Year, as Percent of Average

Table 7-1 Monthly Precipitation Totals at Various Locations in California, Water Year¹ 2019–2020 (inches)

Station ²	Water Year 2019–2020													Water Year 2020–2021		
	2019			2020												
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY Total	Oct	Nov	Dec
Mount Shasta City percent of average	0.21 9	2.47 54	6.25 106	3.85 60	0.12 2	2.23 51	2.05 73	3.17 186	0.70 66	0.48 192	0.10 32	0.00 0	21.63 60	0.01 0	1.84 40	2.32 39
Eureka Woodley Island percent of average	1.51 51	1.75 32	7.63 119	0.15 2	0.50 10	0.00 0	0.03 1	3.49 193	0.65 107	0.01 9	0.05 21	0.22 29	15.99 42	0.27 9	2.32 42	4.33 68
Blue Canyon (DWR-2) percent of average	0.11 3	3.99 51	13.85 132	6.53 53	0.27 3	11.97 141	5.22 104	5.06 186	0.00 0	0.00 0	0.00 0	0.00 0	47.00 75	0.00 0	7.14 91	5.23 50
Sacramento WB City percent of average	0.00 0	0.71 35	4.78 150	1.26 34	0.00 0	1.68 70	2.15 145	0.32 70	0.00 0	0.00 0	0.00 0	0.00 0	10.90 61	0.00 0	0.87 43	1.54 48
San Francisco WB Airport percent of average	0.01 1	1.46 53	3.78 85	1.18 24	0.00 0	1.33 44	1.36 84	0.23 58	0.00 0	0.00 0	0.05 100	0.00 0	9.40 41	0.00 0	0.31 11	1.39 31
Yosemite Headquarters percent of average	0.00 0	2.00 47	5.22 79	0.03 0	0.38 6	0.09 2	3.89 120	1.98 140	0.00 0	0.08 29	0.02 10	0.00 0	13.69 37	0.00 0	1.99 47	2.47 38
Fresno WB Airport percent of average	0.00 0	0.72 65	2.16 123	0.64 32	0.00 0	2.10 114	1.65 153	0.12 43	0.00 0	0.00 0	0.00 0	0.00 0	7.39 68	0.00 0	0.28 25	1.14 65
Grant Grove percent of average	0.00 0	4.78 93	7.36 94	1.28 17	0.49 7	5.61 74	5.64 131	1.71 146	0.00 0	0.01 17	0.11 157	0.01 2	27.00 62	0.00 0	1.11 22	2.62 34
Los Angeles WSO Airport percent of average	0.00 0	1.43 101	4.42 210	0 0	0.00 0	0.00 0	0.02 2	0.12 86	0.47 940	0.00 0	0.00 0	0.00 0	6.46 51	0.00 0	0.10 7	1.65 79
San Diego NWS Lindbergh Field percent of average	0.00 0	2.72 241	4.03 211	0.05 2	0.04 2	0.00 0	0.00 0	0.02 10	0.14 200	0.00 0	0.00 0	0.00 0	7.00 68	0.12 29	0.26 23	0.60 31

¹ Water Year = October 1–September 30² NWS = National Weather Service; WB = Weather Bureau; WSO = Weather Service Office

For the Northern Sierra 8-Station Precipitation Index, December and May were the only two months above normal, registering 10.7 inches (107 percent of average) and 4.3 inches (154 percent of average), respectively. This index accumulated a total of 15.5 inches in December and January. But February, which is usually the third wettest month, measured no precipitation.

The San Joaquin 5-Station Precipitation Index accumulated a total of 9.6 inches from December through February, which is 45 percent of normal. April and May, however, received more than average amounts.

The Tulare Basin 6-Station Precipitation Index accumulated a total of 5.9 inches from December through February, which is

39 percent of normal. April had 208 percent of average.

Mountain Snowpack

Snow accumulation was well below normal as of April 1. Monthly statewide snowpack for the water year is shown in Table 7-3. 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 16.0 inches or 54 percent of average. This was a dramatic change relative to 2019, which was 161 percent of average. April 1 is typically the average annual date of peak snow accumulation. On May 1, 2020, the snowpack was only 36 percent of average.

Precipitation Indices

Northern Sierra 8-Station Precipitation Index (8SI)

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 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. Precipitation from this region is a primary source for the State's water supply.

The rain gauge stations are listed below:

- | | | |
|----------------------|-------------------------------|------------------|
| 1) Mount Shasta City | 4) Quincy | 7) Blue Canyon |
| 2) Shasta Dam | 5) Brush Creek | 8) Pacific House |
| 3) Mineral | 6) Sierraville Ranger Station | |

San Joaquin 5-Station Precipitation Index (5SI)

In the central Sierra Nevada, precipitation is indexed by averaging rain gauge totals at five representative stations, creating what is known as the San Joaquin 5-Station Precipitation Index. The index provides a representative sample of the major watersheds (Stanislaus, Tuolumne, Merced, and San Joaquin rivers) and serves as a wetness index for the San Joaquin River hydrologic region.

The rain gauge stations are listed below:

- | | | |
|---------------------------|------------------------------|--------------------|
| 1) Calaveras Big Trees | 3) Yosemite Headquarters | 5) Huntington Lake |
| 2) Hetch Hetchy Reservoir | 4) North Fork Ranger Station | |

Tulare Basin 6-Station Precipitation Index (6SI)

In the southern Sierra Nevada, precipitation is indexed by averaging rain gauge totals at six representative stations, creating what is known as the Tulare Basin 6-Station Precipitation Index. The index provides a representative sample of the Kings, Kaweah, Tule, and Kern river watersheds.

The rain gauge stations are listed below:

- | | | |
|----------------------|-----------------|-----------------|
| 1) Balch Power House | 3) Giant Forest | 5) Ash Mountain |
| 2) Springville | 4) Pascoes | 6) Isabella |

Table 7-2 Regional Monthly Precipitation for Water Year 2019–2020

	Month	Northern Sierra 8-Station Precipitation Index		San Joaquin 5-Station Precipitation Index		Tulare Basin 6-Station Precipitation Index	
		Precipitation (inches)	Percent of Monthly Average	Precipitation (inches)	Percent of Monthly Average	Precipitation (inches)	Percent of Monthly Average
2019	October	0.3	11	0.0	0	0	0
	November	2.0	38	2.2	61	2.8	108
	December	10.7	107	7.9	122	4.6	100
2020	January	4.8	53	1.4	18	0.7	13
	February	0.0	0	0.3	4	0.6	12
	March	6.3	78	6.2	98	3.5	78
	April	2.8	65	4.4	126	5.2	208
	May	4.3	154	2.1	100	1.1	85
	June	0.4	36	0.1	17	0.1	25
	July	0.1	100	0.0	0	0.0	0
	August	0.1	50	0.0	0	0.0	0
	September	0.0	0	0.0	0	0.0	0
	Total¹	31.8	60	24.6	62	18.6	66

¹ Totals may not sum as expected due to rounding.

River Runoff

Statewide river runoff totaled 47 percent of average in the 2019–2020 water year. The monthly runoff totals for the SRR, the SJR, the TLR, and the Feather River are shown in Table 7-4. As shown, the water year runoff totals for these areas ranged from 51 to 55 percent of average.

From a water supply perspective, the most closely monitored period is April through July. By the end of July, the April–July runoff was 66, 58, and 51 percent of average, for the SRR, SJR, and TLR regions, respectively.

Water Supply Indices

The Sacramento Valley 40–30–30 Index and the San Joaquin Valley 60–20–20 Index were both “dry,” based on observed data for water year 2019–2020.

For more information, see the sidebar, Water Supply Indices.

Water Year 2020–2021 October through December Water Conditions

The last three months of calendar year 2020 marked the beginning of a new water year, 2020–2021. October was a drier-than-average month at less than 5 percent of the statewide precipitation average, followed by a much drier than normal November at 40 percent of the statewide precipitation average. The dryness continued through December, which experienced only about half of the average precipitation. As a result, at the end of December, runoff totals were 39 percent of average for the SRR, 21 percent of average for the SJR, and 30 percent of average for the TLR.

Storage

Statewide Storage

Monthly storage totals for the major Sierra Nevada reservoirs are shown in Table 7-5.

Table 7-3 Statewide Mountain Snowpack for Water Year 2019–2020

	Date	Snow Water Equivalent (inches)	Percent of Average	Percent of April 1 Average ¹
2019	October 1	NA	NA	NA
	November 1	NA	NA	NA
	December 1	3.0	70	11
2020	January 1	9.0	92	33
	February 1	12.0	68	43
	March 1	11.0	44	38
	April 1	16.0	54	54
	May 1	8.1	36	29
	June 1	0.3	5	1
	July 1	0.0	0	0
	August 1	0.0	0	0
	September 1	0.0	0	0

¹April 1 is the average date of peak statewide mountain snowpack. This table is based on snow pillow (a device for measuring mountain snowpack at automated reporting stations) data.

Water year 2019–2020 began at 118 percent of average reservoir storage. Storage, as a percent of average, was never higher for the remaining water year. The percent of average reached the lowest level at the end of July (92 percent). In September, the 2020 water year ended at 93 percent of average.

State Water Project Storage

The State Water Project (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.

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 pumped into the reservoir from late fall to early spring. This water is temporarily stored, then released into the California Aqueduct to meet SWP Contractor peaking demands in the summer months. The remaining SWP dams and reservoirs regulate the stored water supply with delivery patterns designed to fit local water demands.

2020 Storage Totals in Major SWP Reservoirs

End-of-year storage on December 31, 2020, in major SWP reservoirs and the State's share of joint-use reservoirs was

Table 7-4 Unimpaired Runoff for Water Year 2019–2020 (million acre-feet)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	WY
SRR runoff	0.43	0.45	1.24	1.11	0.78	0.91	1.71	1.38	0.63	0.41	0.35	0.33	9.71
percent of average	95	75	76	47	31	31	69	63	53	71	87	88	55
SJR runoff	0.06	0.05	0.21	0.11	0.12	0.25	0.79	0.97	0.30	0.09	0.04	0.02	3.02
percent of average	93	49	93	25	25	38	87	71	29	21	38	43	51
TLR runoff	0.05	0.05	0.10	0.07	0.07	0.10	0.32	0.48	0.17	0.07	0.03	0.02	1.55
percent of average	124	92	117	43	42	38	76	69	28	26	41	56	53
Feather River runoff	0.10	0.10	0.33	0.26	0.18	0.22	0.41	0.30	0.14	0.09	0.08	0.06	2.25
percent of average	109	75	87	48	32	29	60	50	46	65	80	78	52
Statewide runoff													
percent of average	89	38	56	43	29	27	71	63	38	42	65	70	47

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 4 Rivers

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 Reservoir, Kaweah River below Terminus Reservoir, Tule River below Lake Success, Kern River below Lake Isabella

WY: Water Year (October 1–September 30)

2.4 million acre-feet (maf) or 45.71 percent of maximum storage, compared to 3.5 maf or 67 percent of maximum storage at the end of 2019. The average end-of-month total

storage in major SWP reservoirs for 2020 was 3.3 maf.

Runoff Estimates

Unimpaired runoff represents the natural water production in a river basin, unaltered by upstream diversions, storage, or export of water to or import of water from other basins.

Sacramento River Region (SRR)

The runoff estimate for the SRR is the sum of unimpaired flow in million acre-feet (maf) at the following gauging stations:

- | | |
|---|-------------------------------------|
| 1) Sacramento River above Bend Bridge | 3) Yuba River near Smartville |
| 2) Feather River at Oroville
(inflow to Lake Oroville) | 4) American River below Folsom Lake |

San Joaquin 4 Rivers (SJR)

The runoff estimate for the SJR is the sum of unimpaired flow in maf at the following gauging stations:

- | | |
|--|---|
| 1) Stanislaus River below Goodwin Dam
(inflow to New Melones Reservoir) | 3) Merced River below Merced Falls
(inflow to Lake McClure) |
| 2) Tuolumne River below La Grange
(inflow to New Don Pedro Reservoir) | 4) San Joaquin River below Millerton Lake
(inflow to Millerton Lake) |

Tulare Lake Region (TLR)

The runoff estimate for the TLR is the sum of unimpaired flow in maf at the following gauging stations:

- | | |
|--|-----------------------------------|
| 1) Kings River below Pine Flat Reservoir | 3) Tule River below Lake Success |
| 2) Kaweah River below Terminus Reservoir | 4) Kern River below Lake Isabella |

Eight River Index

The Eight River Index is the sum of the unimpaired runoff from the eight rivers in the SRR and the SJR.

Water Supply Indices

Sacramento Valley 40-30-30 Index

State Water Resources Control Board, Water Right Decision 1641 (D-1641) defines the Sacramento Valley Water Year Hydrologic Classification (Sacramento Valley 40-30-30 Index), a water supply forecasting tool used to derive the water year type for the Sacramento Valley. The State Water Resources Control Board 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, 2006, and 2018 Bay-Delta Plans. D-1641 implements portions of the 2018 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 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
- (3) 30%—the previous year's index with a cap of 10 million acre-feet
(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 type forecasts are made beginning in December. The Sacramento Valley 40-30-30 Index May 1 forecast (at the 50 percent exceedance level) determines the "official" 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.

Water Supply Indices (*continued*)

San Joaquin Valley 60-20-20 Index

D-1641 uses a similar method in the San Joaquin Valley Water Year Hydrologic Classification (San Joaquin Valley 60-20-20 Index) to determine the water year type for the San Joaquin Valley. The 60-20-20 factors represent the percentage weight given to the following:

- (1) 60%—the current year’s April through July San Joaquin Valley unimpaired runoff
- (2) 20%—the current year’s October through March San Joaquin Valley unimpaired runoff
- (3) 20%—the previous year’s index with a cap of 4 million acre-feet
(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 (at the 75 percent exceedance level) determines the “official” water year type for implementing D-1641 San Joaquin River Vernalis flow standards.

Lake Oroville

Lake Oroville has a maximum water storage capacity of 3,537,577 acre-feet (af). Runoff from the upper Feather River drainage is collected and stored in this reservoir and released to the Sacramento-San Joaquin Delta (Delta) through Oroville Dam, Thermalito Diversion Dam, and Thermalito Afterbay.

2020 Inflow. Total Lake Oroville inflow for 2020 was 1.8 maf, which was 44 percent of the average (3.99 maf) over the last 30 years. Maximum daily inflow occurred on January 26 at 18,972 af. Minimum daily inflow occurred on September 10 at 806 af.

Peak monthly total inflow occurred in April at 312,170 af, 18 percent of the 2020 total. The highest total inflow in the last 30 years (1990–2020) was in 2017 at 9,009,424 af. The lowest total inflow for the same period was in 2015 at 1,295,451 af.

Figure 7-2 shows monthly Lake Oroville inflow for 2018, 2019, and 2020.

Figure 7-3 shows historical maximum and minimum cumulative Lake Oroville inflow and the current cumulative inflow for 2020.

2020 Storage. Minimum storage occurred on December 31 at 1,236,706 af, 35 percent of

Table 7-5 Monthly Reservoir Storage for Water Year 2019–2020 (thousand acre-feet)

Reservoir	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Shasta	3,271	3,209	3,330	3,482	3,546	3,600	3,687	3,529	3,147	2,678	2,351	2,200
percent of average	124	120	119	115	108	98	95	92	88	85	84	83
Oroville	2,045	1,922	2,079	2,204	2,252	2,294	2,490	2,428	2,179	1,876	1,705	1,631
percent of average	98	92	97	96	92	86	87	82	77	74	75	76
Folsom	598	493	511	487	447	476	697	790	717	555	477	423
percent of average	121	107	109	97	83	75	96	98	92	83	80	78
San Luis	946	877	1,287	1,518	1,412	1,511	1,512	1,300	1,070	967	974	974
percent of average	90	73	94	96	83	84	85	83	85	100	116	105
Pardee	180	177	178	185	181	187	184	200	203	202	200	197
percent of average	104	101	101	103	101	103	100	106	105	106	108	109
New Melones	1,999	2,000	1,981	1,983	1,930	1,892	1,905	1,835	1,716	1,638	1,574	1,519
percent of average	151	149	144	140	133	127	128	123	115	115	117	117
Don Pedro	1,610	1,594	1,622	1,632	1,645	1,648	1,716	1,769	1,687	1,561	1,470	1,416
percent of average	124	122	122	118	115	113	117	116	107	103	105	106
Millerton	268	233	271	316	283	281	335	448	405	266	217	159
percent of average	132	104	98	96	84	77	94	113	98	81	89	72
Pine Flat	428	414	472	491	510	540	686	819	640	339	214	207
percent of average	124	112	116	105	97	96	113	115	94	68	58	62
Kaweah	14	17	30	22	29	41	89	141	82	23	14	11
percent of average	124	125	178	101	114	95	113	116	77	43	69	83
Success	9	6	8	13	17	22	37	44	44	20	8	7
percent of average	104	65	62	74	69	68	87	85	94	60	44	59
Isabella	170	168	168	169	173	180	200	228	197	140	109	101
percent of average	102	106	104	96	94	89	86	77	63	52	52	55
Statewide												
percent of average	118	114	114	110	104	99	101	99	94	92	93	93

lake capacity. Maximum storage occurred on April 30 at 2,490,006 af, 70 percent of lake capacity. End-of-year Lake Oroville storage was 1,236,706 af.

Figure 7-4 shows storage in Lake Oroville for 2019 and 2020.

2020 San Luis Reservoir Operations

San Luis Reservoir is operated jointly by DWR and the U.S. Bureau of Reclamation pursuant to operating procedures adopted in

June 1981. San Luis Reservoir has a normal operating capacity of 2,027,835 af. The SWP share of this capacity is 1,062,180 af.

San Luis Reservoir reached its maximum storage on April 13 at 1,560,535 af, 77 percent of its normal maximum operating capacity. At the beginning of 2020, San Luis Reservoir contained 1,286,842 af, 63 percent of its capacity. The SWP storage share was 888,397 af. The highest end-of-month SWP

share of water storage occurred in March at 974,988 af.

Figure 7-5 shows the SWP share of storage and total storage in San Luis Reservoir for 2019 and 2020.

2020 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 2020, Lake Del Valle held 25,170 af, which was about 33 percent of its maximum capacity of 77,111 af. Its highest storage occurred on June 25 at 38,626 af. Its lowest storage occurred on January 1 at 25,170 af.

On December 31, storage in Lake Del Valle was 29,005 af, 38 percent of its maximum capacity. There was 2,691 af of natural inflow into Lake Del Valle, and 16,003 af of inflow from the South Bay Aqueduct. There were no releases to Arroyo Valle, and releases for

2020 to the South Bay Aqueduct from Lake Del Valle totaled 11,851 af.

2020 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 2020, these reservoirs held 564,931 af, which is 82 percent of their combined normal maximum operating capacity of 689,021 af. At the end of 2020, the reservoirs held 593,379 af, 86 percent of combined normal maximum operating capacity.

Diversions from the Delta

The SWP diverts water from the Delta, through the Barker Slough and Banks pumping plants, for delivery to SWP Contractors' storage facilities. The SWP diverts water from Barker

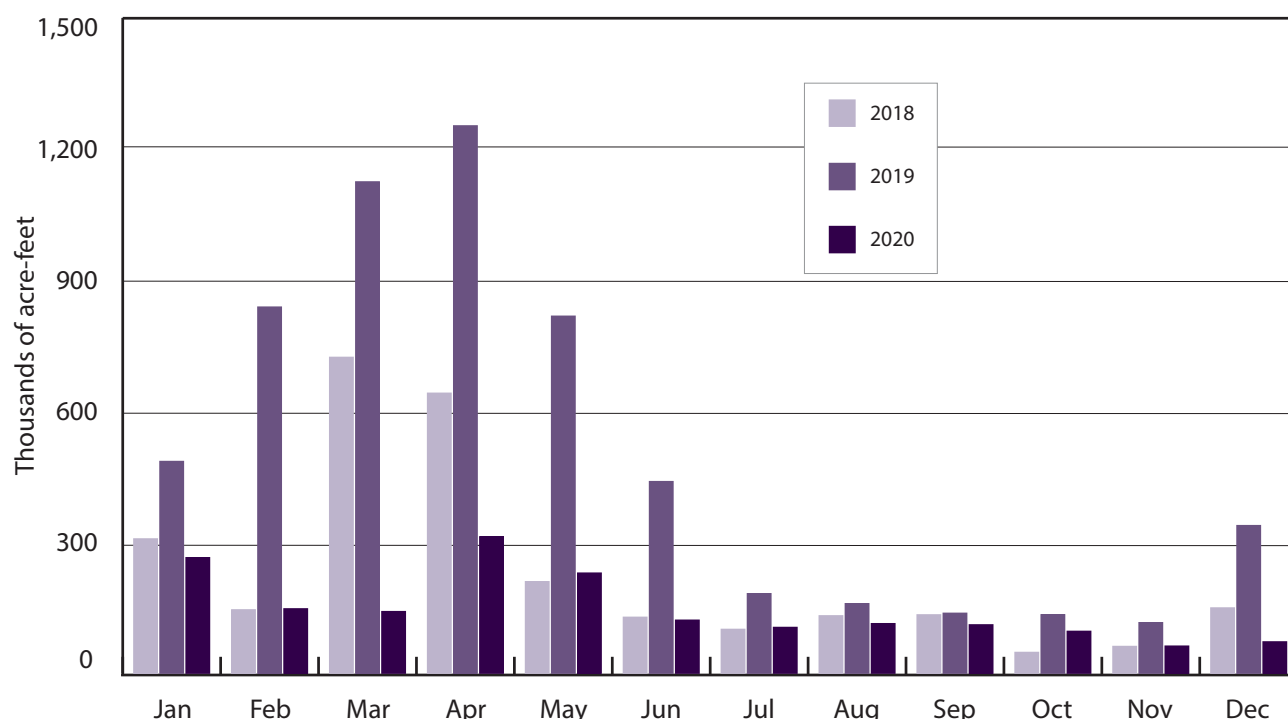


Figure 7-2 Monthly Inflow into Lake Oroville from the Feather River, 2018–2020

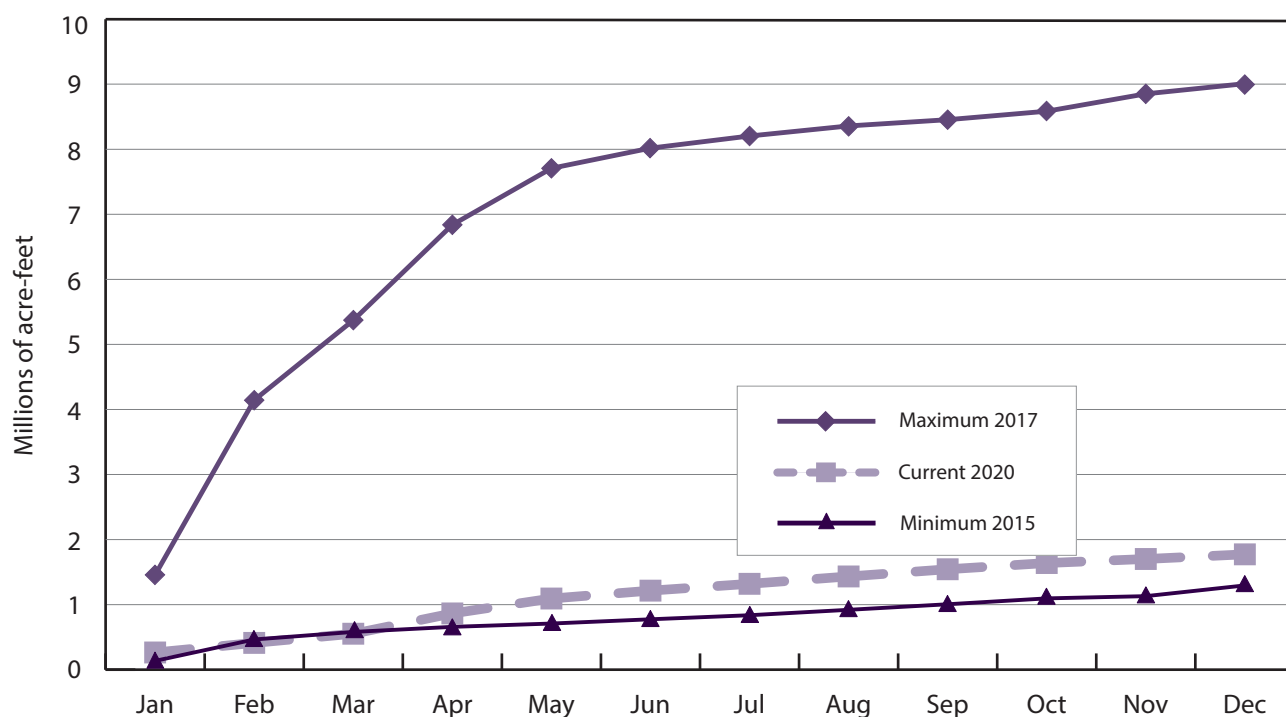


Figure 7-3 Lake Oroville Cumulative Inflow over the Last 30 Years—Current and Historical Maximum and Minimum

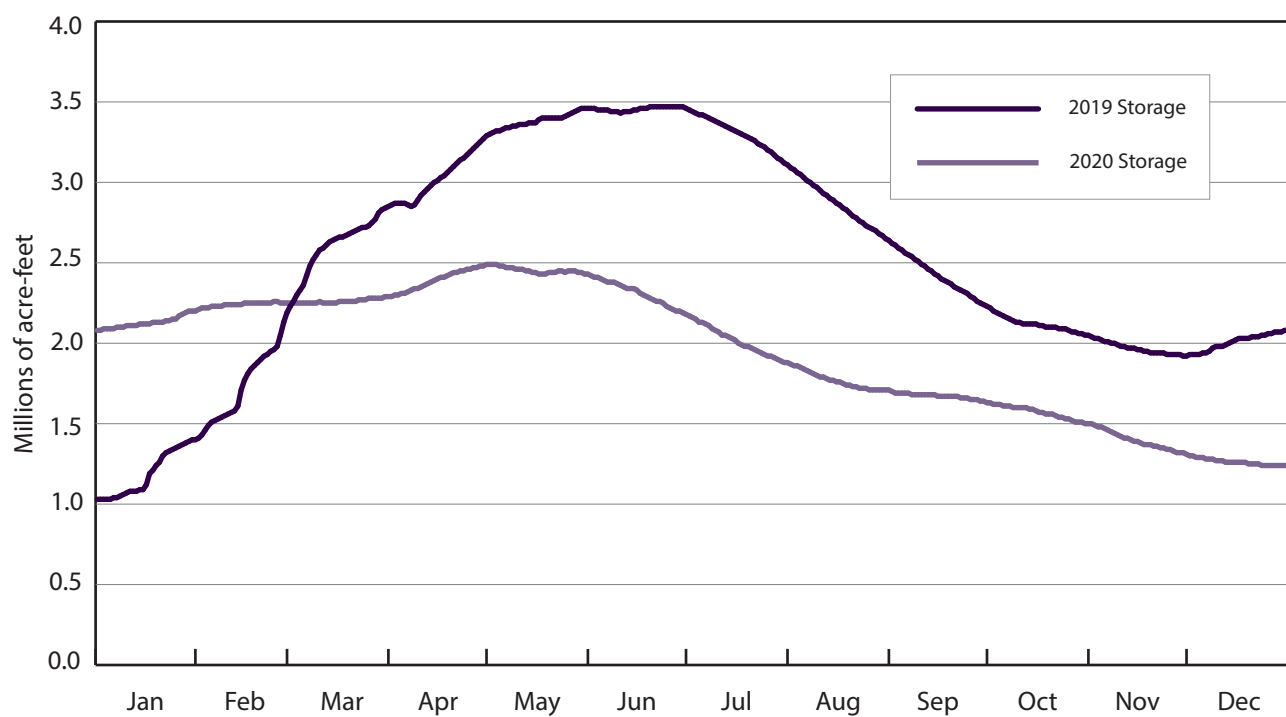


Figure 7-4 Daily Storage in Lake Oroville, 2019 and 2020

Slough Pumping Plant to the North Bay Aqueduct. 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 Central Valley Project (CVP) diverts water to similar areas from the Delta through Jones Pumping Plant and Contra Costa Pumping Plant.

In 2020, the North Bay Aqueduct received 50,712 af of water from the Barker Slough Pumping Plant.

Figure 7-6 shows the amounts of water pumped each month for 2020 at Banks Pumping Plant, totaling 1,047,562 af. Of this amount, the SWP diverted 982,993 af. There was 3,477 af of water pumped for the Cross Valley Canal, and 61,092 af was wheeled for the CVP.

The CVP diverted 1,909,863 af at Jones Pumping Plant and 104,672 af at Contra Costa Pumping Plant in 2020.

The combined Delta exports include all of these plants. Figure 7-7 shows the monthly amounts of water diverted from the Delta in 2020 by the SWP and CVP. Maximum daily Delta exports occurred on August 23 at 19,936 af. Combined SWP and CVP monthly Delta exports in 2020 varied from a low of 99,956 af in May, to a high of 435,118 af in August. Delta exports totaled approximately 3.1 maf in 2020.

Figure 7-8 shows monthly total amounts pumped at Dos Amigos Pumping Plant for 2020. Dos Amigos Pumping Plant diverts water from O'Neill Forebay to the California Aqueduct. Dos Amigos pumped the largest amount in July at 250,554 af.

Figure 7-9 shows the amount of water pumped each month in 2020 at Edmonston Pumping Plant. Water pumped through the Edmonston Pumping Plant for delivery to Southern California totaled 814,668 af.

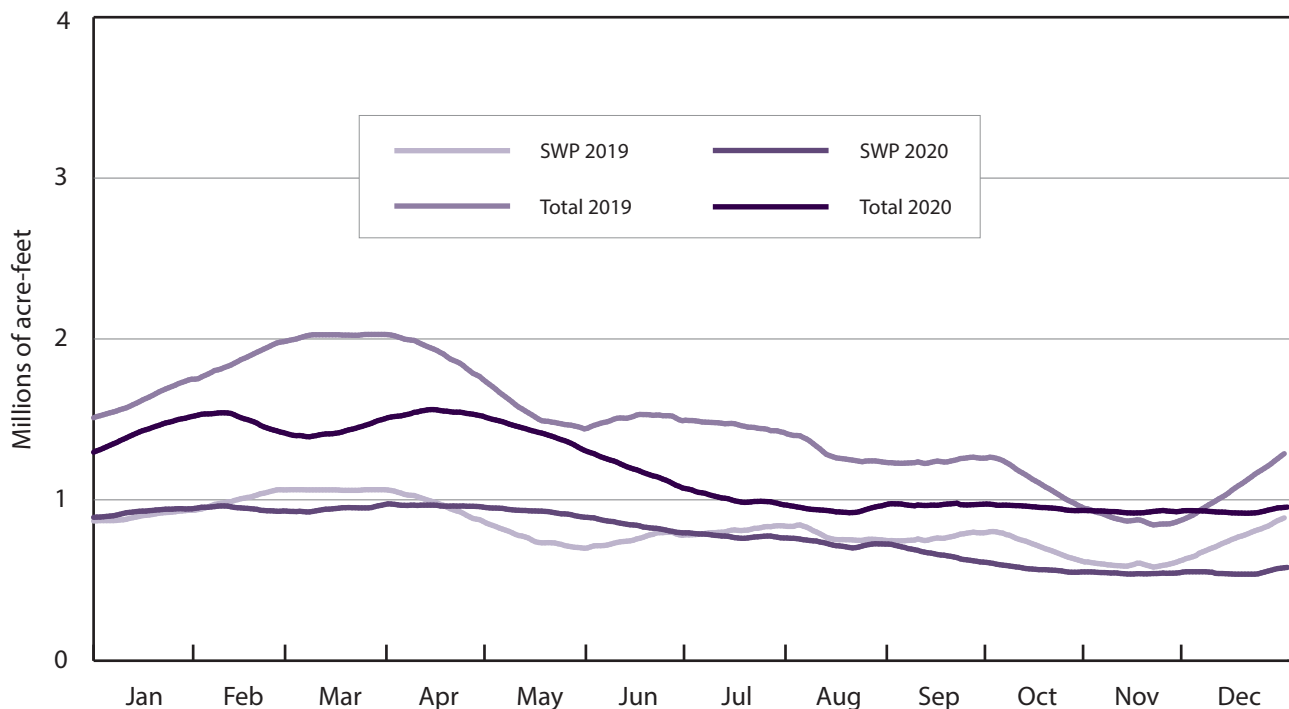


Figure 7-5 SWP Share of Storage and Total Storage in San Luis Reservoir, 2019 and 2020

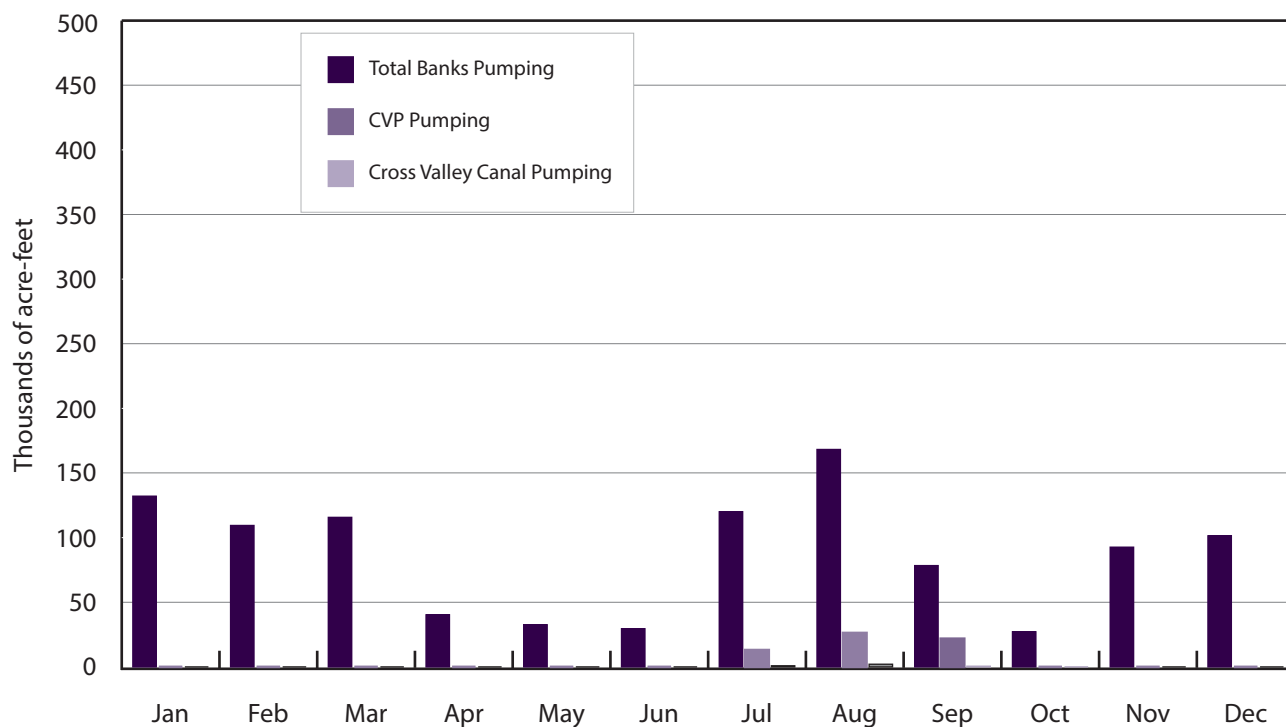


Figure 7-6 Water Pumped at Banks Pumping Plant, 2020

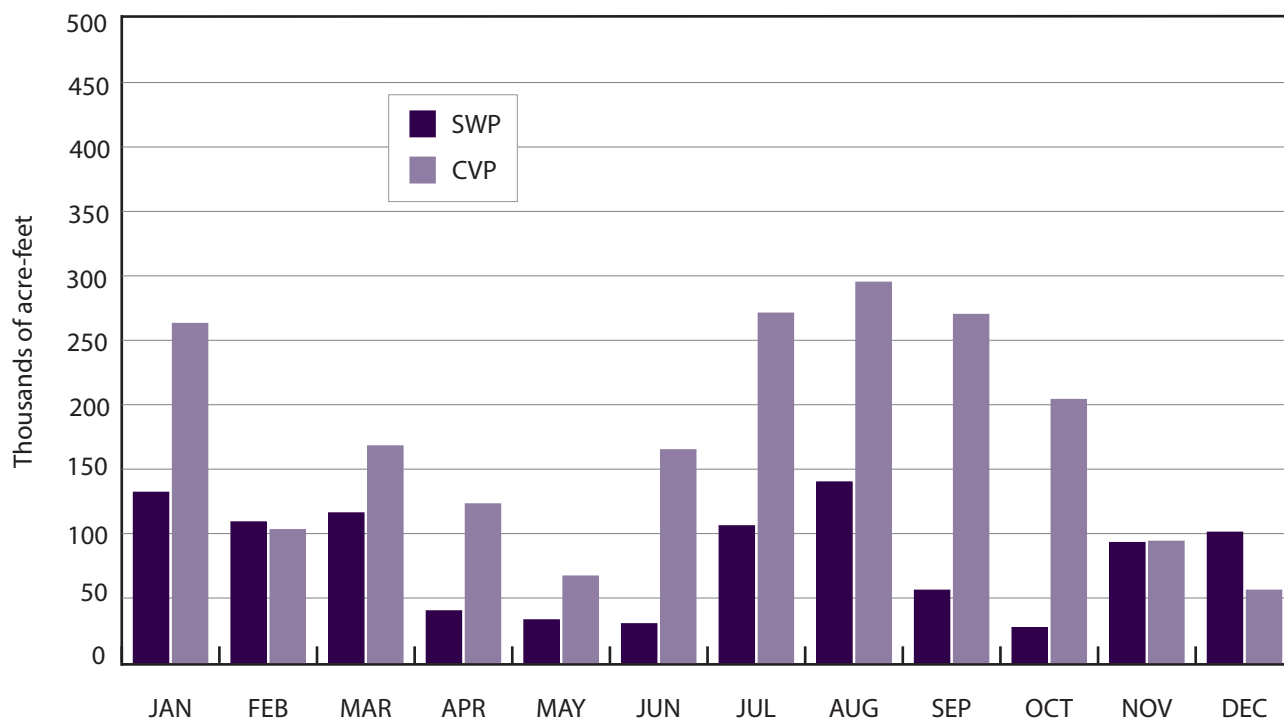


Figure 7-7 Sacramento-San Joaquin Delta Exports by State Water Project and Central Valley Project, 2020

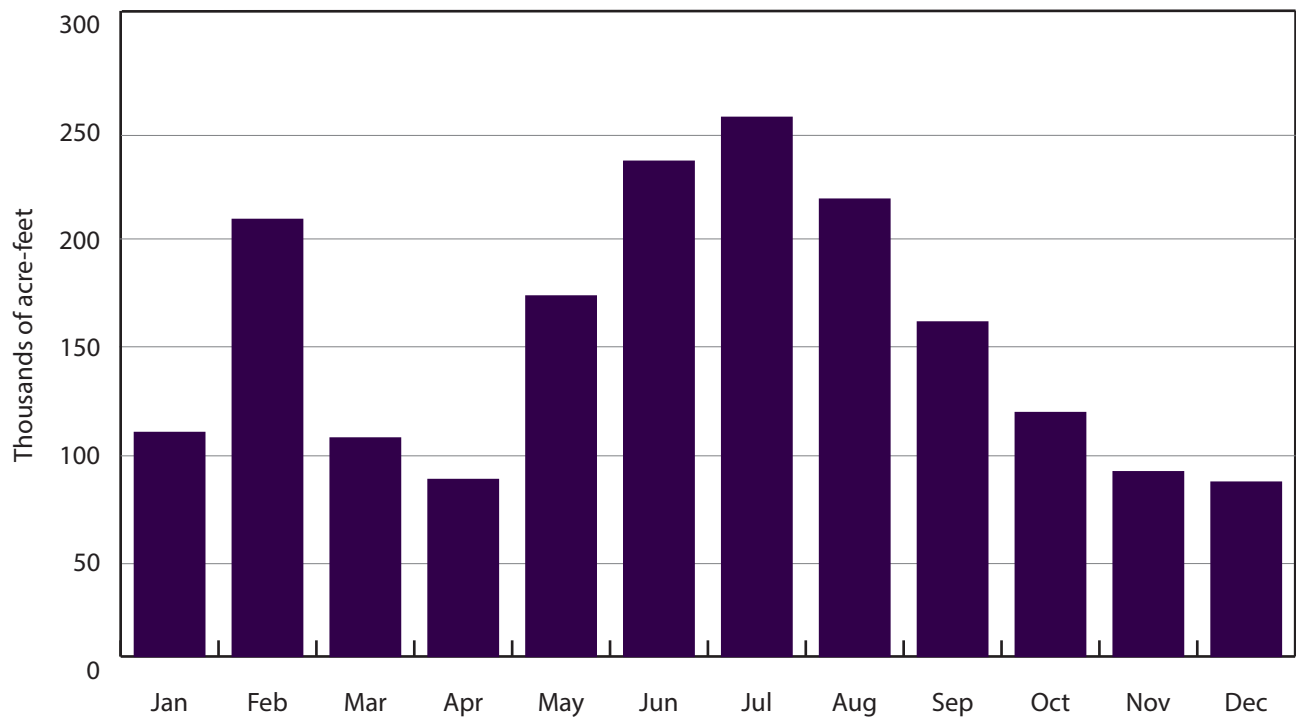


Figure 7-8 Water Pumped at Dos Amigos Pumping Plant, 2020

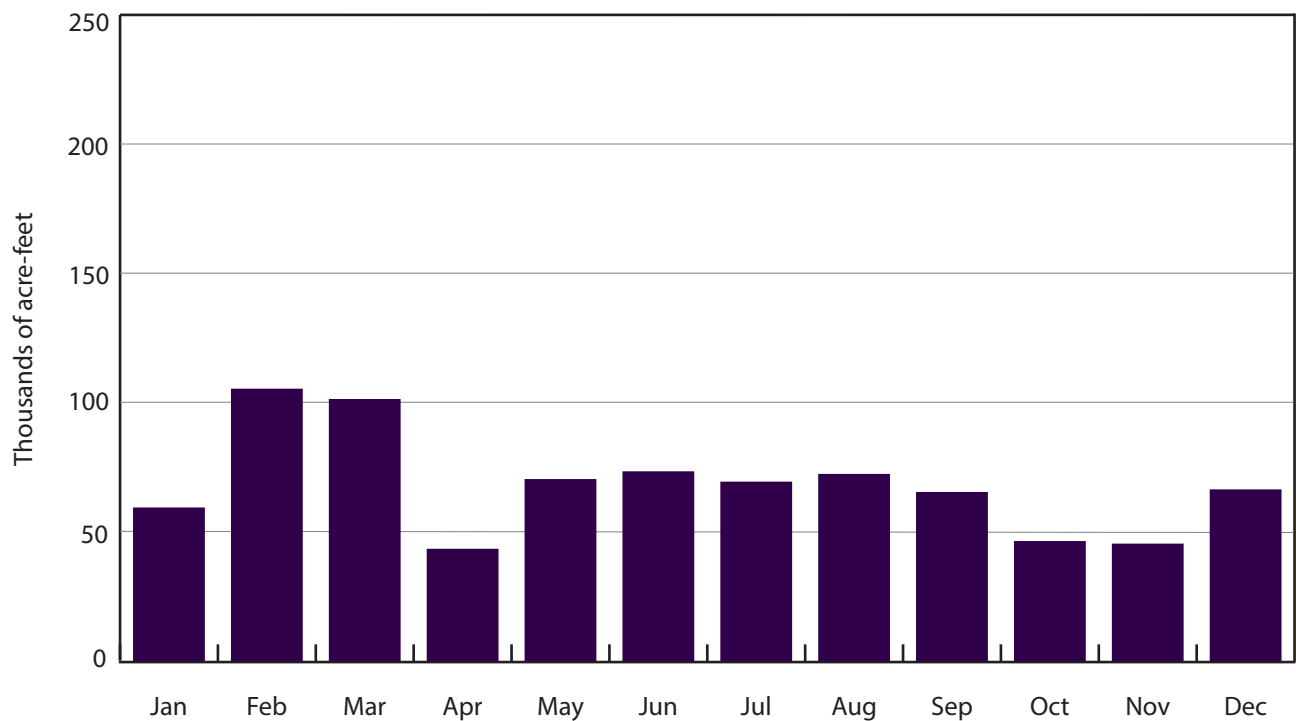


Figure 7-9 Water Pumped at Edmonston Pumping Plant, 2020



Chapter 8

Water Contracts and Deliveries

An aerial view of Lake Oroville Dam in Butte County.

Significant Events in 2020

A total of 2,686,537 acre-feet (af) of State Water Project (SWP) and non-SWP water was delivered to 29 SWP Contractors and 24 other agencies. The portion delivered to SWP Contractors was 1,462,314 af; the portion delivered to non-SWP Contractors was 1,224,223 af.

The hydrologic conditions in the Sacramento and San Joaquin river watersheds were both classified as “dry.” As a result, the Department of Water Resources (DWR) approved 20 percent of the SWP Contractors’ Table A allocation requests.

Eight SWP Contractors recovered approximately 209,191 af of water from water banks.

Information for this chapter was provided by the State Water Project Analysis Office.

State Water Project (SWP) Water Supply Contracts between the Department of Water Resources (DWR) and 29 public agencies and local water districts provide for water service from the SWP and are the basis for the SWP's construction and ongoing 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.

SWP Water Supply Contracts

SWP Water Supply Contracts set forth the maximum amount of water an SWP 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 amount requested by SWP Contractors and approved for delivery by DWR based on hydrologic conditions, current reservoir storage, and combined requests from the SWP Contractors. Under certain water year conditions, DWR is not able to deliver the quantity of water requested by SWP Contractors. In those years, a proportional amount is allocated and delivered according to the SWP Water Supply Contracts by prorating the amount in proportion to each SWP Contractor's annual 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."

SWP water provided under the SWP Water Supply Contracts include current year Table A amounts, transfer and exchange of Table A water, carryover water, Turn-Back Pools A and B water, Multiyear Water Pool Program water, and Article 21 water.

DWR enters into agreements with SWP Contractors and non-SWP Contractors; these agreements may be amended periodically to convey SWP and non-SWP water through

the California Aqueduct. Using SWP facilities, DWR conveys non-SWP water for various agencies according to the terms of water rights and water transfer and exchange agreements. DWR also enters into agreements to approve construction, operation, and maintenance of SWP facilities, including turnouts and turn-ins.

The State Water Project Analysis Office (SWPAO) uses a numbering system for contracts, amendments, and agreements executed by DWR. These numbers, referred to as SWPAO numbers, are designated in Chapter 8 text as "SWPAO #XXXXX" and are located in parentheses in descending order, after each contract, amendment, or agreement description. These numbers can be used as identifiers to contact DWR staff for more detailed information on a particular document.

Contract Extension

As of December 31, 2020, DWR has executed a total of 21 contract extension amendments with the SWP Contractors. In order for the amendments to be effective, a total of 24 SWP Contractors, with an aggregate maximum annual Table A amount of more than 3,950,000 acre-feet (af) must execute, or commit to execute, the amendments with DWR. For additional information regarding the contract extension amendment litigation, please refer to Chapter 5, Legislation and Litigation.

Amendments to SWP Water Supply Contracts

All of the original SWP Water Supply Contracts signed by DWR and the 29 SWP Contractors have been amended to incorporate mutually desired changes.

Most amendments fall under the following general categories:

- permanent transfers of Table A amounts from one SWP Contractor to another
- allocation of costs and benefits for the addition or enlargement of SWP facilities

SWP Water Supply Contracts

The first State Water Project (SWP) 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 SWP Water Supply Contracts; by the end of 1967, 31 agencies had contracted for water. In addition, an SWP Water Supply Contract was executed with the City of West Covina in December 1963, but it was terminated in August 1965, and the city's Table A amount was transferred to Metropolitan through an amendment to its SWP Water Supply Contract with DWR. SWP Water Supply 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, DWR has contracts with 29 SWP contracting agencies. Those contracts have been amended periodically, and as needed, to incorporate mutually agreed upon modifications.

All SWP Water Supply Contracts signed in the 1960s included an estimated date for initial water deliveries and a schedule of the water delivery amount the SWP Contractor could expect 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 SWP Water Supply Contracting agencies was initially 4,230,000 acre-feet (af), assuming full development of the SWP.

The contracts were executed 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 December 31, 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.

- purchase of excess capacity in the California Aqueduct
- provisions to implement Monterey Agreement principles

2020 Amendments to SWP Water Supply Contracts

There were no amendment to the SWP Water Supply Contracts in 2020.

Miscellaneous Agreements with SWP Contractors

2020 Water Conveyance and Exchange Agreements

Water conveyance and exchange agreements that were executed or pending execution with SWP Contractors during 2020 are described below.

Kern

A letter agreement between DWR and Kern, executed November 19, 2020, approved the conveyance of up to 15,000 af of San Joaquin River Exchange Contractors Water Authority's (San Joaquin Exchange Contractors) Central Valley Project (CVP) water to Kern through December 31, 2020. The U.S. Bureau of Reclamation (Reclamation) made this CVP water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Kern under Article 55 of Kern's Water Supply Contract with DWR. During 2020, a total of 11,811 af of CVP water was conveyed to Kern under this agreement. (SWPAO #20034)

Dudley Ridge/Empire

A letter agreement among DWR, Dudley Ridge, and Empire, executed October 14, 2020, approved the transfer of up to 1,500 af of Empire's 2020 Table A water to Dudley Ridge through December 31, 2020, on behalf of landowner Sandridge Partners Incorporated, which farms in both Empire and Dudley Ridge service areas. During 2020,

a total of 305 af of Empire's Table A water was delivered to Dudley Ridge under this agreement. (SWPAO #20033)

Kern/Westlands

A change in point of delivery agreement among DWR, Kern, and Westlands, executed November 23, 2020, approved the delivery of up to 1,900 af of Kern's 2020 Table A water to Westlands' turnout(s) at Reaches 4 through 7 of the California Aqueduct through December 31, 2020. This was to facilitate an exchange of Kern-Tulare Water District's (Kern-Tulare) previously stored CVP water in the West Kern Water District (West-Kern) for Kern's 2020 Table A water. The exchange was accomplished by a series of water deliveries as listed: (1) DWR delivered up to 1,900 af of Kern's 2020 Table A water to Westlands' turnout(s) for use by Westlands and Arroyo Pasajero Mutual Water Company on behalf of Fresno Irrigation District, a Friant Division CVP contractor; (2) in exchange, Kern retained a like amount of CVP water previously stored in West Kern for use in Kern's service area; and/or (3) Kern-Tulare in return would received a like amount of Fresno Irrigation District's pre-1914 Kings River water rights water and/or Friant Division CVP water.

DWR received approval from the State Water Resources Control Board (State Water Board) on November 19, 2020, for an additional exchange of water under the original State Water Board's Division of Water Rights' July 15, 2020 that approved the consolidation of SWP and CVP places of use. During 2020, a total of 1,900 af of Kern's Table A water was delivered to Westlands' turnout(s) under this agreement. (SWPAO #20032)

Kern

A letter agreement between DWR and Kern, executed September 25, 2020, approved the conveyance of up to 2,000 af of CVP Friant recirculation water to Kern through February 28, 2021. Belridge Water Storage

District, a member unit of Kern, acquired this CVP water from Tulare Irrigation District, a Friant Division CVP contractor. Reclamation made this water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Kern under Article 55 of Kern's Water Supply Contract with DWR. During 2020, a total of 652 af was conveyed to Kern under this agreement. (SWPAO #20031)

A letter agreement between DWR and Kern, executed September 25, 2020, approved the conveyance of up to 3,750 af of CVP San Joaquin River Restoration Program water to Kern through February 28, 2021. Belridge Water Storage District, a member unit of Kern, acquired this water from Arvin-Edison Water Storage District, a Friant Division CVP contractor. Reclamation made this water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Kern under Article 55 of Kern's Water Supply Contract with DWR. During 2020, a total of 750 af was conveyed to Kern under this agreement. (SWPAO #20030)

Alameda-Zone 7/Napa

A letter agreement among DWR, Alameda-Zone 7/Napa, executed September 11, 2020, approved the delivery of up to 5,000 af of Napa's 2020 Table A water to Alameda-Zone 7 through December 31, 2020. In exchange, Alameda-Zone 7 will return to Napa, based on an unbalanced exchange ratio of 4:1, up to 1,250 af of its future Table A water through December 31, 2030. During 2020, a total of 5,000 af of Napa's Table A water was delivered to Alameda-Zone 7 under this agreement (SWPAO #20029)

Tulare

A letter agreement between DWR and Tulare, executed September 8, 2020, approved the conveyance of up to 5,300 af of CVP water to Tulare. This CVP water was acquired by Angiola Water District, a member unit of Tulare, from Fresno Slough Water District (up

to 4,000 af) and Mercy Springs Water District (up to 1,300 af). Reclamation made this CVP water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Tulare under Article 55 of Tulare's Water Supply Contract with DWR. This agreement is effective through February 28, 2021. During 2020, a total of 803 af was conveyed to Tulare under this agreement. (SWPAO #20028)

Kern

A letter agreement between DWR and Kern, executed September 3, 2020, approved the conveyance of up to 1,959 af of CVP water to Kern through February 28, 2021. Wheeler Ridge-Maricopa Water Storage District, a member unit of Kern, acquired this CVP water from Hills Valley Irrigation District, Tri-Valley Water District, and the County of Tulare. Reclamation made this CVP water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Kern under Article 55 of Kern's Water Supply Contract with DWR. A subsequent amendment (SWPAO #20027-A), executed September 28, 2020, added Banks Pumping Plant as another alternate point for Reclamation to make the CVP water available to DWR in addition to O'Neill Forebay as specified in the original agreement (SWPAO #20027). During 2020, a total of 1,959 af was conveyed to Kern under this agreement. (SWPAO #20027 and SWPAO #20027-A)

AVEK/Kern

A letter agreement among DWR, AVEK, and Kern, executed August 20, 2020, approved the delivery of up to 7,000 af of AVEK's 2020 Table A water to Kern through December 31, 2020, on behalf of landowner V Lions Operations, LP, which farms in both AVEK and Kern service areas. During 2020, a total of 7,000 af of AVEK's Table A water was delivered to Kern under this agreement. (SWPAO #20026)

Kern

A letter agreement between DWR and Kern, executed September 3, 2020, approved the conveyance of up to 1,695 af of CVP Cross Valley Canal water to Kern through February 28, 2021. Wheeler Ridge-Maricopa Water Storage District acquired this CVP water from Pixley Irrigation District. Reclamation made this CVP water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Kern under Article 55 of Kern's Water Supply Contract with DWR. A subsequent amendment (SWPAO #20025-A), executed September 28, 2020, added Banks Pumping Plant as an alternate point for Reclamation to make the CVP water available to DWR in addition to O'Neill Forebay as specified in the original agreement (SWPAO #20025). During 2020, a total of 1,695 af of water was conveyed to Kern under this agreement. (SWPAO #20025 and SWPAO #20025-A)

Kern/Littlerock

A letter agreement among DWR, Kern, and Littlerock, executed September 8, 2020, approved the delivery of up to 460 af of Littlerock's 2020 Table A water to Kern through December 31, 2020. In exchange, Kern will return to Littlerock, based on an unbalanced exchange ratio of 4:1, up to 115 af of its future Table A water through December 31, 2030. During 2020, a total of 379 af of Littlerock's Table A water was delivered to Kern under this agreement. (SWPAO #20023)

Santa Clara

A letter agreement between DWR and Santa Clara, executed August 6, 2020, approved the exchange of up to 75,000 af of SWP water with Santa Clara's CVP water. Reclamation made available up to 75,000 af of Santa Clara's CVP water to DWR at O'Neill Forebay. DWR delivered Santa Clara's CVP water to SWP service areas south of O'Neill Forebay. In exchange, DWR delivered an equal amount of SWP water to Santa Clara. DWR

filed a petition with the State Water Board and received a one-year approval effective July 16, 2020, for the consolidation of CVP and SWP places of use. This agreement terminates on July 15, 2021. During 2020, a total of 2,453 af of Santa Clara's CVP water was made available to DWR, and a total of 2,453 af of SWP water was delivered to Santa Clara under this agreement. (SWPAO #20022)

Kern

A letter agreement between DWR and Kern, executed July 20, 2020, approved the conveyance of up to 2,500 af of CVP Friant Recirculation Water to Kern through February 28, 2021. Wheeler Ridge-Maricopa Water Storage District acquired this CVP Friant recirculation water from Orange Cove Irrigation District, a CVP Friant Division contractor. Reclamation made this CVP water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Kern under Article 55 of Kern's Water Supply Contract with DWR. During 2020, a total of 1,034 af was made available to DWR at O'Neill Forebay, and a total of 1,034 af of water was conveyed to Kern under this agreement. (SWPAO #20021)

Tulare

A letter agreement between DWR and Tulare, executed July 6, 2020, approved the conveyance of a combined total of up to 40,000 af of CVP water to Tulare through December 31, 2021. This CVP water is Friant recirculation water from Lower Tule River Irrigation District and Orange Cove Irrigation District, and/or Cross Valley Canal Water from Lower Tule River Irrigation District, Pixley Irrigation District, and Hills Valley Irrigation District. Reclamation made this CVP water available to DWR at O'Neill Forebay and/or Banks Pumping Plant for subsequent delivery by DWR to Tulare under Article 55 of Tulare's Water Supply Contract with DWR. During 2020, a total of 9,553 af of water was conveyed to Tulare under this agreement. (SWPAO #20020)

San Gorgonio/Ventura/Casitas Municipal Water District/City of San Buenaventura

A letter agreement among DWR, San Gorgonio, Ventura, City of San Buenaventura, and Casitas Municipal Water District, executed July 29, 2020, approved the delivery of up to 3,000 af of Ventura's 2020 Table A water to San Gorgonio through December 31, 2020. This amount was provided by two of Ventura's member agencies, City of San Buenaventura (up to 2,000 af) and Casitas Municipal Water District (up to 1,000 af). In exchange, San Gorgonio will return to the City of San Buenaventura and Casitas Municipal Water District, based on an unbalanced exchange ratio of 4:1, up to a total of 750 af of its future approved Table A water through December 31, 2030. During 2020, a total of 3,000 af of Ventura's Table A water was delivered to San Gorgonio under this agreement. (SWPAO #20016)

Dudley Ridge/Solano

A letter agreement among DWR, Dudley Ridge, and Solano, executed May 21, 2020, approved the delivery of up to 7,164 af of Solano's 2020 Table A water to Dudley Ridge through December 31, 2020. In exchange, Dudley Ridge will return to Solano, based on an unbalanced exchange ratio of 4:1, up to 1,791 af of its future Table A water through December 31, 2030. During 2020, no water was moved under this agreement. (SWPAO #20014)

Kern

A letter agreement between DWR and Kern, executed June 3, 2020, approved the conveyance of up to 7,740 af of San Joaquin River Exchange Contractors' 2020 CVP water to Kern through December 31, 2020. The water was delivered to Semitropic Water Storage District, a member unit of Kern. Reclamation made the San Joaquin River Exchange Contractors' CVP water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Kern under Article 55

of Kern's Water Supply Contract with DWR. An amendment (SWPAO #20012-A) between DWR and Kern, executed July 24, 2020, increased the amount of San Joaquin River Exchange Contractors' CVP water to Kern, from up to 7,740 af, as specified in the original agreement (SWPAO #20012), to up to 8,494 af. During 2020, a total of 8,494 af of water was conveyed to Kern under this agreement. (SWPAO #20012 and SWPAO #20012-A)

AVEK/Kern/San Gorgonio

A letter agreement among DWR, AVEK, Kern, and San Gorgonio, executed July 22, 2020, approved the conveyance of up to 1,700 af of non-SWP water to San Gorgonio, through December 31, 2020. This non-SWP water was Nickel Family LLC's pre-1914 water rights water that San Gorgonio acquired from AVEK and was made available to DWR at Reach 12E of the California Aqueduct for subsequent delivery by DWR to San Gorgonio under Article 55 of San Gorgonio's Water Supply Contract with DWR. During 2020, a total of 1,700 af of water was delivered to San Gorgonio under this agreement. (SWPAO #20011)

Kern

A letter agreement between DWR and Kern, executed June 3, 2020, approved the conveyance of up to 53,300 af of Kern-Tulare Water District's CVP water to Kern. Reclamation made the CVP water available to DWR at O'Neill Forebay and/or Banks Pumping Plant for subsequent delivery by DWR to Kern under Article 55 of Kern's Water Supply Contract with DWR. DWR filed a petition with the State Water Board and received a one-year approval effective July 15, 2019, for the consolidation of CVP and SWP places of use. This agreement terminated on July 14, 2020. During 2020, a total of 10,660 af of Kern-Tulare Water District's CVP water was conveyed to Kern under this agreement. (SWPAO #20010)

Tulare/Westlands

A letter agreement among DWR, Tulare, and Westlands, executed May 22, 2020, approved the delivery of up to 1,500 af of Tulare's 2020 Table A water to Westlands through December 31, 2020, on behalf of landowner Westlake Farms Incorporated, which farms in both Tulare and Westlands service areas. The water would be used on lands within the Kings County portion of Westlands' service area, which is within the SWP place of use. During 2020, no water was moved under this agreement. (SWPAO #20007)

Dudley Ridge/Mojave

A letter agreement among DWR, Dudley Ridge, and Mojave, executed April 29, 2020, approved the delivery of up to 6,761 af of Mojave's 2020 Table A water to Dudley Ridge through December 31, 2020. In exchange, Dudley Ridge will return to Mojave, based on an unbalanced exchange ratio of 4:1, up to 1,690 af of its future Table A water through December 31, 2030. During 2020, no water was moved under this agreement. (SWPAO #20006)

Kern/Mojave

A letter agreement among DWR, Kern, and Mojave, executed June 10, 2020, approved the delivery of up to 40,384 af of Mojave's 2020 Table A water to Kern through December 31, 2020. In exchange, Kern will return to Mojave, based on an unbalanced exchange ratio of 4:1, up to 10,096 af of its future Table A water through December 31, 2030. During 2020, a total of 17,560 af of Mojave's Table A water was delivered to Kern under this agreement. (SWPAO #20005)

Mojave/Santa Barbara

A letter agreement among DWR, Mojave, and Santa Barbara, executed April 7, 2020, approved the delivery of up to 1,000 af of Mojave's 2020 Table A water to Santa Barbara through December 31, 2020. In exchange, Santa Barbara will

return to Mojave, based on an unbalanced exchange of ratio of 4:1, up to 250 af of its future Table A water through December 31, 2030. During 2020, a total of 400 af of Mojave's Table A water was delivered to Santa Barbara under this agreement. (SWPAO #20004)

Kern/Tulare

A letter agreement among DWR, Kern, and Tulare, executed March 10, 2020, approved the delivery of up to 10,000 af of Tulare's 2020 Table A water to Kern through December 31, 2020, on behalf of landowner J.G. Boswell Company, which farms in both Tulare and Kern service areas. During 2020, no water was moved under this agreement. (SWPAO #20001)

Kern/Metropolitan/Santa Barbara

An agreement among DWR, Kern, Metropolitan, and Santa Barbara, executed January 17, 2020, allows for the delivery of up to 700 af of Santa Barbara's 2019 Table A water to Metropolitan through December 31, 2019. In exchange, Metropolitan will return to Santa Barbara, based on an unbalanced exchange ratio of 2:1, up to 350 af of its future Table A water through December 31, 2025. The water was acquired by Irvine Ranch Water District on behalf of Metropolitan. The agreement also allows for a change in point of delivery of Santa Barbara's 2019 Table A water to Kern's turnout(s) through December 31, 2019 for storage in the Strand and Stockdale Integrated Banking Projects located in Kern County and operated by Kern's member unit, Rosedale-Rio Bravo Water Storage District. Metropolitan will recover the stored water for use in its service area by December 31, 2025. During 2020, no water was moved under this agreement. (SWPAO #19031)

Dudley Ridge/Kern/Metropolitan

A multi-year exchange agreement among DWR, Dudley Ridge, Kern, and Metropolitan, executed July 17, 2020, approved the

exchange of up to 40,000 af of Dudley Ridge's approved Table A water with Irvine Ranch Water District's banked non-SWP water. Irvine Ranch is a landowner and water user within Dudley Ridge, a landowner within Kern County, and a sub-unit of Municipal Water District of Orange County, a member agency of Metropolitan. Irvine Ranch also has banking facilities within Kern County. This agreement allows for the delivery of up to 40,000 af of Dudley Ridge's approved Table A water to Metropolitan and/or for the delivery of Irvine Ranch's non-SWP water to Dudley Ridge through December 31, 2025. In the event that the exchange is not completed by December 31, 2025, an additional five years beginning January 1, 2026, through December 31, 2030, will be given to the party who owes return water until the exchange is completed, minus any applicable losses. During 2020, no water was moved under this agreement. (SWPAO #19001)

Butte

An amendment (SWPAO #17021-B) between DWR and Butte, executed December 18, 2020, approved a quantity change of Pacific Gas & Electric Company's (PG&E) water conveyed to Butte in years 2020 and 2021. This amendment allows for the conveyance of an additional 50 af of PG&E's water, totaling up to 3,050 af, for year 2020 and a reduction by 50 af of PG&E's water, totaling 2,950 af, for year 2021. The original agreement (SWPAO #17021) between DWR and Butte, executed March 26, 2018, approved the conveyance of up to 3,000 af per year of PG&E's water to California Water Service, a member agency of Butte, through December 31, 2027. SWPAO #17021 allowed PG&E to make its water available to DWR at Lake Oroville through the Upper Miocene Canal via PG&E's Lime Saddle Powerhouse. DWR would then deliver this water to California Water Service's turnout(s) via the Thermalito Power Canal under Article 55 of Butte's Water Supply Contract with DWR. In late 2018, a portion of the Miocene Canal was destroyed due to the Camp Fire which

prevented PG&E's water from being made available to Lake Oroville through the Lime Saddle Powerhouse. As a result, amendment (SWPAO #17021-A) between DWR and Butte, executed May 9, 2019, approved an alternate mechanism by diverting PG&E's water just downstream of the Upper Miocene Head Dam into the Feather River water, then to Lake Oroville through December 31, 2021. During 2020, a total of 3,039 af of water was conveyed to Butte under this agreement. (SWPAO #17021, SWPAO #17021-A, SWPAO #17021-B)

Coachella/Kern

An amendment (SWPAO #12023-A) among DWR, Coachella, and Kern, executed October 6, 2020, approved an increase of the amount of water delivered to Coachella, from up to 16,500 af per year, as specified under the original agreement, to 20,000 af per year. The original agreement (SWPAO #12023) among DWR, Coachella, and Kern, executed July 30, 2013, is a multi-year change in point of delivery and conveyance agreement which approved the annual delivery of up to 16,500 af of water acquired by Coachella back to Coachella through December 31, 2035. In 2005, Glorious Land Company and Rosedale-Rio Bravo executed an agreement (2005 Glorious Land Company/Rosedale-Rio Bravo Agreement) to provide a water supply from Rosedale-Rio Bravo to Glorious Land Company's development project in Riverside County. Glorious Land Company was not yet ready to receive the water to which it is entitled under the 2005 Glorious Land Company/Rosedale-Rio Bravo Agreement; subsequently, in 2012, Glorious Land Company and Coachella executed an assignment agreement that allowed Glorious Land Company to assign its rights and obligations of the water under the 2005 Glorious Land Company/Rosedale-Rio Bravo Agreement to Coachella (Assigned Water). The delivery of the Assigned Water to Coachella can be accomplished by (1) a change in point of delivery of a portion of Rosedale-Rio Bravo's allocation of Kern's

Table A water as an exchange for a like amount of the Assigned Water and/or (2) conveyance of the Assigned Water to Coachella under Article 55 of Coachella's Water Supply Contract with DWR by direct pump-in of the water into the California Aqueduct. Glorious Land Company and Rosedale-Rio Bravo entered into an agreement in July 2020 that approved the increase of the Assigned Water. During 2020, a total of 15,778 af of water was delivered to Coachella under this agreement. (SWPAO #12023 and SWPAO #12023-A)

AVEK/Littlerock/Palmdale

An amendment (SWPAO #07031-B) among DWR, AVEK, Littlerock and Palmdale, executed September 10, 2020, approved Palmdale's turnout(s) in Reach 20B of the California Aqueduct as an additional point of delivery for the return of water from AVEK to Littlerock. The original agreement (SWPAO #07031), among DWR, AVEK, and Littlerock, executed December 31, 2007, approved the delivery of up to 1,380 af of Littlerock's 2007 Table A water to AVEK through December 31, 2007. In exchange, AVEK would return to Littlerock an equal amount of its future approved Table A water to Littlerock through December 31, 2017. An amendment (SWPAO #07031-A), among DWR, AVEK, and Littlerock, executed December 22, 2017, extended the term of the original agreement to December 31, 2020. During 2020, a total of 1,380 af of AVEK's Table A water was delivered to Littlerock, thereby completing this agreement. (SWPAO #07031, SWPAO #07031-A, and SWPAO #07031-B)

Water Conveyance and Exchange Agreements Prior to 2020

Kern

A letter agreement between DWR and Kern, executed February 3, 2020, approved the conveyance of up to 10,000 af of 2019–2020 CVP Cross Valley Canal water to

Kern through February 28, 2020. Wheeler Ridge-Maricopa Water Storage District, a member unit of Kern, acquired this CVP water from Pixley Irrigation District and Lower Tule River Irrigation District. Reclamation made this CVP water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Kern under Article 55 of Kern's Water Supply Contract with DWR. During 2020, no water was moved under this agreement. (SWPAO #19041)

Kern/Santa Clarita

A letter agreement among DWR, Kern, and Santa Clarita, executed November 22, 2019, approved the delivery of up to 25,000 af of Santa Clarita's 2019 Table A water to Kern through December 31, 2019. In exchange, Kern will return to Santa Clarita, based on an unbalanced exchange ratio of 2:1, up to 12,500 af of its future Table A water through December 31, 2029. During 2020, a total of 3,708 af of Kern's Table A water was delivered to Santa Clarita under this agreement. (SWPAO #19037)

Kern

An agreement between DWR and Kern, executed October 28, 2019, approved the conveyance of up to 6,000 af of Westlands' CVP water to Kern through February 29, 2020. Westlands' CVP water was delivered to Kern for storage in the groundwater basin underlying Semitropic Water Storage District, a member unit of Kern. Reclamation made this CVP water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Kern under Article 55 of Kern's Water Supply Contract with DWR. During 2020, a total of 886 af of CVP water was conveyed to Kern under this agreement. (SWPAO #19033)

AVEK/Santa Clarita

A letter agreement among DWR, AVEK, and Santa Clarita, executed October 16, 2019, approved the delivery of up to 7,500 af of Santa Clarita's 2019 Table A water to AVEK through December 31, 2019. In exchange,

AVEK will return to Santa Clarita, based on an unbalanced exchange ratio of 2:1, up to 3,750 af of its future Table A water through December 31, 2029. During 2020, a total of 1,406 af of AVEK's Table A water was delivered to Santa Clarita under this agreement. (SWPAO #19032)

Tulare

A letter agreement between DWR and Tulare, executed September 3, 2019, approved the conveyance of up to 40,000 af of non-SWP water to Tulare through December 31, 2020. This non-SWP water consists of Friant Recirculation water from Lower Tule River Irrigation District and Orange Cove Irrigation District; and/or Cross Valley water from Lower Tule River Irrigation District, Pixley Irrigation District, and Hills Valley Irrigation District. Reclamation made this non-SWP water available to DWR at O'Neill Forebay and/or Banks Pumping Plant for subsequent delivery by DWR to Tulare under Article 55 of Tulare's Water Supply Contract with DWR through February 29, 2020. During 2020, a total of 551 af of water was delivered to Tulare under this agreement. (SWPAO #19023)

Santa Clara

A letter agreement between DWR and Santa Clara, executed August 8, 2019, approved the exchange of up to 75,000 af of SWP water supplies with Santa Clara's CVP water supplies. Reclamation made available up to 75,000 af of Santa Clara's CVP water supplies to DWR at O'Neill Forebay for subsequent delivery by DWR to SWP service areas south of O'Neill Forebay. In exchange, DWR delivered an equal amount of SWP water supplies to Santa Clara. DWR filed a petition with the State Water Board and received a one-year approval effective July 15, 2019, for the consolidation of CVP and SWP places of use. This agreement terminated on July 13, 2020. During 2020, a total of 5,659 af of Santa Clara's CVP water was made available to DWR and a total of 5,659 af of SWP water

supplies was delivered to Santa Clara under this agreement. (SWPAO #19022)

AVEK/Palmdale

A letter agreement among DWR, AVEK, and Palmdale, executed November 19, 2018, approved the delivery of up to 5,000 af of Palmdale's 2018 Table A water to AVEK through December 31, 2018. In exchange, AVEK will return an equal amount to Palmdale, up to 5,000 af, of its future Table A water through December 31, 2028. During 2020, a total of 1,500 af of AVEK's Table A water was delivered to Palmdale under this agreement. (SWPAO #18032)

Mojave/Santa Barbara

A letter agreement among DWR, Mojave, and Santa Barbara, executed June 11, 2018, approved the delivery of up to 5,633 af of Mojave's 2018 Table A water to Santa Barbara through December 31, 2018. In exchange, Santa Barbara will return to Mojave, based on an unbalanced exchange ratio of 4:1, up to 1,409 af of its future Table A water through December 31, 2028. During 2020, a total of 193 af of Santa Barbara's Table A water was delivered to Mojave, thereby completing this agreement. (SWPAO #18016)

Dudley Ridge/Kern/Metropolitan

A multiyear exchange and change in point of delivery agreement among DWR, Dudley Ridge, Kern, and Metropolitan, executed June 7, 2018, approved the delivery of up to 12,240 af of Dudley Ridge's approved Table A water to Metropolitan through December 31, 2027. In exchange, Metropolitan will return to Dudley Ridge, based on an unbalanced exchange ratio of 2:1, up to 6,120 af of its future approved Table A water within ten years of taking delivery from Dudley Ridge or by December 31, 2035, whichever comes earlier. This agreement allows for the delivery of a portion of Dudley Ridge's approved Table A water to either Metropolitan's service area and/or to Kern's

turnout(s) for storage in the Irvine Ranch Water District's banking facilities in Kern County on behalf of Metropolitan. Water delivered to Kern County for storage will be returned to Metropolitan for later use in its own service area by December 31, 2035. During 2020, a total of 350 af of Dudley Ridge's Table A water was delivered to Kern's turnout(s) under this agreement. (SWPAO #17030)

Kern

A letter agreement between DWR and Kern, executed July 12, 2017, approved the delivery of up to 50,000 af of Westlands' CVP water to Kern through February 28, 2018 for storage in the Semitropic Water Storage District's Groundwater Banking Program, and the return of a like amount of water to Westlands through December 31, 2028. Reclamation made Westlands' CVP water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Kern under Article 55 of Kern's Water Supply Contract with DWR. This agreement allows for the return delivery of Westlands' stored water to Westlands by the following mechanisms: (1) direct pump-in of the water into the California Aqueduct in exchange for an equal amount of SWP water concurrently made available by DWR to Reclamation at O'Neill Forebay, for subsequent delivery by Reclamation to Westlands; and/or (2) delivery of Kern's Table A water to O'Neill Forebay for subsequent delivery by Reclamation to Westlands and as an exchange, a like amount of Westlands' stored water will be used in Kern's service area. During 2020, a total of 1,958 af of Kern's water was made available to Reclamation at O'Neill Forebay for delivery to Westlands under this agreement. (SWPAO #17020)

Napa/Santa Clara

A letter agreement among DWR, Napa, and Santa Clara, executed December 21, 2016, approved the delivery of up to 8,259 af

of Napa's approved SWP water to Santa Clara through December 31, 2016. Delivery was approved to Santa Clara's turnout(s) located on the South Bay Aqueduct or to San Luis Reservoir and/or at Turnout 59. In exchange, Santa Clara will return to Napa, based on an unbalanced exchange ratio of 2:1, up to 4,130 af of its future SWP water through December 31, 2026. During 2020, a total of 130 af of Santa Clara's Table A water was delivered to Napa, thereby completing this agreement. (SWPAO #16031)

Dudley Ridge/Santa Clara

A letter agreement among DWR, Dudley Ridge, and Santa Clara, executed July 12, 2013, approved the annual conveyance of up to 3,100 af, minus carriage water losses, of non-SWP water to Dudley Ridge and Santa Clara, on a 50:50 shared basis, through December 31, 2025. This non-SWP water is Browns Valley Irrigation District's pre-1914 water rights water. DWR conveys this non-SWP water to Dudley Ridge and Santa Clara under Article 55 of Dudley Ridge's and Santa Clara's respective Water Supply Contracts with DWR. In 2020, Santa Clara elected to decline its option to receive its share of the non-SWP water; and in April 2020, DWR approved the conveyance of up to 3,100 af of this non-SWP water solely to Dudley Ridge for 2020. During 2020, a total of 2,170 af of non-SWP water was conveyed to Dudley Ridge under this agreement. (SWPAO #13020)

Butte

Three multiyear agreements (SWPAO #13013, SWPAO #13014, and SWPAO #13015) were executed in 2014 among DWR, Butte, and several participating SWP Contractors. Butte's Water Supply Contract with DWR provides for Butte to have a maximum Table A amount of 27,500 af per year. Butte determined that 24,000 af per year of its Table A amount is not needed to meet its in-county demands for 2014 through 2021 and requested a

delivery of up to 24,000 af per year of its Table A water to Palmdale, Dudley Ridge, and Kern. Of this, up to 10,000 af of Butte's allocated Table A water is made available to transfer to Palmdale. The remaining balance of up to 14,000 af of Butte's allocated Table A water is shared on a percentage basis of 85.66 percent and 14.34 percent for transfer to Kern and Dudley Ridge, respectively. Butte also determined that the difference of 3,500 af per year (27,500 af minus 24,000 af) may not be fully utilized by Butte for its in-county needs and requested a delivery of a portion of the 3,500 af per year on a percentage basis to Palmdale, Dudley Ridge, and Kern when it becomes available (Butte's Additional Water). In 2020, Butte's allocated Table A water was delivered as follows:

Butte/Kern. A multiyear agreement among DWR, Butte, and Kern, executed August 5, 2014, approved the annual delivery of a portion of Butte's allocated Table A water plus a portion of Butte's Additional Water when it becomes available to four of Kern's member units (Belridge Water Storage District, Berrenda Mesa Water Storage District, Lost Hills Water District, and Wheeler Ridge-Maricopa Water Storage District) in years 2014 through 2021. During 2020, a total of 1,584 af of Butte's Table A water was delivered to Kern under this agreement. (SWPAO #13015)

Butte/Dudley Ridge. A multiyear of this agreement among DWR, Butte, and Dudley Ridge, executed August 5, 2014, approved the annual delivery of a portion of Butte's allocated Table A water plus a portion of Butte's Additional Water when it becomes available to Dudley Ridge in years 2014 through 2021. During 2020, a total of 265 af of Butte's Table A water was delivered to Dudley Ridge under this agreement. (SWPAO #13014)

Butte/Palmdale. A multiyear agreement among DWR, Butte, and Palmdale, executed August 5, 2014, approved the annual delivery

of a portion of Butte's allocated Table A water plus a portion of Butte's Additional Water when it becomes available to Palmdale in years 2014 through 2021. During 2020, a total of 1,322 af of Butte's Table A water was delivered to Palmdale under this agreement. (SWPAO #13013)

Dudley Ridge/Kern/Metropolitan

A multiyear exchange and change in point of delivery agreement among DWR, Dudley Ridge, Kern, and Metropolitan, executed December 16, 2013, approved the delivery of up to 8,700 af of Dudley Ridge's approved SWP water to Metropolitan through December 31, 2017. In exchange, Metropolitan will return to Dudley Ridge, based on an unbalanced exchange ratio of 2:1, up to 4,350 af of its future approved SWP water through December 31, 2022. This agreement allows for the delivery of a portion of Dudley Ridge's approved SWP water to either Metropolitan's service area and/or to Kern's turnout(s) for storage in the Rosedale-Rio Bravo/Irvine Ranch Water District Banking and Exchange Program for later use by Metropolitan in its own service area. During 2020, a total of 96 af of Metropolitan's Table A water was delivered to Dudley Ridge under this agreement. (SWPAO #13012)

Dudley Ridge/Tulare

A multiyear agreement among DWR, Dudley Ridge, and Tulare, executed September 7, 2012, approved the transfer of Dudley Ridge's approved Table A water to Tulare and/or the transfer of Tulare's approved Table A water to Dudley Ridge for landowners who farm in both Dudley Ridge and Tulare service areas with no expected return. This agreement is effective through December 31, 2035. During 2020, a total of 899 af of Tulare's Table A water was delivered under this agreement. (SWPAO #12011)

Kern/Santa Clarita

A letter agreement among DWR, Kern, and Castaic Lake (transferred to Santa Clarita Valley Water Agency in 2018), executed January 23, 2012, approved the delivery of up to 5,000 af of Castaic Lake's approved SWP water to Kern through December 31, 2012. In exchange, Kern will return to Santa Clarita, based on an unbalanced exchange ratio of 2:1, up to 2,500 af of its future SWP water through December 31, 2022. During 2020, a total of 500 af of Kern's Table A water was delivered to Santa Clarita, thereby completing this agreement. (SWPAO #11016)

A letter agreement among DWR, Kern, and Castaic Lake (transferred to Santa Clarita in 2018), executed August 22, 2011, approved the delivery of up to 19,000 af of Castaic Lake's approved SWP water to Kern through December 31, 2011. In exchange, Kern will return to Santa Clarita, based on an unbalanced exchange ratio of 2:1, up to 9,500 af of its future SWP water through December 31, 2021. A subsequent amendment (SWPAO #11010-A), executed July 16, 2012, extended the term to deliver Castaic Lake's SWP water to Kern through December 31, 2012. During 2020, a total of 4,596 af of Kern's Table A water was delivered to Santa Clarita, thereby completing this agreement. (SWPAO #11010 and SWPAO #11010-A)

Dudley Ridge/Kern

A multiyear agreement among DWR, Dudley Ridge, and Kern, executed June 13, 2011, approved the delivery of a portion of Dudley Ridge's Table A water to Kern for landowners who farm in both Dudley Ridge and Kern service areas, with no expected return, through December 31, 2020. During 2020, a total of 18,900 af of Dudley Ridge's water was delivered to Kern under this agreement. (SWPAO #10030)

Kern

An agreement between DWR and Kern, executed November 19, 2010, approved the delivery of up to 50,000 af of Westlands' CVP water to Kern through February 28, 2011, and the return of a like amount of water, less losses, to Westlands through December 31, 2021. Reclamation made Westlands' CVP water available to DWR at O'Neill Forebay for subsequent delivery by DWR to Kern under Article 55 of Kern's Water Supply Contract with DWR. The return water to Westlands would be made available to Reclamation at O'Neill Forebay for delivery by Reclamation to Westlands. During 2020, a total of 2,042 af of Kern's water was provided to Reclamation at O'Neill Forebay for subsequent delivery to Westlands, thereby completing this agreement. (SWPAO #10022)

Crestline/San Gorgonio

A letter agreement among DWR, Crestline, and San Gorgonio, executed July 29, 2010, approved the delivery of up to 1,000 af of Crestline's 2010 Table A water to San Gorgonio through December 31, 2010. In exchange, San Gorgonio would return to Crestline an equal amount, up to 1,000 af, of its future Table A water through December 31, 2020. During 2020, a total of 500 af of San Gorgonio's water was delivered to Crestline under this agreement thereby completing this agreement. (SWPAO #10020)

Empire/Westlands

A long-term change in place of use agreement among DWR, Empire, and Westlands, executed March 3, 2011, approved the annual delivery of up to 2,000 af of Empire's Table A water to Westlands' turnout(s) through April 1, 2027, on behalf of two landowners, Brooks Farms and Newton Brothers Farms, who farm in both Empire and Westlands service areas. The State Water Board issued an order authorizing the long-term change in place

of use on November 21, 2011. During 2020, a total of 284 af of Empire's Table A water was delivered to Westlands under this agreement. (SWPAO #10008)

Tulare/Westlands

A long-term change in place of use agreement among DWR, Tulare, and Westlands, executed January 7, 2011, approved the annual delivery of up to 8,000 af of Tulare's Table A water to Westlands' turnout(s) through April 1, 2027. The delivery is made on behalf of two landowners, Hansen Ranches and Newton Brothers Farms, who farm in both Tulare and Westlands service areas. The State Water Board issued an order authorizing the long-term change in place of use on November 21, 2011, and shall remain in effect through April 1, 2027. During 2020, a total of 2,716 af of Tulare's Table A water was delivered to Westlands under this agreement. (SWPAO #10006)

Napa/Solano

A long-term agreement among DWR, Napa, and Solano, executed October 11, 2010, approved the conveyance of up to 500 af annually of the City of Vallejo's water to Napa's turnout(s) located on the North Bay Aqueduct under Article 55 of Napa's Water Supply Contract with DWR. The City of Vallejo, member agency of Solano, has water rights to this water originating from tributaries Cache Slough and Lindsay Slough of the Sacramento River. The City of Vallejo's water delivered through Napa's turnout(s) will be used in the City of American Canyon within Solano's service area. This agreement is effective through December 31, 2035. An amendment (SWPAO #10005-A) among DWR, Napa, and Solano, executed December 15, 2016, increased the annual amount of the City of Vallejo's water delivered to Napa's turnout(s) from 500 af under the original agreement (SWPAO #10005) to 1,000 af, retroactive January 1, 2014. During 2020,

a total of 500 af of water was conveyed to Napa's turnout(s) under this agreement. (SWPAO #10005 and SWPAO #10005-A)

Kern/Santa Clarita

A long-term change in point of delivery and conveyance agreement among DWR, Castaic Lake (transferred to Santa Clarita Valley Water Agency in 2018), and Kern, executed February 5, 2008, approved the delivery of up to 11,000 af per year of Kern River pre-1914 water rights water acquired by Santa Clarita from Buena Vista Water Storage District, a member unit of Kern, to Santa Clarita. The delivery of the Kern River pre-1914 water rights water to Santa Clarita is accomplished by either (1) a change in point of delivery of a portion of Kern's Table A water to Santa Clarita as an exchange for a like amount of Buena Vista Water Storage District's water, and/or (2) by direct pump-in of the Kern River pre-1914 water rights water to the California Aqueduct and conveyed to Santa Clarita under Article 55 of Santa Clarita's Water Supply Contract with DWR. During 2020, a total of 11,000 af was delivered to Santa Clarita under this agreement. (SWPAO #07008)

Kings/Westlands

A long-term change in point of delivery agreement among DWR, Kings, and Westlands, executed March 24, 2004, approved the delivery of up to 5,000 af of Kings' Table A water annually through Westlands' turnout(s) for use within Kings' service area. This agreement is effective through December 31, 2035. During 2020, a total of 1,802 af of Kings' Article 56(c) carryover water was delivered to Westlands' turnout(s) under this agreement. (SWPAO #04005)

Solano/Cities of Fairfield, Vacaville and Benicia

A settlement agreement among DWR, Solano, and the cities of Fairfield, Vacaville,

and Benicia (Three Cities); and a separate conveyance agreement between DWR and Solano, executed concurrently on May 19, 2003, provides for the delivery of up to 31,620 af per year of settlement water to Solano for use by the Three Cities through December 31, 2035. DWR conveys the settlement water through the North Bay Aqueduct to the Three Cities to help meet their current and future municipal and industrial water needs. During 2020, a total of 5,497 af of settlement water was delivered to Solano for conveyance to the Three Cities under this agreement. (SWPAO #03017)

Kings/Tulare

A long-term change in point of delivery agreement among DWR, Kings, and Tulare, executed March 10, 2006, approved the annual delivery of up to 200 af of Kings' Table A water to Westlands' turnout(s) through December 31, 2035. This water was conveyed to GWF Energy LLC for the Henrietta Peaker Project located within Kings' service area. During 2020, a total of 4 af of Kings' Table A water was delivered to Westlands' turnout(s) under this agreement. (SWPAO #02031)

Kern

A long-term change in point of delivery agreement between DWR and Kern, executed June 8, 2000, approved the annual delivery of a portion of Kern's Table A water to Western Hills Water District (Western Hills). In exchange, Kern will receive a like amount of local water acquired by Western Hills stored in the Pioneer Groundwater Banking Project. On April 21, 2000, the State Water Board approved Western Hills' service area to be included within the authorized SWP place of use. During 2020, a total of 663 af of Kern's Table A water was delivered to Western Hills under this agreement. (SWPAO #01001)

Napa/Solano

A change in point of delivery agreement among DWR, Napa, and Solano, executed December 26, 2001, approved the annual delivery of up to 628 af of Napa's Table A water to the City of Vallejo's Water Treatment Plant located in Solano's service area through December 31, 2025. This water is subsequently conveyed to the City of American Canyon, a member agency of Napa. This agreement is effective through December 31, 2035. During 2020, a total of 58 af of Napa's Table A water was delivered to Solano's turnout(s) under this agreement. (SWPAO #00029)

AVEK/Mojave

A change in point of delivery agreement (SWPAO #97003) among DWR, AVEK, and Mojave, executed November 13, 1997, approved the delivery of up to 2,250 af of Mojave's Table A water annually to AVEK's turnout(s) in Reach 19A of the California Aqueduct through December 31, 2019. Mojave's Table A water is delivered to the solar power generating plant that is located within Mojave's service area, but not located near any of Mojave's delivery facilities. AVEK has the conveyance facilities and agreed to provide water service on Mojave's behalf. An amendment (SWPAO #97003-A) among DWR, Mojave, and AVEK, executed January 12, 2012, extended the term of the original agreement to December 31, 2035, and increased the annual delivery amount to AVEK's turnout(s), from up to 2,250 af to up to 4,800 af. SWPAO #97003-A also approved the delivery of up to 1,800 af per year of Mojave's Table A water through AVEK's turnout(s) for use by the solar power generating plant and the delivery of up to 3,000 af per year of Mojave's approved Table A water to AVEK's groundwater basin as a backup water supply to the plant in the event of an outage on the SWP system. Another amendment (SWPAO #97003-B) among DWR, Mojave, and AVEK, executed April 30, 2015, approved an additional

point of delivery of Mojave's Table A water to AVEK's turnout(s) at Reach 20A of the California Aqueduct. During 2020, a total of 8 af of Mojave's Article 56(c) carryover water was delivered to AVEK's turnout(s) under this agreement. (SWPAO #97003, SWPAO #97003-A, and SWPAO #97003-B)

Introduction of Local Water Agreements

No Introductions of Local Water Agreements were executed in 2020.

Turnout Agreements

Kern County Water Agency

On October 15, 2020, DWR executed an agreement with Kern County Water Agency and Berrenda Mesa Water District for the modification, operation and maintenance of the Berrenda Mesa 3 Turnout, which is located at Milepost 13.08 of the California Aqueduct's Coastal Branch. The Berrenda Mesa 3 Turnout was modified to include a traveling trash screen and conveyor belt system. This Agreement supersedes the February 29, 1984, Amendment No. 1 that added the Berrenda Mesa 3 turnout to the July 16, 1976, operations and maintenance agreement for the Berrenda Mesa 3 turnout.

Del Puerto Water District

On February 10, 2020, DWR executed an agreement with Del Puerto Water District for the construction, operation and maintenance of the Shiraz Ranch turnout, which is located at Milepost 49.52R of the California Aqueduct and has a design capacity of 3 cubic feet per second.

Kern County Water Agency

On September 25, 2020, DWR executed an agreement with Kern County Water Agency and Wheeler Ridge-Maricopa Water Storage District for the modification, operation and maintenance of the Wheeler Ridge-Maricopa-9A turnout, which is

located at Milepost 279.02 of the California Aqueduct. The Wheeler Ridge-Maricopa-9A turnout was modified to include a traveling water screen, conveyor belt system, and associated electrical work. This agreement amends and supplements, but does not supersede, the March 4, 1971, Operation Agreement.

Metropolitan Water District of Southern California and San Bernardino Valley Municipal Water District

On July 23, 2020, the State Water Project Analysis Office executed an agreement with Metropolitan and San Bernardino Valley Municipal Water District for the construction, operation and maintenance of the Santa Ana River turnout, which is located at Milepost 423.76 of the California Aqueduct's Santa Ana Valley Pipeline. This agreement terminates the November 26, 1973, agreement between DWR and Metropolitan and transfers the ownership, as well as operation and maintenance responsibilities, of the turnout to San Bernardino Valley Municipal Water District.

Palmdale Water District

On December 7, 2020, DWR executed an agreement with Palmdale Water District for the operation and maintenance of the Palmdale turnout, which is located at Milepost 346.98 of the California Aqueduct. This agreement replaces and supersedes any agreement for the operation and maintenance of the Palmdale turnout, including the March 24, 1986, agreement.

Activities Related to the Monterey Amendments

Storage of Water Outside SWP Contractor Service Areas

Pursuant to Article 56(c) of the Monterey Amendments, eight SWP 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. The active change in point of delivery agreements are listed in Table 8-1. These agreements include provisions for conveyance to and from storage, and recovery methods by exchange and/or pump-in to the California Aqueduct. During 2020, no water was conveyed to storage, and 73,718 af was recovered from storage.

Turn-Back Water Pool Programs

In 2020, no SWP Contractor participated in the 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 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 Sacramento-San Joaquin Delta (Delta) requirements are met. During Delta excess conditions, Solano and Napa are contracted to receive Article 21 deliveries in all years. During 2020, 994 af of Article 21 water was delivered to SWP Contractors.

Table 8-2 lists Article 21 water delivered to SWP Contractors.

Flexible Storage Program

Pursuant to Article 54 of the Monterey Amendments, the Flexible Storage Program provides the option to SWP Contractors participating in the repayment of the capital costs of Castaic Lake and Lake Perris to withdraw water in excess of approved deliveries. The program objective is to provide additional flexibility to benefit local water management activities. Participating

SWP Contractors are given five years to replace withdrawn stored water 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 Contractors participating in the Castaic Lake Flexible Storage Program include Metropolitan, Ventura, and Santa Clarita. 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 Contractor allowed to withdraw water, up to a maximum of 65,000 af, from Lake Perris.

In 2020, Metropolitan started the year with a flexible storage balance due of zero af. Metropolitan did not withdraw any flexible storage water in 2020 and replaced zero af, leaving Metropolitan with an end-of-year flexible storage balance due of zero. Santa Clarita started the year with a flexible storage balance due of zero af. Santa Clarita did not withdraw any flexible storage water in 2020, and replaced zero af, leaving Santa Clarita with an end-of-year flexible storage balance due of zero.

Carryover Program

Pursuant to Article 56 of the Monterey Amendments, SWP Contractors can elect to store SWP water outside of their respective service areas and carry the water 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

Table 8-1 Storage of Water Outside SWP Water Contractor Service Areas in 2020 (acre-feet)¹

Contractor	Contract Status	Storage Provider	To Storage (includes losses, if any)	From Storage	Return By
Alameda-Zone 7					
SWPAO #00037 ^a	Continuing	Semitropic	0	1,000	2035
SWPAO #01035 ^a	Continuing	Semitropic	0	0	2035
SWPAO #02010 ^a	Continuing	Semitropic	0	0	2035
SWPAO #03008 ^a	Continuing	Semitropic	0	0	2035
SWPAO #04017	Continuing	Semitropic	0	0	2035
SWPAO #06010	Continuing	Cawelo	0	0	2035
Alameda County					
SWPAO #07005	Continuing	Semitropic	0	832	2035
SWPAO #10009	Continuing	Semitropic	0	12,069	2035
Dudley Ridge					
<i>SWP Water</i>					
SWPAO #08050	Continuing	Kern Water Bank	0	8,450	2035
SWPAO #09002	Continuing	Semitropic	0	0	2035
<i>Non-SWP Water</i>					
SWPAO #09040 ^a	Continuing	Kern Water Bank	0	0	2020
SWPAO #03053	Continuing	Cawelo	0	0	2035
Metropolitan					
SWPAO #95010	Continuing	Semitropic	0	5,090	2035
SWPAO #01013 ^a	Continuing	Arvin-Edison	0	0	2035
SWPAO #03019	Continuing	Kern Delta	0	11,730	2035
SWPAO #11011	Continuing	Mojave	0	0	2035
SWPAO #16006	Continuing	AVEK	0	0	2025
Santa Barbara					
SWPAO #17022	Continuing	Semitropic	0	0	2035
San Bernardino					
SWPAO #11015	Continuing	Kern Delta	0	5,000	2035
Santa Clara					
<i>SWP Water</i>					
SWPAO #06011	Continuing	Semitropic	0	9,841	2035
SWPAO #10012	Continuing	Semitropic	0	0	2035
<i>Non-SWP Water</i>					
SWPAO #06012 ^a	Continuing	Semitropic	0	3,864	2035
SWPAO #10029	Continuing	Semitropic	0	3,095	2035
SWPAO #11012	Continuing	Semitropic	0	0	2035
Santa Clarita (formal name change, per SWPAO #18006)					
SWPAO #02015 ^a	Continuing	Semitropic	0	2,713	2022
SWPAO #03060 ^a	Continuing	Semitropic	0	0	2024
SWPAO #05016	Continuing	Rosedale-Rio Bravo	0	10,034	2035
SWPAO #16032	Continuing	Semitropic	0	0	2035
Total			0	73,718	

¹ Storage amounts in this table may differ from the amounts in Table 8-6 due to water-type reclassification.^a Indicates amendments to agreement.

Table 8-2 Article 21 Water Deliveries (acre-feet)

Contractor	Purchased
Napa	994
Total	994

is allocated among the SWP Contractors requesting storage in proportion to their annual Table A amount for that year.

In 2020, a total to 380,937 af of carryover water was delivered. Twenty-six SWP Contractors took delivery of Article 56(c) water in the amount of 379,135 af of previously approved Table A water, carried over as extended carryover. A total of 1,802 af of SWP Contractors' carryover water was delivered to non-SWP Contractors.

2020 Water Transfers

A total of 150,011 af of water was made available through SWP facilities to SWP and CVP buyers from a combination of reservoir releases and groundwater substitution. See Table 8-3 for a list of sellers that provided water for transfer in 2020. A total of 98,718 af of transfer water was delivered to Kern, Alameda County, Dudley Ridge, Kings, Santa Clara, San Luis & Delta-Mendota Water Authority, and Westlands. Carriage water losses of 30 percent were assessed for all transfer water originating in the Sacramento River watershed. A conveyance loss of 10 percent was applied to the transfer from the Merced River. See Table 8-4 for a list of the SWP buyers and the quantities delivered.

Lower Yuba River Accord

For Lower Yuba River Accord background information, see the sidebar, Lower Yuba River Accord.

Component 1, 2, 3, and 4 Water Deliveries

In 2020, the Sacramento Valley Water Year Hydrologic Classification was dry. The total quantity of Component 1 water was 43,538 af; there was no Component 2 water or Component 3 water; and Component 4 water was 77,000 af.

For additional information about the Lower Yuba River Accord, see previous Bulletin 132 editions.

Agreements with Non-SWP Contractors

In addition to negotiating agreements with SWP Contractors to provide for specified water deliveries, DWR also enters into agreements with non-SWP Contractors to provide water conveyance service.

Reclamation and Cross Valley Canal Contractors

Reclamation supplies CVP water that DWR conveys through the California Aqueduct to Reach 12E or to storage in San Luis Reservoir for County of Fresno, County of Tulare, Hills Valley Irrigation District, Kern-Tulare Water District, Pixley Irrigation District, and Tri-Valley Water District (Cross Valley Canal Contractors). The contracts between DWR, Reclamation, and Cross Valley Canal Contractors have been serially renewed, most recently on March 1, 2020.

County of Fresno

On March 1, 2020, DWR, Reclamation, and County of Fresno executed federal contract 14-06-200-8292A-IR18 (SWPAO #20302). SWPAO #20302 renewed federal contract 14-06-200-8292A-IR17 (SWPAO #18301). In 2020, DWR delivered 3,155 af to the County of Fresno under this agreement.

Table 8-3 2020 Water Transfers Seller Activities (acre-feet)

Sellers	Buyers	SWPAO #	Transfer Action	Transfer Water Available at Point of Transfer ¹
Butte Water District	Kern, Alameda County, Dudley Ridge, Kings ⁴	20-700	Groundwater Substitution	2,310
Cordua Irrigation District ²	Kern, Alameda County, Dudley Ridge, Kings	20-701	Groundwater Substitution	7,142
Garden Highway Mutual Water Company	Kern, Alameda County, Dudley Ridge, Kings	20-702	Groundwater Substitution	4,215
Sutter Extension Water District	Kern, Alameda County, Dudley Ridge, Kings	20-704	Groundwater Substitution	2,308
Tule Basin Farms	Kern, Alameda County, Dudley Ridge, Kings	20-705	Groundwater Substitution	2,462
Plumas Mutual Water Company	Kern, Alameda County, Dudley Ridge, Kings	20-724	Groundwater Substitution	4,467
South Sutter Water District	Kern, Alameda County, Dudley Ridge, Kings	20-725	Groundwater Substitution	9,309
Carmichael Water District	Kern, Alameda County, Dudley Ridge, Kings	20-754	Groundwater Substitution	1,432
City of Sacramento	Kern, Alameda County, Dudley Ridge, Kings	20-757	Groundwater Substitution	11,342
Golden State Water Company	Kern, Alameda County, Dudley Ridge, Kings	20-759	Groundwater Substitution	2,107
Anderson-Cottonwood Irrigation District	San Luis & Delta-Mendota Water Authority	20-707	Groundwater Substitution	1,957
Pelger Mutual Water Company	San Luis & Delta-Mendota Water Authority	20-711	Groundwater Substitution	1,391
Reclamation District 1004	San Luis & Delta-Mendota Water Authority	20-713	Groundwater Substitution	1,354
Henle Family Limited Partnership	San Luis & Delta-Mendota Water Authority	20-730	Groundwater Substitution	191
Pelger Road 1700, LLC	San Luis & Delta-Mendota Water Authority	20-731	Groundwater Substitution	1,720
Sutter Water District	San Luis & Delta-Mendota Water Authority	20-732	Groundwater Substitution	4,631
Windswept Orchards, LLC	San Luis & Delta-Mendota Water Authority	20-733	Groundwater Substitution	570
Pleasant Grove-Verona Mutual Water Company	San Luis & Delta-Mendota Water Authority	20-712	Groundwater Substitution	5,101
Te Velda Revocable Family Trust	San Luis & Delta-Mendota Water Authority	20-714	Groundwater Substitution	821
River Garden Farms	San Luis & Delta-Mendota Water Authority	20-751	Groundwater Substitution	3,431
Natomas Central Mutual Water Company	San Luis & Delta-Mendota Water Authority	20-758	Groundwater Substitution	5,950
Placer County Water Agency	Westlands	20-715	Reservoir Release	19,000
Merced Irrigation District ³	Kern, Santa Clara ⁵	20-717	Reservoir Release	45,000
Foresthill Public Utility District	Westlands	20-740	Reservoir Release	1,900
Georgetown Divide Public Utility	Westlands	20-741	Reservoir Release	1,900
El Dorado Irrigation District (Weber)	Westlands	20-752	Reservoir Release	665
El Dorado Irrigation District (Jenkinson)	Westlands	20-753	Reservoir Release	7,335
Total				150,011

¹ After adjustments, streamflow depletion, and conveyance losses unless otherwise noted.

² Cordua Irrigation District made available 7,740 af at the Point of Transfer (the Yuba River Marysville Gage) from additional 9,198 af of groundwater pumping less 6.5 percent streamflow depletion upstream of the Marysville Gage and 10 percent June fisheries releases. 7,142 af of transfer water entered the Delta after deducting 6.5 percent streamflow depletion downstream of Marysville Gage.

³ Merced Irrigation District made available 45,000 af Merced River at Cressy; however, there was 4,564 af loss between Merced River at Cressy and Merced River near Stevinson, and 12,424 af lost between Merced River near Stevinson and Merced River near Vernalis. After 10 percent San Joaquin River conveyance loss, 25,211 [(45,000 - 4,564 - 12,424) * 90 percent] af was available for export.

⁴ Proportionate share: Kern (91.37 percent), Alameda County (3.91 percent), Dudley Ridge (3.85 percent), and Kings (0.87 percent).

⁵ Proportionate share: Kern (66.67 percent) and Santa Clara (33.33 percent).

County of Tulare

On March 1, 2020, DWR, Reclamation, and County of Tulare executed federal contract 14-06-200-8293A-IR18 (SWPAO #20301). SWPAO #20301 reviewed federal contract 14-06-200-9293-IR17 (SWPAO #19302). In 2020, DWR did not deliver water under this agreement.

Hills Valley Irrigation District

On March 1, 2020, DWR, Reclamation, and Hills Valley Irrigation District executed federal contract 14-06-200-8466A-IR18 (SWPAO #20303). SWPAO #20303 renewed federal contract 14-06-200-8466A-IR17 (SWPAO #18303). In 2020, DWR did not deliver water under this agreement.

Table 8-4 2020 Water Transfer Buyer Activities (acre-feet)

Buyers	Water Available to Buyer ¹	Carriage Water Losses ²	Net Water Delivered
Alameda County	1,841	552	1,289
Dudley Ridge	1,813	544	1,269
Kern	61,706	14,777	46,929
Kings	410	123	287
Santa Clara	9,336	934	8,402
San Luis & Delta-Mendota Water Authority	27,117	8,135	18,982
Westlands	30,800	9,240	21,560
Total	133,023	34,305	98,718

¹ Net transfer water made available after adjustment to the transfer water made available at point of transfer due to verified losses.

² Carriage water losses of 30 percent were applied to all transfers originating in the Sacramento River watershed. A conveyance loss of 10 percent was applied to the transfer from the Merced River.

Kern-Tulare Water District

On March 1, 2020, DWR, Reclamation, and Kern-Tulare Water District executed federal contract 14-06-200-8601A-IR18 (SWPAO #20304). SWPAO #20304 renewed federal contract 14-06-200-8466A-IR17 (SWPAO #18304). In 2020, DWR delivered 3,116 af to Kern-Tulare Water District.

Kern-Tulare Water District/Rag Gulch Water District

On January 1, 2009, Rag Gulch Water District merged into Kern-Tulare Water District. The Rag Gulch Water District's contracts remain separate from Kern-Tulare Water District's original agreement. Kern-Tulare Water District is responsible for the former Rag Gulch Water District agreements.

On March 1, 2020, DWR, Reclamation, and Kern-Tulare Water District executed federal contract 14-06-200-8367A-IR18 (SWPAO #20307). SWPAO #20307 renewed federal contract 14-06-200-8367A-IR16 (SWPAO #18307). In 2020, DWR did not deliver water under this agreement.

Lower Tule River Irrigation District

On March 1, 2020, DWR, Reclamation, and Lower Tule River Irrigation District executed federal contract 14-06-200-8237A-IR18 (SWPAO #20305). SWPAO #20305 renewed federal contract 14-06-200-8237A-IR17 (SWPAO #18303). In 2020, DWR did not deliver water under this agreement.

On July 27, 2020, DWR executed a letter agreement with Lower Tule River Irrigation District to add Reach 3 of the California Aqueduct as a point of delivery for SWPAO #20305 until February 28, 2021 (SWPAO #20310). In 2020, DWR delivered 1,500 af for Lower Tule River Irrigation District.

Pixley Irrigation District

On March 1, 2020, DWR, Reclamation, and Pixley Irrigation District executed federal contract 14-06-200-8238A-IR18 (SWPAO #20306). SWPAO #20306 renewed federal contract 14-06-200-8238A-IR17 (SWPAO #18306). In 2020, DWR delivered 1,275 af under this agreement.

Tri-Valley Water District

On March 1, 2020, DWR, Reclamation, and Tri-Valley Water District executed federal contract 14-06-200-8565A-IR18 (SWPAO #20308). SWPAO #20308 renewed federal contract 14-06-200-8238A-IR17 (SWPAO #18308). In 2020, DWR did not deliver water under this agreement.

Reclamation—Joint Point of Diversion

On August 10, 2020, DWR executed a joint point of diversion agreement (SWPAO #19304) with Reclamation. Under this agreement, DWR makes excess SWP conveyance capacity available to Reclamation for the conveyance of water from the Delta at Banks Pumping Plant. This includes: (1) making up for curtailed

Lower Yuba River Accord

The Lower Yuba River Accord (Yuba Accord) settled long standing litigation over instream flow issues associated with the operation of the Yuba River Development Project. Operated by the Yuba County Water Agency (Yuba), the Yuba River Development Project's primary purposes are water supply, flood control, power generation, recreation, and environmental protection and enhancement.

The Yuba Accord was developed collaboratively by fisheries, environmental and agricultural interests, and local, State, and federal agencies. It provides a framework for a comprehensive, science-based, consensus-oriented program to protect and enhance 24 miles of the lower Yuba River extending from Englebright Dam downstream to the Yuba River's confluence with the Feather River. The Yuba Accord establishes instream flow requirements to provide sufficient flows in the river for fisheries and to allow Yuba to meet local water needs and transfer water to other users. It provides Yuba with a source of revenue for local activities, including a comprehensive conjunctive use program, flood control improvements, and a lower Yuba River fisheries program. It also improves water supply reliability for the State Water Project (SWP) and Central Valley Project (CVP).

The Yuba Accord is based on three separate but related agreements: a water purchase agreement; a set of conjunctive use agreements; and a fisheries agreement. The agreements were executed in late 2007 and early 2008, and the State Water Resources Control Board approved the Yuba Accord on March 25, 2008.

Fisheries Agreement

The Fisheries Agreement is between DWR, Yuba, the California Department of Fish and Wildlife, Friends of the River, South Yuba Citizens League, The Bay Institute, and Trout Unlimited. The U.S. Fish and Wildlife Service and National Marine Fisheries Service participate under the Statement of Support for Proposed Lower Yuba River Fisheries Agreement. The Fisheries Agreement establishes instream flow requirements to benefit salmon, steelhead, and other fish species in the lower Yuba River by improving instream habitat conditions. The agreement also establishes a long-term fisheries monitoring, studies, and enhancement program for the lower Yuba River.

Conjunctive Use Agreements

The conjunctive use agreements between Yuba and its member units establish a comprehensive conjunctive use program that integrates surface water and groundwater supplies with the local irrigation districts and mutual water companies that Yuba serves in Yuba County. Groundwater supplies will help meet local water supply needs in dry years, facilitating Yuba's operation of its storage facilities to meet the instream flow requirements called for in the Fisheries Agreement and commitments of water transfer in the Water Purchase Agreement.

Water Purchase Agreement

The Water Purchase Agreement is between Yuba and DWR. It creates a long-term water transfer program, allowing Yuba River water to be transferred to other users in California and to provide additional water to offset Sacramento-San Joaquin Delta (Delta) SWP and CVP export reductions for the protection and restoration of Delta fisheries. The Water Purchase Agreement has been amended seven times, and 23 agencies have agreed to continue their participation through 2025.

Under the agreement, the range of transfer volumes is segregated into four components, which reflect variations in pricing, purpose of use, and schedule:

Component 1 water includes up to 60,000 acre-feet (af) purchased by DWR and Reclamation annually.

Component 2 water includes water that DWR and Reclamation purchase from Yuba—up to 15,000 af in a dry year and up to 30,000 af in a critical year.

Component 3 water includes all storage component water above Components 1 and 2 quantities purchased by DWR and Reclamation.

Component 4 water includes groundwater supplies that Yuba may offer to DWR and Reclamation for purchase.

water exports from Jones Pumping Plant associated with improving conditions for fish in the Delta; (2) replacing water exports foregone during maintenance and repair of CVP facilities between the Delta and O'Neill Forebay; and (3) conveying Reclamation's share of Component 1 water provided under the Lower Yuba River Accord. As part of the joint point of diversion agreement, the first 21,000 af conveyed through Banks Pumping Plant include a charge for the temporary barriers in the Delta.

In 2020, DWR pumped 61,092 af of CVP water at Banks Pumping Plant. After applying a 2 percent deduction for contract conveyance losses, DWR conveyed 59,870 af of CVP water to O'Neill Forebay.

Reclamation and Kern National Wildlife Refuge—U.S. Fish and Wildlife Services

A letter agreement sent by DWR on September 17, 2012, and accepted by Reclamation on September 21, 2012, provided for DWR to deliver up to 30,500 af of CVP water to the Kern National Wildlife Refuge from June 1, 2012, through September 30, 2028. Under the agreement, DWR conveys CVP water from the end of Reach 7 of the California Aqueduct to Buena Vista Water Storage District's turnouts in Reaches 10A and 12E. DWR conveyed a total of 21,447 af during 2020 (SWPAO #12309).

Reclamation and San Joaquin Valley National Cemetery—U.S. Department of Veterans Affairs

A pending letter agreement among DWR, Reclamation, and the U.S. Department of Veterans Affairs provides 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 256 af to the national cemetery through Reach 2B of the California Aqueduct in 2020 under this pending agreement. (SWPAO #10310)

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 685 af in 2020 under this pending agreement. (SWPAO #04300)

Delta Settlement Agreements

DWR negotiated contracts with various Delta agencies to settle adverse impact claims by the agencies against DWR due to operation of the SWP. Water deliveries to these agencies in 2020 are reported in the sections covering deliveries to non-SWP Contractors later in this chapter.

City of Antioch

On July 31, 2020, DWR and the City of Antioch entered into a settlement agreement that replaced and superseded the 1968 agreement in its entirety (Agreement #7312020). According to the new settlement agreement, DWR compensates the City of Antioch \$27 million toward the cost of construction of the Brackish

Water Desalination Project to desalt water diverted from the Delta. The City of Antioch has till January 1, 2023, to commence the construction of the Brackish Water Desalination Project. DWR will reimburse the City of Antioch for the purchase of substitute water when the number of usable days as defined by contract is below 208 till January 1, 2023. This agreement settles all disputes and release claims now or in the future pertaining to potential impacts of SWP operations on Antioch.

In 2020, DWR determined that 77 usable days were available to the City of Antioch under the contract. This resulted in 137 days needing to be reimbursed. DWR used four days of carryover credit from the previous year to offset water-day deficiency. This resulted in 133 days needing to be reimbursed. DWR reimbursed the City of Antioch \$1,571,460.99 for the purchase of substitute water.

Contra Costa Water District

DWR and Contra Costa Water District (Contra Costa) executed an agreement on April 21, 1967, that requires DWR to reimburse Contra Costa for decreases in availability of usable river water in Mallard Slough caused by operation of the SWP. DWR reimburses Contra Costa for the purchase of substitute water when the number of usable days, as defined by the contract, is below 142. Credits for the number of usable days above 142 in this same period accrue to offset the water-day deficiencies in future years.

In 2020, DWR determined that no usable days were available to Contra Costa under the contract. This resulted in 142 days of unadjusted deficiency. Using 10 days of carryover credit from the previous year resulted in 132 days of adjusted deficiency. DWR reimbursed Contra Costa \$438,727 for contract deficiencies.

East Contra Costa Irrigation District

DWR and East Contra Costa Irrigation District (East Contra Costa) executed an agreement on January 7, 1981, that requires East Contra Costa to make payments to DWR for the assurance of adequate water supply and specific water quality from Delta channels. An agreement between DWR, East Contra Costa, and Contra Costa, executed April 11, 1991, allows for intake at Rock Slough on Contra Costa Canal by Contra Costa to treat water for municipal and industrial users within East Contra Costa's service area. It was amended February 7, 2000, to allow diversions under both contracts at the Rock Slough intake of the Contra Costa Canal and the Los Vaqueros Reservoir intake at Old River.

East Contra Costa paid DWR \$47,681 for the assurance of adequate water supply and specific water quality in 2020.

North Delta Water Agency

North Delta Water Agency's (North Delta) agreement with DWR, executed January 28, 1981, requires North Delta to make payments to DWR for the assurance of adequate water supply and specific water quality from Delta channels. An amendment signed on January 21, 1997, changed the monitoring station at Emmaton to Three Mile Slough and reduced North Delta's payments in lieu of assessments on land DWR owns within North Delta's jurisdiction. A memorandum of understanding was executed on May 26, 1998, to establish the joint position with respect to implementation of water quality objectives contained in the 1995 Bay-Delta water quality control plan.

An agreement executed on May 21, 2008, resolved a lawsuit regarding the assessment of California Department of Fish and Wildlife's (DFW) land within North Delta boundaries. Under this agreement, DWR agreed to reimburse North Delta for lands owned by DFW within North Delta's

boundaries. The 2008 agreement expired May 4, 2011. An agreement executed on June 6, 2019 between DWR and DFW settled the issues related to the DFW-owned lands within North Delta's boundary by extending credit to the amount equal to the charge levied against DFW property within North Delta (Agreement #346137). This agreement offers an opportunity for both DWR and DFW to partner on restoration and environmental projects within North Delta by applying for mitigation credit for the restoration projects performed in the North Delta by DFW. In 2020, DWR applied \$167,805 toward DFW lands within North Delta. DWR invoiced North Delta \$617,836 for the assurance of adequate water supply and specific water quality in 2020.

Del Puerto

An agreement among DWR, Reclamation, Del Puerto, and Oak Flat, executed September 16, 2020, approved the exchange of up to 1,000 af of Del Puerto's CVP water for an equivalent amount of Oak Flat's 2020 and/or 2021 Table A water through July 15, 2021. DWR will deliver up to 1,000 af of Oak Flat's Table A water to Oak Flat's turnout(s) located on the California Aqueduct for use by Del Puerto within Del Puerto's service area. In exchange, Reclamation will make an equivalent amount of Del Puerto's CVP water available to DWR at O'Neill Forebay. DWR filed a petition with the State Water Board and received a one-year approval order, effective July 16, 2020, for the consolidation of SWP and CVP places of use. During 2020, a total of 212 af of water was delivered to Oak Flat's turnout(s) under this agreement. (SWPAO #20024)

An agreement among DWR, Reclamation, Del Puerto, and Oak Flat, executed October 21, 2019, approved the exchange of up to 2,000 af of Del Puerto's CVP water for an equivalent amount of Oak Flat's 2019 and/or 2020 Table A water through July 13, 2020. DWR would deliver up to 2,000 af

of Oak Flat's Table A water to Oak Flat's turnout(s) located on the California Aqueduct for use by Del Puerto within Del Puerto's service area. In exchange, Reclamation would make an equivalent amount of Del Puerto's CVP water available to DWR at O'Neill Forebay. DWR filed a petition with State Water Board, and received a one-year approval order, effective July 15, 2019, for the consolidation of SWP and CVP places of use. During 2020, a total of 257 af of water was delivered to Oak Flat's turnout(s) under this agreement. (SWPAO #19024)

Water Deliveries

The SWP delivers water for a variety of beneficial uses. In addition to delivering Table A water to SWP Contractors, the SWP

- conveys water to other public and local agencies through special contracts and agreements;
- provides water for wildlife and recreational uses; and
- stores, releases, and delivers local runoff water from SWP facilities to agencies that hold local water rights.

Summary of 2020 Water Deliveries

In 2020, a total of 2,686,537 af of SWP and non-SWP water was delivered to 29 SWP Contractors and 24 non-SWP agencies. The SWP portion totaled 1,462,314 af, and the non-SWP portion totaled 1,224,223 af.

Figure 8-1 shows amounts of water delivered to various locations during 2020.

SWP

DWR conveys SWP water as defined in the SWP Water Supply Contracts. SWP water includes current year Table A water, transfer and exchange of Table A water, carryover of Table A water, and Article 21 water.

The 2,686,537 af delivered to SWP Contractors was categorized as follows:

- 552,968 af of Table A water
- 55,076 af of transfers and exchanges of Table A water among SWP Contractors
- 379,135 af of 2019 carryover water
- 944 af of Article 21 water
- 209,191 af of water bank recovery
- 21,589 af of delivery of backup water
- 5,497 af of settlement water
- 786 af for parks and recreation
- 17,775 af of local water
- 16,559 af of permit water
- 196,158 af of other non-SWP programs

Non-SWP

DWR conveys non-SWP water to various non-SWP Contractors according to the terms of water rights and water transfer and exchange agreements. Non-SWP water may include contracted supply; water bank recovery water; local water; recreation water; fish and wildlife enhancement water; water delivered to Cross Valley Canal contractors, Reclamation, and Delta agencies; and annual contracts.

The 1,224,223 af portion delivered to 24 non-SWP agencies was categorized accordingly:

- 7,372 af of SWP contracted supply
- No delivery under Article 21 transfer
- 55,854 af of other non-SWP programs
- 1,132,846 af of regulated delivery of local supply
- 6 af for parks and recreation
- 421 af for fish and wildlife
- 11,922 af of Cross Valley Canal Contractors
- 21,447 af for Kern National Wildlife Refuge
- 941 af for annual contracts



Figure 8-1 Water Delivered in 2020 and Delivery Locations of SWP Contractors and Feather River Area Districts with Water Rights Agreements with DWR

Allocation of Table A Water

Each year, by October 1, SWP Contractors submit initial requests for Table A water 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. The Table A allocations are based on operations studies that assume 90 percent exceedance of historical water supply (where exceedance refers to the possibility that water supply in the coming year will be less than the historical average annual water supply), current reservoir storage, and total requests by the SWP 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 exceedance criterion is fairly conservative.

On October 1, 2019, SWP Contractors submitted initial requests for 2020 totaling 4.17 million af.

DWR approved delivery of 0.42 million af on November 27, 2019, resulting in initial Table A amounts of 10 percent of SWP Contractor requests. DWR increased the 2020 Table A amounts to 0.83 million af, for a final allocation of 20 percent, on May 22, 2020.

Table 8-5 lists the changes in Table A amounts that were approved by DWR based on updated hydrologic conditions.

Specific Water Delivery Information

Specific information about water deliveries made to SWP Contractors and other agencies

Table 8-5 2020 Allocated Table A Amounts

Notice to SWP Contractors No.	Allocation Amount (maf)	Percentage of Requested Water
19-12	0.42	10
20-02	0.63	15
20-05	0.83	20

during 2020, and historical deliveries from 1962 through 2020, is presented in the following four sections, each with a corresponding table located at the end of the chapter.

Please note that the water delivery figures listed in the tables are accurate at the time of this Bulletin 132 publication, but small volumes of water may be reclassified over time pursuant to SWP 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’s State Water Project Analysis Office.

Water Delivered to SWP Contractors in 2020 by Service Area

Table 8-6 shows SWP water delivered in 2020 by service area. The following information is arranged by column number.

Columns 1 through 5 show a detailed breakdown of Table A water delivered to SWP Contractors in 2020. (The amounts also include SWP water that was delivered to non-SWP Contractors.)

Column 3 shows no water delivered under the Water Pool Program in 2020.

Column 4 shows 380,937 af was carried over from previous years for delivery in 2020. The carryover water included deliveries to non-SWP agencies.

The carryover program was designed to encourage the most effective and beneficial use of water and to avoid obligating SWP Contractors to use or lose water by December 31 of each year. The SWP Contractors’ Water Supply 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).

Column 5 shows all Table A water delivered in 2020—a total of 994,551 af.

Column 6 shows Article 21 water delivered to SWP Contractors. In 2020, a total of 944 af of Article 21 water was delivered.

Column 7 shows zero af of other SWP water. Other SWP water consists of settlement water delivered to Solano.

Column 8 shows a total of 995,545 af of SWP water was delivered in 2020. This includes total Table A water not transferred, exchanged, or stored; Table A water transferred or exchanged; Multiyear Water Pool Program water; carryover; and other SWP water consisting of settlement water.

Columns 9, 10, and 11 include deliveries of non-SWP water to SWP Contractors. Column 9 shows delivery of 21,589 af of backup water, Column 10 shows 209,191 af of water bank recovery, and Column 11 shows 235,989 af of other non-SWP water. Other non-SWP water is local and permit water that an SWP Contractor has a water right to, or has purchased from, exchanged with, or transferred from non-SWP agencies.

Column 12 shows total amounts of water delivered to SWP Contractors. In 2020, the SWP delivered 1,462,314 af of water to the 29 SWP Contractors.

Water Delivered in 2020 by Month

Table 8-7 shows water delivery amounts by month. During 2020, the SWP provided water service to 53 agencies, including 29 SWP Contractors. The following discussion summarizes the SWP and non-SWP water deliveries.

SWP Water. SWP water, as defined in the SWP 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 for 2020 is found under the “Miscellaneous Agreements with SWP Contractors” section in this chapter’s preceding pages or is listed below.

Deliveries in the North Bay Area included 22,056 af of settlement and permit waters delivered to Napa, Solano, and the cities of Fairfield, Vacaville, and Benicia.

In the South Bay Area, a total of 15,986 af of local water was delivered to Alameda-Zone 7 and Alameda County. These two South Bay Aqueduct SWP Contractors hold water rights to runoff from the Lake Del Valle watershed.

In the Southern California area, 1,034 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 the Crestline area.

Non-SWP Water. In 2020, DWR used SWP facilities to convey non-SWP water for various non-SWP agencies according to the terms of water rights and water transfer and exchange agreements. Detailed information concerning those deliveries is in this chapter.

Last Chance Creek Water District. On December 22, 2020, DWR and Last Chance Creek Water District renewed their contract for delivery of water till December 31, 2030 (SWPAO #20309). According to the agreement, the annual quantity of delivery to Last Chance Creek Water District shall not be less than 5,000 af or exceed 12,000 af depending on storage on Frenchman Lake. In 2020, a total of 7,748 af was supplied from Frenchman Lake to Last Chance Creek Water District.

Water Rights Water. Water in this category is transported through SWP facilities to agencies with settlement agreements with DWR. Some water passes through SWP

transportation facilities; some is stored in SWP reservoirs for release later. In 2020, the following water was delivered to the Feather River, North Bay, South Bay, Delta, and Southern California areas, as summarized below.

Seven non-SWP Contractors received 1,117,314 af, under their water right settlement agreements, as follows:

- Garden Highway Mutual Water Company, 10,609 af
- Joint Water Districts Board, 738,019 af
- Oswald Water District, 2,230 af
- Plumas Mutual Water Company, 8,865 af
- Tudor Mutual Water Company, 3,768 af
- Western Canal Water District, 353,306 af
- Valverde and Ramelli, 517 af

DWR conveyed local water totaling 7,597 af through SWP facilities on behalf of two non-SWP agencies:

- Thermalito Water and Sewer District (formerly Thermalito Irrigation District) 2,172 af
- South Feather Water and Power Agency (formerly Oroville-Wyandotte Irrigation District), 5,425 af

Delta. In the Delta, no water was delivered to Byron-Bethany 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, a total of 22,056 af of Settlement and Permit waters to Napa, Solano Water County Water Agency and Cities of Fairfield, Vacaville, and Benicia.

South Bay Area. In the South Bay Area, a total of 10,550 af of local water was delivered to Alameda-Zone 7 and Alameda County. These two South Bay Aqueduct SWP

Contractors hold water rights to runoff from the Lake Del Valle watershed.

Southern California Area. In the Southern California area, 526 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 the Crestline Lake Arrowhead area.

Annual Table A Water and Water Conveyed by Type Since 1962

Table 8-8 shows information on annual Table A water and water conveyed, by type, for the previous 59 years. The following discussion is arranged according to column numbers.

Annual Table A Water. Columns 1 through 7 show the amount of SWP Contractors' annual maximum Table A water by area for years 1962 through 2020 as specified in the Table A schedules of the SWP 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 Contractor may request for years 1962 through 2035 can be found in Table B-4 of 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 2020. In 2020, a total of 994,551 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 2020. Article 21 and unscheduled water are 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 2020, a total of 994 af of Article 21 or unscheduled water was delivered.

Other Water. Column 10 includes amounts of water classified as other water delivered in 2020, including non-SWP water conveyed through SWP facilities and regulated delivery of local supply. In 2020, a total of 557,547 af of other water was delivered.

Feather River Diversions. Column 11 includes amounts of water from the Feather River delivered according to agreements with non-SWP Contractors on the Feather River, including Last Chance Creek Water District. In 2020, a total of 1,132,659 af was delivered to agencies in the Feather River area.

Recreation and Fish and Wildlife Water. Column 12 shows water conveyed for recreational use or to improve water quality for fish and wildlife. In 2020, a total of 786 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 South Bay Aqueduct, 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.

SWP Water Delivered Since 1962

Table 8-9 shows SWP water delivered by category from 1962 to 2020.

Table 8-6 Water Delivered to SWP Contractors in 2020, by Service Area (acre-feet)^{1, 2}

Service Area and SWP Contractor	Table A Water Deliveries					SWP Water			Non-SWP Water				Total Water Delivered [12]
	2020 Table A Not Transferred, Exchanged, or Stored [1]	2020 Table A Transferred or Exchanged [2]	2020 Water Pool Programs [3]	Carryover Water [4]	Total Table A [5]	2020 Article 21 [6]	Other SWP Water [7]	Total SWP Water [8]	Delivery of Backup Water [9]	Water Bank Recovery [10]	Other Non-SWP Water [11]		
Feather River													
Butte	147	3,171	-	-	3,318	-	-	3,318	-	-	3,039	6,357	
Plumas	406	-	-	-	406	-	-	406	-	-	-	406	
Yuba City	1,812	-	-	-	1,812	-	-	1,812	-	-	-	1,812	
North Bay													
Napa	48	5,058	-	10,359	15,465	994	-	16,459	-	-	500	16,959	
Solano	860	-	-	15,248	16,108	-	-	16,108	-	-	21,556	37,664	
South Bay													
Alameda-Zone 7	7,411	-	-	10,661	18,072	-	-	18,072	-	1,000	11,911	30,983	
Alameda County	-	-	-	9,449	9,449	-	-	9,449	-	12,401	1,929	23,779	
Santa Clara	-	130	-	21,843	21,973	-	-	21,973	-	16,800	18,151	56,924	
San Joaquin Valley													
Oak Flat	487	-	-	1,653	2,140	-	-	2,140	-	-	-	2,140	
Kings	580	4	-	2,060	2,644	-	-	2,644	-	-	525	3,169	
Dudley Ridge	120	3,416	-	9,193	12,729	-	-	12,729	8,450	-	4,453	25,632	
Empire	1	589	-	658	1,248	-	-	1,248	-	-	-	1,248	
Kern	124,607	11,367	-	51,127	187,101	-	-	187,101	11,425	139,451	118,795	456,772	
Tulare	7,047	3,615	-	3,866	14,528	-	-	14,528	-	-	11,522	26,050	
Central Coastal													
San Luis Obispo	1,318	-	-	1,366	2,684	-	-	2,684	-	-	-	2,684	
Santa Barbara	1,206	193	-	10,569	11,968	-	-	11,968	-	-	-	11,968	
Southern California													
AVEK	4,504	11,286	-	32,216	48,006	-	-	48,006	-	-	-	48,006	
Coachella	27,670	-	-	69,175	96,845	-	-	96,845	-	3,222	16,751	116,818	
Crestline	-	-	-	215	215	-	-	215	-	-	526	741	
Desert	11,150	-	-	27,875	39,025	-	-	39,025	-	-	167	39,192	
Little Rock	27	379	-	118	524	-	-	524	-	-	-	524	
Metropolitan	330,879	99	-	78,013	408,991	-	-	408,991	-	16,820	5,694	431,505	
Mojave	-	17,960	-	3,159	21,119	-	-	21,119	-	-	6,699	27,818	
Palmdale	1,905	-	-	1,681	3,586	-	-	3,586	-	-	608	4,194	
San Bernardino	10,940	-	-	4,344	15,284	-	-	15,284	-	5,000	3,220	23,504	
San Gabriel	5,670	-	-	2,223	7,893	-	-	7,893	-	-	-	7,893	
San Geronio	2,616	9	-	4,211	6,836	-	-	6,836	-	-	2,123	8,959	
Santa Clarita	11,551	-	-	3,036	14,587	-	-	14,587	1,714	14,497	7,820	38,618	
Ventura	6	3,370	-	6,619	9,995	-	-	9,995	-	-	-	9,995	
Total	552,968	60,646	-	380,937	994,551	994	-	995,545	21,589	209,191	235,989	1,462,314	

¹ 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.

² This table includes SWP water that was delivered to non-SWP Contractors. Transfers and exchanges shown in Column 2 include SWP water deliveries to non-SWP Contractors.

Table 8-7 Total Amounts of Water Delivered in 2020, by Month (acre-feet)

1 of 10

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2020 Total Deliveries
FEATHER RIVER AREA													
<i>SWP Agencies</i>													
City of Yuba City													
Carryover	0	0	0	0	0	0	919	893	0	0	0	0	1,812
Yuba Total	0	0	0	0	0	0	919	893	0	0	0	0	1,812
County of Butte													
Table A	4	7	9	10	13	15	20	19	17	14	10	9	147
Table A Transferred to Others*	0	0	0	0	0	0	451	2,256	432	5	0	27	3,171
Non-SWP Water Transferred from Others	156	157	170	171	222	272	399	478	380	304	178	152	3,039
Butte Total (*excluded from total)	160	164	179	181	235	287	419	497	397	318	188	161	3,186
Plumas County Flood Control and Water Conservation District													
Table A	0	0	0	5	37	67	89	90	75	35	8	0	406
Plumas Total	0	0	0	5	37	67	89	90	75	35	8	0	406
<i>Non-SWP Contractors</i>													
Garden Highway Mutual Water Company													
Regulated delivery of local supply	0	0	187	1,819	2,413	2,986	2,183	627	394	0	0	0	10,609
Joint Water Districts Board													
Regulated delivery of local supply	25,840	0	0	33,510	110,122	113,095	128,335	101,187	34,540	61,900	71,760	57,730	738,019
Last Chance Creek Water District													
Regulated delivery of local supply	0	0	0	440	1,529	1,738	1,797	1,966	0	157	60	61	7,748
Oswald Water District													
Regulated delivery of local supply	0	0	210	171	240	325	356	348	393	176	11	0	2,230
Plumas Mutual Water Company													
Regulated delivery of local supply	0	0	533	720	1,713	1,650	841	230	953	1,732	493	0	8,865
South Feather Water and Power Agency													
Regulated delivery of local supply	123	118	156	221	700	744	799	847	821	590	204	102	5,425
Thermalito Water and Sewer District													
Regulated delivery of local supply	86	98	107	154	213	269	308	301	251	200	123	62	2,172
Tudor Mutual Water Company													
Regulated delivery of local supply	0	0	70	231	578	832	965	617	382	89	4	0	3,768
Western Canal Water District													
Regulated delivery of local supply	12,604	0	0	10,865	52,148	55,539	66,810	43,143	9,597	34,755	46,148	21,697	353,306
Valverde and Ramelli													
Regulated delivery of local supply	0	6	6	4	53	58	129	108	102	52	7	7	517

Table 8-7 Total Amounts of Water Delivered in 2020, by Month (acre-feet)

2 of 10

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2020 Total Deliveries
<i>SWP</i>	4	7	9	15	50	82	1,028	1,002	92	49	18	9	2,365
<i>Non-SWP</i>	38,809	379	1,439	48,306	169,931	177,508	202,922	149,844	47,813	99,955	118,988	79,804	1,135,698
Feather River Area Total	38,813	386	1,448	48,321	169,981	177,590	203,950	150,846	47,905	100,004	119,006	79,813	1,138,063
NORTH BAY AREA													
<i>SWP Agencies</i>													
Napa County Flood Control and Water Conservation District													
Table A	0	0	48	0	0	0	0	0	0	0	0	0	48
Table A Transferred from Others	130	0	0	0	0	0	0	0	0	0	0	0	130
Table A Transferred to Others*	0	0	0	7	3	12	14	11	3,281	1,730	0	0	5,058
Article 21	771	223	0	0	0	0	0	0	0	0	0	0	994
Carryover Water	0	701	0	520	1,082	1,278	1,357	1,372	1,278	976	953	842	10,359
Non-SWP Water Transferred from Others	0	0	0	0	0	0	0	0	2	261	83	154	500
Napa Total (*excluded from total)	901	924	48	520	1,082	1,278	1,357	1,372	1,280	1,237	1,036	996	12,031
Solano County Water Agency													
Table A	0	0	0	0	0	0	0	0	0	0	169	691	860
Table A Transferred from Others	0	0	0	7	3	12	14	11	10	1	0	0	58
Carryover Water	364	43	157	714	879	1,483	1,538	1,700	2,565	2,077	2,743	985	15,248
Non-SWP Water	586	2,906	227	2,657	3,587	1,897	1,873	1,927	1,389	1,523	1,405	1,579	21,556
Non-SWP Water Transferred to Others*	0	0	0	0	0	0	0	0	0	261	83	154	498
Solano Total (*excluded from total)	950	2,949	384	3,378	4,469	3,392	3,425	3,638	3,964	3,601	4,317	3,255	37,722
<i>SWP</i>	1,265	967	205	1,241	1,964	2,773	2,909	3,083	3,853	3,054	3,865	2,518	27,697
<i>Non-SWP</i>	586	2,906	227	2,657	3,587	1,897	1,873	1,927	1,391	1,784	1,488	1,733	22,056
North Bay Area Total	1,851	3,873	432	3,898	5,551	4,670	4,782	5,010	5,244	4,838	5,353	4,251	49,753
SOUTH BAY AREA													
<i>SWP Agencies</i>													
Alameda County Flood Control and Water Conservation District, Zone 7													
Table A	9	0	0	0	0	0	1,517	3,040	0	1,008	640	1,197	7,411
Table A Transferred from Others	0	0	0	0	0	0	0	0	3,271	1,729	0	0	5,000
Carryover Water	903	1,207	1,657	2,747	0	1,218	1,141	1,788	0	0	0	0	10,661
Water Bank Recovery	0	0	0	0	0	0	0	0	0	0	1,000	0	1,000
Non-SWP Water	178	150	369	313	4,404	3,796	582	0	0	0	0	8	9,800
Non-SWP Water Transferred from Others	0	0	0	0	0	0	2,043	0	0	68	0	0	2,111
Alameda-Zone 7 Total (*excluded from total)	1,090	1,357	2,026	3,060	4,404	5,014	5,283	4,828	3,271	2,805	1,640	1,205	35,983

Table 8-7 Total Amounts of Water Delivered in 2020, by Month (acre-feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2020 Total Deliveries
Alameda County Water District													
Carryover Water	1,014	303	0	889	528	1,321	805	1,000	1,253	0	1,119	1,217	9,449
Water Bank Recovery	0	832	468	807	947	1,327	1,172	1,948	1,074	2,098	1,728	0	12,401
Non-SWP Water	48	82	0	121	491	0	0	0	0	0	8	0	750
Non-SWP Water Transferred from Others	0	0	0	0	0	0	1,179	0	0	0	0	0	1,179
Alameda County Total (*excluded from total)	1,062	1,217	468	1,817	1,966	2,648	3,156	2,948	2,327	2,098	2,855	1,217	23,779
Santa Clara Valley Water District													
Table A Transferred to Others*	130	0	0	0	0	0	0	0	0	0	0	0	130
Carryover Water	5,730	6,697	2,706	2,406	0	0	0	309	1,092	340	803	1,760	21,843
Water Bank Recovery	0	0	0	0	2,208	3,095	4,336	861	0	0	2,436	3,864	16,800
Non-SWP Water Transferred from Others	0	0	0	0	2,238	3,421	0	3,927	3,500	4,805	260	0	18,151
Santa Clara Total (*excluded from total)	5,730	6,697	2,706	2,406	4,446	6,516	4,336	5,097	4,592	5,145	3,499	5,624	56,794
Non-SWP Contractors													
Byron-Bethany Irrigation District													
Regulated delivery of local supply	187	0	0	0	0	0	0	0	0	0	0	0	187
Musco Family Olive Company													
Regulated delivery of local supply	31	56	68	56	62	58	56	60	69	79	51	39	685
San Joaquin Valley National Cemetery													
Regulated delivery of local supply	2	23	22	3	10	44	48	35	32	21	12	4	256
Western Hills Water District													
Regulated delivery of local supply	22	29	32	34	82	101	99	108	69	35	26	26	663
Recreation/Fish and Wildlife (SWP Share)													
Lake Del Valle	1	2	3	2	3	9	9	3	4	0	0	0	36
SWP	7,679	8,238	4,398	6,078	613	2,649	3,571	6,248	5,689	3,112	2,588	4,200	55,063
Non-SWP	446	1,143	927	1,300	10,360	11,741	9,416	6,831	4,675	7,071	5,495	3,915	63,320
South Bay Area Total	8,125	9,381	5,325	7,378	10,973	14,390	12,987	13,079	10,364	10,183	8,083	8,115	118,383
SAN JOAQUIN VALLEY AREA													
SWP Agencies													
County of Kings													
Table A	0	0	0	0	0	48	391	40	0	101	0	0	580
Table A Transferred to Others*	0	0	0	0	0	0	0	0	1	1	1	1	4
Carryover Water	15	18	16	18	23	26	31	27	27	23	18	16	258
Carryover Water Transferred to Others*	106	89	118	143	256	285	122	166	100	181	123	113	1,802
Non-SWP Water Transferred from Others	0	0	0	0	0	0	209	96	165	55	0	0	525

Table 8-7 Total Amounts of Water Delivered in 2020, by Month (acre-feet)

4 of 10

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2020 Total Deliveries
Kings Total (*excluded from total)	15	18	16	18	23	74	631	163	192	179	18	16	1,363
Dudley Ridge Water District													
Table A	0	0	0	0	0	0	70	0	2	0	47	1	120
Table A Water Transferred from Others	0	0	0	0	353	546	260	0	0	333	69	4	1,565
Table A Transferred to Others*	0	1,066	0	2,000	0	0	0	0	0	350	0	0	3,416
Carryover Water	11	69	27	0	0	1,120	0	0	0	539	0	0	1,766
Carryover Water Transferred to Others*	0	5,334	0	0	2,093	0	0	0	0	0	0	0	7,427
Delivery of Backup Water	0	0	0	43	0	0	0	0	0	0	0	0	43
Delivery of Backup Water Transferred from Others	0	0	0	0	8,407	0	0	0	0	0	0	0	8,407
Non-SWP Water Transferred from Others	0	0	0	0	0	0	484	484	2,167	1,032	286	0	4,453
Dudley Ridge Total (*excluded from total)	11	69	27	43	8,760	1,666	814	484	2,169	1,904	402	5	16,354
Empire West Side Irrigation District													
Table A	0	1	0	0	0	0	0	0	0	0	0	0	1
Table A Transferred to Others*	0	0	0	0	0	0	0	284	0	305	0	0	589
Carryover Water	266	392	0	0	0	0	0	0	0	0	0	0	658
Empire Total (*excluded from total)	266	393	0	0	0	0	0	0	0	0	0	0	659
Kern County Water Agency													
Table A	0	0	0	0	0	24,146	40,394	24,584	16,941	18,534	0	8	124,607
Table A Transferred from Others	0	1,066	0	2,000	0	17,560	0	1,963	0	0	3,256	3,744	29,589
Table A Transferred to Others*	22	1,488	1,919	2,021	2,036	1,118	99	608	69	35	1,926	26	11,367
Carryover Water	6,684	12,826	2,663	425	17,465	892	0	0	0	0	5,772	0	46,727
Carryover Water Transferred from Others	0	5,334	0	0	2,093	0	0	0	0	0	0	0	7,427
Carryover Water Transferred to Others*	0	0	1,100	1,100	1,100	1,100	0	0	0	0	0	0	4,400
Water Bank Recovery	0	440	13,585	19,808	26,794	35,536	28,433	10,912	2,737	718	488	0	139,451
Water Bank Recovery Water Transferred to Others*	0	832	468	6,397	9,202	9,303	11,518	7,799	4,236	7,433	5,225	7,327	69,740
Delivery of Backup Water	0	0	0	1,075	0	0	3,989	2,502	0	0	0	3,859	11,425
Delivery of Backup Water Transferred to Others*	0	0	0	0	8,407	0	0	0	0	0	0	0	8,407
Non-SWP Water Transferred from Others	0	886	0	0	0	2,082	28,298	39,725	26,355	5,500	14,432	1,517	118,795
Non-SWP Water Transferred to Others*	0	0	0	9,243	1,843	1,100	1,375	2,758	3,792	427	3,314	1,162	25,014
Kern Total (*excluded from total)	6,684	20,552	16,248	23,308	46,352	80,216	101,114	79,686	46,033	24,752	23,948	9,128	478,021
Oak Flat Water District													
Table A	0	0	0	0	0	0	285	202	0	0	0	0	487
Carryover Water	0	104	145	214	351	396	0	62	142	151	50	38	1,653

Table 8-7 Total Amounts of Water Delivered in 2020, by Month (acre-feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2020 Total Deliveries
Oak Flat Total	0	104	145	214	351	396	285	264	142	151	50	38	2,140
Tulare Lake Basin Water Storage District													
Table A	0	0	0	0	0	0	1,288	5,699	60	0	0	0	7,047
Table A Transferred to Others*	0	0	0	0	353	1,809	1,453	0	0	0	0	0	3,615
Carryover Water	1,013	54	0	0	57	972	1,439	1	330	0	0	0	3,866
Non-SWP Water Transferred from Others	150	401	0	0	0	0	3,464	5,094	1,743	598	72	0	11,522
Tulare Total (*excluded from total)	1,163	455	0	0	57	972	6,191	10,794	2,133	598	72	0	22,435
California State Parks/Fish and Wildlife (SWP Share)													
California State Parks, Cattle	0	0	0	0	0	0	0	0	0	0	0	2	2
California Fish and Wildlife, O'Neill	20	42	23	16	66	22	49	36	35	0	67	59	435
California Fish and Wildlife, Lateral 4	0	0	0	0	23	45	11	0	0	0	0	0	79
California State Parks, O'Neill	1	0	0	0	0	0	1	0	0	0	0	0	2
California State Parks, San Luis	1	0	0	1	0	1	0	0	2	0	0	0	5
California State Parks/Fish and Wildlife (SWP Share) Total	22	42	23	17	89	68	61	36	37	0	67	61	523
Non-SWP Contractors													
U.S. Bureau of Reclamation													
Non-SWP Water Transferred to Others*	150	401	0	0	2,238	5,503	9,775	5,462	3,809	3,820	11,811	750	43,719
California Fish and Wildlife	17	35	19	12	73	54	47	34	29	0	54	47	421
California State Parks	0	0	0	2	0	1	0	0	2	1	0	0	6
Reclamation Total (*excluded from total)	17	35	19	14	73	55	47	34	31	1	54	47	427
CVP Annual Contractors													
Kern National Wildlife Refuge	2,728	0	0	1,757	0	0	0	902	4,376	4,953	4,419	2,312	21,447
CVP Annual Contractors Total	2,728	0	0	1,757	0	0	0	902	4,376	4,953	4,419	2,312	21,447
Cross Valley Canal Contractors													
Kern-Tulare Water District	1,506	1,610	0	0	0	0	0	0	0	0	0	0	3,116
Pixley Irrigation District	0	0	0	0	0	0	610	665	0	0	0	0	1,275
County of Fresno	1,000	2,155	0	0	0	0	2,196	346	949	885	0	0	7,531
Cross Valley Canal Total	2,506	3,765	0	0	0	0	2,806	1,011	949	885	0	0	11,922
Westlands Water District													
Table A Transferred from Others	0	0	0	0	0	1,263	1,453	284	1	1	1,901	1	4,904
Carryover Water Transferred from Others	106	89	118	143	256	285	122	166	100	181	123	113	1,802
Non-SWP Water Transferred from Others	0	0	0	0	0	0	0	0	16,599	3,421	0	0	20,020
Non-SWP Water Transferred to Others*	0	886	0	0	0	0	209	0	0	25	0	0	1,120
Westlands Total (*excluded from total)	106	89	118	143	256	1,548	1,575	450	16,700	3,603	2,024	114	26,726

Table 8-7 Total Amounts of Water Delivered in 2020, by Month (acre-feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2020 Total Deliveries
San Luis & Delta Mendota Water Authority	0	0	0	0	0	1,263	1,453	284	1	1	1,901	1	4,904
SWP	8,117	19,995	2,992	2,817	20,687	47,322	45,794	33,064	17,640	19,863	11,303	3,986	233,580
Non-SWP	5,401	5,527	13,604	22,697	35,274	37,673	80,764	77,391	60,122	17,163	19,751	7,735	383,102
San Joaquin Valley Area Total	13,518	25,522	16,596	25,514	55,961	84,995	126,558	110,455	77,762	37,026	31,054	11,721	616,682
CENTRAL COASTAL AREA													
<i>SWP Agencies</i>													
San Luis Obispo County Flood Control and Water Conservation District													
Table A	153	163	143	120	108	114	94	120	127	66	0	110	1,318
Carryover Water	68	59	83	106	136	139	169	158	134	149	87	78	1,366
San Luis Obispo Total	221	222	226	226	244	253	263	278	261	215	87	188	2,684
Santa Barbara County Flood Control and Water Conservation District													
Table A	0	0	11	20	21	82	112	129	114	277	145	295	1,206
Table A Transferred from Others	0	0	0	0	0	80	80	80	80	80	0	0	400
Table A Transferred to Others*	0	0	0	0	0	0	0	0	0	0	193	0	193
Carryover Water	771	821	881	779	1,174	1,287	1,551	1,362	1,152	600	83	108	10,569
Santa Barbara Total (*excluded from total)	771	821	892	799	1,195	1,449	1,743	1,571	1,346	957	228	403	12,175
SWP	992	1,043	1,118	1,025	1,439	1,702	2,006	1,849	1,607	1,172	315	591	14,859
Central Coastal Area Total	992	1,043	1,118	1,025	1,439	1,702	2,006	1,849	1,607	1,172	315	591	14,859
SOUTHERN CALIFORNIA AREA													
<i>SWP Agencies</i>													
Antelope Valley-East Kern Water Agency													
Table A	0	0	0	1,532	2,970	0	2	0	0	0	0	0	4,504
Table A Transferred to Others*	0	0	0	0	375	670	941	1,069	549	682	3,256	3,744	11,286
Carryover Water	3,685	5,204	1,521	0	0	3,383	4,075	4,339	3,927	2,790	1,837	1,455	32,216
Carryover Water Transferred from Others	1	3	3	0	1	0	0	0	0	0	0	0	8
AVEK Total (*excluded from total)	3,686	5,207	1,524	1,532	2,971	3,383	4,077	4,339	3,927	2,790	1,837	1,455	36,728
Coachella Valley Water District													
Table A	0	0	0	0	0	0	0	0	11,053	8,042	4,027	4,548	27,670
Carryover Water	26,522	27,970	8,253	0	6,430	0	0	0	0	0	0	0	69,175
Water Bank Recovery	0	0	0	0	0	0	0	0	0	1,948	61	1,213	3,222
Non-SWP Water Transferred from Others	0	0	0	8,757	743	0	163	146	2,478	427	2,875	1,162	16,751
Coachella Total	26,522	27,970	8,253	8,757	7,173	0	163	146	13,531	10,417	6,963	6,923	116,818
Crestline-Lake Arrowhead Water Agency													

Table 8-7 Total Amounts of Water Delivered in 2020, by Month (acre-feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2020 Total Deliveries
Table A Transferred from Others	0	0	0	0	0	0	0	0	0	0	0	0	9
Carryover Water	0	0	0	0	0	0	78	137	0	0	0	0	215
Carryover Water Transferred from Others	0	0	0	0	0	0	0	31	161	133	77	89	491
Non-SWP Water	55	75	63	43	105	119	66	0	0	0	0	0	526
Crestline Total (*excluded from total)	55	75	63	43	105	119	144	177	161	133	77	89	1,241
Desert Water Agency													
Table A	0	0	0	0	0	0	0	0	4,444	4,318	1,188	1,200	11,150
Carryover Water	10,687	11,466	3,326	0	2,396	0	0	0	0	0	0	0	27,875
Non-SWP Transferred from Others	0	0	0	0	0	0	66	59	42	0	0	0	167
Desert Total	10,687	11,466	3,326	0	2,396	0	66	59	4,486	4,318	1,188	1,200	39,192
Littlerock Creek Irrigation District													
Table A	0	0	0	0	5	12	2	3	1	0	0	4	27
Table A Transferred from Others	0	0	0	0	375	670	335	0	0	0	0	0	1,380
Table A Transferred to Others*	0	0	0	0	0	0	0	379	0	0	0	0	379
Carryover Water	27	39	45	3	4	0	0	0	0	0	0	0	118
Littlerock Total (*excluded from total)	27	39	45	3	384	682	337	3	1	0	0	4	1,525
The Metropolitan Water District of Southern California													
Table A	0	0	14,134	17,024	1,210	37,822	43,821	51,430	29,281	47,832	48,466	39,859	330,879
Table A Transferred from Others	0	0	0	0	0	0	0	0	0	350	166	204	720
Table A Transferred to Others*	0	0	0	0	0	0	3	0	0	23	69	4	99
Carryover Water	28,864	13,333	2,605	651	26,170	6,390	0	0	0	0	0	0	78,013
Water Bank Recovery	0	0	0	5,590	5,696	1,846	2,874	814	0	0	0	0	16,820
Non-SWP Water Transferred from Others	0	0	0	0	0	0	2,211	2,010	1,473	0	0	0	5,694
Metropolitan Total (*excluded from total)	28,864	13,333	16,739	23,265	33,076	46,058	48,906	54,254	30,754	48,182	48,632	40,063	432,126
Mojave Water Agency													
Table A Transferred from Others	0	0	0	0	0	0	0	0	0	0	193	0	193
Table A Transferred to Others*	0	0	0	0	0	17,640	80	80	80	80	0	0	17,960
Carryover Water	1,867	18	0	3	20	1	307	367	194	180	3	191	3,151
Carryover Water Transferred to Others*	1	3	3	0	1	0	0	0	0	0	0	0	8
Non-SWP Water	935	876	919	902	931	888	922	326	0	0	0	0	6,699
Mojave Total (*excluded from total)	2,802	894	919	905	951	889	1,229	693	194	180	196	191	10,043
Palmdale Water District													
Table A	0	0	0	0	0	0	0	301	0	0	792	812	1,905
Table A Transferred from Others	0	0	0	0	0	0	191	941	981	682	0	27	2,822

Table 8-7 Total Amounts of Water Delivered in 2020, by Month (acre-feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2020 Total Deliveries
Carryover Water	338	752	513	13	65	0	0	0	0	0	0	0	1,681
Non-SWP Water Transferred from Others	0	0	0	0	0	0	500	0	0	0	108	0	608
Palmdale Total	338	752	513	13	65	0	691	1,242	981	682	900	839	7,016
San Bernardino Valley Municipal Water District													
Table A	0	0	0	0	1,406	0	0	0	1,076	4,063	1,784	2,611	10,940
Carryover Water	81	512	1,015	842	0	0	0	644	1,250	0	0	0	4,344
Water Bank Recovery	0	0	0	0	0	1,847	544	1,846	763	0	0	0	5,000
Non-SWP Water Transferred from Others	0	0	0	0	0	0	1,494	0	0	0	1,496	230	3,220
San Bernardino Total (*excluded from total)	81	512	1,015	842	1,406	1,847	2,038	2,490	3,089	4,063	3,280	2,841	23,504
San Gabriel Valley Municipal Water District													
Table A	0	115	0	0	0	2,339	1,603	1,613	0	0	0	0	5,670
Carryover Water	1,311	912	0	0	0	0	0	0	0	0	0	0	2,223
San Gabriel Total (*excluded from total)	1,311	1,027	0	0	0	2,339	1,603	1,613	0	0	0	0	7,893
San Geronio Pass Water Agency													
Table A	0	0	0	0	424	579	326	74	0	291	922	0	2,616
Table A Transferred from Others	0	0	0	0	0	0	0	0	1,414	1,586	0	0	3,000
Table A Transferred to Others*	0	0	0	0	0	0	0	9	0	0	0	0	9
Carryover Water	0	2,065	1,055	0	600	0	0	0	0	0	0	0	3,720
Carryover Water Transferred to Others*	0	0	0	0	0	0	0	31	161	133	77	89	491
Non-SWP Water Transferred from Others	0	0	0	0	0	0	393	1,383	317	0	30	0	2,123
San Geronio Total (*excluded from total)	0	2,065	1,055	0	1,024	579	719	1,457	1,731	1,877	952	0	11,459
Santa Clarita Valley Water Agency													
Table A	0	0	0	0	1,376	1,799	674	0	2,026	1,543	2,934	1,199	11,551
Table A Transferred from Others	0	1,459	1,887	1,987	1,954	1,017	606	1,300	0	0	0	0	10,210
Carryover Water	2,047	781	208	0	0	0	0	0	0	0	0	0	3,036
Carryover Water Transferred from Others	0	0	1,100	1,100	1,100	1,100	0	0	0	0	0	0	4,400
Water Bank Recovery	0	0	0	0	351	1,188	2,592	2,330	2,399	3,387	0	2,250	14,497
Delivery of Backup Water	0	0	0	0	0	0	339	1,196	179	0	0	0	1,714
Non-SWP Water Transferred from Others	0	0	0	486	1,100	1,100	1,639	1,375	1,100	0	1,000	20	7,820
Santa Clarita Total	2,047	2,240	3,195	3,573	5,881	6,204	5,850	6,201	5,704	4,930	3,934	3,469	53,228
Ventura County Watershed Protection District													
Table A	0	0	0	0	0	0	0	0	0	0	0	6	6
Table A Transferred to Others*	0	0	0	0	0	0	0	0	1,414	1,586	166	204	3,370
Carryover Water	4,639	1,198	0	0	0	0	0	0	0	0	782	0	6,619

Table 8-7 Total Amounts of Water Delivered in 2020, by Month (acre-feet)

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2020 Total Deliveries
Ventura Total (*excluded from total)	4,639	1,198	0	0	0	0	0	0	0	0	782	6	6,625
Non-SWP Agencies													
United Water Conservation District	0	0	1,169	0	0	0	0	0	0	0	0	0	1,169
Los Angeles Department of Water and Power	0	0	0	0	0	0	3	0	0	0	0	0	3
California State Parks/Fish and Wildlife (SWP Share)													
Castaic Lagoon	0	0	0	0	0	0	0	0	0	0	11	4	15
Lake Perris—Parks and Recreation	1	0	0	0	0	0	44	15	21	12	2	0	95
Pyramid Lake	2	5	3	2	3	6	8	6	7	6	4	2	54
Silverwood Lake	3	3	2	3	3	6	9	7	9	7	6	5	63
California State Parks/Fish and Wildlife (SWP Share) Total	6	8	5	5	6	12	61	28	37	25	23	11	227
SWP	80,075	65,835	35,670	23,160	46,512	55,124	52,084	61,217	55,845	71,835	63,194	52,216	662,767
Non-SWP	990	951	2,151	15,778	8,926	6,988	13,803	11,485	8,751	5,762	5,570	4,875	86,030
Southern California Area Total	81,065	66,786	37,821	38,938	55,438	62,112	65,887	72,702	64,596	77,597	68,764	57,091	748,797
SWP WATER													
SWP Water Supply Contracts													
Table A	166	286	14,345	18,711	7,570	67,023	91,607	88,237	65,217	86,124	61,132	52,550	552,968
Table A Transfer and Exchanges	130	2,525	1,887	3,994	2,685	19,885	1,486	4,304	5,756	4,761	3,684	3,979	55,076
Carryover Water	96,908	92,881	27,979	11,430	60,574	21,006	12,491	13,297	13,505	7,958	14,327	6,779	379,135
SWP Contracted Supply to Non-SWP Agencies	128	118	150	177	338	1,649	1,677	558	170	217	2,050	140	7,372
Subtotal	97,332	95,810	44,361	34,312	71,167	109,563	107,261	106,396	84,648	99,060	81,193	63,448	994,551
Other Water Supply Contracts													
Article 21	771	223	0	0	0	0	0	0	0	0	0	0	994
Delivery of Backup Water	0	0	0	1,118	8,407	0	4,328	3,698	179	0	0	3,859	21,589
Water Bank Recovery	0	1,272	14,053	26,205	35,996	44,839	39,951	18,711	6,973	8,151	5,713	7,327	209,191
Subtotal	771	1,495	14,053	27,323	44,403	44,839	44,279	22,409	7,152	8,151	5,713	11,186	231,774
Non-SWP Water Supply Contracts													
Local Water	1,216	1,183	1,351	1,379	5,931	4,803	1,570	326	0	0	8	8	17,775
Settlement Water	483	1,727	29	788	1,652	58	0	0	107	365	0	288	5,497
Vallejo Permit Water	103	1,179	198	1,869	1,935	1,839	1,873	1,927	1,284	1,419	1,488	1,445	16,559
Other Non-SWP Programs	306	1,444	170	9,414	4,303	6,875	42,542	54,777	39,720	12,789	20,737	3,081	196,158
Subtotal	2,108	5,533	1,748	13,450	13,821	13,575	45,985	57,030	41,111	14,573	22,233	4,822	235,989
SWP Total	100,211	102,838	60,162	75,085	129,391	167,977	197,525	185,835	132,911	121,784	109,139	79,456	1,462,314

Table 8-7 Total Amounts of Water Delivered in 2020, by Month (acre-feet)

10 of 10

Contracting Agency and Type of Service	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2020 Total Deliveries
NON-SWP WATER													
<i>Non-SWP Contractors</i>													
SWP Park and Recreation, Fish and Wildlife	29	52	31	24	98	89	131	67	78	25	90	72	786
Other Non-SWP Programs	0	0	1,169	0	0	0	13,034	16,631	21,599	3,421	0	0	55,854
Regulated delivery of local supply	38,840	222	1,269	48,135	169,709	177,236	202,523	149,366	47,433	99,651	118,810	79,652	1,132,846
CVP California State Parks	0	0	0	2	0	1	0	0	2	1	0	0	6
CVP California Fish and Wildlife	17	35	19	12	73	54	47	34	29	0	54	47	421
<i>CVP/Reclamation Contractors</i>													
Cross Valley Canal Contractors	2,506	3,765	0	0	0	0	2,806	1,011	949	885	0	0	11,922
Kern National Wildlife Refuge	2,728	0	0	1,757	0	0	0	902	4,376	4,953	4,419	2,312	21,447
Annual Contracts	33	79	90	59	72	102	104	95	101	100	63	43	941
Non-SWP Total	44,153	4,153	2,578	49,989	169,952	177,482	218,645	168,106	74,567	109,036	123,436	82,126	1,224,223
Grand Total	144,364	106,991	62,740	125,074	299,343	345,459	416,170	353,941	207,478	230,820	232,575	161,582	2,686,537

Table 8-8 Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2020 (acre-feet)

Year	Annual Table A Amounts According to Water Supply Contracts							Water Conveyed								
								Deliveries								
	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 ¹ [9]	Other Water ² [10]	Feather River Diversions ³ [11]	Recreation/ Fish and Wildlife Water [12]	Subtotal [13]	Initial Fill Water [14]	Losses and Storage Changes ⁴ [15]	Total [16]
1962	-	-	-	-	-	-	-	-	-	9,704	7,499	-	17,203	9	272	17,484
1963	-	-	-	-	-	-	-	-	-	13,212	16,049	-	29,261	71	185	29,517
1964	-	-	-	-	-	-	-	-	-	21,743	17,891	-	39,634	171	152	39,957
1965	-	-	-	-	-	-	-	-	-	35,985	27,425	-	63,410	93	729	64,232
1966	-	-	-	-	-	-	-	-	-	59,599	33,361	-	92,960	-	1,746	94,706
1967	-	-	11,538	-	-	-	11,538	11,354	-	45,225	24,639	-	81,218	8,328	4,212	93,758
1968	550	-	109,900	77,350	-	3,700	191,500	171,709	121,534	1,214	903,367	-	1,197,824	498,926	117,906	1,814,656
1969	620	-	98,700	163,075	-	5,000	267,395	193,020	72,397	8,692	832,454	-	1,106,563	510,614	72,196	1,689,373
1970	700	-	114,200	202,000	-	5,700	322,600	233,993	131,848	25,401	804,320	-	1,195,562	23,947	2,435	1,221,944
1971	890	-	116,200	251,800	-	6,700	375,590	357,340	294,581	35,438	825,886	8	1,513,253	7,853	5,812	1,526,918
1972	970	-	118,300	413,066	-	209,423	741,759	611,801	422,322	53,848	875,529	6,489	1,969,989	100,274	53,062	2,123,325
1973	1,100	-	120,400	383,652	-	481,100	986,252	692,888	294,916	29,540	851,285	1,155	1,869,784	204,638	53,798	2,128,220
1974	1,230	-	122,400	460,650	-	597,920	1,182,200	874,075	412,453	31,493	963,956	2,118	2,284,095	237,554	10,657	2,532,306
1975	1,610	-	124,500	545,809	-	714,950	1,386,869	1,223,990	620,685	46,995	924,696	3,377	2,819,743	103,352	(94,606)	2,828,489
1976	1,990	-	126,500	543,417	-	836,480	1,508,387	1,373,002	551,685	103,546	1,018,653	1,745	3,048,631	61,122	(681,025)	2,428,728
1977	2,420	-	128,600	581,400	-	954,901	1,667,321	573,896	-	410,991	624,497	1,111	1,610,495	-	(131,151)	1,479,344
1978	1,850	-	130,700	635,900	-	1,049,584	1,818,034	1,312,365	16,215	177,245	836,864	1,691	2,344,380	64,443	717,370	3,126,193
1979	2,130	-	132,700	702,685	-	1,190,573	2,028,088	1,404,292	646,830	431,693	933,067	1,766	3,417,648	12,302	(83,430)	3,346,520
1980	1,810	500	134,800	758,100	1,946	1,317,614	2,214,770	1,511,491	402,217	40,269	925,750	2,131	2,881,858	-	(26,606)	2,855,252
1981	1,940	650	137,000	818,000	2,813	1,432,065	2,392,468	1,889,125	908,428	283,310	993,785	4,688	4,079,336	-	(802,263)	3,277,073
1982	1,970	800	139,200	876,500	5,626	1,550,449	2,574,545	1,738,056	215,134	144,267	819,586	4,646	2,921,689	-	480,752	3,402,441
1983	2,000	950	141,400	867,118	8,439	1,681,257	2,701,164	1,184,119	13,019	172,030	633,778	7,849	2,010,795	-	(90,997)	1,919,798
1984	3,630	1,100	143,600	979,211	12,698	1,744,098	2,884,337	1,587,593	262,917	366,273	891,128	7,040	3,114,951	-	(140,182)	2,974,769
1985	3,760	1,250	145,800	1,019,049	21,138	1,864,849	3,055,846	1,912,765	301,844	474,417	924,049	4,033	3,617,108	-	92,885	3,709,993
1986	4,190	1,400	148,100	1,091,946	28,210	1,983,890	3,257,736	2,007,906	24,350	177,176	843,040	3,865	3,056,337	-	284,380	3,340,717
1987	4,620	1,550	150,300	1,188,500	35,204	2,103,941	3,484,115	2,113,915	114,907	375,810	882,301	7,672	3,494,605	-	(390,413)	3,104,192
1988	5,060	15,471	152,500	1,246,100	43,722	2,225,482	3,688,335	2,376,373	-	520,375	884,877	4,889	3,786,514	-	(92,850)	3,693,664
1989	5,500	24,615	156,700	1,290,400	56,342	2,424,633	3,958,190	2,853,747	-	474,559	830,500	8,135	4,166,941	-	447,917	4,614,858
1990	6,040	28,190	160,900	1,313,450	70,486	2,500,600	4,079,666	2,582,151	90	424,697	875,099	9,262	3,891,299	-	(528,869)	3,362,430
1991	11,880	29,590	166,400	1,338,011	70,486	2,510,200	4,126,567	549,113	3,521	543,582	565,395	4,879	1,666,490	-	167,435	1,833,925

Table 8-8 Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2020 (acre-feet)

2 of 3

Year	Annual Table A Amounts According to Water Supply Contracts							Water Conveyed						Total [16]		
								Deliveries			Initial Fill Water [14]	Losses and Storage Changes ⁴ [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]	Table A Water [8]	Article 21, Surplus, and Unscheduled Water ¹ [9]	Other Water ² [10]			Feather River Diversions ³ [11]		Recreation/ Fish and Wildlife Water [12]	Subtotal [13]
1992	11,920	32,010	171,900	1,342,300	70,486	2,510,200	4,138,816	1,410,799	1,156	166,992	613,978	2,605	2,195,530	-	(63,541)	2,131,989
1993	11,960	34,620	177,400	1,342,300	70,486	2,510,200	4,146,966	2,313,236	-	256,853	822,589	2,609	3,395,287	-	726,123	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	-	(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	85,560	860,077	2,575	2,979,635	-	69,536	3,049,171
1996	12,100	48,225	186,000	1,301,630	70,486	2,492,900	4,111,341	2,514,824	28,647	252,346	1,005,148	3,907	3,804,872	86	491,550	4,296,508
1997	12,150	49,315	188,000	1,297,300	45,201	2,492,900	4,084,866	2,260,383	21,432	322,000	993,211	4,146	3,601,172	527	(11,806)	3,589,893
1998	12,200	50,420	188,000	1,272,300	45,201	2,517,900	4,086,021	1,726,519	20,288	127,405	872,738	2,108	2,749,058	-	(132,491)	2,616,567
1999	13,940	55,020	188,000	1,272,300	70,486	2,519,900	4,119,646	2,738,903	158,070	85,312	1,108,672	4,324	4,095,281	-	(189,525)	3,905,756
2000	14,000	55,945	210,000	1,205,300	70,486	2,565,900	4,121,631	3,172,407	308,785	353,584	1,085,886	4,096	4,924,758	-	(20,103)	4,904,655
2001	14,670	66,561	220,000	1,185,519	70,486	2,566,900	4,124,136	1,579,291	48,145	632,403	1,077,997	2,942	3,340,778	-	159,983	3,500,761
2002	14,730	67,396	220,000	1,182,519	70,486	2,569,900	4,125,031	2,634,672	43,115	311,976	1,131,880	3,712	4,125,355	-	80,709	4,206,064
2003	14,790	68,231	220,400	1,182,119	70,486	2,570,900	4,126,926	2,975,817	59,828	160,087	1,006,995	2,862	4,205,589	-	459,377	4,664,966
2004	13,100	69,056	222,619	1,170,000	70,486	2,581,800	4,127,061	2,644,787	218,496	403,542	1,171,835	2,887	4,441,547	-	108,840	4,550,387
2005	10,800	69,481	222,619	1,170,000	70,486	2,582,300	4,125,686	2,827,256	731,083	92,858	1,074,706	1,515	4,727,418	-	529,347	5,256,765
2006	11,124	69,856	222,619	1,170,000	70,486	2,582,800	4,126,885	2,973,349	621,339	43,774	1,094,944	3,628	4,837,034	-	(119,981)	4,717,053
2007	11,520	70,231	222,619	1,170,000	70,486	2,584,450	4,129,306	2,180,751	309,973	598,789	1,193,237	2,581	4,285,331	-	(524,851)	3,760,480
2008	39,120	70,606	222,619	1,170,000	70,486	2,593,100	4,165,931	1,244,240	2,729	769,517	1,087,669	2,778	3,106,933	-	(758,813)	2,348,120
2009	39,190	70,981	222,619	1,170,000	70,486	2,593,100	4,166,376	1,385,266	6,032	709,885	1,125,147	2,047	3,228,377	-	(31,319)	3,197,058
2010	13,491	76,531	222,619	1,140,000	70,486	2,623,100	4,146,227	2,010,672	7,505	790,602	978,172	1,167	3,788,118	-	461,751	4,249,869
2011	14,388	76,581	222,619	1,140,000	70,486	2,623,100	4,147,174	2,847,572	420,691	388,632	1,028,542	1,593	4,687,030	-	358,354	5,045,384
2012	39,420	76,631	222,619	1,140,000	70,486	2,623,100	4,172,256	2,593,699	-	367,609	1,047,832	1,609	4,010,749	-	(537,209)	3,473,540
2013	39,510	76,681	222,619	1,140,000	70,486	2,623,100	4,172,396	1,623,212	-	614,203	1,166,635	1,641	3,405,691	-	(256,889)	3,148,802
2014	39,600	76,731	222,619	1,136,556	70,486	2,626,544	4,172,536	475,533	1,444	699,678	839,792	677	2,017,124	-	(222,460)	1,794,664
2015	39,700	76,781	222,619	1,133,556	70,486	2,626,544	4,172,686	846,547	690	585,388	675,530	721	2,108,876	-	(419,759)	1,689,117
2016	39,800	76,781	222,619	1,133,556	70,486	2,629,544	4,172,786	2,021,891	3,319	343,472	974,673	1,401	3,344,756	-	(527,248)	2,817,508

Table 8-8 Total Amounts of Annual Table A Water and Water Conveyed, by Type, 1962–2020 (acre-feet)

Year	Annual Table A Amounts According to Water Supply Contracts							Water Conveyed								
	Deliveries							Subtotal								
	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 ¹ [9]	Other Water ² [10]	Feather River Divisions ³ [11]	Recreation/ Fish and Wildlife Water [12]	Subtotal [13]	Initial Fill Water [14]	Losses and Storage Changes ⁴ [15]	Total [16]
2017	39,800	76,781	222,619	1,133,556	70,486	2,629,544	4,172,786	3,106,473	296,804	411,745	967,411	775	4,783,208	-	(206,091)	4,573,934
2018	39,800	76,781	222,619	1,133,556	70,486	2,629,544	4,172,786	1,567,462	2,180	607,518	979,689	879	3,157,728	-	(8,343)	3,149,385
2019	39,800	76,781	222,619	1,133,556	70,486	2,629,544	4,172,786	2,572,959	246,192	361,067	988,801	957	4,169,976	-	(83,006)	4,086,970
2020	39,800	76,781	222,619	1,129,556	70,486	2,633,544	4,172,786	994,551	944	557,547	1,132,659	786	2,686,537	-	(483,306)	2,203,231
Total	734,933	1,979,106	9,351,561	52,529,268	2,350,634	104,150,867	171,096,369	92,300,945	9,567,785	16,979,340	49,571,189	160,277	168,579,536	1,834,310	(1,998,250)	168,415,596

¹ 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).

² Includes amounts of SWP and non-SWP water conveyed for SWP and non-SWP Contractors.

³ Includes amounts of water diverted under various water rights agreements.

⁴ 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 the California Aqueduct from the Kern River Intertie.

Table 8-9 SWP Water Delivered by Category, 1962–2020 (acre-feet)

Year	Table Water A			Article 21/Unscheduled			Other SWP Water Deliveries				
	Municipal and Industrial	Agricultural	Total Table A¹	Municipal and Industrial	Agricultural	Total Article 21/Unscheduled	Other Water²	Feather River Diversions³	Fish & Wildlife/ Recreation Water	Total Other SWP Water Deliveries	
1962	0	0	0	0	0	0	9,704	7,499	0	17,203	
1963	0	0	0	0	0	0	13,212	16,049	0	29,261	
1964	0	0	0	0	0	0	21,743	17,891	0	39,634	
1965	0	0	0	0	0	0	35,985	27,425	0	63,410	
1966	0	0	0	0	0	0	59,599	33,361	0	92,960	
1967	5,563	5,791	11,354	0	0	0	45,225	24,639	0	69,864	
1968	86,541	85,168	171,709	10,000	111,534	121,534	1,214	903,367	0	904,581	
1969	63,956	129,064	193,020	0	72,397	72,397	8,692	832,454	0	841,146	
1970	83,415	150,578	233,993	0	131,848	131,848	25,401	804,320	0	829,721	
1971	93,776	263,564	357,340	0	294,581	294,581	35,438	825,886	8	861,332	
1972	186,796	425,005	611,801	0	422,322	422,322	53,848	875,529	6,489	935,866	
1973	297,497	395,391	692,888	0	294,916	294,916	29,540	851,285	1,155	881,980	
1974	423,982	450,093	874,075	0	412,453	412,453	31,493	963,956	2,118	997,567	
1975	670,492	553,498	1,223,990	356	620,329	620,685	46,995	924,696	3,377	975,068	
1976	631,876	741,126	1,373,002	4,147	547,538	551,685	103,546	1,018,653	1,745	1,123,944	
1977	354,930	218,966	573,896	0	0	0	410,991	624,497	1,111	1,036,599	
1978	782,625	529,740	1,312,365	0	16,215	16,215	177,245	836,864	1,691	1,015,800	
1979	692,888	711,404	1,404,292	0	646,830	646,830	431,693	933,067	1,766	1,366,526	
1980	726,545	784,946	1,511,491	52,200	350,017	402,217	40,269	925,750	2,131	968,150	
1981	1,053,273	835,852	1,889,125	18,920	889,508	908,428	283,310	993,785	4,688	1,281,783	
1982	916,014	822,042	1,738,056	140	214,994	215,134	144,267	819,586	4,646	968,499	
1983	482,749	701,370	1,184,119	0	13,019	13,019	172,030	633,778	7,849	813,657	
1984	725,799	861,794	1,587,593	3,663	259,254	262,917	366,273	891,128	7,040	1,264,441	
1985	983,341	929,424	1,912,765	9,638	292,206	301,844	474,417	924,049	4,033	1,402,499	
1986	998,611	1,009,295	2,007,906	2,595	21,755	24,350	177,176	843,040	3,865	1,024,081	
1987	1,079,983	1,033,932	2,113,915	6,949	107,958	114,907	375,810	882,301	7,672	1,265,783	
1988	1,308,071	1,068,302	2,376,373	0	0	0	520,375	884,877	4,889	1,410,141	
1989	1,602,543	1,251,204	2,853,747	0	0	0	474,559	830,500	8,135	1,313,194	
1990	1,876,072	706,079	2,582,151	0	90	90	424,697	875,099	9,262	1,309,058	
1991	536,669	12,444	549,113	3,521	0	3,521	543,582	565,395	4,879	1,113,856	
1992	955,687	455,112	1,410,799	1,156	0	1,156	166,992	613,978	2,605	783,575	
1993	1,069,258	1,243,978	2,313,236	0	0	0	256,853	822,589	2,609	1,082,051	

Table 8-9 SWP Water Delivered by Category, 1962–2020 (acre-feet)

(Continued)

Year	Table Water A			Article 21/Unscheduled		Other SWP Water Deliveries				Total Deliveries
	Municipal and Industrial	Agricultural	Total Table A ¹	Municipal and Industrial	Agricultural	Total Article 21/Unscheduled	Other Water ²	Feather River Diversions ³	Fish & Wildlife/Recreation Water	Total Other SWP Water Deliveries
1994	1,134,992	614,359	1,749,351	48,150	64,475	112,625	236,739	874,018	8,200	1,118,957
1995	801,570	1,165,523	1,967,093	17,984	46,346	64,330	85,560	860,077	2,575	948,212
1996	1,143,638	1,371,186	2,514,824	12,091	16,556	28,647	252,346	1,005,148	3,907	1,261,401
1997	1,220,200	1,040,183	2,260,383	2,814	18,618	21,432	322,000	993,211	4,146	1,319,357
1998	865,795	860,724	1,726,519	9,982	10,306	20,288	127,405	872,738	2,108	1,002,251
1999	1,405,311	1,333,592	2,738,903	61,191	96,879	158,070	85,312	1,108,672	4,324	1,198,308
2000	1,949,922	1,222,485	3,172,407	170,302	138,483	308,785	353,584	1,085,886	4,096	1,443,566
2001	1,173,731	405,560	1,579,291	14,971	33,174	48,145	632,403	1,077,997	2,942	1,713,342
2002	1,921,139	713,533	2,634,672	15,478	27,637	43,115	311,976	1,131,880	3,712	1,447,568
2003	2,188,647	788,521	2,977,168	23,019	36,809	59,828	160,087	1,006,995	2,862	1,169,944
2004	2,001,278	643,509	2,644,787	103,890	114,606	218,496	403,542	1,171,835	2,887	1,578,264
2005	1,923,222	904,034	2,827,256	186,787	544,296	731,083	92,858	1,074,706	1,515	1,169,079
2006	1,973,419	999,930	2,973,349	293,358	327,981	621,339	143,774	1,094,944	3,628	1,242,346
2007	1,670,740	510,011	2,180,751	186,570	123,403	309,973	598,789	1,193,237	2,581	1,794,607
2008	1,024,147	220,093	1,244,240	2,729	0	2,729	773,445	1,087,669	2,778	1,863,892
2009	1,036,052	349,214	1,385,266	6,032	0	6,032	709,885	1,125,147	2,047	1,837,079
2010	1,503,322	507,350	2,010,672	7,505	0	7,505	790,602	978,172	1,167	1,769,941
2011	1,876,438	971,134	2,847,572	207,307	213,384	420,691	388,632	1,028,542	1,593	1,418,767
2012	1,880,188	713,511	2,593,699	0	0	0	367,609	1,047,832	1,609	1,417,050
2013	1,198,284	424,928	1,623,212	0	0	0	614,203	1,166,635	1,641	1,782,479
2014	405,314	70,219	475,533	1,444	0	1,444	699,678	839,792	677	1,540,147
2015	620,511	226,036	846,547	690	0	690	585,388	675,530	721	1,261,639
2016	1,505,573	516,318	2,021,891	3,319	0	3,319	343,472	974,673	1,401	1,319,546
2017	2,057,048	1,049,425	3,106,473	165,556	131,248	296,804	411,745	967,411	775	1,379,931
2018	1,185,960	381,502	1,567,462	2,180	0	2,180	607,518	979,689	879	1,588,086
2019	1,763,478	809,481	2,572,959	97,916	148,276	246,192	361,067	988,801	957	1,350,825
2020	755,649	238,902	994,551	994	0	994	557,547	1,132,659	786	1,690,992
Total	56,874,520	35,426,425	92,300,945	1,755,544	7,812,241	9,567,785	16,979,340	49,571,189	160,277	66,710,806
										168,579,536

¹ Includes Table A, Table A transfers, Table A exchanges, Carryover, and Pool Water.

² Includes water conveyed for SWP and non-SWP Contractors.

³ Includes amounts of water diverted according to various water rights agreements.



Chapter 9

Power Resources

The solar electric facility near Pearblossom Pumping Plant is in Los Angeles County. DWR receives 27,400 megawatt hours of solar energy and renewable energy credits annually from the facility.

Significant Events in 2020

Energy used at the 29 State Water Project (SWP) pumping and generating plants—excluding Castaic Powerplant, which is owned and operated by Los Angeles Department of Water and Power (LADWP)—totaled 6.54 million megawatt hours (MWh). To meet SWP energy needs, the Department of Water Resources (DWR) purchased 0.99 million MWh of energy at a cost of \$30.49 million. This included 0.41 million MWh from four renewable energy electric utilities at a cost of \$17.26 million and 0.58 million MWh of long-term energy at a cost of \$13.24 million. Additional associated energy costs totaled \$132.55 million, including transmission costs. The total cost of energy-related costs for 2020 was \$163.05 million.

Pursuant to WSPP (formerly known as Western Systems Power Pool) bilateral trades, transactions made under the Lodi Energy Center Power Sales Agreement, transactions under the California Independent System Operator (CAISO), and revenues from other long-term contracts, DWR received a total of \$68.45 million.

Information for this chapter was provided by the State Water Project Analysis Office, the State Water Project Power and Risk Office, and the Hydropower License Planning and Compliance Office.

State Water Project (SWP) Contractors depend on the SWP to obtain economical sources of power to deliver affordable water. Consequently, the Department of Water Resources (DWR) administers a comprehensive power resources program. Key elements of the program include projection of power 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 Contractors;
- meet responsibilities and criteria of the Western Electricity Coordinating Council (WECC); and
- conform to regulations of the Federal Energy Regulatory Commission (FERC).

To achieve these goals, DWR constructed its own power facilities. Additionally, DWR 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 provide a mix of regulation, spinning, and nonspinning reserves to the CAISO's ancillary services market. DWR's power resources program also takes advantage of SWP water storage and conveyance capacities, which cost-effectively control pump loads and generation.

Major Electric Utility Industry Developments

In 2020, CAISO focused on issues affecting grid reliability such as adjusting its

operations to conform with COVID-19 restrictions, managing record-breaking region-wide summer conditions, increased integration of storage resources, and the continued need for flexible resources, including electric storage.

CAISO maintained initiatives to expand the CAISO Balancing Authority Area to include entities outside the current CAISO footprint. Among these initiatives are the Regional Resource Adequacy, Regional Integration of California Greenhouse Gas Compliance, and Energy Imbalance Market Governance.

DWR Participation in Electric Utility Industry Activities

DWR continued to participate in CAISO's stakeholder processes to help ensure tariff and business practice manuals are compatible with SWP operations. DWR's participation in CAISO stakeholder processes focused on the following primary elements in 2020:

- market initiatives road map
- stakeholder initiatives catalog
- budget and grid management charge process
- transmission access charge structure
- day-ahead market enhancements
- extended day-ahead market
- resource adequacy enhancements
- local capacity procurement for 2020 requirements

- annual resource adequacy processes including Path 26 allocation, import allocation, and net qualifying capacity
- flexible capacity needs study process for 2020
- maximum import capability stabilization and multi-year allocation
- proxy demand resource clarifications
- resource adequacy availability incentive mechanism penalty settlement dispute
- energy storage and distributed energy resources, phase 4
- system-level market power mitigation
- intertie deviation settlement
- congestion revenue rights auction efficiency and reform
- commitment cost enhancements, phase 3
- commitment costs and default energy bids enhancements
- regional integration and Energy Imbalance Market greenhouse gas (GHG) compliance
- generator interconnection process enhancements
- excess behind the meter production
- hybrid resources
- variable operations and maintenance cost review
- market settlement timeline
- pseudo-ties of shared resources
- transmission planning
- regional energy market

In addition, DWR participated in the California Energy Commission's planning processes by submitting a demand forecast to the commission.

Besides CAISO and the 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 numbers given in parenthesis, if applicable):

- CAISO demand response report (ER06-615)
- FERC review of Pacific Gas & Electric Company (PG&E) and DWR work performance agreement (ER18-656)
- CAISO resource adequacy (ER18-728, ER18-857, ER15-1825, ER18-1699, EL18-177, ER20-94, ER19-1562, ER19-1542, ER20-1552)
- CAISO commitment cost enhancements, phase 3 (ER20-1592)
- CAISO commitment costs and default energy bid enhancements (ER19-2727, ER20-2360)
- CAISO congestion revenue rights (ER18-1344, ER18-2034, ER19-26)
- CAISO Order 841 compliance (ER19-468)
- CAISO energy storage and distributed energy resources, phase 3b (ER20-2443)
- CAISO intertie deviation settlement (ER20-1890)
- CAISO Amendment 60 (ER04-835)
- CAISO hybrid resources, phase 1 (ER20-2890)
- CAISO Order 831 compliance (ER19-2757)
- CAISO excess behind the meter production (ER21-190)
- CAISO pseudo-ties of shared resources (ER21-447)
- CAISO capacity procurement mechanism soft offer cap (ER20-1075)
- CAISO grid management charge—cost of service update (ER21-112)
- CAISO tariff clarifications (ER20-2374, ER20-1281)
- CAISO market settlement timeline (ER20-2617)
- CAISO deliverability assessment initiative (ER20-732)
- U.S. Department of Energy notice of proposed rulemaking for fuel-secure generation units (RM17-3, RM18-1)

- FERC notice of proposed rulemaking on electric transmission incentives (RM20-10)
- FERC distributed energy resources technical considerations for the bulk power system (RM18-9)
- FERC grid enhancing technologies (AD19-19)
- FERC credit reforms in wholesale electric markets (AD20-6)
- PG&E transmission owner tariff filing (TO20) proposal to increase transmission revenue requirement rates for retail and wholesale customers of CAISO (ER19-413)
- PG&E transmission owner tariff annual update filing proposal to increase transmission revenue requirement rates for retail and wholesale customers of CAISO (ER19-13)
- San Diego Gas & Electric transmission owner tariff annual update filing (TO5—Cycle 12) proposal to increase transmission revenue requirement rates for retail and wholesale customers of CAISO (ER20-503)
- San Diego Gas & Electric transmission owner tariff annual update filing (TO5—Cycle 3) proposal to increase transmission revenue requirement rates for retail and wholesale customers of CAISO (ER21-526)
- Southern California Edison (SCE) transmission owner tariff filing (TO2019A) proposal to increase transmission revenue requirement rates for retail and wholesale customers of CAISO (ER19-1553)
- Trans Bay Cable transmission owner tariff filing (ER19-2846)
- SCE transmission owner tariff annual update filing (TO2020) proposal to increase transmission revenue requirement rates for retail and wholesale customers of CAISO (ER19-1553)
- PG&E's proposal to update its transmission revenue balancing account (ER21-131)
- PG&E proposed annual update to its transmission revenue balancing account (ER19-11)
- San Diego Gas & Electric proposed annual update to its transmission revenue balancing account (ER21-301)
- SCE's proposal to update its San Diego Gas & Electric proposed annual update to its transmission revenue balancing account (ER21-261)

North American Electric Reliability Corporation (NERC) Reliability Compliance

Background

The Energy Policy Act of 2005 assigned FERC the responsibility for bulk electric system reliability and the North American Electric Reliability Corporation (NERC) was subsequently tasked with establishing mandatory reliability standards for the bulk electric system. WECC is the regional entity responsible for the reliability and security of the bulk electric system in the Western Interconnection, which includes western Canada and the western United States. WECC oversees implementation of the reliability standards and validation of compliance, including assessment of penalties and sanctions. Details of the NERC reliability standards and the attributes of the compliance program can be found in Bulletin 132-11.

DWR's Internal Compliance Program

To align with NERC's risk-based approach to monitoring and enforcing compliance with NERC reliability standards, DWR conducted an internal NERC reliability standards risk assessment survey to identify and analyze DWR's risks associated with the standards. DWR will use these results to develop a risk assessment tool and risk management plans for its highest risk standards.

NERC requires that owners of bulk electric system transmission elements functionally map with a registered transmission planner and a transmission operator. In response, DWR registered as a transmission planner and is in discussions with NERC and WECC regarding the necessity of DWR registering as a transmission operator to meet those mapping requirements.

DWR also submitted, in compliance with the requirements of the reliability standards, its annual self-certification to WECC for 2019. The submittal certified DWR's compliance with the requirements of a WECC-determined subset of standards or provided a violation report supported by a mitigation plan to resolve the outstanding items. Violation of these standards can lead to financial penalties or reduced operating flexibility.

Greenhouse Gas Management

In 2020, DWR reported its calendar year 2019 pump load, generation, energy imports, and sulfur hexafluoride emissions to the California Air Resources Board. DWR's sulfur hexafluoride emissions were below the maximum allowable limit; however, because the allowable limit will be lower in future years, DWR continued to implement plans to further reduce its sulfur hexafluoride emissions. DWR continued to work with the California Air Resources Board to ensure that the new GHG regulations will not have significant impacts on SWP operation. DWR also reported its 2019 GHG emissions to The Climate Registry.

DWR procured compliance instruments to meet its contractual obligation for the Lodi Energy Center's Cap-and-Trade Program compliance cost.

Hydropower License Planning and Compliance

DWR holds three hydropower licenses and two conduit exemptions issued by FERC.

The FERC projects and project numbers are listed below:

- Oroville Facilities, FERC Project No. 2100
- South SWP Hydropower, FERC Project No. 2426
- Pine Flat Transmission Line, FERC Project No. 2876
- Alamo Powerplant Project, FERC Project No. 14579
- Mojave Siphon Powerplant Project, FERC Project No. 14580

FERC licenses and conduit exemptions may contain terms and conditions related to operations, maintenance, engineering, dam safety, security, environmental and cultural resources, recreation, and public safety. FERC also conducts safety, security, and environmental inspections, and DWR is required to comply with all findings of the inspections. Compliance with FERC requirements is an important function of DWR operations since FERC has the authority to levy fines for noncompliance. FERC also considers the record of compliance when considering the conditions of license renewals.

Oroville Facilities Relicensing

On January 26, 2005, DWR filed an application with FERC requesting a new license for the Oroville Facilities. (More detailed information about the relicensing process is available in previous editions of Bulletin 132.) The original 50-year license expired January 31, 2007. On February 1, 2007, FERC issued an annual license with the same terms and conditions as DWR's expired license. The original license automatically renews annually until the new license is issued. Issuance of the new license had been delayed pending issuance of the National Marine Fisheries Service biological opinion, which was completed and filed with FERC on December 5, 2016. With the filing of the National Marine Fisheries Service biological opinion, FERC now has all required

documentation to issue a new license, which is anticipated in the near future.

For more information about Oroville Facilities relicensing compliance, see Chapter 3, Environmental Programs, and Chapter 12, Recreation.

South SWP Hydropower and Devil Canyon Project Relicensing

The existing FERC license for South SWP Hydropower covers Warne, Castaic, and Devil Canyon power plants and expires on January 31, 2022.

On August 1, 2016, DWR filed two preliminary application documents and notices of intent with FERC for the relicensing of South SWP Hydropower and requested the Devil Canyon Powerplant (i.e., Devil Canyon Project) be relicensed separately from Warne and Castaic power plants. The first preliminary application document and notice of intent were submitted by DWR and Los Angeles Department of Water and Power (LADWP) for the relicensing of Warne and Castaic power plants. (LADWP operates and maintains the Castaic Powerplant and is a joint licensee with DWR on FERC Project No. 2426.) Warne and Castaic power plants will continue to be referred to as South SWP Hydropower. The second preliminary application document and notice of intent were filed solely on behalf of DWR for the relicensing of the Devil Canyon Project.

With the August 1, 2016, submission of the Devil Canyon Project preliminary action document, DWR also requested FERC's approval to use the Traditional License Process in lieu of the Integrated Licensing Process, which is FERC's default relicensing process. DWR and LADWP will use the Integrated License Process for South SWP Hydropower relicensing.

On September 30, 2016, FERC issued a notice to proceed and approved DWR's request to use the Traditional License Process for the Devil Canyon Project. Upon completion of the relicensing effort, FERC will issue one new license to DWR and LADWP as co-licensees for the Warne and Castaic power plants, which will retain the name and number South SWP Hydropower, FERC Project No. 2426, and one new license to DWR for the Devil Canyon Powerplant, to be assigned the name and number Devil Canyon Project, FERC Project No. 14797.

For both P-2426 and P-14797 from April 2018 onward, DWR met with State, federal, and non-governmental organization stakeholder agencies to discuss development of protection, mitigation, and enhancement measures. These meetings were a collaborative effort to establish relationships and refine DWR's commitments with respect to environmental, cultural, and recreational resource issues to gain early consensus with stakeholders.

South SWP Hydropower, FERC Project No. 2426.

DWR and LADWP consulted with various Native American tribes whose traditional sites could potentially be affected by the project, and on September 21, 2017, concurrence was obtained from the State Historic Preservation Officer on the Area of Potential Effects for cultural resources and tribal resources studies. On May 15, 2018, DWR and LADWP submitted an initial study report for the South SWP Hydropower Project documenting relicensing study progress to date and any variances to the original study plan approved by FERC on June 14, 2017. Stakeholders reviewed and commented on the initial study report with suggestions for study modifications or new studies. On September 7, 2018, upon consideration of all stakeholder requests, FERC approved the final modified DWR and LADWP study plan for the South SWP Hydropower Project.

By the end of 2018, the field work investigations of all 22 studies for the South SWP Hydropower Project had begun. Of these, field work for 14 investigations had been completed and the remaining investigations are ongoing. One study completed both the field work and the Field Results and Data Summary.

Devil Canyon Project, FERC Project No. 14797. For the Devil Canyon Project, the field work investigations and nine of the 11 Field Results and Data Summaries were completed by the end of 2018. The remaining two studies are ongoing.

Final License Application. DWR and LADWP filed a final license application with FERC on January 30, 2020, for relicensing of the South SWP Hydropower Project. FERC reviewed and accepted the application as complete. This major milestone sets into motion the FERC process of reviews and additional information requests.

The final license application for the Devil Canyon Project was submitted to FERC in 2019 and is addressed in Bulletin 132-20.

Existing SWP Power Facilities

Figure 9-1 shows the names, locations, and nameplate capacities of the SWP's primary power facilities.

Hydroelectric

Hydroelectric generation provides the largest share of SWP power resources. The combined Hyatt Powerplant and Robie Thermalito Pumping-Generating Plant generate about 2.2 billion kilowatt hours of energy in a median water year, while the 3 megawatts (MW) from the Thermalito Diversion Dam Powerplant add another 24 million kilowatt hours 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.

Renewables

To meet its GHG reduction goals, DWR executed agreements with various entities to purchase zero GHG emission energy used by the SWP.

DWR Power Planning Activities

DWR's power planning for the SWP includes periodic development of an Integrated Resource Plan, which concludes with plans for long-term and mid-term power procurements necessary to operate the SWP and ensures rate stability through energy market disruptions.

DWR's power planning also includes the Renewable Energy Procurement Plan, which is part of its *Climate Action Plan Phase I: Greenhouse Gas Emissions Reduction Plan*. Information about the Renewable Energy Procurement Plan and the *Climate Action Plan* is available in previous editions of Bulletin 132.

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. As needed, DWR also transacts with marketers and other utilities.

Joint Developments

In 1966, DWR entered into a contract with 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

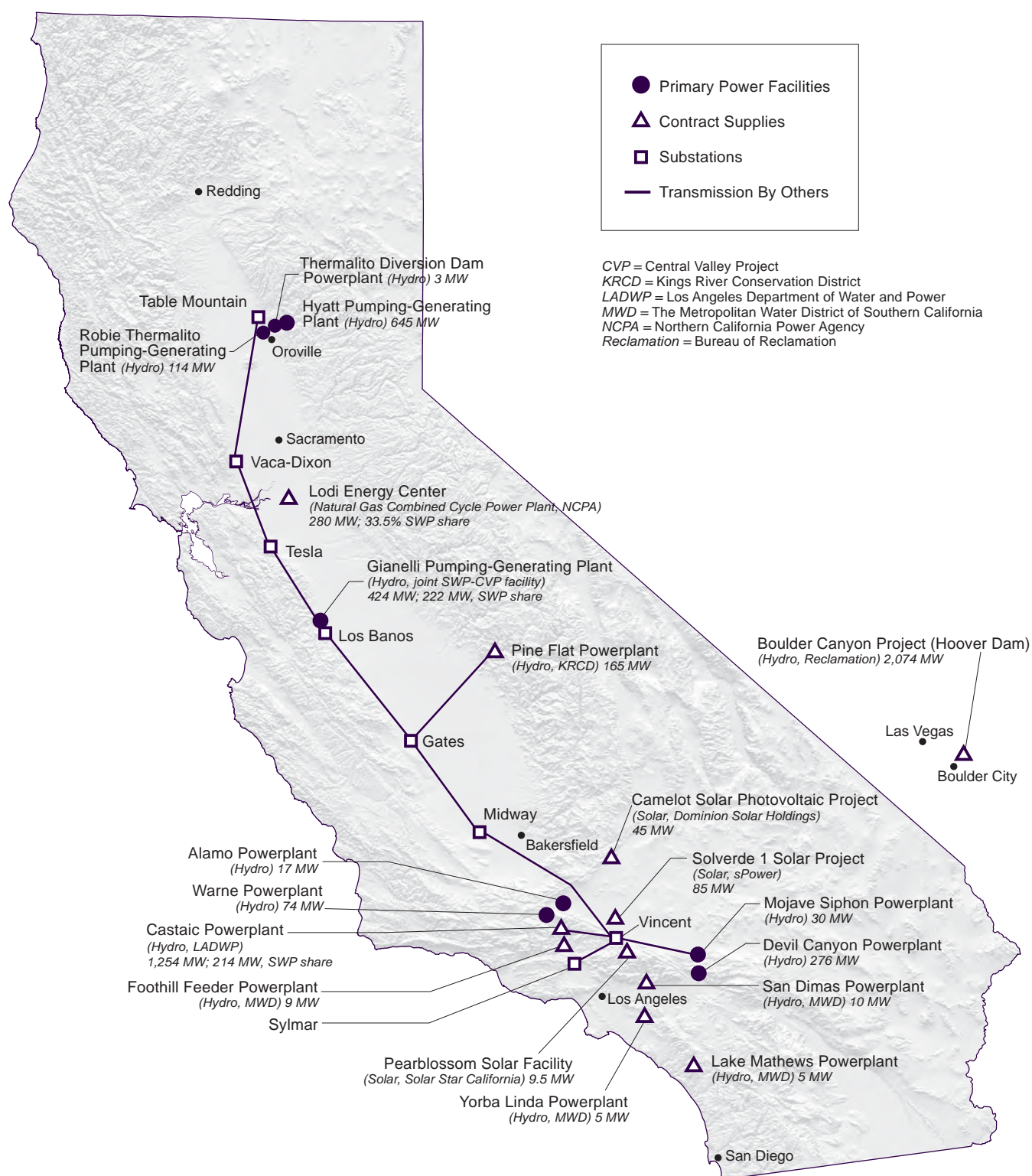


Figure 9-1 Names, Locations, and Nameplate Capacities of Primary State Water Project Power Facilities

on weekly water schedules through the West Branch.

Gianelli Pumping-Generating Plant is a joint-use facility owned and operated by DWR and the U.S. Bureau of Reclamation. DWR's share is 222 MW, and the U.S. Bureau of Reclamation's share is 202 MW.

Long-term Purchase Agreements

In 1979, DWR and Kings River Conservation District executed an agreement under which DWR receives the output of the 165 MW hydroelectric Pine Flat Powerplant. The power plant supplies DWR with about 400,000 megawatt hours (MWh) of energy in median water years.

On September 9, 2019, DWR and The Metropolitan Water District of Southern California (Metropolitan) executed an agreement under which DWR receives the output of four small hydroelectric plants totaling 29 MW starting on October 1, 2019. DWR also receives renewable energy credits from these four hydroelectric plants. The agreement's termination date is September 30, 2022.

In 2010, DWR and various public agencies executed an agreement with the Northern California Power Agency to finance, construct, operate, and maintain the Lodi Energy Center—a 280 MW natural gas combined cycle combustion turbine generation facility that Northern California Power Agency would own and operate, and from which DWR would receive 33.5 percent of the output. The facility achieved its commercial operation date on November 27, 2012.

Originally executed in 2013 and amended in 2014, the 20-year agreement for the 45 MW RE Camelot photovoltaic solar generation facility provides DWR with approximately 124,000 MWh of solar energy and renewable credits annually until 2034.

In 2015, DWR and Solar Star California XLIV executed a 20-year agreement, with an optional 10-year extension, under which DWR receives approximately 27,400 MWh of solar energy and renewable energy credits annually from the 9.5 MW Pearblossom Solar Facility, which is adjacent to the Pearblossom Pumping Plant.

In 2015, DWR and Solverde 1 executed a 20-year agreement under which DWR receives approximately 230,000 MWh of solar energy and renewable energy credits annually from the 85 MW solar plant.

In 2015, DWR and Metropolitan executed an agreement under which DWR received the output of five small hydroelectric plants totaling 51.4 MW and approximately 54,574 MWh of energy and renewable energy credits. The agreement's termination date was December 31, 2020.

In 2017, DWR, the U.S. Department of Energy, the Western Area Power Administration (Desert South West Region), and the U.S. Bureau of Reclamation executed a 50-year agreement under which DWR receives up to 6,500 MWh of zero-emission energy annually from the Boulder Canyon Project (Hoover Dam), located near Boulder City, Nevada.

The renewable energy procured under these agreements will further increase the amount of renewable and zero GHG emission energy used by the SWP and will help DWR meet its GHG reduction goals.

Short-term Purchase Agreements

DWR typically engages in short-term power transactions with member utilities and energy marketers under the WSPP. These transactions include energy and capacity to meet the requirements of resource adequacy, which is a planning and procurement process to ensure adequate resources.

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 periods when power costs are lower and maximize power generation 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. Because of DWR's water delivery priority, these bids are normally restricted to contingency events.

Contractual Transmission Agreements

DWR has contracts with CAISO, PG&E, and SCE for transmission interconnection and network transmission service for SWP power resources and pumping loads. Detailed information about past contractual transmission agreements is available in previous editions of Bulletin 132.

Additionally, DWR has wholesale distribution service agreements with SCE for service over SCE's distribution system from the CAISO interchange points to SWP loads and resources.

In July 2016, DWR and PG&E executed a work performance agreement in which DWR provided funding to PG&E to perform transmission studies, pre-parallel inspection, and witness testing at the

Robie Thermalito Pumping-Generating Plant. This work was needed for Robie Thermalito Pumping-Generating Plant to be commercially operational again following the fire at the facility in November 2012. The agreement was amended in 2018 and 2019 to reflect the estimated increase in project costs. Work was completed in September 2020 and the Robie Thermalito Pumping-Generating Plant became commercially operational after PG&E granted all units at the facility permission to operate.

Also in 2016, DWR and SCE coordinated engineering, design, and construction of the transmission facilities for Citrus Pump Station in San Bernardino County. The Citrus Pump Station entered commercial operation in January 2020. SCE subsequently performed a final true-up of DWR-SCE Citrus Pump Station Interconnection Facilities Agreement costs. It yielded a reduction in the monthly interconnection facilities charge and a refund of the income tax component of contribution security tax.

In December 2017, DWR and SCE executed a construction agreement in which SCE provided funding for DWR to perform engineering, design, and construction of relay upgrades at DWR's Mojave Siphon and Devil Canyon power plants. Work is anticipated to be completed by the end of 2022.

In July 2020, DWR gave one-year advance written notice of termination to PG&E, Northern California Power Agency, and City of Santa Clara dba Silicon Valley Power for the Agreement of Cotenancy in the Castle Rock Junction-Lakeville 230 kilovolt Transmission Line (Agreement). The written notice identified termination of DWR's transmission capacity rights and obligations under the Agreement to be effective August 1, 2019.

In October 2020, DWR, PG&E, and CAISO executed an amendment to the Large Generator Interconnection Agreement to capture changes resulting from the DWR's post commercial operation date modification request for its Robie Thermalito Pumping-Generating Plant and realignment of the transmission lines from Hyatt Powerplant to the 230 kilovolt Table Mountain Substation following the Oroville Dam spillways incident in February 2017.

SWP Power Operations in 2020

Tables 9-1 through 9-4, at the end of the chapter, present historical information about SWP power operations for calendar year 2020, including energy consumed, generated, purchased, and sold. Note that in some instances, these tables may not sum as expected due to rounding.

Energy Consumed

In 2020, energy used for SWP operations at the 29 SWP pumping and generating plants totaled 3.878 million 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 U.S. Bureau of Reclamation furnishes additional energy for this purpose.

Table 9-1 shows the amount of energy used each month at SWP pumping and power generating plants to operate the SWP in 2020.

Energy Generated and Purchased

Table 9-2 shows the amounts of energy generated at SWP facilities in 2020, as well as energy purchased for SWP operations.

Hydroelectric

The Hyatt-Thermalito power complex in Oroville generated 1,320,175 MWh of energy in 2020.

Energy generated at SWP aqueduct recovery plants—Gianelli, Alamo, Mojave Siphon, Devil Canyon, and Warne—totaled 763,195 MWh.

Natural Gas

The SWP received generation from the Lodi Energy Center. SWP's 33.5 percent share of the Lodi Energy Center's energy output for 2020 was 236,543 MWh.

Contractual Resource Arrangements in 2020

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 2020, LADWP provided 400,742 MWh for DWR's share of energy generated at Castaic Powerplant.

DWR's share of Gianelli Pumping-Generating Plant used 84,811 MWh and generated 80,355 MWh of energy in 2020.

Purchases and Costs

Table 9-3 shows the amounts of energy, transmission, and other services purchased in 2020. Amounts include contractual short-term and long-term energy trades and associated transactions of energy, transmission, capacity, and ancillary services with CAISO, and miscellaneous energy-related costs.

DWR transacted 0.99 million MWh of energy at a cost of \$30.49 million. Other SWP-related costs include \$5.54 million for transmission service outside CAISO and \$127.01 million for operation, maintenance, and miscellaneous CAISO charges, among other things. Key costs associated with the latter amount are (1) \$6.7 million for operations and maintenance, related to Pine Flat Powerplant; and (2) \$9.4 million for debt service and \$7.73 million for capital improvement, management, operations, and maintenance, connected to the Lodi Energy Center. The \$5.54 million for transmission service outside CAISO includes \$0.31 million for PG&E and \$3.89 million for SCE, among other things.

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 2020, the power plant provided 240,148 MWh of energy to the SWP at an energy component cost of \$1.84 million.

Under the Metropolitan Small Hydro contract, DWR purchased 93,294 MWh of energy in 2020 from four small hydroelectric power plants on the Metropolitan system at a cost of \$4.97 million.

Also, under the Lodi Energy Center Power Sales Agreement with Northern California Power Agency, DWR received a purchase credit of \$12.71 million based on 236,541 MWh generated at the Lodi Energy Center plant during 2020 and conveyed to the CAISO power grid. This amount is shown as revenue in Table 9-4.

Under renewable energy contracts with RE Camelot, LLC; Metropolitan; Solar Star California XLIV, LLC; and Solverde 1, LLC, DWR received a total of 409,892 MWh at a cost of \$17.26 million.

Finally, under the *Boulder Canyon Project Agreement* with the U.S. Department

of Energy, Western Area Power Administration, DWR received 5,087 MWh at a cost of \$60,255.

Short-term Energy 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 2020, the SWP did not purchase short-term energy from bilateral marketers. This is reflected in Table 9-3.

Contractual Sales of Excess Power

In 2020, DWR received \$68.45 million in energy revenues. This includes (1) \$47.71 million for ancillary service transactions, made through CAISO; and (2) \$18.54 million associated with long-term contracts, including, among other things, \$12.93 million related to the Lodi Energy Center Power Sales Agreement with Northern California Power Agency.

Other Long-term Agreements

Under the terms of the contract with the U.S. Department of Energy, Western Area Power Administration, DWR acts as CAISO scheduling coordinator for the joint-use facilities of the San Luis Unit and certain DWR pumping facilities occasionally used to pump federal water. During 2020, DWR incurred a net cost of \$1.78 million. The actual CAISO charges and revenue associated with this amount are included—but not listed independently—on Tables 9-3 and 9-4.

Forecasting Power Operations

Each year, after reviewing the SWP 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 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.

Table 9-1 Energy Used at Pumping Plants and Power Plants in 2020, by Month (megawatt-hours)

Pumping Plants and Power Plants	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Hyatt-Thermalito Power Complex (station service)	60	124	158	37	13	0	0	29	344	42	17	129	953
North Bay Interim Pumping Plant	0	0	0	0	0	0	0	0	0	0	0	0	0
Cordelia Pumping Plant	641	1,111	130	732	1,153	1,201	1,239	1,272	1,281	1,225	1,124	946	12,054
Barker Slough Pumping Plant	333	708	88	726	1,101	896	887	946	1,038	939	1,038	786	9,486
South Bay Pumping Plant	5,966	7,330	7,428	7,434	10,090	13,457	9,160	8,799	7,298	7,950	4,728	3,079	92,718
Del Valle Pumping Plant	14	13	315	209	279	278	149	7	6	7	12	14	1,302
Banks Pumping Plant	37,990	31,669	33,715	11,926	9,691	8,860	30,065	39,608	16,112	8,098	26,192	28,756	282,701
Gianelli Pumping-Generating Plant (SWP share)	21,363	6,693	19,535	4,645	47	0	3,273	9,947	410	863	5,641	12,421	84,811
Dos Amigos Pumping Plant (SWP share)	10,391	15,876	9,593	6,903	10,368	14,780	16,235	21,302	21,073	11,832	11,269	10,678	160,301
Buena Vista Pumping Plant	11,300	19,803	17,521	8,358	14,225	20,291	22,448	22,379	19,435	13,940	12,445	17,156	199,301
Teerink Pumping Plant	16,813	29,644	28,286	12,741	20,803	21,583	21,084	21,141	19,133	13,478	12,871	18,789	236,364
Chrisman Pumping Plant	37,056	65,412	62,931	27,959	45,265	46,817	45,210	45,855	42,170	29,342	28,381	41,494	517,892
Edmonston Pumping Plant	133,595	237,543	227,274	96,661	158,248	162,147	154,228	160,092	146,181	103,926	101,093	148,136	1,829,125
Alamo Powerplant (station service)	20	0	1	29	19	3	7	2	11	22	36	11	161
Pearblossom Pumping Plant	25,263	40,659	26,822	8,784	12,029	17,766	18,537	21,770	17,890	12,689	14,764	15,918	232,889
Pine Flat Powerplant (station service) ¹	0	72	244	209	0	0	0	0	150	212	217	154	1,258
Mojave Siphon Powerplant (station service)	34	1	0	47	36	12	14	10	8	35	45	18	260
Devil Canyon Powerplant (station service)	107	0	0	0	41	0	1	0	0	4	24	19	196
Oso Pumping Plant	5,201	11,425	16,705	8,191	13,794	11,479	10,111	9,128	9,425	6,765	5,813	11,403	119,441
Warne Powerplant (station service)	12	18	0	165	30	169	90	123	297	103	98	1	1,108
Las Perillas Pumping Plant	239	426	348	483	991	1,349	1,571	1,346	836	516	62	86	8,253
Badger Hill Pumping Plant	617	1,125	920	1,249	2,556	3,534	4,065	3,474	2,207	1,303	134	195	21,379
Devil's Den Pumping Plant	719	735	799	730	1,021	1,206	1,424	1,302	1,137	856	258	454	10,642
Bluestone Pumping Plant	667	685	745	680	948	1,119	1,319	1,204	1,055	791	226	410	9,849
Polonio Pass Pumping Plant	740	758	828	756	1,047	1,229	1,457	1,326	1,160	864	247	460	10,871
Greenspot Pump Station	54	1,342	997	270	1,051	527	66	70	66	64	60	55	4,624
Crafton Hills Pump Station	129	2,028	1,471	363	1,482	1,160	1,342	2,023	2,220	2,242	1,192	390	16,041
Cherry Valley Pump Station	15	321	133	14	123	58	76	230	183	218	116	12	1,499
Citrus Pump Station	430	42	51	45	44	697	1,708	2,433	2,697	2,722	1,441	532	12,843
Total Energy Required for the SWP²	309,768	475,563	457,038	200,347	306,496	330,639	345,764	375,818	313,825	221,047	229,542	312,502	3,878,350

¹ Pine Flat station service energy provided by CAISO under Market Redesign and Technology Upgrade (MRTU) operation.

² Totals may not sum as expected due to rounding.

Table 9-2 Energy Generated and Purchased in 2020, by Month (megawatt-hours)

Sources of Energy	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SWP Energy Sources													
Hyatt-Thermalito Power Complex	79,154	57,223	57,978	64,009	168,581	208,681	223,909	145,977	89,888	102,073	71,748	50,954	1,320,175
Gianelli Pumping-Generating Plant (SWP share)	0	8,181	1,541	4,032	13,295	20,308	9,358	7,978	5,432	6,215	2,573	1,442	80,355
Alamo Powerplant	4,535	7,468	4,670	1,337	2,207	3,314	3,256	4,128	2,257	2,336	2,503	2,594	40,606
Mojave Siphon Powerplant	2,705	4,682	2,938	641	970	1,542	1,401	2,105	1,370	1,121	1,745	1,481	22,711
Devil Canyon Powerplant	42,510	67,734	40,692	12,356	18,269	30,019	28,998	34,687	28,405	24,879	33,299	17,324	379,171
Warne Powerplant	4	18,177	36,067	18,306	29,258	24,517	21,460	19,051	20,345	14,129	13,061	25,978	240,352
<i>Subtotal</i>	<i>128,908</i>	<i>163,474</i>	<i>143,888</i>	<i>100,681</i>	<i>232,580</i>	<i>288,382</i>	<i>288,383</i>	<i>213,924</i>	<i>147,696</i>	<i>150,752</i>	<i>124,928</i>	<i>99,774</i>	<i>2,083,371</i>
Energy Sources from Long-term Agreements													
Castaic Powerplant	13,728	36,804	48,686	29,616	44,640	37,080	34,224	30,528	32,640	22,560	20,088	50,208	400,802
Metropolitan Small Hydro Generation	0	0	0	0	0	0	0	0	0	0	0	0	0
Pine Flat Powerplant (Kings River Conservation District)	0	0	0	1,677	38,643	86,135	89,510	23,492	692	0	0	0	240,148
Energy to Metropolitan for CRA ¹ Pumping	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy from Metropolitan for CRA ¹	0	0	0	0	0	0	0	0	0	0	0	0	0
Lodi Energy Center	21,738	0	0	0	0	12,304	25,149	48,597	24,790	29,463	20,909	53,593	236,543
Hoover-Boulder Canyon Project	240	342	340	512	621	556	509	472	472	443	411	275	5,193
Renewable Energy ²	26,327	35,230	30,681	41,135	60,093	56,901	59,448	53,354	42,652	38,480	31,640	27,065	503,186
Purchases													
Purchases (Firm and WSPP Contracts)	0	0	0	0	0	0	0	0	0	0	0	0	0
CAISO Energy ³	140,566	239,713	233,263	26,726	-70,081	-138,414	-126,309	54,048	89,672	8,811	52,475	135,181	645,651
<i>Subtotal</i>	<i>202,598</i>	<i>312,089</i>	<i>313,150</i>	<i>99,666</i>	<i>73,916</i>	<i>54,561</i>	<i>82,530</i>	<i>210,491</i>	<i>190,919</i>	<i>99,758</i>	<i>125,523</i>	<i>266,321</i>	<i>2,031,523</i>
Total Resources	331,506	475,563	457,038	200,347	306,496	342,943	370,913	424,415	338,615	250,510	250,451	366,095	4,114,893
Less Energy Sales ⁴	-21,738	0	0	0	0	-12,304	-25,149	-48,597	-24,790	-29,463	-20,909	-53,593	-236,543
Total Energy Provided to the SWP⁵	309,768	475,563	457,038	200,347	306,496	330,639	345,764	375,818	313,825	221,047	229,542	312,502	3,878,350

¹ Contractual Resource Arrangement (CRA).² RE Camelot, LLC; Solar Star California XLIV, LLC; The Metropolitan Water District of Southern California; and Solverde 1, LLC. Actual energy received is being reported and does not include deemed delivered quantity.³ Energy provided by CAISO for balancing the total SWP loads and resources.⁴ Includes Power Received under Lodi Energy Center Power Sales Agreement as a purchase credit.⁵ Totals may not sum as expected due to rounding.

Table 9-3 Energy, Transmission, and Related Costs in 2020

Category	Energy Trades (MWh)	Energy Cost (in dollars)	Transmission Cost Outside CAISO (in dollars)	Energy-Related Costs (in dollars)	Total Cost (in dollars)
CAISO–Bilateral Trades					0
CAISO–Other ¹				99,395,006	99,395,006
Energy Marketers–Bilaterals (WSPP)				82,845	82,845
Long-term Contracts ²	575,070 ^a	13,236,194	5,535,520	27,537,116	46,309,203
Long-term Energy Markets– Renewable Energy ³	409,892	17,258,542			17,258,542
Total	984,962	30,494,735	5,535,520	127,014,967	163,045,596

¹ Transmission, capacity, imbalance energy, etc.² Kings River Conservation District; Los Angeles Department of Water and Power; The Metropolitan Water District of Southern California; Northern California Power Agency; Pacific Gas & Electric Company, Southern California Edison; and Boulder Canyon Project.³ RE Camelot, LLC; The Metropolitan Water District of Southern California; Solar Star California, XLIV, LCC; and Solverde 1 LLC.^a Includes 236,541 MWh generated at Lodi Energy Center.**Table 9-4 Energy and Energy-related Revenue in 2020 per Contract Agreements**

Category	Energy Trades (MWh)	Energy Revenues (in dollars)	Other Energy- related Revenue (in dollars)	Total Revenues (in dollars)
CAISO–Bilateral Trades				0
CAISO–Other ¹			47,711,739	47,711,739
Energy Marketers–Bilaterals			2,197,500	2,197,500
NCPA Long-Term Energy Contract (LEC)	236,541 ^a	12,707,113	224,024	12,931,137
Long-term Contracts ²		3,376,326	2,219,442	5,595,768
Long-term Renewable Energy Contracts			15,735	15,735
Total	236,541	16,083,439	52,368,440	68,451,879

¹ Transmission, capacity, imbalance energy, etc.² Los Angeles Department of Water and Power; Northern California Power Agency, City of Santa Clara, and Western Area Power Administration.^a All from Northern California Power Agency Lodi Energy Center.



Chapter 10

Facilities Maintenance

Thermalito Diversion Dam on the Feather River.

Significant Events in 2020

In March, the COVID-19 pandemic presented the Department of Water Resources (DWR) with the unique challenge of continuing the State Water Project (SWP) operation and maintenance. Overall, DWR rapidly adjusted work practices to prevent the spread of the COVID-19 virus in the workplace to protect SWP staff and critical assets. These efforts allowed for the successful continuity of operations of the SWP.

DWR finalized and submitted the Oroville Dam Complex Part 12D safety inspection/Director's Safety Review Board (DSRB) and Level 2 risk analysis reports to the Federal Energy Regulatory Commission (FERC) and Division of Safety of Dams (DSOD). In addition, DWR completed the Oroville Dam Safety Comprehensive Needs Assessment project and its multiple-volume reports submitted to FERC and DSOD. As part of the process, an independent review board of dam safety experts conducted independent technical reviews of key deliverables and documented its review of DWR's work products.

Field investigations associated with the Pyramid Dam Emergency Spillway Investigation concluded in March. The scope of the field investigation included drilling 41 rock core holes, geologic mapping, laboratory testing, and installation of three inclinometer casings and eight automated vibrating wire piezometers. DWR conducted Level 2 risk analyses for Pyramid and Castaic dams.

In July, the Director's Safety Review Board for Perris Dam began with subject matter expert presentations to its members and State regulators.

In September, the North Complex fire impacted SWP operations. DWR shut off all Hyatt Powerplant units and established minimum flows via the River Valve Outlet System between September 9th and 11th. Severe smoke in the Oroville area limited DWR's ability to perform routine maintenance. DWR maintained critical functions such as dam safety surveillance, and operations to meet regulatory compliance and security patrols.

The Pyramid and Castaic dam modernization programs continued to provide a comprehensive, cohesive, and coordinated approach to the modernization efforts of each facility and appurtenances to ensure maximum flexibility, public safety, and reliable operations to the State Water Project.

Information for this chapter was provided by the Division of Operations and Maintenance, the Division of Safety of Dams, the Division of Regional Assistance, 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.

Dam Safety Inspections and Reports

DWR conducts several types of inspections on SWP facilities to ensure that each dam is safe for continued operation. The Dam Safety Services (DSS), Division of Safety of Dams (DSOD), Federal Energy Regulatory Commission (FERC), and the U.S. Bureau of Reclamation (Reclamation) conduct various inspections and safety analyses to ensure the safety of SWP dams.

O&M staff, through the DSS and field divisions, inspect, collect, and analyze data for all SWP dams and appurtenant structures. DSS also conducts performance and instrumentation analyses and prepares annual reports that are distributed to the field divisions for scheduling and maintenance. The reports are also sent to FERC and to DSOD for their review.

In accordance with Division 3 of the California Water Code, DSOD has regulatory authority over jurisdictional dams owned and operated by DWR. DSOD is responsible for overseeing all design modifications and construction activities on jurisdictional SWP dams. In accordance with the California Code of Regulations (Title 23, Division 2, Chapter 1, Article 5), DSS and DSOD coordinate on and participate in the Director's Safety Review Board (DSRB) which includes a periodic evaluation of SWP dams with regard to dam safety and performance.

Additionally, 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 an in-depth instrumentation review of dam surveillance data. DSOD engineers and geologists evaluate proposed modifications to existing dams, as well as designs for any proposed new jurisdictional dams. DSOD oversees construction activities to ensure work is performed in accordance with approved plans and specifications. DSOD also performs comprehensive independent reevaluations of dams and their appurtenant structures. Downstream hazard classifications and condition assessment ratings are updated for the dams as needed. Definitions are on DSOD's website. Table 10-1 shows conditions assessment ratings for 2020.

FERC inspects all FERC-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. Under FERC's requirements, consulting engineers and geologists are retained to evaluate SWP dam facilities every five years.

DWR contracts periodically with independent consultants to review the safety of SWP dams and power facilities, except for Pearblossom Spill Basin Dam. That facility was originally designed to be used during misoperation at the Pearblossom Pumping Plant. The spill basin was never fully completed, has never been used, and is not under DSOD jurisdiction.

Table 10-1 Condition Assessments

Facility	Rating
Antelope Dam	Satisfactory
Frenchman Dam	Satisfactory
Grizzly Valley Dam	Satisfactory
Oroville Dam	Fair
Thermalito Diversion Dam	Satisfactory
Thermalito Forebay Main Dam	Satisfactory
Thermalito Afterbay Dam	Satisfactory
Feather River Fish Barrier Dam	Satisfactory
Bethany Dams	Satisfactory
Clifton Court Forebay Dam	Satisfactory
Del Valle Dam	Satisfactory
Dyer Reservoir	Satisfactory
Patterson Dam	Satisfactory
Pyramid Dam	Satisfactory
Castaic Dam	Fair
Cedar Springs Dam	Satisfactory
Devil Canyon Powerplant Second Afterbay Dam	Satisfactory
Perris Dam	Satisfactory
Crafton Hills Dam	Satisfactory

Routine Inspections

During 2020, O&M, along with agency representatives from DSOD, FERC, and Reclamation, conducted routine periodic inspections for all the dams in the Oroville Field Division, Delta Field Division, San Luis Field Division, and Southern Field Division. Table 10-2 shows SWP dam inspections conducted in 2020.

Independent Reviews Director's Safety Review Board

Under California Water Code, Section 6056, 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. In accordance with this California Water Code requirement, DWR formed the DSRB.

The DSRB consists of three independent consultants that meet at least once every five years to review the operational performance of DWR-owned dams and more frequently when consulting on new dams. The DSRB independently reviews and assesses the safety conditions of SWP dams.

DSRB 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 DSRB then prepares reports on each dam, approving dams as safe for continued operation and making recommendations. Based on DSRB recommendations, DWR prepares action plans. There were no DSRB inspections in 2020.

FERC Reviews

FERC annually conducts dam safety inspections with O&M for SWP dams under its jurisdiction. DWR is the licensee for FERC Project No. 2100 (P-2100) and FERC Project No. 2426 (P-2426). P-2100 consists of dams associated with Oroville Field Division facilities that include Oroville Dam, Thermalito Diversion Dam, Feather River Fish Barrier Dam, Thermalito Forebay Dam, and Thermalito Afterbay Dam. P-2426 dams are associated with Pyramid, Quail, Cedar Springs, and Devil Canyon Powerplant Second Afterbay facilities in the Southern Field Division. Every five years, a FERC Part 12D safety inspection is also conducted. In 2019, the Part 12D inspections for P-2100

Table 10-2 State Water Project Dam Inspections in 2020

		Type of Inspection						
		Operations & Maintenance Dam Safety Branch	Division of Safety of Dams	Federal Energy Regulatory Commission	U.S. Bureau of Reclamation Annual Inspection	U.S. Bureau of Reclamation 8-Year Periodic Facility Review	Director's Safety Review Board	Part 12D 5-Year Review
Field Division	Facility							
Oroville								
	Antelope Dam	X	X	–	–	–	–	–
	Frenchman Dam	X	–	–	–	–	–	–
	Grizzly Valley Dam	X	X	–	–	–	–	–
	Oroville Dam	X	X	X	–	–	–	–
	Bidwell Canyon Saddle Dam	X	X	X	–	–	–	–
	Parish Camp Saddle Dam	X	X	X	–	–	–	–
	Thermalito Diversion Dam	X	–	X	–	–	–	–
	Thermalito Forebay Dam	X	–	X	–	–	–	–
	Thermalito Afterbay Dam	X	X	X	–	–	–	–
	Feather River Fish Barrier Dam	X	-	X	–	–	–	–
Delta								
	Bethany Dams	X	X	–	–	–	–	–
	Clifton Court Forebay Dam	X	X	–	–	–	–	–
	Del Valle Dam	X	X	–	–	–	–	–
	Dyer Reservoir	X	X	–	–	–	–	–
	Patterson Dam	X	X	–	–	–	–	–
San Luis*								
	Little Panoche Detention Dam	X	–	–	X	X	–	–
	Los Banos Detention Dam	X	–	–	X	X	–	–
	O'Neill Dam	X	–	–	X	X	–	–
	Sisk Dam	X	–	–	X	X	–	–
Southern								
	West Branch							
	Castaic Dam	X	X	–	–	–	–	X
	Pyramid Dam	X	X	X	–	–	–	X
	Quail Canal and Dam	X	–	X	–	–	–	X
	William Warne Power Development	X	–	X	–	–	–	–
	East Branch							
	Cedar Springs Dam	X	X	X	–	–	–	X
	Devil Canyon Powerplant Second Afterbay Dam	X	X	X	–	–	–	X
	Perris Dam	X	X	–	–	–	–	–
	Crafton Hills Dam	X	X	–	–	–	–	–
	Crafton Hills Reservoir Enlargement Dam	X	X	–	–	–	–	–

"X" indicates dam inspection was conducted at SWP facility.

"-" indicates dam inspection was not conducted at SWP facility.

* The San Luis Field Division dams and the Quail Canal and Dam are not under DSOD jurisdiction. DSOD inspects dams at least once every fiscal year (July 1 through June 30). Frenchman, Thermalito Diversion, Thermalito Forebay, Feather River Fish Barrier, and Crafton Hills dams were inspected in fiscal years 2019-2020 and 2020-2021; however, they were not inspected in calendar year 2020.

dams were conducted. In 2020, the annual FERC inspections were deferred because of the COVID-19 pandemic and were rescheduled to 2021.

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. The FERC review process generated two documents: the *FERC Part 12D Safety Inspection Report* and the *Potential Failure Mode Analysis Report*. DSS and FERC's Dam Safety Engineer also inspect FERC-licensed facilities annually.

Supporting Technical Information Document

The *Supporting Technical Information Document* is a separate report that summarizes SWP project elements and details that do not change significantly over time. In the event of an emergency, the document serves as a summary and general overview for DWR, FERC, and consultants. The document is updated as required but is not generated as part of any of the dam safety inspections.

Canal Condition Assessment Program Inspections

Canal Condition Assessment Program inspections are typically scheduled biennially. No Condition Assessment Program visual inspections took place in 2020. The most recent biennial canal Condition Assessment Program visual inspections took place in 2019, and future canal Condition Assessment Program visual inspections will commence in 2021.

In 2020, an unmanned survey vessel outfitted with remote sensors was used to provide a high-resolution scan of the canal

below normal water levels. The bathymetry survey provided a complete visual condition assessment of the canal below the waterline. The new unmanned survey vessel was used to conduct canal bathymetry surveys of the canal in San Luis Field Division, San Joaquin Field Division, and Southern Field Division in 2020.

Pipeline Condition Assessment Program Inspections

The Condition Assessment Program for pipelines consists of inspections and other risk-informed treatments of these assets. This includes pipelines, tunnels, siphons, and discharge lines.

Inspection criteria consists of observation and assessment of deficiencies such as cracks, delamination, spalls, joint separation, leakage, roundness, corrosion, and any other observable defects or abnormalities. Additionally, as technologies and methods for the reliable asset management of these pipelines improve, more noninvasive inspection technologies are being utilized for condition assessment without the need to remove the pipeline from service. In recent years, DWR has employed nondestructive inspection and testing technologies for the pipelines.

During 2020, the Pipeline Condition Assessment Program successfully completed over 33 total miles of pipeline structural integrity inspections and reports. The program shared these reports and their findings and recommendations with the field divisions. Each inspection is summarized below in the section titled "Repairs, Modifications, and Inspections by Field Division".

Spillway Inspection Program

Oroville Dam Safety Comprehensive Needs Assessment

In 2017, DWR initiated the Oroville Dam Safety Comprehensive Needs Assessment to identify measures to bolster the safety and reliability of Oroville Dam and the appurtenant structures. In 2020, the Oroville Dam Safety Comprehensive Needs Assessment project was completed, and its multiple-volume report was submitted to DSOD and FERC. As part of the process, an independent review board of dam safety experts conducted independent technical reviews of key deliverables and documented its review of DWR's work products. The Comprehensive Needs Assessment also included engagement with an ad hoc group of community stakeholders. The ad hoc group both provided community perspectives and communicated about the Comprehensive Needs Assessment process and findings to the larger Oroville community.

Oroville Facilities Level 2 Risk Analysis

Following the Level 2 risk analysis for Oroville Dam, DWR pursued a Level 2 risk analysis for Pyramid and Castaic dams in 2020 to advance its risk management approach and expertise.

Arroyo Pasajero Program

As of 2020, the West Side Detention Basin's flood control features continued to function as expected, and work to address the transfer documents to Reclamation also continued. See Bulletin 132-20 for background information.

Repairs, Modifications, and Inspections by Field Division

DWR continually monitors all SWP facilities and performs repairs, modifications, and inspections as necessary to ensure safe,

reliable water delivery. The following sections describe significant and noteworthy repairs, modifications, and inspections conducted in 2020 by Oroville, Delta, San Luis, San Joaquin, and Southern field divisions.

Oroville Field Division

Between April 25 and May 30, DWR performed spillway monitoring at Antelope Dam during a spill event to ensure safe operation. No adverse condition or abnormalities were identified during the inspections.

In June, the spillways of the Antelope, Frenchman, and Grizzly Valley dams were cored to extract concrete cores for material testing and investigate potential subsurface issues identified from the 2018 nondestructive evaluations.

In May, eight vibrating wire piezometers were installed at the toe of Oroville Dam to better quantify and study the behavior of the seepage collection system.

In August and September, four new vibrating wire piezometers were drilled through the piers of the Oroville Dam service spillway (flood control outlet) structure and within the foundation rock to measure the piezometric pressures.

At Thermalito Diversion Dam, underwater concrete repairs to stop log rails for radial gate Nos. 1 and 2 were completed.

The Sutter-Butte Outlet Powerplant and Richvale Canal headworks at Thermalito Afterbay Dam were inspected in February.

In March, load balance testing and rope access inspection of the Thermalito Forebay bypass radial gate was performed. An inspection of Robie Thermalito Pumping-Generating Plant penstock No. 1 was also completed.

Specification No. 20-08 for Thermalito Afterbay River Outlets radial gate refurbishment was advertised, awarded, and a notice to begin work was issued in November.

In December, a contract for Specification No. 20-20 for the Bethany Dam Rodent Burrow Prevention Project was advertised and awarded.

Environmental surveys, permitting, and California Environmental Quality Act activities for the Delta Dams Rodent Burrow Prevention Project were advanced.

The Del Valle Dam flood control outlet works was dewatered to allow an inspection of repairs made in 2018 to the stilling basin. The repairs were found to be in good condition.

DWR Division of Engineering Project Geology performed geomorphic mapping with recently acquired LiDAR (light detection and ranging) and cone penetrometer tests to constrain the location of the West Tracy Fault in proximity to Clifton Court Forebay Dam. The work required the acquisition of temporary entry permits to perform work on private parcels.

The Peace Valley Pipeline was inspected in October and November. The inspection included a visual, electromagnetic, and three-dimensional survey scan of the interior of the pipeline on October 5–9, as well as a leak detection inspection performed on November 9–10. No critical or major findings were identified.

DWR Division of Engineering initiated a subsurface investigation of the Castaic Dam spillway in November as part of the Castaic Dam Modernization Program. The investigation included (1) drilling 20 rock core holes along the upper and middle sections of the spillway, (2) installing 18 vibrating wire in-line extensometers and

31 vibrating wire piezometers, (3) performing downhole geophysics and pressure-meter testing, and (4) collection and testing of foundation materials.

In January, the Devil Canyon Powerplant Second Afterbay was dewatered to perform the annual gate exercise, allowing for the inspection of the asphalt liner. Between January and March, DWR conducted the 10-year San Bernardino intake tower inspection and corrosion abatement on Devil Canyon Powerplant penstock No. 1. Penstock No. 1 was recoated from manhole 1 to manhole 3.

DWR provided numerous briefings and projections to Castaic Dam stakeholders regarding the anticipated drawdown of the reservoir to accomplish the seismic retrofit of the outlet tower bridge and its piers.

The refurbishment and reinstallation of the 132-inch diameter butterfly valve at Castaic Dam was completed.

Delta Field Division

The Delta Field Division, under the pipeline Condition Assessment Program, completed a total of 24.1 miles of leak detection inspection of the South Bay Aqueduct. This leak detection inspection was performed using a special device in June and December 2020. This stretch of pipe consists of a 72-inch prestressed concrete cylinder pipe. The device is a free-swimming tool used while a pipe is still full of water to detect leaks within the pipeline by using acoustic sounds. The device is tracked externally as it travels the length of the pipeline collecting data, after which the device is extracted for the data to be analyzed.

San Luis Field Division

The San Luis Field Division bathymetry survey and canal liner repair project (Specification No. 20-16) was created to

address known canal repair locations. Repairs include replacing or repairing cracked and buckled concrete panels, grouting voids in and behind the concrete liner, and repairing erosion damage. The time and material contract allowed for canal liner repairs to be completed. Also, part of this project was to conduct a canal bathymetry (below water) survey and assessment of the canal using an unmanned surface vehicle outfitted with remote sensors that provide a high-resolution scan of the entire canal. DWR Division of Engineering processed the data and provided detailed pool-by-pool reports summarizing the bathymetry survey findings. The San Luis Field Division canal bathymetry survey took place in June and July. Pool Nos. 9–21 were surveyed.

In January, a pipeline condition assessment was completed for the Dos Amigos Pumping Plant discharge line Nos. 2, 4, and 5. This inspection covered approximately 0.6 miles of 18-foot diameter steel and reinforced concrete pipeline.

DSS reviewed and provided comments to 75 percent and 90 percent design plans and specifications for the Sisk Dam safety modification project. The 75 percent review was conducted in July, and the 90 percent review was conducted in October.

San Joaquin Field Division

The San Joaquin Field Division bathymetry survey and canal liner repair project (Specification No. 21-06) was created to address known canal repair locations. Repairs included replacing or repairing cracked and buckled concrete panels, grouting voids in and behind the concrete liner, and repairing erosion damage. The time and material contract allowed for canal liner repairs to be completed. Also, part of this project is to conduct a canal bathymetry survey (below water) and assessment of the

canal using an unmanned surface vehicle outfitted with remote sensors that provide a high-resolution scan of the entire canal. DWR Division of Engineering processed the data and provided detailed pool-by-pool reports summarizing the bathymetry survey findings. The San Joaquin Field Division canal bathymetry survey took place in September and October; pools Nos. 22–41 were surveyed, and the Coastal Branch canal was not surveyed.

Southern Field Division

Southern Field Division performed concrete repairs to the spillway walls and weir at the Castaic Dam spillway. In addition, a ground penetrating radar survey and coring was performed to evaluate the integrity of the spillway wall concrete.

The Southern Field Division bathymetry survey and canal liner repair project (Specification No. 20-21) was created to address known canal repair locations. Repairs included replacing or the repairing cracked and buckled concrete panels, grouting voids in and behind the concrete liner, and repairing erosion damage. The time and material contract allowed for canal liner repairs to be completed. Also, part of this project was to conduct a canal bathymetry (below water) survey and assessment of the canal using an unmanned surface vehicle outfitted with remote sensors that provide a high-resolution scan of the entire canal. DWR Division of Engineering processed the data and provided detailed pool-by-pool reports summarizing the bathymetry survey findings. The Southern Field Division canal bathymetry survey took place in August and September. All canal pools on the West and East Branches of the SWP were surveyed.

The pipeline Condition Assessment Program inspected 5.2 miles of the Peace Valley Pipeline for leaks using a special device. This stretch of pipe consists of a 12-foot diameter

prestressed concrete cylinder pipe. The device is a free-swimming tool used while a pipe is still full of water to detect leaks within the pipeline by using acoustic sounds. The device is tracked externally as it travels the length of the pipeline collecting data, after which the device is extracted for the data to be analyzed. In addition, during this same inspection window, a visual inspection and structural assessment was performed of the Peace Valley Pipeline.

A pipeline condition assessment was successfully completed of the San Bernadino Tunnel and intake tower as part of an extended outage of the East Branch in January. This pipeline inspection consisted of 3.8 miles of variable diameter steel-lined and reinforced concrete tunnel.

Other Inspections

Bridges and Overchutes

In addition to the conveyance facilities, three bridges in the Oroville Field Division, two bridges in the Delta Field Division, 17 bridges and 61 overchutes in San Joaquin Field Division, and 22 bridges in the Southern Field Division were inspected as part of a regularly scheduled maintenance program.

Outages for Maintenance and Repair of Facilities

Table 10-3 presents information, arranged chronologically, about significant scheduled and unscheduled outages at SWP pumping and power plants in 2020. The table includes information about incidents resulting in outages of 14 days or more.

Table 10-3 Outages for Maintenance and Repair of Facilities in 2020, by Month

1 of 8

Month	Facility	Unit	Outage Description
January	Badger Hill Pumping Plant	3	January 1 to April 15 for motor removal and repair (continued from previous year)
	Banks Pumping Plant	3	January 1 to February 6 for amortisseur winding high temperature
	Banks Pumping Plant	7	January 1 to December 31 for unit refurbishment (continued from February 4, 2019)
	Buena Vista Pumping Plant	6	January 21 to February 21 for Condition Assessment Program inspection
	Cherry Valley Pump Station	1	January 6 to February 2 for coating removal on inlet and discharge valves
	Cherry Valley Pump Station	2	January 6 to February 2 for coating removal on inlet and discharge valves
	Cherry Valley Pump Station	3	January 6 to February 2 for coating removal on inlet and discharge valves
	Cherry Valley Pump Station	4	January 6 to February 2 for coating removal on inlet and discharge valves
	Chrisman Pumping Plant	1	January 6 to April 8 for Condition Assessment Program inspection and brush preventative maintenance
	Chrisman Pumping Plant	2	January 6 to April 8 for Condition Assessment Program inspection and brush preventative maintenance
	Chrisman Pumping Plant	3	January 6 to April 8 for Condition Assessment Program inspection and brush preventative maintenance
	Citrus Pump Station	7	January 1 to December 31 for motor removal and refurbishment
	Del Valle Pumping Plant	2	January 1 to June 17 for pump rebuild
	Del Valle Pumping Plant	2	January 1 to November 15 per South Bay water contractor request (continued from July 1, 2019)
	Devil Canyon Powerplant	1	January 6 to March 27 for penstock #1 line repair and test waterway gates
	Devil Canyon Powerplant	2	January 6 to March 27 for penstock #1 line repair and test waterway gates
	Devil Canyon Powerplant	3	January 1 to January 15 for relay upgrade work
	Devil Canyon Powerplant	4	January 1 to January 15 for relay upgrade work
	Dos Amigos Pumping Plant	1	January 1 to December 31 for unit refurbishment
	Dos Amigos Pumping Plant	3	January 13 to January 30 for discharge line inspection and Condition Assessment Program inspection
	Edmonston Pumping Plant	7	January 1 to November 26 for thrust pump trouble
	Edmonston Pumping Plant	9	January 1 to January 24 for discharge valve failed to open
	Edmonston Pumping Plant	11	January 1 to December 31 for stator rewind and rotor refurbishment (continued from November 4, 2019)
	Gianelli Pumping-Generating Plant	5	January 15 to February 11 for penstock #3 repairs

Table 10-3 Outages for Maintenance and Repair of Facilities in 2020, by Month

2 of 8

Month	Facility	Unit	Outage Description
	Gianelli Pumping-Generating Plant	6	January 15 to February 11 for penstock #3 repairs
	Gianelli Pumping-Generating Plant	8	January 1 to December 31 for turbine motor refurbishment (continued from December 20, 2019)
	South Bay Pumping Plant	4	January 1 to December 31 for pump shaft repair
	Hyatt Powerplant	1	January 1 to December 31 for unit refurbishment (continued from August 2, 2015)
	Hyatt Powerplant	2	January 1 to March 23 for penstock #1 outage
	Hyatt Powerplant	3	January 1 to March 23 for penstock #1 outage (continued from December 9, 2019)
	Hyatt Powerplant	5	January 6 to February 24 for unit 86 prior to remote supervisory control and data acquisition alarm for field ground brush spark are reported
	Las Perillas Pumping Plant	4	January 1 to May 26 for discharge line #1 installation of blind flange
	Robie Thermalito Pumping-Generating Plant	1	January 1 to January 31 for dive for grout and inspection
	Robie Thermalito Pumping-Generating Plant	1	January 1 to September 2 for unit commissioning testing
	Robie Thermalito Pumping-Generating Plant	2	January 1 to June 26 for unit commissioning testing
	Robie Thermalito Pumping-Generating Plant	3	January 1 to June 29 for unit commissioning testing
	Robie Thermalito Pumping-Generating Plant	4	January 1 to March 3 for unit commissioning testing
	Warne Powerplant	1	January 1 to February 5 for switchyard line and bus relay upgrade
	Warne Powerplant	2	January 1 to February 5 for switchyard line and bus relay upgrade
February	Badger Hill Pumping Plant	3	February 18 to April 3 for programmable logic controller replacement
	Banks Pumping Plant	1	February 9 to February 26 for Condition Assessment Program inspection and discharge valve hydraulic preventative maintenance
	Banks Pumping Plant	6	February 10 to March 3 for voltage dip
	Buena Vista	6	February 6 to March 6 for Condition Assessment Program inspection and pump repack
	Citrus Pump Station	1	February 18 to March 6 for buoy line install
	Citrus Pump Station	2	February 18 to March 6 for buoy line install
	Citrus Pump Station	3	February 18 to March 6 for buoy line install
	Citrus Pump Station	4	February 18 to March 6 for buoy line install
	Citrus Pump Station	5	February 18 to March 6 for buoy line install
	Citrus Pump Station	6	February 18 to March 6 for buoy line install
	Citrus Pump Station	8	February 18 to March 6 for buoy line install

Table 10-3 Outages for Maintenance and Repair of Facilities in 2020, by Month

3 of 8

Month	Facility	Unit	Outage Description
March	Cordelia Pumping Plant	1	February 23 to September 12 for pump and motor refurbishment
	Oso Pumping Plant	7	February 24 to March 12 for annual Condition Assessment Program inspection
	Pearblossom Pumping Plant	8	February 10 to February 28 for annual Condition Assessment Program inspection
	Teerink Pumping Plant	1	February 4 to February 21 for Condition Assessment Program inspection and brush preventative maintenance
	Teerink Pumping Plant	2	February 4 to February 21 for Condition Assessment Program inspection and brush preventative maintenance
	Teerink Pumping Plant	3	February 4 to February 21 for Condition Assessment Program inspection and brush preventative maintenance
	Banks Pumping Plant	2	March 16 to April 9 for Condition Assessment Program inspection
	Barker Slough Pumping Plant	1	March 2 to March 20 for annual North Bay outage
	Barker Slough Pumping Plant	2	March 2 to March 20 for annual North Bay outage
	Barker Slough Pumping Plant	3	March 2 to March 20 for annual North Bay outage
	Barker Slough Pumping Plant	4	March 2 to March 20 for annual North Bay outage
	Barker Slough Pumping Plant	5	March 2 to March 20 for annual North Bay outage
	Barker Slough Pumping Plant	6	March 2 to March 20 for annual North Bay outage
	Barker Slough Pumping Plant	7	March 2 to March 20 for annual North Bay outage
	Barker Slough Pumping Plant	8	March 2 to March 20 for annual North Bay outage
	Barker Slough Pumping Plant	9	March 2 to March 20 for annual North Bay outage
	Citrus Pump Station	1	March 26 to June 10 for preventative maintenance plan grease line repair
	Citrus Pump Station	2	March 26 to June 10 for preventative maintenance plan grease line repair
	Citrus Pump Station	3	March 26 to June 10 for preventative maintenance plan grease line repair
	Citrus Pump Station	4	March 26 to June 10 for preventative maintenance plan grease line repair
	Citrus Pump Station	5	March 26 to June 10 for preventative maintenance plan grease line repair
	Citrus Pump Station	6	March 26 to June 10 for preventative maintenance plan grease line repair
	Citrus Pump Station	8	March 26 to June 10 for preventative maintenance plan grease line repair
	Cordelia Pumping Plant	1	March 2 to March 20 for annual North Bay outage

Table 10-3 Outages for Maintenance and Repair of Facilities in 2020, by Month

Month	Facility	Unit	Outage Description
April	Cordelia Pumping Plant	2	March 2 to March 20 for annual North Bay outage
	Cordelia Pumping Plant	3	March 2 to March 20 for annual North Bay outage
	Cordelia Pumping Plant	4	March 2 to March 20 for annual North Bay outage
	Dos Amigos Pumping Plant	5	March 24 to April 24 for excitation problems
	Gianelli Pumping-Generating Plant	3	March 9 to April 28 for penstock #2 hydraulics and unit Condition Assessment Program inspection
	Gianelli Pumping-Generating Plant	4	March 9 to April 28 for penstock #2 hydraulics and unit Condition Assessment Program inspection
	Mojave Siphon Powerplant	3	March 9 to April 17 for Condition Assessment Program inspection, relay, and trip testing
	Pearblossom Pumping Plant	7	March 9 to March 26 for annual Condition Assessment Program inspection
	Chrisman Pumping Plant	6	April 20 to May 22 for discharge line #3 Condition Assessment Program inspection, and brush preventative maintenance
	Chrisman Pumping Plant	7	April 20 to May 22 for discharge line #3 work, Condition Assessment Program inspection and brush preventative maintenance
May	Las Perillas Pumping Plant	4	April 27 to May 26 for electrical and engineering testing for acceptance
	Banks Pumping Plant	5	May 4 to May 22 for Condition Assessment Program inspection and preventative maintenance
	Edmonston Pumping Plant	3	May 15 to October 23 for vibration testing
	Mojave Siphon Powerplant	2	May 18 to June 5 for annual Condition Assessment Program inspection
	Oso Pumping Plant	4	May 4 to May 20 for annual Condition Assessment Program inspection
	Pearblossom Pumping Plant	3	May 11 to May 28 for annual Condition Assessment Program inspection
June	Robie Thermalito Pumping-Generating Plant	4	May 29 to August 31 for rebuild of plant due to fire
	Banks Pumping Plant	1	June 7 to October 7 for carbon dioxide release with no alarm or indication of smoke or fire
	Banks Pumping Plant	2	June 7 to October 7 for carbon dioxide release with no alarm or indication of smoke or fire
	Banks Pumping Plant	3	June 7 to July 23 for carbon dioxide release with no alarm or indication of smoke or fire
	Banks Pumping Plant	6	June 1 to June 18 for Condition Assessment Program inspection and discharge valve hydraulic preventative maintenance

Table 10-3 Outages for Maintenance and Repair of Facilities in 2020, by Month

5 of 8

Month	Facility	Unit	Outage Description
July	South Bay Pumping Plant	1	June 10 to December 31 for discharge valve failed to open
	Citrus Pump Station	2	June 17 to November 7 for variable frequency drive issues
	Oso Pumping Plant	8	June 1 to June 23 for unit Condition Assessment Program inspection and repair
	Pearblossom Pumping Plant	6	June 8 to June 26 for annual Condition Assessment Program inspection
	Banks Pumping Plant	4	July 6 to July 24 for Condition Assessment Program inspection and discharge valve hydraulic preventative maintenance
	Banks Pumping Plant	9	July 20 to August 21 for automatic voltage regulator replacement
	Oso Pumping Plant	1	July 6 to August 7 for unit Condition Assessment Program inspection
	Pearblossom Pumping Plant	5	July 13 to July 31 for Condition Assessment Program inspection, relay, and trip testing
	Pearblossom Pumping Plant	8	July 13 to July 31 for Condition Assessment Program inspection, relay, and trip testing
	Buena Vista Pumping Plant	10	July 13 to August 3 for Condition Assessment Program inspection and brush preventative maintenance
	Chrisman Pumping Plant	8	July 27 to September 2 for discharge line #4 work and Condition Assessment Program inspection
	Chrisman Pumping Plant	9	July 27 to September 2 for discharge line #4 work and Condition Assessment Program inspection
August	Banks Pumping Plant	10	August 31 to October 2 for Condition Assessment Program inspection and automatic voltage regulator replacement
	Cordelia Pumping Plant	1	August 16 to December 31 for motor removal and repair
	Mojave Siphon Powerplant	1	August 3 to August 28 for annual Condition Assessment Program inspection and flow meter upgrade
	Oso Pumping Plant	2	August 31 to September 17 for Condition Assessment Program inspection
	Pearblossom Pumping Plant	9	August 10 to November 2 for Condition Assessment Program inspection and power factor testing performed on transformers to ensure they are functioning correctly
September	Banks Pumping Plant	8	September 21 to October 9 for Condition Assessment Program inspection and programmable logic controller
	Thermalito Diversion Dam	1	September 1 to October 16 for annual maintenance
	Devil Canyon Powerplant	3	September 9 to October 2 for transformer KY3 Condition Assessment Program inspection
	Oso Pumping Plant	6	September 28 to October 16 for annual Condition Assessment Program inspection

Table 10-3 Outages for Maintenance and Repair of Facilities in 2020, by Month

6 of 8

Month	Facility	Unit	Outage Description
October	Pearblossom Pumping Plant	1	September 8 to September 24 for unit Condition Assessment Program inspection
	Buena Vista Pumping Plant	1	September 8 to September 22 for discharge line #1 inspection
	Buena Vista Pumping Plant	2	September 8 to September 22 for discharge line #1 inspection
	Buena Vista Pumping Plant	3	September 8 to September 22 for discharge line #1 inspection
	Chrisman Pumping Plant	4	September 28 to November 5 for discharge line #2 work and Condition Assessment Program inspection
	Chrisman Pumping Plant	5	September 28 to November 5 for discharge line #2 work and Condition Assessment Program inspection
	Gianelli Pumping-Generating Plant	1	September 10 to October 16 for penstock #1 inspection
	Gianelli Pumping-Generating Plant	2	September 10 to October 16 for penstock #1 inspection
	Banks Pumping Plant	8	October 11 to October 26 for automatic voltage regulator replacement and relay testing
	Barker Slough Pumping Plant	2	October 19 to December 31 for pump and motor refurbishment
	Devil Canyon Powerplant	3	October 19 to November 20 for transformer Condition Assessment Program inspection and power factor testing performed on transformers to ensure they are functioning correctly
	Devil Canyon Powerplant	4	October 19 to November 20 for transformer Condition Assessment Program inspection and power factor testing performed on transformer to ensure they are functioning correctly
	Pearblossom Pumping Plant	4	October 19 to November 20 for transformer Condition Assessment Program inspection and power factor testing performed on transformer to ensure they are functioning correctly double testing
	Pearblossom Pumping Plant	1	October 26 to November 16 for forebay dredging
	Pearblossom Pumping Plant	2	October 26 to November 16 for forebay dredging
	Pearblossom Pumping Plant	3	October 26 to November 16 for forebay dredging
	Pearblossom Pumping Plant	4	October 26 to November 16 for forebay dredging
	Pearblossom Pumping Plant	5	October 26 to November 16 for forebay dredging
	Pearblossom Pumping Plant	6	October 26 to November 16 for forebay dredging
	Pearblossom Pumping Plant	7	October 26 to November 16 for forebay dredging
	Pearblossom Pumping Plant	8	October 26 to November 16 for forebay dredging
	Pearblossom Pumping Plant	9	October 26 to November 16 for forebay dredging

Table 10-3 Outages for Maintenance and Repair of Facilities in 2020, by Month

7 of 8

Month	Facility	Unit	Outage Description
	Pearblossom Pumping Plant	2	October 5 to December 31 for annual Condition Assessment Program inspection and programmable logic controller upgrade
	Warne Powerplant	1	October 5 to December 1 for switchyard Condition Assessment Program inspection
	Buena Vista Pumping Plant	5	October 1 to December 18 for protective relay replacement
	Buena Vista Pumping Plant	7	October 1 to December 17 for protective relay replacement
	Edmonston Pumping Plant	1	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	2	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	3	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	4	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	5	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	6	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	7	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	8	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	9	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	10	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	11	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	12	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	13	October 26 to November 8 for discharge line crossover repair
	Edmonston Pumping Plant	14	October 26 to November 8 for discharge line crossover repair
	Las Perillas Pumping Plant	3	October 5 to November 25 programmable logic controller

Table 10-3 Outages for Maintenance and Repair of Facilities in 2020, by Month

8 of 8

Month	Facility	Unit	Outage Description
November	Las Perillas Pumping Plant	4	October 5 to November 25 programmable logic controller
	Banks Pumping Plant	11	November 9 to December 31 for Condition Assessment Program inspection and power factor testing performed on transformer to ensure they are functioning correctly
	South Bay Pumping Plant	7	November 6 to November 20 for switchgear and exciter preventative maintenance
	Buena Vista Pumping Plant	2	November 4 to December 31 for backfill piping repair
	Edmonston Pumping Plant	11	November 18 to December 31 stator rewind and rotor work
	Las Perillas Pumping Plant	2	November 30 to December 23 for programmable logic controller replacement
	Las Perillas Pumping Plant	5	November 30 to December 23 for programmable logic controller replacement
	Gianelli Pumping-Generating Plant	4	November 25 to December 31 for exciter and strainer preventative maintenance
	Pearblossom Pumping Plant	4	November 30 to December 21 for annual Condition Assessment Program inspection
December	Cherry Valley Pump Station	1	December 4 to December 31 due to pipe rupture
	Cherry Valley Pump Station	2	December 4 to December 31 due to pipe rupture
	Cherry Valley Pump Station	3	December 4 to December 31 due to pipe rupture
	Cherry Valley Pump Station	4	December 4 to December 31 due to pipe rupture
	Greenspot Pump Station	1	December 17 to December 31 for supply line leak repair
	Greenspot Pump Station	2	December 17 to December 31 for supply line leak repair
	Greenspot Pump Station	3	December 17 to December 31 for supply line leak repair
	Greenspot Pump Station	4	December 17 to December 31 for supply line leak repair
	Greenspot Pump Station	5	December 17 to December 31 for supply line leak repair
	Warne Powerplant	2	December 7 to December 31 for annual Condition Assessment Program inspection



Chapter 11

Engineering, Construction, and Real Estate

Crews prepare for drilling activities on the emergency spillway for the Pyramid Dam Modernization Program in Los Angeles County.

Significant Events in 2020

Engineering, construction, and real estate work continued to enhance, expand, repair, and protect the State Water Project (SWP) and other facilities within the State. Significant projects included the seismic remediation of Perris Dam; emergency and recovery efforts of Oroville Dam service and emergency spillways; canal liner raise and instrumentation between Mileposts 175 and 213; and habitat restoration projects.

The COVID-19 pandemic disrupted supply chains and availability of resources. Most Department of Water Resources (DWR) employees changed from working at DWR locations to exclusively working remotely (telework). For jobs in which telework was not an option, safety considerations such as masking and social distancing were implemented. These two factors directly affected the amount of work performed in 2020.

Information for this chapter was provided by the Division of Engineering and the Division of Operations and Maintenance.

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. Oroville Dam was constructed between 1961 and 1967. Construction of the South Bay Aqueduct facilities started in 1960, and the first SWP water deliveries through the South Bay Aqueduct began in 1962 to Alameda County.

In 1963, the Department of Water Resources (DWR) began work on the California Aqueduct, and by 1968, the SWP was delivering water to SWP Contractors in the San Joaquin Valley. By 1973, with the completion of the 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.

Other water deliveries occurred as follows:

- 1968—The first SWP water was delivered through the first phase facilities of the North Bay Aqueduct and through the first phase facilities of the Coastal Branch.
- 1974—The first SWP water was delivered through the West Branch facilities to Los Angeles County.
- 1988—SWP water was delivered through the second phase facilities of the North Bay Aqueduct to Solano County.
- 1997—SWP water was delivered through the second phase facilities of the Coastal Branch Aqueduct to San Luis Obispo and Santa Barbara 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 previously been deferred were built to ensure water quality and fish enhancement in the Sacramento-San Joaquin Delta (Delta).

From 1974 through 2020, study, design, and construction activities included 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. Specific projects included Perris Dam seismic remediation and assessing potential habitat restoration and water conveyance options in the Delta.

Study and Design Activities

In 2020, work to enhance, expand, repair, and protect the SWP water delivery system continued. Engineering activities supported more efficient water deliveries within the confines of legal and environmental constraints and power availability. Significant projects included San Luis Field Division Pools 20 and 21 embankment subsidence rehabilitation and Perris Dam emergency release facility design. Table 11-1 (at the end of the chapter) provides a list of completed and ongoing design work that was undertaken in 2020.

DWR's Division of Engineering (DOE) continued to plan and design projects for development into the construction phase, including awarding construction contracts. DOE worked with many DWR divisions and offices, as well as local, State, and federal agencies. DOE conducted special studies of dams, canal embankments, and other SWP facilities; prepared preliminary designs and estimates; developed and administered construction contract documents; and carried out construction projects.

New or Continuing Activities

The following list includes study and design activities continued from previous reporting periods or initiated in 2020:

- Upper Feather Division
 - » Antelope Dam, Grizzly Valley Dam, and Frenchman Dam 2017 spillway inspections—study
 - » Upper Feather River dams faulting and seismicity updated reports—study
- Oroville Division
 - » Oroville Dam emergency spillway stability analyses—study
- South Bay Aqueduct
 - » Milepost 35 out of round repair—design
- San Luis Division
 - » Dos Amigos Pumping Plant geologic investigation, review, and planning workshop—study
- South San Joaquin Division
 - » Buena Vista Pumping Plant water line replacement—design
 - » San Joaquin Field Division liner raise and instrumentation—design
- Tehachapi Division
 - » Edmonston Pumping Plant east and west elevators replacement—design
- Mojave Division
 - » Cedar Springs Dam spillway inspections—study
- Santa Ana Division
 - » Perris Dam emergency release facility—preliminary design and environmental documents
 - » Crafton Hills Reservoir seepage repair—study
- West Branch
 - » Pyramid Dam spillway inspections—study
 - » Castaic Dam spillway inspections—study
- Other Projects
 - » California Aqueduct subsidence—study

Completed Activities

In 2020, DOE completed the following studies and activities:

- San Luis Field Division irrigation crossings inspection and repair—design
- San Luis Field Division Pools 20 and 21 embankment subsidence rehabilitation—study

Construction Activities

DWR divides the SWP into the following construction divisions: Upper Feather; Oroville; Delta; Suisun Marsh Facilities; North Bay Aqueduct; California Aqueduct (North San Joaquin, San Luis, South San Joaquin, and Tehachapi divisions), also known as the “main line”; East Branch (Mojave and Santa Ana divisions); West Branch; and Coastal Branch.

DOE worked on 21 construction contracts in various SWP construction divisions in 2020. Contract projects included levee repairs, a new setback levee for the Yolo Bypass, radial gate repairs for SWP facilities, and concrete repairs for the California Aqueduct. Table 11-2 (at the end of the chapter) provides a list of new, ongoing, and completed construction contracts undertaken in 2020. Resolution of contract claims may extend the actual contract closeout beyond the completion or acceptance date.

SWP—General

Northern Yolo Bypass

All site work to modify the Fremont Weir and build a new channel for improved adult fish passage (Specification No. 17-18) was finished in February 2020, and the contract was accepted in June 2020.

Oroville Division

Hyatt Powerplant, Thermalito Diversion Dam Powerplant, and Oroville Operations and Maintenance Center Fire Systems Modernization Project

DWR continued construction and installation of the fire alarm and suppression systems at the Oroville Operations and Maintenance Center (Specification No. 15-06). It also continued to complete the punch list items provided by the California Department of Forestry and Fire Protection's Office of the State Fire Marshal. Acceptance is expected in June 2021.

Robie Thermalito Pumping-Generating Plant

Furnish Main Control Board System. The main control board system (Specification No. 16-11) was procured. Site acceptance testing and training for the main control board system was completed, and the main control board system was turned over to Oroville Field Division. Work is expected to be completed in June 2021.

Fire Safety Modernization. All life safety improvements (Specification No. 16-14), which began in February 2017, have been completed and accepted. Work included replacements, upgrades, and modifications and installation of new fire suppression and detection systems. Systems included fire alarm and voice evacuation, carbon dioxide suppression, inert gas suppression, high pressure water mist, standpipe and hose fire protection, and deluge. Work also included heating, ventilating, and air conditioning systems modifications, as well as new egresses. Heating, ventilating, and air conditioning and fire alarm systems were completed and commissioned in 2020. The State Fire Marshal signed off on the project in August 2020, and work is expected to be completed in June 2021.

Restoration and Modernization. All equipment installation (Specification No. 16-16), which began in April 2017, was completed. Plant start-up work and all Pacific Gas & Electric Company certifications for power production were completed. Start-up and commissioning work on Unit Nos. 1 and 2 were completed. Units were released for commercial operation in January for Unit No. 2 and September for Unit No. 1. The plant was formally turned over to Oroville Field Division in September 2020. Work is expected to be completed in June 2021.

Oroville Dam Service Spillway Emergency Repairs

DWR completed minor modifications to the fire alarm system at the hazmat material storage building (Specification No. 17-04) and received a certificate of occupancy in March 2020. Work was completed in July 2020.

Oroville Emergency Response and Recovery

DWR continued restoration repairs needed because of the 2017 Oroville Dam spillways incident (Specification No. 17-09). DWR completed the fire suppression system. The Fire Marshal inspection was completed in April 2020, and work is expected to be completed in February 2021.

Oroville Dam, Thermalito Diversion Dam, and Oroville Operations and Maintenance Center Security Hardening

Security improvements at the Oroville Field Division water facilities (Specification No. 18-09) continued. Work included performing gate repairs; wiring the Oroville Operations and Maintenance Center entrance for bollard systems and guard house; and digging holes and placing posts for four new gates along the Hyatt Powerplant perimeter. Work is expected to be completed in June 2021.

Bidwell Canyon Stage II, Improvements (Site 8)

Rock slope protection, subgrade preparation, drain rock placement, and rebar work (Specification No. 18-05) continued. Work was delayed until November 2020 because of low lake elevations and cement shortage. Concrete placement continued through December 2020. Work is expected to be completed in April 2021.

Lake Oroville Marina Low Water Access Trail (Site 9A)

A trail from the existing Lime Saddle boat ramp down to the mobile Lake Oroville Marina (Specification No. 18-17) was partially constructed. Rising water levels in Lake Oroville during 2019 inundated the construction site. Incomplete work was deleted in order to close out the contract, and work was accepted in July 2020.

Lake Oroville Loafer Point Boat Launch Facility

Stage I (Site 3B). The project (Specification No. 19-08) continued. In-water work at the toe of the ramp was completed in January 2020, which included the bottom 400 feet of the ramp and work below 900 feet. Precast restroom utility connections and concrete slabs around restrooms were placed. The boarding float was installed. Final electrical work was completed, and light burn-in (electrical stress testing) was finished. Civil work on the second bridge site started in November 2020. Work is expected to be accepted in January 2021.

Stage II (Site 10). This project consists of constructing a paved roadway, parking lot, and boat ramp (Specification No. 20-13). The notice to begin work was issued in October 2020, and earthwork started in November. Work is expected to be accepted in September 2021.

Delta Facilities

Temporary Rock Barriers —2019, 2020, and 2021

Installation and removal of barriers at Old River near Tracy, Middle River, and Grant Line Canal (Specification No. 18-19) were completed for 2020. Work is expected to be completed in March 2022.

Sherman and Twitchell Islands

Fish release station work (Specification No. 19-01) included cutting piles to grade and installing exclusion fencing. Fish screens, structural steel platforms, and control systems were installed. Work is expected to be completed in June 2021.

Winter Island Tidal Wetland Habitat Restoration

Weed abatement and additional seeding (Specification No. 19-06) were completed in March 2020. All work was completed, and the contract was completed in May 2020.

North San Joaquin Division

Clifton Court Forebay Dam

All work to refurbish radial Gate Nos. 1, 2, 3, 4, and 5 on the Clifton Court Forebay Dam control structure (Specification No. 16-06) was completed in June 2019, and the contract was completed in September 2020.

San Luis Division

Canal Liner and Embankment Repair, Milepost 62.3

This project included dewatering Pool 12 of the California Aqueduct (Specification No. 17-26). Work was originally completed in 2018. However, while repairing Milepost 62.3, the aqueduct slope at Milepost 65, also within Pool 12, failed. This additional embankment repair at Milepost 65 was then added to this project as an emergency repair. The contract was completed in April 2020.

South San Joaquin Division

Canal Liner Raise and Instrumentation, Mileposts 175 to 213

Work to extend the elevation of the concrete canal liner along segments of the California Aqueduct and complete miscellaneous canal instrumentation-related work in Kings and Kern counties (Specification No. 20-15) began in October 2020. Work is expected to be completed in November 2021.

Mojave Division

Cedar Springs Dam

Spillway underdrain pipe repairs and access road improvements (Specification No. 18-18) began in March 2019. The contractor continued breaking and removing material from the trench on both sides of the spillway per "Memorandum Directive No. 12: Trench Widening." However, because of schedule conflicts associated with potentially imposing restrictions on lake operation, the contract was terminated effective September 1, 2020. Work is to be completed under Specification No. 18-09 in accordance with California Public Contract Code Section 10122. [The California Public Contract Code permits award of contracts without competitive bidding in circumstances involving work of (1) an emergency nature or (2) of a limited scope.] Work is expected to be completed in June 2021.

Santa Ana Division

Perris Dam

Seismic retrofits of the tower bridge (Specification No. 19-03) began in July 2019. Work includes installing new elastomeric bearing pads and sole plates. Work is expected to be completed in September 2020.

Construction Activities in Multiple Divisions

Suisun Marsh and Delta Legal Boundary

Levee and wetland maintenance in the Suisun Marsh and Delta (Specification No. 18-02) continued. Work included installing sheet piles at the water control structure at Bradmoor Island, Property 322; placing a pipe-plug in the water control structure at Bradmoor Island, Property 329; and removing a palm tree, placing aggregate base, and hydroseeding at Bradmoor Island, Property 604. Work is expected to be completed in March 2022.

Environmental Activities

The services provided by DWR's environmental scientists include review and develop project designs to minimize environmental impacts; perform preliminary site inspections to assess potential impacts; prepare California Environmental Quality Act documents; develop compliance strategies; draft and review contract specifications; and secure environmental permits. Ongoing construction activities are monitored for compliance with the requirements outlined in the specifications and permits for each construction contract and to ensure that specific mitigation measures are implemented to reduce or eliminate environmental impacts. The following are notable environmental activities for 2020.

Perris Dam Emergency Release Facility Efforts

Efforts to plan and design the emergency release facility at Perris Dam continued. Several environmental permits for the project that DWR had applied for in 2019 were obtained in 2020. DWR filed an addendum to the final environmental impact report on September 30, 2020.

Subsidence Program

San Joaquin Field Division Liner Raise and Instrumentation Project

Environmental planning for the California Aqueduct Subsidence Program continued in 2020. Preparation of the draft initial study and mitigated negative declaration for the San Joaquin Field Division Liner Raise and Instrumentation Project was circulated for public review on May 15, 2020. The final initial study and mitigated negative declaration was released in July 2020. The environmental team also provided support for construction activities.

California Aqueduct–San Luis Canal Embankment and Liner Raise Project

DWR continued assessing the environmental impacts for the California Aqueduct–San Luis Canal Embankment and Liner Raise Project, as well as preparing the draft environmental assessment and draft initial study. Environmental and cultural surveys began in 2020 and are expected to continue into 2021.

Castaic Dam Modernization Program

Castaic Dam High Intake Tower Bridge Retrofit Project

Environmental planning efforts to support the Castaic Dam High Intake Tower Bridge Retrofit Project, which would seismically retrofit the tower bridge at Castaic Lake, began in 2020. This included conducting tribal consultation in accordance with Assembly Bill 52 (Gatto et al.; Chapter 532, Statutes of 2014) requirements; filing an initial study and mitigated negative declaration for compliance with the California Environmental Quality Act; and applying for and obtaining several environmental permits for the project, such as a Lake and Streambed Alteration Agreement from the California Department of Fish and Wildlife and a Clean Water

Act Section 401 Water Quality Standard Certification from the Los Angeles Regional Water Quality Control Board. The environmental team also worked with the engineering and contract development teams to draft plans and specifications for the construction contract.

Real Estate Activities

In 2020, DWR processed a net total of \$3.42 million in payments 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 entry permits, licenses, leases, and relocation expenses.

SWP Acquisitions

In 2020, DWR conducted the following activities related to SWP acquisitions.

Yolo Bypass Salmonid Habitat Restoration and Fish Passage Program

Fremont Weir Adult Fish Passage Modification Project. DWR executed a right-of-way agreement for damages to property with the Yolo County Public Works Division allowing DWR to provide reimbursement to return county roads used for project purposes to pre-project conditions.

Agricultural Road Crossing 4 Fish Passage Project. DWR executed two temporary entry permits to enter property in Yolo County to access existing telemetry receivers, conduct surveys, and for such other incidental purposes as may be required.

Big Notch Project. DWR executed a license and associated warrant request between DWR and the Sacramento and San Joaquin Drainage District, acting by and through the Central Valley Flood Protection Board, to allow DWR access to Central Valley Flood

Protection Board Parcel Nos. 00122, 00123, and 00127B, on the west side of the Fremont Weir, for geotechnical and potentially geophysical surveys.

Fish Restoration Program

Lower Yolo Ranch Tidal Restoration Project.

Acquisition activities included the following:

- executed a memorandum of agreement with Westlands Water District to memorialize the organizations' mutual understandings regarding an agricultural easement required for Westlands Water District's grading permit from Yolo County, which is necessary for the project
- executed a warrant request to Fidelity National Title Company per the terms of the habitat credit development and purchase agreement entered into between DWR and Westlands Water District to meet the requirements of the 2008 biological opinion issued by the U.S. Fish and Wildlife Service

Wings Landing Tidal Habitat Restoration Project.

DWR executed a grant deed for a 267-acre fee acquisition and a 5.62-acre flood easement acquisition in Solano County from Natural Resources Group Inc. for habitat restoration within the Delta to meet the requirements of the delta smelt biological opinion issued by the U.S. Fish and Wildlife Service for the SWP as well as the California Department of Fish and Wildlife's longfin smelt incidental take permit.

Prospect Island Tidal Habitat Restoration Project.

DWR executed a Department of the Army license between DWR and the U.S. Army Corps of Engineers for property in Yolo and Solano counties to stage and construct a boat ramp.

Division of Integrated Science and Engineering Reclamation District 1600 Groundwater Study

DWR executed four temporary entry permits to allow DWR to enter property in Yolo County to access, maintain, and operate telemetry receivers; collect data; and for other incidental purposes.

Yolo Bypass Telemetry Receivers Project

DWR executed 11 temporary entry permits to enter property in Yolo County to access, maintain, and operate telemetry receivers; collect data; and for other incidental purposes.

North Central Region Office, Bethel Island Water Quality Monitoring Station Project

DWR executed two warrant requests per the terms of the temporary entry permit that automatically renews each year between DWR and a private landowner, which allows DWR to enter upon private property for the purposes of accessing, installing, operating, and maintaining a telemetered water quality monitoring station in Contra Costa County.

South Delta Temporary Barriers Project

Acquisition activities included the following:

- executed an encroachment permit with Reclamation District 1 and processed the associated application fee for entry and use of property for installation, operation, and maintenance of a replacement gate with multi-lock configuration in San Joaquin County
- executed nine temporary entry permits and associated warrant requests with reclamation districts and property owners to store and transport rock material and install and maintain a new gate at Grant Line Canal, Middle River, and Old River barrier sites in San Joaquin County

Suisun Marsh Monitoring Program

Morrow Island Monitoring Project. DWR executed a warrant request payable to the Morrow Island Land Company as annual payment for a lease that allows DWR access to a parcel in Solano County for maintenance and data collection from two groundwater monitoring information stations, Goodyear Slough (S-35) and Godfather II (S-37).

Other Water Monitoring Stations. DWR executed two temporary entry permits to access existing water monitoring stations in Solano County for the purposes of performing periodic maintenance, data collection, and for such other incidental purposes as may be required.

North Bay Aqueduct Pipeline Encasement Project

DWR executed a certificate of common use between DWR and the California Department of Transportation District 4 in relation to the California Department of Transportation's Highway 12-Jameson Canyon Road Widening Project in Napa and Solano counties.

California Aqueduct Subsidence Program

Pools 17 and 18, and Pools 20 and 21, Embankment and Liner Raise Projects. DWR executed 26 temporary entry permits to enter property in Fresno and Kings counties to conduct environmental, cultural, and geodetic surveys.

Pools 20 and 21, Embankment Subsidence Rehabilitation. DWR executed 13 temporary entry permits to enter property in Fresno and Kings counties to conduct environmental, cultural, and geodetic surveys.

Pools 17 and 18, Geomorphic Mapping. DWR executed nine temporary entry permits to enter private property in Fresno County to conduct geomorphic mapping surveys and for such other incidental purposes as may be required.

East Branch Extension, Phase II Projects

DWR fully executed three quitclaim deeds to clear temporary construction easements.

Mileposts 230.88 and 231.25 Exploration, Study, Design, and Repair Project

Acquisition activities included the following:

- executed two temporary entry permits to conduct geomorphic mapping surveys and for such other incidental purposes as may be required in Kern County
- executed a one-year entry license agreement between DWR and Chevron U.S.A. Inc. to allow entry to property in Kern County for geotechnical exploration, surveying, and such other incidental purposes as may be required

Irrigation Crossing Pipe Inspection and Repairs

Pools 17 and 18, and Pools 20 and 21. DWR executed two temporary entry permits to conduct pipeline inspection, repair, verification of California Aqueduct water intrusion, and for such other incidental purposes as may be required.

Tejon Mountain Village Project

DWR executed an agreement for exchange of interests and related matters; a director's grant deed with reservation of easements; two easement modification agreements; an amendment to the right-of-way contract; a side letter agreement to perform maintenance and repair work; a corrective easement deed; and an easement agreement to exchange easements with Tejon Ranch Company over Bear Trap Road to facilitate public access and utilities to the development while reserving the right to review any future utility installations through the encroachment permit process.

Perris Seepage Recovery Project

Acquisition activities included the following:

- executed an initial 25-year license agreement between DWR and the City of Perris allowing DWR entry onto property in Riverside County to install six groundwater monitoring wells, collect data, install appurtenances, and for monitoring and maintenance
- executed a five-year entry permit between DWR and The Metropolitan Water District of Southern California allowing DWR entry onto property in Riverside County to install two groundwater monitoring wells, collect data, install appurtenances, and for maintenance
- executed an initial five-year license agreement between DWR and the Eastern Municipal Water District allowing DWR entry onto property in Riverside County to install one groundwater monitoring well, collect data, install appurtenances, and for monitoring and maintenance

Lake Perris Outlet Works Modification Project

DWR executed a temporary entry permit between DWR and The Metropolitan Water District of Southern California that allows DWR access to property to perform hollow-tip auger drilling and cone penetration test drilling in Riverside County.

SWP Property Management

In 2020, DWR conducted the following activities related to property management:

- managed leasing activities of SWP nonoperating properties and collected lease revenue totaling \$676,148
- processed 43 and executed 14 encroachment permit applications

- collected fees totaling \$697,055 for review and inspection costs related to encroachment permit applications
- coordinated review of nine tentative tract map developments within one mile of the SWP

SWP Appraisals

In 2020, DWR completed the following appraisals for the SWP:

- Oroville 250 kilovolt power line relocation—provided one appraisal review
- Perris Dam Emergency Release Facility Project—provided two appraisal reviews
- North Bay Aqueduct, Highway 12–Jameson Canyon Road Widening Project—provided one appraisal review for a California Department of Transportation—drafted appraisal
- East Branch Extension, Mentone Citrus Acquisition Project—provided one appraisal report
- Santa Ana Pipeline, Entry Permit 1830—provided one appraisal report
- Tejon Mountain Village Project—provided two appraisal reviews

Table 11-1 Study and Design Activities, 2020

Construction Division and Facility	Study or Design Activity	Date Design Began	Design Actual/ Estimated Completion Date
Upper Feather Division			
Antelope Dam, Grizzly Valley Dam, and Frenchman Dam spillways	Inspections	June 2017	December 2023
Upper Feather River dams	Faulting and seismicity updated reports	February 2016	December 2022
Oroville Division			
Oroville Dam	Seepage and slope stability analyses	July 2016	December 2021
South Bay Aqueduct			
South Bay Aqueduct	Milepost 35 out of round repair	August 2017	October 2021
San Luis Division			
Dos Amigos Pumping Plant	Geologic investigation, review, planning workshop	October 2018	December 2021
San Luis Field Division	Inspect and repair irrigation crossings	July 2016	September 2020
	Pools 20 and 21 embankment subsidence rehabilitation	August 2018	October 2020
South San Joaquin Division			
Buena Vista Pumping Plant	Replace water line	October 2016	October 2022
San Joaquin Field Division	Liner raise and instrumentation	February 2018	December 2022
Tehachapi Division			
Edmonston Pumping Plant	East and west elevators replacement	December 2017	December 2025
Mojave Division			
Cedar Springs Dam spillway	Inspections	July 2017	December 2023
Santa Ana Division			
Perris Dam	Emergency release facility preliminary design and environmental documents	October 2006	June 2022
Crafton Hills Reservoir	Seepage repair study	May 2016	December 2023
West Branch			
Pyramid Dam spillway	Inspections	May 2017	December 2023
Castaic Dam spillway	Inspections	October 2017	December 2023
Other Projects			
San Luis and San Joaquin field divisions	California Aqueduct subsidence study	July 2015	December 2020

Table 11-2 Construction Activities, 2020

Sheet 1 of 2

Construction Division and Facility	Construction Contract (Specification Number)	Notice to Begin Work	Acceptance Date (expected or actual)	Estimated Total Contract Costs (in thousands of dollars)
State Water Project—General				
Northern Yolo Bypass	Fremont Weir modification to build new channel for improved adult fish passage (17-18)	September 2017	June 2020	7,736
Oroville Division				
Hyatt Powerplant, Thermalito Diversion Dam Powerplant, and Oroville Operations and Maintenance Center	Fire systems modernization (15-06)	October 2015	June 2021	26,746
Robie Thermalito Pumping-Generating Plant	Main control board system installation (16-11)	December 2016	June 2021	2,657
	Life safety improvements (16-14)	February 2017	June 2021	14,188
	Restoration and modernization of fire safety and suppression systems (16-16)	April 2017	June 2021	19,151
Oroville Dam	Service spillway (flood control outlet) and emergency spillway repairs (17-04)	February 2017	July 2020	108,233
	Service spillway (flood control outlet) and emergency spillway restoration (17-09)	April 2017	February 2021	676,680
Bidwell Canyon, Site 8	Stage II improvements, including reconstructing and paving existing gravel lot to provide additional paved vehicle/trailer parking spaces (18-05)	October 2018	April 2021	6,608
Oroville Dam, Thermalito Diversion Dam, and Oroville Operations and Maintenance Center	Security improvements at the Oroville Field Division water facilities located in Butte County (18-09)	August 2018	June 2021	35,824
Lake Oroville Marina Low Water Access Trail, Site 9A	Construct trail from existing Lime Saddle boat ramp to mobile Lake Oroville Marina (18-17)	October 2018	July 2020	293
Lake Oroville, Loafer Point, Site 3B	Stage I boat launch facility (19-08)	December 2019	January 2021	5,663
Lake Oroville, Loafer Point, Site 10	Stage II boat launch facility (20-13)	October 2020	September 2021	6,594
Delta Facilities				
Temporary Rock Barriers —2019, 2020, and 2021	Middle River, Old River, and Grant Line Canal (18-19)	January 2019	March 2022	6,713
Sherman and Twitchell islands	Fish screens (19-01)	May 2019	June 2021	5,418
Winter Island	Tidal wetland habitat restoration (19-06)	July 2019	May 2020	905
North San Joaquin Division				
Clifton Court Forebay Dam	Refurbish radial gates 1, 2, 3, 4, and 5 (16-06)	September 2016	September 2020	11,832
San Luis Division				
Milepost 62.3	Canal liner and embankment repair (17-26)	February 2018	April 2020	13,115
South San Joaquin Division				
Mileposts 175 to 213	Canal liner raise and instrumentation (20-15)	October 2020	November 2021	3,080

Table 11-2 Construction Activities, 2020

Construction Division and Facility	Construction Contract (Specification Number)	Notice to Begin Work	Acceptance Date (expected or actual)	Estimated Total Contract Costs (in thousands of dollars)
Mojave Division				
Cedar Springs Dam	Spillway underdrain pipe repairs and access road improvements (18-18)	March 2019	June 2021	4,972
Santa Ana Division				
Perris Dam	Tower bridge seismic retrofit (19-03)	July 2019	September 2020	932
Multiple Divisions				
Suisun Marsh and Delta Legal Boundary	Levee and wetland maintenance 2018, 2019, 2020, and 2021 (18-02)	April 2018	March 2022	3,591



Chapter 12 Recreation

Lightning Tree Boat Ramp at Lake Davis in Plumas County.

Significant Events in 2020

Overall, 2020 was an anomalous year for State Water Project (SWP) recreation because of safety concerns. With no treatment for or vaccine to prevent COVID-19 (coronavirus disease 2019, a highly contagious respiratory disease caused by the SARS-CoV-2 virus), and in response to the State of Emergency declared March 4, 2020, the Governor issued Executive Order N-33-30 on March 19, 2020. The executive order required all Californians—except for those who worked in certain federally-defined critical infrastructure sectors—to stay home indefinitely. The California Department of Parks and Recreation (California State Parks) closed visitors centers and eliminated almost all recreation events and campfire programs. People were required to practice “social distancing,” physical distance maintained between individuals in order to avoid catching or transmitting an infectious disease. As a result, recreation activities largely shut down except in cases where people could avoid crowds, such as on uncrowded trail systems.

Once sites were allowed to reopen later in 2020, safety measures varied by facility. Some remained open to a limited number of guests, while others required an advance reservation. Most SWP recreational facilities required all guests to use a face mask except outdoors and reduced campground attendance to 50 percent capacity, which created a one-site safety zone between each campsite.

Information for this chapter was provided by the Division of Regional Assistance, the Public Affairs Office, the Division of Operations and Maintenance, 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, horseback riding, and swimming. Under the Davis-Dolwig Act, these recreational opportunities, as well as fish and wildlife enhancements, are not allocable as water and power costs to the SWP water contractors. The Davis-Dolwig Act, together with the Burns-Porter Act, provide financing for SWP recreational facilities and fish and wildlife enhancement projects, declaring that these projects benefit all the people of California and should be paid for by all Californians. Department of Water Resources (DWR) coordinates with the California Department of Parks and Recreation (California State Parks) and the California Department of Fish and Wildlife (DFW) to ensure that the recreation and fish and wildlife enhancement potential at SWP facilities is fully realized.

Recreation Areas

The SWP has 39 developed recreation areas or sites throughout California, including 18 developed fishing access sites. Figure 12-1 shows the name and location of each area.

Recreation Use

The COVID-19 Pandemic

Overall, 2020 was an anomalous year for SWP recreation because of safety concerns. With no treatment for or vaccine to prevent COVID-19 (coronavirus disease 2019, a highly contagious respiratory disease caused by the SARS-CoV-2 virus), and in response to the State of Emergency declared March 4, 2020, the Governor issued Executive Order N-33-30 on March 19, 2020. The executive order required all Californians—except for those who worked in certain federally-defined critical infrastructure sectors—to stay home indefinitely. DWR closed most of its offices and moved employees to home telework if they did not fall within the federally-defined critical infrastructure sectors. California State Parks closed visitors centers and eliminated almost all recreation events and campfire programs, including canceling boat tours. People were allowed to leave their homes

for such necessities as food, prescriptions, and health care, but were required to practice “social distancing,” physical distance maintained between individuals in order to avoid catching or transmitting an infectious disease. As a result, recreation activities largely shut down except in cases where people could get completely away from crowds, such as on uncrowded trail systems.

Once sites were allowed to reopen later in 2020, safety measures varied by facility. Some remained open to a limited number of guests, while others required an advance reservation. East Bay Regional Park District (EBRPD) was required to comply with the San Francisco Bay Area’s local shelter-in-place orders, which required that everyone except emergency staff stay home for three months, closing businesses, schools, and regional recreational parks such as Lake Del Valle Regional Park. Los Angeles County Department of Parks and Recreation (LADPR) kept Castaic Lake and Castaic Lagoon open but implemented protective measures such as 50 percent capacity limits; prohibiting all camping and swimming; discontinuing rental equipment; and canceling all recreation programs. Most SWP recreational facilities required all guests to use a face mask except outdoors and reduced campground attendance to

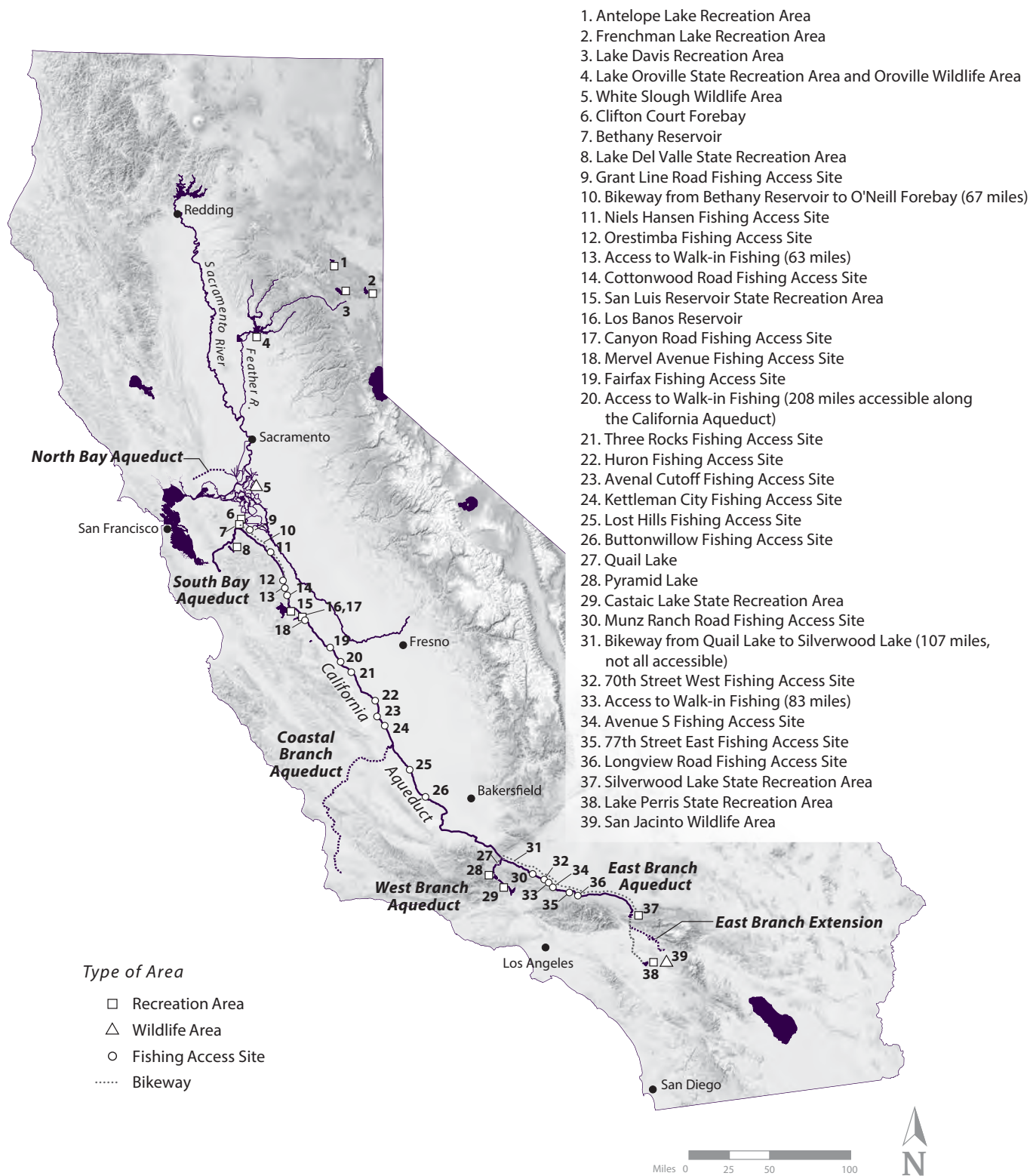


Figure 12-1 Names and Locations of SWP Recreation Areas

50 percent capacity, which created a one-site safety zone between each campsite.

Recreation Days

Since the SWP began delivering water in 1962, nearly 265,119,818 recreation days have been recorded at SWP recreation facilities. A recreation day is defined as one individual user visiting a recreation site along the SWP within all or part of a one-day period.

SWP facilities supported an estimated 3.3 million recreation days of use (see Table 12-1) in 2020 despite the COVID-19 pandemic.

SWP Educational Visitors Centers

All three visitors centers closed in spring 2020 because of the COVID-19 pandemic:

- The Lake Oroville Visitors Center closed in April and reported 33,300 recreation days, down from 92,000 the year before. (Outdoor recreation around the visitors center, such as trails, remained open throughout the year.)
- Numbers are not available for Romero Overlook Visitors Center, located at San Luis Reservoir, which closed in mid-March.
- The Vista Del Lago Visitors Center, located at Pyramid Lake, closed in mid-March and reported 29,700 recreation days, down from 173,000 the year before.

Three additional visitors centers located at SWP facilities are operated by either California State Parks or by EBRPD:

- (1) Rocky Ridge Visitors Center, located at Lake Del Valle, is operated by EBRPD. Using partial funding from DWR's annual allocation of the Land and Water Conservation Fund grant, it has been closed for major remodeling since 2019. When it reopens in 2021,

EBRPD will rename it the "Del Valle Visitor Center."

- (2) Ya'i Heki' Regional Indian Museum, located at Lake Perris, was originally constructed by DWR and is operated by California State Parks. No information was provided for 2020.
- (3) The Silverwood Lake Nature Center, constructed by California State Parks, had been closed to the public prior to the COVID-19 pandemic for remodeling and remained closed to complete remodeling. The outdoor wayfinding signage was finalized, and installation of newly fabricated exhibits began. It is expected to reopen in 2021.

Overall, the recreation usage of over 3.3 million recreation days at the SWP facilities listed in Table 12-1 contributed significantly to the total visitation reported at the 280 units of the California State Park System in fiscal year 2020–2021.

Upper Feather River Lakes Recreation Studies

The U.S. Forest Service operates the recreation areas at the Upper Feather River lakes. Only paid recreation uses, such as campground or day-use fees, are reported to DWR. Free dispersed recreation use is not reported; consequently, recreation use is underreported for the three Upper Feather River lakes in Table 12-1. In an effort to obtain more accurate data about these locations, DWR conducts an annual creel survey and an annual fisheries survey at one of the Upper Feather River lakes on a rotating basis. In 2020, the annual recreation survey was concentrated at Lake Davis; however, it was interrupted throughout the reporting season by national forest closures and closures caused by fires.

Creel Survey 2020

A creel survey is a sampling tool used to measure the fishing activities of sport anglers

Table 12-1 Estimated Recreation Days in 2020, by Field Division Facility

Facility, Grouped by Field Division	Recreation Days
Oroville Field Division	
Frenchman Lake	154,500 ^{a,b}
Antelope Lake	84,300 ^{a,b}
Lake Davis	192,200 ^{a,b}
Lake Oroville, Thermalito Diversion Pool, and Thermalito Forebay	520,100 ^d
Thermalito Afterbay and Oroville Wildlife Area	441,600 ^d
Feather River Fish Hatchery	13,300 ^d
Lake Oroville Visitors Center	33,300 ^e
Subtotal	1,439,300
Delta Field Division	
Lake Del Valle	220,900 ^d
Bethany Reservoir	1,800 ^c
White Slough Wildlife Area	4,000 ^a
Subtotal	226,700
San Luis Field Division	
San Luis Reservoir State Recreation Area: San Luis Reservoir, O'Neill Forebay, and Los Banos Reservoir	361,200 ^d
Romero Overlook Visitors Center	40,000 ^e
Subtotal	401,200
San Joaquin Field Division	
Fishing Access Sites: Kettleman City, Lost Hills, Buttonwillow, and California Aqueduct Walk-in Fishing	18,200 ^a
Subtotal	18,200
Southern Field Division	
Silverwood Lake	100,700 ^d
Lake Perris	367,800 ^d
Vista Del Lago Visitors Center	29,700 ^e
Pyramid Lake	46,500 ^d
Castaic Lake and Castaic Lagoon	606,300 ^d
Fishing Access Site: Quail Lake	3,300 ^a
Fishing Access Site: Longview Road	100 ^a
California Aqueduct: Walk-in Fishing	5,500 ^a
California Aqueduct: Bikeway	7,700 ^a
Subtotal	1,167,600
Total for Recreational Sites	3,149,900
Total for Visitors Centers	103,100
Grand Total	3,253,000

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 noted, which are based on partial data.

^a These locations are not regularly monitored and are visually monitored only. It is likely that these areas are used significantly more than what is represented here, but it is difficult to ascertain realistic annual use.

^b Because of high employee turnover at the Beckwourth Ranger District, the U.S. Forest Service was only able to provide user data for these sites for May and June 2019. Using 2018 data for the missing months of data, a rough estimated total was obtained for these locations.

^c At this facility, attendance is only counted Thursdays through Sundays, but the park is open to the public the remainder of the week using the honor system of payment.

^d The COVID-19 pandemic, as well as the continuing effects of the 2019 fires, caused closures and limited openings at these facilities, which affected recreation numbers. Each facility underwent its own specific closures depending upon the managing agency.

^e DWR's visitors centers were closed in mid-March 2020 because of the COVID-19 pandemic. The attendance numbers were reported or estimated prior to closing for the year.

and to estimate the number of fish harvested from a body of water. It involves interviewing anglers about the day's fishing effort, including what the angler caught, released, and how much time was spent fishing. In 2020, DWR did not conduct its normal creel surveys because of the COVID-19 pandemic and the need to limit public interaction in order to adhere to local and State physical distancing protocols.

Fisheries Survey 2020

Since construction of the Upper Feather River projects in the 1960s, streamflow release schedules for all three reservoirs (Antelope, Frenchman, and Davis lakes) have been reevaluated and modified to varying degrees. DWR modifies streamflow to improve downstream conditions for both streamside recreation and wild trout populations. Managing these reservoirs provides information about recreation enhancement use levels and quality, as well as reassurance that northern pike (*Esox lucius*) remain eradicated from the system. The annual fisheries survey provides additional data about fishery abundance populations and health. For 2020, DWR did not conduct its electrofishing survey at any of the Upper Feather River lakes because of the COVID-19 pandemic and the need to adhere to local health department physical distancing protocols.

Oroville Recreation Plan Amendment

To help offset the temporary closures of the Oroville Facilities caused by the 2017 Oroville Dam spillways incident (see Bulletin 132-18), DWR proposed early implementation of certain proposed Settlement Agreement Recreation Management Plan recreation facilities to provide additional recreation opportunities. These include permanent increases in parking, boat launching capacity, and enhanced trailhead facilities. For completed projects, see the Recreation chapter in Bulletins 132-18 through 132-20.

For projects currently underway, see the "Lake Oroville State Recreation Area" sections in this chapter.

Recreation Facilities

Planning

SWP Recreation Coordinating Committee

The SWP Recreation Coordinating Committee meets biannually throughout the state at SWP facilities to discuss ongoing and future SWP recreation projects. See Bulletin 132-19 for background information.

Delayed 2019 Fall Meeting Summary.

The meeting was originally scheduled for the first week of December 2019 at Lake Perris but was postponed to January 28, 2020, and moved to Castaic Lake. The Los Angeles County Department of Parks and Recreation (LADPR) hosted. DWR's Division of Operations and Maintenance presented its water predictions report, as well as how the water operations branch determines the SWP water allocation considering SWP Contractor Water Supply Contracts. United Water Conservation District, a local water district that receives water through SWP Contractor Ventura County Watershed Protection District, gave a presentation on the history of, and actions it is taking to address, an infestation of its Lake Piru by invasive quagga mussels (*Dreissena rostriformis*) and the importance of taking all precautions to avoid an infestation into SWP waters. The Wildlife Conservation Board provided updates on earlier discussions of the many grants available to State and local agencies to plan and implement recreation projects for the coming year. The National Marine Fisheries Service gave a presentation on the endangered Southern California steelhead (a distinct population segment of *Oncorhynchus mykiss*) of the Santa Clara River watershed, which affects Lake Piru, Castaic Lake, and Pyramid Lake. The Committee Chair concluded the meeting with a presentation on the Davis-Dolwig Act.

The second day of the meeting began at Castaic Lake's boating center; LADPR hosted. The variety of water-based classes, lessons, and camps available through LADPR and the Friends of Castaic Lake was explained, as well as the different kinds of watercraft available for rent to the public and to various sailing and boating clubs. The second half of the day was held at Pyramid Lake's facilities, hosted by Pyramid Lake's recreation contractor. After reviewing campground improvements, dock improvements, and the boat rentals available to the public, attendees visited boat-in day use facilities throughout the lake via pontoon boats. Attendees also visited the Vista Del Lago Visitors Center to view new displays about the SWP installed by DWR's Public Affairs Office.

2020 Spring Meeting Summary. Because of the COVID-19 pandemic, the meeting was held remotely using videoconference software. This was the first time the meeting was not held in-person. Reduced to four and a half hours, the July 28 meeting was kept to necessary SWP-only business and was well attended. DWR's Division of Operations and Maintenance presented its forecasted reservoir report, and SWP park superintendents provided mid-year facility reports for their respective parks. The Committee Chair provided updates on the C.A.S.T. for Kids Program (fishing events for children with special needs that frequently take place at SWP facilities; C.A.S.T. stands for "Catch A Special Thrill"), which was placed on hiatus during the COVID-19 pandemic; announced committee member retirements; and discussed DWR's annual allocation from the Land and Water Conservation Fund. The Division of Operations and Maintenance concluded the meeting with a cyanobacteria status report for SWP reservoirs.

Fall 2020 Meeting Summary. The meeting was held remotely on December 9, using videoconference software to maintain social distancing. In addition to routine

SWP business, it included updates on grants available from the Wildlife Conservation Board and climatic predictions for the coming winter from DWR's State Climatologist. Oroville Field Division's Recreation and Land Use Section discussed its Land and Water Conservation Fund application for federal fiscal year 2020–2021 for improvements to the Brad Freeman Trail.

Lake Oroville State Recreation Area

Enterprise Boat Ramp Expansion—Design and Permitting. DWR plans to expand the existing Enterprise Boat Ramp by constructing both a new Stage 2 concrete parking area to accommodate approximately 12 vehicles with trailers as well as a new Stage 2 ramp with two launch lanes and one boarding float lane that extends 750 feet in elevation. The project is expected to begin in 2024 or 2025.

Lake Oroville Trails Brochure. A travel brochure of all trails actively maintained by or on behalf of DWR around Lake Oroville, the Oroville Wildlife Area, and the Thermalito Diversion Pool is planned for release in 2021. The brochure shows the location of the trails with descriptions, vertical and horizontal alignments of trails, trailheads, day use areas, boat ramps, campgrounds, and other recreation features provided by DWR in the Oroville area. The brochure will continue to be updated as changes to DWR facilities are made.

Antelope Lake Recreation Area

DWR engineers from Northern Region Office took elevation measurements by the boat launch facilities for a future fishing pier that will be accessible to users with disabilities.

Castaic Lake State Recreation Area

The 50-year contract to manage recreation at Castaic Lake State Recreation Area between California State Parks and LADPR expired in November 2019. A new contract is being

negotiated between the two agencies for a 25-year term.

Silverwood Lake State Recreation Area

California State Parks' improvement plans include trail projects to remove or remove and replace asphalt paths throughout the park, create a new path for users with disabilities from Rio Group Campground restrooms to the group camp shade structure, and a major renovation of the group camps Valle and Barranca, which includes replacing the existing facilities with all new facilities. In addition, the outdoor wayfinding signage associated with the nature center was finalized.

New Facilities

DWR's Grant Funding for New Recreation Land and Water Conservation Fund.

Administered by the National Park Service at the federal level and by California State Parks at the State level, the Land and Water Conservation Fund provides matching grants to states for outdoor recreation projects. DWR receives an annual allocation but must file an application and comply with the stringent qualification process. See Bulletin 132-19 for background information.

The following application was submitted in February 2020 for the SWP. DWR jointly used its annual allocation for federal fiscal year 2019–2020 with EBRPD for the replacement of the existing women's restroom facility adjacent to the Rocky Ridge Visitors Center (which is being renamed Del Valle Visitor Center) at Lake Del Valle. EBRPD will install new unisex stalls with upgraded toilets, stalls, sinks, and doors that are accessible to users with disabilities. DWR's federal fiscal year 2019–2020 allocation from the Land and Water Conservation Fund was \$255,641. With the 50-percent-required match by the Land and Water Conservation Fund, the total cost of this project was \$511,282.

Improvements to Facilities

Upper Feather River Lakes

The U.S. Forest Service graded the roads around Lake Davis and Frenchman Lake.

Lake Oroville State Recreation Area

Bidwell Canyon Boat Ramp Improvements.

The Stage 2 area consisted of a gravel parking lot and a two-lane concrete boat ramp. DWR, in coordination with California State Parks, began constructing 101 concrete parking spaces for vehicles with trailers, two new boat launch lanes, and two boarding float lanes between 745 and 700 feet in elevation. The project also improved the vertical alignment of the access road to the Stage 3 section, increasing accessibility to the lake for houseboats. Work began during fall 2018 but was unable to be completed prior to the lake rising quickly in winter 2019. Impacts from the North Complex Fire further delayed work in 2020.

Lake Del Valle State Recreation Area

In 2020, improvement projects under \$100,000 included the following:

- installed 72.5-ton boulders in campground
- installed a fence at the Arroyo Road Staging Area (Supplies were purchased in 2018, but weather and staffing issues prevented completion of this project in both 2018 and 2019.)
- to prevent flood damage, relocated new kayak concession building to higher elevation for winter 2020
- placed new concrete around four free-standing outdoor showers (two towers on the east side and two on the west side of the park), accessible to users with disabilities
- replaced the ramp and landing for users with disabilities at the marina store

In 2020, improvement projects over \$100,000 included the following:

- Service Yard, Phase II (Project 5529): Grading and concrete work was finished in 2017; equipment storage buildings were installed in 2018; and flood lights and bollards were installed in 2020. Service Yard, Phase III, began in 2020.
- Replace Kayak Concession Building (Project 5251): A park model cabin was purchased from a company that creates mobile office trailers and modular buildings.

San Luis Reservoir State Recreation Area

California State Parks made the following facility improvements in 2020:

- replaced 3,000 feet of water line at the Basalt Campground and Day Use Area
- refurbished the San Luis Creek boarding floats
- repainted the restrooms at San Luis Creek and Medeiros day use areas
- repainted the entrance stations at San Luis Creek and Basalt day use areas
- removed approximately 100 hazardous trees throughout the recreation area
- repaired or replaced 17 damaged shade ramadas
- replaced 44 barbecues and 25 firepits throughout the recreation area

Silverwood Lake State Recreation Area

California State Parks made the following facility improvements in 2020:

- completed construction of a new concrete slab and new shade structure at Rio Group Campground
- began installation of newly fabricated exhibits at the nature center
- began construction to replace the effluent line from the Cleghorn Treatment Plant

Lake Perris State Recreation Area

California State Parks made the following facility improvements in 2020:

- removed the old marina building, preserving electrical and plumbing for a future marina
- repaved Lot 9 and Lot 10
- upgraded approximately 20 campsites (electrical pedestals), repaired concrete sidewalks, and installed soap dispensers in all campground bathrooms

Recreation Activities

The SWP, with its many reservoirs and hundreds of miles of aqueducts, offers Californians extensive and varied recreational opportunities. Figure 12-2 shows the various types of recreation available along the SWP.

Lake Oroville State Recreation Area

Because of the COVID-19 pandemic, DWR, California State Parks, and the other agencies that usually host events in the Lake Oroville State Recreation Area canceled nearly all events for the year. The exception was the Fourth of July fireworks display, hosted by the Rotary Club of Oroville. Physical distancing restrictions were observed by requiring all spectators either to stay in their vehicles to watch the fireworks or to watch from home. The fireworks were held at the Oroville Municipal Airport.

Prior to any confirmed cases of COVID-19 in California, the Altacal Audubon Society hosted the annual Snow Goose Festival of the Pacific Flyway at the Chico Masonic Family Center on January 25 and 26, 2020. Approximately 600 visitors viewed the exhibit area. DWR's Oroville Field Division ran an exhibit booth featuring a storyboard about the bald eagle's nest on display at the Lake Oroville Visitors Center along with some children's activities.

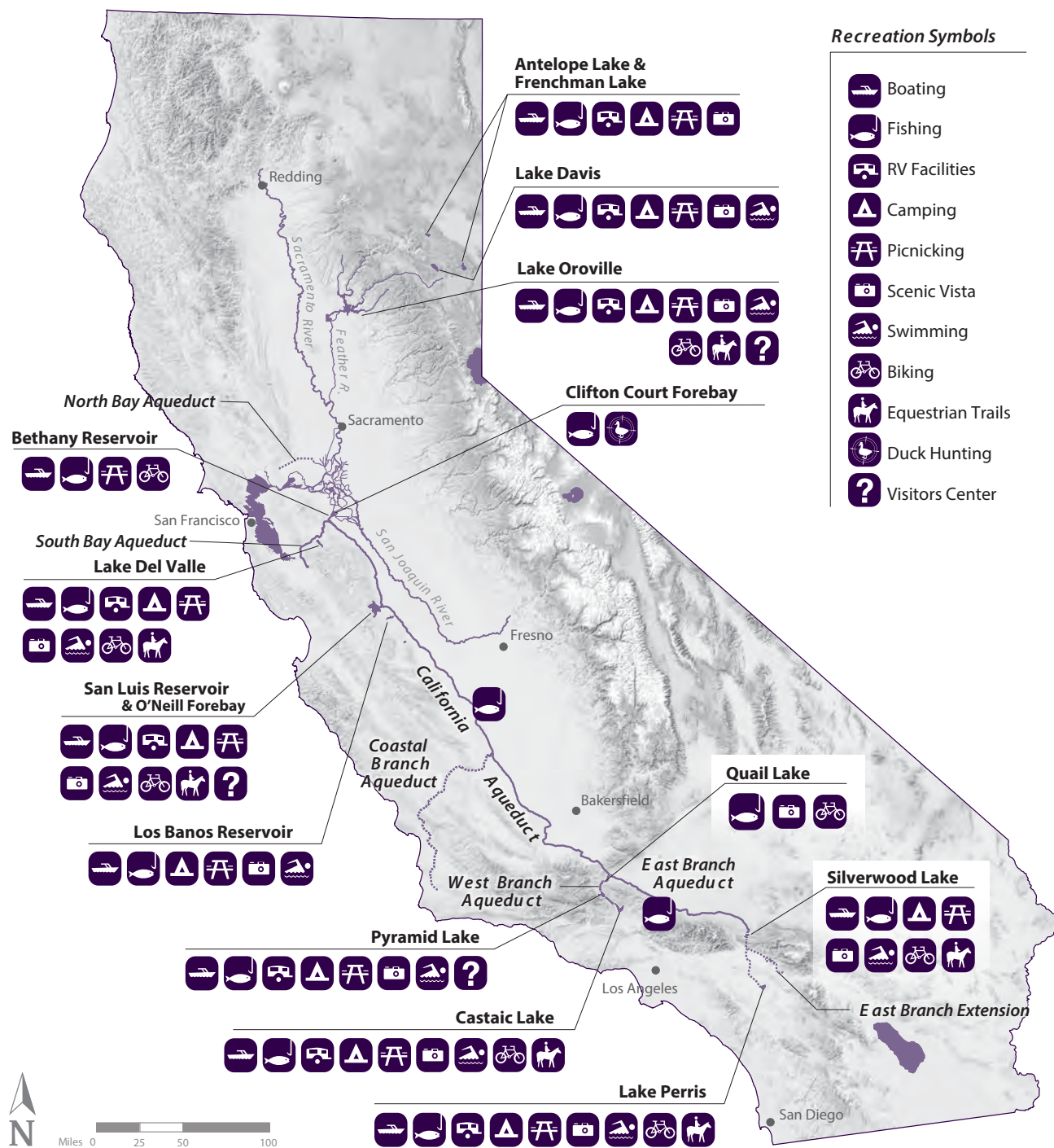


Figure 12-2 Types of Recreation along the SWP

Lake Del Valle State Recreation Area

Because of the COVID-19 pandemic, EBRPD canceled community events and EBRPD programs with 50 or more in attendance from March 11, 2020, through the end of 2020. In addition, on March 15, 2020, EBRPD closed all visitors centers and rental facilities and canceled programs and special events until Sunday, April 12, 2020. The regional parks and trails remained open to the public throughout 2020.

Between April and September, boats were not allowed to launch from the boat launch ramps because the quagga mussel inspection stations were closed to protect inspection staff. Beginning in October, these stations reopened. In 2020, there were 1,729 total boat launches, a 79.4 percent decrease from 2019, which had 8,395 boat launches.

EBRPD sponsored 10 in-person Regional in Nature programs with 146 participants and one non-Regional in Nature virtual program with 61 participants. The Regional in Nature programs included the topics A New Year View, Park'n'Play, Sunset Saunter, Beat the Heat, Tarantula Talk, Woodland Walking, and Winter Water Birding.

EBRPD also held its school programs Arroyo Study; Skull Detectives; and Geology: If Rocks Could Talk.

On March 14, 2020, a half-marathon, 10-kilometer, and five-kilometer trail run was held at Lake Del Valle. It was the only special event that occurred at Lake Del Valle. All other special events were canceled for the year.

San Luis Reservoir State Recreation Area

California State Parks sponsored the “Path of the Padres” hikes, funded by the Four Rivers Association. During February, eight hikers experienced wildflowers, geology, cultural and historical areas, and Native American sites along the first day’s hike of the 35-mile trail. Water conservation and

the reservoir systems at Los Banos and San Luis reservoirs were discussed on a boat ride to the trailhead. After the first day, the rest of the planned 2020 “Path of the Padres” hikes were canceled because of the COVID-19 pandemic.

Castaic Lake State Recreation Area

LADPR reported that despite the COVID-19 pandemic, attendance was very strong. For example, there were more boats on both the main lake and the lagoon than there had been a decade prior. Camping sold out on all weekends, regardless of the season. Fall boat attendance numbers were representative of a typical summer (summers typically have more boat activity than autumn). LADPR also saw major increases in all outdoor recreation use, including walking, as well as by bicycle, scooter, electric bicycle, and all other devices people could obtain.

LADPR reported a temporary decrease in attendance only in March 2020, when many organizations across California temporarily closed or limited open hours because of COVID-19 restrictions, local health department guidelines, or both. However, Castaic Lake’s attendance numbers increased drastically after March. In an effort to create physical distancing, the swim beaches were open to 50 percent fewer cars, or every other parking space.

Silverwood Lake State Recreation Area

The Mojave River Natural History Association provided crafts to about 30 kids a month from May through August in the Campfire Center.

Lake Perris State Recreation Area

California State Parks and local agencies sponsored or hosted several activities in 2020, despite the COVID-19 pandemic:

- two hiking and walking tours

- two Junior Ranger Programs for kids
- two special events with guest speakers
- three off-site school presentations
- one job shadow day

California State Parks also oversaw two bald eagle counts.

Fish Planting

In 2020, DFW planted approximately 340,500 fish into SWP reservoirs (see Table 12-2). This was 3.1 percent more fish than the 330,200 fish planted in 2019, during which a disease outbreak in DFW facilities caused a major decrease in healthy trout (see Bulletin 132-20, Chapter 12). The largest increases in SWP facilities receiving fish in 2020 were Los Banos Reservoir (75.4 percent) and both Lake Oroville and Thermalito Afterbay (approximately 30 percent for each).

DWR purchased 57,585 rainbow trout (59,150 pounds of fish) from both DFW and private hatcheries for Pyramid, Castaic, and Silverwood lakes for recreation mitigation under its hydropower license, Federal Energy Regulatory Commission Project No. 2426.

Of the total rainbow trout purchased by DWR, 13,200 fish (23,500 pounds of fish; 40 percent) were purchased from a supplier near Mount Lassen, and the balance were purchased from DFW. Pyramid Lake received 15,865 fish (18,400 pounds of fish), Castaic Lake received 23,935 fish (20,450 pounds of fish), and Silverwood Lake received 17,785 fish (20,300 pounds of fish).

EBRPD also purchased and planted additional fish into Lake Del Valle: 13,050 pounds of three- to six-pound rainbow trout from a supplier near Mount Lassen. EBRPD charges an additional fishing permit fee to compensate for the cost of these non-State purchases, but the popularity of this supplier's rainbow trout (referred to as "Lassen Rainbows") makes Lake Del Valle a popular fishing spot in the San Francisco Bay Area. The park was closed part of the year because of the COVID-19 pandemic.

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

Table 12-2 Fish Planted by the Department of Fish and Wildlife in 2020 (thousands)^{1,2}

Location	Eagle Lake Rainbow Trout	Brook Trout	Rainbow Trout	Chinook Salmon	Steelhead Trout	Brown Trout	Total for Lake
Antelope Lake	3.3						3.3
Lake Davis	11.8		19.6				31.4
Frenchman Lake						52.0	52.0
Lake Oroville				132.5			132.5
Thermalito Afterbay					43.8		43.8
Lake Del Valle	4.4		16.6				21.0
Los Banos Reservoir			12.1				12.1
Pyramid Lake	3.1		7.1				10.2
Castaic Lake	6.9		11.6				18.6
Silverwood Lake	2.0		13.7				15.7
Lake Perris							0.0
Total	31.5	0	80.7	132.5	43.8	52.0	340.5

¹ Information provided by the Department of Fish and Wildlife

² Please note that, in some instances, the figures in this table may not sum as expected due to rounding.

to the yearly SWP Table A allocation. Per the 20 percent SWP Table A allocation for 2020, maximum diversion amounts under the onshore recreation agreement were allocated at 20 percent, or a total of 1,356 acre-feet (af) as follows: 550 af at San Luis Reservoir; 80 af at Lake Del Valle; 466 af at Castaic Lake and Castaic Lagoon; 250 af at Lake Perris; and 10 af at Bethany Reservoir. Actual deliveries under the agreement totaled 153 af as follows: seven af at San Luis Reservoir; 36 af at Lake Del Valle; 15 af at Castaic Lake and Castaic Lagoon; 95 af at Lake Perris; and zero af at Bethany Reservoir. Additional SWP recreation deliveries included 63 af at Silverwood Lake and 54 af at Pyramid Lake.

Recreation Financing

Capital Cost Allocations

Table 12-3 shows capital costs allocated to recreation and fish and wildlife enhancement and overall costs of lands acquired for recreation development through 2020. Total capital costs increased by \$19,837,203 over those reported in Bulletin 132-20 because of an increase of \$19,837,203 in 2020, and no adjustments in years prior to 2020. The increase in 2020 included \$11,666,683 in joint costs and \$8,170,520 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.

Table 12-3 Recreation and Enhancement Capital Costs of the State Water Project (in dollars)

Facility	Joint Costs Allocated to Recreation and Enhancement			Specific Costs Allocated to Recreation and Enhancement			Total
	1952-2019 Updated	2020	Subtotal	1952-2019 Updated	2020	Subtotal	
Frenchman Dam and Lake (78.5%) ^a							
California Water Resources Development Bond Fund	102,997	0	102,997	3,379	0	3,379	106,376
All Other Funds	2,747,445	19,967	2,767,412	49,950	0	49,950	2,817,362
Antelope Dam and Lake (100%) ^a							
California Water Resources Development Bond Fund	1,033,261	0	1,033,261	3,167	0	3,167	1,036,428
All Other Funds	4,656,604	22,185	4,678,789	201,137	0	201,137	4,879,926
Grizzly Valley Dam and Lake Davis (99.0%) ^a							
California Water Resources Development Bond Fund	4,003,092	0	4,003,092	204,475	0	204,475	4,207,567
All Other Funds	4,194,902	7,151	4,202,053	554,246	0	554,246	4,756,299
Other Feather River Projects (100%) ^a							
California Water Resources Development Bond Fund	0	0	0	9	0	9	9
All Other Funds	746,153	0	746,153	9,921	0	9,921	756,074
Delta Facilities (3.4%) ^a							
California Water Resources Development Bond Fund	0	0	0	0	0	0	0
All Other Funds	18,239,304	2,447,612	20,686,916	0	0	0	20,686,916
San Luis Dam and Reservoir, O'Neill Forebay, and Los Banos Reservoir (3.4%) ^a							
California Water Resources Development Bond Fund	988,910	0	988,910	395,284	0	395,284	1,384,194
All Other Funds	6,556,879	488,727	7,045,606	867,243	0	867,243	7,912,849
California Aqueduct, Delta to Dos Amigos Pumping Plant (3.4%) ^a							
California Water Resources Development Bond Fund	4,467,667	0	4,467,667	422,681	0	422,681	4,890,348
All Other Funds	7,875,348	661,396	8,536,744	-45,422	0	-45,422	8,491,322
Oroville Division (2.9%) ^a							
California Water Resources Development Bond Fund	5,725,216	0	5,725,216	7,809,509	0	7,809,509	13,534,725
All Other Funds	39,979,730	2,008,610	41,988,340	22,846,144	8,169,854	31,015,998	73,004,338
Del Valle Dam and Lake Del Valle (48.0%) ^a							
California Water Resources Development Bond Fund	10,546,762	0	10,546,762	519,425	0	519,425	11,066,187
All Other Funds	4,431,672	56,756	4,488,428	-32,202	0	-32,202	4,456,226
California Aqueduct, Dos Amigos Pumping Plant to Termini (0.4%-32.3%) ^{a,b}							
California Water Resources Development Bond Fund	48,382,162	0	48,382,162	3,880,547	0	3,880,547	52,262,709
All Other Funds	145,160,807	5,954,279	151,115,086	7,565,413	666	7,566,079	158,681,165
Total	309,838,911	11,666,683	321,505,594	45,254,906	8,170,520	53,425,426	374,931,020

^a Percentages are the share of joint costs.

^b Specific recreation costs for Dos Amigos Pumping Plant to Termini include \$2,905,649 for Castaic Dam and Lake, \$795,130 for Cedar Springs Dam and Silverwood Lake, \$6,847,788 for Perris Dam and Lake Perris, and \$898,059 for the California Aqueduct.



Chapter 13

Financial Analysis

California State Assembly member Pauline Davis speaks during the groundbreaking ceremony for the construction of the Grizzly Valley Dam in Plumas County. Davis was known as “Lady of the Lakes” and coauthored the \$130 million Davis-Grunsky Act for local water development. Historical photo taken September 27, 1964.

Significant Events in 2020

On August 6, the Department of Water Resources (DWR) delivered \$544.210 million and \$515.150 million of Water System Revenue Bonds, Series BB and BC, respectively. The proceeds of both series were presold on July 29 to refinance previously sold bonds and pay bond financing costs. Series BB was also sold to fund construction expenditures and refinance commercial paper.

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 2020 through 2030.

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 operations, maintenance, power, and replacement (OMP&R) costs; and debt service payments for bonds expended for construction. The results of the current financial analysis, dated December 31, 2020, are presented in Tables 13-1 and 13-2, located at the end of this chapter. (Please note that, in some instances, the tables and text figures in this chapter may not sum as expected 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 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 that future construction

costs through the year 2030, including reimbursement of \$671 million interim financing for prior expenditures, will total \$3.4 billion. Special capital requirements for revenue bond financing of these construction costs are projected at \$179 million for a total capital requirement of \$3.6 billion. This projection includes construction and financing costs for the following significant SWP projects planned for completion by 2030:

- Perris Dam remediation
- Thermalito Diversion Dam Powerplant restoration and modernization
- SWP protective relay replacement
- SWP Sacramento-San Joaquin Delta (Delta) compliance program
- SWP fire systems modernization
- Sherman and Twitchell islands fish screens
- Oroville Dam Spillway response, recovery, and restoration
- Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project
- California Aqueduct subsidence study and remediation
- Federal Energy Regulatory Commission (FERC) Project No. 2100 relicensing
- FERC Project No. 2426 relicensing
- Financial Management Enhancements Program
- SWP Dam Safety Program

Most of these capital requirements will be financed from the projected sale of \$3.5 billion of revenue bonds. No direct payments from SWP Contractors are projected. The remaining \$45 million of the total capital requirement of \$3.6 billion will be financed from capital resources revenues

and the transfer of revenues not needed for operation costs or debt service.

The analysis of capital requirements and financing presented in Table 13-1 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 SWP Contractors. Table 13-1 also excludes the costs of associated facilities financed and constructed by local interests or State agencies other than DWR. Those facilities are essential for realizing full benefits from the SWP and include onshore recreational developments at SWP facilities and local distribution facilities.

The allocation of capital expenditures for various SWP purposes is detailed in Table 13-3.

Capital Requirements

Lines 1 through 20 in Table 13-1 show actual and projected SWP capital requirements through 2030. Estimates of future capital expenditures include allowances for construction cost escalation of 3.32 percent per year from 2022 through 2030. Right-of-way costs are escalated at 4.0 percent per year from 2022 through 2030. 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 costs for Phase II, improvements, and the Alternate Intake Project.

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 consisted of replacing the existing tank with two 5-million-gallon tanks. Construction of the new tanks began in 2007 and was completed in 2010.

The Alternate Intake Project was to include a new point of diversion along the Sacramento River or its tributaries, a new pumping plant, an in-line storage tank, and an underground pipeline connection to the existing North Bay Aqueduct. Completion of the environmental documentation, design, and construction was postponed. In 2018, the project was suspended at the request of the Solano County Water Agency. In 2019, the project was officially terminated.

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.

Table 13-3 Allocation of Capital Expenditures (in thousands of dollars)

Facilities and Construction Divisions	Expenditures Incurred Through 2020	Future Expenditures 2021–2030	Total	Preliminary Allocation Among Project Purposes			
				Water Supply and Power Generation	Flood Control ¹	Recreation and Fish and Wildlife Enhancement	Other ²
Project Construction Expenditures							
Upper Feather Division	19,790	29,255	49,045	3,324	0	45,721	0
Oroville Division (excludes Small Hydro)	1,716,416	804,767	2,521,183	3,324	71,761	131,498	0
Delta Facilities Division	639,064	304,756	943,820	912,730	0	31,090	0
North Bay Aqueduct	121,871	24,230	146,101	146,101	0	0	0
South Bay Aqueduct (excludes Enlargement)	208,415	53,610	262,025	227,236	13,179	21,610	0
California Aqueduct							
North San Joaquin Division	494,844	105,408	600,252	583,343	0	16,909	0
San Luis Division	639,544	627,623	1,267,167	1,243,230	0	23,936	0
South San Joaquin Division	367,595	158,818	526,413	507,928	0	18,485	0
Tehachapi Division	405,669	93,437	499,106	477,853	0	21,252	0
Mojave Division (excludes Small Hydro)	402,322	23,045	425,367	381,980	0	43,387	0
Santa Ana Division	493,965	212,964	706,929	565,234	0	141,695	0
West Branch	607,449	277,921	885,370	830,291	0	55,079	0
Coastal Branch	511,275	45,132	556,406	556,406	0	0	0
Subtotal, California Aqueduct	3,922,662	1,544,347	5,467,009	5,146,266	0	320,743	0
Other Project Facilities							
Small Hydroelectric Power Generating Facilities	102,851	13,873	116,725	116,725	0	0	0
Off-Aqueduct Power Generating Facilities	491,574	0	491,574	491,574	0	0	0
South Bay Aqueduct Enlargement	208,883	1,526	210,409	210,409	0	0	0
East Branch Enlargement	462,031	0	462,031	462,031	0	0	0
East Branch Extension	424,842	0	424,842	424,842	0	0	0
Coastal Power Allocation	30,708	0	30,708	30,708	0	0	0
Agricultural Drainage Facilities	92,642	5,173	97,815	0	0	0	97,815
Planning and Pre-operations	90,218	34,033	124,252	124,252	0	0	0
Unassigned/Miscellaneous	(35,713)	(71,440)	(107,153)	0	0	0	(107,153)
Subtotal, Project Construction Expenditures	8,496,256	2,744,131	11,240,387	8,299,521	84,940	550,662	(9,337)
Other Capital Requirements							
Davis-Grunsky Act Program	130,000	0	130,000	0	0	0	130,000
Total Capital Expenditures	8,626,256	2,744,131	11,370,387	8,299,521	84,940	550,662	120,663

¹ Reflects DWR's allocation to this purpose, irrespective of federal payments.

² Includes 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.

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 13-4. Costs for Alamo Powerplant consist of expenditures for Unit 1 facilities allocated to enlargement.

**Table 13-4 East Branch Enlargement
Capital Costs by Facility (in millions of dollars)**

Facility	Amount
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

Work on the draft environmental impact report, mapping, and conceptual design for Phase II of the enlargement began in March 2007 and ceased in 2013 at the request of the participating contractors. 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. Phase II construction has been postponed indefinitely.

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 included enlargement of the Crafton Hills Reservoir and construction of the Yucaipa Connector Pipeline. Construction of this phase was completed in 2014. Phase II will increase the pumping capacity to 100 percent of design capacity. Construction of Phase II began in 2012 and was completed in 2017, with final documentation to be completed in 2021. 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 South Bay Aqueduct (SBA) to its original design capacity. Construction began in 2006, and overall project work was completed in 2016.

Line 11, Power Generation and Transmission Facilities, does not include the East Branch Enlargement share of costs for Alamo, Mojave Siphon, and Devil Canyon power plants shown in Line 7 of Table 13-1. The capital costs for facilities included in Line 11 are shown in Table 13-5.

Line 12, Additional Conservation Facilities, shows projected costs to plan and study additional conservation facilities. Specific planning activities and projected spending amounts for 2021 through 2030 are shown in Table 13-6. 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/California WaterFix costs. DWR's share of the Bay Delta Conservation Plan/California WaterFix 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.

DWR assumes that future costs of the drainage program will be financed by revenue transfers (Line 37).

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

Table 13-5 Estimated Capital Costs for Power Generation and Transmission Facilities (in millions of dollars)

Power Plants	Amount
Reid Gardner, Unit 4	314.2
Bottle Rock	120.9
South Geysers	49.6
Devil Canyon	36.8
Warne	84.5
Alamo	44.9
Mojave Siphon	43.9
Hyatt	46.2
Robie Thermalito	183.4
Thermalito Diversion Dam	14.1
<i>Subtotal</i>	<i>938.4</i>
Transmission Lines	Amount
Midway–Wheeler Ridge	10.7
Geysers–Lakeville	6.9
<i>Subtotal</i>	<i>17.6</i>
Total	955.9

Table 13-6 Estimated Future Costs for Planning Additional Conservation Facilities (in millions of dollars)

Activity	Amount
SWP Future Water Supply	32.7
Other Planning Costs	0.0
Total	32.7

those costs ultimately will be allocated to California Aqueduct units described in the preceding paragraphs.

Line 15, Total 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. Authorized in 1960 as part of the Burns-Porter Act, the Davis-Grunsky 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 Act program loans and grants includes management and oversight of recreation projects and contracts. Administration costs are recovered from revenues generated by repayment of Davis-Grunsky Act loans. Recreation grant contracts are 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.

As of December 31, 2020, 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 13-7.

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 13-1 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 19 percent of the expenditures through 2020 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 State tideland oil revenues, in accordance with a continuing authorization. The California Water Fund was used to finance

\$508 million, or approximately 6 percent, of the construction expenditures through 2020.

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, 2020, DWR had sold \$13 billion of revenue bonds. That amount includes \$7.2 billion of refunded bonds, leaving a total principal obligation of \$5.8 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 \$483 million of Water System Revenue Bond proceeds has been applied to the East Branch Enlargement project through December 31, 2020. Of this total, \$425 million was used for construction expenditures and \$58 million was used for bond discounts, interest costs, and debt service reserve requirements.

Line 23, East Branch Enlargement, Future Bonds, shows no projected bond sales for this financial analysis.

Line 24, East Branch Extension, Current Bonds, shows that \$438 million of Water System Revenue Bond proceeds has been spent through December 31, 2020. Of this total, \$435 million was used for construction expenditures, and \$3.4 million was used for bond discounts, interest costs, and debt service reserve requirements.

Line 25, East Branch Extension, Future Bonds, shows no projected bond sales for this financial analysis.

Table 13-7 Application of Revenue Bond Proceeds (in millions of dollars)

Bond Series ¹	Construction Expenditures	Other Capital Requirements				Subtotal	Total Principal Amount of Bonds
		Reimbursement of General Fund	Capitalized Interest	Capitalized Operating Costs	Bond Financing and Refunding Costs ²		
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

Table 13-7 Application of Revenue Bond Proceeds (in millions of dollars)

Bond Series ¹	Construction Expenditures	Other Capital Requirements				Subtotal	Total Principal Amount of Bonds
		Reimbursement of General Fund	Capitalized Interest	Capitalized Operating Costs	Bond Financing and Refunding Costs ²		
Water System Facilities Series AJ	69.3	0.0	3.7	0.0	143.9	147.6	216.9
Water System Facilities Series AK	32.0	0.0	0.9	0.0	3.4	4.3	36.3
Water System Facilities Series AL	0.0	0.0	0.0	0.0	105.9	105.9	105.9
Water System Facilities Series AM	0.0	0.0	0.0	0.0	184.0	184.0	184.0
Water System Facilities Series AN	44.8	0.0	0.3	0.0	4.4	4.7	49.5
Water System Facilities Series AO	0.0	0.0	0.0	0.0	317.5	317.5	317.5
Water System Facilities Series AP	47.7	0.0	1.2	0.0	(3.5)	(2.4)	45.3
Water System Facilities Series AQ	122.6	0.0	7.2	0.0	(9.6)	(2.4)	120.2
Water System Facilities Series AR	168.1	0.0	5.4	0.0	(12.1)	(6.7)	161.4
Water System Facilities Series AS	0.0	0.0	0.0	0.0	645.8	645.8	645.8
Water System Facilities Series AT	139.5	0.0	5.9	0.0	3.9	9.8	149.2
Water System Facilities Series AU	104.6	0.0	3.4	0.0	1.3	4.7	109.3
Water System Facilities Series AV	120.9	0.0	7.3	0.0	(21.7)	(14.4)	106.5
Water System Facilities Series AW	363.0	0.0	29.5	0.0	35.7	65.1	428.1
Water System Facilities Series AX	0.0	0.0	0.0	0.0	350.7	350.7	350.7
Water System Facilities Series AY	0.0	0.0	0.0	0.0	140.8	140.8	140.8
Water System Facilities Series AZ	129.7	0.0	6.6	0.0	79.0	85.6	215.3
Water System Facilities Series BA	346.0	0.0	9.0	0.0	(55.5)	(46.5)	299.6
Water System Facilities Series BB	569.0	0.0	29.3	0.0	(54.1)	(24.8)	544.2
Water System Facilities Series BC	0.0	0.0	0.0	0.0	515.1	515.2	515.2
Subtotal	5,436.5	2.6	379.6	14.8	7,184.5	7,581.4	13,017.9^a
Future East Branch Enlargement Bonds	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Future East Branch Extension Bonds	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Future SBA Enlargement Bonds	1.5	0.0	0.0	0.0	0.1	0.1	1.6
Future Water System Facilities Bonds	3,626.7	0.0	78.7	0.0	100.2	179.0	3,805.7
Total	9,064.7	2.6	458.4	14.8	7,284.7	7,760.5	16,825.2

¹ 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.

² Bond financing and refunding costs include funds applied to debt service reserve requirements.

^a Includes \$7,233.1 million of refunded principal, leaving a net principal obligation of \$5,784.9 million.

Line 26, South Bay Aqueduct Enlargement, Current Bonds, shows that \$227 million of Water System Revenue Bond proceeds had been spent through December 31, 2020. Of this total, \$226 million was used for construction expenditures, and \$0.8 million was used for bond discounts, interest costs, and debt service reserve requirements.

Line 27, South Bay Aqueduct Enlargement, Future Bonds, shows DWR's estimate of \$1.6 million of additional 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, 2020, \$3.3 billion of proceeds from Water System Revenue Bonds, Series A through Series BB and BC, was applied to SWP projects other than the East Branch Enlargement, the East Branch Extension, and the SBA Enlargement. Of this total, \$3.2 billion was used to pay for construction expenditures and \$0.1 billion was used to pay for bond discounts, capitalized interest, and debt service reserve requirements.

Line 29, Water System Facilities, Future Bonds, shows that \$3.8 billion of future water revenue bonds is needed to provide \$3.6 billion for construction of SWP water system facilities and \$0.2 billion 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 have been 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, 2015, 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 authorized four series of Water Revenue Commercial Paper Notes. Series 1 is authorized for \$600 million of notes. Series 2, 3, and 4 are authorized for a combined \$800 million to cover costs for the Oroville Dam Spillway Recovery and

Restoration Project that are not federally reimbursed. 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, Direct Pay, shows the revenues received directly from the contractors rather than financing through bonds for certain SWP project construction expenditures. At this time, the North Bay Aqueduct Alternate Intake is funded this way.

Line 36, Application of Capital Resources Revenues to Construction, presents the Capital Resources Revenues applied for capital expenditures.

Line 37, 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 13-2). Projected amounts for the years 2021 through 2030 include funds to finance expenditures for agricultural drainage facilities, as indicated in Line 13 of Table 13-1, and expenditures for additional conservation facilities, as indicated in Line 12.

Line 38, Subtotal, Other Capital Financing, is the total of Lines 31 through 37.

Line 39, Total Financing of Capital Requirements, totals Lines 21, 30, and 38.

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 OMP&R costs and meet all repayment obligations on

funds used to finance SWP construction and other authorized costs during the period 2021 through 2030. Data on annual revenues and expenditures are presented in Table 13-2. A detailed discussion of each line item follows.

Project Revenues

Project revenues primarily consist of SWP Contractor payments required under their individual 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

- 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 (Cologne; Chapter 411, Statutes of 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 (RFWE) amounted to \$5 million per year and were appropriated by the California Legislature from the State tideland oil revenues. There have been no appropriations from this fund since 1985.

Legislation enacted in 1989 offset a portion of the amount owed to the SWP by the State for costs allocated to RFWE against the amount the SWP owed to the California Water Fund (see Line 39). Since the final offset in 1994, DWR has accumulated \$167.2 million in capital costs through December 31, 2020.

In 2012, the Davis-Dolwig Act was amended to appropriate \$10 million per fiscal year from the Harbors and Watercraft Revolving Fund to cover a portion of the OMP&R and capital costs allocated to RFWE. Starting in fiscal year 2012–2013, \$7.5 million is being appropriated for ongoing OMP&R and capital costs and \$2.5 million is being appropriated to reimburse for past unreimbursed OMP&R and capital costs.

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.

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 for

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 13-8).

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 13-9 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 back of this bulletin, is based on known conditions and substantiates DWR's determination of 2022 water charges to be billed on July 1, 2021. However, information about significant differences between the sum of future charges included in Lines 2 through 12 of Table 13-2 and the

Table 13-8 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 issues.

Table 13-9 Actual Bond Sales and Project Interest Rates by Date of Sale

1 of 3

Bond Sales	Date of Sale	Delivery Date	Dollar-Years ¹ (thousands)	Interest Cost (thousands)	Issue Interest Rate ² (percent)	Project Interest Rate ³ (percent)
\$ 50,000,000 Bond Anticipation Notes	11/21/63	11/21/63	26,944	531	1.971	1.971
\$100,000,000 Series A Water Bonds	2/18/64	2/18/64	3,402,000	119,750	3.520	3.508
\$ 50,000,000 Series B Water Bonds	5/5/64	5/5/64	1,726,000	60,986	3.533	3.516
\$100,000,000 Series C Water Bonds	10/7/64	10/7/64	3,452,000	123,764	3.585	3.544
\$100,000,000 Series D Water Bonds	2/16/65	2/16/65	3,497,900	122,403	3.499	3.531
\$100,000,000 Series E Water Bonds	11/23/65	11/23/65	3,497,900	130,029	3.717	3.573
\$100,000,000 Series F Water Bonds	6/8/66	6/8/66	3,497,900	137,359	3.927	3.638
\$100,000,000 Series G Water Bonds	11/22/66	11/22/66	3,497,900	143,788	4.111	3.711
\$100,000,000 Series H Water Bonds	3/21/67	3/21/67	3,497,900	129,261	3.695	3.709
\$100,000,000 Series J Water Bonds	7/18/67	7/18/67	3,497,900	143,199	4.094	3.754
\$100,000,000 Series K Water Bonds	11/14/67	11/14/67	3,497,900	163,887	4.685	3.853
\$150,000,000 Revenue Bonds, Oroville Division, Series A	4/3/68	4/3/68	5,228,700	270,289	5.169	
\$100,000,000 Series L Water Bonds	7/11/68	7/11/68	3,497,900	166,918	4.772	3.941
\$100,000,000 Series M Water Bonds	10/22/68	10/22/68	3,497,900	169,989	4.860	4.021
\$ 94,995,000 Revenue Bonds, Oroville Division, Series B	4/1/69	4/1/69	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	6/16/70	200,000	11,660	5.830	4.030
\$100,000,000 Series N Water Bonds	2/2/71	2/2/71	3,447,900	190,292	5.519	4.148
\$100,000,000 Series Q Bond Anticipation Notes	3/10/71	3/10/71	100,000	2,349	2.349	4.143
\$100,000,000 Series P Water Bonds	4/21/71	4/21/71	3,397,900	193,377	5.691	4.255
\$150,000,000 Series Q and R Water Bonds	11/9/71	11/9/71	5,171,850	265,734	5.138	4.342
\$ 40,000,000 Series S Water Bonds	3/28/72	3/28/72	1,399,160	76,509	5.468	4.371
\$139,165,000 Devil Canyon–Castaic Revenue Bonds	8/8/72	8/8/72	4,776,204	258,839	5.419	4.457
\$ 10,000,000 Series T Water Bonds	3/20/73	3/20/73	185,265	9,491	5.123	4.459
\$ 10,000,000 Series U Water Bonds	1/13/76	1/13/76	158,750	8,731	5.500	4.462
\$ 10,000,000 Series V Water Bonds	11/15/77	11/15/77	158,750	7,573	4.770	4.462
\$ 95,800,000 Pyramid Hydroelectric Revenue Bonds	10/23/79	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	7/1/81	347,906	29,572	8.500	
\$ 75,600,000 Bottle Rock Project, Bond Anticipation Notes	12/1/81	12/1/81	264,600	25,137	9.500	
\$ 24,400,000 Alamo Project, Bond Anticipation Notes	12/1/81	12/1/81	24,266	2,305	9.499	4.589
\$200,000,000 Reid Gardner Project, Series B Revenue Bonds	7/7/82	7/7/82	4,623,137	553,793	11.979	
\$125,000,000 Reid Gardner Project, Series C Revenue Bonds	11/16/82	11/16/82	2,720,045	255,744	9.402	
\$ 37,500,000 Small Hydro Project I, Series D Revenue Bonds	11/16/82	11/16/82	837,769	84,587	10.097	4.666
\$ 37,500,000 South Geysers Project, Series D Revenue Bonds	11/16/82	11/16/82	930,325	90,021	9.676	
\$125,000,000 Bottle Rock Project, Series E Revenue Bonds	4/27/83	4/27/83	2,624,805	225,102	8.576	
\$ 50,000,000 Alamo Project, Series F Revenue Bonds	4/27/83	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	4/27/83	608,550	52,578	8.640	
\$239,505,000 Reid Gardner Project, Series G Revenue Bonds	3/15/85	3/15/85	4,524,136	425,840	9.413	
\$206,690,000 Power Facilities Series H Revenue Bonds	6/20/86	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	7/15/86	3,427,165	254,915	7.438	

Table 13-9 Actual Bond Sales and Project Interest Rates by Date of Sale

2 of 3

Bond Sales	Date of Sale	Delivery Date	Dollar-Years ¹ (thousands)	Interest Cost (thousands)	Issue Interest Rate ² (percent)	Project Interest Rate ³ (percent)
\$100,000,000 Series B Water System Revenue Bonds	5/5/87	5/5/87	2,564,012	194,817	7.598	
\$ 9,000,000 Series C Water System Revenue Bonds	12/1/87	12/1/87	324,000	31,995	9.875	
\$100,000,000 Series D Water System Revenue Bonds	6/14/88	6/14/88	2,640,510	201,253	7.622	
\$ 9,000,000 Series E Water System Revenue Bonds	11/29/88	12/5/88	324,000	31,995	9.875	
\$160,030,000 Series F Water System Revenue Bonds	3/15/89	4/20/89	2,779,838	189,261	6.808	
\$100,000,000 Series G Water System Revenue Bonds	3/6/90	3/6/90	2,434,175	172,277	7.077	
\$100,000,000 Series H Water System Revenue Bonds	1/10/91	1/10/91	2,459,172	168,857	6.866	
\$180,000,000 Series I Water System Revenue Bonds	5/14/91	5/14/91	4,366,680	294,090	6.735	
\$ 9,000,000 Series W Water Bonds	8/1/91	8/1/91	95,250	6,172	6.480	
\$649,835,000 Series J Water System Revenue Bonds	1/16/92	1/28/92	12,422,222	745,198	5.999	4.621
\$100,000,000 Series K Water System Revenue Bonds	5/12/92	6/4/92	2,366,783	147,064	6.214	
\$537,830,000 Series L Water System Revenue Bonds	5/19/93	6/2/93	11,414,859	640,518	5.611	4.620
\$ 2,000,000 Series X Water Bonds	9/1/93	9/1/93	26,000	1,247	4.796	4.621
\$ 1,400,000 Series Y Water Bonds	11/30/94	11/30/94	19,483	1,249	6.411	
\$190,000,000 Series M Water System Revenue Bonds	12/9/93	12/21/93	3,911,846	194,981	4.984	
\$152,000,000 Series N Water System Revenue Bonds	3/3/95	3/14/95	2,241,606	122,658	5.472	
\$335,000,000 Series O Water System Revenue Bonds	12/5/95	12/20/95	7,528,890	375,667	4.990	
\$160,000,000 Series P Water System Revenue Bonds	5/7/96	5/22/96	3,553,823	204,524	5.755	
\$266,630,000 Series Q Water System Revenue Bonds	11/5/96	12/4/96	5,481,815	299,846	5.470	4.620
\$ 20,700,000 Series R Water System Revenue Bonds	3/10/97	3/12/97	564,125	36,627	6.493	
\$200,205,000 Series S Water System Revenue Bonds	7/30/97	8/13/97	4,093,110	203,755	4.978	4.615
\$135,665,000 Series T Water System Revenue Bonds	7/30/97	3/4/98	1,310,620	66,942	5.108	
\$207,180,000 Series U Water System Revenue Bonds	11/19/98	12/1/98	4,032,075	200,758	4.979	
\$ 20,580,000 Series V Water System Revenue Bonds	11/19/98	12/1/98	525,100	32,819	6.250	
\$260,995,000 Series W Water System Revenue Bonds	5/1/01	5/17/01	3,659,312	195,822	5.351	4.613
\$160,225,000 Series X Water System Revenue Bonds	5/1/02	6/4/02	2,732,785	139,109	5.090	4.610
\$329,885,000 Series Y Water System Revenue Bonds	7/25/02	3/5/03	4,422,973	222,654	5.034	
\$170,655,000 Series Z Water System Revenue Bonds	10/1/02	10/16/02	1,706,132	75,696	4.437	
\$108,705,000 Series AA Water System Revenue Bonds	10/4/02	3/5/03	2,114,341	104,220	4.929	
\$189,625,000 Series AB Water System Revenue Bonds	3/9/04	3/18/04	4,344,942	173,788	4.000	
\$272,070,000 Series AC Water System Revenue Bonds	12/15/04	1/6/05	4,479,436	209,150	4.669	
\$112,390,000 Series AD Water System Revenue Bonds	6/14/05	7/7/05	1,827,449	90,461	4.950	4.608
\$632,890,000 Series AE Water System Revenue Bonds	4/23/08	5/1/08	8,884,000	436,216	4.910	
\$287,735,000 Series AF Water System Revenue Bonds	3/11/09	3/19/09	2,980,895	143,464	4.813	
\$169,115,000 Series AG Water System Revenue Bonds	11/17/09	12/2/09	2,907,605	142,774	4.910	
\$ 97,675,000 Series AH Water System Revenue Bonds	10/27/10	11/9/10	1,432,014	72,176	5.040	4.610
\$ 92,275,000 Series AI Water System Revenue Bonds	10/27/10	9/7/11	698,716	34,936	5.000	
\$216,930,000 Series AJ Water System Revenue Bonds	10/6/11	10/13/11	2,080,429	100,663	4.839	
\$ 36,370,000 Series AK Water System Revenue Bonds	2/28/12	3/13/12	495,566	23,466	4.735	
\$105,875,000 Series AL Water System Revenue Bonds	2/28/12	9/5/12	739,447	36,972	5.000	

Table 13-9 Actual Bond Sales and Project Interest Rates by Date of Sale

Bond Sales	Date of Sale	Delivery Date	Dollar-Years ¹ (thousands)	Interest Cost (thousands)	Issue Interest Rate ² (percent)	Project Interest Rate ³ (percent)
\$183,960,000 Series AM Water System Revenue Bonds	2/28/12	3/5/13	1,440,539	72,027	5.000	
\$ 49,525,000 Series AN Water System Revenue Bonds	9/19/12	9/27/12	646,489	31,783	4.916	
\$317,505,000 Series AO Water System Revenue Bonds	9/19/12	9/27/12	2,830,185	71,219	2.516	
\$ 45,340,000 Series AP Water System Revenue Bonds	3/12/13	3/26/13	621,111	25,008	4.026	
\$120,205,000 Series AQ Water System Revenue Bonds	5/21/13	6/18/13	2,120,496	85,993	4.055	
\$161,445,000 Series AR Water System Revenue Bonds	2/25/14	3/6/14	2,126,626	91,827	4.318	
\$645,795,000 Series AS Water System Revenue Bonds	9/30/14	10/30/14	7,285,936	363,246	4.986	
\$149,245,000 Series AT Water System Revenue Bonds ⁴	10/29/14	11/6/14	2,784,834	83,541	3.000	
\$109,275,000 Series AU Water System Revenue Bonds ⁴	8/25/15	9/2/15	1,946,180	40,285	2.070	
\$106,530,000 Series AV Water System Revenue Bonds	5/10/16	5/24/16	1,302,906	56,488	4.336	
\$428,130,000 Series AW Water System Revenue Bonds	10/13/16	10/20/16	5,454,047	259,585	4.759	
\$350,670,000 Series AX Water System Revenue Bonds	12/6/17	12/9/17	2,920,117	146,006	5.000	
\$140,825,000 Series AY Water System Revenue Bonds	12/6/17	12/9/17	1,050,620	30,038	2.859	
\$215,295,000 Series AZ Water System Revenue Bonds	10/10/18	10/18/18	1,906,161	94,688	4.967	
\$299,590,000 Series BA Water System Revenue Bonds	4/16/19	4/24/19	3,034,581	151,729	5.000	
\$544,210,000 Series BB Water System Revenue Bonds	7/29/20	8/6/20	5,235,480	261,774	5.000	
\$515,150,000 Series BC Water System Revenue Bonds	7/29/20	8/6/20	4,308,552	59,584	1.383	
Total			266,555,878	14,414,583		
Portion allocated to Project Interest Rate			63,903,487	2,945,789	4.610	4.610

¹ A unit equivalent to one dollar of principal amount outstanding for one year.

² The total interest rate (without regard to discounts paid or to premiums received) divided by the total dollar-years, expressed as a percent.

³ Cumulative interest costs divided 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 Branch Extension Facilities, or South Bay Aqueduct Enlargement Facilities.)

⁴ Variable rate issue. Assumed an interest rate. Actual interest cost and rate will vary.

substantiation of 2021 charges included in Appendix B are as described below.

- Future capital costs in Appendix B are based on the prevailing prices as of December 31, 2020. Those costs presented in the financial analysis include allowances for price escalation.
- Pre-2021 charges in Appendix B represent charges as they should have been, according to currently known conditions. Pre-2021 charges included in Table 13-2 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 13-2 for 2021 and thereafter have been adjusted for any apparent overpayments or underpayments of pre-2021 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 BC bonds. Charges in Table 13-2 apply to Series A through Series BC 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 BC bonds. Surcharge values included in Table 13-2 apply to Series B through Series BC bonds and to assumed future issues required to finance

SWP construction costs included in Table 13-1.

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 East Afterbay
- 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 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 U.S. 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. A review of the percentage paid by Reclamation was completed in 1987 and resulted in a federal share of 44.09 percent. During the review concluded in 2019, DWR agreed to reevaluate Reclamation's percentage every five years based on the preceding five years of actual operating expenditures. Operating expenditures for calendar years 2006 through 2010 were reviewed, and the percentage paid by Reclamation for calendar years 2011 through 2015 was reduced to 39.72 percent. In 2018, the percentage was set at 39.90 for calendar years 2016 through 2020. The amounts in Line 16 are based on the assumption that the federal share will be 37.67 percent for calendar years 2021 through 2030.

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 (Porter, et al.; Chapter 27, Statutes of 1966), DWR's budget will include appropriations of monies from the General Fund necessary

for RFWE in connection with State water projects.

Annual OMP&R costs allocated to RFWE are to be paid by annual appropriations from the General Fund. Through fiscal year 1982–1983, these appropriations totaled \$16.7 million. No additional appropriations have been made from this fund since fiscal year 1982–1983.

Legislation enacted in 1989 offset a portion of the amount owed to the SWP by the State for costs allocated to RFWE against the amount the SWP owed to the California Water Fund (see Line 39). Since the final offset in 1994, DWR has accumulated \$352.1 million in OMP&R costs through December 31, 2020.

In 2012, the Davis-Dolwig Act was amended to appropriate \$10 million per fiscal year from the Harbors and Watercraft Revolving Fund to cover a portion of the OMP&R and capital costs allocated to RFWE. Starting in fiscal year 2012–2013, \$7.5 million is being appropriated for ongoing OM&R and capital RFWE costs and \$2.5 million is being appropriated to reimburse DWR for past unreimbursed OMP&R and capital costs.

Line 18, Davis-Grunsky Loan Repayments, shows the repayments by local agencies of \$81.7 million of loans disbursed as of December 31, 2020. 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 13-1. 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 power plants 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

- 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
- deposits to a reserve for future SWP construction

Project expenses are presented in Lines 26 through 36 of Table 13-2.

Line 26, Project Operations, Maintenance, Power, and Replacement Costs, shows the OMP&R portion of the historical and projected costs presented in Table 13-10.

Table 13-10 and Line 26 of Table 13-2 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 2020. 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 9, 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, 2020, a net deposit (which includes returned deposits) of \$119.5 million had been made; \$106.1 million had been spent for replacement costs. The balance of the replacement reserve as of that date was \$37.8 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 net of several income and expenditure items.

Income items related to revenue bonds are as follows:

- 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
- deposits to and withdrawals from operating reserves to meet day-to-day cash flow requirements

The 1952–2020 column also includes advances to DWR’s revolving fund for working funds to purchase mobile equipment and to meet day-to-day operating expenses.

Table 13-10 Operations, Maintenance, Power, and Replacement Costs by Facility, Composition, and Purpose (in thousands of dollars)

Feature	Calendar Year															TOTAL
	1962-2018	2019	2020	1962-2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031-2035	
Project Facility																
Feather River facilities	1,910,420	99,239	105,427	2,115,086	100,100	98,300	99,801	99,041	100,225	101,600	101,849	104,435	104,183	105,107	529,912	3,659,639
North Bay Aqueduct	141,767	6,918	9,828	158,513	11,130	9,485	8,397	9,324	9,427	9,545	9,558	9,789	9,755	9,830	49,399	304,152
Delta facilities	1,330,883	77,684	64,389	1,472,956	113,407	108,609	97,988	105,195	106,452	107,912	108,177	110,923	110,655	111,637	603,696	3,157,607
Suisun Marsh	115,587	11,790	10,166	137,543	8,086	6,747	8,093	7,535	7,625	7,730	7,748	7,945	7,926	7,996	40,314	255,288
South Bay Aqueduct	493,874	19,271	22,021	535,166	27,375	22,686	22,211	23,909	24,149	24,421	24,424	24,983	24,865	25,028	125,322	904,539
California Aqueduct																
Delta to Edmonston	5,384,906	267,924	204,402	5,857,232	214,124	273,131	273,231	301,913	286,558	301,594	282,071	305,145	309,994	294,986	1,538,886	10,238,866
Edmonston to Perris	4,962,367	242,333	191,591	5,396,291	210,887	267,865	273,898	307,782	310,962	307,487	312,625	313,786	314,456	310,889	1,601,463	9,928,391
West Branch	294,993	37,273	46,132	378,398	2,100	68,358	38,185	37,091	37,808	38,687	38,367	39,888	39,521	40,417	194,528	953,348
Coastal Branch	447,510	22,828	24,344	494,682	22,488	25,017	25,526	26,982	27,256	27,559	27,557	28,183	28,045	28,224	141,245	902,764
East Branch Enlargement	174,017	10,789	13,170	197,976	12,369	11,905	11,740	11,841	11,983	12,147	12,177	12,486	12,456	12,567	63,356	383,003
East Branch Extension	79,843	13,343	11,679	104,865	11,862	11,953	11,439	12,035	12,169	12,322	12,339	12,639	12,595	12,694	63,802	290,714
Off-Aqueduct power-generating facilities	1,588,200	110	111	1,588,421	112	114	115	116	117	118	119	121	122	123	633	1,590,231
Recreation, planning, and Central Valley Project negotiations	12,872	2,270	3,590	18,732	2,423	2,807	2,840	1,214	784	0	0	0	0	0	0	28,800
Water quality monitoring	424,976	12,683	12,683	450,342	12,683	12,683	12,683	11,379	11,379	11,379	11,379	11,379	11,379	11,379	79,653	647,697
Davis-Grunsky Act Program	6,721	309	127	7,157	127	127	127	127	127	127	127	127	127	127	891	9,321
Subtotal	17,368,936	824,764	719,660	18,913,360	749,273	919,787	886,275	955,485	947,021	962,629	948,517	981,829	986,079	971,005	5,033,100	33,254,359
Payments to/credits from PG&E* under Comprehensive Agreement	(59,848)	0	0	(59,848)	0	0	0	0	0	0	0	0	0	0	0	(59,848)
Total OMP&R Costs	17,309,088	824,764	719,660	18,853,512	749,273	919,787	886,275	955,485	947,021	962,629	948,517	981,829	986,079	971,005	5,033,100	33,194,511
Composition																
Salaries and expenses of headquarters personnel	4,828,109	213,446	158,738	5,200,293	169,075	245,810	227,545	260,360	258,387	261,878	259,738	269,140	271,062	266,833	1,399,499	9,089,620
Salaries and expenses of field personnel	6,607,181	252,206	200,622	7,060,009	213,685	310,668	287,583	329,056	326,563	330,975	328,270	340,153	342,582	337,238	1,768,758	11,975,540
Pumping power																
Used by pumping plants	5,269,076	394,094	362,589	6,025,759	350,964	405,936	407,289	403,428	398,146	406,002	396,742	408,753	408,748	398,415	2,021,318	12,031,499
Produced by generation plants	(811,542)	(35,092)	(2,400)	(849,034)	15,437	(42,741)	(36,257)	(37,475)	(36,192)	(36,344)	(36,352)	(36,338)	(36,435)	(31,604)	(157,108)	(1,320,443)
Off-Aqueduct power-generating facilities requirement	1,588,200	110	111	1,588,421	112	114	115	116	117	118	119	121	122	123	633	1,590,231
Oroville-Thermalito insurance premiums	8,963	0	0	8,963	0	0	0	0	0	0	0	0	0	0	0	8,963
Less portion of costs incurred during construction	(121,051)	0	0	(121,051)	0	0	0	0	0	0	0	0	0	0	0	(121,051)
Payments to/credits from PG&E* under Comprehensive Agreement	(59,848)	0	0	(59,848)	0	0	0	0	0	0	0	0	0	0	0	(59,848)
Total OMP&R Costs	17,309,088	824,764	719,660	18,853,512	749,273	919,787	886,275	955,485	947,021	962,629	948,517	981,829	986,079	971,005	5,033,100	33,194,511
Project Purpose																
Water supply and power generation	16,113,507	760,989	651,364	17,525,859	681,470	851,984	818,471	887,681	879,218	894,826	880,714	914,026	918,276	903,201	4,694,084	30,849,811
Recreation and fish and wildlife enhancement	360,761	25,540	29,079	415,380	29,079	29,079	29,079	29,079	29,079	29,079	29,079	29,079	29,079	29,079	145,397	851,571
Flood control	413,070	19,662	19,922	452,654	19,920	19,920	19,920	19,920	19,920	19,920	19,920	19,920	19,920	19,920	99,600	751,454
Miscellaneous purposes																
Federal share: San Luis and Delta facilities	437,921	16,947	17,930	472,797	17,438	17,438	17,438	17,438	17,438	17,438	17,438	17,438	17,438	17,438	87,192	734,373
Other (Davis-Grunsky, drainage, City of Los Angeles)	43,677	1,627	1,365	46,670	1,365	1,365	1,365	1,365	1,365	1,365	1,365	1,365	1,365	1,365	6,827	67,150
Payments to/credits from PG&E* under Comprehensive Agreement	(59,848)	0	0	(59,848)	0	0	0	0	0	0	0	0	0	0	0	(59,848)
Total OMP&R Costs	17,309,088	824,764	719,660	18,853,512	749,273	919,787	886,275	955,485	947,021	962,629	948,517	981,829	986,079	971,005	5,033,100	33,194,511

* Pacific Gas & Electric Company

The expenditure items related to revenue bonds are as follows:

- 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
- 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 36 of Table 13-1. In Table 13-2, 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, 2020, show the total principal and interest payments, respectively, on bonds sold to date. Table 13-11 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 BC).

Lines 32 and 33, Payments on Projected Future Water Bonds, include the projected annual bond debt service amounts for future water revenue bonds included on Lines 23, 25, 27, and 29 of Table 13-1 for the East Branch Enlargement, East Branch Extension, SBA Enlargement, and other water system

facilities. Assumptions about the bond debt service on these future bonds are that

- interest costs for the water revenue bonds average 1.60 percent; and
- 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 debt 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, Bond Debt Service, is the total of Lines 34 and 35.

Line 37, Total Operating Expenses and Bond 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 RFWE 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 bond 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 13-12 represent estimated costs of water delivery by service area for calendar years 2022 and 2027. The unit rates include costs of existing and future SWP facilities accounted for in Table 13-1 and Table 13-7. The unit water charges are based on the assumption that in 2022 and 2027, the SWP will be able to deliver the entire amount of water requested by each contractor. The unit water charges included in Table 13-12 are listed both as 2022 dollars and as escalated rates reflecting assumed future inflation of 4.0 percent from 2022 through 2027.

Table 13-12 Estimated Unit Water Charges for 2022 and 2027, by Service Area (in dollars per acre-foot)

Service Area and Charge	2022 (in 2022 dollars)	2027 (in 2027 dollars)
Feather River Area		
Capital; OM&R	635	726
North Bay Area		
Capital; OM&R	541	642
Power	26	25
Total	567	667
South Bay Area		
Capital; OM&R	527	641
Power	59	59
Total	586	700
Coastal Area		
Capital; OM&R	1,313	1,559
Power	135	193
Total	1,448	1,752
San Joaquin Area		
Capital; OM&R	251	286
Power	31	28
Total	282	314
Southern California Area		
Capital; OM&R	490	545
Power	172	220
Total	662	765

Table 13-1 Capital Requirements and Financing, December 31, 2020 (in thousands of dollars)

Line Number/Item	Calendar Year															
	1952–2018	2019	2020	1952–2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2021–2030	1952–2030
CAPITAL REQUIREMENTS																
1. Initial Project Facilities	2,202,316	0	0	2,202,316	0	0	0	0	0	0	0	0	0	0	0	2,202,316
2. North Bay Aqueduct	116,787	132	739	117,658	1,745	3,152	1,280	0	0	0	0	0	0	0	6,178	123,835
3. Delta & Suisun Marsh Facilities	407,623	23,047	71,989	502,658	51,386	72,648	44,832	13,872	21,024	13,145	6,303	89	76	76	223,451	726,109
4. Final 4 Units at Banks Delta Pumping Plant	43,673	0	0	43,673	0	0	0	0	0	0	0	0	0	0	0	43,673
5. Coastal Branch Aqueduct	522,754	1,952	3,389	528,095	3,400	3,025	4,413	481	282	211	244	0	0	0	12,055	540,150
6. West Branch Aqueduct	231,498	10,523	18,611	260,632	14,886	24,204	20,256	31,745	63,345	75,827	38,784	0	0	0	269,046	529,678
7. East Branch Enlargement	462,031	0	0	462,031	0	0	0	0	0	0	0	0	0	0	0	462,031
8. East Branch Improvements	576,122	18,787	31,724	626,633	170	105	0	0	0	0	0	0	0	0	275	626,908
9. East Branch Extension	425,070	189	(418)	424,842	0	0	0	0	0	0	0	0	0	0	0	424,842
10. South Bay Aqueduct Improvements and Enlargement	275,138	769	313	276,220	1,488	38	0	0	0	0	0	0	0	0	1,526	277,745
11. Power Generation and Transmission Facilities	946,874	6,732	2,307	955,913	7,550	2,093	1,241	0	0	0	0	0	0	0	10,885	966,798
12. Additional Conservation Facilities	178,196	2,989	2,595	183,779	2,800	3,454	3,472	3,472	3,472	3,472	3,472	3,472	3,472	3,472	34,033	217,812
13. Agricultural Drainage Facilities	90,086	1,318	1,238	92,642	1,634	1,763	1,776	0	0	0	0	0	0	0	5,173	97,815
14. Other Costs	1,483,581	184,879	150,702	1,819,162	237,130	248,542	278,430	419,707	350,200	156,578	106,499	118,396	112,469	153,557	2,181,509	4,000,672
15. Total Project Construction Expenditures	7,961,749	251,317	283,190	8,496,256	322,189	359,025	355,699	469,278	438,323	249,233	155,304	121,958	116,017	157,105	2,744,131	11,240,387
16. Davis-Grunsky Act Program Costs	130,000	0	0	130,000	0	0	0	0	0	0	0	0	0	0	0	130,000
17. Special Capital Requirements Under Revenue Bond Financing	556,417	(46,456)	(59,805)	450,156	22,553	23,126	22,977	30,630	28,490	15,996	9,907	7,820	7,428	10,140	179,066	629,222
18. Total Capital Requirements	8,648,165	204,862	223,385	9,076,412	344,742	382,151	378,676	499,908	466,813	265,229	165,211	129,778	123,445	167,245	2,923,197	11,999,608
19. Power Facilities Capital Requirements	946,874	6,732	2,307	955,913	7,550	2,093	1,241	0	0	0	0	0	0	0	10,885	966,798
20. Water Facilities Capital Requirements	7,701,292	198,130	221,077	8,120,498	337,192	380,057	377,435	499,908	466,813	265,229	165,211	129,778	123,445	167,245	2,912,312	11,032,811
FINANCING OF CAPITAL REQUIREMENTS																
Power Facilities Revenue Bond Proceeds																
21. Power Facilities Revenue Bonds through Series H	1,162,458	0	0	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	482,639	0	0	482,639	0	0	0	0	0	0	0	0	0	0	0	482,639
23. East Branch Enlargement, Future Bonds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24. East Branch Extension, Current Bonds	438,022	275	4	438,301	0	0	0	0	0	0	0	0	0	0	0	438,301
25. East Branch Extension, Future Bonds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26. South Bay Aqueduct Enlargement, Current Bonds	225,954	200	535	226,689	0	0	0	0	0	0	0	0	0	0	0	226,689
27. South Bay Aqueduct Enlargement, Future Bonds	0	0	0	0	1,594	40	0	0	0	0	0	0	0	0	1,634	1,634
28. Water System Facilities, Current Bonds	2,727,641	299,115	258,621	3,285,376	0	0	0	0	0	0	0	0	0	0	0	3,285,376
29. Water System Facilities, Future Bonds	0	0	0	0	509,738	516,383	484,176	565,408	552,313	300,729	190,711	135,278	128,945	163,973	3,547,653	3,547,653
30. Subtotal, Water System Revenue Bonds	3,874,257	299,590	259,160	4,433,007	511,333	516,423	484,176	565,408	552,313	300,729	190,711	135,278	128,945	163,973	3,549,287	7,982,294
Other Capital Financing																
31. Initial Project Facilities Bond Proceeds	1,452,452	0	0	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	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	508,056	0	0	0	0	0	0	0	0	0	0	0	508,056
34. Interim Financing	810,599	(99,233)	(40,275)	671,091	(171,091)	(138,772)	(110,000)	(70,000)	(90,000)	(40,000)	(30,000)	(10,000)	(10,000)	(1,228)	(671,091)	0
35. Direct Pay	8,085	5	0	8,090	0	0	0	0	0	0	0	0	0	0	0	8,090
36. Application of Capital Resources Revenues to Construction	566,269	0	0	566,269	0	0	0	0	0	0	0	0	0	0	0	566,269
37. Revenue Transfers Applied	135,990	4,500	4,500	144,990	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	45,000	189,990
38. Subtotal, Other Capital Financing	3,611,451	(94,728)	(35,775)	3,480,947	(166,591)	(134,272)	(105,500)	(65,500)	(85,500)	(35,500)	(25,500)	(5,500)	(5,500)	3,272	(626,091)	2,854,857
39. Total Financing of Capital Requirements	8,648,165	204,862	223,385	9,076,412	344,742	382,151	378,676	499,908	466,813	265,229	165,211	129,778	123,445	167,245	2,923,197	11,999,608

Table 13-2 State Water Project Revenues and Expenditures, December 31, 2020 (in thousands of dollars)

Line Number/Item	Calendar Year															
	1952–2018	2019	2020	1952–2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2021–2030	1952–2030
PROJECT REVENUES																
1. Capital Resources Revenues	814,701	0	0	814,701	0	0	0	0	0	0	0	0	0	0	0	814,701
Water Contractor Payments																
2. Transportation Capital	6,034,482	223,738	214,102	6,472,322	210,423	214,251	225,044	239,685	238,451	237,374	236,508	235,750	234,789	233,162	2,305,438	8,777,759
3. Transportation Minimum	5,451,502	271,167	299,254	6,021,922	288,336	345,662	307,091	315,510	318,665	321,851	325,070	328,321	331,604	334,920	3,217,030	9,238,952
4. Transportation Variable	7,236,140	317,502	175,292	7,728,934	171,931	302,134	310,605	377,466	362,393	369,490	357,068	369,837	379,978	360,565	3,361,467	11,090,402
5. Off-Aqueduct Power Facilities	3,218,914	2,282	2,364	3,223,560	4,068	5,200	10,000	5,400	1,000	0	0	0	0	0	25,668	3,249,228
6. Delta Water Charge	4,295,145	292,398	340,503	4,928,046	340,925	398,288	449,776	430,435	419,321	418,593	428,683	406,464	433,044	417,921	4,143,452	9,071,498
7. East Branch Enlargement	1,161,904	46,627	47,465	1,255,996	48,832	46,313	47,003	41,561	45,974	25,247	25,892	21,034	21,542	14,242	337,640	1,593,636
8. East Branch Extension	316,247	45,362	43,861	405,470	46,967	44,604	43,518	43,836	43,948	44,623	48,470	54,464	54,391	45,281	470,103	875,572
9. Coastal Extension	72,310	2,590	3,373	78,273	3,485	4,216	3,160	3,158	2,567	2,647	2,463	3,613	3,646	0	28,955	107,228
10. South Bay Aqueduct Enlargement	159,896	19,254	18,648	197,798	19,273	18,937	19,168	19,135	18,918	20,103	20,713	21,679	21,588	9,652	189,165	386,963
11. Tehachapi East Afterbay	64,513	6,079	5,930	76,521	6,192	6,059	6,136	6,143	6,023	6,740	7,110	7,771	7,734	645	60,552	137,074
12. Water Revenue Bond Surcharge	900,864	49,417	18,808	969,089	83,770	89,122	90,711	89,412	86,548	83,904	87,133	79,063	81,222	61,557	832,444	1,801,532
13. Subtotal, Water Contractor Payments	28,911,916	1,276,415	1,169,599	31,357,930	1,224,204	1,474,785	1,512,212	1,571,742	1,543,809	1,530,574	1,539,110	1,527,995	1,569,539	1,477,945	14,971,914	46,329,844
14. Revenue Bond Cover Adjustments	(1,229,726)	(61,402)	(68,586)	(1,359,714)	(69,834)	(75,530)	(72,904)	(72,068)	(70,573)	(65,328)	(68,374)	(64,099)	(65,420)	(45,700)	(669,831)	(2,029,545)
15. Rate Management Adjustments	(663,982)	(40,471)	(40,471)	(744,923)	(40,471)	(40,471)	(40,471)	(40,471)	(40,471)	(40,471)	(40,471)	(40,471)	(40,471)	(40,471)	(404,708)	(1,149,631)
Other Revenues																
16. Federal Payments for Project Operating Costs	470,432	22,380	15,491	508,303	25,242	25,242	25,242	25,242	25,242	25,242	25,242	25,242	25,242	25,242	252,417	760,719
17. Appropriations for Operating Costs Allocated to Recreation	68,009	2,352	4,786	75,146	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000	175,146
18. Davis-Grunsky Loan Repayments	79,875	861	946	81,682	880	868	852	774	711	680	606	564	415	395	6,747	88,429
19. Revenue Bond Proceeds	652,977	0	0	652,977	0	0	0	0	0	0	0	0	0	0	0	652,977
20. Interest Earnings on Operating Revenues	588,015	6,192	3,253	597,460	4,725	4,725	4,725	4,725	4,725	4,725	4,725	4,725	4,725	4,725	47,250	644,710
21. Oroville-Thermalito Payments	249,279	0	0	249,279	0	0	0	0	0	0	0	0	0	0	0	249,279
22. Miscellaneous Revenues	184,264	0	0	184,264	0	0	0	0	0	0	0	0	0	0	0	184,264
23. Subtotal, Other Revenues	2,292,850	31,785	24,476	2,349,111	40,847	40,834	40,819	40,740	40,678	40,647	40,573	40,531	40,382	40,362	406,413	2,755,524
24. Total Operating Revenues	29,311,058	1,206,327	1,085,019	31,602,404	1,154,745	1,399,619	1,439,656	1,499,943	1,473,443	1,465,422	1,470,837	1,463,957	1,504,031	1,432,136	14,303,789	45,906,193
25. Total Operating Revenues and Capital Resources Revenues	30,125,759	1,206,327	1,085,019	32,417,105	1,154,745	1,399,619	1,439,656	1,499,943	1,473,443	1,465,422	1,470,837	1,463,957	1,504,031	1,432,136	14,303,789	46,720,894
PROJECT EXPENSES																
26. Project Operations, Maintenance, Power, and Replacement Costs	17,309,088	824,764	719,660	18,853,512	749,273	919,787	886,275	955,485	947,021	962,629	948,517	981,829	986,079	971,005	9,307,899	28,161,412
27. Deposits to Replacement Reserves	115,213	(485)	4,741	119,469	0	0	0	0	0	0	0	0	0	0	0	119,469
28. Deposits to Special Reserves Under Revenue Bond Financing	911,770	104,711	96,580	1,113,062	83,589	84,228	71,412	59,495	35,326	(8,974)	(49,943)	(100,285)	(145,523)	(142,417)	(113,092)	999,969
29. Capital Resources Expenditures	686,932	0	0	686,932	0	0	0	0	0	0	0	0	0	0	0	686,932
Payments of Bond Debt Service																
30. Principal Repayments on Bonds Sold Through December 31, 2015 (Current Bonds)	4,027,341	164,518	190,218	4,382,077	195,412	206,899	194,560	200,732	203,296	191,005	212,205	202,070	214,283	142,024	1,962,486	6,344,563
31. Interest on Bonds Sold Through December 31, 2015 (Current Bonds)	6,680,828	124,511	115,671	6,921,010	114,866	106,346	97,147	87,577	78,995	70,310	61,293	54,326	47,394	40,773	759,027	7,680,037
32. Future Water Bond Principal Repayments	0	0	0	0	48,016	24,311	60,532	101,014	143,377	198,401	259,266	299,099	330,001	357,097	1,821,114	1,821,114
33. Future Water Bond Interest Payments	0	0	0	0	28,442	8,433	16,092	23,250	29,241	35,851	41,369	41,882	39,996	36,726	301,282	301,282
34. Total Principal	4,027,341	164,518	190,218	4,382,077	243,428	231,210	255,092	301,746	346,673	389,406	471,471	501,169	544,284	499,121	3,783,600	8,165,677
35. Total Interest	6,680,828	124,511	115,671	6,921,010	143,308	114,779	113,239	110,827	108,236	106,161	102,662	96,208	87,390	77,499	1,060,309	7,981,319
36. Subtotal, Bond Debt Service	10,708,169	289,029	305,889	11,303,087	386,736	345,989	368,331	412,573	454,909	495,567	574,133	597,377	631,674	576,620	4,843,909	16,146,996
NET REVENUES																
37. Total Operating Expenses and Bond Debt Service	29,731,173	1,218,019	1,126,870	32,076,062	1,219,598	1,350,004	1,326,017	1,427,553	1,437,256	1,449,222	1,472,707	1,478,921	1,472,230	1,405,207	14,038,716	46,114,778
38. Net System Revenues	394,586	(11,692)	(41,851)	341,043	(64,853)	49,615	113,639	72,390	36,186	16,200	(1,870)	(14,964)	31,801	26,929	265,073	606,116
Application of Net System Revenues																
39. California Water Fund Repayment	305,765	0	0	305,765	0	0	0	0	0	0	0	0	0	0	0	305,765
40. Revenues Used for Capital Expenditures	113,490	4,500	4,500	122,490	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	45,000	167,490

Table 13-11 Annual Debt Service on Bonds Sold through December 31, 2020 (in thousands of dollars)

Calendar Year	Series A through Y Water Bonds		Oroville Revenue Bonds ¹		Pyramid Project Revenue Bonds ²		Alamo Project Revenue Bonds ²		Small Hydro Project Revenue Bonds ²		Water System Facilities Water System Revenue Bonds ³		Subtotal		Devil Canyon-Castaic Project Revenue Bonds		Reid Gardner Project Revenue Bonds ^{2,3}		South Geysers Project Revenue Bonds ²		Bottle Rock Project Revenue Bonds ²		East Branch Enlargement Project Water System Revenue Bonds ³		Coastal Branch Extension Facilities Water System Revenue Bonds		East Branch Extension Facilities Water System Revenue Bonds ³		South Bay Enlargement Facilities Water System Revenue Bonds ³		Tehachapi East Afterbay Facilities Water System Revenue Bonds ³		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	2,803	0	0	0	0	0	0	0	0	0	0	0	0	2,803	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,803	
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	11,114	
1966	0	16,742	0	0	0	0	0	0	0	0	0	0	0	0	16,742	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,742	
1967	0	26,912	0	0	0	0	0	0	0	0	0	0	0	0	26,912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26,912	
1968	0	37,760	0	3,876	0	0	0	0	0	0	0	0	0	0	41,636	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41,636	
1969	0	47,461	0	10,448	0	0	0	0	0	0	0	0	0	0	57,909	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57,909	
1970	0	53,198	0	13,145	0	0	0	0	0	0	0	0	0	0	66,343	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66,343	
1971	0	62,898	0	13,145	0	0	0	0	0	0	0	0	0	0	76,043	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76,043	
1972	0	67,974	1,260	13,112	0	0	0	0	0	0	0	0	1,260	81,086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,260	81,086	
1973	1,200	69,348	1,330	13,042	0	0	0	0	0	0	0	0	2,530	82,390	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,530	90,098	
1974	3,000	69,532	1,400	12,969	0	0	0	0	0	0	0	0	4,400	82,501	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,400	90,209	
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	69,407	1,555	12,811	0	0	0	0	0	0	0	0	8,555	82,218	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,555	89,926	
1977	10,200	69,323	1,635	12,727	0	0	0	0	0	0	0	0	11,835	82,050	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11,835	89,758	
1978	12,700	69,312	5,775	12,537	0	0	0	0	0	0	0	0	18,475	81,849	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18,475	89,557	
1979	13,650	68,690	11,585	12,275	0	0	0	0	0	0	0	0	25,235	80,965	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,235	88,673	
1980	16,050	67,968	3,265	11,739	0	7,900	0	0	0	0	0	0	19,315	87,607	0	7,708	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,315	95,315	
1981	18,050	67,109	4,885	11,444	0	7,292	0	0	0	0	0	0	22,935	85,845	0	7,708	0	5,312	0	0	0	0	0	0	0	0	0	0	0	0	0	22,935	98,865	
1982	19,250	66,162	17,920	10,968	0	7,292	0	0	0	0	0	0	37,170	84,422	0	7,708	0	14,347	0	0	0	0	0	0	0	0	0	0	0	0	0	37,170	106,477	
1983	20,520	65,148	21,110	10,147	0	7,292	0	2,449	0	3,727	0	0	41,630	88,763	900	7,708	0	35,719	0	4,777	0	6,017	0	0	0	0	0	0	0	0	0	42,530	142,984	
1984	21,785	64,068	10,005	9,013	640	7,292	0	4,198	0	3,727	0	0	32,430	88,298	955	7,647	0	35,719	0	5,647	0	10,315	0	0	0	0	0	0	0	0	0	33,385	147,626	
1985	22,555	62,932	12,700	8,628	675	7,238	0	4,198	0	3,727	0	0	35,930	86,723	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	137,477	
1986	23,830	61,742	11,435	7,859	715	7,377	0	4,263	0	3,537	0	0	35,980	84,778	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	145,027		
1987	25,495	60,492	11,715	7,188	790	7,513	265	4,329	0	3,348	0	4,952	38,265	87,822	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	153,159		
1988	26,770	59,165	6,685	6,664	830	7,447	280	4,314	345	3,348	710	11,037	35,620	91,975	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	157,881		
1989	28,145	57,825	33,705	5,513	875	7,378	295	4,298	365	3,328	1,148	14,373	64,533	92,715	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	154,898		
1990	29,385	56,473	10,385	4,301	930	7,305	320	4,279	405	3,304	1,227	19,555	42,652	95,217	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	159,331		
1991	30,365	55,070	12,055	3,922	980	7,227	335	4,257	430	3,276	2,129	27,569	46,294	101,321	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	171,497		
1992	31,745	54,233	14,135	2,985	2,395	5,308	1,260	3,086	960	2,553																								

Table 13-11 Annual Debt Service on Bonds Sold through December 31, 2020 (in thousands of dollars)

Calendar Year	Series A through Y Water Bonds		Oroville Revenue Bonds ¹		Pyramid Project Revenue Bonds ²		Alamo Project Revenue Bonds ²		Small Hydro Project Revenue Bonds ²		Water System Facilities Water System Revenue Bonds ³		Subtotal		Devil Canyon- Castaic Project Revenue Bonds		Reid Gardner Project Revenue Bonds ^{2,3}		South Geysers Project Revenue Bonds ²		Bottle Rock Project Revenue Bonds ²		East Branch Enlargement Project Water System Revenue Bonds ³		Coastal Branch Extension Facilities Water System Revenue Bonds		East Branch Extension Facilities Water System Revenue Bonds ³		South Bay Enlargement Facilities Water System Revenue Bonds ³		Tehachapi East Afterbay Facilities Water System Revenue Bonds ³		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	4,661	1,094	2,720	694	2,442	547	70,157	67,783	105,415	73,129	6,910	2,045	0	0	0	0	0	0	22,883	10,248	1,572	936	11,246	15,790	7,487	7,644	2,557	2,215	158,070	112,007
2019	16,975	1,804	0	0	4,238	939	2,499	641	2,173	458	87,019	82,533	112,904	86,375	7,325	1,682	0	0	0	0	0	0	20,227	9,168	983	1,089	12,652	16,304	7,757	7,675	2,670	2,218	164,518	124,511
2020	17,405	956	0	0	5,287	703	3,153	503	2,735	316	104,766	85,236	133,346	87,714	7,765	1,298	0	0	0	0	0	0	21,434	7,193	1,760	905	14,429	13,666	8,509	6,387	2,974	1,752	190,217	118,915
2021	8,595	318	0	0	2,637	415	1,644	336	1,211	156	116,701	97,716	130,788	98,941	8,230	890	0	0	0	0	0	0	24,260	5,667	1,947	743	16,917	11,763	9,768	5,587	3,501	1,427	195,411	125,018
2022	1,885	59	0	0	4,956	310	4,679	267	1,161	115	140,237	92,499	152,918	93,250	8,725	458	0	0	0	0	0	0	23,386	4,574	2,642	660	16,121	11,098	9,926	5,178	3,542	1,281	217,260	116,499
2023	85	7	0	0	1,025	96	542	58	647	73	151,293	86,098	153,592	86,332	0	0	0	0	0	0	0	0	19,303	3,637	1,915	543	16,319	10,409	10,551	4,737	3,760	1,124	205,440	106,782
2024	35	2	0	0	657	49	370	34	432	47	155,491	78,475	156,985	78,607	0	0	0	0	0	0	0	0	21,383	2,711	1,988	468	16,844	9,683	11,014	4,247	3,939	951	212,153	96,667
2025	0	0	0	0	134	31	96	22	160	38	154,683	71,715	155,073	71,806	0	0	0	0	0	0	0	0	25,738	1,794	1,595	388	17,555	8,977	11,318	3,769	4,014	780	215,293	87,514
2026	0	0	0	0	141	25	101	18	183	34	155,504	64,526	155,929	64,603	0	0	0	0	0	0	0	0	9,615	1,242	1,723	325	18,758	8,230	12,801	3,238	4,775	593	203,601	78,231
2027	0	0	0	0	375	18	268	13	261	26	170,455	57,047	171,359	57,104	0	0	0	0	0	0	0	0	10,366	799	1,725	245	22,721	7,420	13,958	2,643	5,301	371	225,430	68,582
2028	0	0	0	0	0	0	0	0	146	14	157,596	50,658	157,742	50,672	0	0	0	0	0	0	0	0	6,632	551	2,727	164	27,936	6,914	15,012	2,360	5,906	294	215,955	60,955
2029	0	0	0	0	0	0	0	0	155	7	169,066	44,376	169,221	44,383	0	0	0	0	0	0	0	0	7,094	399	2,832	85	28,426	6,283	15,315	1,984	5,975	196	228,863	53,330
2030	0	0	0	0	0	0	0	0	0	0	127,780	38,394	127,780	38,394	0	0	0	0	0	0	0	0	1,299	256	0	0	21,712	5,619	6,138	1,610	400	99	157,329	45,978
2031	0	0	0	0	0	0	0	0	0	0	134,298	32,733	134,298	32,733	0	0	0	0	0	0	0	0	1,319	231	0	0	22,760	4,556	6,625	1,348	427	86	165,429	38,954
2032	0	0	0	0	0	0	0	0	0	0	141,102	26,237	141,102	26,237	0	0	0	0	0	0	0	0	1,380	174	0	0	24,017	3,440	6,947	1,027	450	67	173,896	30,945
2033	0	0	0	0	0	0	0	0	0	0	147,406	19,932	147,406	19,932	0	0	0	0	0	0	0	0	1,420	132	0	0	25,082	2,368	6,576	720	471	50	180,955	23,202
2034	0	0	0	0	0	0	0	0	0	0	154,137	13,331	154,137	13,331	0	0	0	0	0	0	0	0	1,465	90	0	0	27,422	1,243	6,908	433	488	33	190,420	15,130
2035	0	0	0	0	0	0	0	0	0	0	160,689	6,746	160,689	6,746	0	0	0	0	0	0	0	0	1,508	45	0	0	28,044	621	7,161	180	508	16	197,910	7,608
Total	1,582,400	2,384,309	244,995	246,522	106,623	195,833	59,844	100,976	49,020	81,915	3,284,244	2,566,439	5,327,126	5,575,994	139,165	283,872	440,493	567,878	65,341	114,454	137,654	224,290	488,020	603,712	42,467	45,134	431,638	292,132	223,011	132,612	72,506	40,774	7,367,421	7,880,851

¹ Principal and interest schedule adjusted to reflect early redemption of bonds.
² Allocated portions of Power Facilities Revenue Bonds and Water System Revenue Bonds.
³ Interest includes a minimum fee for Water System Revenue Bonds Series AB.



Chapter 14

SWP Education and Information

Department of Water Resources and U.S. Fish and Wildlife Service educate students at Riverview Middle School in Rio Vista about the Delta on March 12, 2020, as part of the RVERS program.

Significant Events in 2020

The California Department of Water Resources (DWR) Public Affairs Office (PAO) expanded messaging about State Water Project (SWP) projects and programs through many methods in 2020.

PAO kicked off the 60th anniversary of the SWP with digital articles and social media postings. A video of former DWR Director William Gianelli was developed and released. Video, photography, and messaging was also created for the Castaic Dam and Pyramid Dam modernization programs, SWP operations closures because of the COVID-19 pandemic, the power outages at SWP facilities caused by wildfires, the Santa Ana Pipeline outage, and SWP algal blooms.

In November 2020, DWR marked a major milestone with the completion of a Safety Comprehensive Needs Assessment for Oroville Dam and its appurtenant structures. The assessment identified priorities and appropriate solutions to bolster the integrity and resiliency of the Oroville Dam complex to ensure public safety.

With the onset of the COVID-19 pandemic, several outreach activities were suspended due to temporary closures of SWP facilities and visitors centers. Several SWP facilities re-opened later in the year with public safety and social distancing requirements.

In 2020, DWR began the two-year statutory review process of the first groundwater sustainability plans from groundwater sustainability agencies as part of the Sustainable Groundwater Management Act that was passed in 2014.

Pixel, DWR's digital photography website, had 649,748 page views and 14,258 users in 2020. The department's YouTube channel had more than 18,000 subscribers and 3 million views.

DWR provided approximately 15,000 materials to educators throughout California in 2020. In response to the school closures because of the COVID-19 pandemic, PAO created an online live chat program called Water Wednesdays.

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 and DWR's mission, programs, and activities. PAO disseminates information by way of news releases, interviews, digital articles, brochures, and other printed and electronic communications. Additional avenues of communication include videos, graphics, exhibits, press conferences, photography, public meetings, social media, and special events.

News Topics

In 2020, PAO participated in several outreach efforts and news media responses related to SWP policy, programs, events, and activities.

Oroville Spillways Recovery

The Oroville Dam spillways site rehabilitation project began with minor grading of slopes in the spillway complex for drainage and aesthetics, restoration of recreation trails that were reopened to the public, replacement of soil (growing medium), and application of a hydroseed mix for site stabilization and erosion control.

The service spillway and the Oroville Dam emergency spillway were reconstructed and are able to handle flows as needed to manage reservoir levels and provide flood protection for the surrounding communities. Public safety and flood protection are DWR's top priority in operational decisions regarding Lake Oroville. PAO continues to inform the community about Oroville operations.

Oroville-Thermalito Complex

The Robie Thermalito Pumping-Generating Plant was fully restored to service in September after being closed in 2012 due to extensive fire damage. During the closure, DWR replaced one of the generating units with a new, energy-efficient turbine that provides more clean hydropower generation from the same water releases and deliveries.

Lower reservoir levels at Lake Oroville allowed completion of a new paved parking lot and additional boat launch lanes at Bidwell Canyon Stage II, started in 2018, as well as the first stage of a new boat launch facility at Loafer Point in Lake Oroville's Loafer Creek recreation area. The Loafer Point Stage I facility has three boat launch lanes from 900 feet to 800 feet, parking, and a restroom. The Loafer Point Stage II project, extending six boat launch lanes from 805 feet to 705 feet and three lanes to 675 feet, began in November.

PAO produced a video of a virtual tour of the Feather River Fish Hatchery, which was closed to student tours and the public because of the COVID-19 pandemic, to educate students and the public about the hatchery's purpose and spawning operations.

In addition to more than a thousand email subscribers in May, DWR started publishing content of the weekly *Lake Oroville Community Update* newsletter in a local newspaper every Sunday.

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act, passed in 2014, provides a framework for groundwater management and empowers local groundwater sustainability agencies to develop and implement long-term plans to manage their groundwater sustainability within 20 years. In 2020, DWR received and began the two-year statutory review process of the

first groundwater sustainability plans from agencies from all the critically overdrafted basins, as well as several from non-critically overdrafted basins. DWR continued to provide assistance to local sustainability agencies, including relevant groundwater datasets, funding for local planning support, and facilitation support for the agencies. PAO provided communications for these efforts and informational public meetings that DWR hosted throughout the state. Eight articles related to groundwater sustainability were posted on the Updates section of the DWR website and five public notices were posted related to available grant funding.

Snow Surveys

For water year 2020, a lack of precipitation resulted in a snowpack of just 50 percent of average on April 1, as measured by the California Cooperative Snow Survey Program, making it the 10th smallest snowpack in California since 1950. California's reservoirs received just a third of the water runoff from precipitation and snowmelt that they did during the same time period a year ago.

As part of the monthly snow surveys' press conferences at Phillips Station near Lake Tahoe, PAO responded to multiple media outlets attending the event. In addition to providing a broadcast of the event on Facebook Live, as well as video and photography website links, PAO distributed advisories, news releases, and social media messaging.

SWP Allocations

DWR announced on December 2, 2019, an initial allocation of 10 percent for 2020 for the 29 SWP Contractors that collectively serve more than 27 million Californians and about 750,000 acres of irrigated farmland. DWR announced an increase to 15 percent on January 24, and the final allocation at 20 percent on May 22. PAO distributed news

releases for each allocation announcement and responded to media and public requests.

Algal Blooms at SWP Reservoirs

For algal bloom advisories at Pyramid Lake, San Luis Reservoir, and O'Neill Forebay, PAO responded to media and public inquiries and distributed news releases and social media messaging.

News Media

Publications

Brochures

PAO creates and maintains more than 40 brochures about the SWP and DWR. They are distributed to the public and others at events throughout California. Digital copies are also available.

Spanish translations were prepared for several topics, including the Feather River Fish Hatchery, Delta Conveyance, Salton Sea, the Sustainable Groundwater Management Act, SWP visitors centers, SWP recreation, algal bloom awareness, and water education. PAO posted a new algal bloom video in Spanish on DWR's YouTube channel.

DWR News Releases

PAO issued several news releases related to the SWP. These releases included DWR performing exploratory work near Sisk Dam, SWP allocations, San Luis Reservoir and Pyramid Lake algal bloom advisories, SWP facilities' campground closures, and the beginning of the Castaic Dam spillway assessment.

Digital Resources

E-News

Each weekday, PAO compiles and electronically distributes news articles, digital articles, and commentaries on water-related issues to more than

5,000 subscribers. These news clips inform DWR staff, water managers, other stakeholders, and interested members of the public about current issues relevant to DWR and its programs.

Topics highlighted in the weekday news clips include water supply, water quality, climate change, drought, watershed programs, activities of other water-related agencies and groups, and relevant legislation.

DWR Updates

PAO develops and posts digital articles and blogs about DWR projects, programs, and employees on DWR's website in the DWR Updates section. SWP topics covered in 2020 included Lake Oroville Community updates, SWP operations during public emergencies, SWP camping opportunities, the Pyramid Dam Modernization Program completing its spillway investigations, the Chinook salmon escapement survey study on the Feather River, algal blooms at SWP reservoirs, the Division of Operations and Maintenance's Apprentice Program, DWR Director Gianelli's Legacy to the SWP, and DWR teaming with federal partners to protect endangered species in SWP water.

Social Media

DWR's social media presence includes Facebook, Twitter, Instagram, and YouTube. DWR increased its social media presence through continued engagement with followers on each platform, using more multimedia—graphics, videos, photos—and identifying stakeholders that amplify content on their own social media channels. In 2020, the follower counts for DWR's social media channels were:

- Facebook: 35,500
- Twitter: 22,500
- Instagram: 3,000
- LinkedIn: 13,700
- YouTube: 18,130

PAO posts multiple updates to its social media channels about various DWR projects, including the SWP, along with news and activities of interest to the public and DWR employees.

Photography and Videos

PAO's photography and video units documented several SWP facilities and programs in 2020.

Pixel, DWR's digital photography website, had 649,748 page views and 14,258 users in 2020. Of the 24,491 images on Pixel in 2020, 4,661 images were uploaded to Pixel that year. Photography covered Castaic Dam spillway investigations, the San Bernardino Tunnel inspection, the Santa Ana Pipeline inspection, the Oroville Dam piezometers installation, Castaic Lake, Pearblossom Pumping Plant dredging in the forebay, Lake Oroville, Hyatt Powerplant's intake gates, Pyramid Dam spillway investigations, Upper Feather River lakes' dam inspections, the Feather River salmon carcass survey, Lake Oroville's Loafer Point's new boat launch ramp, Feather River Fish Hatchery, Thermalito Afterbay, snow surveys, DWR's Sentinel research vessel, the Robie Thermalito Pumping-Generating Plant, quagga mussel inspections, the bathymetric boat underwater inspection of the California Aqueduct in Fresno County, the Dutch Slough tidal habitat restoration project, and the Lookout Slough tidal restoration project.

With a total of 18,130 subscribers by the end of the year, DWR's YouTube channel gained 2,988 subscribers in 2020. The channel had 3,072,593 views with Oroville Spillways videos receiving the most views. Videos posted in 2020 to DWR's YouTube channel covered snow surveys, flood preparedness, Santa Ana Pipeline repairs, Oroville Ad Hoc Group meetings, Water Wednesdays, DWR's Sentinel research vessel, a Feather River Fish Hatchery virtual tour, and a Delta Conveyance Deep Dive.

Website

PAO manages the content on DWR's public website, including text, photos, and video. PAO advises DWR departmental programs on page layout, edited text, and selected photos for SWP program pages.

As part of the updates to SWP pages, website updates were provided for Pyramid and Castaic Dam Seismic modernization programs and for SWP recreation and SWP modernization programs. PAO also updated the Perris Dam Remediation Project and algal bloom web pages.

Community Relations and Outreach

In 2020, PAO continued to educate the public about water, water conservation, and the SWP through virtual events because of the COVID-19 pandemic.

DWR Tours Program

DWR's tours program regularly attracts international and domestic groups interested in touring SWP facilities and learning about California's water system. Because of the COVID-19 pandemic, visitors center tours were unavailable from mid-March 2020 to the end of the year.

SWP Visitors Centers

DWR's three visitors centers at Lake Oroville, San Luis Reservoir, and Pyramid Lake house exhibits and information related to the SWP and DWR's mission by engaging visitors with current and future water issues. DWR also provides the public with information on water safety and recreational opportunities at SWP facilities. Figure 14-1 shows the SWP visitors center locations.

DWR visitors centers were closed to the public in mid-March 2020 because of the COVID-19 pandemic.

SWP Recreation Outreach Events

The goal of the SWP recreation outreach program is to educate the public about water safety and the many recreational opportunities available at SWP facilities. As part of this outreach effort, PAO attends community events, state and county fairs, and state- and federally-sponsored events. PAO also forms partnerships with state, federal, and community groups.

In 2020, because of the COVID-19 pandemic, outreach events were canceled.

School Education Program

DWR's School Education Program seeks to educate California's students, parents, and educators about water conservation, the role of the SWP in California's water conveyance systems, and the effects of the state's geography, climate, and population on water resources. The program provides classroom resources to California teachers, coordinates water education professional development workshops, and facilitates a statewide network of water educators. The COVID-19 pandemic and the resulting school closures, transition to virtual learning, emphasis on English/language arts and mathematics often to the exclusion of other subjects, and cancellations of large gatherings, led to significant changes to the program in 2020.

School Events and Educator Outreach

Prior to the statewide school closures on March 13, 2020, PAO attended two San Joaquin County AgVenture events, where approximately 400 children received information on ways to lower their water footprint.

Other spring events, such as State Scientist Day and the Sacramento Regional Science Technology Engineering Math (STEM) Fair were canceled as were fall events like AgVenture.

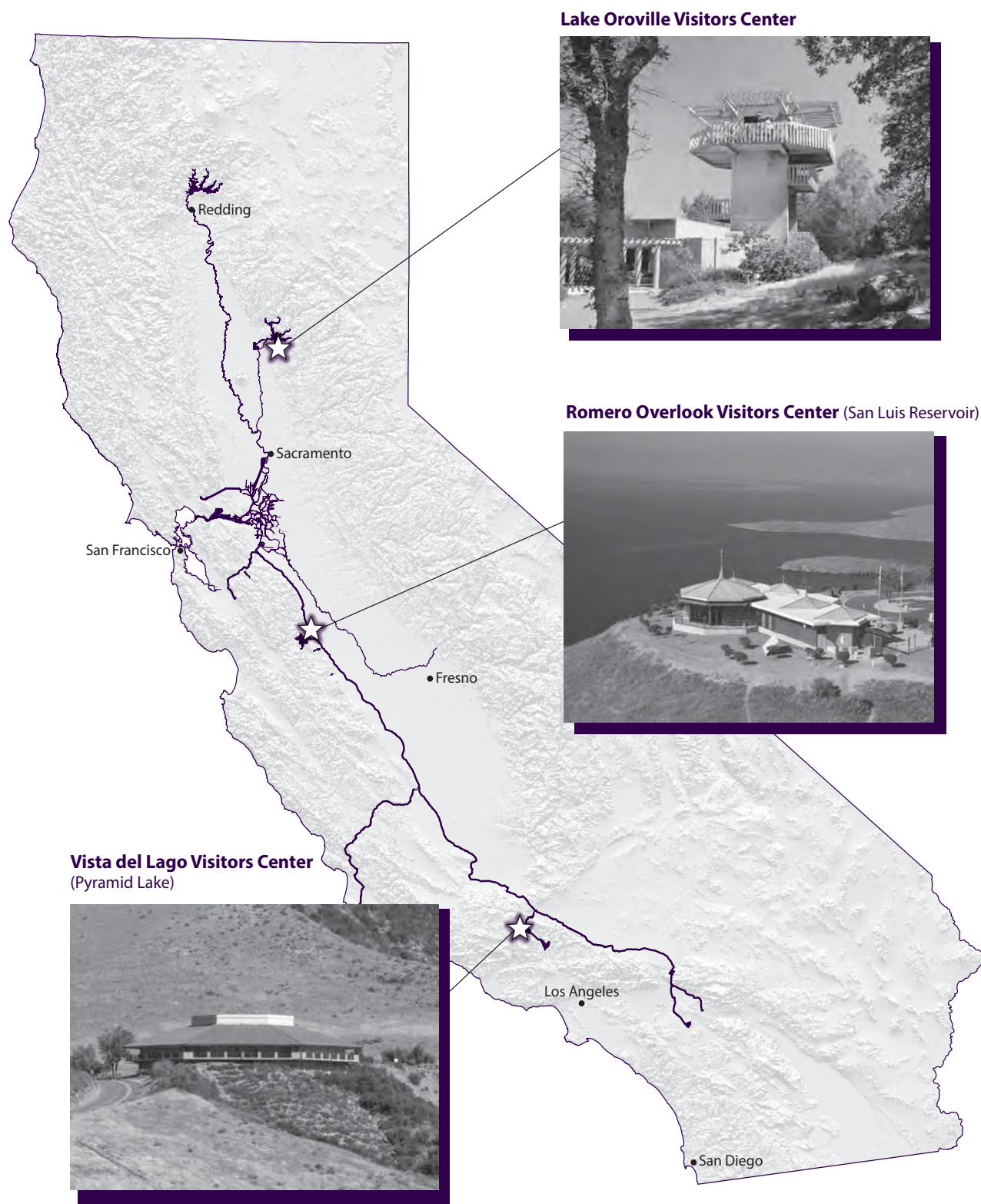


Figure 14-1 Visitors Centers on the SWP

One notable achievement during the two and a half months of in-person education was the implementation of the Rio Vista Estuarine Research Station, or RVERS, program. This collaboration, begun in 2019 between the Water Education Program and Division of Environmental Services, was a two-day push-in program for middle school students in Rio Vista. The goal of the program was to introduce students to the Sacramento-San Joaquin Delta, its role in the SWP, and career opportunities in the water resources field. In February and March, DWR scientists were able to present the 6th and 7th grade programs, with the final lesson being a field study for 7th graders on March 11.

Supplementary Teaching Materials

The school education program provides supplementary teaching materials including posters, maps, worksheets, workbooks, and videos to California teachers, water agencies, and other non-formal educators. These can be ordered through the *Water Facts & Fun* online catalog or received at outreach events.

In 2020, DWR provided approximately 15,000 materials to educators throughout California. These numbers are significantly lower than in previous years, likely reflecting the school shutdowns and turn to online learning.

Water Wednesdays

In response to the school closures, DWR developed an online live chat program called Water Wednesdays. These 30-minute programs featured DWR subject matter experts sharing their work and answering questions from the audience. Eighteen presentations were completed in May and June and September to November. They addressed Delta ecology, California's water sources, flood awareness and risk reduction, and the salmon lifecycle.

Professional Development for Teachers

In-person gatherings, including the teacher institutes funded by DWR, were canceled in 2020.

Collaboration and Partnerships

DWR's School Education Program continued to collaborate with other water educators throughout the state. In 2020, PAO collaborated with the following:

- Project Water Education Today (WET) Advisory Committee
- California Environmental Education Interagency Network Committee
- Water Education Committee
- National Network for Ocean and Climate Change Interpretation Governing Council

In February 2020, the Water Education Committee met on the Central California coast for a two-day meeting hosted by the City of Santa Barbara and Ventura Water. More than 40 water educators, outreach, and public information staff heard from a number of local education and outreach experts and visited the El Estero Water Resource Center, Charles E. Meyer Desalination Plant, and the Santa Barbara Botanical Garden.

In May, because of the COVID-19 pandemic, the Water Education Committee began to meet virtually on a monthly basis. Thirty to fifty educators came together each month to learn best practices in moving educational resources and programming online and provide support. In October, committee members from Metropolitan Water District of Orange County, Valley Water, and the Inland Empire Resource Conservation District, along with DWR, hosted a two-day online conference about social-emotional learning, trauma-informed education, and how those apply to water education.

Glossary

This glossary contains terms used in the text of Bulletin 132-21 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.

actinospores One of two life stages of myxozoan parasites. This life stage is released into the water column from infected polychaete worms and infect fish such as salmon. See myxozoan.

adaptive management The process of improving management effectiveness by learning from the results of carefully designed decisions or experiments.

afterbay A storage reservoir downstream of a power plant or large reservoir that regulates fluctuating discharges from a spillway, 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.

alluvial fan The alluvial deposit of a stream where it issues from a gorge upon a plain or of a tributary stream at its junction with the main stream.

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 both marine and freshwater 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.

arroyo (1) A watercourse (such as a creek) in an arid region; (2) a water-carved gully or channel.

arsenic A solid substance (metalloid) naturally existing in the Earth's crust and in crushed rock. It is highly toxic in its inorganic form. Higher levels of arsenic tend to be found in groundwater (aquifers) as compared to surface waters (e.g., lakes and rivers).

atmospheric river A short-lived, narrow stream of high-velocity wind that carries large amounts of water vapor from tropical oceans to mid-latitude land areas resulting in large amounts of precipitation in those areas.

B

Bay-Delta Plan Formally known as the San Francisco Bay/Sacramento-San Joaquin Delta Estuary Water Quality Control Plan, it establishes water quality control measures and flow requirements needed to provide reasonable protection of beneficial uses in the Bay-Delta watershed. The State Water Resources Control Board is responsible for adopting and updating the Bay-Delta Plan.

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.

berm A narrow shelf, path, or ledge typically at the top or bottom of a slope; also, a mound or wall of earth or sand.

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 scientific assessment issued by the U.S. Fish and Wildlife Service or National Marine Fisheries Service, required by the Endangered Species Act for listed species. Determines the likelihood of a

federal action 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 Somewhat salty. Water containing dissolved minerals in amounts that exceed normally acceptable standards for municipal, domestic, and irrigation uses. Brackish water contains considerably less saline than seawater.

bromide A salt which naturally occurs in small quantities in seawater; 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.

butterfly valve A device that controls the passage of water through pipelines. Valves are important for water infrastructure because they act as the primary line of defense when there is an issue in the pipeline and water flow needs to be isolated to prevent effects on adjacent infrastructure. A butterfly valve is distinguished from other types of valves by its closing mechanism, which is a disk that rotates.

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 (CALFED) A federal and State multiagency program established by the 1994 Bay-Delta Accord. CALFED's mission was to develop and implement a long-term comprehensive plan that would restore ecological health and improve water management in the Bay-Delta system. In 2010, all functions and responsibilities of CALFED were assumed by the Delta Stewardship Council.

California Environmental Quality Act (California Public Resources Code Section 21000 et seq.) Passed by the Legislature in 1970 shortly after the United States federal government passed the National Environmental Policy Act, this act codified a statewide policy of environmental protection.

California WaterFix An infrastructure project that would include constructing two tunnels to convey water from the north to the south Delta. The purpose of California WaterFix is to modernize water infrastructure and

provide a secure and reliable source of water to meet the needs of farmers and communities, while including measures to address the needs of fish and wildlife.

case-in-chief The portion of a trial whereby the party with the burden of proof in the case presents its evidence. The term differs from a rebuttal, whereby a party seeks to contradict the other party's evidence.

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.

chloride (1) A compound of chlorine with another element or group, especially a salt or ester of hydrochloric acid; (2) a monovalent anion consisting of one atom of chlorine. Chloride is one of the most common anions found in tap water. It generally combines with calcium, magnesium, or sodium to form various salts: for example, sodium chloride (NaCl) is formed when chloride and sodium combine.

chlorophyll *a* One of the main groups of pigments contained in the algal species that make up phytoplankton.

chrysophyte flagellates Dominating the phytoplankton community in many water bodies that have low levels of nutrients, chrysophyte flagellates may have one or two flagella.

circuit breaker A switch that automatically interrupts the current of an overloaded electric circuit.

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 other things, that occur over several decades or longer.

conduit exemptions In certain cases, projects may qualify for an exemption from Federal Energy Regulatory Commission licensing. Those receiving an exemption are exempt from the requirements of Part I of the Federal Power Act.

conjunctive use Application of surface water and groundwater to meet the demand for a beneficial use. Coordinated and planned management of both surface water and groundwater resources to maximize the efficient use of the resources; 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 that 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.

Cormack-Jolly-Seber model A type of capture-recapture model used to estimate abundance/population size and survival.

COVID-19 pandemic A global outbreak of coronavirus disease 2019 (COVID-19), a highly contagious respiratory disease caused by the SARS-CoV-2 virus. To try and reduce the infection rate, people wore masks, practiced social distancing, and quarantined at home. Telework (working from home) became common during this time.

creel survey A creel is a wicker basket to hold fish: an angler's fishing basket. A creel survey is a sampling tool used to measure the fishing activities of sport anglers and to estimate the number of fish harvested from a body of water. It involves interviewing anglers about the day's fishing effort, including what the angler caught, released, how much time was spent fishing, and sometimes measuring fish and counting boats or watercraft.

crop idling Removing lands from irrigation with the aim of returning the lands to irrigation later. Crop idling may be done once or can be episodic.

crown fire A forest fire that spreads from treetop to treetop.

cryptophyte A plant that produces its buds underwater (such as algae) or underground on corms, bulbs, or rhizomes.

cryptophyte flagellates Single-celled algae that have two flagella used for swimming. The cryptophytes are single-celled flagellates and have pigments found in no other group of algae (phycoerythrin and phycocyanin). Pigments are structures that absorb light and include the pigment, chlorophyll.

cypriniform fish A soft-finned fish of the order Cypriniforms. It includes carps, minnows, loaches, and relatives.

cubic feet per second A volumetric flow rate, which is equivalent to a volume of 1 cubic foot flowing every second.

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.

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.

Delta Simulation Model 2 (DSM2) A hydrodynamic and water quality simulation model used to simulate water flow and 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.

diatom Microscopic marine or freshwater colonial algae that 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 marine and freshwater environments and best known as causers of harmful algal blooms.

disked, disking To cultivate with an implement (such as a harrow or plow) that turns and loosens the soil with a series of discs.

dissolved organic carbon A general description of the organic material dissolved in water. Organic carbon occurs as the result of decomposition of plant or animal material.

dissolved organic nitrogen That subset of dissolved organic carbon that also contains nitrogen. Dissolved organic nitrogen compounds in lakes and rivers originate from photosynthetic organisms (algae and plants) and excretion of nitrogenous waste by animals, but leachate (liquid that drains or “leaches” from a landfill) from soil, sewage discharge, and atmospheric deposition can also contribute organic nitrogen to the 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.

D-net A net with an orifice shaped like the letter “D” used for collecting bottom plankton and larval fish.

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.

Dynamic Mercury Cycling Model (D-MCM) An aquatic mercury cycling model used to model mercury biogeochemical processes in the Yolo Bypass. It includes inorganic mercury, methylmercury, and elemental mercury in water, sediments, and a food web. Hydrodynamic inputs for D-MCM are generated with TUFLOW, a high-resolution hydrodynamic model.

E

ecosystem restoration The activity of improving the condition of natural landscapes and biotic communities.

egg mat A man-made device to mimic the job of plants in the wild, it catches fish eggs and offers some protection from predators until the laid eggs can be seen and counted or collected for sampling or surveying.

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. Also called specific conductance.

electrofishing A fishing technique that uses direct current electricity flowing between a submerged cathode and anode. This affects the movements of nearby fish so that they swim toward the anode, where they can be caught or stunned. Electrofishing is a common scientific survey method used to sample fish populations to determine abundance, density and species composition. When performed correctly, electrofishing results in no permanent harm to the fish, which return to their natural mobility state in as little as two minutes after being caught.

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 (EIR) 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 the National Environmental Policy Act.

environmental water The water for wetlands, for the instream flow in a major river or the Bay-Delta, or for a designated wild and scenic river.

epiphyte An organism that usually grows on the surface of a plant and derives its moisture and nutrients from the air, rain, water (in marine environments), or from debris accumulating around it.

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.

euglenoid flagellates A single-celled organism, either green and photosynthetic or colorless and non-photosynthetic, with one or two flagella emerging from a well-defined gullet.

evapotranspiration The amount of water transpired by plants, retained in plant tissues, and evaporated from plant tissues and surrounding soil surfaces.

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 the Bureau of 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 SWP and Central Valley Project 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

FERC Part 12D inspection Part 12D in the Code of Federal Regulations contains the regulations governing the periodic inspection of FERC-licensed dam projects by an independent consultant.

fish planting Releasing hatchery-raised fish into a water body for the purposes of supplementing existing populations or creating new ones for fishing (also referred to as “stocking” or simply “planting”).

flagellates Organisms with one or more whip-like structures called flagella, which are used for locomotion or feeding.

flashboard One or more boards projecting above the top of a dam to increase the depth of the water.

floodplain A strip of relatively level land bordering a stream or river that is often inundated during times of high water.

forage 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.

fry Young, recently hatched fish that are able to swim and catch their own food.

fuel Any material that burns. Fuel feeds a fire by providing energy. It can be anything from live or dead plants to structures, such as homes. There are different types of fuel, such as fuels in the understory (surface fuels) and fuels that extend from the ground to surface into higher levels of the forest (ladder fuels).

fyke A type of fish trap. It is a long, cylindrical netting bag kept open by hoops. Several cones fitted inside the cylinder make entry easy and exit difficult for the fish. Also called a fyke net or fyke trap.

G

geosmin An organic compound with a distinct earthy flavor and aroma, which most people can easily smell. The odor detection threshold of geosmin

is very low, ranging from 0.006 to 0.01 micrograms per liter in water. Geosmin literally translates to “earth smell,” and is a contributor to the strong scent (petrichor) that occurs in the air when rain falls after a dry spell of weather or when soil is disturbed.

green algae A large, informal grouping of algae (singular: green alga). Like plants, green algae contain two forms of chlorophyll, which the algae use to capture light energy to fuel the manufacture of sugars. Unlike plants, green algae are primarily aquatic.

greenhouse gas emissions Also referred to as carbon intensity or carbon footprint, greenhouse gases trap heat in the atmosphere and contribute to climate change. They 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.

ground fire A fire that burns mostly in decayed rotos below ground and in the duff layer (the duff layer is made up of compacted dead plant materials such as leaves, bark, needles, and twigs). Ground fires are sustained by glowing combustion (without flames) and can go undetected for a long time because they produce little to no smoke and spread slowly.

groundwater Water located beneath the land surface that 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 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 with a group of particular environmental conditions.

hydroelectric Relating to or denoting the generation of electricity using flowing water (typically from a reservoir held behind a dam or other barrier) to drive a turbine that powers a generator.

hydrologic region DWR divides California into 10 hydrologic regions, corresponding to the state's major water drainage basins: North Coast, San Francisco Bay, Central Coast, South Coast, Sacramento River, San Joaquin River, Tulare Lake, North Lahontan, South Lahontan, and Colorado River.

hydrology The science dealing with the occurrence, circulation, distribution, and properties of the waters of the earth and its atmosphere.

I

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 Central Valley Project to use Banks Pumping Plant as a point of diversion. The SWP and Central Valley Project may use one another's diversion facilities under certain conditions.

joint-use facilities Those portions of the SWP that serve both SWP and Central Valley Project 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 DWR Division of Safety of Dams.

L

land subsidence The lowering of the natural land surface in response to: earth movements; the lowering of fluid pressure or groundwater level; consolidation of underlying soils; removal of underlying supporting materials by mining (e.g., oil and gas extraction); compaction caused by wetting; or oxidation of organic matter in soils (e.g., 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.

louver An opening provided with one or more slanted fixed or movable fins to allow flow of water; also, a vane or shutter of a louver.

M

macrofauna Animals large enough to be seen by the naked eye.

mark-recapture Method used to estimate the size of a population where it is not practical to count every individual. A small number of animals are captured, marked, and released back into the population. Later, another small number of animals is captured, and the researcher records how many of the animals have a mark.

maximum contaminant level The highest drinking water contaminant concentration allowed under federal and State Safe Drinking Water Act regulations.

megawatt (MW) One million watts.

megawatt hour (MWh) A unit of energy. It is a measure of the actual amount of power consumed or produced by one megawatt expended for a period of one hour.

mercury A silver-white poisonous heavy metallic element that is liquid at ordinary temperatures and is used especially in batteries, in dental amalgam, and in scientific instruments. Mercury can enter watersheds in many ways, including as the by-product of industrial combustion. Mercury is emitted into the air as a particulate where it can combine with other elements to form methylmercury (MeHg). In this form it can be introduced to bodies of water and easily transferred up through the food chain.

mesocosm Any outdoor experimental system that examines the natural environment under controlled conditions. Mesocosm studies provide a link between field surveys and highly controlled laboratory experiments.

methylmercury (MeHg) See mercury.

microsiemens One million siemens. See siemens.

millisiemens One thousand siemens. See siemens.

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, including strategies to reduce greenhouse gas emissions.

Monterey Agreement An agreement executed in December 1994 among DWR and the SWP contractors to address fundamental contract issues by amending the Water Supply Contracts.

Monterey Amendments Amendments to the Water Supply Contracts for the SWP entered into by DWR and most (27 of 29) of the SWP 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, whose costs are normally allocated among the different functions it provides. For example, a project that provides water supply, flood control, and generates hydroelectricity.

myxozoan A group of microscopic parasites often with two life stages. The myxospore stage infects several types of aquatic worms when ingested. This produces the actinospore stage, which then infects the fish host.

O

Operations Criteria and Plan (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 Central Valley Project and the SWP and identifies factors influencing the physical and institutional conditions and decision-making processes under which the projects currently operate. 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 Central Valley Project 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 the U.S. Fish and Wildlife Service to the Bureau of Reclamation that comprises the U.S. Fish and Wildlife Service biological opinion on the coordinated operations of the Central Valley Project and the SWP.

Order WR WR means “water rights.” The State Water Resources Control Board uses an alpha-numeric system to identify the water rights orders it issues each year.

orthomosaic An orthophoto, orthophotograph or orthoimage is an aerial photograph geometrically corrected (“orthorectified”) such that the scale is uniform: the photo has the same lack of distortion as a map. Unlike an uncorrected aerial photograph, an orthophotograph can be used to measure true distances, because it is an accurate representation of the Earth’s surface, having been adjusted for topographic relief, lens distortion, and camera tilt.

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

passive integrated transponder tag A small radio transponder that contains a specific code, which allows individual fish, as well as amphibians, reptiles, birds and even rocks, to be assigned a unique 10- or 15-digit alphanumeric identification number.

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.

penstock (1) A sluice or gate for regulating a flow (as of water); (2) a conduit or pipe for conducting water.

Periodic Facility Review Part 12D in the Code of Federal Regulations contains the regulations governing the periodic inspection of FERC-licensed dam projects by an independent consultant.

PFAS Per- and polyfluoroalkyl substances (PFAS) are an emerging concern in drinking water supplies. They include the compounds perfluorobutanoic acid (PFBA), perfluoropentanoic acid (PFPeA), and perfluorohexanoic acid (PFHxA).

pH A measure of acidity and alkalinity of a substance, measured on a scale from 1 to 14. A value of 7 represents neutrality. Lower numbers indicate increasing acidity (the lower the number, the more acidic it is) and higher numbers increasing alkalinity (the higher the number, the more alkaline the substance is). Water has a pH of 7.

pheophytin *a* A primary degradation product of chlorophyll *a*, and its relative concentration is useful for estimating the general physiological state of phytoplankton populations.

phytoplankton Minute plants, such as algae, that live suspended in bodies of water and drift with the current.

place of use Water rights most often have a place of use. The place of use may be defined in a court decree or adjudication and shown on an associated map. In most court decrees, the place of the use for a water right is “forever,” unless another case comes up to change that place.

potential failure mode analysis (PFMA) PFMA is common among any dam safety organization, and as the name implies, is a focused analysis of the targeted dam to potentially develop a catastrophic failure event based on structural conditions, the age of the dam’s infrastructure, seismic events, major flooding events, operational protocols (e.g., human error), and surveillance approach. The goal of a PFMA is to consider how a dam can fail, identify those failure modes and what would trigger them, and then establish a surveillance and monitoring program that would recognize an identified (as found in the PFMA) catastrophic triggering event in its early stages to prevent it.

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.

preliminary application document One of the documents required by the Federal Energy Regulatory Commission to file an original, new, or subsequent hydropower license application using the Traditional Licensing Process. The preliminary application document is filed during the first stage of the three-stage process.

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.

pumping-generating plant A plant that can either pump water or generate electricity.

R

radial gates Gates used to control the flow of water into or from a reservoir, canal, or pipeline, or through a channel. Each gate can close under its own weight and is operated independently by remote control.

radiotelemetry Automatic measurement and transmission of data from remote sources via radio to a receiving station for recording and analysis.

raw water Water found in the environment, such as rainwater, surface water (e.g., lakes, streams, and the ocean), or groundwater, that has not been treated. Most water is considered raw until it is treated for consumption or used for agriculture or industry.

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.

recreation Water-dependent recreation activities that are consumptive (e.g., parks), flat-water (e.g., boating), or flow-based (e.g., whitewater rafting).

redd A shallow nest of fish eggs covered with gravel in a streambed.

Regional in Nature program A professional term used by California State Parks and certain other local-level California park districts to describe nature programs offered by their districts. Other nature programs offered at a park but not administered by the district are referred to as “non-Regional in Nature” in this context.

repayment reach California 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.)

reservoir A large natural or artificial lake used as a source of water supply.

riffle A shallow extending across a streambed and causing broken water; a stretch of water flowing over a riffle.

riparian 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 zones provide important fish and wildlife habitat.

rotary screw trap A tool that is commonly used to assess changes in the abundance or production of juvenile Chinook salmon. These traps are also being used in some locations to assess the success of restoration activities. Rotary screw traps consist of a funnel-shaped cone that is screened with 3-millimeter (mm) diameter perforated plate. The trap cone is suspended above the water between two aluminum pontoons. Baffles in the trap cone cause the trap cone to rotate as water flows past the trap. As the trap cone rotates, fish that are moving downstream past the trap are guided into a live-box that is attached to the rear of the trap cone.

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 that lives in a tube that it builds.

saline Consisting of or containing salt. Saline water (more commonly known as salt water) is water that contains a high concentration of dissolved salts (mainly sodium chloride).

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.

salvage (fish) At the SWP and Central Valley Project 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.

seine A large net with sinkers on one edge and floats on the other that hangs vertically in the water and is used to enclose and catch fish when its ends are pulled together or are drawn ashore; also, to fish with or catch fish with a seine. Beach seining involves dragging a rectangular net with poles attached to the ends through the water a short distance to capture fish.

service area The geographic area served by a water agency.

siemens The derived unit of electric conductance, electric susceptance, and electric admittance in the International System of Units (SI). It is named after the German inventor and industrialist Ernst Werner von Siemens, and was previously called the millimho. One siemens is equal to 1,000 millisiemens or 1,000,000 microsiemens.

slough A wetland, usually a swamp or shallow lake, often a backwater to a larger body of water. Water tends to be stagnant or may flow slowly on a seasonal basis. Along the West Coast, sloughs are often named for the quiet, backwater parts of bays and therefore, they are part of the estuary, where freshwater flows from creeks and runoff from land mix with salty ocean water transported by the tides.

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 will allow it to live in salt water.

smolting To become a smolt. See smolt.

snowpack The annual accumulation of snow in mountain areas.

social distancing The practice of maintaining a greater than usual distance (such as six feet or more) from other people or of avoiding direct contact with people in public places during the outbreak of a contagious disease in order

to minimize exposure and reduce the transmission of infection. Also called physical distancing.

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 legal protection (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.

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.

streamflow The rate of water flow past a specified point in a channel.

subsidence See land subsidence.

sulfate A salt produced by combining sulfuric acid with other substances. Sulfates can be found in almost all natural water. The origin of most sulfate compounds is the oxidation of sulfite ores, the presence of shales, or the industrial wastes. Sulfate is one of the major dissolved components of rain. Three types of treatment systems will remove sulfate from drinking water: reverse osmosis, distillation, or ion exchange.

Sustainable Groundwater Management Act A three-bill legislative package, composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley), collectively known as the Sustainable Groundwater Management Act (SGMA), which was passed in 2014.

switchyard A usually enclosed area for the switching facilities of a power station.

T

Table A amount Refers to a table in the water supply contracts that sets forth the annual amount of project water that an individual contractor may

request under their contract. Table A amounts are used by DWR for allocating SWP supplies and costs among the contractors.

take (federal Endangered Species Act) To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct; may include significant habitat modification or degradation if it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

taxon (1) A scientifically classified group or entity: a taxonomic unit (such as a genus or order) of any rank; (2) the name applied to a taxonomic group in a formal system of nomenclature.

telemetry The process of recording and transmitting the readings of an instrument. Fish radiotelemetry involves tracking the movement of fish using surgically-implanted radio transmitters.

temporary urgency change petition A formal request to the State Water Resources Control Board for conditional, temporary changes to the terms and conditions of a water right. Temporary urgency change orders issued by the State Water Resources Control Board allow water right holders to temporarily deviate from the terms of their existing water right.

threatened species An animal or plant species that 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.

toe of dam The location of the intersection of the natural ground with the dam structure.

total capital cost The total monetary cost of options 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.

total phosphorous An essential nutrient for plants and animals. It is naturally limited in most fresh water systems because it is not as abundant as carbon and nitrogen; introducing a small amount of additional phosphorus

into a waterway can have adverse effects. Sources of phosphorus include soil, rocks, and wastewater treatment.

trace metals The metals subset of trace elements; that is, metals normally present in small but measurable amounts in animal and plant cells and tissues and that are a necessary part of nutrition and physiology. Many biometals are trace metals. Ingestion of, or exposure to, excessive quantities can be toxic.

transmission owner tariff (TOT) Describes the terms under which a utility provides open access to its transmission system to wholesale customers seeking to: (1) interconnect generation facilities to the utility's transmission system to deliver energy and capacity services to the California Independent System Operator (CAISO) Controlled Grid; (2) interconnect wholesale load to Southern California Edison's transmission system; or (3) interconnect new transmission facilities to the utility's transmission system. A utility's TOT also sets revenue requirements and applicable rates and charges for transmission access over the CAISO Controlled Grid and sets the terms and conditions for transmission expansion. A utility's TOT is not applicable for customers seeking service under that utility's retail rates, or interconnection of power projects to the utility's distribution system, or for any other purpose not authorized by the Federal Energy Regulatory Commission.

transponder A device that, upon receiving a designated signal, emits a signal of its own and that is used especially for the detection, identification, and location of objects, or, in wildlife studies, different animals. The term is a contraction of the words transmitter and responder.

tributary A stream that flows into a larger stream or other body of water.

trihalomethanes Any of various derivatives of methane (such as chloroform) that have three halogen atoms per molecule and are formed especially during the chlorination of drinking 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 that 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.

2-methylisoborneol (MIB) MIB and geosmin together account for the majority of biologically-caused taste and odor outbreaks worldwide. MIB has a distinct earthy or musty odor, which most people can easily smell. The odor detection threshold of MIB is very low, ranging from 0.002 to 0.02 micrograms

per liter in water. MIB is produced by various blue-green algae (cyanobacteria) and filamentous bacteria in the class Actinomyces, and also some other prokaryotes and eukaryotes.

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.

V

veliger The free-floating larval stage of mussels.

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 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 exchange 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 transfer.)

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 control plan Designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives.

water quality objectives Specific, legally enforced levels of water quality desired for identified uses including drinking, recreation, fish production or propagation of other aquatic life, agriculture, industry, and urban 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 Right Decision 1641 (D-1641) Adopted by the State Water Resources Control Board in 1999, implements the objectives of the Bay-Delta Plan by placing conditions on water right permits and licenses for the SWP and CVP that require the projects to meet certain objectives in the Bay-Delta Plan.

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. (3) Flood management weirs are lowered sections of levees that allow flood flows in excess of downstream channel capacity to escape into a bypass channel or basin.

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.

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 where the tidally averaged bottom salinity is two 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.

X

young-of-year All of the fish species younger than one year of age.

Z

zooplankton Small aquatic animals that are suspended or swimming in water.

Bulletin 132-21

Appendix B

Data and Computations Used to Determine 2022 Water Charges

Appendix B, Data and Computations Used to Determine 2022 Water Charges, was previously printed and distributed under a December 2021 cover letter from Hong Lin, Financial Manager of SWPAO, to State Water Project 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 December 2021. However, Table B-7 was not published in the December 2021 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-84.

Appendix B

Data and Computations

Used to Determine 2022 Water Charges

Contents

	Page
Types of Water Charges	B-1
Composition and Timing of Water Charges	B-4
Bases for Allocating Reimbursable Costs Among SWP Water Contractors	B-7
Capital and Minimum OMP&R Costs	B-7
Variable OMP&R Costs	B-7
Water Conveyance	B-11
Bases for Reimbursable Costs	B-13
Capital Costs	B-13
Annual Operating Costs	B-14
Transportation and Devil Canyon-Castaic Contract Costs	B-15
Conservation Capital and Operating Costs	B-16
Project Water Charges	B-16
Transportation Charges	B-16
Delta Water Charges	B-21
Water System Revenue Bond Surcharge	B-21
Total Water Charges	B-21
Equivalent Total Water Charges	B-21
Equivalent Water Costs by Reach	B-21
East Branch Enlargement Charges	B-24
East Branch Extension Charges	B-26
South Bay Aqueduct Enlargement Charges	B-26
Short-term Agreements	B-26
Municipal Water Quality Investigations	B-26
Feasibility Study	B-27
Delta Programs	B-28
Lake Perris Seepage Recovery Project	B-29

Figures

	Page
B-1 Relationships of Data Used to Substantiate Statements of Charges	B-2
B-2 Relationships of Data Used to Substantiate East Branch Enlargement Charges	B-3
B-3 Composition of Delta Water Charge and Transportation Charge	B-5
B-4 Repayment Reaches and Descriptions	B-8

Tables

	Page
1 Summary of Permanent Aqueduct Capacity Transfers	B-10
2 Project Purpose Cost Allocation Factors	B-14
3 Criteria for Amortizing Capital Costs of Transportation Facilities	B-17
4 Minimum OMP&R Costs of Reach 31A Assigned Directly to Kern County Water Agency	B-18
5 Summary of 2020 Off-Aqueduct Power Facility Charges and Credits	B-19
6 Projected Charges for Off-Aqueduct Power Facilities	B-19
7 Kilowatt-Hour per Acre-Foot Factors for Allocating Off-Aqueduct Power Facility Costs	B-20
8 Extra Peaking Charges for Additional Power, by Pumping Plant	B-22
9 Extra Peaking Charges for Additional Power, by Contractor	B-23
10 Determination of Factors for Distributing Capital and Minimum OMP&R Costs of East Branch Enlargement Facilities Among Participating Contractors	B-25
11 East Branch Extension Facilities Debt Service for 2022	B-26
12 Factors for Distributing Minimum OMP&R Costs of the East Branch Extension Facilities	B-27
13 South Bay Aqueduct Enlargement Debt Service for 2022	B-27

Computational Tables

		Page
B-1	Factors for Distributing Reach Capital Costs Among Contractors	B-30
B-2	Factors for Distributing Reach Minimum OMP&R Costs Among Contractors	B-32
B-3	Power Costs and Credits, Transmission Costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant	B-34
B-4	Maximum Contractual Table A Amounts	B-38
B-5A	Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor	B-42
B-5A-Adj	Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor	B-64
B-5B	Annual Water Quantities Delivered to Each Contractor	B-70
B-6	Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities	B-74
B-7	Reconciliation of Capital Costs Allocated to Water Supply and Power Generation	B-84
B-8	SWP Capital Costs of Requested Delivery Structures	B-85
B-9	Capital Costs of Requested Excess Peaking Capacity	B-86
B-10	Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge	B-88
B-11	Minimum OMP&R Costs of Each Aqueduct Reach to be Reimbursed through Minimum OMP&R Component of Transportation Charge	B-96
B-12	Variable OMP&R Costs to be Reimbursed through Variable OMP&R Component of Transportation Charge	B-106
B-13	Capital and Operating Costs of Project Conservation Facilities to be Reimbursed through Delta Water Charge	B-110
B-14	Capital Costs of Transportation Facilities Allocated to Each Contractor	B-112
B-15	Capital Cost Component of Transportation Charge for Each Contractor	B-116
B-16A	Minimum OMP&R Component of Transportation Charge for Each Contractor	B-120
B-16B	Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities	B-124

B-17	Unit Variable OMP&R Component of Transportation Charge	B-128
B-18	Variable OMP&R Component of Transportation Charge for Each Contractor	B-134
B-19	Total Transportation Charge for Each Contractor	B-138
B-20A	Calculation of Delta Water Rates	B-142
B-20B	Delta Water Rates by Facility	B-143
B-21	Total Delta Water Charge for Each Contractor	B-144
B-22	Water System Revenue Bond Surcharge for Each Contractor	B-148
B-23	Total Transportation and Delta Water Charge for Each Contractor	B-152
B-24	Equivalent Unit Charge for Water Supply for Each Contractor	B-156
B-25	Equivalent Unit Transportation Costs of Water Delivered from or through Each Aqueduct Reach	B-157
B-26	Capital Costs of Each Aqueduct Reach to be Reimbursed through the Capital Cost Component of the East Branch Enlargement Transportation Charge Phase 1 and Phase 2	B-158
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 Phase 1 and Phase 2	B-160
B-28	Capital Costs of East Branch Enlargement Transportation Facilities Allocated to Each Contractor Phase 1 and Phase 2	B-162
B-29	Capital Cost Component of East Branch Enlargement Facilities Transportation Charge for Each Contractor	B-163
B-30	Minimum OMP&R Component of East Branch Enlargement Facilities Transportation Charge for Each Contractor	B-164
B-31	Total East Branch Enlargement Facilities Transportation Charge for Each Contractor	B-165

State Water Project Water Contractors

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

Full Name	Abbreviation
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
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
Littlerock Creek Irrigation District	Littlerock
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
Santa Clarita Valley Water Agency ¹	Santa Clarita
Solano County Water Agency	Solano
Tulare Lake Basin Water Storage District	Tulare
Ventura County Watershed Protection District	Ventura

¹ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

Appendix B

Data and Computations

Used to Determine 2022 Water Charges

The State of California, acting by and through the Department of Water Resources (DWR), annually furnishes Statements of Charges to the 29 State Water Project (SWP or Project) water contractors. Article 29(e) of the *Standard Provisions for Water Supply Contract*, 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 SWP water contractors during calendar year 2022. The information is based on established data about the SWP, both known and projected, as of June 2021 however, small volumes of water may be reclassified over time pursuant to water supply contract provisions. 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 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
- Suisun Marsh facilities
- Yolo Bypass
- A portion of the California Aqueduct from the Delta to Dos Amigos Pumping Plant
- Sisk Dam, San Luis Reservoir, and Gianelli Pumping-Generating Plant

Project Transportation Facilities

- Grizzly Valley Pipeline

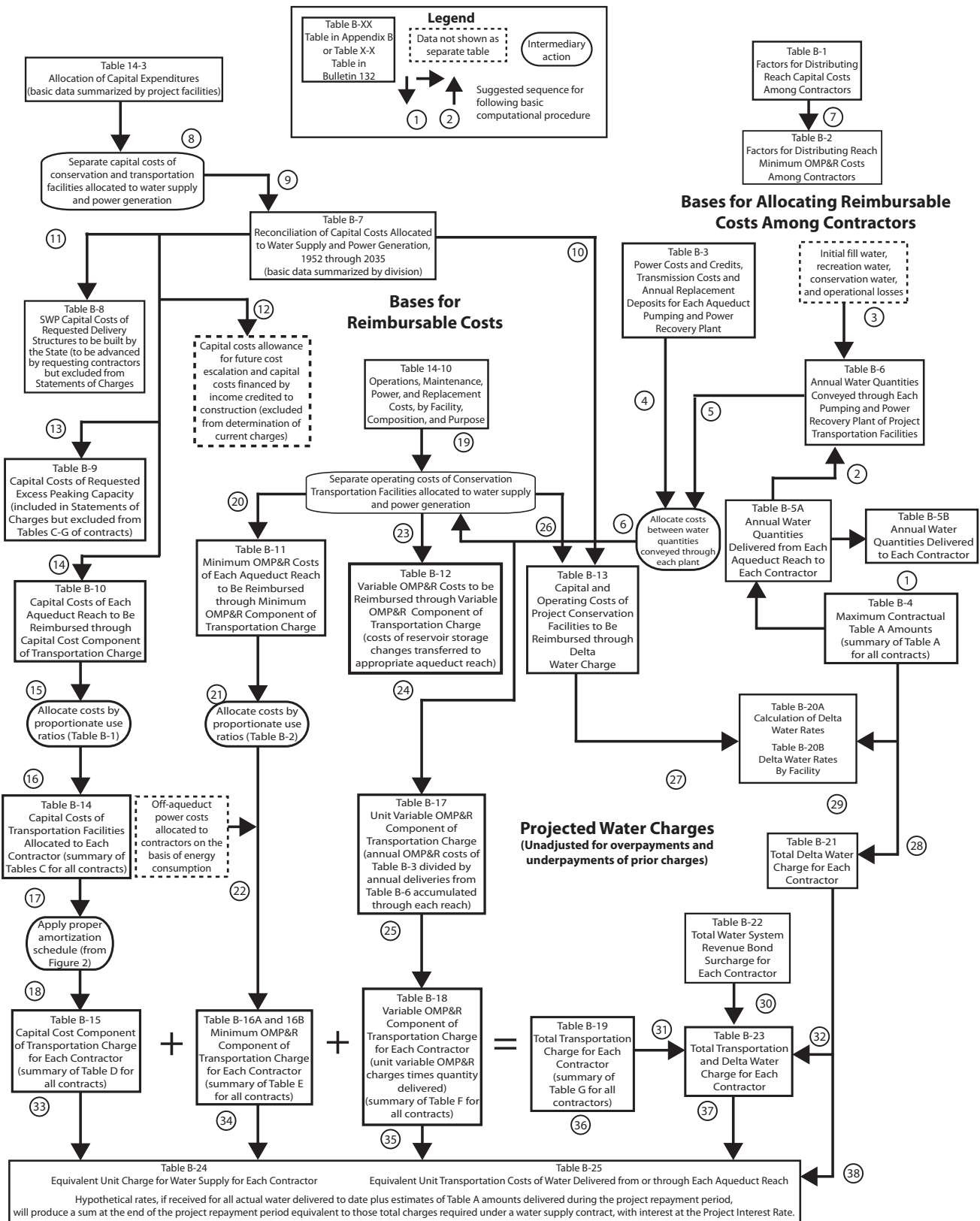


Figure B-1 Relationships of Data Used to Substantiate Statements of Charges

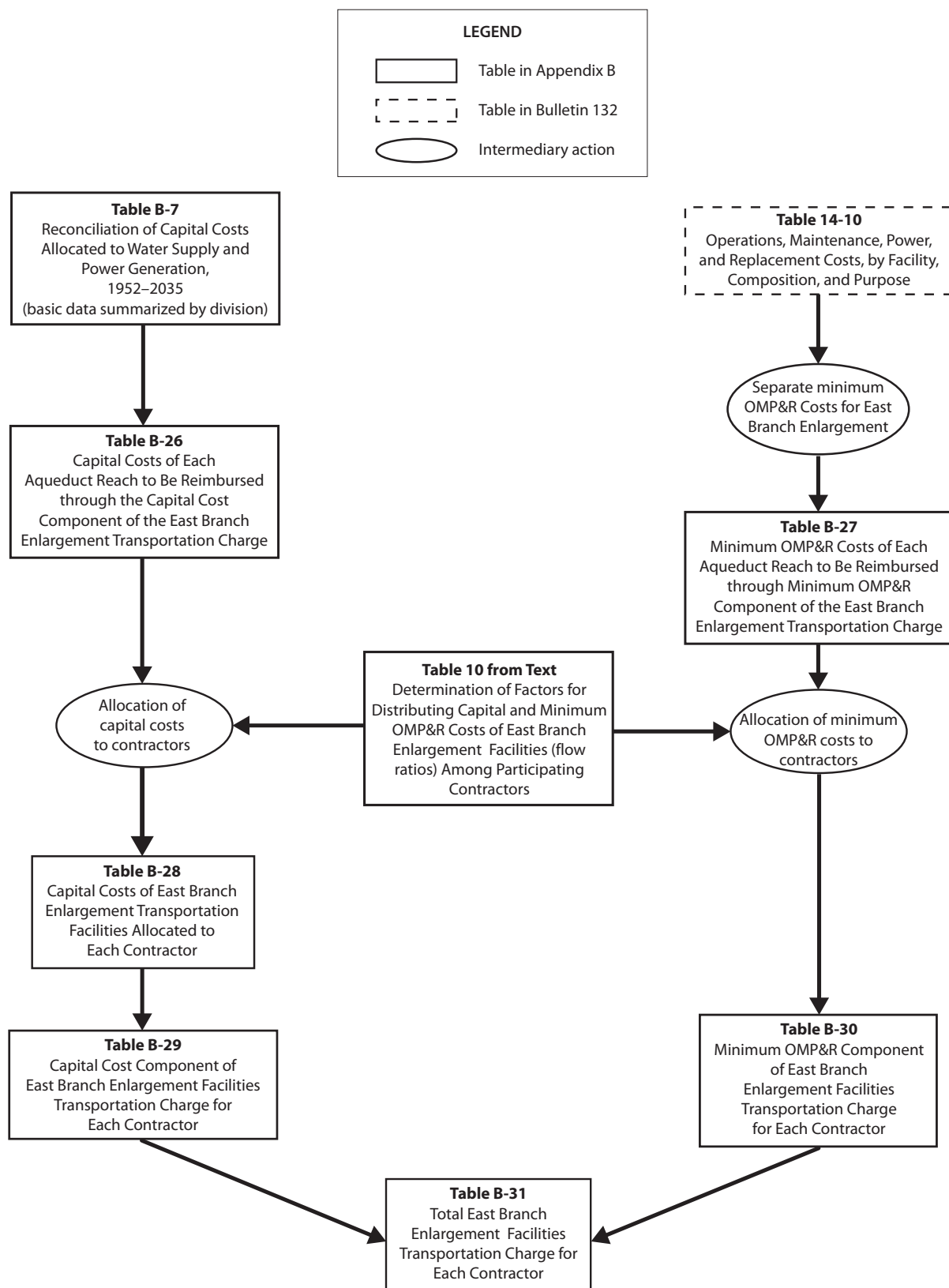


Figure B-2 Relationships of Data Used to Substantiate East Branch Enlargement Charges

- 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 SWP water 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 SWP water contractor's turnout(s). Generally, the annual charge represents each SWP water contractor's proportionate share of the reimbursable capital costs and operating costs of the Project Transportation Facilities.

Each SWP water contractor's allocated share of those reimbursable capital costs is amortized for repayment to DWR, and certain variations are allowed in the amortization methods. SWP water contractors' shares of reimbursable operating costs are repaid in the year such costs are incurred by DWR.

The East Branch Enlargement Transportation Charge is paid by the seven Southern California SWP water 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 SWP water contractors pay an allocated share of the debt service on revenue bonds sold to finance the enlargement. Each SWP water contractor will also 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 SWP water contractors in their respective service areas.

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 DWR all reimbursable capital costs;
- (2) conservation and transportation minimum OMP&R components, which will return to DWR all reimbursable operating costs that do not depend on or vary with quantities of water actually delivered to the SWP water contractors; and
- (3) a transportation variable OMP&R component, which will return to DWR all reimbursable operating costs that depend on and vary with quantities of water actually delivered to the SWP water 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

Delta Water Charge

Capital Cost Component

1. Planning, design, right-of-way, and construction costs of Conservation Facilities
2. Operations and maintenance (O&M) 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 State Water Project (SWP) pumping prior to 1986 (Department of Water Resources-Department of Fish and Wildlife agreement)

Minimum Operations, Maintenance, Power, and Replacement (OMP&R) Component

1. Direct O&M costs of Conservation Facilities
2. General O&M costs allocated to Conservation Facilities
 - a. 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 Wildlife agreement)

Transportation Charge

Capital Cost Component

1. Planning, design, right-of-way, and construction costs of Transportation Facilities
2. Operations and maintenance (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 (e.g., major repair work) 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 Wildlife agreement)

Minimum OMP&R Component

1. Direct O&M costs of Transportation Facilities
 - a. Headquarters and field divisions (portion)
 - b. Insurance and Federal Energy Regulatory Commission (FERC) costs (portion)
2. General O&M costs related to Transportation Facilities
 - a. 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 (downstream costs)
5. Other power costs
 - a. Station service at Transportation Facility power and pumping plants
 - b. Certain transmission service costs (transmission access charges, downstream costs, etc.)
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 service costs, 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 Wildlife agreement)

Variable OMP&R Component

1. Power purchase costs
 - a. Capacity
 - b. Energy
 - c. Pine Flat Powerplant bond service, O&M, and transmission costs allocated to aqueduct pumping plants
2. Alamo, Devil Canyon, Warne, and Castaic power generation credited at the power plant 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 power plants
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 Wildlife agreement)

Note: Excludes costs recovered under the East Branch Enlargement Transportation Charge.

Figure B-3 Composition of Delta Water Charge and Transportation Charge

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 2022.

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 2021, included in those tables, are the redetermined amounts and do not equal the amounts actually paid by SWP water 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 SWP water contractor's Statement of Charges and are reflected in Attachment 3, which is furnished to each SWP water contractor in its annual Statement 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 DWR at the request of SWP water contractors.
- (2) Advances of funds pursuant to Article 10(d) of the standard provisions for delivery structures (turnouts) constructed by DWR at the request

of SWP water 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 SWP water 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 SWP water 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 non-SWP water contractor 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 SWP water 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 DWR 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 DWR 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 DWR on or before the fifteenth day of the month following actual water delivery.

Bases for Allocating Reimbursable Costs Among SWP Water Contractors

This section describes procedures for allocating reimbursable costs of Project Transportation Facilities among SWP water 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 SWP water 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 SWP water contractors under planned conditions of full development.

The derivation of ratios that represent the proportionate maximum use of each

aqueduct reach by the respective SWP water 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 SWP water contractors were last reported in Tables B-1 and B-2 of Bulletin 132-91. Under Article 53 of the Monterey Amendment, agricultural SWP water contractors may sell up to 130,000 acre-feet of aqueduct capacity to municipal and industrial SWP water contractors. The first permanent transfer occurred in 1998. Currently, 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. These reach ratios do not reflect the permanent capacity transfers.

Table B-2 presents corresponding ratios for allocating 2021 and after reimbursable minimum OMP&R costs among SWP water 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 DWR of those costs that depend on and vary with the amount of SWP water deliveries. (The minimum OMP&R

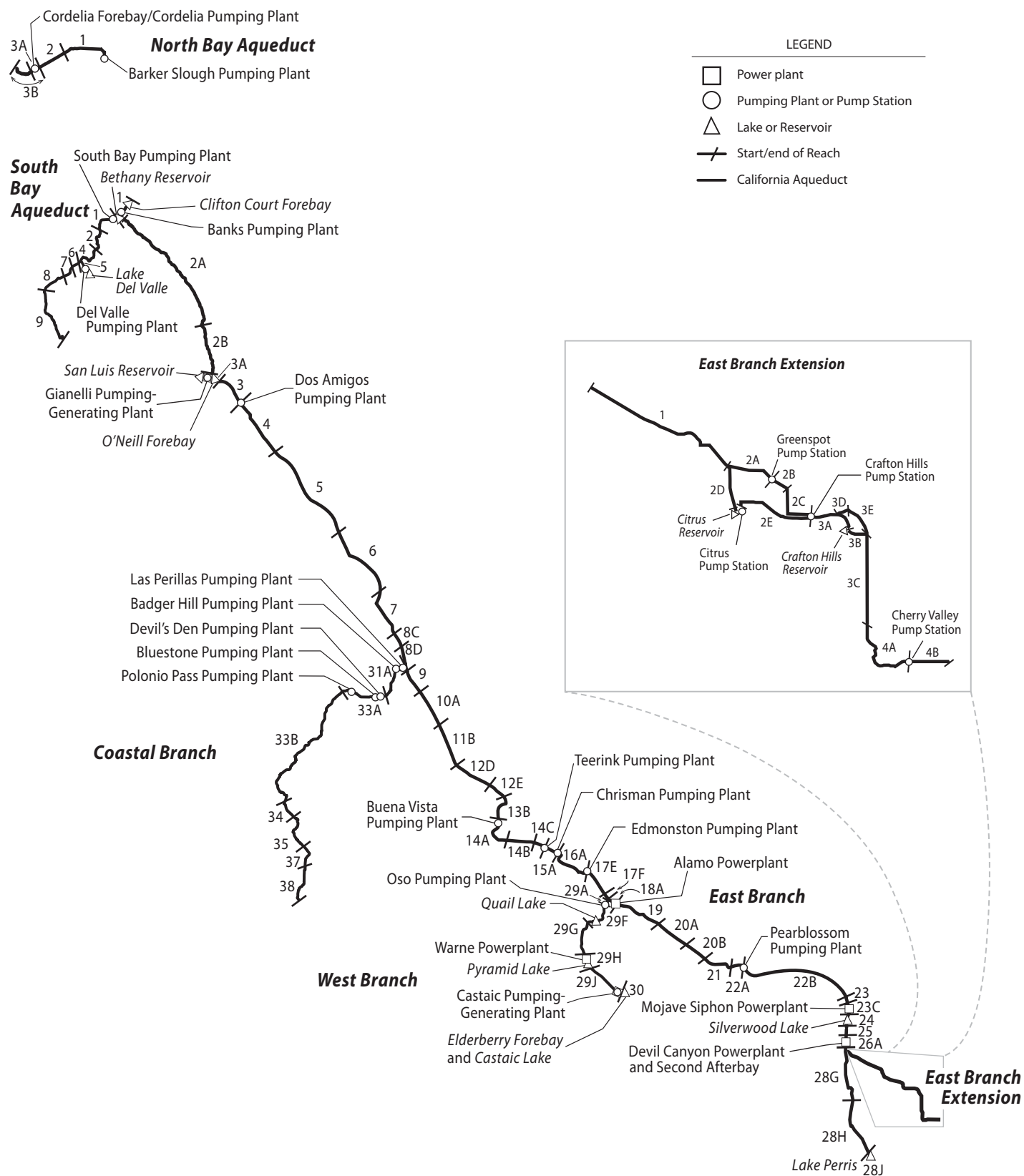


Figure B-4 Repayment Reaches and Descriptions

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 No. 1 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, and 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 (excluding Mojave Siphon Powerplant)
- 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 Portal, 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
- 2D Junction, Foothill Pipeline Near Cone Camp Road to Citrus Pump Station
- 2E Citrus Pump Station to Crafton Hills Pump Station
- 3A Crafton Hills Pump Station to Crafton Hills Reservoir
- 3B Crafton Hills Reservoir to Carter Street Valve Vault
- 3C Carter Street Valve Vault to Garden Air Creek
- 3D Yucaipa Connector Pipeline to Yucaipa Pipeline Tie-in
- 3E Yucaipa Pipeline Tie-in to Carter Street Valve Vault
- 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

Table 1 Summary of Permanent Aqueduct Capacity Transfers

SWP Water Contractor		Capacity Transfer		
Seller	Buyer	Amount (acre-feet)	Effective Year	Transfer Description
Transfers under Monterey Amendment				
Kern	Mojave	25,000	1998	Purchased capacity upstream of Reach 31A
Kern	Santa Clarita Valley ¹	41,000	2000	Purchased capacity upstream of Reach 16A
Kern	Palmdale	4,000	2000	Purchased capacity upstream of Reach 11B
Kern	Alameda-Zone 7	7,000	2000	Purchased capacity upstream of Reach 10A
Kern	Alameda-Zone 7	15,000	2000	Purchased capacity upstream of Reach 10A
Kern	Alameda-Zone 7	10,000	2001	Purchased capacity upstream of Reach 11B
Kern	Solano	5,756	2001	Purchased capacity upstream of Reach 11B and Reach 31A
Kern	Napa	4,025	2001	Purchased capacity upstream of Reach 11B and Reach 31A
Kern	Alameda-Zone 7	2,219	2004	Purchased capacity upstream of 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 of Reach 8D
Tulare	AVEK	3,000	2002	Purchased capacity upstream of Reach 8D
Tulare	Alameda-Zone 7	400	2003	Purchased capacity upstream of Reach 8D
Tulare	Kings	5,000	2004	Purchased capacity upstream of Reach 8D
Tulare	Coachella	9,900	2004	Purchased capacity upstream of Reach 8D
Metropolitan	Coachella	88,100	2005	Purchased capacity upstream of Reach 28J
Metropolitan	Desert	11,900	2005	Purchased capacity upstream of Reach 28J
Tulare	Kings	305	2006	Purchased capacity upstream of Reach 31A
Tulare	Desert	1,750	2010	Purchased capacity upstream of Reach 17F
Tulare	Coachella	5,250	2010	Purchased capacity upstream of Reach 17F
Kern	Desert	4,000	2010	Purchased capacity upstream of Reach 17F and Reach 31A
Kern	Coachella	12,000	2010	Purchased capacity upstream of Reach 17F and Reach 31A
Dudley Ridge	Mojave	7,000	2010	Purchased capacity upstream of Reach 8D
Dudley Ridge	AVEK	1,993	2014	Purchased capacity upstream of Reach 8D
Tulare	AVEK	1,451	2014	Purchased capacity upstream of Reach 8D
Dudley Ridge	Mojave	3,000	2015	Purchased capacity upstream of Reach 8D
Dudley Ridge	Mojave	4,000	2020	Purchased capacity upstream of Reach 8D
<i>Subtotal outside of Article 53</i>		<i>163,022</i>		

¹ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

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 SWP water contractors in proportion to the actual annual use of that reach by the respective SWP water contractors.

Table B-3 summarizes the total power costs, credits, and transmission costs for each aqueduct pumping and power recovery plant. Variable costs are as follows.

- 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 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 SWP 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 as the Article 21 program, is based on individual annual contracts; costs for Article 21 water actually delivered are included in Table B-3.

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 SWP contractor. Projected deliveries for years 2020 through 2035 are based on SWP water contractors' requests for future water deliveries. The quantities included in Table B-5A also include non-project water delivered to SWP water contractors, surplus water deliveries prior to May 1, 1973, and actual Article 21 water deliveries in 1994 and thereafter.

Table B-5A-Adj presents a summary of accounting adjustments that result from water deliveries not originating from the Sacramento-San Joaquin Delta (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, SWP water 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 SWP water contractor. The quantities also include amounts of non-project water and surplus water delivered prior to May 1, 1973, and actual deliveries of Article 21 water in 1994 and thereafter.

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.

- *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.

Water made available to SWP water contractors at down-aqueduct delivery structures and deliveries made from storage withdrawals bear the same variable OMP&R costs per acre-foot as they would if the deliveries were conveyed from the Delta in that year. The 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.

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 SWP water 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 SWP water 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 non-project 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 at the top 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 costs as of December 31, 2020; 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 SWP water 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 DWR in connection with each SWP water contractor's turnouts. Costs incurred by DWR for both State-constructed and SWP contractor-constructed delivery structures are paid directly by the SWP water contractors for which the structures are built. DWR incurs design review and construction inspection costs in connection with SWP 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 The Metropolitan Water District of Southern California (Metropolitan), San Gabriel Valley Municipal Water District, and Antelope Valley-East Kern Water Agency, including the following:

- additional costs incurred by DWR for requested excess capacity;
- advances by SWP water contractors of funds for such costs; and
- credits for advances in excess of costs which were applied to respective SWP water 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 DWR through payments of the Transportation Charge. The additional costs

Table 2 Project Purpose Cost Allocation Factors (percentages)¹

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 ²	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 ^a	78.0 ^b
Remainder of South Bay Aqueduct	100.0	100.0	0.0	0.0
California Aqueduct				
Delta to Dos Amigos Pumping Plant	96.6	96.6	3.4	3.4
Dos Amigos Pumping Plant to termini (excluding Coastal Branch) ^{3,4}	94.3 / 99.6	96.9 / 99.6	5.7 / 0.4	3.1 / 0.4
Aqueduct and Plants ^{3,4}	94.3 / 99.6	96.9 / 99.6	5.7 / 0.4	3.1 / 0.4
Pyramid Dam and Lake ^{3,4}	94.3 / 96.1	96.9 / 96.1	5.7 / 3.9	3.1 / 3.9
Castaic Dam and Lake ^{3,4}	94.3 / 91.1	96.9 / 91.1	5.7 / 8.9	3.1 / 8.9
Silverwood Dam and Lake ^{3,4}	94.3 / 85.3	96.9 / 85.3	5.7 / 14.7	3.1 / 14.7
Perris Dam and Lake ^{3,4}	94.3 / 67.7	96.9 / 67.7	5.7 / 32.3	3.1 / 32.3
Coastal Branch	100.0	100.0	0.0	0.0

¹ Percentages indicated apply to the majority of the facilities with minor exceptions.

² 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.

³ Percentage indicated consists of 48.0 percent of costs allocated to recreation and 26.8 percent to flood control.

^b Percentage indicated consists of 44.9 percent of costs allocated to recreation and 33.1 percent to flood control.

³ Percentage indicated is used for 2012 and previous years.

⁴ Percentage indicated is used for 2013 and forward.

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 DWR, with interest, through SWP water 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 DWR 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 Project 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 SWP water 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 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 pumping plants and power plants that are up-aqueduct from Devil Canyon Powerplant and Castaic Powerplant and 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) projected operating costs (labor only)

were not escalated for calendar years 2022 and 2023, and escalation of certain projected operating costs (labor and operating expense) were 1 percent per year for 2024–2035. Labor and operating expense escalation rates were originally set at 4.0 percent per year for 2022 through 2023, in the Bulletin 132-21 Criteria Memorandum; however, operating cost escalations were eliminated in the Statements of Charges.

Table B-12 shows the portions of variable OMP&R costs in *Table B-3* that are allocable to the water 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 SWP water 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 SWP water contractors under the Delta Water Charge, Oroville power sales, and Gianelli Pumping-Generating Plant credits. *Table B-13* also shows credits applied to the reimbursable capital costs of the initial 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 Attachment 3 of each Statement of Charges. 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 SWP water 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 SWP water contractor is the basis for the Transportation Charge components.

Table B-14 summarizes each SWP water 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 Attachment 3 of the Statements of Charges.

Prepayments of the capital cost component, required under Metropolitan's Amendment 7, are included as negative capital costs in *Table B-14* and Attachment 3 of Metropolitan's Statement of Charges. Solano County Water Agency, Empire West Side Irrigation District, and Santa Clarita Valley Water Agency also prepaid capital costs (Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018. See *Table B-14* footnotes). *Table B-14* includes costs of the Coastal Branch Extension and East Branch Extension to provide water service to San Bernardino Valley Municipal Water District and San Geronio Pass Water Agency. *Table B-14* also includes costs of the Coastal Branch Extension to provide water service to Santa Barbara Flood Control and Water Conservation District.

Both *Table B-14* and Attachment 3 of the six SWP water 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 SWP water 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 Attachment 3 of the Statements of Charges. 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 SWP water 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 Attachment 3 of the Statements of Charges.

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* and adding Municipal Water Quality Investigation program costs to participating SWP water contractors.

Table B-16A excludes Off-Aqueduct Power Facility charges, which are included separately in *Table B-16B*. Both *Table B-16A* and Attachment 3 include the operating

Table 3 Criteria for Amortizing Capital Costs of Transportation Facilities

Contractor	Year of Initial Payment ¹
Alameda County Flood Control and Water Conservation District, Zone 7	1963 ^a
Alameda County Water District	1963
Antelope Valley-East Kern Water Agency	1963
City of Yuba City	b
Coachella Valley Water District	1964
County of Butte	b
County of Kings	1968
Crestline-Lake Arrowhead Water Agency	1964
Desert Water Agency	1963 ^c
Dudley Ridge Water District	1968 ^d
Empire West Side Irrigation District	1968 ^d
Kern County Water Agency	
Agricultural Use	1968 ^d
Municipal and Industrial Use	1968 ^d
Littlerock Creek Irrigation District	1964
The 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 Bernardino Valley Municipal Water District	1963
San Gabriel Valley Municipal Water District	1963 ^c
San Geronio Pass Water Agency	1963 ^c
San Luis Obispo County Flood Control and Water Conservation District	1964 ^e
Santa Barbara County Flood Control and Water Conservation District	1964
Santa Clara Valley Water District	1963
Santa Clarita Valley Water Agency	1964 ^f
Solano County Water Agency	1973
Tulare Lake Basin Water Storage District	1968 ^d
Ventura County Watershed Protection District	1964

¹ Allocated capital costs of transportation facilities amortized in equal annual installments unless otherwise noted.

^a Principal payments on each annual capital cost prior to 1971 delayed until calendar year 1972, except payments for 1963.

^b For City of Yuba City and County of Butte, payments for Delta Water Charge only.

^c Payment deferred for 1963 and added to 1964 payment with accrued interest.

^d For Dudley Ridge Water District, Empire West Side Irrigation District, Kern County Water Agency (agricultural use), Oak Flat Water District, and Tulare Lake Basin Water Storage District, 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.

^e For San Luis Obispo and Santa Barbara, all principal and interest payments for costs of the Coastal Stub were deferred until 1976.

^f Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

costs payable under the Devil Canyon-Castaic contract for the six SWP water contractors down-aqueduct from Devil Canyon Powerplant and Castaic Powerplant.

As part of operating agreements with DWR, Kern County Water Agency (Kern) was billed from 1969 through 1996 for any additional operating costs caused by early installation of units in Las Perillas and Badger Hill pumping plants by Berrenda Mesa Water 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 SWP water contractors, which began in 1997.

Following the execution of the Monterey Amendment, settlement agreements were made. The costs associated with those settlements are to be allocated among all SWP water contractors in proportion to their maximum Table A amounts. As costs are incurred, related charges will be included in the SWP water contractors' annual Statements of Charges as part of the minimum. Between 2002 and 2010, the Monterey Amendment litigation costs recovered from SWP water contractors were \$15.8 million.

Table B-16B summarizes annual Off-Aqueduct Power Facility charges allocated to each SWP 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.

Table 4 Minimum OMP&R Costs of Reach 31A Assigned Directly to Kern County Water Agency (in dollars)

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

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 SWP water contractors in the next year.

Table 5 summarizes Off-Aqueduct Power Facility charges and credits related to deliveries for 2020. The ongoing Reid Gardner Powerplant environmental remediation costs related to the Reid Gardner Powerplant contract expiration in 2013 are tracked independently from annual Reid Gardner operating costs.

Table 5 Summary of 2020 Off-Aqueduct Power Facility Charges and Credits (in dollars)

Charges by Item	
Reid Gardner Powerplant	0
Reid Gardner Closure Costs	2,364,148
Bottle Rock Powerplant	0
South Geysers Powerplant	0
<i>Subtotal</i>	<i>2,364,148</i>
Credits by Item	
Power Sales	0
Net Total Charge	2,364,148

Table 6 shows projected Off-Aqueduct Power Facility charges. Defeasance of Off-Aqueduct Power facilities bonds occurred in June 2016, so no debt service charges or bond cover are included. Additionally, Reid Gardner, Unit 4 Powerplant remediation costs are projected for 2021–2025.

Annual Off-Aqueduct Power Facility charges are allocated among SWP water 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, based on a 60-percent allocation.

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.

The energy required to pump each SWP 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 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. The following provisions are for calculating the variable OMP&R component of the Transportation Charge.

- An annual charge per acre-foot of projected water deliveries to all SWP water contractors served from or through each reach is determined so the projected

Table 6 Projected Charges for Off-Aqueduct Power Facilities (in dollars)

Year	Total Annual Cost	25 Percent Bond Cover
2021	4,068,000	-
2022	5,200,000	-
2023	10,000,000	-
2024	5,400,000	-
2025	1,000,000	-
2026	0	-
2027	0	-
2028	0	-
2029	0	-
2030	0	-
2031	0	-
2032	0	-
2033	0	-
2034	0	-
2035	0	-

Table 7 Kilowatt-Hour per Acre-Foot Factors for Allocating Off-Aqueduct Power Facility Costs

Pumping Plant	kWh per acre-foot ¹	
	At Plant	Cumulative from Delta
Barker Slough	223	223
Cordelia-Benicia	434	657
Cordelia-Vallejo	178	401
Cordelia-Napa	563	786
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
Citrus	1,240	5,789
Crafton Hills	1,087	6,876
Cherry Valley	224	7,100
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

¹ Includes transmission losses.

variable OMP&R costs to be incurred for each reach will be returned to DWR.

- The total annual variable OMP&R component for any SWP 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 SWP 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 SWP water 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 power market energy rates. The amounts of extra peaking charges for additional power costs are shown in *Tables 8 and 9*.

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 SWP water 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 SWP water 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 Attachment 3 of the Statements of Charges.

Table B-19 summarizes the annual Transportation Charges for each SWP water contractor (the sum 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 Attachment 3 of the Statements of Charges.

In accordance with provisions of the Devil Canyon-Castaic contract, Table B-19 and Attachment 3 include amounts of debt service and operating cost payments due from the six SWP water contractors located down-aqueduct from Devil Canyon and Castaic power plants.

Delta Water Charges

Table B-20A presents the calculation of the Delta Water Rate for the initial Conservation Facilities applicable in 2022 in accordance with the amended Article 22(e) and 22(g) of all 29 water supply 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 SWP water contractors who have executed the Monterey Amendment. Included in Table B-20A is the Delta Water Rate for the two SWP water 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 2022 Delta Water Rate from Table B-20A.

Table B-21 summarizes the annual Delta Water Charge for each SWP contractor. The projected charges in Table B-21 are developed by multiplying the total rate per acre-foot, as shown in Table B-20A, by the amount of allocated water for each SWP contractor, as shown in Table B-4.

The projected Delta Water Charges through 2035 include the assumption of escalation of projected operating costs at 1.0 percent per year for 2024–2035.

Water System Revenue Bond Surcharge

Table B-22 summarizes the Water System Revenue Bond Surcharge to the capital cost component of the Delta Water Charge and Transportation Charge for each SWP water contractor. The surcharge shown in Table B-22 is the difference between the capital cost component and the financing costs of Water System Revenue Bond Series B through Series BC. This surcharge is levied according to an amendment to the water supply contracts, which was signed by all of the SWP water contractors.

Total Water Charges

Table B-23 summarizes the total annual charges to each SWP 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 SWP water 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 SWP water contractors.

The equivalent unit Delta Water Charges included in Table B-24 are greater than those presented in Table B-20A because water deliveries are less than the amounts shown in Table B-4.

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.

Table 8 Extra Peaking Charges for Additional Power, by Pumping Plant (in dollars)

Year	Las Perillas													Total
	Cordelia Napa	Cordelia Solano	Barker Slough	South Bay	Banks	Dos Amigos	Badger Hill	Buena Vista	Teerink	Chrisman	Edmonston	Pearlblossom	Oso	
1972	0	0	0	0	0	10,579	24,700	0	0	0	0	0	0	35,279
1973	0	0	0	0	0	0	6,016	0	0	0	0	0	0	6,016
1974	0	0	0	0	0	0	7,140	0	0	0	0	0	0	7,140
1975	0	0	0	0	0	494	6,397	0	0	0	0	0	0	6,891
1976	0	0	0	0	0	0	1,981	0	0	0	0	0	0	1,981
1977	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	48,825
1979	0	0	0	0	0	0	3,306	0	0	0	0	0	0	3,306
1980	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	12,126
1982	0	0	0	0	0	89,339	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	11,315
1984	0	0	0	2,096	84,396	38,607	7,203	11,173	3,823	3,593	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	76,878
1986	0	0	0	0	1,864	863	0	291	354	766	2,683	0	0	6,821
1987	0	0	0	604	17,129	7,838	835	2,295	1,806	3,460	11,058	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	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	76,221
1990	45	0	18	343	19,524	9,044	0	150	145	314	643	0	0	30,226
1991	903	0	281	0	21	8	0	15	17	39	139	41	0	1,464
1992	208	117	203	0	7,070	2,502	0	182	190	435	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	255,337
1994	0	366	393	679	6,566	2,795	454	1,083	155	357	1,121	0	132	14,101
1995	0	0	0	1,717	24,464	9,422	27	1,865	3,475	782	1,104	400	0	43,256
1996	4	0	1	1,983	10,031	4,976	0	391	432	1,015	3,404	1,160	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	595,761
1998	0	0	0	20,966	235,693	106,251	2,354	697	848	1,836	6,426	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	145,010
2000–2020	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	2,184,530

Table 9 Extra Peaking Charges for Additional Power, by Contractor (in dollars)

Year	Napa	Solano	Alameda- Zone 7	Alameda- County	Santa Clara	Dudley Ridge	Empire	Kern	Kings	Oak Flat	Tulare	AVEK	Coachella	Desert	Littlerock	Palmdale	San Gabriel	Santa Clarita ¹	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	0	0	0	0	0	485	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	175	0	0	0	12,126
1982	0	0	0	0	0	2,173	0	80,945	0	0	0	4,671	0	0	0	0	422	1,128	89,339
1983	0	0	0	0	48	9,511	0	0	1,365	0	0	0	0	0	0	0	0	391	11,315
1984	0	0	0	0	2,874	0	0	144,021	281	809	0	0	0	0	0	0	0	2,906	150,891
1985	0	0	0	2,029	0	0	64	25,664	0	98	0	48,767	0	0	0	0	0	256	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	0	0	812	0	0	545	45,025
1988	892	73	665	561	0	1,853	1,404	58,905	0	72	2,368	44,526	0	0	0	0	0	627	111,946
1989	3,478	1,062	96	0	0	13	403	55,085	0	239	8,278	0	0	0	1,035	5,489	0	1,043	76,221
1990	63	0	470	0	0	0	0	28,587	0	0	0	0	0	0	81	1,025	0	0	30,226
1991	1,184	0	0	0	0	0	0	0	0	0	0	0	0	0	280	0	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	24,983	41,156	0	4,856	0	0	255,337
1994	0	759	896	0	0	0	7	9,933	0	0	0	0	0	0	56	0	0	2,450	14,101
1995	0	0	2,353	0	0	10,197	0	28,085	310	0	0	0	0	0	0	2,284	0	27	43,256
1996	5	0	81	2,612	0	334	205	4,552	969	0	7,809	0	0	0	0	3,598	3,232	0	23,397
1997	0	3,932	3,999	0	0	6,190	0	546,733	0	40	0	0	0	0	0	34,867	0	0	595,761
1998	0	0	19,666	8,442	0	22,631	1	312,626	0	651	0	0	0	0	0	11,054	0	0	375,071
1999	0	0	0	0	0	0	0	76,425	0	0	6,922	0	0	0	0	11,576	50,087	0	145,010
2000- 2020	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	24,983	41,156	2,439	74,749	53,741	9,858	2,184,530

¹ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

Those unit costs provide the basis of charges assessed for extra service (such as delivery of allocations down-aqueduct from a SWP water contractor's turnout) and for wheeling service to entities other than the SWP water contractors.

The cumulative unit conveyance costs indicated for reaches in Table B-25 do not necessarily equal the equivalent unit Transportation Charges to SWP water 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 SWP water contractors; however, the unit costs included in Table B-25 reflect the effect of melding the respective buildups and allocation criteria of all SWP water 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 thereafter.

East Branch Enlargement Charges

Table B-26 reflects DWR's projection of annual capital costs of the East Branch Enlargement 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 SWP 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 East Branch Enlargement. The costs are to be repaid by the seven SWP water contractors participating in the East Branch Enlargement. Currently, this table includes only minimum OMP&R costs attributable to the East Branch Enlargement. In accordance with Article 49(e)(1), the SWP water 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 SWP water contractors.

Table B-28 shows each participating SWP water 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 SWP water contractor. This component consists of each SWP water 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 SWP water 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 Charge for each participating SWP water contractor (the sum of the corresponding amounts included in *Tables B-29* and *B-30*).

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 and Second Afterbay
26B	Devil Canyon Powerplant Bypass

Share of Enlargement Capacity (cubic feet per second)								
Reach Number	AVEK	Coachella	Desert	Mojave	Palmdale	San Bernardino	Metropolitan	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	AVEK	Coachella	Desert	Mojave	Palmdale	San Bernardino	Metropolitan	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

East Branch Extension Charges

The East Branch Extension 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 are separated into 3 phases: Phase 1 Original, Phase 1 Improvements, and Phase 2. The East Branch Extension costs will be recovered from two SWP water contractors—San Bernardino Valley Municipal Water District and San Gorgonio Pass Water Agency—in accordance with their amended water supply contracts. The factors for distributing minimum costs are shown in *Table 12*. *Table 11* shows the capital factors and the corresponding debt service, including the 25 percent bond cover, for each of the phases in 2022.

South Bay Aqueduct Enlargement Charges

The South Bay Aqueduct, including the enlargement capacity, began operations in 2015. The enlargement construction costs are being recovered in full by Alameda County Flood Control and Water Conservation District, Zone 7 (Alameda-Zone 7). Capital charges related to a portion of the enlargement construction costs benefitting off-peak pumping operations are initially paid by Alameda-Zone 7 to meet the bond resolution and later recovered from SWP water contractors through the transportation variable charge. The off-peak pumping operations originally paid by Alameda-Zone 7 are then returned to Alameda-Zone 7 as a credit in the subsequent year. *Table 13* shows the corresponding debt service for the enlargement project, including the 25 percent bond cover, and the off-peak pumping debt service included in the 2022 Statements of Charges as described above.

Table 11 East Branch Extension Facilities Debt Service for 2022

SWP Water Contractor	Share of Participation (percent)	Total Debt Service Charge (in dollars)
Phase 1 Original		
San Bernardino	45.8417	4,383,220
San Gorgonio	54.1583	5,178,422
<i>Subtotal</i>	<i>100.0000</i>	9,561,642
Phase 1 Improvements		
San Bernardino	63.3410	3,601,448
San Gorgonio	36.6590	2,084,360
<i>Subtotal</i>	<i>100.0000</i>	5,685,808
Phase 2		
San Bernardino	64.4210	12,218,159
San Gorgonio	35.5790	7,747,952
<i>Subtotal</i>	<i>100.0000</i>	18,966,111
Total		34,213,561

The 2018 Statements of Charges (Bulletin 132-17) began to recover and redistribute the costs of these enlarged facilities using the agreed upon distribution factors.

Short-term Agreements

DWR and the SWP water contractors execute short-term agreements that affect the SWP water contractors' charges.

Municipal Water Quality Investigations

DWR executed a 5-year agreement in 1997 with 16 municipal and industrial SWP water contractors, who agreed to pay for allocated shares of DWR's Municipal Water Quality Investigations program costs. Additional amendments were executed in 2002, 2006, 2008, 2010, 2014, 2017, and 2019 to extend the program. The Municipal Water Quality Investigations charges under this agreement are included in the transportation minimum OMP&R components shown in Table B-16A.

Table 12 Factors for Distributing Minimum OMP&R Costs of the East Branch Extension Facilities

For Calendar Year 2012 and Previous Years				
Reach Number	Reach Description	San Bernardino	San Gorgonio	Total
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 Road 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
2D	Junction, Foothill Pipeline Near Cone Camp Road to Citrus Pump Station	0.777778	0.222222	1.000000
3A	Crafton Hills Pump Station to Crafton Hills Reservoir	0.557330	0.442670	1.000000
3B	Crafton Hills Reservoir to Garden Air Creek	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
For Calendar Year 2013 and Forward				
Reach Number	Reach Description	San Bernardino	San Gorgonio	Total
1	Devil Canyon Powerplant to Junction, Foothill Pipeline near Cone Camp Road	0.81674544	0.18325456	1.00000000
2A	Junction, Foothill Pipeline near Cone Camp Road to Greenspot Pump Station	0.85193106	0.14806894	1.00000000
2B	Greenspot Pump Station to Morton Canyon Valve Vault	0.77144744	0.22855256	1.00000000
2C	Morton Canyon Valve Vault to Crafton Hills Pump Station	0.77144744	0.22855256	1.00000000
2D	Junction, Foothill Pipeline Near Cone Camp Road to Citrus Pump Station	0.76227575	0.23772425	1.00000000
2E*	Citrus Pump Station to Crafton Hills Pump Station	0.73896000	0.26104000	1.00000000
3A	Crafton Hills Pump Station to Crafton Hills Reservoir	0.60766673	0.39233327	1.00000000
3B	Crafton Hills Reservoir to Carter Street Valve Vault	0.58333333	0.41666667	1.00000000
3C*	Carter Street Vault to Garden Air Creek	0.46994300	0.53005700	1.00000000
3D*	Yucaipa Connector Pipeline to Yucaipa Pipeline Tie-In	0.73338500	0.26661500	1.00000000
3E*	Yucaipa Pipeline Tie-In to Carter Street Vault	0.73338500	0.26661500	1.00000000
4A	Garden Air Creek to Cherry Valley Pump Station		1.00000000	1.00000000
4B	Cherry Valley Pump Station to Terminus at Noble Creek		1.00000000	1.00000000

* Reach designation in Phase II (calendar year 2013 and forward) have been modified to reflect new repayment reaches.

Feasibility Study

Nine SWP water 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.

Table 13 South Bay Aqueduct Enlargement Debt Service for 2022

Project	Total Debt Service Charge (in dollars)
Enlargement	
Alameda-Zone 7	17,90,608
Off-Peak Pumping	1,646,177
Total	18,936,785

Delta Programs

SWP water contractors have agreed to participate in several Delta-related programs that started in 2007 and extend into the future.

Delta Conveyance

The first agreement pertains to the Bay Delta Conservation Plan (BDCP), which was agreed to in a Memorandum of Agreement (MOA) for Supplemental Funding for Certain Ecosystem Actions and Support for Implementation of Near-Term Water Supply, Water Quality, Ecosystem, and Levee Actions. The BDCP comprises two elements: fishery costs and consultation costs. These costs were added to the SWP water 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 SWP water 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 DWR and 20 participating SWP water 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 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 water 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 DWR and 16 participating SWP water contractors to provide 50 percent of the project funding. In 2012, \$22 million was billed and in 2013, \$28 million was billed directly to the 16 participating SWP water contractors as a separate line item in the Statements of Charges.

In 2018, a fifth set of funding agreements for the preconstruction planning costs of the California WaterFix facilities was executed between DWR and ten participating SWP water contractors to provide gap funding. Bill years 2018 and 2019 included a total of \$58.4 million, which was billed directly as separate line items in the Statements of Charges and are not reflected in the appendix tables.

In 2020 and again in 2021, funding agreements were signed for a potential Delta conveyance project; planning and design was included for bill years 2021 and 2022. A total of \$44.7 million was billed directly as separate line items in the Statements of Charges and is not reflected in the appendix tables.

Water Purchases

During 2013, SWP water contractors agreed to participate in the San Joaquin River Flow Augmentation Program. The costs of the \$4 million program were recovered in the 2014 Statements of Charges.

During 2015 and 2016, SWP water contractors requested DWR enter into agreements for San Joaquin River flow release purchases with Oakdale Irrigation District and South San Joaquin Irrigation District. The 2015 purchases of \$5.75 million

and the 2016 purchases of \$13.75 million (\$2 million invoiced in 2017) were included in the 2017 and 2018 Statements of Charges. Additionally, SWP water contractors agreed to purchase up to \$12.5 million of 2018 Oakdale Irrigation District flow releases. This purchase was reflected in each SWP water contractor's 2019 charges with interest at the Project Interest Rate of 4.610.

Lake Perris Seepage Recovery Project

In the 2017 Statements of Charges, Metropolitan agreed to fund \$7.25 million (\$7.4 million with interest) for 2016 and 2017 planning and design costs for a proposed Lake Perris Seepage Recovery Project. Prior to the 2022 Statements of Charges, Desert Water Agency and Coachella Valley Water District executed agreements to participate in the project planning and design. DWR approved the use of Article 24(c)(2) of the water supply contracts to allow contractors to repay capital costs at an accelerated rate. DWR refunded Metropolitan the originally advanced \$7.4 million collected as a line item under the Transportation Minimum Component. DWR included agreed upon amounts of \$549 thousand for Desert Water Agency and \$7.96 million for Metropolitan for the Lake Perris Seepage Recovery Project advanced funding charges under Transportation Capital Attachment 4D in the 2022 Statements of Charges. Coachella Valley Water District agreed to recover this project as an amortized charge under the Transportation Capital Component.

TABLE B-1 Factors for Distributing Reach Capital Costs Among Contractors¹

Sheet 1 of 2

Reach No.	Reach Description	Napa	Solano	Alameda-Zone 7	Alameda County	Santa Clara	Future Contractor South Bay	Total
1	NORTH BAY AQUEDUCT							
2	Barker Slough through Fairfield/Vacaville Turnout	0.29667896	0.70332104					1.00000000
3A	Fairfield/Vacaville Turnout to Cordelia Forebay	0.38414552	0.61585448					1.00000000
3B	Cordelia Forebay through Benicia and Vallejo Turnouts		1.00000000					1.00000000
3B	Cordelia Forebay through Napa Turnout Reservoir	1.00000000						1.00000000
	SOUTH BAY AQUEDUCT							
1	Bethany Reservoir through Altamont Turnout			0.22599612	0.20663021	0.49237700	0.07499667	1.00000000
2	Altamont Turnout through 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 through Lake Del Valle			0.14436367	0.12972254	0.33715573	0.38875806	1.00000000
6	Del Valle Junction through South Livermore Turnout			0.14599918	0.21144710	0.50574745	0.13680627	1.00000000
7	South Livermore Turnout through Vallecitos Turnout				0.25176680	0.60218448	0.14604872	1.00000000
8	Vallecitos Turnout through Alameda-Bayside Turnout				0.27934645	0.72065355		1.00000000
9	Alameda-Bayside Turnout through Santa Clara Terminal Facilities					1.00000000		1.00000000
	CALIFORNIA AQUEDUCT							
1	Delta through Bethany Reservoir			0.00954737	0.00872917	0.02080118	0.00342507	N/A

Reach No.	Reach Description	San Luis Obispo	Santa Barbara	AVEK	Coachella	Crestline	Desert	Littlerock
	CALIFORNIA AQUEDUCT							
1	Delta through Bethany Reservoir	0.00533010	0.00983337	0.02939084	0.00528315	0.00133612	0.00871300	0.00049180
2A	Bethany Reservoir to Orestimba Creek	0.00557213	0.01027988	0.03072531	0.00552068	0.00139620	0.00910474	0.00051413
2B	Orestimba Creek to O'Neill Forebay	0.00557824	0.01029119	0.03075915	0.00552831	0.00139814	0.00911733	0.00051469
3	O'Neill Forebay to Dos Amigos Pumping Plant	0.00557719	0.01028923	0.03075332	0.00552772	0.00139798	0.00911637	0.00051461
4	Dos Amigos Pumping Plant to Panoche Creek	0.00557607	0.01028717	0.03074719	0.00552710	0.00139784	0.00911536	0.00051451
5	Panoche Creek to Five Points	0.00557467	0.01028462	0.03073954	0.00552633	0.00139763	0.00911409	0.00051440
6	Five Points to Arroyo Pasajero	0.00557257	0.01028074	0.03072799	0.00552517	0.00139733	0.00911216	0.00051419
7	Arroyo Pasajero to Kettleman City	0.00557189	0.01027949	0.03072428	0.00552480	0.00139723	0.00911154	0.00051413
8C	Kettleman City through Milham Avenue	0.00557103	0.01027792	0.03071961	0.00552432	0.00139712	0.00911076	0.00051405
8D	Milham Avenue through Avenal Gap	0.00568611	0.01049020	0.03135418	0.00563986	0.00142632	0.00930130	0.00052466
9	Avenal Gap through Twisselman Road			0.03426625	0.00616886	0.00156011	0.01017373	0.00057339
10A	Twisselman Road through Lost Hills			0.03481391	0.00626946	0.00158556	0.01033963	0.00058254
11B	Lost Hills to 7th Standard Road			0.03835043	0.00691699	0.00174933	0.01140749	0.00064171
12D	7th Standard Road through Elk Hills Road			0.04031661	0.00727790	0.00184059	0.01200265	0.00067463
12E	Elk Hills Road through Tupman Road			0.04037074	0.00728878	0.00184332	0.01202059	0.00067553
13B	Tupman Road to Buena Vista Pumping Plant			0.04379882	0.00791595	0.00200194	0.01305492	0.00073290
14A	Buena Vista Pumping Plant through Santiago Creek			0.04599268	0.00831952	0.00210399	0.01372049	0.00076961
14B	Santiago Creek through Old River Road			0.04682530	0.00847388	0.00214303	0.01397505	0.00078354
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04825217	0.00873768	0.00220973	0.01441013	0.00080743
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04905609	0.00888679	0.00224744	0.01465600	0.00082089
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.05089794	0.00922722	0.00233351	0.01521742	0.00085171
17E	Edmonston Pumping Plant to Porter Tunnel			0.05329388	0.00967107	0.00244575	0.01594937	0.00089182
17F	Porter Tunnel to Junction, West Branch, California Aqueduct			0.05340725	0.00969176	0.00245098	0.01598349	0.00089372
18A	Junction, West Branch, California Aqueduct through Alamo Powerplant			0.13238112	0.02399391	0.00606795	0.03957043	0.00221525
19	Alamo Powerplant to Fairmont			0.13237766	0.02399451	0.00606811	0.03957141	0.00221522
19C	Buttes Junction through Buttes Reservoir			1.00000000				
20A	Fairmont through 70th Street West			0.06847931	0.02576425	0.00651573	0.04249001	0.00237800
20B	70th Street West to Palmdale			0.02276024	0.02702917	0.00683555	0.04457607	0.00249470
21	Palmdale to Littlerock Creek			0.02318952	0.02754716	0.00696651	0.04543034	0.00254199
22A	Littlerock Creek to Pearblossom Pumping Plant			0.01181870	0.02794143	0.00706621	0.04608043	
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 through Devil Canyon Powerplant							
28G	Devil Canyon Powerplant to Barton Road							
28H	Barton Road to Lake Perris							
28J	Perris Dam and Lake Perris							
29A	Junction, West Branch, California Aqueduct through Oso Pumping Plant							
29F	Oso Pumping Plant through Quail Embankment							
29G	Quail Embankment through Warner Powerplant							
29H	Pyramid Dam and Lake							
29J	Pyramid Lake through Castaic Powerplant							
30	Castaic Dam and Lake							
31A	Avenal Gap to Devil's Den Pumping Plant	0.10560301	0.19482503					
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					

¹ 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 Contractors¹

Sheet 2 of 2

Reach No.	Dudley Ridge	Empire	Future Contractor San Joaquin Valley	Kern		Kings	Oak Flat	Tulare
				Municipal and Industrial	Agricultural			
	CALIFORNIA AQUEDUCT							
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			0.01828057
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.	Mojave	Palmdale	San Bernardino	San Gabriel	San Gorgonio	Santa Clarita ²	Metropolitan	Ventura	California Aqueduct Total
CALIFORNIA AQUEDUCT									
1	0.01101147	0.00369131	0.02362857	0.00650354	0.00398392	0.01285827	0.43929350	0.00429212	1.00000000
2A	0.01151136	0.00385891	0.02469101	0.00679699	0.00416304	0.01343201	0.45921072	0.00448701	1.00000000
2B	0.01152409	0.00386317	0.02472511	0.00680570	0.00416880	0.01345351	0.45973548	0.00449194	1.00000000
3	0.01152193	0.00386244	0.02472246	0.00680478	0.00416835	0.01345294	0.45965407	0.00449108	1.00000000
4	0.01151965	0.00386167	0.02471968	0.00680380	0.00416787	0.01345233	0.45956848	0.00449019	1.00000000
5	0.01151681	0.00386070	0.02471620	0.00680259	0.00416730	0.01345157	0.45946161	0.00448907	1.00000000
6	0.01151251	0.00385926	0.02471095	0.00680076	0.00416640	0.01345042	0.45929991	0.00448738	1.00000000
7	0.01151113	0.00385879	0.02470927	0.00680016	0.00416612	0.01345006	0.45924807	0.00448685	1.00000000
8C	0.01150938	0.00385821	0.02470716	0.00679941	0.00416576	0.01344960	0.45918261	0.00448616	1.00000000
8D	0.01174718	0.00393793	0.02522383	0.00694100	0.00425288	0.01373353	0.46868533	0.00457883	1.00000000
9	0.01283841	0.00430367	0.02758959	0.00758975	0.00465175	0.01356094	0.51227887	0.00500407	1.00000000
10A	0.01304366	0.00437246	0.02803943	0.00771262	0.00472760	0.01377767	0.52049091	0.00508405	1.00000000
11B	0.01436906	0.00481665	0.03093503	0.00850448	0.00521581	0.01517717	0.57349473	0.00560046	1.00000000
12D	0.01510596	0.00506361	0.03254889	0.00894541	0.00548790	0.01595523	0.60297374	0.00588755	1.00000000
12E	0.01512626	0.00507040	0.03259749	0.00895830	0.00549608	0.01597665	0.60379667	0.00589546	1.00000000
13B	0.01641098	0.00550099	0.03540212	0.00972547	0.00596896	0.01733322	0.65516902	0.00639604	1.00000000
14A	0.01723325	0.00577656	0.03720681	0.01021819	0.00627322	0.01820137	0.68807273	0.00671639	1.00000000
14B	0.01754538	0.00588113	0.03789703	0.01040613	0.00638960	0.01853084	0.70057530	0.00683798	1.00000000
14C	0.01808019	0.00606036	0.03907670	0.01072763	0.00658850	0.01909545	0.72199174	0.00704634	1.00000000
15A	0.01838154	0.00616135	0.03974336	0.01090913	0.00670088	0.01941356	0.73406357	0.00716371	1.00000000
16A	0.01907194	0.00639271	0.04126559	0.01132404	0.00695754	0.02014241	0.76170731	0.00743264	1.00000000
17E	0.01997003	0.00669365	0.04325018	0.01186455	0.00729213	0.02109050	0.79767940	0.00778251	1.00000000
17F	0.02001251	0.00670788	0.04334270	0.01188988	0.00730773	0.02113537	0.79937767	0.00779906	1.00000000
18A	0.04960424	0.01662680	0.10730448	0.02944860	0.01809192		0.57469530		1.00000000
19	0.04960300	0.01662640	0.10730707	0.02944876	0.01809230		0.57469556		1.00000000
19C									1.00000000
20A	0.05324853	0.01784830	0.11522152	0.03161798	0.01942666		0.61700971		1.00000000
20B	0.05586076	0.01872390	0.12087843	0.03316986	0.02038045		0.64729087		1.00000000
21	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						0.03544337	0.95147783	0.01307880	1.00000000
29F						0.03544339	0.95147785	0.01307876	1.00000000
29G						0.03544339	0.95147785	0.01307876	1.00000000
29H						0.02817144	0.96278381	0.00904475	1.00000000
29J						0.03544338	0.95147787	0.01307875	1.00000000
30						0.02927284	0.96212388	0.00860328	1.00000000
31A						0.07364766			1.00000000
33A									1.00000000
33B									1.00000000
34									1.00000000
35									1.00000000

¹ Proportionate use factors do not reflect permanent water transfers as a result of the Monterey Amendment and after.² Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-2 Factors for Distributing Reach Minimum OMP&R Costs Among Contractors¹

Sheet 1 of 2

Reach No.	Reach Description	Napa	Solano	Alameda-Zone 7 ²	Alameda County	Santa Clara	Future South Bay Contractor	Total
1	NORTH BAY AQUEDUCT							
2	Barker Slough through Fairfield/Vacaville Turnout	0.29251728	0.70748272					1.00000000
3A	Fairfield/Vacaville Turnout to Cordelia Forebay	0.42000793	0.57999207					1.00000000
3B	Cordelia Forebay through Benicia and Vallejo Turnouts		1.00000000					1.00000000
3B	Cordelia Forebay through Napa Turnout Reservoir	1.00000000						1.00000000
	SOUTH BAY AQUEDUCT²							
1	Bethany Reservoir through Altamont Turnout			0.42946876	0.16864923	0.40188201	0.00000000	1.00000000
2	Altamont Turnout through Patterson Reservoir			0.39618910	0.17848805	0.42532285	0.00000000	1.00000000
4	Patterson Reservoir to Del Valle Junction			0.37257554	0.18546748	0.44195698	0.00000000	1.00000000
5	Del Valle Junction through Lake Del Valle			0.53312173	0.12972254	0.33715573	0.00000000	1.00000000
6	Del Valle Junction through South Livermore Turnout			0.28280545	0.21144710	0.50574745	0.00000000	1.00000000
7	South Livermore Turnout through Vallecitos Turnout			0.14604872	0.25176680	0.60218448	0.00000000	1.00000000
8	Vallecitos Turnout through Alameda-Bayside Turnout				0.27934645	0.72065355		1.00000000
9	Alameda-Bayside Turnout through Santa Clara Terminal Facilities					1.00000000		1.00000000
1	CALIFORNIA AQUEDUCT							
1	Delta through Bethany Reservoir				0.00870517	0.02074403		N/A

Reach No.	Reach Description	San Luis Obispo	Santa Barbara	AVEK	Coachella	Crestline	Desert	Littlerock
	CALIFORNIA AQUEDUCT							
1	Delta through Bethany Reservoir	0.00531721	0.00980965	0.03130290	0.03261149	0.00133220	0.01285625	0.00049034
2A	Bethany Reservoir to Orestimba Creek	0.00556969	0.01027545	0.03278363	0.03414192	0.00139484	0.01346023	0.00051362
2B	Orestimba Creek to O'Neill Forebay	0.00557579	0.01028673	0.03282317	0.03419082	0.00139677	0.01347910	0.00051418
3	O'Neill Forebay to Dos Amigos Pumping Plant	0.00557472	0.01028476	0.03281798	0.03418767	0.00139663	0.01347773	0.00051409
4	Dos Amigos Pumping Plant to Panoche Creek	0.00557360	0.01028270	0.03281253	0.03418436	0.00139648	0.01347630	0.00051400
5	Panoche Creek to Five Points	0.00557222	0.01028014	0.03280571	0.03418023	0.00139630	0.01347451	0.00051388
6	Five Points to Arroyo Pasajero	0.00557012	0.01027626	0.03279539	0.03417401	0.00139599	0.01347180	0.00051368
7	Arroyo Pasajero to Kettleman City	0.00556944	0.01027501	0.03279208	0.03417200	0.00139589	0.01347093	0.00051361
8C	Kettleman City through Milham Avenue	0.00551362	0.01017203	0.03245544	0.03380385	0.00138102	0.01332672	0.00050847
8D	Milham Avenue through Avenal Gap	0.00562578	0.01037893	0.03311858	0.03450099	0.00140943	0.01360122	0.00051880
9	Avenal Gap through Twisselman Road			0.03487590	0.03506593	0.00151577	0.01430879	0.00055739
10A	Twisselman Road through Lost Hills			0.03541492	0.03560973	0.00153966	0.01453292	0.00056600
11B	Lost Hills to 7th Standard Road			0.03876599	0.03898858	0.00168766	0.01592313	0.00061955
12D	7th Standard Road through Elk Hills Road			0.04062326	0.04086218	0.00176990	0.01669509	0.00064922
12E	Elk Hills Road through Tupman Road			0.04067436	0.04091461	0.00177239	0.01671773	0.00065006
13B	Tupman Road to Buena Vista Pumping Plant			0.04396863	0.04423547	0.00191768	0.01808321	0.00070269
14A	Buena Vista Pumping Plant through Santiago Creek			0.04605876	0.04634448	0.00201035	0.01895277	0.00073611
14B	Santiago Creek through Old River Road			0.04670791	0.04700238	0.00203984	0.01922748	0.00074647
14C	Old River Road to Wheeler Ridge Pumping Plant			0.04788751	0.04819483	0.00209269	0.01972179	0.00076533
15A	Wheeler Ridge Pumping Plant to Chrisman Pumping Plant			0.04857809	0.04889274	0.00212358	0.02001090	0.00077637
16A	Chrisman Pumping Plant to Edmonston Pumping Plant			0.05017462	0.05050488	0.00219467	0.02067706	0.00080191
17E	Edmonston Pumping Plant to Porter Tunnel			0.05215958	0.05250984	0.00228321	0.02150622	0.00083365
17F	Porter Tunnel to Junction, West Branch, California Aqueduct			0.05226294	0.05261398	0.00228776	0.02154897	0.00083530
18A	Junction, West Branch, California Aqueduct through Alamo Powerplant			0.13774725	0.11306511	0.00603056	0.05137695	0.00220155
19	Alamo Powerplant to Fairmont			0.13774370	0.11306344	0.00603069	0.05137766	0.00220151
19C	Buttes Junction through Buttes Reservoir			1.00000000				
20A	Fairmont through 70th Street West			0.06855702	0.12212506	0.00651522	0.05550243	0.00237787
20B	70th Street West to Palmdale			0.02284441	0.12811683	0.00683511	0.05822670	0.00249455
21	Palmdale to Littlerock Creek			0.02327543	0.13055246	0.00696606	0.05933989	0.00254183
22A	Littlerock Creek to Pearblossom Pumping Plant			0.01190663	0.13241285	0.00706574	0.06018798	
22B	Pearblossom 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 through Devil Canyon Powerplant				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, California Aqueduct through Oso Pumping Plant			0.00296720				
29F	Oso Pumping Plant through Quail Embankment			0.00296796				
29G	Quail Embankment through Warne Powerplant							
29H	Pyramid Dam and Lake							
29J	Pyramid Lake through Castaic Powerplant							
30	Castaic Dam and Lake							
31A	Avenal Gap to Devil's Den Pumping Plant	0.10542164	0.19449108		0.05400251		0.01800084	
33A	Devil's Den Pumping Plant through Tank 1	0.10101221	0.89898779					
33B	Tank 1 through Chorro Valley Turnout	0.10101221	0.89898779					
34	Chorro Valley Turnout through Lopez Turnout	0.05271277	0.94728723					
35	Lopez Turnout through Guadalupe Turnout		1.00000000					

¹ Proportionate use factors apply to 2022, and reflect permanent capacity water transfers that have been signed as of February 1, 2021.² South Bay Aqueduct factors reflect enlargement capacities for Alameda County Flood Control and Water Conservation District, Zone 7. These factors are applicable for years 2015 and forward.

TABLE B-2 Factors for Distributing Reach Minimum OMP&R Costs Among Contractors¹

Sheet 2 of 2

Reach No.	Napa	Solano	Alameda- Zone 7	Dudley Ridge	Empire	Future Contractor San Joaquin Valley	Kern		Kings	Oak Flat	Tulare
							Municipal and Industrial	Agricultural			
	CALIFORNIA AQUEDUCT										
1	0.00101482	0.00145893	0.02319901	0.01349570	0.00088461	0.00254078	0.02734537	0.27096661	0.00247148	0.00166714	0.02580275
2A	0.00106145	0.00152588	0.00868251	0.01410081	0.00092428	0.00266143	0.02862280	0.28310507	0.00258398	0.00174185	0.02695974
2B	0.00106360	0.00152903	0.00869820	0.01413883	0.00092676	0.00266435	0.02866750	0.28387568	0.00258988		0.02703241
3	0.00106370	0.00152918	0.00869836	0.01414278	0.00092702	0.00266383	0.02866595	0.28395699	0.00259028		0.02703994
4	0.00106379	0.00152932	0.00869852	0.01414692	0.00092729	0.00266329	0.02866433	0.28404246	0.00259072		0.02704786
5	0.00106390	0.00152950	0.00869873	0.01415210	0.00092763	0.00266262	0.02866229	0.28414920	0.00259125		0.02705775
6	0.00106409	0.00152978	0.00869906	0.01415993	0.00092814	0.00266161	0.02865922	0.28431071	0.00259206		0.02707272
7	0.00106415	0.00152988	0.00869918	0.01416245	0.00092832	0.00266127	0.02865823	0.28436250	0.00259232		0.02707752
8C	0.00105126	0.00151126	0.00859811	0.01396988	0.00091570	0.00263462	0.02834121	0.28048000	0.00255949		0.02670939
8D	0.00107347	0.00154323	0.00877815	0.01427284		0.00268820	0.02892875	0.28656839	0.00165698		0.00825002
9	0.00079077	0.00109117	0.00779026				0.03113088	0.28994559			
10A	0.00080367	0.00110880	0.00791534				0.03162743	0.27881661			
11B	0.00064367	0.00094254	0.00351060				0.03469801	0.21548493			
12D							0.03640750	0.18286854			
12E							0.03646180	0.18175865			
13B							0.01396780	0.14042247			
14A							0.00592355	0.10802055			
14B							0.00601264	0.09940480			
14C							0.00617095	0.07838713			
15A							0.00626342	0.06492276			
16A							0.00647554	0.03387634			
17E							0.00198233				
31A	0.00628695	0.00977801	0.02617705			0.05037550		0.36716813	0.00176551		

Reach No.	Mojave	Palmdale	San Bernardino	San Gabriel	San Geronio	Santa Clarita ²	Metroplitan	Ventura	California Aqueduct Total
	CALIFORNIA AQUEDUCT								
1	0.02235967	0.00458372	0.02355927	0.00648440	0.00397223	0.02543294	0.41531378	0.00427755	1.00000000
2A	0.02339345	0.00480082	0.02466697	0.00679035	0.00415899	0.02659606	0.43500352	0.00448066	1.00000000
2B	0.02343677	0.00480645	0.02470097	0.00679904	0.00416471	0.02665338	0.43550031	0.00448557	1.00000000
3	0.02343752	0.00480564	0.02469831	0.00679811	0.00416426	0.02665660	0.43542322	0.00448473	1.00000000
4	0.02343829	0.00480480	0.02469552	0.00679714	0.00416380	0.02665996	0.43534219	0.00448383	1.00000000
5	0.02343927	0.00480373	0.02469202	0.00679592	0.00416322	0.02666418	0.43524098	0.00448272	1.00000000
6	0.02344072	0.00480212	0.02468675	0.00679407	0.00416233	0.02667055	0.43508787	0.00448102	1.00000000
7	0.02344119	0.00480162	0.02468505	0.00679346	0.00416205	0.02667259	0.43503878	0.00448048	1.00000000
8C	0.02316660	0.00475269	0.02442207	0.00672261	0.00411770	0.02634212	0.44210856	0.00443558	1.00000000
8D	0.02365255	0.00484967	0.02492461	0.00686039	0.00420245	0.02690139	0.45116937	0.00452581	1.00000000
9	0.02151929	0.00521180	0.02680496	0.00737540	0.00451947	0.02759444	0.48503968	0.00486251	1.00000000
10A	0.02185034	0.00529275	0.02722726	0.00749079	0.00459067	0.02804585	0.49262963	0.00493763	1.00000000
11B	0.02391004	0.00579559	0.02984414	0.00820674	0.00503189	0.03082566	0.53971652	0.00540476	1.00000000
12D	0.02505081	0.00599111	0.03129850	0.00860427	0.00527709	0.03237873	0.56586015	0.00566365	1.00000000
12E	0.02508148	0.00599865	0.03134228	0.00861586	0.00528449	0.03243323	0.56662365	0.00567076	1.00000000
13B	0.02710686	0.00648455	0.03391167	0.00931912	0.00571769	0.03515621	0.61287595	0.00613000	1.00000000
14A	0.02839029	0.00679287	0.03555047	0.00976684	0.00599398	0.03671535	0.64232226	0.00642137	1.00000000
14B	0.02878644	0.00688867	0.03607197	0.00990811	0.00608189	0.03299597	0.65161359	0.00651184	1.00000000
14C	0.02950887	0.00706269	0.03700648	0.01016250	0.00623945	0.03177926	0.66834427	0.00667625	1.00000000
15A	0.02993197	0.00716455	0.03755281	0.01031130	0.00633155	0.03223745	0.67812999	0.00677252	1.00000000
16A	0.03091124	0.00740007	0.03880992	0.01065425	0.00654351	0.03329671	0.70068423	0.00699505	1.00000000
17E	0.03212830	0.00769290	0.04037534	0.01108105	0.00680742	0.03461371	0.72875471	0.00727174	1.00000000
17F	0.03219190	0.00770814	0.04045569	0.01110307	0.00682097	0.03468230	0.73020283	0.00728615	1.00000000
18A	0.04929713	0.01652427	0.10664131	0.02926634	0.01798005		0.46986948		1.00000000
19	0.04929585	0.01652388	0.10664396	0.02926656	0.01798044		0.46987231		1.00000000
19C									1.00000000
20A	0.05324421	0.01784728	0.11521174	0.03161525	0.01942494		0.50757898		1.00000000
20B	0.05585607	0.01872278	0.12086783	0.03316690	0.02037859		0.53249023		1.00000000
21	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						0.05726734	0.92702291	0.01274255	1.00000000
29F						0.05726649	0.92702302	0.01274253	1.00000000
29G						0.05742327	0.92979606	0.01278067	1.00000000
29H						0.03349572	0.95753173	0.00897255	1.00000000
29J						0.05740996	0.92980918	0.01278086	1.00000000
30						0.03248607	0.95895422	0.00855971	1.00000000
31A	0.09301782					0.07351496			1.00000000
33A									1.00000000
33B									1.00000000
34									1.00000000
35									1.00000000

¹ Proportionate use factors apply to 2022 and reflect permanent capacity water transfers that have been signed as of February 1, 2021.² Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-3 Power Costs and Credits, Transmission Costs and Annual Replacement Deposits for Each Aqueduct Pumping and Power Recovery Plant¹ (in dollars)

Calendar Year	NORTH BAY AQUEDUCT			SOUTH BAY AQUEDUCT	CALIFORNIA AQUEDUCT			
	Reach 1	Reach 3A	Reach 3B	Reach 1*	Reach 1	Reach 4	Reach 14A	Reach 15A
	Barker Slough Pumping Plant	Cordelia Pumping Plant Solano	Cordelia Pumping Plant Napa ²	South Bay and Del Valle Pumping Plants	Banks Pumping Plant	Dos Amigos Pumping Plant	Buena Vista Pumping Plant	Teerink Pumping Plant
	[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	6,365,669	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	36,054	26,104	11,921	521,799	6,462,089	2,482,790	1,749,495	1,508,344
2000	60,770	42,270	15,522	738,749	8,139,852	3,158,037	3,023,609	3,191,600
2001	370,971	247,499	211,786	4,203,321	27,319,774	10,577,923	14,853,220	15,739,675
2002	192,540	104,564	61,470	2,036,126	17,666,689	7,284,182	8,870,415	9,554,380
2003	198,411	118,387	97,762	2,591,352	24,686,904	9,172,710	10,694,766	11,529,669
2004	262,243	139,241	107,251	2,420,894	22,910,295	9,450,923	12,600,249	13,757,895
2005	291,653	148,222	149,332	2,796,466	33,843,372	12,777,130	11,868,461	12,642,244
2006	242,154	117,460	148,345	2,568,839	24,339,547	10,548,227	11,560,760	12,365,249
2007	462,111	228,602	257,569	4,819,491	23,715,006	11,695,763	17,525,962	19,010,104
2008	430,968	196,012	308,003	3,431,443	14,724,510	6,683,865	11,681,734	13,417,359
2009	221,737	103,298	164,960	2,502,266	13,817,405	4,321,537	7,111,190	7,918,673
2010	265,310	112,275	219,598	2,505,650	27,496,067	9,982,260	11,242,799	11,838,347
2011	275,556	115,853	232,342	3,360,022	40,345,447	15,490,865	14,791,387	15,502,466
2012	268,876	119,755	188,049	3,669,585	23,718,573	12,244,296	14,182,610	14,515,920
2013	442,871	206,271	329,682	5,239,983	22,948,225	9,508,627	13,263,175	13,678,767
2014	390,522	185,664	478,305	4,499,338	18,515,305	4,795,725	8,620,766	8,976,306
2015	393,929	241,043	364,189	5,351,140	16,683,160	6,200,710	10,649,282	12,031,281
2016	283,041	159,315	265,349	4,689,684	38,238,739	12,514,225	16,718,094	18,121,865
2017	310,500	185,234	200,744	3,347,913	47,565,007	22,786,344	24,575,554	25,903,780
2018	538,277	313,909	342,546	5,573,674	31,770,996	11,881,306	15,476,432	15,985,383
2019	480,702	265,853	337,820	2,882,357	43,147,702	17,697,724	18,965,532	20,058,958
2020	600,922	371,216	399,188	4,788,083	17,691,531	7,967,640	10,082,476	11,993,898
2021	595,208	251,810	390,084	5,828,570	26,780,699	5,212,534	9,938,956	8,898,066
2022	596,826	0	569,595	5,289,964	44,093,754	17,846,237	23,399,613	23,848,477
2023	696,447	0	664,670	5,453,497	45,056,204	17,215,243	22,073,371	22,365,683
2024	644,130	0	421,755	5,865,968	54,646,800	20,403,180	25,648,141	26,455,147
2025	645,432	0	422,608	5,877,824	31,092,080	20,272,575	25,390,871	26,173,364
2026	645,390	0	422,580	5,877,438	55,930,466	20,271,242	25,389,201	26,171,643
2027	645,520	0	422,665	5,878,626	27,732,713	20,275,339	25,394,332	26,176,931
2028	645,273	0	422,503	5,876,370	48,948,866	20,267,559	25,384,588	26,166,888
2029	645,414	0	422,596	5,877,661	53,847,924	20,272,011	25,390,164	26,172,636
2030	645,413	0	422,595	5,877,649	42,463,346	20,271,968	25,390,111	26,172,581
2031	645,404	0	422,589	5,877,568	41,209,988	20,271,691	25,389,763	26,172,222
2032	645,416	0	422,597	5,877,679	46,861,774	20,272,074	25,390,243	26,172,717
2033	645,493	0	422,647	5,878,374	41,465,822	20,274,470	25,393,244	26,175,811
2034	645,258	0	422,493	5,876,235	42,006,631	20,267,091	25,384,002	26,166,284
2035	645,562	0	422,693	5,884,084	46,925,341	20,276,660	25,395,988	26,178,639
TOTAL	16,944,066	4,275,572	12,066,844	179,149,908	1,294,850,654	544,435,709	668,692,912	696,750,428

¹ Starting with 2005, transmission costs that vary and depend on power usage are included, therefore recovered through the variable component.

² Power costs for the period 1968 through 1987 are for an interim facility.

* 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 Plant¹ (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 2E (EBX)
	Chrisman Pumping Plant	Edmonston Pumping Plant	Alamo Powerplant	Pearblossom Pumping Plant	Mojave Siphon Powerplant	Devil Canyon Powerplant	Greenspot Pump Station	Citrus Pump Station
	[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	3,755,592	14,466,419	(2,980,122)	1,910,542	(2,587,958)	(15,232,207)	0	0
2000	7,198,298	25,885,224	(5,123,988)	3,787,674	(4,402,610)	(25,758,437)	0	0
2001	35,022,118	127,851,427	(3,383,762)	18,669,512	(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	25,596,032	94,010,922	(3,408,979)	14,573,122	(6,565,620)	(27,777,638)	0	0
2004	30,537,142	112,157,127	(6,431,864)	17,022,676	(7,858,117)	(32,044,505)	78,555	0
2005	27,903,257	98,001,353	(5,880,165)	17,491,390	(6,454,740)	(28,818,797)	69,675	0
2006	27,031,692	85,162,213	(4,091,143)	15,897,803	(6,391,206)	(34,897,387)	123,850	0
2007	41,483,141	138,963,883	(3,029,048)	19,290,741	(5,896,486)	(28,814,592)	249,247	0
2008	26,303,550	82,319,716	(3,426,928)	10,848,292	(3,300,797)	(16,968,293)	243,120	0
2009	16,505,648	75,455,351	(3,266,008)	9,232,680	(2,288,833)	(13,842,660)	360,469	0
2010	26,188,035	95,967,889	(5,115,083)	16,896,385	(5,653,201)	(24,769,829)	313,518	0
2011	33,898,542	118,678,644	(6,536,645)	23,343,392	(7,792,422)	(32,285,174)	371,784	0
2012	32,006,954	111,758,355	(2,492,869)	16,862,107	(8,905,115)	(23,525,846)	436,935	0
2013	29,886,253	105,217,112	(2,081,221)	12,238,125	(4,915,165)	(14,305,918)	460,795	0
2014	19,719,066	68,276,577	(1,786,122)	7,199,676	(1,465,644)	(5,391,598)	317,659	0
2015	26,670,261	94,909,655	(2,289,717)	9,270,446	(2,103,231)	(6,675,218)	345,261	0
2016	39,961,379	143,096,047	(7,801,980)	24,272,460	(8,723,634)	(21,862,397)	705,640	0
2017	56,645,959	205,575,605	(14,494,695)	40,095,735	(21,279,891)	(37,337,924)	370,732	1,050,753
2018	35,296,124	125,887,073	(5,755,465)	21,747,385	(6,979,417)	(19,682,937)	7,946	1,225,939
2019	43,750,142	157,292,047	(6,884,861)	32,506,327	(12,556,957)	(31,124,021)	154,185	1,539,458
2020	26,333,407	93,092,327	(5,090,373)	11,838,048	(4,186,298)	(9,479,273)	215,603	652,160
2021	19,719,853	70,539,123	(2,438,111)	8,438,047	(2,778,062)	(4,488,744)	5,549	151,515
2022	54,076,396	197,861,051	(10,425,755)	34,260,875	(17,688,297)	(28,826,658)	0	571,213
2023	50,600,594	184,824,062	(10,426,424)	35,217,253	(17,669,251)	(28,793,497)	0	531,337
2024	60,315,059	220,303,567	(13,199,360)	39,194,993	(16,736,299)	(27,880,711)	0	632,457
2025	59,659,270	217,856,124	(13,196,543)	39,274,217	(16,736,299)	(27,880,712)	0	633,735
2026	59,655,347	217,841,800	(13,196,543)	39,271,634	(16,736,299)	(27,880,711)	0	633,694
2027	59,667,402	217,885,820	(13,196,543)	39,279,570	(16,736,299)	(27,880,712)	0	633,822
2028	59,644,508	217,802,218	(13,196,543)	39,264,500	(16,736,298)	(27,880,711)	0	633,578
2029	59,657,610	217,850,062	(13,196,543)	39,273,125	(16,736,299)	(27,880,710)	0	633,718
2030	59,657,486	217,849,607	(13,196,543)	39,273,043	(16,736,299)	(27,880,711)	0	633,716
2031	59,656,667	217,846,617	(13,196,543)	39,272,503	(16,736,299)	(27,880,712)	0	633,708
2032	59,657,796	217,850,740	(13,196,543)	39,273,246	(16,736,299)	(27,880,712)	0	633,720
2033	59,664,847	217,876,491	(13,196,543)	39,277,889	(16,736,299)	(27,880,711)	0	633,794
2034	59,643,131	217,797,191	(13,196,543)	39,263,594	(16,736,298)	(27,880,711)	0	633,564
2035	59,671,293	217,900,028	(13,196,543)	39,282,133	(16,736,299)	(27,880,710)	0	633,863
TOTAL	1,553,202,302	5,593,804,029	(302,746,085)	947,122,229	(382,345,534)	(1,094,623,093)	4,830,523	13,325,744

¹ 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 Plant¹ (in dollars)

Calendar Year	CALIFORNIA AQUEDUCT (continued)							Grand Total
	Reach 3A (EBX)	Reach 4B (EBX)	Reach 29A	Reach 29G	Reach 29J	Reach 31A	Reach 33A	
	Crafton Hills Pump Station	Cherry Valley Pump Station	Oso Pumping Plant	Warne Powerplant	Castaic Powerplant	Las Perillas and Badger Hill Pumping Plants	Devil's Den, Bluestone, and Polonio Pass Pumping Plants	
	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]
1961	0	0	0	0	0	0	0	0
1962	0	0	0	0	0	0	0	36,771
1963	0	0	0	0	0	0	0	55,654
1964	0	0	0	0	0	0	0	73,240
1965	0	0	0	0	0	0	0	137,665
1966	0	0	0	0	0	0	0	186,064
1967	0	0	0	0	0	0	0	231,968
1968	0	0	0	0	0	118,676	0	1,117,913
1969	0	0	0	0	0	78,350	0	773,646
1970	0	0	0	0	0	136,429	0	1,103,798
1971	0	0	0	0	0	166,296	0	1,476,135
1972	0	0	79,315	0	(211,144)	212,938	0	3,073,359
1973	0	0	122,787	0	(1,057,564)	114,897	0	2,934,059
1974	0	0	157,511	0	(1,547,884)	111,442	0	3,683,880
1975	0	0	314,636	0	(2,455,461)	88,451	0	5,817,780
1976	0	0	326,967	0	(2,827,557)	139,279	0	8,211,705
1977	0	0	75,335	0	(3,734,462)	63,079	0	886,421
1978	0	0	89,383	0	(1,542,479)	176,153	0	7,272,153
1979	0	0	102,584	0	(2,776,030)	188,881	0	9,599,576
1980	0	0	236,768	0	(3,415,486)	168,458	0	10,419,251
1981	0	0	444,280	0	(2,834,322)	169,177	0	17,563,899
1982	0	0	539,245	(783,626)	(3,463,971)	168,390	0	13,477,272
1983	0	0	214,069	(1,488,439)	(6,649,718)	17,920	0	(7,452,864)
1984	0	0	484,239	(4,088,209)	(4,710,802)	112,679	0	(4,159,491)
1985	0	0	874,069	(5,930,176)	(15,698,638)	146,843	0	(9,861,182)
1986	0	0	1,269,590	(5,579,301)	(11,072,448)	297,886	0	11,622,736
1987	0	0	1,355,533	(6,445,265)	(11,726,458)	245,082	0	6,701,444
1988	0	0	1,515,349	(7,457,050)	(13,026,992)	214,519	0	6,239,207
1989	0	0	2,156,915	(8,822,367)	(15,535,849)	282,180	0	24,585,082
1990	0	0	2,913,030	(11,225,401)	(20,510,539)	416,832	0	48,154,174
1991	0	0	576,721	(3,882,595)	(6,579,194)	3,610	0	2,462,222
1992	0	0	829,862	(6,369,339)	(10,976,538)	101,665	0	(5,509,968)
1993	0	0	70,836	(4,665,393)	(9,531,404)	(111,306)	0	(24,907,973)
1994	0	0	1,503,796	(7,249,239)	(13,126,331)	206,086	(1,127)	13,499,083
1995	0	0	247,869	(1,934,202)	(4,049,615)	243,434	0	(142,957)
1996	0	0	895,929	(4,248,531)	(8,457,232)	296,170	0	15,870,542
1997	0	0	902,690	(4,824,488)	(8,776,260)	298,483	208,816	14,336,879
1998	0	0	(67,399)	(1,811,154)	(4,644,120)	(55,491)	(92,902)	(24,405,948)
1999	0	0	757,085	(5,831,573)	(9,811,777)	170,445	241,369	(2,343,588)
2000	0	0	1,307,386	(10,161,472)	(17,729,381)	228,532	378,042	(6,020,323)
2001	0	0	6,412,531	(7,918,467)	(13,370,061)	1,061,695	2,140,040	216,231,944
2002	0	0	4,246,409	(11,349,183)	(19,513,997)	547,531	1,344,783	94,808,314
2003	0	0	4,642,103	(10,436,535)	(17,134,431)	637,936	1,538,955	134,765,827
2004	68,914	7,290	5,682,375	(12,281,228)	(21,354,179)	675,724	1,804,179	149,713,081
2005	49,010	2,548	3,712,885	(7,106,531)	(13,339,416)	859,917	1,753,288	162,760,553
2006	144,846	16,318	2,767,050	(7,208,025)	(12,042,760)	870,640	1,547,938	130,822,412
2007	256,954	11,191	7,601,732	(11,444,524)	(21,845,299)	1,344,081	2,350,122	218,235,752
2008	327,206	7,446	4,778,592	(7,762,363)	(14,997,326)	1,168,629	1,735,140	132,149,878
2009	391,372	7,531	4,625,483	(6,997,502)	(15,725,766)	711,012	1,018,798	102,348,640
2010	431,030	19,506	3,835,535	(6,643,531)	(11,641,405)	939,577	1,507,158	155,937,888
2011	499,615	33,108	3,568,564	(5,996,974)	(10,892,193)	1,149,892	2,173,461	210,327,529
2012	533,579	48,171	5,510,580	(8,863,057)	(15,797,149)	1,041,736	2,019,898	179,541,943
2013	557,947	36,868	6,767,052	(9,189,037)	(15,851,695)	1,447,274	2,073,468	177,959,459
2014	440,998	16,594	4,838,287	(4,376,621)	(7,912,327)	1,678,114	2,547,742	130,564,331
2015	461,141	15,152	7,368,826	(6,599,051)	(11,183,098)	1,696,668	2,009,646	165,811,474
2016	781,683	49,119	6,588,412	(7,078,001)	(12,085,744)	1,623,737	3,143,145	253,660,177
2017	1,235,207	86,117	6,599,088	(7,354,995)	(12,930,250)	1,692,267	3,146,388	347,975,171
2018	968,007	44,318	5,320,507	(5,753,362)	(10,120,900)	2,057,442	3,745,154	229,890,338
2019	1,054,944	52,540	4,581,874	(5,121,274)	(8,967,375)	1,795,450	2,462,679	284,371,806
2020	825,191	77,427	6,198,068	(6,008,803)	(10,521,051)	1,887,620	2,026,382	161,755,390
2021	132,620	13,178	4,384,838	(3,270,809)	(5,621,865)	889,425	858,797	144,431,281
2022	502,771	85,382	7,977,693	(8,425,468)	(13,992,772)	1,144,793	3,868,755	336,634,445
2023	467,734	79,043	5,980,760	(6,344,205)	(10,325,948)	1,178,548	3,985,882	322,831,003
2024	555,988	98,772	7,639,761	(6,867,355)	(10,141,428)	911,153	5,989,789	394,901,507
2025	557,112	98,971	7,314,667	(6,574,307)	(10,141,428)	913,768	6,008,793	367,662,122
2026	557,076	98,965	7,314,186	(6,574,307)	(10,141,428)	913,708	6,008,398	392,473,480
2027	557,188	98,985	7,315,664	(6,574,307)	(10,141,428)	913,892	6,009,612	364,358,792
2028	556,974	98,947	7,312,857	(6,575,140)	(10,141,428)	913,542	6,007,307	385,416,358
2029	557,097	98,968	7,314,463	(6,574,307)	(10,141,428)	913,742	6,008,626	390,406,530
2030	557,096	98,968	7,314,448	(6,574,307)	(10,141,428)	913,740	6,008,614	379,021,093
2031	557,088	98,967	7,314,347	(6,574,307)	(10,141,428)	913,728	6,008,531	377,762,092
2032	557,099	98,969	7,314,486	(6,575,140)	(10,141,428)	913,745	6,008,645	383,420,824
2033	557,164	98,980	7,315,350	(6,574,307)	(10,141,428)	913,853	6,009,355	378,074,296
2034	556,962	98,944	7,312,688	(6,574,307)	(10,141,428)	913,520	6,007,168	378,465,469
2035	557,225	98,991	7,316,141	(6,574,307)	(10,141,428)	913,952	6,010,004	383,583,310
TOTAL	16,814,838	1,896,273	232,384,681	(355,513,764)	(647,343,799)	44,278,516	123,620,840	9,165,873,793

¹ 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 (acre-feet)

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA ¹				CENTRAL COASTAL AREA		
	Napa ²	Solano	Total	Alameda-Zone 7	Alameda County	Santa Clara	Total	San Luis Obispo	Santa Barbara	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	29,025	47,506	76,531	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

¹ 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.

² Napa'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 (acre-feet)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge	Empire	Kern			Kings	Oak Flat	Tulare	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	48,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,136,556
2015	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2016	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2017	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2018	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2019	45,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,133,556
2020	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2021	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2022	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2023	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2024	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2025	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2026	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2027	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2028	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2029	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2030	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2031	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2032	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2033	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2034	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
2035	41,350	3,000	134,600	848,130	982,730	9,305	5,700	87,471	1,129,556
TOTAL	3,008,632	199,000	7,693,900	51,855,303	59,549,203	403,050	352,822	5,959,901	69,472,608

TABLE B-4 Maximum Contractual Table A Amounts (acre-feet)

Calendar Year	SOUTHERN CALIFORNIA AREA									
	AVEK	Coachella	Crestline	Desert	Littlerock	Mojave	Palmdale	San Bernardino	San Gabriel	San Geronio
	[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	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	20,000	5,200	526	8,000	170	8,400	1,620	1,677	122	0
1973	25,000	5,800	870	9,000	290	10,700	2,940	48,000	11,500	0
1974	30,000	6,400	1,160	10,000	400	13,100	4,260	50,000	12,300	0
1975	35,000	7,000	1,450	11,000	520	15,400	5,580	52,500	13,100	0
1976	44,000	7,600	1,740	12,000	640	17,800	6,900	55,000	14,000	0
1977	50,000	8,421	2,030	13,000	730	20,200	8,220	57,500	14,800	0
1978	57,000	9,242	2,320	14,000	920	0	9,340	60,000	15,700	0
1979	63,000	10,063	2,610	15,000	1,040	24,900	10,260	62,500	16,600	0
1980	69,200	10,884	2,900	17,000	1,150	27,200	11,180	65,500	17,400	6,800
1981	75,000	12,105	3,190	19,000	1,270	23,100	11,700	68,500	18,300	7,800
1982	81,300	13,326	3,480	21,000	1,380	22,843	12,320	71,500	19,100	8,800
1983	87,700	14,547	3,770	23,000	1,500	34,300	12,940	74,500	19,900	9,800
1984	35,000	15,768	4,060	25,000	1,610	36,700	13,560	78,000	20,700	10,800
1985	40,000	16,989	4,350	27,000	1,730	39,000	14,180	81,500	21,800	11,800
1986	42,000	18,210	4,640	29,000	1,840	41,400	14,800	85,000	23,200	12,900
1987	44,000	19,431	4,930	31,500	1,960	43,700	15,420	89,000	24,600	14,000
1988	46,000	20,652	5,220	34,000	2,070	46,000	16,040	93,000	26,000	15,100
1989	125,700	21,873	5,510	36,500	2,190	48,500	16,660	97,000	27,400	16,200
1990	132,100	23,100	5,800	38,100	2,300	50,800	17,300	101,500	28,800	17,300
1991	138,400	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800	17,300
1992	138,400	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800	17,300
1993	138,400	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800	17,300
1994	138,400	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800	17,300
1995	138,400	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800	17,300
1996	138,400	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800	0
1997	138,400	23,100	5,800	38,100	2,300	50,800	17,300	102,600	28,800	0
1998	138,400	23,100	5,800	38,100	2,300	75,800	17,300	102,600	28,800	0
1999	138,400	23,100	5,800	38,100	2,300	75,800	17,300	102,600	28,800	2,000
2000	138,400	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800	3,000
2001	138,400	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800	4,000
2002	141,400	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800	4,000
2003	141,400	23,100	5,800	38,100	2,300	75,800	21,300	102,600	28,800	5,000
2004	141,400	33,000	5,800	38,100	2,300	75,800	21,300	102,600	28,800	6,000
2005	141,400	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800	6,500
2006	141,400	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800	7,000
2007	141,400	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800	8,650
2008	141,400	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800	17,300
2009	141,400	121,100	5,800	50,000	2,300	75,800	21,300	102,600	28,800	17,300
2010	141,400	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800	17,300
2011	141,400	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800	17,300
2012	141,400	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800	17,300
2013	141,400	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800	17,300
2014	144,844	138,350	5,800	55,750	2,300	82,800	21,300	102,600	28,800	17,300
2015	144,844	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800	17,300
2016	144,844	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800	17,300
2017	144,844	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800	17,300
2018	144,844	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800	17,300
2019	144,844	138,350	5,800	55,750	2,300	85,800	21,300	102,600	28,800	17,300
2020	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2021	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2022	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2023	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2024	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2025	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2026	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2027	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2028	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2029	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2030	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2031	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2032	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2033	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2034	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
2035	144,844	138,350	5,800	55,750	2,300	89,800	21,300	102,600	28,800	17,300
TOTAL	7,507,768	4,782,511	321,556	2,626,000	127,210	4,069,043	1,127,720	5,909,177	1,641,322	748,350

TABLE B-4 Maximum Contractual Table A Amounts (acre-feet)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	Grand Total
	Santa Clarita ³	Metropolitan	Ventura	Total	Yuba City	Butte	Plumas	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	3,700	0	0	3,700	0	300	250	550	0	191,500
1969	5,000	0	0	5,000	0	350	270	620	0	267,395
1970	5,700	0	0	5,700	0	400	300	700	0	322,600
1971	6,700	0	0	6,700	0	450	440	890	0	375,590
1972	8,936	154,772	0	209,423	0	500	470	970	0	741,759
1973	12,400	354,600	0	481,100	0	600	500	1,100	0	986,252
1974	15,400	454,900	0	597,920	0	700	530	1,230	0	1,182,200
1975	18,200	555,200	0	714,950	0	1,050	560	1,610	0	1,386,869
1976	21,200	655,600	0	836,480	0	1,400	590	1,990	0	1,508,387
1977	24,100	755,900	0	954,901	0	1,800	620	2,420	0	1,667,321
1978	24,762	856,300	0	1,049,584	0	1,200	650	1,850	0	1,818,034
1979	28,000	956,600	0	1,190,573	0	1,450	680	2,130	0	2,028,088
1980	30,400	1,057,000	1,000	1,317,614	0	1,100	710	1,810	0	2,214,770
1981	32,800	1,157,300	2,000	1,432,065	0	1,200	740	1,940	0	2,392,468
1982	34,800	1,257,600	3,000	1,550,449	0	1,200	770	1,970	0	2,574,545
1983	37,300	1,358,000	4,000	1,681,257	0	1,200	800	2,000	0	2,701,164
1984	39,600	1,458,300	5,000	1,744,098	1,600	1,200	830	3,630	0	2,884,337
1985	41,800	1,558,700	6,000	1,864,849	1,700	1,200	860	3,760	0	3,055,846
1986	43,600	1,659,300	8,000	1,983,890	2,100	1,200	890	4,190	0	3,257,736
1987	45,600	1,759,800	10,000	2,103,941	2,500	1,200	920	4,620	0	3,484,115
1988	48,000	1,860,400	13,000	2,225,482	2,900	1,200	960	5,060	0	3,688,335
1989	50,100	1,961,000	16,000	2,424,633	3,300	1,200	1,000	5,500	0	3,958,190
1990	52,000	2,011,500	20,000	2,500,600	3,800	1,200	1,040	6,040	0	4,079,666
1991	54,200	2,011,500	20,000	2,510,200	9,600	1,200	1,080	11,880	0	4,126,567
1992	54,200	2,011,500	20,000	2,510,200	9,600	1,200	1,120	11,920	0	4,138,816
1993	54,200	2,011,500	20,000	2,510,200	9,600	1,200	1,160	11,960	0	4,146,966
1994	54,200	2,011,500	20,000	2,510,200	9,600	1,200	1,200	12,000	0	4,154,201
1995	54,200	2,011,500	20,000	2,510,200	9,600	1,200	1,250	12,050	0	4,163,066
1996	54,200	2,011,500	20,000	2,492,900	9,600	1,200	1,300	12,100	0	4,111,341
1997	54,200	2,011,500	20,000	2,492,900	9,600	1,200	1,350	12,150	0	4,084,866
1998	54,200	2,011,500	20,000	2,517,900	9,600	1,200	1,400	12,200	0	4,086,021
1999	54,200	2,011,500	20,000	2,519,900	9,600	2,890	1,450	13,940	0	4,119,646
2000	95,200	2,011,500	20,000	2,565,900	9,600	2,890	1,510	14,000	0	4,121,631
2001	95,200	2,011,500	20,000	2,566,900	9,600	3,500	1,570	14,670	0	4,124,136
2002	95,200	2,011,500	20,000	2,569,900	9,600	3,500	1,630	14,730	0	4,125,031
2003	95,200	2,011,500	20,000	2,570,900	9,600	3,500	1,690	14,790	0	4,126,926
2004	95,200	2,011,500	20,000	2,581,800	9,600	3,500	0	13,100	0	4,127,061
2005	95,200	1,911,500	20,000	2,582,300	9,600	1,200	0	10,800	0	4,125,686
2006	95,200	1,911,500	20,000	2,582,800	9,600	1,200	324	11,124	0	4,126,885
2007	95,200	1,911,500	20,000	2,584,450	9,600	1,200	720	11,520	0	4,129,306
2008	95,200	1,911,500	20,000	2,593,100	9,600	27,500	2,020	39,120	0	4,165,931
2009	95,200	1,911,500	20,000	2,593,100	9,600	27,500	2,090	39,190	0	4,166,376
2010	95,200	1,911,500	20,000	2,623,100	9,600	1,731	2,160	13,491	0	4,146,227
2011	95,200	1,911,500	20,000	2,623,100	9,600	2,548	2,240	14,388	0	4,147,174
2012	95,200	1,911,500	20,000	2,623,100	9,600	27,500	2,320	39,420	0	4,172,256
2013	95,200	1,911,500	20,000	2,623,100	9,600	27,500	2,410	39,510	0	4,172,396
2014	95,200	1,911,500	20,000	2,626,544	9,600	27,500	2,500	39,600	0	4,172,536
2015	95,200	1,911,500	20,000	2,629,544	9,600	27,500	2,600	39,700	0	4,172,686
2016	95,200	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2017	95,200	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2018	95,200	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2019	95,200	1,911,500	20,000	2,629,544	9,600	27,500	2,700	39,800	0	4,172,786
2020	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2021	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2022	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2023	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2024	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2025	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2026	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2027	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2028	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2029	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2030	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2031	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2032	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2033	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2034	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
2035	95,200	1,911,500	20,000	2,633,544	9,600	27,500	2,700	39,800	0	4,172,786
TOTAL	4,545,098	109,260,272	988,000	143,654,027	449,900	775,559	106,474	1,331,933	0	233,688,159

³ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 1 of 21

Calendar Year	FEATHER RIVER AREA			NORTH BAY AQUEDUCT							
	Butte	Grizzly Valley Pipeline Plumas	Yuba City	Reach 1	Reach 3A		Reach 3A-T		Reach 3B		Total
				Solano	Napa	Solano	Napa	Solano	Napa ¹	Solano	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
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	1,214	0	1,214
1969	0	0	0	0	0	0	0	0	2,687	0	2,687
1970	0	70	0	0	0	0	0	0	3,618	0	3,618
1971	192	64	0	0	0	0	0	0	2,521	0	2,521
1972	186	505	0	0	0	0	0	0	3,647	0	3,647
1973	53	679	0	0	0	0	0	0	3,792	0	3,792
1974	127	648	0	0	0	0	0	0	4,870	0	4,870
1975	253	405	0	0	0	0	0	0	6,840	0	6,840
1976	527	382	0	0	0	0	0	0	7,122	0	7,122
1977	706	303	0	0	0	0	0	0	8,226	0	8,226
1978	579	278	0	0	0	0	0	0	6,034	0	6,034
1979	302	329	0	0	0	0	0	0	6,561	0	6,561
1980	267	295	0	0	0	0	0	0	6,707	0	6,707
1981	221	355	0	0	0	0	0	0	9,001	0	9,001
1982	334	305	0	0	0	0	0	0	1,213	0	1,213
1983	325	262	0	0	0	0	0	0	2,287	0	2,287
1984	177	272	108	0	0	0	0	0	2,923	0	2,923
1985	308	254	62	0	0	0	0	0	4,039	0	4,039
1986	313	317	328	1,400	0	0	0	0	3,519	0	4,919
1987	459	452	88	1,550	0	0	0	0	7,693	0	9,243
1988	385	523	303	1	0	9,725	0	0	5,392	0	15,118
1989	300	486	403	10	0	17,246	0	0	6,195	0	23,451
1990	380	548	494	3,275	0	15,856	0	0	6,940	0	26,071
1991	328	420	265	3,117	0	3,855	0	0	1,380	0	8,352
1992	117	485	642	5,553	0	9,220	0	0	4,001	0	18,774
1993	256	444	746	14,709	0	14,471	0	0	5,286	0	34,466
1994	329	492	1,035	10,343	0	14,913	0	0	6,792	0	32,048
1995	203	308	910	5,452	0	15,893	0	0	5,182	0	26,527
1996	257	360	820	12,930	0	17,069	0	0	4,893	0	34,892
1997	185	231	1,005	16,029	0	17,501	0	0	4,341	0	37,871
1998	527	0	1,054	11,562	0	18,204	0	0	5,359	0	35,125
1999	286	0	1,096	15,191	0	19,562	0	0	5,304	0	40,057
2000	586	0	901	15,490	0	11,290	0	10,235	4,958	0	41,973
2001	513	0	1,065	14,849	0	11,377	0	8,360	9,345	0	43,931
2002	419	0	1,181	18,841	0	11,130	0	8,589	6,875	0	45,435
2003	551	0	1,324	17,260	0	9,682	9	7,009	7,637	0	41,597
2004	1,440	0	1,434	20,951	0	10,691	135	10,860	7,999	500	51,136
2005	527	0	1,894	18,290	0	10,585	160	8,444	7,509	500	45,488
2006	468	0	5,342	16,573	0	10,865	208	7,578	7,581	500	43,305
2007	956	0	2,327	19,187	0	12,301	180	15,312	10,777	500	58,257
2008	451	243	1,923	21,436	15	11,410	37	7,974	13,240	500	54,612
2009	581	200	2,114	15,004	0	8,651	27	6,795	10,877	500	41,854
2010	807	243	2,331	17,598	0	8,231	70	4,487	12,347	500	43,233
2011	1,092	98	2,297	15,202	0	7,761	39	5,032	11,275	0	39,309
2012	1,374	79	2,695	16,508	0	8,298	47	4,541	9,860	0	39,254
2013	908	366	4,850	16,525	0	10,082	60	9,262	12,478	0	48,407
2014	1,617	251	4,237	7,354	0	6,856	41	5,469	14,123	0	33,843
2015	2,763	285	3,004	8,581	0	6,538	66	8,717	11,133	0	35,035
2016	2,518	387	1,229	10,802	1	6,464	45	6,339	8,947	0	32,598
2017	2,320	363	1,746	13,764	0	7,484	24	7,017	8,201	0	36,490
2018	3,029	508	1,715	15,487	0	8,493	22	11,092	11,660	0	46,754
2019	2,955	436	1,655	13,814	8	8,035	16	9,633	11,261	0	42,767
2020	3,186	406	1,812	17,115	0	10,410	58	10,139	12,031	0	49,753
2021	3,288	135	3,398	11,487	0	10,944	1	14,844	13,069	0	50,345
2022	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2023	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2024	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2025	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2026	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2027	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2028	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2029	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2030	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2031	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2032	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2033	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2034	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
2035	450	730	5,760	28,654	0	0	0	0	17,415	0	46,069
TOTAL	47,531	24,692	140,473	844,396	24	381,093	1,245	187,728	622,572	3,500	2,040,558

¹ For the period 1968 through 1987, deliveries were non-project water pumped through an interim facility.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 2 of 21

Calendar Year	SOUTH BAY AQUEDUCT ²										Total
	Reach 1		Reach 2	Reach 4	Reach 5		Reach 6	Reach 7	Reach 8	Reach 9	
	Alameda-Zone 7	Alameda County	Alameda-Zone 7	Alameda-Zone 7	Alameda-Zone 7	Alameda County	Alameda-Zone 7	Alameda County	Alameda County	Santa Clara	
	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
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	91,991	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	98,122
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	5,843	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	1,899	0	25,363	4,421	18,481	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	262	0	7,598	9,987	2,972	0	14,112	0	13,331	63,794	112,056
2013	237	0	11,253	9,998	3,171	0	20,197	31	23,609	78,623	147,119
2014	206	0	7,517	4,321	975	0	15,469	8,989	13,669	39,970	91,116
2015	182	0	6,136	3,640	4,594	0	15,520	6,389	14,838	65,773	117,072
2016	53	0	6,677	10,488	3,480	0	20,786	21	9,064	68,652	119,221
2017	85	0	4,188	9,110	3,225	0	9,850	0	9,734	44,995	81,187
2018	84	0	7,318	4,243	4,452	0	23,426	209	17,952	77,136	134,820
2019	142	0	10,113	3,957	3,108	0	16,076	21	8,439	40,533	82,389
2020	151	0	6,515	3,148	1,935	0	14,434	5,375	17,654	52,930	102,142
2021	258	0	5,200	3,221	999	0	20,290	6,091	17,388	53,665	107,112
2022	300	0	5,900	10,450	3,260	0	18,461	3,549	14,835	60,000	116,755
2023	300	0	5,960	10,450	3,260	0	18,401	3,549	14,835	60,000	116,755
2024	300	0	6,020	10,450	3,260	0	18,341	3,549	14,835	60,000	116,755
2025	300	0	6,070	10,450	3,260	0	18,291	3,549	14,835	60,000	116,755
2026	300	0	6,070	10,450	3,260	0	18,291	3,549	14,835	60,000	116,755
2027	300	0	6,070	10,450	3,260	0	18,291	3,549	14,835	60,000	116,755
2028	300	0	6,070	10,450	3,260	0	18,291	3,549	14,835	60,000	116,755
2029	300	0	6,070	10,450	3,260	0	18,291	3,549	14,835	60,000	116,755
2030	300	0	6,070	10,450	3,260	0	18,291	3,549	14,835	60,000	116,755
2031	300	0	6,070	10,450	3,260	0	18,291	3,549	14,835	60,000	116,755
2032	300	0	6,070	10,450	3,260	0	18,291	3,549	14,835	60,000	116,755
2033	300	0	6,070	10,450	3,260	0	18,291	3,549	14,835	60,000	116,755
2034	300	0	6,070	10,450	3,260	0	18,291	3,549	14,835	60,000	116,755
2035	300	0	6,070	10,450	3,260	0	18,291	3,549	14,835	60,000	116,755
TOTAL	29,470	53,844	423,466	420,453	130,228	11,722	837,408	385,543	752,818	4,655,536	7,700,488

² 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 (acre-feet)

Sheet 3 of 21

Calendar Year	CALIFORNIA AQUEDUCT											
	NORTH SAN JOAQUIN DIVISION						SAN LUIS DIVISION					
	Reach 1	Reach 2A					Reach 3		Reach 3A			
	Kern (Agricultural)	Alameda- Zone 7	Kern (Agricultural)	Oak Flat ³	Santa Clara	Tulare	Dudley Ridge	Metropolitan	Alameda- Zone 7	Alameda County	AVEK	Dudley Ridge
	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]	[33]	[34]
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	3,084	0	0	0	0	0	0	0	0
1969	0	0	0	3,016	0	0	0	0	0	0	0	0
1970	0	0	0	5,911	0	0	0	0	0	0	0	0
1971	0	0	0	7,212	0	0	0	0	0	0	0	0
1972	0	0	0	8,166	0	0	0	0	0	0	0	0
1973	0	0	0	3,214	0	0	0	0	0	0	0	0
1974	0	0	0	3,471	0	0	0	0	0	0	0	0
1975	0	0	0	3,576	0	0	0	0	0	0	0	0
1976	0	0	0	4,112	0	0	0	0	0	0	0	0
1977	0	0	0	1,472	0	0	0	0	0	0	0	0
1978	0	0	0	3,906	0	0	0	0	0	0	0	0
1979	0	0	0	6,149	0	0	0	0	0	0	0	0
1980	0	0	0	5,700	0	0	0	0	0	0	0	0
1981	0	0	0	4,300	0	0	0	0	0	0	0	0
1982	0	0	0	3,838	0	0	0	0	0	0	0	0
1983	0	0	0	3,822	0	0	0	0	0	0	0	0
1984	0	0	0	5,700	0	0	0	0	0	0	0	0
1985	0	0	0	5,433	0	0	0	0	0	0	0	0
1986	0	0	0	5,107	0	0	0	0	0	0	0	0
1987	0	0	0	5,625	0	0	0	0	0	0	0	0
1988	0	0	0	4,412	0	0	0	0	0	0	0	0
1989	0	0	0	6,091	0	300	602	0	0	0	0	0
1990	0	0	0	2,922	200	0	0	0	0	0	0	0
1991	0	0	0	141	0	0	0	0	0	0	0	0
1992	0	0	0	2,239	0	0	0	0	0	0	0	0
1993	0	0	0	2,858	0	0	0	0	0	0	0	0
1994	0	0	0	3,071	0	0	0	0	0	0	0	0
1995	0	0	0	5,169	0	0	0	0	0	0	0	0
1996	0	0	0	4,904	0	0	0	0	0	0	0	0
1997	0	0	0	5,238	0	0	0	11,100	0	0	0	0
1998	0	0	0	4,401	0	0	0	(11,100)	0	0	0	0
1999	0	0	0	4,871	0	0	0	0	0	0	0	0
2000	0	0	0	4,508	0	0	0	0	0	0	0	0
2001	0	0	638	3,592	0	0	0	0	0	0	0	0
2002	0	0	773	4,885	0	0	0	0	0	0	0	0
2003	0	7	917	4,266	0	0	0	0	0	0	0	0
2004	0	38	786	4,629	0	0	0	0	0	0	0	0
2005	0	299	1,046	4,194	0	0	0	0	0	0	0	0
2006	0	321	1,103	4,242	0	0	0	0	0	0	0	0
2007	0	320	1,031	3,567	0	0	0	0	0	0	0	0
2008	8,885	56	1,744	1,985	0	0	0	0	0	0	5,873	0
2009	0	0	1,169	1,993	0	0	0	0	0	0	0	0
2010	0	0	1,124	2,906	0	0	0	0	0	0	0	0
2011	0	0	1,112	2,715	0	0	0	0	0	0	0	0
2012	0	0	1,258	3,208	0	0	0	0	0	0	0	6,068
2013	0	0	1,156	2,820	0	0	0	0	0	0	0	0
2014	0	0	609	1,520	0	0	0	0	5,808	7,408	0	16,789
2015	0	0	718	1,077	0	0	0	0	2,360	6,032	0	14,460
2016	0	0	677	1,855	0	0	0	0	0	0	0	0
2017	0	0	738	2,893	0	0	0	0	0	0	0	0
2018	0	0	735	2,289	0	0	0	0	0	0	0	7,885
2019	0	0	659	2,184	0	0	0	0	0	0	0	0
2020	0	0	663	2,140	0	0	0	0	0	500	0	8,450
2021	0	0	358	822	0	0	0	0	4,950	3,202	0	6,200
2022	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2023	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2024	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2025	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2026	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2027	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2028	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2029	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2030	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2031	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2032	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2033	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2034	0	0	1,300	3,420	0	0	0	0	0	0	0	0
2035	0	0	1,300	3,420	0	0	0	0	0	0	0	0
TOTAL	8,885	1,041	37,214	251,301	200	300	602	0	13,118	17,142	5,873	59,852

³ Includes 425 acre-feet of 1988 advance allocation and 141 acre-feet of 1992 advance allocation.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 4 of 21

Calendar Year	CALIFORNIA AQUEDUCT											
	SAN LUIS DIVISION (continued)											
	Reach 3A (continued)								Reach 4			
	Kern		Metropolitan	San Gorgonio	Santa Barbara	Santa Clara	Santa Clarita ⁴	Tulare	Dudley Ridge	Kern		Santa Clarita ⁴
	Municipal and Industrial	Agricultural								Municipal and Industrial	Agricultural	
	[35]	[36]	[37]	[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]
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	1,898	0	12,647	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	14,446	0	3,500	0
1996	0	0	0	0	0	0	0	0	0	1,125	4,162	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	3,320	68,960	0	0	0	0	0	0	0	1,517	878	0
2001	0	140,242	0	0	0	30,000	0	0	0	0	0	0
2002	6,000	62,024	0	0	0	0	0	0	0	0	0	0
2003	0	151,044	29,596	0	0	0	0	0	0	0	1,351	0
2004	0	44,877	0	0	0	0	0	0	0	0	0	0
2005	0	109,712	50,000	0	0	8,804	0	277	0	0	7,000	0
2006	0	19,575	0	0	0	0	0	0	0	0	0	0
2007	71,567	116,272	0	0	0	0	0	0	0	0	0	0
2008	0	94,562	0	0	0	0	0	0	0	0	10,721	0
2009	0	164,653	52,933	0	0	9,999	3,300	0	0	0	0	0
2010	0	35,896	124,543	0	0	9,993	0	0	0	0	0	0
2011	0	0	78,324	0	0	1,825	0	0	0	0	0	0
2012	0	23,401	0	0	0	0	0	0	0	0	0	0
2013	0	64,524	0	0	0	6,000	0	0	0	0	0	6,000
2014	0	104,689	15,000	0	0	27,476	0	0	0	0	0	0
2015	0	105,549	0	0	0	17,115	0	0	0	0	3,278	0
2016	0	54,247	37,283	0	7,230	28,878	5,940	0	0	0	1,047	0
2017	0	0	15,946	0	15,584	3,497	30,000	0	0	0	0	0
2018	0	23,607	0	0	0	2,000	0	0	0	0	0	0
2019	0	27,009	0	0	0	852	0	0	0	0	0	0
2020	0	71,344	0	0	0	3,864	1,714	0	0	0	1,401	0
2021	0	34,777	0	19	0	18,151	984	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	80,887	1,516,964	403,625	19	22,814	168,454	41,938	277	16,344	2,642	45,985	6,000

⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 5 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SAN LUIS DIVISION (continued)									SOUTH SAN JOAQUIN DIVISION		
	Reach 4		Reach 5							Reach 6		
	Tulare	Dudley Ridge	Empire	Kern		Metropolitan	Oak Flat	Santa Clarita ⁴	Tulare	Empire	Kern	
				Municipal and Industrial	Agricultural						Municipal and Industrial	Agricultural
	[47]	[48]	[49]	[50]	[51]	[52]	[53]	[54]	[55]	[56]	[57]	[58]
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	1,550	0	0	0
1989	0	0	0	0	18,831	0	0	0	0	0	0	8,260
1990	1,500	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	10,823	0	0	0	0	0	0	0	0	0	0
1993	0	27,200	0	0	28,200	0	2,000	5,095	1,624	0	0	31,200
1994	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	21,776	0	0	0	0	0	0	3,932
1996	0	0	0	1,125	81,507	0	0	0	4,000	0	0	0
1997	0	0	0	9,080	154,940	0	0	0	3,500	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	20,400	33,340
1999	1,300	0	0	0	0	21,500	0	0	8,000	0	0	33,776
2000	0	0	0	8,130	57,647	0	0	0	0	0	1,457	35,847
2001	0	0	0	0	0	0	0	0	2,457	0	0	0
2002	0	0	0	0	0	0	0	0	3,000	0	0	0
2003	0	0	0	0	0	0	0	0	3,900	0	0	0
2004	0	0	0	0	0	0	0	0	3,850	0	0	0
2005	0	0	0	0	0	0	0	0	1,000	0	0	0
2006	0	0	0	0	0	0	0	0	3,000	0	0	0
2007	0	0	0	0	0	0	0	0	3,600	0	0	0
2008	0	0	0	0	0	0	0	0	1,355	0	0	0
2009	0	0	870	0	0	0	0	0	1,490	0	0	0
2010	0	0	431	0	0	0	0	0	0	0	0	0
2011	0	0	0	0	0	0	0	0	0	400	0	0
2012	0	0	449	0	0	0	0	0	2,800	514	0	0
2013	0	0	692	0	8,393	0	0	0	5,350	280	0	0
2014	0	0	303	0	0	0	0	0	661	38	0	0
2015	8,166	0	142	0	1,349	0	0	0	7,576	120	0	0
2016	7,723	0	425	0	7,553	0	0	0	24,251	446	0	0
2017	0	0	0	0	0	0	0	0	3,000	100	0	0
2018	0	0	301	0	0	0	0	0	2,210	0	0	0
2019	0	0	0	0	0	0	0	0	1,500	449	0	0
2020	0	0	284	0	499	0	0	0	2,716	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	500	0	0	0	0	0	0	0	0	0
2023	0	0	500	0	0	0	0	0	0	0	0	0
2024	0	0	500	0	0	0	0	0	0	0	0	0
2025	0	0	500	0	0	0	0	0	0	0	0	0
2026	0	0	500	0	0	0	0	0	0	0	0	0
2027	0	0	500	0	0	0	0	0	0	0	0	0
2028	0	0	500	0	0	0	0	0	0	0	0	0
2029	0	0	500	0	0	0	0	0	0	0	0	0
2030	0	0	500	0	0	0	0	0	0	0	0	0
2031	0	0	500	0	0	0	0	0	0	0	0	0
2032	0	0	500	0	0	0	0	0	0	0	0	0
2033	0	0	500	0	0	0	0	0	0	0	0	0
2034	0	0	500	0	0	0	0	0	0	0	0	0
2035	0	0	500	0	0	0	0	0	0	0	0	0
TOTAL	18,689	38,023	10,897	18,335	380,695	21,500	2,000	5,095	92,390	2,347	21,857	146,355

⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 6 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 6 (continued)			Reach 7							Reach 8C	
	Kings	Metropolitan	Tulare	Dudley Ridge	Kern		Kings	Metropolitan	Santa Clarita ⁴	Tulare	Dudley Ridge	Empire
					Municipal and Industrial	Agricultural						
	[59]	[60]	[61]	[62]	[63]	[64]	[65]	[66]	[67]	[68]	[69]	[70]
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	1,978
1969	0	0	0	0	0	0	0	0	0	0	0	56
1970	0	0	0	0	0	0	0	0	0	0	0	3,942
1971	0	0	0	0	0	0	0	0	0	0	0	5,990
1972	0	0	0	0	0	0	0	0	0	0	0	5,795
1973	0	0	0	0	0	0	0	0	0	0	0	3,000
1974	0	0	0	0	0	0	0	0	0	0	0	3,000
1975	0	0	0	0	0	0	0	0	0	0	0	3,000
1976	0	0	0	0	0	0	0	0	0	0	0	3,000
1977	0	0	0	0	0	0	0	0	0	0	0	738
1978	0	0	0	0	0	0	0	0	0	0	0	454
1979	0	0	0	0	0	0	0	0	0	0	0	1,739
1980	0	0	0	0	0	0	0	0	0	0	0	894
1981	0	0	0	0	0	0	0	0	0	0	0	5,859
1982	0	0	0	0	0	0	0	0	0	0	0	361
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	5,197
1986	0	0	0	0	0	0	0	0	0	0	0	1,170
1987	0	0	0	0	0	0	0	0	0	0	0	2,525
1988	0	0	0	0	0	0	0	0	0	0	0	3,475
1989	0	0	0	0	0	5,262	0	0	0	0	2,391	3,000
1990	0	0	0	0	0	0	0	0	0	0	0	1,279
1991	0	0	0	0	0	0	0	0	0	0	0	221
1992	0	0	0	0	0	0	0	0	0	0	280	1,354
1993	0	0	0	0	18,157	10,043	0	0	0	0	0	2,741
1994	0	0	0	0	0	0	0	0	2,100	0	0	1,666
1995	0	0	0	0	10,875	20,595	0	0	0	0	0	1,631
1996	0	0	0	0	3,424	69,704	0	0	0	0	95	1,868
1997	0	0	0	0	27,079	32,463	0	0	0	0	0	0
1998	0	0	3,000	200	3,998	62,081	0	0	0	0	90	542
1999	0	11,000	23,000	0	7,923	19,500	0	500	0	4,470	86	3,176
2000	0	0	3,000	0	0	45,137	0	20,000	1,200	20,500	166	1,799
2001	0	0	600	0	0	0	0	0	0	0	14	1,360
2002	0	0	0	0	0	0	0	0	0	12,067	0	1,405
2003	0	0	0	0	0	0	0	0	0	15,103	0	1,436
2004	3,250	0	0	0	0	0	0	0	0	0	0	3,562
2005	6,954	0	0	0	0	0	6,904	0	0	4,000	0	3,834
2006	2,659	0	0	0	0	0	2,500	0	0	6,000	0	3,282
2007	3,119	0	0	0	0	16,214	0	0	0	2,545	0	2,084
2008	2,159	0	0	400	0	1,998	1,330	0	0	1,500	0	947
2009	1,779	0	2,100	1,400	0	0	0	0	0	600	0	164
2010	2,477	0	0	0	0	0	0	0	0	3,850	0	2,828
2011	2,964	0	0	0	0	0	0	0	0	2,500	0	1,515
2012	2,706	0	500	0	0	0	2,000	0	0	0	0	1,279
2013	2,666	0	1,159	500	0	0	0	0	0	1,121	0	595
2014	1,109	0	275	0	0	0	0	0	0	0	0	175
2015	391	0	0	850	0	0	0	0	0	0	0	362
2016	1,009	0	4,257	0	0	0	0	0	0	3,175	0	951
2017	1,902	0	0	0	0	0	0	0	0	0	0	318
2018	2,450	0	0	0	0	0	0	0	0	0	0	852
2019	2,060	0	0	0	0	0	0	0	0	0	788	347
2020	2,301	0	0	0	0	0	0	0	0	0	0	659
2021	1,585	0	0	0	0	0	0	0	0	0	0	150
2022	3,120	0	0	0	0	0	0	0	0	0	0	400
2023	3,120	0	0	0	0	0	0	0	0	0	0	400
2024	3,120	0	0	0	0	0	0	0	0	0	0	400
2025	3,120	0	0	0	0	0	0	0	0	0	0	400
2026	3,120	0	0	0	0	0	0	0	0	0	0	400
2027	3,120	0	0	0	0	0	0	0	0	0	0	400
2028	3,120	0	0	0	0	0	0	0	0	0	0	400
2029	3,120	0	0	0	0	0	0	0	0	0	0	400
2030	3,120	0	0	0	0	0	0	0	0	0	0	400
2031	3,120	0	0	0	0	0	0	0	0	0	0	400
2032	3,120	0	0	0	0	0	0	0	0	0	0	400
2033	3,120	0	0	0	0	0	0	0	0	0	0	400
2034	3,120	0	0	0	0	0	0	0	0	0	0	400
2035	3,120	0	0	0	0	0	0	0	0	0	0	400
TOTAL	87,220	11,000	37,891	3,350	71,456	282,997	12,734	20,500	3,300	77,431	3,910	105,155

⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 7 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 8C (continued)				Reach 8D							Reach 9
	Kern		Kings	Tulare	Dudley Ridge	Empire	Kern		Kings	San Luis Obispo	Tulare	Dudley Ridge
	Municipal and Industrial	Agricultural					Municipal and Industrial	Agricultural				
	[71]	[72]	[73]	[74]	[75]	[76]	[77]	[78]	[79]	[80]	[81]	[82]
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	900	25,100	26,360	0	0	0	0	0	0	0
1969	0	0	100	7,081	31,375	0	0	0	0	0	0	0
1970	0	0	0	0	40,407	0	0	0	0	0	3,408	0
1971	0	0	3,700	80,906	41,053	0	0	0	0	0	41,579	0
1972	0	0	1,400	144,843	42,443	0	0	0	0	0	113,550	0
1973	0	0	1,500	26,317	22,057	0	0	1,500	0	0	24,147	0
1974	0	0	1,500	32,603	33,390	0	0	0	0	0	39,686	0
1975	0	0	1,600	41,536	40,555	0	0	0	0	0	44,722	0
1976	0	0	1,600	26,595	41,421	0	0	0	0	0	32,216	0
1977	0	0	1,530	12,984	11,153	0	0	0	0	0	5,097	0
1978	0	0	2,070	3,934	51,747	0	0	0	0	0	8,119	0
1979	0	0	2,000	74,758	38,544	0	0	0	0	0	80,363	0
1980	0	0	2,200	35,140	41,000	0	0	0	0	0	40,304	0
1981	0	0	2,300	50,888	41,000	0	0	0	0	0	32,550	0
1982	0	0	1,536	4,405	41,000	0	0	0	214	0	14,146	0
1983	0	0	3,550	1,001	42,900	0	0	0	0	0	5	0
1984	0	0	3,100	3,677	45,100	0	0	0	0	0	2,066	0
1985	0	0	3,400	68,638	46,251	0	0	0	0	0	41,153	0
1986	0	0	3,700	40,017	50,249	0	0	0	0	0	39,338	0
1987	0	0	4,000	30,359	46,288	0	0	0	0	0	62,725	0
1988	0	0	4,000	46,281	47,994	0	0	0	0	0	48,035	0
1989	0	0	4,000	63,703	52,158	0	0	0	0	0	63,947	0
1990	0	0	2,000	23,504	36,296	0	0	161	0	0	32,066	0
1991	0	0	0	1,697	927	0	0	0	0	0	483	0
1992	0	0	1,806	15,982	12,667	0	0	0	0	0	30,746	0
1993	0	0	4,000	57,112	23,221	0	0	0	0	0	65,732	197
1994	0	0	2,116	21,510	28,793	0	0	1,726	0	0	40,852	0
1995	989	10,527	4,000	40,934	45,240	0	2,959	27,270	0	0	57,435	0
1996	0	1,500	4,000	84,130	52,722	0	0	1,455	0	100	148,745	0
1997	0	1,500	0	9,467	57,496	0	0	0	0	100	9,402	4,900
1998	0	1,000	15	8,956	49,435	0	0	20,000	0	0	8,721	0
1999	0	400	4,000	90,334	58,290	0	0	9,000	0	0	162,631	0
2000	0	400	3,600	63,842	57,920	0	0	0	0	0	113,952	0
2001	0	0	1,560	23,300	40,155	0	0	6,089	0	0	58,369	0
2002	0	0	2,854	34,009	48,179	0	0	7,522	0	0	47,426	0
2003	0	0	3,692	25,317	45,732	0	0	8,350	0	0	61,521	0
2004	0	0	5,803	30,546	45,823	0	0	4,979	0	0	55,625	0
2005	0	0	4,057	42,450	58,627	0	0	0	1,891	0	92,552	0
2006	0	0	1,105	34,367	61,410	0	0	0	3,266	0	64,840	0
2007	0	0	657	31,305	39,974	0	0	7,740	1,921	0	49,633	0
2008	0	0	240	14,146	18,974	0	0	21,242	107	0	16,903	0
2009	0	0	1,612	13,522	12,037	0	0	19,684	0	0	16,794	5,500
2010	0	0	26	14,005	17,346	0	0	14,094	1,900	0	40,609	0
2011	0	0	2,160	23,814	22,427	0	0	65	1,194	0	30,827	292
2012	0	0	2,699	25,847	17,122	0	0	2,168	0	0	56,570	3,400
2013	0	0	1,029	16,490	19,605	0	0	4,239	950	0	24,241	1,941
2014	0	0	81	2,880	12,960	0	0	3,554	66	0	5,118	1,000
2015	0	0	838	977	9,473	0	0	2,000	0	0	617	1,250
2016	0	0	2,651	534	11,403	0	0	140	0	0	2,447	3,430
2017	0	0	1,428	17,107	15,319	0	0	0	1,611	0	39,654	0
2018	0	0	1,261	16,630	4,821	438	0	0	2	0	31,711	4,849
2019	0	0	750	12,773	7,222	0	0	1,683	1,772	0	40,281	500
2020	0	0	48	1,716	6,743	305	0	0	820	0	21,618	8,201
2021	0	0	55	7,500	8,012	0	0	12,700	385	0	11,248	0
2022	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2023	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2024	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2025	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2026	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2027	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2028	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2029	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2030	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2031	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2032	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2033	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2034	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
2035	0	0	912	20,993	26,168	900	0	0	1,368	0	31,490	0
TOTAL	989	15,327	122,597	1,921,371	2,187,168	13,343	2,959	177,361	35,251	200	2,617,385	35,460

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 8 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 9 (continued)				Reach 10A							
	Empire	Kern		Tulare	Alameda-Zone 7	Alameda County	AVEK	Dudley Ridge	Empire	Kern		Metropolitan
		Municipal and Industrial	Agricultural							Municipal and Industrial	Agricultural	
	[83]	[84]	[85]	[86]	[87]	[88]	[89]	[90]	[91]	[92]	[93]	[94]
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	30,951	0	0	0	0	0	0	0	0	0
1969	0	0	24,489	0	0	0	0	0	0	0	0	0
1970	0	0	46,114	1,855	0	0	0	0	0	0	158	0
1971	0	0	58,356	0	0	0	0	0	0	0	9,973	0
1972	0	0	75,464	0	0	0	0	0	0	0	5,876	0
1973	0	0	54,583	0	0	0	0	0	0	0	22,948	0
1974	0	0	63,814	0	0	0	0	0	0	10,019	22,719	0
1975	0	0	50,021	0	0	0	0	0	0	2,791	72,121	0
1976	0	0	53,465	0	0	0	0	0	0	74	50,444	0
1977	0	0	24,668	0	0	0	0	0	0	201	34,451	0
1978	0	0	72,231	0	0	0	0	0	0	0	161,889	0
1979	0	0	74,524	0	0	0	0	0	0	285	153,245	0
1980	0	0	79,946	0	0	0	0	0	0	3,780	131,836	0
1981	0	0	76,508	0	0	0	0	0	0	341	133,500	0
1982	0	0	76,877	0	0	0	0	0	0	4,700	164,832	0
1983	0	2,217	84,573	0	0	0	0	0	0	0	146,493	0
1984	0	4,100	85,732	0	0	0	0	0	0	6,910	150,302	0
1985	0	0	67,696	0	0	0	0	0	0	6,495	153,473	0
1986	0	0	79,943	0	0	0	0	0	0	5,065	198,099	0
1987	0	0	97,732	0	0	0	0	0	0	900	226,521	0
1988	0	1,100	83,858	0	0	0	0	0	0	9,529	212,495	0
1989	0	0	91,134	0	0	0	0	0	0	21,038	251,979	0
1990	0	0	83,108	0	0	0	0	0	0	25,189	47,472	0
1991	0	13,683	601	0	0	0	0	0	0	1,142	6,820	0
1992	0	28	40,183	0	0	0	0	0	0	3,685	89,390	0
1993	0	5,945	53,597	0	0	0	0	0	0	775	233,862	44,496
1994	0	0	44,994	0	0	0	0	0	0	5,227	126,792	0
1995	0	0	64,076	0	0	0	0	0	0	366	229,448	50,000
1996	0	2,236	89,291	0	0	6,200	0	0	0	6,666	199,854	95,000
1997	0	0	72,013	0	0	10,000	0	900	0	3,577	157,385	125,000
1998	0	0	57,530	0	1,970	3,780	0	0	0	2,603	163,587	39,500
1999	0	0	72,734	0	22,910	16,100	0	0	0	1,657	190,787	75,850
2000	0	0	73,562	0	23,940	13,380	0	0	0	7,672	283,208	0
2001	0	0	54,198	0	5,000	0	0	0	0	160	98,175	0
2002	0	0	60,957	0	14,287	2,083	0	0	0	145	171,498	0
2003	0	0	54,724	0	6,500	18,800	0	0	0	217	174,674	70,940
2004	0	0	54,330	0	5,740	8,000	0	0	0	65,751	117,286	0
2005	0	0	53,206	0	0	28,422	0	0	0	146	232,519	31,210
2006	0	0	56,909	0	5,740	27,447	0	5,000	0	0	237,623	0
2007	0	0	66,018	0	717	1,029	0	3,000	0	0	203,794	0
2008	0	0	63,315	0	0	0	0	2,800	0	1,702	103,176	0
2009	0	0	64,007	2,330	0	0	0	2,000	0	690	95,798	0
2010	0	0	76,357	0	3,000	7,000	0	2,000	0	14	102,773	74,000
2011	0	0	78,177	2,000	3,414	16,020	0	2,908	0	26	137,476	149,012
2012	0	0	69,395	2,000	0	7,500	0	1,660	0	29	201,876	45,000
2013	0	0	82,005	0	0	0	0	2,500	0	2,057	116,190	0
2014	0	0	67,754	0	0	0	0	0	0	0	40,332	0
2015	0	0	64,809	0	0	0	0	0	0	3,751	49,953	0
2016	0	0	68,699	0	5,000	18,272	0	1,075	0	817	101,941	0
2017	774	0	75,501	0	19,381	19,302	9,226	2,446	251	867	166,972	77,731
2018	0	0	69,618	900	0	0	11,015	5,717	0	2,604	93,384	0
2019	1,142	0	68,454	10,486	13,447	13,271	4,762	613	0	3,712	119,564	87,058
2020	0	0	63,865	0	0	0	4,269	914	0	2,492	83,325	0
2021	0	0	59,600	0	0	0	0	1,000	0	0	44,746	0
2022	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2023	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2024	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2025	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2026	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2027	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2028	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2029	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2030	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2031	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2032	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2033	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2034	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
2035	0	0	60,000	0	5,000	6,816	0	0	0	0	217,324	60,000
TOTAL	1,916	29,309	4,316,266	19,571	201,046	312,030	29,272	34,533	251	215,867	9,767,570	1,804,797

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 9 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 10A (continued)					Reach 11B							
	San Bernardino	Santa Barbara	Santa Clara	Santa Clarita ⁴	Tulare	Alameda Zone 7	AVEK	Dudley Ridge	Empire	Kern		Metropolitan	Santa Clarita ⁴
										Municipal and Industrial	Agricultural		
	[95]	[96]	[97]	[98]	[99]	[100]	[101]	[102]	[103]	[104]	[105]	[106]	[107]
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	24,776	0	0
1969	0	0	0	0	2,842	0	0	0	0	0	64,682	0	0
1970	0	0	0	0	4,315	0	0	0	0	0	72,279	0	0
1971	0	0	0	0	0	0	0	0	0	0	63,773	0	0
1972	0	0	0	0	0	0	0	0	0	0	72,358	0	0
1973	0	0	0	0	0	0	0	0	0	0	67,544	0	0
1974	0	0	0	0	0	0	0	0	0	0	87,476	0	0
1975	0	0	0	0	0	0	0	0	0	0	85,675	0	0
1976	0	0	0	0	0	0	0	0	0	0	85,067	0	0
1977	0	0	0	0	0	0	0	0	0	3,981	29,603	0	0
1978	0	0	0	0	0	0	0	0	0	0	88,753	0	0
1979	0	0	0	0	0	0	0	0	0	484	108,379	0	0
1980	0	0	0	0	0	0	0	0	0	3,112	103,207	0	0
1981	0	0	0	0	0	0	0	0	0	494	104,395	0	0
1982	0	0	0	0	0	0	0	0	0	798	99,081	0	0
1983	0	0	0	0	0	0	0	0	0	2,069	94,117	0	0
1984	0	0	0	0	0	0	0	0	0	2,349	124,819	0	0
1985	0	0	0	0	0	0	0	0	0	10,666	118,646	0	0
1986	0	0	0	0	0	0	0	0	0	8,673	124,836	0	0
1987	0	0	0	0	0	0	0	0	0	13,074	111,877	0	0
1988	0	0	0	0	0	0	0	0	0	13,509	114,031	0	0
1989	0	0	0	0	0	0	0	0	0	9,986	127,058	0	0
1990	0	0	0	0	0	0	0	0	0	9,319	104,107	0	0
1991	0	0	0	0	0	0	0	0	0	6,099	118	0	0
1992	0	0	0	0	0	0	0	0	0	7,419	35,093	0	0
1993	0	0	0	0	0	0	0	0	0	2,696	72,645	0	0
1994	0	0	0	0	0	0	0	0	0	3,506	71,202	0	0
1995	0	0	0	0	0	0	0	0	0	1,154	97,072	0	0
1996	0	0	45,000	0	0	0	0	0	0	1,185	96,250	0	0
1997	0	0	35,000	0	0	0	0	0	0	1,111	104,823	0	0
1998	0	0	23,800	0	0	0	0	0	0	1,311	72,646	0	0
1999	0	0	30,000	0	0	0	0	0	0	2,127	92,262	0	0
2000	0	0	23,730	0	0	0	0	1,500	0	3,793	89,622	0	0
2001	0	0	0	0	0	0	0	0	0	636	73,105	0	0
2002	0	0	3,311	24,000	0	0	0	0	0	1,457	91,123	0	0
2003	0	0	33,000	0	0	0	0	0	0	1,379	87,174	0	0
2004	0	0	0	32,522	0	0	0	0	0	1,299	97,722	0	0
2005	0	0	55,448	0	0	0	0	0	0	824	93,554	0	0
2006	0	0	64,036	0	0	0	0	0	0	0	98,417	0	0
2007	0	0	3,692	0	0	0	0	0	0	4,030	94,334	0	0
2008	0	0	4,306	0	0	0	0	0	0	263	93,417	0	0
2009	0	0	0	0	0	0	0	300	0	127	96,776	0	0
2010	0	0	51,990	0	800	0	0	5,350	0	381	92,220	0	0
2011	0	0	65,770	0	500	0	0	0	0	1,160	105,682	0	0
2012	2,868	0	0	0	0	0	0	2,000	0	1,019	94,519	0	5,500
2013	0	0	0	0	0	0	0	2,500	0	1,167	110,418	0	5,500
2014	0	0	0	0	0	0	0	9,786	0	0	87,728	0	0
2015	0	0	0	0	0	0	0	8,200	0	4,553	84,288	0	0
2016	0	0	9,634	0	0	0	0	5,000	0	1,037	91,735	942	0
2017	0	0	71,163	5,340	0	0	0	3,569	255	19,966	93,037	0	0
2018	0	900	42,600	0	0	0	3,985	7,490	0	422	91,111	0	0
2019	0	1,100	63,600	5,002	1,652	511	0	2,887	0	472	87,332	0	0
2020	0	0	0	0	0	0	990	4,785	0	204	84,064	350	0
2021	0	0	0	0	0	0	0	0	0	0	55,009	0	0
2022	0	0	0	4,050	0	0	0	0	0	0	5,400	0	0
2023	0	0	0	2,555	0	0	0	0	0	0	5,400	0	0
2024	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
2025	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
2026	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
2027	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
2028	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
2029	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
2030	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
2031	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
2032	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
2033	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
2034	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
2035	0	0	0	1,060	0	0	0	0	0	0	5,400	0	0
TOTAL	2,868	2,000	626,080	86,189	10,109	511	4,975	53,367	255	149,311	4,786,637	1,292	11,000

⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 10 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	SOUTH SAN JOAQUIN DIVISION (continued)										
	Reach 11B		Reach 12D			Reach 12E					
	Tulare	Dudley Ridge	Kern		Alameda Zone 7	Alameda County	AVEK	Dudley Ridge	Kern		Metropolitan
			Municipal and Industrial	Agricultural					Municipal and Industrial	Agricultural	
	[108]	[109]	[110]	[111]	[112]	[113]	[114]	[115]	[116]	[117]	[118]
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	9,279	0
1971	0	0	0	0	0	0	0	0	0	28,056	0
1972	0	0	0	0	0	0	0	0	0	62,342	0
1973	0	0	0	0	0	0	0	0	0	13,082	0
1974	0	0	0	0	0	0	0	0	2,651	4,248	0
1975	0	0	0	0	0	0	0	0	0	10,787	0
1976	0	0	0	0	0	0	0	0	37,519	20,555	0
1977	0	0	0	0	0	0	0	0	20,280	1,737	0
1978	0	0	0	0	0	0	0	0	47,133	15,011	0
1979	0	0	0	0	0	0	0	0	50,740	61,567	0
1980	0	0	0	0	0	0	0	0	32,039	22,252	0
1981	0	0	0	0	0	0	0	0	59,917	58,470	0
1982	0	0	0	0	0	0	0	0	36,139	75,587	0
1983	0	0	0	0	0	0	0	0	0	10,950	0
1984	0	0	0	0	0	0	0	0	63,941	39,929	0
1985	0	0	0	0	0	0	0	0	69,839	84,117	0
1986	0	0	0	0	0	0	0	0	62,109	51,540	0
1987	0	0	0	0	0	0	0	0	95,297	86,223	0
1988	0	0	0	0	0	0	0	0	86,390	123,249	0
1989	0	0	0	0	0	0	0	0	83,965	146,544	0
1990	0	0	0	0	0	0	0	0	82,164	38,973	0
1991	0	0	0	0	0	0	0	0	8,842	303	0
1992	0	0	0	0	0	0	0	0	47,181	57,048	0
1993	0	0	0	0	0	0	0	0	84,822	285,554	5,504
1994	0	0	0	0	0	0	0	0	66,188	77,839	0
1995	0	0	0	0	0	0	0	1,000	107,130	181,097	0
1996	0	0	0	0	0	0	0	4,131	89,257	134,138	0
1997	0	0	0	0	0	0	0	8,012	32,061	128,329	1,486
1998	0	0	0	0	0	0	0	5,925	28,258	88,998	24,234
1999	0	0	0	0	0	0	0	1,321	110,161	255,343	62,162
2000	0	0	21	0	0	0	0	953	11,772	156,215	149,731
2001	0	0	41	0	0	0	0	0	385	51,076	0
2002	0	0	760	6	0	0	0	0	0	135,335	0
2003	0	0	2,431	152	0	0	0	0	39,479	112,056	45,989
2004	0	0	3,419	768	0	0	0	1,600	52,303	95,893	0
2005	0	0	2,841	644	3,419	1,878	0	1,154	43,835	340,281	15,384
2006	0	0	2,513	1,556	10,000	0	0	0	82,207	296,230	5,065
2007	0	0	2,164	2,284	0	0	0	0	1,179	87,764	0
2008	0	0	1,514	3,000	0	0	0	0	0	58,983	0
2009	0	0	564	4,274	0	0	0	0	0	82,434	0
2010	974	0	1,904	2,206	10,000	0	0	0	4,851	72,809	134,855
2011	3,500	0	973	65	10,000	1,960	0	0	26,249	309,617	109,787
2012	0	0	3,128	939	20,308	0	0	200	19,423	103,482	92,803
2013	0	0	3,473	1,531	0	0	0	0	26,652	60,295	0
2014	0	0	0	5,225	0	0	0	0	0	500	0
2015	0	0	985	3,486	0	0	0	0	280	2,750	0
2016	0	0	2,225	1,442	7,000	0	0	0	1,225	64,819	3,908
2017	0	0	1,830	789	10,619	0	25,417	13,924	7,852	343,922	78,271
2018	0	107	923	28	0	0	0	0	0	90,347	3,512
2019	14,975	0	974	2	4,942	0	6,590	896	3,266	304,555	58,417
2020	0	0	944	627	0	0	1,741	0	0	77,510	0
2021	0	0	297	2,274	0	0	0	0	0	141,450	0
2022	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2023	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2024	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2025	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2026	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2027	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2028	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2029	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2030	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2031	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2032	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2033	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2034	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
2035	0	0	4,500	0	5,000	0	0	0	46,199	55,097	30,000
TOTAL	19,449	107	96,924	31,298	146,288	3,838	33,748	39,116	2,371,767	5,932,828	1,211,108

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 11 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 12E (continued)				Reach 13B							
	San Bernardino	Santa Barbara	Santa Clara	Santa Clarita ⁴	Alameda-Zone 7	Alameda County	Dudley Ridge	Kern		Metropolitan	Palmdale	Santa Barbara
								Municipal and Industrial	Agricultural			
	[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	0	0	0	0	0	4,891	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	17,388	0	0	0
1973	0	0	0	0	0	0	0	0	9,297	0	0	0
1974	0	0	0	0	0	0	0	8,038	4,246	0	0	0
1975	0	0	0	0	0	0	0	8,538	7,059	0	0	0
1976	0	0	0	0	0	0	0	5,626	8,855	0	0	0
1977	0	0	0	0	0	0	0	0	5,024	0	0	0
1978	0	0	0	0	0	0	0	21,773	7,601	0	0	0
1979	0	0	0	0	0	0	0	5,663	17,766	0	0	0
1980	0	0	0	0	0	0	0	0	22,515	0	0	0
1981	0	0	0	0	0	0	0	7,844	14,037	0	0	0
1982	0	0	0	0	0	0	0	0	25,553	0	0	0
1983	0	0	0	0	0	0	0	0	3,491	0	0	0
1984	0	0	0	0	0	0	0	12,117	26,178	0	0	0
1985	0	0	0	0	0	0	0	0	67,711	0	0	0
1986	0	0	0	0	0	0	0	0	66,551	0	0	0
1987	0	0	0	0	0	0	0	5,609	40,374	0	0	0
1988	0	0	0	0	0	0	0	9,298	47,167	0	0	0
1989	0	0	0	0	0	0	0	5,504	57,114	0	0	0
1990	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
1992	0	0	0	0	0	0	0	789	17,449	0	0	0
1993	0	0	0	0	0	0	0	12,798	88,157	0	0	0
1994	0	0	0	0	0	0	0	2,494	33,148	0	0	0
1995	0	0	0	0	0	0	0	8,751	110,685	0	0	0
1996	0	0	0	0	0	0	0	28,063	64,849	0	0	0
1997	0	0	0	0	0	0	0	43,803	49,312	0	0	0
1998	0	0	0	0	0	0	0	29,444	40,085	5,500	0	0
1999	0	0	0	0	0	0	0	12,969	92,998	0	0	0
2000	0	0	0	0	0	0	0	0	102,202	0	0	0
2001	0	0	0	0	0	0	1,733	0	33,925	0	0	0
2002	0	0	0	0	0	0	736	0	71,444	0	0	0
2003	0	0	0	0	0	0	350	2,396	124,582	1,865	0	0
2004	0	0	0	0	0	0	1,657	1,922	73,801	0	0	0
2005	0	0	2,619	20,000	2,321	0	14,540	21,781	269,631	192	0	0
2006	0	0	0	20,000	0	0	5,670	11,787	196,116	0	0	0
2007	0	0	0	8,200	0	0	2,161	0	72,240	0	0	0
2008	0	0	0	0	0	0	0	200	9,785	0	0	0
2009	0	0	0	0	0	0	0	0	12,060	0	0	0
2010	0	0	0	25,844	0	0	304	0	63,966	22,000	0	0
2011	8,066	4,002	706	0	2,331	3,420	34,733	4,896	265,382	25,845	7,000	7,893
2012	19,066	0	0	6,416	0	0	0	448	70,805	1,950	2,500	0
2013	0	0	0	0	0	0	0	0	14,189	0	0	0
2014	0	0	0	0	0	0	0	0	2,246	0	0	0
2015	0	0	0	0	0	0	0	0	481	0	0	0
2016	0	0	0	0	0	0	0	3,005	12,815	0	0	0
2017	0	0	0	0	0	0	28,487	3,201	191,350	4,477	352	0
2018	0	0	0	0	0	0	0	0	9,710	0	0	0
2019	0	0	0	0	0	0	20,124	0	118,397	0	0	0
2020	0	0	0	0	0	0	0	0	154	0	0	0
2021	0	0	0	0	0	0	0	0	9,282	0	0	0
2022	0	0	0	4,050	0	0	0	0	24,500	0	0	0
2023	0	0	0	2,555	0	0	0	0	24,500	0	0	0
2024	0	0	0	1,060	0	0	0	0	24,500	0	0	0
2025	0	0	0	1,060	0	0	0	0	24,500	0	0	0
2026	0	0	0	1,060	0	0	0	0	24,500	0	0	0
2027	0	0	0	1,060	0	0	0	0	24,500	0	0	0
2028	0	0	0	1,060	0	0	0	0	24,500	0	0	0
2029	0	0	0	1,060	0	0	0	0	24,500	0	0	0
2030	0	0	0	1,060	0	0	0	0	24,500	0	0	0
2031	0	0	0	1,060	0	0	0	0	24,500	0	0	0
2032	0	0	0	1,060	0	0	0	0	24,500	0	0	0
2033	0	0	0	1,060	0	0	0	0	24,500	0	0	0
2034	0	0	0	1,060	0	0	0	0	24,500	0	0	0
2035	0	0	0	1,060	0	0	0	0	24,500	0	0	0
TOTAL	27,132	4,002	3,325	99,785	4,652	3,420	110,495	286,402	3,037,487	61,829	9,852	7,893

⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 12 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 13B (continued)		Reach 14A				Reach 14B				Reach 14C	
	Santa Clara	Tulare	AVEK	Dudley Ridge	Kern		AVEK	Dudley Ridge	Kern		AVEK	Dudley Ridge
					Municipal and Industrial	Agricultural			Municipal and Industrial	Agricultural		
	[131]	[132]	[133]	[134]	[135]	[136]	[137]	[138]	[139]	[140]	[141]	[142]
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	3	0	0
1971	0	0	0	0	0	23,844	0	0	0	49,929	0	0
1972	0	0	0	0	0	26,621	0	0	0	77,034	0	0
1973	0	0	0	0	0	15,328	0	0	0	47,040	0	0
1974	0	0	0	0	0	7,794	0	0	0	32,356	0	0
1975	0	0	0	0	0	10,306	0	0	0	27,736	0	0
1976	0	0	0	0	0	268	0	0	0	35,296	0	0
1977	0	0	0	0	0	8,299	0	0	0	13,539	0	0
1978	0	0	0	0	0	34,029	0	0	0	72,351	0	0
1979	0	0	0	0	3,012	27,356	0	0	0	59,413	0	0
1980	0	0	0	0	4,312	16,876	0	0	0	40,513	0	0
1981	0	0	0	0	4,511	13,007	0	0	8	42,753	0	0
1982	0	0	0	0	3,735	24,240	0	0	184	57,739	0	0
1983	0	0	0	0	1,168	20,302	0	0	0	57,922	0	0
1984	0	0	0	0	137	35,369	0	0	10	79,179	0	0
1985	0	0	0	0	206	33,103	0	0	0	72,855	0	0
1986	0	0	0	0	180	26,384	0	0	0	70,864	0	0
1987	0	0	0	0	610	30,098	0	0	9	67,710	0	0
1988	0	0	0	0	622	32,778	0	0	19	75,968	0	0
1989	0	0	0	0	721	29,292	0	0	7	82,201	0	0
1990	0	0	0	0	673	26,800	0	0	13	81,076	0	0
1991	0	0	0	0	768	0	0	0	0	0	0	0
1992	0	0	0	0	673	16,238	0	0	464	41,143	0	0
1993	0	0	0	0	629	17,832	0	0	0	62,493	0	0
1994	0	0	0	0	2,513	16,760	0	0	3,000	54,011	0	0
1995	0	3,500	0	0	3	21,234	0	0	0	67,391	0	0
1996	0	0	0	0	0	26,978	0	0	0	85,936	0	0
1997	0	0	0	0	0	23,035	0	0	0	79,790	0	0
1998	0	0	0	0	0	15,706	0	0	0	58,132	0	0
1999	0	0	0	0	0	21,153	0	0	0	67,576	0	0
2000	0	0	0	0	0	19,264	0	0	0	70,585	0	0
2001	0	0	0	0	0	12,452	0	0	0	49,602	0	0
2002	0	0	0	0	0	11,161	0	0	0	52,762	0	0
2003	0	0	0	0	0	13,685	0	0	0	44,576	0	0
2004	0	0	0	0	0	13,030	0	0	0	52,012	0	0
2005	9,014	0	0	0	0	15,663	0	0	0	56,739	0	0
2006	0	0	0	0	0	17,779	0	0	0	65,142	0	0
2007	0	0	0	0	0	21,435	0	0	0	67,955	0	0
2008	2,324	0	0	0	0	20,087	0	0	0	63,497	0	0
2009	0	0	0	0	0	22,281	0	0	0	60,726	0	0
2010	0	10,000	0	0	0	21,964	0	0	0	58,110	0	0
2011	0	0	0	0	0	24,131	0	0	0	61,859	0	0
2012	0	8,000	0	0	0	25,982	0	0	0	64,489	0	0
2013	0	0	0	0	0	29,414	0	0	0	62,137	0	0
2014	0	0	0	0	0	28,172	0	0	0	50,337	0	0
2015	0	0	0	0	0	25,886	0	0	0	48,996	0	0
2016	0	0	0	0	0	27,686	0	0	0	55,147	0	0
2017	0	0	0	0	0	26,520	0	0	0	67,600	0	0
2018	0	0	1,207	820	0	24,524	0	2,220	0	56,850	290	2,327
2019	0	0	1,705	0	0	24,675	749	0	0	62,912	0	0
2020	0	0	0	0	0	24,083	0	0	0	49,475	0	0
2021	0	0	0	0	0	34,294	0	0	0	31,028	0	0
2022	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2023	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2024	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2025	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2026	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2027	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2028	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2029	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2030	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2031	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2032	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2033	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2034	0	0	0	0	0	18,900	0	0	0	40,800	0	0
2035	0	0	0	0	0	18,900	0	0	0	40,800	0	0
TOTAL	11,338	21,500	2,912	820	24,473	1,349,798	749	2,220	3,714	3,483,685	290	2,327

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 13 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											TEHACHAPI DIVISION
	Reach 14C (continued)			Reach 15A				Reach 16A				Reach 17E
	Kern		Metropolitan	AVEK	Dudley Ridge	Kern		AVEK	Dudley Ridge	Kern		Kern
	Municipal and Industrial	Agricultural				Municipal and Industrial	Agricultural			Municipal and Industrial	Agricultural	Municipal and Industrial
	[143]	[144]	[145]	[146]	[147]	[148]	[149]	[150]	[151]	[152]	[153]	[154]
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	24,187	0	0	0	0	3,552	0	0	0	0	0
1972	0	35,016	0	0	0	0	6,064	0	0	0	4,768	0
1973	0	19,043	0	0	0	0	19,916	0	0	0	1,961	0
1974	0	12,601	0	0	0	0	18,000	0	0	3,000	1,564	0
1975	0	12,783	0	0	0	0	35,420	0	0	3,200	9,867	0
1976	0	9,005	0	0	0	0	39,551	0	0	3,500	11,667	0
1977	0	3,757	0	0	0	0	6,158	0	0	3,420	685	0
1978	0	24,542	0	0	0	0	31,148	0	0	7,989	1,655	0
1979	0	22,372	0	0	0	0	38,602	0	0	2,813	15,808	0
1980	0	19,953	0	0	0	0	37,817	0	0	2,700	16,145	0
1981	7	18,729	0	0	0	0	39,033	0	0	2,636	18,156	0
1982	0	26,479	0	0	0	0	47,782	0	0	1,921	16,577	0
1983	0	26,613	0	0	0	0	37,426	0	0	1,400	17,907	0
1984	2	34,996	0	0	0	0	49,848	0	0	1,338	24,246	0
1985	0	31,758	0	0	0	0	44,078	0	0	1,309	16,820	0
1986	0	34,566	0	0	0	0	42,461	0	0	1,213	15,559	0
1987	10	31,019	0	0	0	0	34,748	0	0	1,665	10,170	0
1988	1	37,165	0	0	0	16	41,978	0	0	1,925	8,987	0
1989	5	37,800	0	0	0	2	43,239	0	0	2,668	8,649	0
1990	9	34,174	0	0	0	6	36,347	0	0	2,819	8,608	0
1991	0	0	0	0	0	0	0	2,000	0	2,588	343	0
1992	0	18,084	0	0	0	0	24,243	0	0	2,087	8,275	0
1993	0	28,103	0	0	0	0	27,997	0	0	2,494	9,167	0
1994	1,000	22,624	0	0	0	0	29,511	0	0	3,011	13,877	0
1995	0	31,285	0	0	0	0	26,134	0	0	3,188	15,042	0
1996	0	38,879	0	0	0	0	36,186	0	0	2,573	18,142	0
1997	0	33,512	0	0	0	0	36,281	0	0	3,997	17,048	0
1998	0	23,097	0	0	0	0	28,712	0	0	3,751	17,032	0
1999	0	31,489	0	0	0	0	36,801	0	0	3,316	24,071	0
2000	0	33,716	0	0	0	0	40,063	0	0	3,015	20,919	0
2001	0	23,557	0	0	0	0	31,192	0	0	1,894	13,476	0
2002	0	27,138	0	0	0	0	41,552	0	0	4,227	14,520	0
2003	0	24,783	12,911	0	0	0	36,602	0	0	1,168	16,799	0
2004	0	30,313	0	0	0	0	40,184	0	0	2,239	19,714	0
2005	0	21,979	0	0	0	0	39,870	0	0	167	18,353	0
2006	1,413	20,193	5,440	0	0	0	46,244	0	0	279	22,570	0
2007	0	24,947	1,881	0	0	0	47,390	0	0	204	26,229	0
2008	0	27,847	0	0	0	0	33,029	0	0	3,834	18,426	0
2009	0	27,185	0	0	0	0	26,007	0	0	1,531	19,517	0
2010	0	25,477	29,818	0	0	0	22,045	0	0	1,033	19,829	0
2011	0	27,061	27,326	0	0	0	42,158	0	0	3,808	17,957	0
2012	0	23,446	31,703	0	0	0	27,920	0	0	3,453	19,842	0
2013	0	25,004	6,592	0	0	0	28,147	0	0	148	21,311	4
2014	0	20,992	0	0	0	0	10,784	0	0	0	18,673	1
2015	0	17,267	0	0	0	0	10,202	0	0	2,407	16,214	0
2016	0	23,159	911	0	0	0	15,901	0	0	1,324	21,278	0
2017	0	28,487	19,176	0	0	0	45,572	0	0	2,249	24,558	0
2018	0	23,473	18,751	2,149	979	0	15,525	2,243	1,249	258	22,838	0
2019	0	24,155	0	0	0	0	35,180	0	0	1,773	21,917	0
2020	0	22,267	0	0	0	0	14,439	0	0	1,493	18,222	0
2021	0	28,263	0	0	0	0	22,593	0	0	750	23,627	0
2022	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2023	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2024	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2025	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2026	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2027	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2028	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2029	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2030	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2031	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2032	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2033	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2034	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
2035	0	18,100	0	0	0	0	26,900	0	0	8,622	17,845	0
TOTAL	2,447	1,527,740	154,509	2,149	979	24	1,948,232	4,243	1,249	230,483	1,019,415	5

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 14 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	MOJAVE DIVISION											
	Reach 18A	Reach 19					Reach 20A					
	AVEK	AVEK	Metropolitan	Mojave	Santa Barbara	Santa Clara	AVEK	Metropolitan	Mojave	Palmdale	Santa Barbara	Santa Clara
	[155]	[156]	[157]	[158]	[159]	[160]	[161]	[162]	[163]	[164]	[165]	[166]
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	1,223	0	0	0	0	0	0	0	0	0	0
1975	0	7,622	0	0	0	0	420	0	0	0	0	0
1976	3,808	23,063	0	0	0	0	471	0	0	0	0	0
1977	1,231	8,927	0	0	0	0	773	0	0	0	0	0
1978	1,321	36,333	0	0	0	0	5,549	0	0	0	0	0
1979	2,098	49,910	0	0	0	0	7,555	0	0	0	0	0
1980	2,610	61,534	0	0	0	0	7,605	0	0	0	0	0
1981	2,340	65,690	0	0	0	0	10,333	0	0	0	0	0
1982	1,669	41,127	0	0	0	0	7,313	0	0	0	0	0
1983	43	26,377	0	0	0	0	6,253	0	0	0	0	0
1984	90	22,462	0	0	0	0	9,558	0	0	0	0	0
1985	8	23,440	0	0	0	0	11,613	0	0	1,510	0	0
1986	8	16,898	0	0	0	0	13,808	0	0	3,041	0	0
1987	0	15,958	0	0	0	0	15,493	0	0	2,389	0	0
1988	0	13,471	0	0	0	0	17,117	0	0	366	0	0
1989	0	18,007	0	0	0	0	23,481	0	0	381	0	0
1990	0	17,281	0	0	0	0	25,843	0	0	282	0	0
1991	0	728	0	0	0	0	4,282	0	1,391	84	0	0
1992	0	7,238	0	0	0	0	18,518	0	1,310	185	0	0
1993	0	13,340	0	0	0	0	23,662	0	1,514	164	0	0
1994	0	19,122	0	0	0	0	25,250	0	1,399	299	0	0
1995	0	20,222	0	0	0	0	22,385	0	1,227	328	0	0
1996	0	23,919	0	0	0	0	26,979	0	1,316	354	0	0
1997	0	28,834	0	64	0	0	27,999	0	1,272	313	0	0
1998	0	22,466	0	1,345	0	0	25,985	0	0	195	0	0
1999	0	30,944	0	1,439	0	0	32,409	0	0	377	0	0
2000	0	34,786	0	1,361	0	0	37,819	0	0	0	0	0
2001	0	24,370	0	1,385	0	0	33,216	0	0	0	0	0
2002	0	14,297	0	1,370	0	0	36,311	0	0	0	0	0
2003	0	12,145	0	1,285	0	0	39,532	0	0	0	0	0
2004	0	11,201	0	1,223	0	0	40,408	0	0	0	0	0
2005	11	11,804	0	1,051	0	0	41,496	0	0	0	0	0
2006	0	18,438	0	1,021	0	0	53,878	0	0	0	0	0
2007	0	22,916	0	1,176	0	0	47,639	0	0	0	0	0
2008	0	9,096	0	1,238	0	0	33,919	0	0	0	0	0
2009	0	5,717	0	1,345	0	0	35,402	0	0	0	0	0
2010	0	10,825	0	1,181	0	0	43,122	0	0	0	0	0
2011	0	55,707	0	2,184	0	0	35,543	0	0	0	0	0
2012	0	41,053	0	1,306	0	0	33,390	0	0	0	0	0
2013	16	13,414	0	1,095	0	0	33,507	0	0	0	0	0
2014	0	621	0	41	0	0	15,761	0	1,004	0	0	0
2015	0	0	0	0	0	0	12,447	0	1,023	0	0	0
2016	11	15,374	14	0	0	0	20,506	0	984	0	0	0
2017	318	66,255	7,526	71	5,781	2,000	19,123	2,500	858	0	0	5,500
2018	0	19,848	5,460	0	0	0	27,841	0	866	0	0	0
2019	0	28,176	20,001	0	100	0	28,085	0	502	0	1,219	0
2020	0	5,931	9	0	0	0	26,557	0	8	0	0	0
2021	0	4	0	9	0	0	11,956	0	12	0	0	0
2022	270	18,897	0	20	0	0	61,317	0	0	0	0	0
2023	276	19,465	0	20	0	0	60,555	0	0	0	0	0
2024	288	20,049	0	20	0	0	59,748	0	0	0	0	0
2025	294	20,649	0	20	0	0	58,944	0	0	0	0	0
2026	294	20,649	0	20	0	0	58,944	0	0	0	0	0
2027	294	20,649	0	20	0	0	58,944	0	0	0	0	0
2028	294	20,649	0	20	0	0	58,944	0	0	0	0	0
2029	294	20,649	0	20	0	0	58,944	0	0	0	0	0
2030	294	20,649	0	20	0	0	58,944	0	0	0	0	0
2031	294	20,649	0	20	0	0	58,944	0	0	0	0	0
2032	294	20,649	0	20	0	0	58,944	0	0	0	0	0
2033	294	20,649	0	20	0	0	58,944	0	0	0	0	0
2034	294	20,649	0	20	0	0	58,944	0	0	0	0	0
2035	294	20,649	0	20	0	0	58,944	0	0	0	0	0
TOTAL	19,650	1,323,664	33,010	21,470	5,881	2,000	1,908,116	2,500	14,686	10,268	1,219	5,500

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 15 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)										
	MOJAVE DIVISION (continued)										
	Reach 20B			Reach 21			Reach 22A		Reach 22B		
	AVEK	Littlerock	Palmdale	AVEK	Littlerock	Palmdale	AVEK	Littlerock	AVEK ⁵	Coachella ⁶	Desert ⁶
	[167]	[168]	[169]	[170]	[171]	[172]	[173]	[174]	[175]	[176]	[177]
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	338	0	0	0	0	0	0
1973	0	0	0	0	290	0	0	0	0	5,800	9,000
1974	0	0	0	0	400	0	0	0	0	6,400	10,000
1975	0	0	0	0	520	0	0	0	0	7,000	11,000
1976	416	0	0	0	589	0	0	0	0	7,600	12,000
1977	271	0	0	0	111	0	0	0	0	0	0
1978	934	0	0	0	208	0	0	0	0	10,084	15,300
1979	930	0	0	0	133	0	0	0	0	10,063	15,000
1980	655	0	0	0	191	0	3	0	0	10,884	17,000
1981	966	0	0	0	1,270	0	46	0	0	12,105	19,000
1982	8	0	0	0	0	0	174	0	0	13,326	21,000
1983	20	0	0	0	38	0	268	0	0	14,547	23,000
1984	2	0	0	0	1	0	550	0	0	15,768	25,000
1985	217	0	32	0	0	16	1,786	0	0	16,989	27,000
1986	0	0	45	0	163	10	1,735	0	0	18,210	29,000
1987	151	0	1,624	0	1,080	1,366	2,273	5	214	19,431	31,500
1988	281	0	1,261	0	419	143	3,210	0	0	20,652	34,000
1989	112	0	7,848	0	971	780	3,591	0	89	21,873	36,500
1990	84	0	8,292	0	1,747	34	3,988	0	10	23,100	38,100
1991	131	0	3,830	0	522	0	2,427	0	0	6,930	11,430
1992	650	0	3,850	0	251	0	3,859	0	0	10,427	17,197
1993	996	0	7,597	0	734	0	5,098	0	0	0	0
1994	124	0	8,119	0	1,098	0	4,657	0	0	0	0
1995	0	0	6,633	0	480	0	4,679	0	0	0	0
1996	0	0	11,080	0	494	0	5,458	0	0	0	0
1997	0	0	11,548	0	444	0	5,549	0	0	0	0
1998	0	0	8,557	0	404	0	4,468	0	0	0	0
1999	36	0	12,901	0	342	0	5,684	0	0	0	0
2000	80	0	9,060	5,002	0	0	5,890	0	0	0	0
2001	282	0	10,427	0	0	0	4,989	0	0	0	0
2002	1,662	0	18,496	0	0	0	5,404	0	497	0	0
2003	2,289	0	11,547	0	0	0	6,063	0	0	0	0
2004	1,774	0	12,139	0	0	23	6,095	0	253	0	0
2005	1,336	0	11,678	0	0	34	5,184	0	0	0	0
2006	1,415	0	12,487	0	0	5	6,653	0	0	0	0
2007	1,349	0	19,609	0	0	25	7,711	0	588	0	0
2008	792	25	14,255	0	0	0	4,756	0	0	0	0
2009	366	42	15,339	0	0	0	4,185	0	0	0	0
2010	643	0	10,969	0	0	0	3,899	0	0	0	0
2011	507	0	9,881	0	0	0	2,289	0	0	0	0
2012	901	0	16,397	0	0	0	2,328	0	0	0	0
2013	693	0	10,567	0	0	0	3,227	0	118	0	0
2014	744	0	8,406	0	0	0	1,318	0	88	0	0
2015	447	0	5,836	0	0	0	1,298	0	116	0	0
2016	677	0	10,516	0	0	0	3,155	0	144	0	0
2017	1,204	0	13,858	0	0	0	2,231	0	0	0	0
2018	1,551	0	10,210	0	0	0	2,212	0	0	0	0
2019	1,375	0	11,821	0	234	0	2,680	0	245	0	0
2020	1,681	1,380	7,016	0	145	0	2,551	0	0	0	0
2021	1,366	0	3,413	0	93	0	1,808	0	0	0	0
2022	2,505	0	19,543	0	1,380	0	3,155	0	492	0	0
2023	2,581	0	19,543	0	1,380	0	3,249	0	504	0	0
2024	2,659	0	19,543	0	1,380	0	3,346	0	528	0	0
2025	2,739	0	19,543	0	1,380	0	3,446	0	540	0	0
2026	2,739	0	19,543	0	1,380	0	3,446	0	540	0	0
2027	2,739	0	19,543	0	1,380	0	3,446	0	540	0	0
2028	2,739	0	19,543	0	1,380	0	3,446	0	540	0	0
2029	2,739	0	19,543	0	1,380	0	3,446	0	540	0	0
2030	2,739	0	19,543	0	1,380	0	3,446	0	540	0	0
2031	2,739	0	19,543	0	1,380	0	3,446	0	540	0	0
2032	2,739	0	19,543	0	1,380	0	3,446	0	540	0	0
2033	2,739	0	19,543	0	1,380	0	3,446	0	540	0	0
2034	2,739	0	19,543	0	1,380	0	3,446	0	540	0	0
2035	2,739	0	19,543	0	1,380	0	3,446	0	540	0	0
TOTAL	67,992	1,447	620,746	5,002	33,030	2,436	193,085	5	9,826	251,189	402,027

⁵ Year 1988 advance allocation.⁶ In accordance with the exchange agreement between the noted agencies, Metropolitan assumed responsibility for payment of variable OMP&R costs on the exchange water in reaches beyond Reach 22B, and Desert and Coachella 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 (acre-feet)

Sheet 16 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	MOJAVE DIVISION (continued)									
	Reach 22B (continued)					Reach 23	Reach 24			
	Littlerock	Metropolitan ⁶	Mojave	Palmdale	Santa Barbara	Mojave	Crestline	Metropolitan ⁶	Mojave	San Bernardino
	[178]	[179]	[180]	[181]	[182]	[183]	[184]	[185]	[186]	[187]
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	55	0	0	0	464	0	0	0
1973	0	(14,800)	0	0	0	0	389	0	0	0
1974	0	(16,400)	0	0	0	14	627	0	0	0
1975	0	(18,000)	0	0	0	0	825	0	0	0
1976	0	(19,600)	0	0	0	0	1,002	0	0	0
1977	0	0	22	0	0	58	1,109	0	0	0
1978	0	(25,384)	0	0	0	0	1,209	0	0	0
1979	0	(25,063)	4,000	0	0	0	1,260	0	0	0
1980	0	(27,884)	4,000	0	0	0	1,239	0	0	0
1981	0	(31,105)	4,000	0	0	0	1,485	0	0	0
1982	0	(34,326)	10,500	0	0	0	1,238	0	0	0
1983	0	(37,547)	0	0	0	0	911	0	0	0
1984	0	(40,768)	0	0	0	0	1,128	0	0	0
1985	0	(43,989)	0	0	0	0	1,422	0	0	0
1986	0	(47,210)	0	0	0	0	1,506	0	0	0
1987	0	(50,931)	17	0	0	0	1,849	0	0	0
1988	0	(54,652)	9	0	0	0	2,006	0	0	0
1989	0	(58,373)	0	0	0	200	2,170	0	0	0
1990	0	(61,200)	0	0	0	0	1,827	0	0	0
1991	0	(18,360)	0	0	0	0	849	0	2,032	0
1992	0	(27,624)	42	0	0	0	519	0	9,334	0
1993	0	0	0	0	0	0	439	0	10,000	0
1994	0	0	14,634	0	0	0	785	0	819	0
1995	0	0	7,495	0	0	0	409	0	0	0
1996	0	0	6,111	0	0	0	485	0	0	0
1997	0	0	9,038	0	0	0	651	0	0	0
1998	0	0	2,580	0	0	0	187	0	0	0
1999	0	0	6,705	0	0	0	1,132	0	0	0
2000	0	0	10,019	0	0	0	1,194	0	0	0
2001	0	0	3,048	0	0	0	1,057	0	0	0
2002	0	0	2,976	0	0	0	2,189	0	0	0
2003	0	7,625	13,150	0	0	0	1,563	17,249	0	0
2004	0	0	11,953	0	0	0	2,006	0	0	0
2005	0	5,942	12,169	0	0	0	807	14,058	341	0
2006	0	0	32,993	0	0	0	641	0	0	0
2007	0	0	27,684	0	0	0	1,768	0	17,249	710
2008	0	0	20,479	0	0	0	848	0	3,679	411
2009	0	0	20,214	0	0	0	894	0	7,488	149
2010	0	0	27,640	0	0	0	357	0	9,331	26
2011	0	30,907	2,915	0	0	0	474	14,141	0	31
2012	0	12,025	9,938	0	0	0	624	2,994	0	0
2013	0	0	5,888	0	0	0	1,368	0	500	0
2014	0	0	2,536	0	0	0	1,233	0	0	202
2015	0	0	7,807	0	0	0	1,253	0	0	0
2016	0	0	12,949	0	1,125	0	1,084	0	8,350	120
2017	0	0	23,020	0	0	0	897	0	10,866	219
2018	0	0	4,605	0	0	0	1,193	0	0	237
2019	200	0	16,971	245	0	0	403	0	4,457	0
2020	0	0	3,344	0	0	0	715	0	0	0
2021	0	0	7,592	0	0	1,134	1,799	0	0	48
2022	0	0	31,430	0	0	17,960	3,480	0	0	142
2023	0	0	31,430	0	0	17,960	3,480	0	0	142
2024	0	0	31,430	0	0	17,960	3,480	0	0	142
2025	0	0	31,430	0	0	17,960	3,480	0	0	142
2026	0	0	31,430	0	0	17,960	3,480	0	0	142
2027	0	0	31,430	0	0	17,960	3,480	0	0	142
2028	0	0	31,430	0	0	17,960	3,480	0	0	142
2029	0	0	31,430	0	0	17,960	3,480	0	0	142
2030	0	0	31,430	0	0	17,960	3,480	0	0	142
2031	0	0	31,430	0	0	17,960	3,480	0	0	142
2032	0	0	31,430	0	0	17,960	3,480	0	0	142
2033	0	0	31,430	0	0	17,960	3,480	0	0	142
2034	0	0	31,430	0	0	17,960	3,480	0	0	142
2035	0	0	31,430	0	0	17,960	3,480	0	0	142
TOTAL	200	(596,717)	789,118	245	1,125	252,846	102,209	48,442	84,446	4,141

⁶ In accordance with the exchange agreement between the noted agencies, Metropolitan assumed responsibility for payment of variable OMP&R costs on the exchange water in reaches beyond Reach 22B, and Desert and Coachella 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 (acre-feet)

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION									
	Reach 26A					Reach 28G	Reach 28H			Reach 28J
	Coachella ⁶	Desert ⁶	Metropolitan ⁶	San Bernardino ⁷	San Gabriel	Metropolitan	Coachella	Desert	Metropolitan	Coachella
	[188]	[189]	[190]	[191]	[192]	[193]	[194]	[195]	[196]	[197]
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	1,275	0	0	0	0	0	0
1973	0	0	444	32,426	0	18,942	0	0	0	0
1974	0	0	84,981	16,605	612	0	0	0	0	0
1975	0	0	169,960	13,865	5,450	0	0	0	0	0
1976	0	0	215,312	12,273	6,071	0	0	0	55	0
1977	0	0	64,823	24,833	8,996	0	0	0	43	0
1978	0	0	297,708	4,055	7,771	0	0	0	48	0
1979	0	0	260,903	18	290	0	0	0	1,290	0
1980	0	0	300,345	0	1,085	0	0	0	3,013	0
1981	0	0	395,678	16,021	3,619	0	0	0	4,365	0
1982	0	0	214,566	8,409	12,599	0	0	0	3,961	0
1983	0	0	175,288	5,994	734	0	0	0	6,645	0
1984	0	0	122,311	5,556	7,656	0	0	0	109,743	0
1985	0	0	147,599	7,390	5,028	0	0	0	182,781	0
1986	0	0	215,265	6,421	9,454	0	0	0	131,439	0
1987	0	0	175,012	18,751	10,630	0	0	0	144,743	0
1988	0	0	247,101	21,386	8,948	0	0	0	199,641	0
1989	0	0	326,217	20,782	12,839	0	0	0	247,430	0
1990	0	0	399,387	18,831	16,649	0	0	0	257,796	0
1991	0	0	107,182	3,661	5,399	0	0	0	38,832	0
1992	0	0	219,524	3,358	7,908	0	0	0	85,341	0
1993	23,100	38,100	98,291	4,361	14,397	0	0	0	61,841	0
1994	14,102	23,257	192,979	9,135	15,230	0	0	0	134,262	0
1995	23,100	38,100	107,299	696	12,922	0	0	0	117,762	0
1996	62,219	102,622	73,438	6,064	15,989	0	0	0	144,906	0
1997	58,100	53,100	157,215	9,654	18,175	0	0	0	107,853	0
1998	78,100	58,100	36,770	1,878	9,310	0	6,582	7,708	77,473	1,027
1999	50,480	58,100	139,752	12,874	21,729	0	0	0	206,689	0
2000	42,323	58,234	326,647	0	15,140	0	0	0	379,713	0
2001	9,100	15,010	284,007	0	2,360	0	0	0	260,984	0
2002	16,755	27,640	301,700	26,399	24,851	0	0	0	340,635	0
2003	14,443	23,819	464,719	5,000	21,934	0	0	0	246,485	0
2004	15,465	21,190	428,316	40,000	12,541	0	0	0	357,995	0
2005	34,356	49,089	361,976	15,834	13,984	0	0	0	242,245	0
2006	121,100	50,000	404,594	20,000	16,284	0	0	0	342,734	0
2007	66,007	27,253	370,971	10,022	4,024	0	7,221	2,981	271,874	0
2008	40,171	24,643	210,520	187	7,212	0	6,620	1,785	175,460	0
2009	45,074	17,872	138,216	0	11,520	0	948	391	126,265	0
2010	53,866	18,398	463,654	20,008	19,180	0	30,415	12,257	129,145	1,311
2011	84,566	34,076	610,454	368	23,591	0	5,713	2,303	213,215	0
2012	98,793	33,806	362,047	50,723	22,058	0	16,575	8,266	86,266	2,219
2013	33,551	17,611	234,576	1,120	9,252	0	28,232	3,180	45,039	4,756
2014	9,966	3,049	95,402	1,345	1,200	0	1,103	0	0	1,801
2015	26,600	67	110,774	2,100	5,760	0	10,996	9,611	25,883	0
2016	59,654	21,893	427,649	3,974	16,088	0	9,768	0	72,825	0
2017	67,648	26,819	721,554	2,560	22,056	0	4,301	0	285,400	11,959
2018	112,281	47,746	176,826	3,654	17,055	0	24,386	0	135,252	2,421
2019	34,588	13,938	705,757	2,901	23,220	0	0	0	127,090	0
2020	73,920	39,192	56,590	3,725	7,893	0	30,210	0	23,224	12,688
2021	16,418	2,788	97,105	672	1,440	0	0	0	8,236	0
2022	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2023	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2024	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2025	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2026	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2027	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2028	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2029	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2030	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2031	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2032	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2033	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2034	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
2035	83,010	33,450	420,921	0	17,280	0	0	0	279,185	0
TOTAL	2,547,986	1,413,812	18,192,298	497,164	780,053	18,942	183,070	48,482	10,072,507	38,182

⁶ In accordance with the exchange agreement between the noted agencies, Metropolitan assumed responsibility for payment of variable OMP&R costs on the exchange water in reaches beyond Reach 22B, and Desert and Coachella 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.

⁷ Includes 1,650 acre-feet recaptured from groundwater storage in 1982, 10,000 acre-feet in 1987, and 8,749 acre-feet in 1988. This water was stored under DWR's Ground Water Demonstration Program.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 18 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION (continued)									
	Reach 28J (continued)		Reach EBX1			Reach EBX2C	Reach EBX3A		Reach EBX4B-G	Reach EBX4B
	Desert	Metropolitan	Coachella	Metropolitan	San Bernardino	San Bernardino	San Bernardino	San Gorgonio	San Gorgonio	San Gorgonio
	[198]	[199]	[200]	[201]	[202]	[203]	[204]	[205]	[206]	[207]
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	251	0	0	0	0	0	0	0	0
1976	0	2,000	0	0	0	0	0	0	0	0
1977	0	2,442	0	0	0	0	0	0	0	0
1978	0	64,054	0	0	0	0	0	0	0	0
1979	0	94,353	0	0	0	0	0	0	0	0
1980	0	91,532	0	0	0	0	0	0	0	0
1981	0	149,405	0	0	0	0	0	0	0	0
1982	0	155,629	0	0	0	0	0	0	0	0
1983	0	41,616	0	0	0	0	0	0	0	0
1984	0	5,672	0	0	0	0	0	0	0	0
1985	0	6,538	0	0	0	0	0	0	0	0
1986	0	30,071	0	0	0	0	0	0	0	0
1987	0	26,315	0	0	0	0	0	0	0	0
1988	0	22,209	0	0	0	0	0	0	0	0
1989	0	51,462	0	0	0	0	0	0	0	0
1990	0	36,060	0	0	0	0	0	0	0	0
1991	0	5,958	0	0	0	0	0	0	0	0
1992	0	12,223	0	0	0	0	0	0	0	0
1993	0	4,588	0	0	0	0	0	0	0	0
1994	0	4,725	0	0	0	0	0	0	0	0
1995	0	21,099	0	0	0	0	0	0	0	0
1996	0	12,418	0	0	0	0	0	0	0	0
1997	0	47,777	0	0	0	0	0	0	0	0
1998	4,839	50,411	0	0	0	0	0	0	0	0
1999	0	8,163	0	0	0	0	0	0	0	0
2000	0	7,864	0	5,466	18,399	0	0	0	0	0
2001	0	33,414	0	0	26,488	0	0	0	0	0
2002	0	41,552	0	1,427	37,069	0	0	0	0	0
2003	0	50,776	0	74,496	16,703	1,793	2,617	0	0	116
2004	0	20,437	0	120,338	13,229	1,430	2,371	0	0	841
2005	0	114,499	8,163	153,700	12,715	966	1,978	57	0	692
2006	0	32,242	0	147,432	11,832	885	2,455	159	3,471	807
2007	0	48,923	0	94,208	38,151	3,130	4,984	119	3,758	177
2008	0	10,432	0	16,745	25,038	686	8,536	287	3,863	1,042
2009	0	5,849	0	18,314	25,041	4,090	9,792	274	4,499	1,898
2010	528	65,439	0	0	19,190	617	9,415	123	2,555	5,685
2011	0	51,638	0	0	19,578	699	9,275	109	1,213	9,290
2012	3,029	36,875	0	0	27,534	3,177	9,440	164	0	11,010
2013	0	40,494	0	0	19,850	3,034	7,901	180	0	9,445
2014	0	998	0	0	4,610	375	4,322	102	0	5,044
2015	1,539	977	0	0	15,970	382	5,474	454	0	3,481
2016	0	30,785	0	0	46,122	3,649	7,784	647	0	10,816
2017	4,817	59,375	0	0	52,218	6,682	15,919	898	0	14,946
2018	0	13,336	0	0	26,108	4,241	9,258	553	0	12,622
2019	0	66,952	0	0	50,827	13,622	11,113	177	0	14,152
2020	0	3,777	0	0	10,906	2,349	6,524	0	0	11,459
2021	0	0	0	0	12,080	82	730	0	0	2,063
2022	0	0	0	0	61,418	0	0	0	0	10,380
2023	0	0	0	0	61,418	0	0	0	0	10,380
2024	0	0	0	0	61,418	0	0	0	0	10,380
2025	0	0	0	0	61,418	0	0	0	0	10,380
2026	0	0	0	0	61,418	0	0	0	0	10,380
2027	0	0	0	0	61,418	0	0	0	0	10,380
2028	0	0	0	0	61,418	0	0	0	0	10,380
2029	0	0	0	0	61,418	0	0	0	0	10,380
2030	0	0	0	0	61,418	0	0	0	0	10,380
2031	0	0	0	0	61,418	0	0	0	0	10,380
2032	0	0	0	0	61,418	0	0	0	0	10,380
2033	0	0	0	0	61,418	0	0	0	0	10,380
2034	0	0	0	0	61,418	0	0	0	0	10,380
2035	0	0	0	0	61,418	0	0	0	0	10,380
TOTAL	14,752	1,683,605	8,163	632,126	1,389,510	51,889	129,888	4,303	19,359	260,906

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 19 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)						
	WEST BRANCH						
	Reach 29A	Reach 29F	Reach 29H		Reach 30		
	AVEK	AVEK	Santa Clarita ⁴	Ventura	Coachella	Desert	Metropolitan ⁸
	[208]	[209]	[210]	[211]	[212]	[213]	[214]
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	0	53	0	0	0	0	71,938
1973	0	20	0	0	0	0	155,297
1974	0	36	0	0	0	0	209,136
1975	0	26	0	0	0	0	374,280
1976	0	24	0	0	0	0	420,684
1977	0	0	0	0	0	0	122,447
1978	0	0	0	0	0	0	171,139
1979	0	0	0	0	0	0	145,591
1980	0	0	0	0	0	0	164,721
1981	0	0	0	0	0	0	277,503
1982	0	0	0	0	0	0	351,362
1983	0	0	0	0	0	0	157,519
1984	0	0	0	0	0	0	260,624
1985	0	0	0	0	0	0	390,696
1986	0	0	0	0	0	0	379,275
1987	0	0	0	0	0	0	417,285
1988	0	0	0	0	0	0	488,265
1989	0	0	0	0	0	0	589,962
1990	0	0	0	4,836	0	0	764,380
1991	0	0	0	988	0	0	257,835
1992	0	0	0	0	0	0	420,849
1993	0	6	0	0	0	0	437,470
1994	0	0	0	0	0	0	475,900
1995	0	0	0	0	0	0	139,882
1996	0	0	0	0	0	0	267,618
1997	0	11	0	0	10,240	16,890	271,379
1998	0	7	0	0	0	0	187,277
1999	0	0	0	0	0	0	327,001
2000	0	0	0	2,200	0	0	632,991
2001	0	0	0	0	0	0	444,764
2002	0	0	0	3,148	0	0	723,605
2003	0	0	6,768	3,150	0	0	678,964
2004	0	0	0	4,047	0	0	797,294
2005	0	0	0	0	0	0	538,839
2006	0	0	0	0	0	0	574,679
2007	0	0	0	1,890	0	0	711,831
2008	0	0	0	1,980	0	0	485,156
2009	0	0	0	3,150	0	0	589,294
2010	0	0	0	3,150	0	0	376,877
2011	0	0	0	2,520	0	0	375,921
2012	0	24	0	3,150	0	0	553,244
2013	0	47	0	2,242	0	0	565,849
2014	0	0	0	0	0	0	275,992
2015	0	0	0	630	0	0	435,892
2016	0	0	0	1,890	0	0	509,583
2017	510	0	0	2,678	0	0	354,401
2018	0	0	0	1,102	0	0	326,408
2019	0	0	0	18,150	0	0	281,887
2020	0	0	0	6,625	0	0	347,809
2021	0	0	0	2,521	0	0	198,314
2022	270	0	0	1,890	0	0	356,794
2023	276	0	0	1,890	0	0	356,794
2024	288	0	0	1,890	0	0	356,794
2025	294	0	0	1,890	0	0	356,794
2026	294	0	0	1,890	0	0	356,794
2027	294	0	0	1,890	0	0	356,794
2028	294	0	0	1,890	0	0	356,794
2029	294	0	0	1,890	0	0	356,794
2030	294	0	0	1,890	0	0	356,794
2031	294	0	0	1,890	0	0	356,794
2032	294	0	0	1,890	0	0	356,794
2033	294	0	0	1,890	0	0	356,794
2034	294	0	0	1,890	0	0	356,794
2035	294	0	0	1,890	0	0	356,794
TOTAL	4,578	254	6,768	96,507	10,240	16,890	24,472,025

⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.⁸ Deliveries exclude 6,171 acre-feet of 1982 exchange water.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 20 of 21

Calendar Year	CALIFORNIA AQUEDUCT (continued)								
	WEST BRANCH (continued)				COASTAL BRANCH				
	Reach 30 (continued)				Reach 31A				
	San Bernardino	Santa Barbara	Santa Clarita ⁴	Ventura	AVEK	Dudley Ridge	Kern		Kings
							Municipal and Industrial	Agricultural	
	[215]	[216]	[217]	[218]	[219]	[220]	[221]	[222]	[223]
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	71,657	0
1969	0	0	0	0	0	0	0	52,094	0
1970	0	0	0	0	0	0	0	71,910	0
1971	0	0	0	0	0	0	0	98,481	0
1972	0	0	0	0	0	0	0	107,850	0
1973	0	0	0	0	0	0	0	69,227	0
1974	0	0	0	0	0	0	0	68,474	0
1975	0	0	0	0	0	0	0	74,516	0
1976	0	0	0	0	0	0	0	78,358	0
1977	0	0	0	0	0	0	0	35,504	0
1978	0	0	0	0	0	0	0	81,242	0
1979	0	0	7	0	0	0	0	104,017	0
1980	0	0	1,210	0	0	0	0	97,497	0
1981	0	0	5,761	0	0	0	0	97,054	0
1982	0	0	9,516	0	0	0	0	83,076	0
1983	0	0	9,476	0	0	0	0	87,859	0
1984	0	0	11,477	0	0	0	0	119,098	0
1985	0	0	12,401	0	0	0	0	110,124	0
1986	0	0	13,928	0	0	0	0	118,298	0
1987	0	0	16,167	0	0	0	0	116,259	0
1988	0	0	18,904	0	0	0	0	109,435	0
1989	0	0	21,719	0	0	0	0	102,156	0
1990	0	0	22,139	0	0	0	0	103,362	0
1991	0	1,240	3,846	0	0	0	0	780	0
1992	0	0	14,812	0	0	0	0	73,748	0
1993	0	0	13,787	0	0	0	0	90,764	0
1994	0	0	14,919	0	0	0	200	77,536	0
1995	0	0	17,747	0	0	0	0	85,050	0
1996	0	0	18,448	0	0	0	0	100,578	0
1997	0	0	22,842	1,850	0	0	0	97,020	0
1998	0	0	19,782	1,850	0	0	0	86,879	0
1999	0	0	28,813	1,850	0	0	0	92,095	0
2000	0	0	31,085	1,850	0	0	0	85,215	0
2001	0	0	30,701	1,850	0	0	0	63,448	0
2002	8,601	0	42,080	1,850	0	0	0	65,055	0
2003	0	0	44,967	1,850	0	0	0	65,691	0
2004	0	0	47,463	1,203	0	0	0	66,498	0
2005	0	0	36,747	1,665	0	4,684	0	68,190	0
2006	0	0	40,017	1,850	0	0	0	85,214	0
2007	0	0	45,919	1,110	0	0	0	93,954	49
2008	0	0	42,878	1,818	0	0	17,059	68,385	0
2009	0	0	38,784	741	0	0	0	83,255	0
2010	0	0	31,288	925	0	2,967	0	81,047	276
2011	0	0	31,445	1,480	0	200	0	86,594	238
2012	0	0	36,153	1,203	33,511	0	0	50,050	0
2013	0	0	44,126	648	0	0	0	82,887	0
2014	0	0	29,448	93	0	0	0	74,406	0
2015	0	0	29,189	370	0	7,500	0	71,616	0
2016	0	0	31,888	1,110	1,489	0	0	86,363	0
2017	0	0	47,912	11,573	0	500	0	94,876	1,704
2018	0	0	42,835	648	0	2,542	0	86,401	0
2019	0	0	42,961	1,388	3,648	0	0	73,993	347
2020	0	0	48,828	370	0	5,000	0	84,476	0
2021	0	0	45,691	842	0	0	0	62,948	305
2022	0	0	47,020	10,110	0	0	0	52,260	183
2023	0	0	50,010	10,110	0	0	0	52,260	183
2024	0	0	53,000	10,110	0	0	0	52,260	183
2025	0	0	53,000	10,110	0	0	0	52,260	183
2026	0	0	53,000	10,110	0	0	0	52,260	183
2027	0	0	53,000	10,110	0	0	0	52,260	183
2028	0	0	53,000	10,110	0	0	0	52,260	183
2029	0	0	53,000	10,110	0	0	0	52,260	183
2030	0	0	53,000	10,110	0	0	0	52,260	183
2031	0	0	53,000	10,110	0	0	0	52,260	183
2032	0	0	53,000	10,110	0	0	0	52,260	183
2033	0	0	53,000	10,110	0	0	0	52,260	183
2034	0	0	53,000	10,110	0	0	0	52,260	183
2035	0	0	53,000	10,110	0	0	0	52,260	183
TOTAL	8,601	1,240	1,893,136	183,527	38,648	23,393	17,259	5,174,200	5,481

⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-5A Annual Water Quantities Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Calendar Year	CALIFORNIA AQUEDUCT (continued)					Grand Total
	COASTAL BRANCH (continued)				Total	
	Reach 31A (continued)		Reach 33A			
	Santa Clarita ⁴	Tulare	San Luis Obispo	Santa Barbara		
	[224]	[225]	[226]	[227]	[228]	[229]
1962	0	0	0	0	0	8,906
1963	0	0	0	0	0	12,645
1964	0	0	0	0	0	20,911
1965	0	0	0	0	0	34,026
1966	0	0	0	0	0	54,913
1967	0	0	0	0	0	56,763
1968	7,382	0	0	0	192,188	294,457
1969	9,970	0	0	0	195,705	268,104
1970	11,739	0	0	0	276,211	369,459
1971	12,490	0	0	0	553,081	654,442
1972	13,905	0	0	0	895,006	1,037,770
1973	9,418	0	0	0	638,930	737,532
1974	9,700	0	0	0	783,984	878,947
1975	10,700	0	0	0	1,129,728	1,230,830
1976	11,700	0	0	0	1,245,662	1,380,124
1977	5,075	0	0	0	465,442	582,381
1978	11,362	0	0	0	1,339,268	1,458,733
1979	19,138	0	0	0	1,537,075	1,666,457
1980	13,882	0	0	0	1,413,363	1,536,456
1981	12,700	0	0	0	1,779,479	1,918,563
1982	12,700	0	0	0	1,641,571	1,750,862
1983	12,659	0	0	0	1,089,626	1,187,156
1984	12,741	0	0	0	1,489,814	1,591,416
1985	12,099	0	0	0	1,863,544	1,990,295
1986	13,301	0	0	0	1,882,290	1,999,155
1987	11,821	0	0	0	1,984,570	2,131,608
1988	11,534	0	0	0	2,221,538	2,385,122
1989	14,645	0	0	0	2,686,838	2,853,747
1990	6,440	0	0	0	2,398,121	2,582,151
1991	716	0	0	0	489,489	549,113
1992	5,887	0	0	0	1,374,775	1,471,454
1993	4,157	0	0	0	2,173,352	2,315,235
1994	9,422	0	0	0	1,727,504	1,861,976
1995	9,486	0	0	0	1,926,835	2,031,423
1996	14,052	0	0	0	2,429,928	2,543,472
1997	4,870	0	1,099	7,439	2,263,966	2,405,444
1998	311	0	3,592	18,618	1,657,381	1,764,963
1999	4,086	0	3,743	20,137	2,755,025	2,898,961
2000	8,395	0	3,962	22,741	3,390,079	3,569,072
2001	1,238	0	4,283	18,946	2,034,350	2,175,194
2002	2,737	0	4,355	27,636	2,738,943	2,909,555
2003	4,001	0	4,453	26,968	3,151,625	3,327,811
2004	3,776	0	4,165	29,705	3,050,652	3,230,590
2005	2,709	0	4,251	23,344	3,597,829	3,753,874
2006	2,735	0	4,209	23,275	3,526,551	3,693,938
2007	6,071	0	3,776	27,740	3,088,763	3,284,475
2008	0	0	3,402	18,393	1,978,428	2,152,219
2009	1	0	3,801	15,452	2,065,868	2,227,564
2010	768	0	3,757	17,775	2,694,511	2,836,927
2011	1,746	0	3,819	21,050	3,510,684	3,666,432
2012	2,404	0	3,944	19,474	2,727,753	2,883,211
2013	6,128	0	3,681	18,018	2,023,225	2,224,875
2014	0	0	3,206	16,757	1,111,222	1,242,286
2015	0	0	3,438	11,673	1,339,811	1,497,970
2016	0	0	4,199	27,182	2,203,916	2,359,869
2017	370	2,159	2,845	29,740	3,648,178	3,770,284
2018	62	0	2,427	27,448	1,861,752	2,048,578
2019	382	11,606	2,642	18,138	2,928,291	3,058,493
2020	0	0	2,684	12,175	1,431,960	1,589,259
2021	0	0	3,141	2,809	1,052,730	1,217,008
2022	2,000	0	12,410	27,292	2,326,138	2,495,902
2023	2,000	0	12,448	27,292	2,326,176	2,495,940
2024	2,000	0	12,524	27,292	2,326,252	2,496,016
2025	2,000	0	12,570	27,292	2,326,298	2,496,062
2026	2,000	0	12,570	27,292	2,326,298	2,496,062
2027	2,000	0	12,570	27,292	2,326,298	2,496,062
2028	2,000	0	12,570	27,292	2,326,298	2,496,062
2029	2,000	0	12,570	27,292	2,326,298	2,496,062
2030	2,000	0	12,570	27,292	2,326,298	2,496,062
2031	2,000	0	12,570	27,292	2,326,298	2,496,062
2032	2,000	0	12,570	27,292	2,326,298	2,496,062
2033	2,000	0	12,570	27,292	2,326,298	2,496,062
2034	2,000	0	12,570	27,292	2,326,298	2,496,062
2035	2,000	0	12,570	27,292	2,326,298	2,496,062
TOTAL	391,611	13,765	264,526	884,721	134,226,254	144,179,996

⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

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 (acre-feet)

Calendar Year	CALIFORNIA AQUEDUCT													
	SAN LUIS DIVISION													
	Reach 1	Reach 3A												
	Santa Clara	Alameda-Zone 7	Alameda County	AVEK	Crestline	Dudley Ridge	Kern (Agricultural)	Kings	Metropolitan	Mojave	Palmdale	San Bernardino	San Gabriel	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	
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	0	(11,135)	0	0	0	0	0	0	
2001	0	0	0	0	0	0	(11,487)	0	0	0	0	0	0	
2002	0	0	0	0	0	0	(9,332)	0	0	0	0	0	0	
2003	0	0	0	0	0	0	(18,428)	0	0	0	0	0	0	
2004	0	0	0	0	0	0	(866)	0	0	0	0	0	0	
2005	0	0	0	0	0	(576)	(20,082)	0	0	0	0	0	0	
2006	0	0	0	0	0	0	(20,239)	0	0	0	0	0	0	
2007	0	0	0	0	0	0	(9,867)	0	0	0	0	0	0	
2008	(8,885)	0	0	0	0	0	(99,439)	0	0	0	0	0	0	
2009	0	0	0	(5,926)	(1)	(28)	(88,699)	0	(815)	(5)	(15)	(21)	(4)	
2010	0	0	0	0	0	0	(87,370)	0	(181,745)	0	0	0	0	
2011	0	0	0	0	0	0	(56,909)	0	(106,423)	0	0	0	0	
2012	0	0	0	0	0	(6,068)	(60,762)	0	0	0	0	0	0	
2013	0	0	0	0	0	0	(11,846)	0	0	0	0	0	0	
2014	0	0	0	(32)	(5)	(36)	(114,007)	(2)	(789)	(6)	(14)	(23)	(6)	
2015	0	(6,264)	(8,763)	(6)	(1)	(16,796)	(76,141)	0	(159)	(1)	(3)	(5)	(1)	
2016	0	(1,904)	(4,677)	0	0	0	(69,891)	0	0	0	0	0	0	
2017	0	0	0	0	0	(14,831)	(68,628)	0	(70,867)	0	0	0	0	
2018	0	0	0	0	0	(7,885)	(55,715)	0	0	0	0	0	0	
2019	0	0	0	0	0	0	(80,188)	0	0	0	0	0	0	
2020	0	0	0	0	0	(8,450)	(63,578)	0	0	0	0	0	0	
2021	0	0	0	0	0	0	(4,599)	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)	(8,168)	(13,440)	(5,964)	(7)	(54,670)	(1,039,208)	(2)	(360,798)	(12)	(32)	(49)	(11)	

TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 2 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SAN LUIS DIVISION (continued)								SOUTH SAN JOAQUIN DIVISION				
	Reach 3A (continued)							Reach 4		Reach 7		Reach 10A	
	San Geronio	San Luis Obispo	Santa Barbara	Santa Clara	Santa Clarita ¹	Tulare	Ventura	Kern (Agricultural)	Tulare	Kern (Agricultural)	Tulare	Alameda-Zone 7	Alameda County
	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]
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	0	0	(12,806)	0	(24,167)	(2,981)	0	0
2001	0	0	0	0	0	0	0	0	0	0	(25,164)	(1,807)	0
2002	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	(4,000)	0	0	(6,020)	0	0	0	0
2005	0	0	0	(20,000)	0	(277)	0	0	0	0	0	0	0
2006	0	0	0	(53,573)	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0	(5,000)
2008	0	0	0	(3,681)	0	0	0	0	0	0	0	(7,000)	(10,000)
2009	(4)	(2)	(19)	(1,000)	(38)	(49)	(1)	0	0	0	0	0	(3,083)
2010	0	0	0	(44,668)	(3,300)	(17,551)	0	0	0	0	0	0	0
2011	0	0	0	(51,404)	0	(11,096)	0	0	0	0	0	0	0
2012	0	0	0	0	0	(9,366)	0	0	0	0	0	0	0
2013	0	0	0	0	0	(6,054)	0	0	0	0	0	(4,000)	(4,000)
2014	(13)	(134)	(926)	0	(34)	(8)	0	0	0	0	0	(8,074)	(13,652)
2015	(3)	(27)	(187)	(21,076)	(7)	(1)	0	0	0	0	0	(11,185)	(14,115)
2016	0	0	0	(6,706)	0	0	0	0	0	0	0	(324)	0
2017	0	0	(11,128)	(83,322)	(17,988)	(4,000)	0	0	0	0	0	0	0
2018	0	0	0	(32,999)	0	(16,950)	0	0	0	0	0	0	(5,000)
2019	0	0	0	(62,615)	0	(7,754)	0	0	0	0	0	0	0
2020	0	0	0	(8,112)	(1,714)	(10,907)	0	0	0	0	0	(1,000)	(7,594)
2021	0	0	0	0	0	(193)	0	0	0	0	0	(907)	(1,344)
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	(20)	(163)	(12,260)	(389,156)	(23,081)	(88,206)	(1)	(12,806)	(6,020)	(24,167)	(28,145)	(34,297)	(63,788)

¹ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

**TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered
from Each Aqueduct Reach to Each Contractor (acre-feet)**

Sheet 3 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)												
	SOUTH SAN JOAQUIN DIVISION (continued)												
	Reach 10A (continued)						Reach 12E						
	Desert	Kern (Agricultural)	Metropolitan	San Bernardino	Santa Clara	Santa Clarita ¹	Alameda- Zone 7	Alameda County	AVEK	Coachella	Desert	Dudley Ridge	Kern (Agricultural)
	[27]	[28]	[29]	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
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	0	0	0	0	0	0	0	0
2001	0	(1,813)	(31,500)	0	(30,000)	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0	(14,638)
2003	0	0	(10,000)	0	0	0	0	0	0	0	0	0	(5,170)
2004	0	(3)	(93,555)	0	0	0	0	0	0	0	0	0	0
2005	0	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	0
2007	0	(12,469)	(93,986)	0	(20,000)	0	0	0	0	0	0	0	(16,618)
2008	(4,864)	0	(99,024)	0	(10,000)	0	0	0	(8,393)	(3,000)	(3,486)	0	(103,683)
2009	0	(7,733)	(65,499)	0	(27,319)	(4,950)	0	0	(6,393)	(3,000)	0	0	(105,145)
2010	0	(56)	0	0	0	0	0	0	0	(8,393)	0	0	(43,833)
2011	0	0	0	0	0	0	0	0	0	0	0	0	(14,223)
2012	0	0	0	0	(17,000)	0	0	0	0	(4,000)	0	0	(12,815)
2013	0	(24,626)	(37,544)	0	(27,308)	0	0	0	0	(16,500)	0	0	(34,355)
2014	0	(7,476)	(30,049)	(694)	(29,134)	(4,951)	(5,901)	0	0	(5,000)	0	0	(90,996)
2015	0	(20,190)	(32,517)	0	(40,572)	0	(5,029)	0	0	(9,500)	0	0	(56,927)
2016	0	(626)	(12,440)	0	(1,122)	0	0	0	0	(16,500)	0	0	(64,384)
2017	0	0	0	0	0	0	0	0	0	(5,397)	0	0	(6,075)
2018	0	0	0	0	0	0	0	0	0	(20,603)	0	0	(28,601)
2019	0	0	0	0	0	0	0	0	(99)	0	0	0	0
2020	0	(95)	(3,616)	0	(9,369)	(5,000)	0	(5,307)	0	(19,000)	0	0	(75,648)
2021	0	(113,413)	0	0	(3,137)	(498)	(139)	(207)	0	(4,750)	0	(693)	(234,265)
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	(4,864)	(188,500)	(509,730)	(694)	(214,961)	(15,399)	(11,069)	(5,514)	(14,885)	(115,643)	(3,486)	(693)	(907,376)

¹ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 4 of 5

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SOUTH SAN JOAQUIN DIVISION (continued)											
	Reach 12E (continued)					Reach 13B						
	Metropolitan	San Bernardino	San Geronio	Santa Clara	Santa Clarita ¹	Alameda-Zone 7	Alameda County	Dudley Ridge	Kern Agricultural	Metropolitan	Palmdale	San Bernardino
	[40]	[41]	[42]	[43]	[44]	[45]	[46]	[47]	[48]	[49]	[50]	[51]
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	(20,800)	0	0	0	0	0	0	0	(132,228)	0	0	0
2002	0	0	0	0	0	0	0	0	(22,161)	0	0	0
2003	(5,073)	0	0	0	0	0	0	0	(15,316)	(24,523)	0	0
2004	(17,765)	0	0	0	0	0	0	0	(43,985)	(4,813)	0	0
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	(5,000)	0	0	0	(11,000)	0	0	0	(257,750)	0	(4,926)	0
2008	(8,402)	0	0	0	(11,000)	0	0	0	(228,579)	(25,721)	0	0
2009	(14,516)	0	0	(6,134)	(11,000)	0	0	0	(186,044)	0	0	0
2010	(52,413)	0	0	0	(2,750)	0	0	0	(59,451)	0	0	0
2011	(23,419)	0	0	0	0	0	0	0	(29,041)	0	0	0
2012	0	0	0	0	0	0	0	(6,068)	(103,364)	0	0	0
2013	(31,478)	(1,500)	0	0	0	0	0	0	(160,286)	(1,033)	0	0
2014	(9,882)	(400)	0	0	(13,824)	(931)	(1,088)	(16,789)	(161,077)	(17,184)	0	(3,906)
2015	(6,899)	0	0	(288)	(13,993)	(1,600)	(2,097)	(14,460)	(112,780)	(21,935)	0	0
2016	(23,389)	0	0	0	(5,940)	0	0	0	(28,033)	0	0	0
2017	(6,375)	0	(1,700)	0	0	0	0	0	(60,240)	0	0	0
2018	(2,618)	0	(1,700)	0	(6,000)	0	0	(1,506)	(54,934)	0	0	0
2019	(5,114)	0	(1,601)	0	(1,100)	0	0	0	(40,181)	0	0	0
2020	(10,884)	(5,000)	(1,700)	(7,431)	(18,747)	0	0	(3,540)	(110,307)	(2,320)	0	0
2021	(4,584)	0	(1,214)	(482)	(7,237)	0	0	(5,507)	(216,187)	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	(248,611)	(6,900)	(7,915)	(14,335)	(102,591)	(2,531)	(3,185)	(47,870)	(2,021,944)	(97,529)	(4,926)	(3,906)

¹ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-5A-Adj Annual Water Quantity Adjustments to Water Delivered from Each Aqueduct Reach to Each Contractor (acre-feet)

Sheet 5 of 5

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 22A	Reach 22B		Reach 24	Reach EBX2C	
	Santa Clara	Kern (Agricultural)	Kern (Agricultural)	Metropolitan	Kern (Agricultural)	Kern (Agricultural)	AVEK	AVEK	Metropolitan	Metropolitan	San Bernardino	
	[52]	[53]	[54]	[55]	[56]	[57]	[58]	[59]	[60]	[61]	[62]	[63]
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	(51,089)
2001	0	(396)	(242)	0	0	0	0	(152)	0	0	0	(255,589)
2002	0	0	0	0	0	0	0	0	0	0	0	(46,131)
2003	0	0	0	(12,380)	0	0	0	0	0	0	0	(90,890)
2004	0	0	0	(25,512)	0	0	0	0	0	0	(844)	(197,363)
2005	0	0	0	0	0	0	0	0	0	0	(7)	(40,942)
2006	0	0	0	0	0	0	0	0	0	0	(2)	(73,814)
2007	0	0	0	(24,225)	0	0	0	0	(8,751)	(17,249)	0	(486,841)
2008	0	0	0	(37,602)	0	0	0	0	(4,816)	(3,679)	(6)	(681,260)
2009	0	(1,706)	(5,168)	(54,948)	(2,788)	(444)	0	0	0	(7,488)	(11)	(609,996)
2010	0	(1,867)	(4,761)	(32,758)	(2,913)	0	0	0	0	(2,891)	0	(546,720)
2011	0	0	0	(16,065)	0	0	0	0	0	0	0	(308,580)
2012	0	(73)	(862)	(10,010)	(405)	0	0	0	0	0	0	(230,793)
2013	(17,692)	(264)	(4,691)	(33,205)	(406)	0	0	0	0	0	0	(416,788)
2014	(5,253)	(6,898)	(10,773)	(47,358)	(5,962)	0	(1,046)	0	0	0	0	(614,333)
2015	(4,625)	(10,554)	(11,108)	(70,200)	(5,560)	0	(1,516)	0	0	0	0	(597,091)
2016	0	(8,376)	(4,939)	(29,819)	(3,549)	0	(1,056)	0	0	0	0	(283,675)
2017	0	0	0	(5,863)	0	0	0	0	0	0	0	(356,414)
2018	0	(6,266)	(4,988)	(13,893)	(1,656)	0	0	0	0	0	0	(261,314)
2019	0	0	0	(5,861)	0	0	0	0	0	0	0	(204,513)
2020	0	(7,738)	(6,033)	0	(1,163)	0	0	0	0	0	0	(394,253)
2021	0	(6,827)	(6,067)	0	(3,527)	0	0	0	0	0	0	(615,777)
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	(27,570)	(50,965)	(59,632)	(419,699)	(27,929)	(444)	(3,618)	(152)	(13,567)	(31,307)	(870)	(7,364,166)

Tables B-5B 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-5B Annual Water Quantities Delivered to Each Contractor (acre-feet)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA ¹				CENTRAL COASTAL AREA		
	Napa ²	Solano	Total	Alameda-Zone 7	Alameda County	Santa Clara	Total	San Luis Obispo	Santa Barbara	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	129,062	218,398	3,819	32,945	36,764
2012	9,907	29,347	39,254	55,239	20,831	63,794	139,864	3,944	19,474	23,418
2013	12,538	35,869	48,407	44,856	23,640	84,623	153,119	3,681	18,018	21,699
2014	14,164	19,679	33,843	34,296	30,066	67,446	131,808	3,206	16,757	19,963
2015	11,199	23,836	35,035	32,432	27,259	82,888	142,579	3,438	11,673	15,111
2016	8,993	23,605	32,598	53,484	27,357	107,164	188,005	4,199	35,537	39,736
2017	8,225	28,265	36,490	56,458	29,036	127,155	212,649	2,845	51,105	53,950
2018	11,682	35,072	46,754	39,523	18,161	121,736	179,420	2,427	28,348	30,775
2019	11,285	31,482	42,767	52,296	21,731	104,985	179,012	2,642	20,557	23,199
2020	12,089	37,664	49,753	26,183	23,529	56,794	106,506	2,684	12,175	14,859
2021	13,070	37,275	50,345	34,918	26,681	71,816	133,415	3,141	2,809	5,950
2022	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,410	27,292	39,702
2023	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,448	27,292	39,740
2024	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,524	27,292	39,816
2025	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,570	27,292	39,862
2026	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,570	27,292	39,862
2027	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,570	27,292	39,862
2028	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,570	27,292	39,862
2029	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,570	27,292	39,862
2030	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,570	27,292	39,862
2031	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,570	27,292	39,862
2032	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,570	27,292	39,862
2033	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,570	27,292	39,862
2034	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,570	27,292	39,862
2035	17,415	28,654	46,069	48,371	25,200	60,000	133,571	12,570	27,292	39,862
TOTAL	623,841	1,416,717	2,040,558	2,207,681	1,540,357	5,472,433	9,220,471	264,726	930,895	1,195,621

¹ For the period June 1962 through November 1967, deliveries were supplied by non-project water.² For the period 1968 through 1987, deliveries are non-project water pumped through an interim facility.

TABLE B-5B Annual Water Quantities Delivered to Each Contractor (acre-feet)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge	Empire	Kern			Kings	Oak Flat	Tulare	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	1,146,062	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	980,020
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	702,099	726,671	3,836	1,985	33,904	789,517
2009	21,237	1,034	2,912	779,826	782,738	3,391	1,993	36,836	847,229
2010	27,967	3,259	8,183	689,917	698,100	4,679	2,906	70,238	807,149
2011	60,560	1,915	37,112	1,157,336	1,194,448	6,556	2,715	63,141	1,329,335
2012	30,450	2,242	27,500	779,572	807,072	7,405	3,208	95,717	946,094
2013	27,046	1,567	33,501	711,840	745,341	4,645	2,820	48,361	829,780
2014	40,535	516	1	516,001	516,002	1,256	1,520	8,934	568,763
2015	41,733	624	11,976	508,842	520,818	1,229	1,077	17,336	582,817
2016	20,908	1,822	9,633	634,649	644,282	3,660	1,855	42,387	714,914
2017	64,245	1,698	35,965	1,159,922	1,195,887	6,645	2,893	61,920	1,333,288
2018	41,006	1,591	4,207	608,151	612,358	3,713	2,289	51,451	712,408
2019	33,030	1,938	10,197	970,487	980,684	4,929	2,184	93,273	1,116,038
2020	34,093	1,248	5,133	596,414	601,547	3,169	2,140	26,050	668,247
2021	15,212	150	1,047	562,949	563,996	2,330	822	18,748	601,258
2022	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2023	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2024	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2025	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2026	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2027	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2028	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2029	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2030	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2031	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2032	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2033	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2034	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
2035	26,168	1,800	59,321	538,426	597,747	5,583	3,420	52,483	687,201
TOTAL	2,613,315	134,164	3,627,110	44,986,939	48,614,049	263,283	253,301	4,850,128	56,728,240

TABLE B-5B Annual Water Quantities Delivered to Each Contractor (acre-feet)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	AVEK	Coachella	Crestline	Desert	Littlerock	Mojave	Palmdale	San Bernardino	San Gabriel	San Geronio
	[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	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	53	0	464	0	338	55	0	1,275	0	0
1973	20	5,800	389	9,000	290	0	0	32,426	0	0
1974	1,259	6,400	627	10,000	400	14	0	16,605	612	0
1975	8,068	7,000	825	11,000	520	0	0	13,865	5,450	0
1976	27,782	7,600	1,002	12,000	589	0	0	12,273	6,071	0
1977	11,202	0	1,109	0	111	80	0	24,833	8,996	0
1978	44,137	10,084	1,209	15,300	208	0	0	4,055	7,771	0
1979	60,493	10,063	1,260	15,000	133	4,000	0	18	290	0
1980	72,407	10,884	1,239	17,000	191	4,000	0	0	1,085	0
1981	79,375	12,105	1,485	19,000	1,270	4,000	0	16,021	3,619	0
1982	50,291	13,326	1,238	21,000	0	10,500	0	8,409	12,599	0
1983	32,961	14,547	911	23,000	38	0	0	5,994	734	0
1984	32,662	15,768	1,128	25,000	1	0	0	5,556	7,656	0
1985	37,064	16,989	1,422	27,000	0	0	1,558	7,390	5,028	0
1986	32,449	18,210	1,506	29,000	163	0	3,096	6,421	9,454	0
1987	34,089	19,431	1,849	31,500	1,085	17	5,379	18,751	10,630	0
1988	34,079	20,652	2,006	34,000	419	9	1,770	21,386	8,948	0
1989	45,280	21,873	2,170	36,500	971	200	9,009	20,782	12,839	0
1990	47,206	23,100	1,827	38,100	1,747	0	8,608	18,831	16,649	0
1991	9,568	6,930	849	11,430	522	3,423	3,914	3,661	5,399	0
1992	30,265	10,427	519	17,197	251	10,686	4,035	3,358	7,908	0
1993	43,102	23,100	439	38,100	734	11,514	7,761	4,361	14,397	0
1994	49,153	14,102	785	23,257	1,098	16,852	8,418	9,135	15,230	0
1995	47,286	23,100	409	38,100	480	8,722	6,961	696	12,922	0
1996	56,356	62,219	485	102,622	494	7,427	11,434	6,064	15,989	0
1997	62,393	68,340	651	69,990	444	10,374	11,861	9,654	18,175	0
1998	52,926	85,709	187	70,647	404	3,925	8,752	1,878	9,310	0
1999	69,073	50,480	1,132	58,100	342	8,144	13,278	12,874	21,729	0
2000	83,577	42,323	1,194	58,234	0	11,380	9,060	18,399	15,140	0
2001	62,857	9,100	1,057	15,010	0	4,433	10,427	26,488	2,360	0
2002	58,171	16,755	2,189	27,640	0	4,346	18,496	72,069	24,851	0
2003	60,029	14,443	1,563	23,819	0	14,435	11,547	26,113	21,934	116
2004	59,731	15,465	2,006	21,190	0	13,176	12,162	57,030	12,541	841
2005	59,831	42,519	807	49,089	0	13,561	11,712	31,493	13,984	749
2006	80,384	121,100	641	50,000	0	34,014	12,492	35,172	16,284	4,437
2007	80,203	73,228	1,768	30,234	0	46,109	19,634	56,997	4,024	4,054
2008	54,436	46,791	848	26,428	25	25,396	14,255	34,858	7,212	5,192
2009	45,670	46,022	894	18,263	42	29,047	15,339	39,072	11,520	6,671
2010	58,489	85,592	357	31,183	0	38,152	10,969	49,256	19,180	8,363
2011	94,046	90,279	474	36,379	0	5,099	16,881	38,017	23,591	10,612
2012	111,207	117,587	624	45,101	0	11,244	18,897	112,808	22,058	11,174
2013	51,022	66,539	1,368	20,791	0	7,483	10,567	31,905	9,252	9,625
2014	18,532	12,870	1,233	3,049	0	3,581	8,406	10,854	1,200	5,146
2015	14,308	37,596	1,253	11,217	0	8,830	5,836	23,926	5,760	3,935
2016	41,356	69,422	1,084	21,893	0	22,283	10,516	61,649	16,088	11,463
2017	124,284	83,908	897	31,636	0	34,815	14,210	77,598	22,056	15,844
2018	72,341	139,088	1,193	47,746	0	5,471	10,210	43,498	17,055	13,175
2019	78,015	34,588	403	13,938	434	21,930	12,066	78,463	23,220	14,329
2020	43,720	116,818	715	39,192	1,525	3,352	7,016	23,504	7,893	11,459
2021	15,134	16,418	1,799	2,788	93	8,747	3,413	13,612	1,440	2,082
2022	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2023	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2024	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2025	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2026	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2027	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2028	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2029	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2030	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2031	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2032	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2033	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2034	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
2035	86,906	83,010	3,480	33,450	1,380	49,410	19,543	61,560	17,280	10,380
TOTAL	3,655,026	3,038,830	102,209	1,895,963	34,682	1,162,566	643,547	2,111,193	780,053	284,587

TABLE B-5B Annual Water Quantities Delivered to Each Contractor (acre-feet)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	GRAND TOTAL
	Santa Clarita ^{3,4}	Metropolitan	Ventura	Total	Yuba City	Butte	Plumas	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	7,382	0	0	7,382	0	0	0	0	0	294,457
1969	9,970	0	0	9,970	0	0	0	0	0	268,104
1970	11,739	0	0	11,739	0	0	70	70	0	369,459
1971	12,490	0	0	12,490	0	192	64	256	0	654,442
1972	13,905	71,938	0	88,028	0	186	505	691	0	1,037,770
1973	9,418	159,883	0	217,226	0	53	679	732	0	737,532
1974	9,700	277,717	0	323,334	0	127	648	775	0	878,947
1975	10,700	526,491	0	583,919	0	253	405	658	0	1,230,830
1976	11,700	618,451	0	697,468	0	527	382	909	0	1,380,124
1977	5,075	189,755	0	241,161	0	706	303	1,009	0	582,381
1978	11,362	507,565	0	601,691	0	579	278	857	0	1,458,733
1979	19,145	477,074	0	587,476	0	302	329	631	0	1,666,457
1980	15,092	531,727	0	653,625	0	267	295	562	0	1,536,456
1981	18,461	795,846	0	951,182	0	221	355	576	0	1,918,563
1982	22,216	691,192	0	830,771	0	334	305	639	0	1,750,862
1983	22,135	343,521	0	443,841	0	325	262	587	0	1,187,156
1984	24,218	457,582	0	569,571	108	177	272	557	0	1,591,416
1985	24,500	683,625	0	804,576	62	308	254	624	0	1,990,295
1986	27,229	708,840	0	836,368	328	313	317	958	0	1,999,155
1987	27,988	712,424	0	863,143	88	459	452	999	0	2,131,608
1988	30,438	902,564	0	1,056,271	303	385	523	1,211	0	2,385,122
1989	36,364	1,156,698	0	1,342,686	403	300	486	1,189	0	2,853,747
1990	28,579	1,396,423	4,836	1,585,906	494	380	548	1,422	0	2,582,151
1991	4,562	391,447	988	442,693	265	328	420	1,013	0	549,113
1992	20,699	710,313	0	815,658	642	117	485	1,244	0	1,471,454
1993	23,039	652,190	0	818,737	746	256	444	1,446	0	2,315,235
1994	26,441	807,866	0	972,337	1,035	329	492	1,856	0	1,861,976
1995	27,233	436,042	0	601,951	910	203	308	1,421	0	2,031,423
1996	32,500	593,380	0	888,970	820	257	360	1,437	0	2,543,472
1997	27,712	721,810	1,850	1,003,254	1,005	185	231	1,421	0	2,405,444
1998	20,093	410,065	1,850	665,746	1,054	527	0	1,581	0	1,764,963
1999	32,899	852,617	1,850	1,122,518	1,096	286	0	1,382	0	2,898,961
2000	40,680	1,522,412	4,050	1,806,449	901	586	0	1,487	0	3,569,072
2001	31,939	1,023,169	1,850	1,188,690	1,065	513	0	1,578	0	2,175,194
2002	68,817	1,408,919	4,998	1,707,251	1,181	419	0	1,600	0	2,909,555
2003	55,736	1,701,615	5,000	1,936,350	1,324	551	0	1,875	0	3,327,811
2004	83,761	1,724,380	5,250	2,007,533	1,434	1,440	0	2,874	0	3,230,590
2005	59,456	1,528,045	1,665	1,812,911	1,894	527	0	2,421	0	3,753,874
2006	62,752	1,512,186	1,850	1,931,312	5,342	468	0	5,810	0	3,693,938
2007	60,190	1,499,688	3,000	1,879,129	2,327	956	0	3,283	0	3,284,475
2008	42,878	898,313	3,798	1,160,430	1,923	451	243	2,617	0	2,152,219
2009	42,085	930,871	3,891	1,189,387	2,114	581	200	2,895	0	2,227,564
2010	57,900	1,420,331	4,075	1,783,847	2,331	807	243	3,381	0	2,836,927
2011	33,191	1,686,570	4,000	2,039,139	2,297	1,092	98	3,487	0	3,666,432
2012	50,473	1,224,907	4,353	1,730,433	2,695	1,374	79	4,148	0	2,883,211
2013	61,754	892,550	2,890	1,165,746	4,850	908	366	6,124	0	2,224,875
2014	29,448	387,392	93	481,804	4,237	1,617	251	6,105	0	1,242,286
2015	29,189	573,526	1,000	716,376	3,004	2,763	285	6,052	0	1,497,970
2016	37,828	1,083,900	3,000	1,380,482	1,229	2,518	387	4,134	0	2,359,869
2017	83,622	1,626,357	14,251	2,129,478	1,746	2,320	363	4,429	0	3,770,284
2018	42,897	679,545	1,750	1,073,969	1,715	3,029	508	5,252	0	2,048,578
2019	48,345	1,347,162	19,538	1,692,431	1,655	2,955	436	5,046	0	3,058,493
2020	50,542	431,759	6,995	744,490	1,812	3,186	406	5,404	0	1,589,259
2021	46,675	303,655	3,363	419,219	3,398	3,288	135	6,821	0	1,217,008
2022	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,495,940
2023	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,016
2024	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
2025	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
2026	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
2027	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
2028	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
2029	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
2030	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
2031	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
2032	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
2033	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
2034	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
2035	57,120	1,146,900	12,000	1,582,419	5,760	450	730	6,940	0	2,496,062
TOTAL	2,544,822	58,248,898	280,034	74,782,410	140,473	47,531	24,692	212,696	0	144,179,996

³ Devil's Den Water District merged with Castaic Lake Water Agency effective January 1, 1992.⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities (acre-feet)

Sheet 1 of 10

Calendar Year	NORTH BAY AQUEDUCT											
	Barker Slough Pumping Plant				Cordelia Pumping Plant Solano				Cordelia Pumping Plant Napa			
	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 ¹	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	41,973	43,826	0	4	21,525	21,529	0	180	4,958	5,138
2001	0	1,760	43,931	45,691	0	0	19,737	19,737	0	0	9,345	9,345
2002	0	496	45,435	45,931	0	0	19,719	19,719	0	0	6,875	6,875
2003	0	3,991	41,597	45,588	0	0	16,700	16,700	0	0	7,637	7,637
2004	0	2,181	51,136	53,317	0	0	21,686	21,686	0	0	8,499	8,499
2005	0	935	45,488	46,423	0	0	19,189	19,189	0	0	8,009	8,009
2006	0	1,005	43,305	44,310	0	0	18,651	18,651	0	0	8,081	8,081
2007	0	1,189	58,257	59,446	0	0	27,793	27,793	0	0	11,277	11,277
2008	0	845	54,612	55,457	0	0	19,436	19,436	0	255	13,740	13,995
2009	0	537	41,854	42,391	0	0	15,473	15,473	0	130	11,377	11,507
2010	0	809	43,233	44,042	0	0	12,788	12,788	0	254	12,847	13,101
2011	0	803	39,309	40,112	0	0	12,832	12,832	0	213	11,275	11,488
2012	0	686	39,254	39,940	0	0	12,886	12,886	0	196	9,860	10,056
2013	0	1,150	48,407	49,557	0	0	19,404	19,404	0	350	12,478	12,828
2014	0	2,597	33,843	36,440	0	0	12,366	12,366	0	970	14,123	15,093
2015	0	144	35,035	35,179	0	0	15,321	15,321	0	76	11,133	11,209
2016	0	552	32,598	33,150	0	0	12,849	12,849	0	278	8,947	9,225
2017	0	1,639	36,490	38,129	0	0	14,525	14,525	0	646	8,201	8,847
2018	0	3,330	46,754	50,084	0	0	19,607	19,607	0	899	11,660	12,559
2019	0	1,767	42,767	44,534	0	0	17,692	17,692	0	769	11,261	12,030
2020	0	960	49,753	50,713	0	0	20,607	20,607	0	248	12,031	12,279
2021	0	51	50,345	50,396	0	0	25,789	25,789	0	5	13,069	13,074
2022	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2023	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2024	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2025	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2026	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2027	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2028	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2029	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2030	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2031	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2032	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2033	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2034	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420
2035	0	51	46,069	46,120	0	0	0	0	0	5	17,415	17,420

¹ 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 (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	Transportation Water						Conservation Water	Total	
				Water Supply ²	Recreation		Initial Fill Water	Operational Losses	Reservoir Storage Changes	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	20,767	(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)	539,748	4,879	545,695	554,904	1,100,599	
1992	0	2,881	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	145	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	83,788	(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	2,736,094	830	2,944,004	(398,297)	2,545,707	
2008	0	2,215	880	116,562	166	119,823	0	130,066	(3,350)	1,413,730	1,082	1,541,528	(397,949)	1,143,579	
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	1,727	3,436	95,802	117	101,082	0	224,076	51,667	2,243,593	1,163	2,520,499	454,585	2,975,084	
2011	0	1,534	(2,332)	112,952	122	112,276	0	314,282	(21,148)	3,315,056	1,588	3,609,778	165,312	3,775,090	
2012	0	2,025	5,931	112,056	150	120,162	0	143,580	20,504	2,609,016	1,606	2,774,706	(473,745)	2,300,961	
2013	0	2,753	(5,596)	147,119	137	144,413	0	173,145	(6,654)	1,753,556	1,641	1,921,688	(123,957)	1,797,731	
2014	0	3,285	4,951	91,116	46	99,398	0	114,127	36,033	588,005	650	738,815	301,102	1,039,917	
2015	0	2,727	(8,482)	117,072	43	111,360	0	109,951	(41,424)	859,792	690	929,009	(140,538)	788,471	
2016	0	2,031	5,558	119,221	69	126,879	0	106,956	(57,641)	2,039,462	1,399	2,090,176	503,353	2,593,529	
2017	0	2,409	(6,363)	81,187	46	77,279	0	118,158	12,421	3,372,951	775	3,504,305	(3,969)	3,500,336	
2018	0	2,778	(391)	134,820	100	137,307	0	104,012	45,050	1,735,258	879	1,885,199	167,385	2,052,584	
2019	0	1,873	185	82,389	103	84,550	0	105,128	(38,086)	2,806,167	953	2,874,162	67,564	2,941,726	
2020	0	2,584	3,835	102,142	36	108,597	0	103,871	37,158	1,139,849	786	1,281,664	(261,971)	1,019,693	
2021	0	3,382	0	107,112	400	110,894	0	117,199	(149,000)	544,065	8,660	520,924	56,149	577,073	
2022	0	3,386	(4,000)	116,755	400	116,541	0	120,599	152,000	2,442,893	8,660	2,724,152	(194,315)	2,529,837	
2023	0	3,386	(4,000)	116,755	400	116,541	0	118,668	(4,000)	2,442,931	8,660	2,566,259	79,189	2,645,448	
2024	0	3,351	0	116,755	400	120,506	0	128,486	11,289	2,443,007	8,660	2,591,442	79,858	2,671,300	
2025	0	3,351	0	116,755	400	120,506	0	130,241	(12,518)	2,443,053	8,660				

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities (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	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	11,079	25,126	0	189,104	0	225,309	0	0	0	0	0	0
1969	3,887	9,922	0	192,689	0	206,498	0	0	0	0	0	0
1970	7,668	1,901	0	270,300	0	279,869	4,779	1,012	0	3	0	5,794
1971	23,207	(12,030)	0	545,869	0	557,046	7,853	8,399	0	101,512	0	117,764
1972	145,066	(6,635)	(6,558)	886,840	6,481	1,025,194	100,274	20,044	(6,558)	223,626	6,481	343,867
1973	214,941	(6,778)	1,329	635,716	1,147	846,355	204,638	35,695	1,329	311,096	1,147	553,905
1974	247,894	(16,765)	(15,295)	780,513	2,108	998,455	237,554	19,672	(15,295)	388,949	2,108	632,988
1975	110,149	(12,144)	(693)	1,126,152	3,358	1,226,822	103,352	26,342	(693)	672,531	3,358	804,890
1976	67,834	(456)	(152,171)	1,241,550	1,581	1,158,338	61,122	29,428	(152,171)	785,055	1,581	725,015
1977	0	26,359	(116,219)	463,970	737	374,847	0	25,173	(116,219)	271,944	560	181,458
1978	67,457	1,905	79,308	1,335,362	680	1,484,712	65,027	17,751	121,904	762,043	674	967,399
1979	17,397	33,884	(51,299)	1,530,926	685	1,531,593	12,302	46,157	(51,299)	737,714	502	745,376
1980	3,159	34,391	(272,825)	1,407,663	1,514	1,173,902	0	49,025	(134,009)	778,059	1,262	694,337
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	1,143,735
1982	5,979	57,146	116,086	1,631,868	4,205	1,815,284	0	29,059	117,174	990,863	4,045	1,141,141
1983	6,071	63,583	(101,155)	1,085,804	7,475	1,061,778	0	40,205	(101,155)	593,920	7,291	540,261
1984	38,649	109,263	(112,744)	1,484,114	5,391	1,524,673	0	38,487	(114,984)	781,955	5,244	710,702
1985	0	86,772	138,898	1,858,111	4,936	2,088,717	0	42,838	139,689	992,606	4,804	1,179,937
1986	0	51,963	19,989	1,877,183	3,426	1,952,561	0	36,751	37,546	1,014,294	3,285	1,091,876
1987	0	64,827	(25,707)	1,978,945	7,121	2,025,186	0	30,495	(25,522)	1,027,361	6,937	1,039,271
1988	0	72,679	(34,592)	2,217,126	4,490	2,259,703	0	38,804	(29,747)	1,244,196	4,360	1,257,613
1989	0	90,090	(29,411)	2,679,845	7,652	2,748,176	0	29,594	(60,826)	1,532,625	7,490	1,508,883
1990	0	115,074	(11,323)	2,394,999	8,922	2,507,672	0	46,865	(15,092)	1,769,991	8,879	1,810,643
1991	0	92,227	9,325	489,348	4,605	595,505	0	39,274	96,506	446,916	4,560	587,256
1992	0	118,796	(225,603)	1,372,536	2,079	1,267,808	0	28,138	(98,271)	920,978	1,995	852,840
1993	0	136,432	(220,537)	2,170,494	1,864	2,088,253	0	14,186	(128,363)	908,200	1,676	795,699
1994	0	152,414	(78,957)	1,724,433	3,098	1,800,988	0	35,083	(88,211)	1,107,122	2,918	1,056,912
1995	0	137,937	(12,473)	1,921,666	1,711	2,048,841	0	33,963	(16,431)	706,742	1,669	725,943
1996	0	45,591	14,927	2,425,024	2,998	2,488,540	0	31,304	15,438	988,612	2,928	1,038,282
1997	527	107,033	(66,814)	2,247,628	2,090	2,290,464	0	42,670	40,852	1,054,461	2,076	1,140,059
1998	0	95,185	(338,076)	1,664,080	1,589	1,422,778	0	41,910	(106,487)	753,731	1,585	690,739
1999	0	95,262	(2,778)	2,750,154	3,285	2,845,923	0	48,502	(2,807)	1,131,826	3,279	1,180,800
2000	0	134,231	7,726	3,273,337	4,222	3,419,516	0	37,514	7,726	1,814,685	4,216	1,864,141
2001	0	150,830	(18,830)	1,615,776	1,218	1,748,994	0	31,361	(18,830)	1,318,835	1,211	1,332,577
2002	0	92,905	50,342	2,628,462	3,968	2,775,677	0	41,565	50,342	1,831,874	3,961	1,927,742
2003	0	85,360	(48,181)	2,893,333	10,656	2,941,168	0	43,352	(48,181)	1,909,192	10,645	1,915,008
2004	0	25,865	3,161	2,807,825	652	2,837,503	0	41,551	3,161	2,102,371	649	2,147,732
2005	0	62,569	(159,678)	3,423,490	581	3,326,962	0	35,019	(159,678)	1,846,180	559	1,722,080
2006	0	(12,341)	(120,122)	3,501,308	504	3,369,349	0	30,271	(120,122)	2,077,130	504	1,987,783
2007	0	47,736	118,196	2,419,032	312	2,585,276	0	43,400	118,196	2,002,793	305	2,164,694
2008	0	103,375	(4,230)	1,296,068	361	1,395,574	0	39,056	(4,230)	1,275,174	327	1,310,327
2009	0	76,206	(726)	1,318,452	1,367	1,395,299	0	32,900	(726)	1,217,847	1,295	1,251,316
2010	0	75,028	48,231	2,307,963	636	2,431,858	0	41,741	48,231	1,505,105	603	1,595,680
2011	0	66,937	(18,816)	3,343,960	870	3,392,951	0	39,914	(18,816)	1,820,268	742	1,842,108
2012	0	113,586	14,573	2,539,221	942	2,668,322	0	95,029	14,573	1,672,197	938	1,782,737
2013	0	174,857	(1,058)	1,549,837	836	1,724,472	0	105,771	(1,058)	1,275,717	795	1,381,225
2014	0	105,741	31,082	433,625	214	570,662	0	72,181	31,082	523,726	172	627,161
2015	0	103,380	(32,942)	724,850	155	795,443	0	46,903	(32,942)	738,410	151	752,522
2016	0	100,424	(63,199)	1,867,309	981	1,905,515	0	63,781	(63,199)	1,428,801	981	1,430,364
2017	0	116,906	18,784	3,493,870	351	3,629,911	0	103,689	18,784	2,084,752	300	2,207,525
2018	0	105,704	45,441	1,677,471	275	1,828,891	0	70,151	45,441	1,179,655	225	1,295,472
2019	0	101,466	(38,271)	2,843,631	303	2,907,129	0	81,478	(38,271)	1,692,642	280	1,736,129
2020	0	91,831	33,323	1,041,793	306	1,167,253	0	75,325	33,323	850,471	227	959,346
2021	0	72,802	(149,000)	372,282	7,210	303,294	0	43,479	(149,000)	542,350	7,010	443,839
2022	0	74,164	156,000	2,321,418	7,210	2,558,792	0	44,841	156,000	1,613,486	7,010	1,821,337
2023	0	74,954	0	2,321,456	7,210	2,403,620	0	45,631	0	1,616,476	7,010	1,669,117
2024	0	70,436	11,289	2,321,532	7,210	2,410,467	0	41,113	11,289	1,619,466	7,010	1,678,878
2025	0	70,499	(12,518)	2,321,578	7,210	2,386,769	0	41,176	(12,518)	1,619,466	7,010	1,655,134
2026	0	70,511	24,308	2,321,578	7,210	2,423,607	0	41,188	24,308	1,619,466	7,010	1,691,972
2027	0	70,424	(17,799)	2,321,578	7,210	2,381,413	0	41,101	(17,799)	1,619,466	7,010	1,649,778
2028	0	70,564	12,291	2,321,578	7,210	2,411,643	0	41,241	12,291	1,619,466	7,010	1,680,008
2029	0	70,491	(9,046)	2,321,578	7,210	2,390,233	0	41,168	(9,046)	1,619,466	7,010	1,658,598
2030	0	70,555	20,756	2,321,578	7,210	2,420,099	0	41,232	20,756	1,619,466	7,010	1,688,464
2031	0	70,427	(97,726)	2,321,578	7,210	2,301,489	0	41,104	(97,726)	1,619,466	7,010	1,569,854
2032	0	70,029	84,999	2,321,578	7,210	2,483,816	0	40,706	84,999	1,619,466	7,010	1,752,181
2033	0	70,234	(94,652)	2,321,578	7,210	2,304,370	0	40,911	(94,652)	1,619,466	7,010	1,572,735
2034	0	69,726	69,593	2,321,578	7,210	2,468,107	0	40,403	69,593	1,619,466	7,010	1,736,472
2035	0	69,066	(242,659)	2,321,578	7,210	2,155,195	0	39,743	(242,659)	1,619,466	7,010	1,423,560

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities (acre-feet)

Sheet 4 of 10

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	
1961	[39] 0	[40] 0	[41] 0	[42] 0	[43] 0	[44] 0	[45] 0	[46] 0	[47] 0	[48] 0	[49] 0	[50] 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	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0
1970	198	2	0	0	0	200	0	0	0	0	0	0
1971	7,533	(112)	0	3,552	0	10,973	7,366	(159)	0	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	583,926
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	881,843	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	90,711	48,231	1,409,122	603	1,548,667	0	58,174	48,231	1,389,990	603	1,496,998
2011	0	114,286	(18,816)	1,695,956	742	1,792,168	0	67,210	(18,816)	1,653,798	742	1,702,934
2012	0	114,502	14,573	1,537,522	938	1,667,535	0	70,999	14,573	1,510,007	938	1,596,517
2013	0	116,975	(1,058)	1,190,730	795	1,307,442	0	69,572	(1,058)	1,162,989	795	1,232,298
2014	0	70,655	31,082	489,254	172	591,163	0	52,458	31,082	484,432	172	568,144
2015	0	67,819	(32,942)	738,123	151	773,151	0	56,466	(32,942)	733,481	151	757,156
2016	0	106,907	(63,199)	1,365,032	981	1,409,721	0	83,653	(63,199)	1,352,680	981	1,374,115
2017	0	127,631	18,784	1,948,832	300	2,095,547	0	114,305	18,784	1,903,260	300	2,036,649
2018	0	86,871	45,441	1,074,340	225	1,206,877	0	76,849	45,441	1,057,343	225	1,179,858
2019	0	108,332	(38,271)	1,584,307	280	1,654,648	0	79,072	(38,271)	1,549,127	280	1,590,208
2020	0	84,476	33,323	768,417	227	886,443	0	65,393	33,323	755,141	227	854,084
2021	0	39,849	(149,000)	461,659	7,010	359,518	0	39,599	(149,000)	442,593	7,010	340,202
2022	0	41,211	156,000	1,535,686	7,010	1,739,907	0	40,961	156,000	1,508,786	7,010	1,712,757
2023	0	42,001	0	1,538,676	7,010	1,587,687	0	41,751	0	1,511,776	7,010	1,560,537
2024	0	37,483	11,289	1,541,666	7,010	1,597,448	0	37,233	11,289	1,514,766	7,010	1,570,298
2025	0	37,546	(12,518)	1,541,666	7,010	1,573,704	0	37,296	(12,518)	1,514,766	7,010	1,546,554
2026	0	37,558	24,308	1,541,666	7,010	1,610,542	0	37,308	24,308	1,514,766	7,010	1,583,392
2027	0	37,471	(17,799)	1,541,666	7,010	1,568,348	0	37,221	(17,799)	1,514,766	7,010	1,541,198
2028	0	37,611	12,291	1,541,666	7,010	1,598,578	0	37,361	12,291	1,514,766	7,010	1,571,428
2029	0	37,538	(9,046)	1,541,666	7,010	1,577,168	0	37,288	(9,046)	1,514,766	7,010	1,550,018
2030	0	37,602	20,756	1,541,666	7,010	1,607,034	0	37,352	20,756	1,514,766	7,010	1,579,884
2031	0	37,474	(97,726)	1,541,666	7,010	1,488,424	0	37,224	(97,726)	1,514,766	7,010	1,461,274
2032	0	37,076	84,999	1,541,666	7,010	1,670,751	0	36,826	84,999	1,514,766	7,010	1,643,601
2033	0	37,281	(94,652)	1,541,666	7,010	1,491,305	0	37,031	(94,652)	1,514,766	7,010	1,464,155
2034	0	36,773	69,593	1,541,666	7,010	1,655,042	0	36,523	69,593	1,514,766	7,010	1,627,892
2035	0	36,113	(242,659)	1,541,666	7,010	1,342,130	0	35,863	(242,659)	1,514,766	7,010	1,314,980

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities (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	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	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	5,446	8	0	0	0	5,454	0	0	0	0	0	0
1972	100,274	16,067	(6,558)	74,123	6,481	190,387	0	0	0	0	0	0
1973	204,638	34,051	1,329	207,808	1,147	448,973	0	0	0	0	0	0
1974	237,554	18,181	(15,295)	313,634	2,108	556,182	0	0	0	0	0	0
1975	103,352	20,183	(693)	573,219	3,358	699,419	0	0	0	0	0	0
1976	61,122	21,096	(152,171)	685,768	1,581	617,396	0	0	0	0	0	0
1977	0	18,424	(116,219)	236,086	560	138,851	0	0	0	0	0	0
1978	65,027	20,887	121,904	590,329	674	798,821	0	0	0	0	0	0
1979	12,302	46,332	(51,299)	568,338	502	576,175	0	0	0	0	0	0
1980	0	52,967	(134,009)	639,743	1,262	559,963	0	0	0	0	0	0
1981	0	40,602	23,359	938,482	4,112	1,006,555	0	0	0	0	0	0
1982	0	37,244	117,296	812,206	4,045	970,791	0	0	0	0	0	0
1983	0	40,690	(101,155)	431,182	7,291	378,008	0	0	0	0	0	0
1984	0	42,112	(115,214)	556,830	5,244	488,972	0	0	0	0	0	0
1985	0	45,265	139,988	792,477	4,804	982,534	0	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	436,565
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	60,181	48,231	1,369,128	603	1,478,143	0	32,025	6,964	956,888	363	996,240
2011	0	64,370	(18,816)	1,632,033	742	1,678,329	0	34,783	(1,405)	1,220,667	500	1,254,545
2012	0	65,684	14,573	1,486,712	938	1,567,907	0	22,523	(229)	892,938	550	915,782
2013	0	69,789	(1,058)	1,141,530	795	1,211,056	0	20,563	3,278	528,614	501	552,956
2014	0	43,179	31,082	465,759	172	540,192	0	16,120	41,923	160,225	81	218,349
2015	0	43,312	(32,942)	714,860	151	725,381	0	10,834	(7,059)	248,779	71	252,625
2016	0	41,071	(63,199)	1,330,078	981	1,308,931	0	6,898	7,625	785,607	163	800,293
2017	0	66,781	18,784	1,876,453	300	1,962,318	0	27,722	(56,730)	1,459,379	235	1,430,606
2018	0	41,613	45,441	1,030,755	225	1,118,034	0	6,170	56,121	659,762	155	722,208
2019	0	35,731	(38,271)	1,525,437	280	1,523,177	0	2,373	(29,553)	1,181,051	148	1,154,019
2020	0	43,103	33,323	735,426	227	812,079	0	119	32,814	331,794	158	364,885
2021	0	38,049	(149,000)	418,216	7,010	314,275	0	23,053	(4,000)	170,848	1,630	191,531
2022	0	39,411	156,000	1,482,319	7,010	1,684,740	0	23,053	0	1,066,235	1,630	1,090,918
2023	0	40,201	0	1,485,309	7,010	1,532,520	0	23,053	0	1,066,229	1,630	1,090,912
2024	0	35,683	11,289	1,488,299	7,010	1,542,281	0	20,881	21,309	1,066,217	1,630	1,110,037
2025	0	35,746	(12,518)	1,488,299	7,010	1,518,537	0	20,965	(11,624)	1,066,211	1,630	1,077,182
2026	0	35,758	24,308	1,488,299	7,010	1,555,375	0	20,930	13,030	1,066,211	1,630	1,101,801
2027	0	35,671	(17,799)	1,488,299	7,010	1,513,181	0	20,861	(6,161)	1,066,211	1,630	1,082,541
2028	0	35,811	12,291	1,488,299	7,010	1,543,411	0	20,961	4,006	1,066,211	1,630	1,092,808
2029	0	35,738	(9,046)	1,488,299	7,010	1,522,001	0	20,955	(913)	1,066,211	1,630	1,087,883
2030	0	35,802	20,756	1,488,299	7,010	1,551,867	0	20,930	8,528	1,066,211	1,630	1,097,299
2031	0	35,674	(97,726)	1,488,299	7,010	1,433,257	0	20,956	(31,057)	1,066,211	1,630	1,057,740
2032	0	35,276	84,999	1,488,299	7,010	1,615,584	0	20,865	43,953	1,066,211	1,630	1,132,659
2033	0	35,481	(94,652)	1,488,299	7,010	1,436,138	0	20,854	(37,929)	1,066,211	1,630	1,050,766
2034	0	34,973	69,593	1,488,299	7,010	1,599,875	0	20,769	28,588	1,066,211	1,630	1,117,198
2035	0	34,313	(242,659)	1,488,299	7,010	1,286,963	0	20,892	(49,219)	1,066,211	1,630	1,039,514

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities (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		Total
				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	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	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	21	0	0	0	0	21	0	0	0	0	0	0
1972	35,243	5,282	(153)	1,794	0	42,166	0	0	0	0	0	0
1973	80,177	21,522	(2,700)	52,201	72	151,272	0	0	0	0	0	0
1974	76,694	10,847	(11,149)	102,839	44	179,275	0	0	0	0	0	0
1975	10,000	2,364	(8,397)	190,351	70	194,388	0	0	0	0	0	0
1976	4,168	7,040	(16,055)	236,713	152	232,018	0	0	0	0	0	0
1977	0	11,398	(17,534)	102,326	580	96,770	0	0	0	0	0	0
1978	19,922	5,696	69,130	374,845	498	470,091	0	0	0	0	0	0
1979	12,302	6,836	(32,518)	362,114	502	349,236	0	0	0	0	0	0
1980	0	16,200	6,159	401,214	781	424,354	0	0	0	0	0	0
1981	0	4,992	(36,278)	574,573	933	544,220	0	0	0	0	0	0
1982	0	5,251	55,232	401,037	1,919	463,439	0	0	0	0	0	0
1983	0	11,745	(26,847)	231,188	1,180	217,266	0	0	0	0	0	0
1984	0	18,228	23,230	252,066	1,494	295,018	0	0	0	0	0	0
1985	0	25,292	(2,815)	350,758	1,076	374,311	0	0	0	0	0	0
1986	0	30,876	12,258	394,156	1,508	438,798	0	0	0	0	0	0
1987	0	27,552	(15,270)	377,531	1,239	391,052	0	0	0	0	0	0
1988	0	32,209	1,101	501,300	971	535,581	0	1,977	1,101	501,291	971	505,340
1989	0	31,500	(20,363)	661,189	1,407	673,733	0	29,110	(20,363)	661,100	1,407	671,254
1990	0	32,672	(5,916)	730,560	1,388	758,704	0	23,692	(5,916)	730,550	1,388	749,714
1991	0	15,209	34,774	163,913	394	214,290	0	(543)	34,774	163,913	394	198,538
1992	0	13,989	(17,451)	338,249	423	335,210	0	(13,193)	(17,451)	338,207	423	307,986
1993	0	9,779	(3,455)	255,117	443	261,884	0	(11,922)	(3,455)	255,117	443	240,183
1994	0	150	3,395	409,928	430	413,903	0	1,601	3,395	395,294	430	400,720
1995	0	6,820	(29,282)	328,882	427	306,847	0	10,458	(29,282)	321,387	427	302,990
1996	0	9,514	(11,410)	424,252	565	422,921	0	(5,577)	(11,410)	418,141	565	401,719
1997	0	(1,124)	38,960	461,563	507	499,906	0	5,171	38,960	452,525	507	497,163
1998	0	(2,087)	16,361	334,965	363	349,602	0	11,496	16,361	332,385	363	360,605
1999	0	(1,154)	(8,486)	505,624	396	496,380	0	11,065	(8,486)	498,919	396	501,894
2000	0	(23,296)	(10,472)	864,999	449	831,680	0	4,896	(10,472)	854,980	449	849,853
2001	0	(9,304)	3,478	635,316	452	629,942	0	7,403	3,478	632,420	452	643,753
2002	0	3,810	8,398	823,690	490	836,388	0	9,300	8,398	820,217	490	838,405
2003	0	2,814	(20,787)	962,488	355	944,870	0	(6,586)	(20,787)	941,713	355	914,695
2004	0	(15,558)	17,207	1,047,521	171	1,049,341	0	5,034	17,207	1,035,315	171	1,057,727
2005	0	(18,967)	(50,014)	1,043,564	84	974,667	0	827	(50,014)	1,025,453	84	976,350
2006	0	(21,986)	8,653	1,187,627	98	1,174,392	0	(845)	8,653	1,154,634	98	1,162,540
2007	0	(13,055)	(5,091)	975,802	103	957,759	0	3,060	(5,091)	956,281	103	954,353
2008	0	723	5,383	550,143	80	556,329	0	8,380	5,383	534,480	80	548,323
2009	0	3,807	(5,619)	431,289	1,100	430,577	0	10,520	(5,619)	411,075	1,100	417,076
2010	0	1,854	6,964	886,249	363	895,430	0	9,649	6,964	858,609	363	875,585
2011	0	7,953	(1,405)	1,114,556	500	1,121,604	0	13,506	(1,405)	1,080,734	500	1,093,335
2012	0	3,499	(229)	797,563	550	801,383	0	3,492	(229)	795,600	550	779,413
2013	0	6,273	3,278	466,095	501	476,147	0	12,172	3,278	460,089	501	476,040
2014	0	11,143	41,923	133,376	81	186,523	0	13,671	41,923	130,752	81	186,427
2015	0	7,067	(7,059)	229,244	71	229,323	0	9,953	(7,059)	221,321	71	224,286
2016	0	8,750	7,625	735,426	163	751,964	0	5,792	7,625	721,208	163	734,788
2017	0	22,451	(56,730)	1,332,154	235	1,298,110	0	7,679	(56,730)	1,309,134	235	1,260,318
2018	0	4,197	56,121	591,774	155	652,247	0	4,206	56,121	587,169	155	647,651
2019	0	14,998	(29,553)	1,086,858	148	1,072,451	0	6,055	(29,553)	1,069,197	148	1,045,847
2020	0	19,156	32,814	286,516	158	338,644	0	11,914	32,814	283,172	158	328,058
2021	0	17,703	(4,000)	152,187	1,430	167,320	0	14,233	(4,000)	144,595	1,430	156,258
2022	0	17,703	0	959,148	1,430	978,281	0	14,233	0	927,226	1,430	942,889
2023	0	17,703	0	959,160	1,430	978,293	0	14,233	0	927,226	1,430	942,889
2024	0	15,531	21,309	959,184	1,430	997,454	0	12,061	21,309	927,226	1,430	962,026
2025	0	15,615	(11,624)	959,196	1,430	964,617	0	12,145	(11,624)	927,226	1,430	929,177
2026	0	15,580	13,030	959,196	1,430	989,236	0	12,110	13,030	927,226	1,430	953,796
2027	0	15,511	(6,161)	959,196	1,430	969,976	0	12,041	(6,161)	927,226	1,430	934,536
2028	0	15,611	4,006	959,196	1,430	980,243	0	12,141	4,006	927,226	1,430	944,803
2029	0	15,605	(913)	959,196	1,430	975,318	0	12,135	(913)	927,226	1,430	939,878
2030	0	15,580	8,528	959,196	1,430	984,734	0	12,110	8,528	927,226	1,430	949,294
2031	0	15,606	(31,057)	959,196	1,430	945,175	0	12,136	(31,057)	927,226	1,430	909,735
2032	0	15,515	43,953	959,196	1,430	1,020,094	0	12,045	43,953	927,226	1,430	984,654
2033	0	15,504	(37,929)	959,196	1,430	938,201	0	12,034	(37,929)	927,226	1,430	902,761
2034	0	15,419	28,588	959,196	1,430	1,004,633	0	11,949	28,588	927,226	1,430	969,193
2035	0	15,542	(49,219)	959,196	1,430	926,949	0	12,072	(49,219)	927,226	1,430	891,509

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities (acre-feet)

Sheet 7 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION									
	Devil Canyon Powerplant						Greenspot Pump Station			
	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	0	4,526	4,526
2004	0	11,166	15,150	1,033,309	85	1,059,710	0	0	3,798	3,798
2005	0	4,500	(63,441)	1,010,247	0	951,306	0	0	3,686	3,686
2006	0	8,208	7,571	1,153,993	0	1,169,772	0	0	7,775	7,775
2007	0	8,216	(5,872)	953,803	0	956,147	0	0	12,168	12,168
2008	0	10,599	7,759	533,221	0	551,579	0	0	14,408	14,408
2009	0	10,035	(5,600)	410,032	1,025	415,492	0	0	20,542	20,542
2010	0	6,275	5,344	851,786	307	863,712	0	0	18,395	18,395
2011	0	7,359	2,371	1,066,088	417	1,076,235	0	0	20,586	20,586
2012	0	(1,942)	(2,225)	771,982	459	768,274	0	0	23,791	23,791
2013	0	3,306	3,042	458,221	416	464,985	0	0	20,560	20,560
2014	0	9,919	42,495	129,317	27	181,758	0	0	9,843	9,843
2015	0	8,923	(3,561)	220,068	35	225,465	0	0	9,791	9,791
2016	0	(2,942)	3,074	711,654	107	711,893	0	0	22,896	22,896
2017	0	(8,690)	(53,233)	1,297,152	150	1,235,379	0	0	6,682	6,682
2018	0	3,164	53,152	585,739	95	642,150	0	0	4,241	4,241
2019	0	3,039	(19,717)	1,064,337	88	1,047,747	0	0	13,622	13,622
2020	0	5,007	27,438	282,457	95	314,997	0	0	2,349	2,349
2021	0	10,066	(3,000)	141,614	1,250	149,930	0	0	82	82
2022	0	10,065	0	905,644	1,250	916,959	0	0	0	0
2023	0	10,065	0	905,644	1,250	916,959	0	0	0	0
2024	0	8,462	689	905,644	1,250	916,045	0	0	0	0
2025	0	8,489	4,591	905,644	1,250	919,974	0	0	0	0
2026	0	8,475	(3,819)	905,644	1,250	911,550	0	0	0	0
2027	0	8,479	745	905,644	1,250	916,118	0	0	0	0
2028	0	8,481	(5,355)	905,644	1,250	910,020	0	0	0	0
2029	0	8,481	2,909	905,644	1,250	918,284	0	0	0	0
2030	0	8,480	296	905,644	1,250	915,670	0	0	0	0
2031	0	8,475	(1,976)	905,644	1,250	913,393	0	0	0	0
2032	0	8,449	18,821	905,644	1,250	934,164	0	0	0	0
2033	0	8,449	(23,419)	905,644	1,250	891,924	0	0	0	0
2034	0	8,443	21,651	905,644	1,250	936,988	0	0	0	0
2035	0	8,451	(31,434)	905,644	1,250	883,911	0	0	0	0

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities (acre-feet)

Sheet 8 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	SANTA ANA DIVISION (continued)											
	Citrus Pump Station ³				Crafton Hills Pump Station				Cherry Valley Pump Station			
	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	Total
	[85]	[86]	[87]	[88]	[89]	[90]	[91]	[92]	[93]	[94]	[95]	[96]
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	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	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	2,733	2,733	0	0	116	116
2004	0	0	0	0	0	0	3,212	3,212	0	0	841	841
2005	0	0	0	0	0	0	2,727	2,727	0	0	692	692
2006	0	0	0	0	0	0	6,892	6,892	0	0	807	807
2007	0	0	0	0	0	0	9,038	9,038	0	0	177	177
2008	0	0	0	0	0	0	13,728	13,728	0	0	1,042	1,042
2009	0	0	0	0	0	0	16,463	16,463	0	0	1,898	1,898
2010	0	0	0	0	0	0	17,778	17,778	0	0	5,685	5,685
2011	0	0	0	0	0	0	19,887	19,887	0	0	9,290	9,290
2012	0	0	0	0	0	0	20,614	20,614	0	0	11,010	11,010
2013	0	0	0	0	0	0	17,526	17,526	0	0	9,445	9,445
2014	0	0	0	0	0	0	9,468	9,468	0	0	5,044	5,044
2015	0	0	0	0	0	0	9,409	9,409	0	0	3,481	3,481
2016	0	0	0	0	0	0	19,247	19,247	0	0	10,816	10,816
2017	0	0	31,763	31,763	0	0	31,763	31,763	0	0	14,946	14,946
2018	0	0	22,433	22,433	0	0	22,433	22,433	0	0	12,622	12,622
2019	0	0	25,442	25,442	0	0	25,442	25,442	0	0	14,152	14,152
2020	0	0	17,983	17,983	0	0	17,983	17,983	0	0	11,459	11,459
2021	0	0	2,793	2,793	0	0	2,793	2,793	0	0	2,063	2,063
2022	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2023	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2024	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2025	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2026	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2027	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2028	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2029	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2030	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2031	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2032	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2033	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2034	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380
2035	0	0	10,380	10,380	0	0	10,380	10,380	0	0	10,380	10,380

³ Citrus Pump Station began operation during calendar year 2017. For projected deliveries south of Greenspot Pump Station, flow is assumed to be through Citrus Pump Station.

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities (acre-feet)

Sheet 9 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)											
	WEST BRANCH											
	Oso Pumping Plant						Warne 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	
	[97]	[98]	[99]	[100]	[101]	[102]	[103]	[104]	[105]	[106]	[107]	[108]
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	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	2,444	133	0	0	0	2,577	0	0	0	0	0	0
1972	63,883	6,557	(6,405)	71,991	6,481	142,507	0	0	0	0	0	0
1973	124,461	16,995	4,029	155,317	1,075	301,877	0	0	0	0	0	0
1974	160,860	12,702	(4,146)	209,172	2,064	380,652	0	0	0	0	0	0
1975	93,352	23,008	7,704	374,306	3,288	501,658	0	0	0	0	0	0
1976	56,954	15,845	(136,116)	420,708	1,429	358,820	0	0	0	0	0	0
1977	0	4,407	(98,685)	122,447	(20)	28,149	0	0	0	0	0	0
1978	45,105	9,061	52,774	171,139	176	278,255	0	0	0	0	0	0
1979	0	25,355	(18,781)	145,598	0	152,172	0	0	0	0	0	0
1980	0	24,576	(140,168)	165,931	481	50,820	0	0	0	0	0	0
1981	0	15,254	59,637	283,264	3,179	361,334	0	0	0	0	0	0
1982	0	23,824	61,685	360,878	2,126	448,513	0	24,468	61,169	360,878	2,126	448,641
1983	0	23,601	(74,308)	166,995	6,111	122,399	0	20,780	(74,308)	166,995	6,111	119,578
1984	0	12,461	(138,146)	272,101	3,750	150,166	0	13,572	(139,219)	275,212	2,208	151,773
1985	0	28,257	142,219	403,097	3,728	577,301	0	29,286	141,492	403,097	874	574,749
1986	0	22,387	25,288	393,203	1,777	442,655	0	21,579	25,288	393,203	1,777	441,847
1987	0	18,164	(10,252)	433,452	5,698	447,062	0	20,885	(10,252)	433,452	5,698	449,783
1988	0	20,461	(30,848)	507,169	3,389	500,171	0	23,253	(31,453)	507,169	3,389	502,358
1989	0	27,914	(40,463)	611,681	6,083	605,215	0	27,131	(40,463)	611,681	6,083	604,432
1990	0	33,666	(9,176)	791,355	7,491	823,336	0	34,208	(9,176)	791,355	7,491	823,878
1991	0	16,460	70,754	263,909	4,166	355,289	0	16,908	70,754	263,909	4,166	355,737
1992	0	8,238	(75,008)	435,661	1,572	370,463	0	9,638	(75,008)	435,661	1,572	371,863
1993	0	2,674	(124,283)	451,263	1,233	330,887	0	1,922	(124,283)	451,257	1,233	330,129
1994	0	18,688	(91,606)	490,819	2,488	420,389	0	23,151	(91,606)	490,819	2,488	424,852
1995	0	21,775	14,330	157,629	1,242	194,976	0	15,860	14,330	157,629	1,242	189,061
1996	0	30,121	26,848	286,066	2,363	345,398	0	21,191	26,848	286,066	2,363	336,468
1997	0	30,468	1,892	323,212	1,569	357,141	0	23,437	1,892	323,201	1,569	350,099
1998	0	26,851	(122,848)	208,916	1,222	114,141	0	26,864	(122,848)	208,909	1,222	114,147
1999	0	25,690	5,679	357,664	2,883	391,916	0	21,822	8,120	357,664	2,883	390,489
2000	0	33,658	18,198	668,126	3,767	723,749	0	27,237	18,198	668,126	3,767	717,328
2001	0	24,551	(22,308)	477,315	759	480,317	0	17,404	(22,308)	477,315	759	473,170
2002	0	44,692	41,944	779,284	3,471	869,391	0	35,058	41,944	779,284	3,471	859,757
2003	0	39,495	(27,394)	735,699	10,290	758,090	0	28,167	(27,394)	735,699	10,290	746,762
2004	0	41,947	(14,046)	850,007	478	878,386	0	31,034	(14,046)	850,007	478	867,473
2005	0	38,154	(109,664)	577,251	475	506,216	0	29,111	(109,664)	577,251	475	497,173
2006	0	38,534	(128,775)	616,546	406	526,711	0	23,453	(128,775)	616,546	406	511,630
2007	0	46,921	123,287	760,750	202	931,160	0	29,978	123,287	760,750	202	914,217
2008	0	36,204	(9,613)	531,832	247	558,670	0	36,744	(9,613)	531,832	247	559,210
2009	0	33,295	4,893	631,969	195	670,352	0	30,564	4,893	631,969	195	667,621
2010	0	27,788	41,267	412,240	240	481,535	0	26,930	41,267	412,240	240	480,677
2011	0	29,227	(17,411)	411,366	242	423,424	0	29,363	(17,411)	411,366	242	423,560
2012	0	42,913	14,802	593,774	388	651,877	0	28,769	14,802	593,750	388	637,709
2013	0	49,029	(4,336)	612,912	294	657,899	0	30,918	(4,336)	612,865	294	639,741
2014	0	27,005	(10,841)	305,533	91	321,788	0	17,555	(10,841)	305,533	91	312,338
2015	0	32,430	(25,883)	466,081	80	472,708	0	22,165	(25,883)	466,081	80	462,443
2016	0	34,186	(70,824)	544,471	818	508,651	0	28,991	(70,824)	544,471	818	503,456
2017	0	38,989	75,514	417,074	65	531,642	0	37,047	75,514	416,564	65	529,190
2018	0	35,425	(10,680)	370,993	70	395,808	0	16,442	(10,680)	370,993	70	376,825
2019	0	33,516	(8,718)	344,386	132	369,316	0	9,606	(8,718)	344,386	132	345,406
2020	0	43,257	509	403,632	69	447,467	0	20,007	509	403,632	69	424,217
2021	0	14,946	(145,000)	247,368	5,380	122,694	0	13,036	(145,000)	247,368	5,380	120,784
2022	0	16,308	156,000	416,084	5,380	593,772	0	14,398	156,000	415,814	5,380	591,592
2023	0	17,098	0	419,080	5,380	441,558	0	15,188	0	418,804	5,380	439,372
2024	0	14,752	(10,020)	422,082	5,380	432,194	0	12,842	(10,020)	421,794	5,380	429,996
2025	0	14,731	(894)	422,088	5,380	441,305	0	12,821	(894)	421,794	5,380	439,101
2026	0	14,778	11,278	422,088	5,380	453,524	0	12,868	11,278	421,794	5,380	451,320
2027	0	14,760	(11,638)	422,088	5,380	430,590	0	12,850	(11,638)	421,794	5,380	428,386
2028	0	14,800	8,285	422,088	5,380	450,553	0	12,890	8,285	421,794	5,380	448,349
2029	0	14,733	(8,133)	422,088	5,380	434,068	0	12,823	(8,133)	421,794	5,380	431,864
2030	0	14,822	12,228	422,088	5,380	454,518	0	12,912	12,228	421,794	5,380	452,314
2031	0	14,668	(66,669)	422,088	5,380	375,467	0	12,758	(66,669)	421,794	5,380	373,263
2032	0	14,361	41,046	422,088	5,380	482,875	0	12,451	41,046	421,794	5,380	480,671
2033	0	14,577	(56,723)	422,088	5,380	385,322	0	12,667	(56,723)	421,794	5,380	383,118
2034	0	14,154	41,005	422,088	5,380	482,627	0	12,244	41,005	421,794	5,380	480,423
2035	0	13,371	(193,440)	422,088	5,380	247,399	0	11,461	(193,440)	421,794	5,380	245,195

TABLE B-6 Annual Water Quantities Conveyed through Each Pumping and Power Recovery Plant of Project Transportation Facilities (acre-feet)

Sheet 10 of 10

Calendar Year	CALIFORNIA AQUEDUCT (continued)													
	WEST BRANCH (continued)						COASTAL BRANCH							
	Castaic Powerplant						Las Perillas and Badger Hill Pumping Plants				Devil's Den, Bluestone, and Polonio Pass Pumping Plants			
	Initial Fill Water	Operational Losses	Reservoir Storage Changes	Deliveries		Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total	Initial Fill Water	Operational Losses	Water Supply Delivery	Total
				Water Supply	Recreation									
	[109]	[110]	[111]	[112]	[113]	[114]	[115]	[116]	[117]	[118]	[119]	[120]	[121]	[122]
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	210	873	79,039	80,122	0	0	0	0
1969	0	0	0	0	0	0	0	1,042	62,064	63,106	0	0	0	0
1970	0	0	0	0	0	0	0	638	83,649	84,287	0	0	0	0
1971	0	0	0	0	0	0	0	3,455	110,971	114,426	0	0	0	0
1972	57,364	1,788	(6,162)	71,938	6,481	131,409	0	1,745	121,755	123,500	0	0	0	0
1973	37,198	6,430	4,542	155,297	1,075	204,542	0	5,479	78,645	84,124	0	0	0	0
1974	82,364	1,772	(950)	209,136	541	292,863	0	7,344	78,174	85,518	0	0	0	0
1975	90,460	5,002	(1,534)	374,280	1,563	469,771	0	5,819	85,216	91,035	0	0	0	0
1976	55,990	(7,695)	(132,036)	420,684	1,429	338,372	0	6,562	90,058	96,620	0	0	0	0
1977	0	(1,485)	(102,532)	122,447	(20)	18,410	0	5,777	40,579	46,356	0	0	0	0
1978	45,105	(2,264)	129,523	171,139	176	343,679	0	9,085	92,604	101,689	0	0	0	0
1979	0	(2,339)	(20,400)	145,598	0	122,859	0	10,896	123,155	134,051	0	0	0	0
1980	0	991	(118,026)	165,931	481	49,377	0	9,449	111,379	120,828	0	0	0	0
1981	0	(44,416)	47,244	283,264	2,704	288,796	0	13,232	109,754	122,986	0	0	0	0
1982	0	(60,135)	59,069	360,878	1,187	360,999	0	7,984	95,776	103,760	0	0	0	0
1983	0	(33,418)	(46,904)	166,995	2,618	89,291	0	5,710	100,518	106,228	0	0	0	0
1984	0	(29,618)	(139,545)	275,212	2,201	108,250	0	5,740	126,387	132,127	0	0	0	0
1985	0	(4,622)	135,007	403,097	844	534,326	0	7,563	120,823	128,386	0	0	0	0
1986	0	(6,664)	21,520	393,203	623	408,682	0	8,719	131,599	140,318	0	0	0	0
1987	0	(519)	(6,241)	433,452	2,734	429,426	0	11,363	128,080	139,443	0	0	0	0
1988	0	12,650	(28,498)	507,169	1,359	492,680	0	12,831	120,969	133,800	0	0	0	0
1989	0	634	(40,154)	611,681	3,161	575,322	0	11,454	116,801	128,255	0	0	0	0
1990	0	(14,012)	(15,101)	786,519	3,419	760,825	0	13,022	109,802	122,824	0	0	0	0
1991	0	(871)	89,637	262,921	2,283	353,970	0	5,802	1,496	7,298	0	0	0	0
1992	0	(609)	(71,795)	435,661	1,543	364,800	0	7,893	79,635	87,528	0	0	0	0
1993	0	21,959	(77,428)	451,257	1,211	396,999	0	9,282	94,921	104,203	0	0	0	0
1994	0	5,205	(95,738)	490,819	2,465	402,751	0	8,515	87,158	95,673	0	0	0	0
1995	0	20,400	75,863	157,629	1,223	255,115	0	6,986	94,536	101,522	0	0	0	0
1996	0	(5,621)	19,088	286,066	2,362	301,895	0	9,663	114,630	124,293	0	0	0	0
1997	0	11,119	(1,802)	323,201	1,566	334,084	527	8,343	110,428	119,298	527	0	8,538	9,065
1998	0	24,544	(57,726)	208,909	1,222	176,949	0	8,415	109,400	117,815	0	0	22,210	22,210
1999	0	(3,670)	6,280	357,664	2,865	363,139	0	2,453	120,061	122,514	0	303	23,880	24,183
2000	0	(19,645)	9,320	665,926	1,556	657,157	0	(429)	120,313	119,884	0	0	26,703	26,703
2001	0	(5,949)	(16,588)	477,315	746	455,524	0	(742)	87,915	87,173	0	0	23,229	23,229
2002	0	10,071	35,623	776,136	305	822,135	0	638	99,783	100,421	0	(151)	31,991	31,840
2003	0	9,075	(17,034)	725,781	356	718,178	0	161	101,113	101,274	0	284	31,421	31,705
2004	0	9,120	(11,440)	845,960	456	844,096	0	492	104,144	104,636	0	480	33,870	34,350
2005	0	21,155	(61,490)	577,251	472	537,388	0	1,484	103,178	104,662	0	573	27,595	28,168
2006	0	4,173	(121,607)	616,546	396	499,508	0	1,994	115,433	117,427	0	2,034	27,484	29,518
2007	0	(1,664)	117,880	758,860	196	875,272	0	3,355	131,590	134,945	0	293	31,516	31,809
2008	0	498	(14,279)	529,852	211	516,282	0	3,696	107,239	110,935	0	(30)	21,795	21,765
2009	0	(2,825)	9,194	628,819	164	635,352	0	2,242	102,509	104,751	0	(3,078)	19,253	16,175
2010	0	(4,135)	40,284	409,090	207	445,446	0	4,265	106,590	110,855	0	272	21,532	21,804
2011	0	(9,084)	(22,531)	408,846	221	377,452	0	3,994	113,647	117,641	0	533	24,869	25,402
2012	0	10,210	16,335	590,600	375	617,520	0	7,411	109,383	116,794	0	589	23,418	24,007
2013	0	13,114	(3,811)	610,623	196	620,122	0	7,637	110,714	118,351	0	295	21,699	21,994
2014	0	4,742	(11,327)	305,533	47	298,995	0	6,636	94,369	101,005	0	4,018	19,963	23,981
2015	0	4,268	(25,001)	465,451	63	444,781	0	5,458	94,227	99,685	0	378	15,111	15,489
2016	0	5,995	(68,486)	542,581	795	480,885	0	6,851	119,233	126,084	0	827	31,381	32,208
2017	0	17,918	75,020	413,886	34	506,858	0	7,192	132,194	139,386	0	7,332	32,585	39,917
2018	0	11,319	(745)	369,891	19	380,484	0	6,521	118,880	125,401	0	952	29,875	30,827
2019	0	10,896	(9,095)	326,236	73	328,110	0	2,988	110,756	113,744	0	1,163	20,780	21,943
2020	0	11,072	3,514	397,007	15	411,608	0	(1,743)	104,335	102,592	0	240	14,859	15,099
2021	0	7,589	(145,000)	244,847	2,330	109,766	0	663	69,203	69,866	0	73	5,950	6,023
2022	0	8,951	156,000	413,924	2,330	581,205	0	663	94,145	94,808	0	73	39,702	39,775
2023	0	9,741	0	416,914	2,330	428,985	0	663	94,183	94,846	0	73	39,740	39,813
2024	0	6,557	(10,020)	419,904	2,330	418,771	0	663	94,259	94,922	0	73	39,816	39,889
2025	0	6,536	(894)	419,904	2,330	427,876	0	663	94,305	94,968	0	73	39,862	39,935
2026	0	6,583	11,278	419,904	2,330	440,095	0	663	94,305	94,968	0	73	39,862	39,935
2027	0	6,565	(11,638)	419,904	2,330	417,161	0	663	94,305	94,968	0	73	39,862	39,935
2028	0	6,605	8,285	419,904	2,330	437,124	0	663	94,305	94,968	0	73	39,862	39,935
2029	0	6,538	(8,133)	419,904	2,330	420,639	0	663	94,305	94,968	0	73	39,862	39,935
2030	0	6,627	12,228	419,904	2,330	441,089	0	663	94,305	94,968	0	73	39,862	39,935
2031	0	6,473	(66,669)	419,904	2,330	362,038	0	663	94,305	94,968	0	73	39,862	39,935
2032	0	6,166	41,046	419,904	2,330	469,446	0	663	94,305	94,968	0	73	39,862	39,935
2033	0	6,382	(56,723)	419,904	2,330	371,893	0	663	94,305	94,968	0	73	39,862	39,935
2034	0	5,959	41,005	419,904	2,330	469,198	0	663	94,305	94,968	0	73	39,862	39,935
2035	0	5,176	(193,440)	419,904	2,330	233,970	0	663	94,305	94,968	0	73	39,862	39,935

TABLE B-7 Reconciliation of Capital Costs Allocated to Water Supply and Power Generation (in thousands of dollars)

Item	Project Costs Allocated to Water Supply and Power Generation							Capital Costs Allocated to Other Purposes	Total State Water Project Capital Cost
	Miscellaneous Income Credited to Construction ¹	Allowance for Future Price Escalation ²	Costs of Construction of Delivery Structures ³	Costs of Requested Excess Capacity and Future Enlargement ⁴	Capital Cost Component of Delta Water Charge ⁵	Capital Cost Component of Transportation Water Charge ⁶	Water Supply and Power Total		
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
CONSERVATION FACILITIES									
Upper Feather Division									
Frenchman Dam and Lake	180	0	0	0	615	0	795	2,924	11,250
Grizzly Valley Dam and Lake Davis	65	0	0	0	55	0	120	8,964	12,160
Antelope Dam and Lake	1	0	0	0	0	0	1	5,916	22,470
Abbey Bridge Dam and Reservoir	0	0	0	0	0	0	0	520	520
Dixie Refuge Dam and Reservoir	0	0	0	0	0	0	0	236	236
Total, Upper Feather Division	246	0	0	0	670	0	916	18,560	46,637
Oroville Division									
Multipurpose Facilities	3,152	0	0	0	1,904,073	0	1,907,225	156,844	2,107,755
Specific Power Facilities	230	0	0	0	410,470	0	410,700	1,426	413,428
Total, Oroville Division	3,382	0	0	0	2,314,543	0	2,317,925	158,271	2,521,183
California Aqueduct									
North San Joaquin Division (R1–2B)	1,210	0	0	0	221,090	0	222,300	4,131	227,542
San Luis Division (R3A–7)	13,152	0	0	0	987,733	0	1,000,885	7,902	1,012,165
Total, California Aqueduct	14,362	0	0	0	1,208,823	0	1,223,185	12,033	1,239,707
Delta Facilities	37,311	0	0	0	840,733	0	878,044	20,728	909,134
Planning and Preoperation	5,302	0	0	0	118,950	0	124,252	0	124,252
TOTAL, CONSERVATION FACILITIES	60,603	0	0	0	4,483,718	0	4,544,320	209,592	4,840,912
TRANSPORTATION FACILITIES									
Upper Feather Division									
Grizzly Valley Pipeline	0	0	315	0	0	2,094	2,409	0	2,409
North Bay Aqueduct	266	0	676	0	0	145,159	146,101	0	146,101
South Bay Aqueduct	1,791	0	3,642	0	0	432,212	437,645	23,877	472,434
California Aqueduct									
North San Joaquin Division	2,462	0	222	0	0	358,359	361,043	9,194	372,710
San Luis Division	9,201	0	0	0	0	233,144	242,345	8,866	255,001
South San Joaquin Division	386	0	5,074	2,065	0	500,403	507,928	17,850	526,413
Tehachapi Division	27	0	0	5,230	0	472,596	477,853	20,879	499,106
Mojave Division	918	0	2,708	0	0	378,354	381,980	41,929	425,367
Santa Ana Division	1,184	0	6,309	5,331	0	552,410	565,234	88,101	706,929
West Branch	37,592	0	455	37	0	792,206	830,291	34,717	885,370
Coastal Branch	(279)	0	213	0	0	556,472	556,406	0	556,406
Total, California Aqueduct	51,491	0	14,982	12,663	0	3,843,945	3,923,082	221,535	4,227,302
TOTAL, TRANSPORTATION FACILITIES	53,548	0	19,615	12,663	0	4,423,410	4,509,236	245,412	4,848,246
East Branch Enlargement	0	0	0	0	0	462,031	462,031	0	462,031
East Branch Extension	0	0	0	0	0	424,842	424,842	0	424,842
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	92,642	97,815
Off-Aqueduct	0	0	0	0	0	491,574	491,574	0	491,574
Power Generation Facilities	0	0	0	0	0	0	0	0	0
Small Hydro	0	0	0	0	14,095	102,630	116,725	0	116,725
Power Generation Facilities	0	0	0	0	0	0	0	0	0
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	(107,153)	(107,153)
Davis-Grunsky	0	0	0	0	0	0	0	130,000	130,000
TOTAL THROUGH 2035	114,151	0	19,615	12,663	4,532,499	5,935,194	10,614,122	570,494	11,370,387

¹ Miscellaneous project receipts that are applied for accounting purposes to reduce the capital costs of the particular facilities.² These allowances are included for planning the future financial program, but not for determining current water charges.³ See Table B-8.⁴ See Table B-9.⁵ See Table B-13.⁶ See Table B-10. Mojave Division total reduced by \$87,033,179 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 State Water Project Water Contractors	Calendar Year Capital Costs ¹						
	1952-2018	2019	2020	2021	2022	2023	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
FEATHER RIVER AREA							
County of Butte	261,979	0	0	0	0	0	261,979
Plumas County Flood Control and Water Conservation District	8,723	0	0	0	0	0	8,723
Thermalito Irrigation District ²	43,939	0	0	0	0	0	43,939
<i>Subtotal</i>	<i>314,641</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>314,641</i>
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
<i>Subtotal</i>	<i>675,703</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>675,703</i>
SOUTH BAY AREA							
Alameda County Flood Control and Water Conservation District, Zone 7	1,911,350	0	0	0	0	0	1,911,350
Alameda County Water District	630,576	0	0	0	0	0	630,576
Santa Clara Valley Water District	33,531	0	0	0	0	0	33,531
San Francisco Water Department ²	1,066,680	0	0	0	0	0	1,066,680
<i>Subtotal</i>	<i>3,642,137</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>3,642,137</i>
CENTRAL COASTAL AREA							
San Luis Obispo County Flood Control and Water Conservation District	58,008	0	0	0	0	0	58,008
Santa Barbara County Flood Control and Water Conservation District	67,058	0	0	0	0	0	67,058
<i>Subtotal</i>	<i>125,066</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>125,066</i>
SAN JOAQUIN VALLEY AREA							
County of Kings	126,017	30,893	0	0	0	0	156,910
Dudley Ridge Water District	345,170	0	0	0	0	0	345,170
Empire West Side Irrigation District	6,358	0	0	0	0	0	6,358
Green Valley Water District ²	5,292	0	0	0	0	0	5,292
Kern County Water Agency	4,029,503	10,332	128,574	100,000	20,000	0	4,288,409
Oak Flat Water District	97,643	0	0	0	0	0	97,643
Santa Clarita Valley Water Agency ³	82,567	0	0	0	0	0	82,567
Tracy Golf and Country Club ²	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 ²	3,342	0	0	0	0	0	3,342
Del Puerto Water District ²	10,885	6,992	86,378	5,000	5,000	0	114,185
<i>Subtotal</i>	<i>4,991,192</i>	<i>48,147</i>	<i>214,952</i>	<i>105,000</i>	<i>25,000</i>	<i>0</i>	<i>5,384,291</i>
SOUTHERN CALIFORNIA AREA							
Antelope Valley-East Kern Water Agency	1,714,102	320,081	64,826	100,000	20,000	0	2,219,009
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	37,653	1,703	0	0	0	63,088
Mojave Water Agency	309,054	0	0	20,000	0	0	329,054
Palmdale Water District	34,173	0	0	0	0	0	34,173
San Bernardino Valley Municipal Water District	960,685	0	1,925	40,000	20,000	0	1,022,610
San Gabriel Valley Municipal Water District	131,052	0	0	0	0	0	131,052
San Geronio Pass Water Agency	174,619	73,814	14,757	5,000	5,000	0	273,190
Santa Clarita Valley Water Agency ³	375,593	0	0	0	0	0	375,593
The Metropolitan Water District of Southern California	4,817,610	0	0	5,000	60,000	0	4,882,610
Ventura County Watershed Protection District	79,699	0	0	0	0	0	79,699
<i>Subtotal</i>	<i>8,683,261</i>	<i>431,548</i>	<i>83,211</i>	<i>170,000</i>	<i>105,000</i>	<i>0</i>	<i>9,473,020</i>
TOTAL	18,432,000	479,695	298,163	275,000	130,000	0	19,614,858

¹ Approximate only, not to be construed as invoice amounts.² Not an SWP water supply contractor.³ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

Table B-9 Capital Costs of Requested Excess Peaking Capacity (in dollars unless otherwise indicated)

Calendar Year	Total Advance Payments and Credits for Excess Capacity	Total Incremental Costs for Excess Capacity	Overpayment (+) or Underpayment (-) ¹	Annual Surplus Money Investment Fund Interest Rate ²		Net Over- or Underpayment With Interest ³
				January–June	July–December	
	[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

¹ Overpayment or underpayment for each calendar year—column [1] minus column [2].² Interest rates shown are annual rates. Interest is credited daily at applicable rates on funds deposited in the State's Surplus Money Investment Fund.³ 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 unless otherwise indicated)

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														
Incremental Costs														
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
Adjustments														
8C through 25	1. Advance Payments Applied to Incremental Costs Amendment 2 ^{See footnote 4.}													
	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 ^{See footnote 5.}													
								(1,532,433)					(10,104,646)	(11,637,079)
	3. Advance Payments Applied to Incremental Costs Amendment 5 ^{See footnote 6.}													
	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 ^{See footnote 7.}													
										(2,721,803)				(2,721,803)
	5. Net Required Advance of Funds ^{See footnote 8.}													
	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)			(10,461,314)	2,524,535
SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT														
Incremental Costs														
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
Adjustments														
	1. Advance Payments Applied to Incremental Costs ^{See footnote 4.}													
	0	184,422	49,052	44,911	61,588	(20,263)	(174,133)						(7,025)	138,552
	2. Interest Credit													
								(6,332)					(79,108)	(85,440)
	3. Net Required Advance of Funds ^{See footnote 8.}													
	0	184,422	49,052	44,911	61,588	(20,263)	(180,465)						(86,133)	53,112
ANTELOPE VALLEY-EAST KERN WATER AGENCY														
Incremental Costs														
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
Adjustments														
	1. Advance Payments Applied to Incremental Costs ^{See footnote 4.}													
				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 ^{See footnote 8.}													
				85,495	52,625	101,648	34,062	(12,794)	(205,354)	0		0	(134,869)	(79,187)

⁴ Actual payments are shown for 1965 through 1976 with 1981 adjusted to reflect overpayments and underpayments without interest for prior years.⁵ Interest for overpayments and underpayments under provisions of Amendment 2 of the contract.⁶ Actual payments are shown for 1965 through 1973 with 1974 adjusted to reflect overpayments and underpayments without interest for prior years.⁷ Interest for overpayments and underpayments under provisions of Amendment 5 of the contract.⁸ 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)

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]	[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	45,090	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	965,119	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)	127,823	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	28,222	237	90	879,428	907,978	1,234,636	68,374	259,542	523
2007	0	61,330	1	0	3,219,041	3,280,372	3,406,319	15,183	70,776	1,884
2008	4	75,107	6,065	5,318	7,878,424	7,964,914	6,248,064	35,890	169,891	5,098
2009	6	26,191	154	0	1,188,559	1,214,905	10,200,386	1,397,365	1,834,913	1,815
2010	(2)	4,652	(45)	(1)	395,328	399,934	7,061,360	104,208	468,313	14,865,982
2011	0	57,075	12	0	175,912	232,999	10,255,032	1,863,342	4,089,221	3,416,710
2012	0	585,216	3	15,163	311,585	911,967	7,800,110	1,379,855	3,102,674	104,555
2013	0	870,300	27	67,533	394,181	1,332,041	2,392,878	1,228,777	1,071,752	328,413
2014	0	781,566	3	109,243	355,488	1,246,300	(122,873)	(1,111,982)	(319,804)	127,441
2015	0	263,641	2	81,504	109,412	454,560	1,779,546	117,701	716,517	127,708
2016	0	142,630	1,260	61,753	45,733	251,375	273,581	105,271	407,238	71,071
2017	0	65,208	889	51,882	7,256	125,236	102,584	2,042	359,064	43,584
2018	0	50,733	1,861	23,293	8,786	84,672	782,350	7,822	1,776,937	30,274
2019	0	75,569	3,149	35,832	12,825	127,375	1,653,648	20,852	27,398	33,217
2020	0	411,565	7,425	144,659	175,321	738,970	1,381,607	78,765	246,885	93,332
2021	0	1,943,781	47,039	1,059,886	894,451	3,945,157	5,660,311	978,746	277,990	336,248
2022	0	1,786,112	81,642	2,409,822	649,877	4,927,452	10,629,482	2,923,964	229,050	779,221
2023	0	602,550	36,580	855,543	27,117	1,521,790	4,085,878	2,570,812	67,991	2,010,749
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	341,139	49,799,315	33,239,377	9,532,866	30,662,351	123,233,910	104,266,824	14,019,782	21,204,042	34,117,513

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			
	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	28,675	27,385	563,114	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	71,991	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	274,381	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	183,575	(706,517)	57,503	40,185	(608,829)
2001	91,721	68,849	404,226	1,190,653	2,319,521	371,407	91,792	8,926	472,124
2002	229,409	453,259	1,107,580	2,977,939	8,236,039	833,187	44,543	22,639	900,369
2003	67,216	509,964	477,926	1,409,228	7,689,872	228,767	22,779	13,565	265,112
2004	3,193	3,100	39,326	3,276,907	4,931,451	892,456	15,333	77,640	985,430
2005	5,341	5,271	4,848	731,512	2,351,567	294,112	40,135	98,505	432,751
2006	1,286	1,342	1,352	15,393	1,582,447	422,511	15,048	177,980	615,539
2007	7,470	7,471	7,471	10,731	3,527,304	490,384	58,152	121,987	670,522
2008	8,415	8,730	8,932	12,419	6,497,439	1,202,812	39,742	85,604	1,328,158
2009	3,042	3,187	3,266	4,591	13,448,565	553,705	40,289	29,613	623,608
2010	732	716	711	1,006	22,503,029	181,161	8,175	2,311	191,646
2011	6,513	7,659	6,472	9,164	19,654,113	813,521	51,565	3,937	869,023
2012	51,903	117,364	68,876	393,352	13,018,689	1,570,134	226,476	75,111	1,871,721
2013	130,731	137,199	384,922	875,282	6,549,953	6,957,464	800,204	237,566	7,995,234
2014	102,374	121,005	107,609	207,301	(888,929)	5,789,004	3,238,636	167,361	9,195,000
2015	26,053	37,802	38,192	62,844	2,906,365	5,857,605	930,778	373,501	7,161,884
2016	1,764	2,488	2,147	14,246	877,805	2,721,640	894,583	411,576	4,027,799
2017	641	794	553	101,577	610,839	7,157,077	695,554	146,255	7,998,885
2018	1,341	1,662	1,158	436,681	3,038,225	3,299,736	929,591	9,624,786	13,854,112
2019	9,889	10,432	9,580	549,064	2,314,080	5,570,312	544,820	235,757	6,350,889
2020	59,361	60,355	58,845	283,021	2,262,171	11,889,761	678,844	416,992	12,985,597
2021	70,508	73,448	69,720	829,209	8,296,180	16,819,375	1,743,090	288,020	18,850,485
2022	37,882	41,833	37,349	277,457	14,956,238	19,750,988	1,662,717	255,953	21,669,658
2023	9,013	10,713	8,828	36,871	8,800,855	11,246,678	1,404,350	93,844	12,744,872
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	1,491,310	5,569,953	7,772,751	22,716,236	211,158,412	214,859,338	56,653,169	36,354,833	307,867,339

TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge (in dollars)

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	Reach 10A
	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]
1952	2,492	3,549	3,987	1,010	1,390	12,428	13	727	1,109	695
1953	6,999	10,144	10,986	2,834	3,869	34,832	45	2,671	4,185	2,569
1954	8,704	12,545	13,693	3,520	4,766	43,228	50	2,719	4,026	2,821
1955	4,273	6,055	6,813	1,728	2,325	21,194	19	888	1,100	1,097
1956	3,295	5,600	5,857	1,445	3,556	19,753	98	3,850	4,376	4,428
1957	3,543	6,115	6,357	1,565	3,998	21,578	234	10,604	13,209	13,269
1958	11,927	19,393	22,037	5,509	7,512	66,378	375	19,033	25,073	25,086
1959	21,979	37,358	39,689	9,813	19,679	128,518	436	20,578	25,697	25,787
1960	207,025	45,419	41,044	12,074	37,633	343,195	1,673	44,565	25,290	47,492
1961	184,443	292,639	170,559	38,338	70,068	756,047	3,949	75,726	30,852	68,505
1962	495,836	549,984	252,698	22,397	26,967	1,347,882	6,131	159,481	62,375	57,705
1963	2,772,189	2,034,351	2,498,712	66,353	30,647	7,402,252	5,861	161,252	81,343	52,585
1964	4,348,311	4,932,301	1,053,227	161,422	251,461	10,746,722	4,014	90,622	117,907	124,014
1965	3,860,997	5,688,252	2,869,931	1,072,111	667,768	14,159,059	15,049	491,042	564,036	622,257
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	2,800,056
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	3,652,342
1968	119,884	395,689	973,956	179,917	461,031	2,130,477	64,234	611,192	940,074	1,025,969
1969	(6,065)	126,946	98,492	107,486	160,668	487,527	58,960	116,146	85,130	145,111
1970	32,387	(20,243)	105,385	(827,457)	1,215,966	506,038	23,011	106,810	84,116	74,366
1971	99,945	230,624	305,227	26,995	341,010	1,003,801	8,813	33,099	23,088	15,595
1972	15,990	90,852	17,053	14,621	281,343	19,859	10,818	33,419	16,603	19,736
1973	6,753	103,707	41,549	13,810	41,427	207,246	5,145	11,089	13,249	14,283
1974	6,618	117,165	55,978	16,199	71,796	267,756	5,434	24,433	16,567	22,111
1975	18,921	107,275	23,671	8,797	152,574	311,238	5,424	15,960	12,966	15,865
1976	17,485	79,554	13,041	5,138	41,687	156,905	19,931	76,280	62,164	76,202
1977	35,707	84,669	9,412	4,028	9,655	143,471	21,096	70,005	97,952	75,628
1978	8,539	428,395	7,006	3,536	6,994	454,470	7,584	40,453	17,395	48,754
1979	(35,394)	543,225	19,463	9,485	(242,253)	294,526	10,474	6,181	6,227	241
1980	66,622	3,450,695	191,307	75,209	185,384	3,969,217	2,158	17,492	17,706	18,165
1981	28,491	(2,244,127)	(44,017)	(15,456)	918,984	(1,356,125)	1,151	9,642	9,541	10,309
1982	100,629	(1,616,569)	20,184	10,359	3,525,738	2,040,341	2,469	8,283	6,956	8,237
1983	75,639	33,881	11,785	6,638	1,811,638	1,939,581	7,955	13,782	11,090	14,488
1984	31,748	87,083	26,712	12,754	3,053,662	3,211,959	26,489	9,959	6,268	7,533
1985	53,251	56,732	13,685	6,934	582,910	713,512	7,220	9,762	7,688	9,215
1986	73,979	201,509	50,668	19,223	1,282,469	1,627,848	8,902	25,011	20,503	22,335
1987	(7,829)	116,268	40,009	15,946	518,349	682,743	12,744	18,927	56,042	16,704
1988	(149,385)	224,154	(406,398)	(137,353)	923,622	454,640	9,833	(119,741)	(60,639)	(159,357)
1989	39,652	594,894	232,852	80,090	575,855	1,523,343	5,279	91,501	278,061	70,153
1990	39,270	259,895	79,589	29,606	461,219	869,579	5,814	41,345	2,016,434	34,841
1991	4,916,134	397,959	98,847	35,860	511,519	5,960,319	4,588	43,140	41,348	36,888
1992	(757,001)	545,729	211,854	74,544	396,398	471,524	3,546	103,695	109,225	103,321
1993	110,233	724,929	186,271	70,815	720,283	1,812,531	15,016	101,634	90,929	90,291
1994	1,151,976	288,018	63,862	27,812	710,770	2,242,438	6,770	42,455	40,696	65,737
1995	285,776	441,479	130,761	58,640	1,914,186	2,830,842	12,548	49,963	43,251	435,909
1996	31,942	(110,471)	34,529	12,219	588,712	556,931	6,444	29,863	27,050	253,433
1997	73,224	513,793	(277,781)	42,881	5,016,215	5,368,332	11,497	49,111	43,799	73,458
1998	19,692	304,115	34,319	16,542	2,819,556	3,194,224	2,562	11,115	8,955	14,618
1999	18,187	158,902	100,061	41,691	1,901,382	2,220,222	5,706	25,179	23,510	47,359
2000	101,618	373,699	78,036	36,186	1,139,073	1,728,613	3,922	23,591	29,281	43,459
2001	(10,513)	(47,112)	519,031	(3,546)	61,595	519,455	2,280	17,030	21,196	42,731
2002	12,237	24,434	6,079,343	3,454	(1,812,639)	4,306,829	3,627	44,010	20,221	87,805
2003	8,864	79,647	(5,377,004)	7,923	6,118,421	837,852	2,130	18,793	16,716	22,946
2004	(16,126)	(14,365)	(50,563)	(2,487)	147,468	63,927	22,520	5,980	3,879	5,493
2005	261	11,360	129,470	3,529	2,533,886	2,678,506	26,301	11,593	6,323	7,316
2006	1,421	27,658	(10,639)	1,444	(28,549)	(8,664)	6,106	2,942	1,621	1,872
2007	2	87,855	39,476	7,718	34,608	169,659	13,352	21,920	11,909	13,807
2008	14,780	16,097	46,719	13,920	2,107,019	2,198,535	9,017	13,020	7,277	8,919
2009	610	216,166	44,901	4,909	(44,365)	222,221	2,362	15,880	8,710	10,301
2010	(75)	1,560,318	130,846	609	(355,963)	1,335,734	(4)	1,773	956	1,111
2011	7,037	644,158	481,685	1,297	78,291	1,212,468	1	6,354	1,748	13,984
2012	44,540	213,896	2,999	29,658	170,358	461,451	1,139	114,545	36,447	73,710
2013	810,117	269,663	810,390	114,448	196,559	2,201,176	42,393	383,194	323,185	342,033
2014	834,389	356,434	549,648	69,916	223,315	2,033,702	12,784	189,301	145,263	168,542
2015	(680,141)	267,565	341,458	4,839	166,339	100,061	12,897	174,314	133,514	164,681
2016	197,380	1,603,834	2,481,303	156,598	396,385	4,835,500	14,934	212,961	118,469	174,835
2017	20,329	1,478,865	2,089,249	136,021	2,382,952	6,107,416	1,743	134,718	104,831	166,509
2018	(25,548)	3,509,055	1,038,675	98,627	1,127,656	5,748,465	494	163,322	175,719	210,467
2019	305,829	3,745,060	3,241,597	199,918	2,651,912	10,144,316	826	284,411	270,933	407,088
2020	127,478	4,080,635	2,232,938	186,297	1,706,439	8,333,788	11,454	597,427	539,265	700,971
2021	320,042	4,819,718	7,283,824	464,565	2,573,179	15,461,327	236,460	959,599	754,568	4,390,133
2022	214,963	5,421,532	6,367,432	285,798	2,312,265	14,601,990	221,948	723,006	549,745	869,708
2023	1,036,559	5,730,980	12,400,263	247,905	2,210,334	21,626,040	371,495	1,094,908	868,794	2,212,399
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	24,048,911	65,427,733	63,124,320	7,970,279	72,572,657	233,143,899	1,871,303	18,185,632	15,188,021	20,349,028

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 11B	Reach 12D	Reach 12E	Reach 13B	Reach 14A	Reach 14B	Reach 14C	Reach 15A	Reach 16A	Subtotal
	[30]	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]
1952	1,279	1,980	995	1,663	794	212	212	1,911	4,440	16,030
1953	4,790	7,480	3,745	6,236	2,599	733	741	7,016	16,513	59,323
1954	4,855	7,565	3,792	6,319	2,880	810	817	7,073	16,601	60,328
1955	1,557	2,404	1,211	2,025	1,183	325	327	2,253	5,223	19,612
1956	6,223	9,233	4,737	8,054	7,026	1,638	1,584	9,939	21,754	82,940
1957	18,772	29,082	14,615	24,411	15,651	3,834	3,864	26,871	62,657	237,073
1958	48,191	78,564	39,087	61,715	33,726	12,330	11,813	49,499	133,083	537,575
1959	67,246	107,781	53,836	86,478	64,824	22,102	21,828	70,838	205,748	773,179
1960	66,317	77,936	39,867	63,517	84,363	23,260	22,305	73,305	204,788	774,678
1961	46,073	88,274	51,457	28,015	242,753	91,290	65,565	150,205	206,305	1,148,969
1962	56,056	69,189	44,851	49,179	208,180	61,489	47,608	133,653	171,396	1,127,293
1963	91,914	173,985	86,405	67,733	425,626	104,436	77,970	102,072	481,941	1,913,123
1964	333,621	291,013	174,469	86,271	1,093,795	684,005	485,033	571,173	1,778,952	5,834,889
1965	1,053,029	1,524,848	1,044,851	196,487	3,385,205	1,655,024	1,436,258	476,830	1,268,176	13,733,092
1966	3,709,779	673,429	466,228	418,141	4,916,319	974,862	724,354	1,829,852	2,896,274	27,347,168
1967	4,636,627	1,881,333	1,244,265	1,238,428	2,788,299	525,653	400,183	1,721,304	3,442,021	30,089,234
1968	1,323,302	4,726,074	3,145,775	8,343,706	10,210,266	1,330,361	1,405,117	7,522,015	7,578,498	48,226,583
1969	229,185	706,272	529,080	3,704,065	15,112,041	1,223,457	1,134,395	9,523,012	13,136,056	45,702,910
1970	85,151	70,725	72,798	320,797	11,031,255	987,213	738,955	8,836,897	13,890,751	36,322,845
1971	45,006	43,988	42,624	339,078	2,925,191	193,255	36,514	3,275,227	7,903,937	14,885,415
1972	32,657	43,939	24,748	81,937	1,388,348	101,784	20,165	1,003,380	3,025,555	5,783,019
1973	16,448	9,980	16,320	25,090	680,834	19,584	13,469	798,805	1,472,313	3,096,609
1974	14,951	19,555	32,240	29,582	524,504	30,735	16,333	778,696	1,031,843	2,546,984
1975	13,479	10,793	13,678	25,827	269,197	25,164	21,048	370,265	489,545	1,289,211
1976	54,217	37,464	59,842	105,332	507,519	59,753	42,776	434,574	618,049	2,154,103
1977	52,919	22,826	54,444	81,293	301,515	49,972	30,152	235,514	580,209	1,673,525
1978	16,469	(2,816)	27,331	43,126	348,674	(653)	1,500	297,817	582,775	1,428,409
1979	6,906	13,401	14,229	25,411	293,786	9,846	7,856	245,590	542,554	1,182,702
1980	18,813	15,608	27,498	34,190	1,676,267	29,169	23,023	1,719,775	3,772,498	7,372,362
1981	14,885	26,473	20,972	25,515	(1,076,221)	27,551	33,674	(1,142,721)	(2,527,211)	(4,566,440)
1982	6,608	7,680	8,346	16,339	(745,914)	9,886	29,393	(804,147)	(1,850,736)	(3,296,600)
1983	9,792	14,174	13,050	35,872	419,650	17,389	24,933	115,983	166,232	864,390
1984	27,613	87,907	49,271	22,732	54,590	75,453	63,060	63,537	119,387	613,799
1985	6,949	5,263	8,013	8,875	(49,408)	9,523	5,867	54,782	82,117	165,866
1986	16,664	16,014	25,031	20,483	140,642	25,960	13,913	154,089	186,348	675,895
1987	13,512	12,369	20,023	15,435	101,453	20,411	8,581	227,047	194,936	718,184
1988	(73,648)	(151,040)	(51,401)	(120,104)	161,077	(75,276)	(75,307)	144,369	262,334	(308,900)
1989	65,216	63,382	120,925	73,037	2,778,880	119,559	36,660	2,952,046	5,955,356	12,610,055
1990	29,230	27,269	49,082	34,048	715,031	44,187	14,537	440,017	640,283	4,092,118
1991	32,195	30,146	55,119	34,144	423,235	50,345	12,116	353,596	774,129	1,890,989
1992	99,765	98,178	192,455	97,638	991,603	185,311	9,210	387,615	731,512	3,113,074
1993	70,131	63,247	118,440	80,530	687,462	109,792	38,960	942,211	857,038	3,265,681
1994	29,221	26,997	50,234	35,154	400,534	44,481	17,426	324,942	853,328	1,937,975
1995	32,487	25,516	49,885	41,733	524,524	48,740	29,125	450,952	628,941	2,373,574
1996	19,489	15,020	30,202	29,333	403,125	26,945	16,405	253,622	388,064	1,498,995
1997	30,890	25,368	48,767	40,900	451,910	47,815	29,878	809,848	481,458	2,144,699
1998	7,107	5,773	10,697	9,676	288,667	10,799	6,819	119,562	440,746	937,096
1999	17,022	13,362	34,410	31,539	260,623	24,634	14,826	264,538	361,516	1,124,225
2000	21,186	32,480	40,180	25,119	168,825	15,243	11,006	151,512	372,997	938,802
2001	14,471	22,325	34,995	8,027	71,645	4,537	3,988	66,918	167,694	477,837
2002	19,626	7,157	78,600	47,505	276,160	22,632	34,980	164,596	286,748	1,093,668
2003	9,280	8,935	18,115	15,308	136,433	6,671	9,686	110,492	159,978	535,484
2004	3,291	4,188	7,001	5,787	52,563	5,588	1,490	50,520	322,068	490,368
2005	6,332	12,579	6,307	6,354	21,617	12,567	44	9,079	43,887	170,299
2006	1,680	3,146	1,618	1,736	5,936	3,109	108	2,695	11,294	43,863
2007	11,909	23,818	11,909	11,910	40,392	23,818	1	16,745	82,675	284,166
2008	6,999	12,960	8,044	8,187	35,363	13,537	568	22,711	63,596	210,197
2009	8,661	16,743	9,057	9,223	34,427	16,975	302	17,919	66,302	216,862
2010	937	1,943	957	920	3,103	1,955	(34)	1,212	6,625	21,454
2011	1,753	3,487	1,747	1,758	40,339	3,484	10	13,658	134,210	222,531
2012	33,065	62,348	34,901	34,973	393,561	64,937	3,511	494,940	686,555	2,034,633
2013	196,084	263,911	240,567	240,749	1,246,859	349,608	127,458	1,544,197	1,678,853	6,979,091
2014	100,229	157,451	115,414	119,313	859,596	168,059	38,512	625,150	1,181,565	3,881,179
2015	89,866	131,273	115,750	139,499	792,774	86,442	25,394	638,139	796,641	3,301,185
2016	83,042	98,410	140,876	14,345,691	846,168	76,643	31,370	1,454,839	1,334,309	18,932,547
2017	70,715	108,546	93,608	301,846	1,312,418	49,060	7,622	777,994	940,299	4,069,911
2018	113,176	150,740	117,305	144,249	1,604,753	8,955	2,595	1,207,423	251,308	4,150,506
2019	260,916	288,113	100,680	117,456	393,381	5,713	4,135	1,155,817	241,116	3,530,584
2020	386,851	720,359	249,714	335,099	616,041	65,252	14,909	458,431	785,339	5,481,114
2021	711,206	1,394,927	1,050,187	936,346	3,929,254	330,584	96,178	1,681,737	3,324,539	19,795,719
2022	376,927	1,532,011	620,416	817,216	2,187,853	300,555	77,127	2,284,437	3,336,768	13,897,717
2023	537,341	9,055,028	827,517	1,340,837	5,764,930	814,504	300,223	5,683,588	11,325,320	40,196,883
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	15,576,504	25,267,882	12,114,004	35,052,096	86,308,474	11,495,574	7,913,025	65,021,997	101,886,916	416,230,456

TABLE B-10 Capital Costs of Each Aqueduct Reach to be Reimbursed through Capital Cost Component of Transportation Charge (in dollars)

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	TEHACHAPI DIVISION			MOJAVE DIVISION						
	Reach 17E	Reach 17F	Subtotal	Reach 18A	Reach 19	Reach 19C	Reach 20A	Reach 20B	Reach 21	Reach 22A
	[40]	[41]	[42]	[43]	[44]	[45]	[46]	[47]	[48]	[49]
1952	9,703	4,072	13,775	4,090	1,520	0	2,561	892	5,788	35
1953	31,337	13,284	44,621	12,610	4,685	0	7,246	3,402	17,846	71
1954	46,243	20,010	66,253	16,642	6,184	0	9,506	4,548	23,558	369
1955	25,880	11,362	37,242	5,612	2,086	0	2,529	2,213	7,947	178
1956	47,487	17,609	65,096	6,038	2,244	0	2,440	2,655	8,542	216
1957	119,673	49,130	168,803	22,348	8,304	0	9,035	9,826	31,616	800
1958	164,056	72,091	236,147	37,917	14,166	123	15,391	16,752	53,569	1,397
1959	151,389	57,883	209,272	38,620	23,450	1,102	23,605	18,604	56,724	1,844
1960	203,222	45,323	248,545	21,356	26,093	5,318	40,523	37,179	43,893	11,029
1961	387,819	85,558	473,377	35,664	32,281	2,262	34,918	37,102	21,532	14,517
1962	353,119	82,610	435,729	68,508	266,284	1,841	10,323	10,730	8,197	4,186
1963	1,191,633	124,572	1,316,390	37,379	435,881	4,137	39,706	40,865	26,670	17,081
1964	1,866,000	775,005	2,641,005	95,693	706,369	8,564	43,342	71,116	33,912	22,793
1965	2,574,824	2,284,869	4,859,693	121,060	716,092	9,156	108,519	343,506	91,095	65,689
1966	5,537,412	9,323,517	14,860,929	366,116	1,644,699	13,373	159,282	1,311,628	160,388	178,538
1967	26,239,390	12,398,708	38,638,098	1,312,022	903,880	24,103	645,078	1,718,942	498,257	367,961
1968	33,363,479	7,416,464	40,779,943	136,804	7,109,653	71,388	1,889,601	2,291,691	1,141,929	1,145,768
1969	40,368,425	6,883,206	47,251,631	213,805	2,465,641	7,423	5,939,151	5,626,284	2,358,737	1,515,147
1970	35,446,706	6,786,231	42,232,937	2,211,077	1,210,665	6,217	3,652,478	5,304,372	3,232,911	2,081,810
1971	20,141,395	6,835,303	26,976,698	1,496,843	284,738	6,994	1,074,759	1,091,123	825,070	432,464
1972	10,002,935	34,791	10,037,726	129,417	409,903	3,620	471,963	635,507	484,772	324,865
1973	3,090,140	36,207	3,126,347	23,931	75,638	2,539	88,416	83,840	63,774	36,179
1974	4,798,348	152,494	4,950,842	28,399	205,581	2,703	138,673	118,639	103,545	54,198
1975	2,144,178	411,404	2,555,582	44,774	70,652	5,066	68,157	169,294	167,240	19,453
1976	1,124,357	174,629	1,298,986	121,043	84,593	6,786	59,967	102,909	44,896	24,732
1977	655,047	31,512	686,559	261,400	133,767	7,521	117,878	120,160	71,389	49,445
1978	1,900,843	27,956	1,928,799	553,014	57,150	5,872	51,615	68,838	32,855	18,183
1979	2,099,385	61,381	2,160,766	626,615	339,536	10,831	37,085	36,225	18,948	10,675
1980	17,433,610	6,046	17,439,656	1,130,429	1,073,430	3,604	308,188	284,545	133,526	121,171
1981	(3,848,206)	6,908	(3,841,298)	1,218,824	845,702	4,498	48,625	32,214	13,223	6,466
1982	11,370,112	6,054	11,376,166	6,968,683	746,900	3,920	33,869	77,988	13,158	14,459
1983	8,862,914	8,269	8,871,183	10,909,386	64,660	2,596	40,793	58,714	25,900	10,363
1984	3,227,937	31,701	3,259,638	8,340,371	309,491	3,124	17,505	35,378	845,423	6,052
1985	1,926,289	10,460	1,936,749	5,264,156	227,986	3,885	68,422	(232,549)	(481,017)	1,945,477
1986	1,381,955	33,788	1,415,743	2,049,111	2,069,663	4,261	2,331,707	(2,046,222)	(1,334,975)	3,260,280
1987	671,183	13,807	684,990	1,347,722	(6,453)	4,684	562,540	(344,829)	55,519	64,264
1988	1,408,760	(49,734)	1,359,026	847,954	(104,961)	13,409	(159,892)	(147,290)	(70,564)	351,489
1989	504,715	64,660	569,375	376,980	207,150	50,953	31,173	60,657	30,217	534,658
1990	783,219	25,218	808,437	202,065	(402,573)	61,192	(637,062)	(403,413)	(635,623)	(97,841)
1991	691,578	33,405	724,983	273,021	22,218	81,545	(188,732)	(18,809)	(147,369)	(17,234)
1992	741,986	24,369	766,355	620,962	384,568	86,644	225,398	338,098	(263,897)	75,210
1993	1,223,402	35,370	1,258,772	1,131,166	248,287	72,746	110,869	180,598	133,941	49,144
1994	806,213	16,681	822,894	998,126	164,096	60,147	51,340	114,273	65,260	26,546
1995	1,538,497	19,443	1,557,940	390,433	157,483	45,990	92,925	121,499	66,503	30,918
1996	2,571,039	10,797	2,581,836	91,593	69,281	22,188	35,656	48,699	44,953	17,787
1997	1,009,249	18,265	1,027,514	135,402	92,607	13,590	65,433	39,973	55,881	27,865
1998	925,574	6,843	932,417	47,486	36,170	4,164	29,900	27,626	20,285	12,816
1999	662,144	12,166	674,310	113,232	49,150	5,329	171,935	58,392	37,660	17,874
2000	408,352	14,333	422,685	120,267	90,145	936	83,478	75,230	44,857	20,181
2001	266,815	10,891	277,706	65,580	186,973	2,223	343,775	121,907	77,799	54,526
2002	247,986	9,586	257,572	35,787	(139,334)	1,374	(111,675)	(82,663)	(7,369)	(43,431)
2003	189,022	12,339	201,361	84,434	(19,049)	0	(11,367)	(7,564)	(3,238)	(3,009)
2004	372,622	4,637	377,259	19,723	17,430	0	18,763	12,619	13,744	5,414
2005	2,264,602	6,587	2,271,188	27,020	18,910	0	25,134	18,874	25,074	6,335
2006	5,855,349	2,353	5,857,702	7,062	4,978	0	6,373	4,511	5,983	1,500
2007	3,829,554	11,915	3,841,469	49,382	35,729	0	47,637	35,725	47,634	11,908
2008	640,715	7,591	648,306	20,474	19,644	0	28,901	19,526	25,456	6,477
2009	9,982,682	9,158	9,991,840	22,893	25,186	0	33,292	24,677	32,865	8,223
2010	11,125,921	725	11,126,646	24,906	2,833	0	3,861	2,980	3,984	994
2011	4,980,108	1,812	4,981,920	4,507	5,253	0	6,981	5,212	6,947	1,737
2012	875,243	32,877	908,120	95,936	114,523	0	152,679	114,484	152,651	38,158
2013	704,335	156,471	860,806	234,199	314,887	0	419,827	314,845	419,785	104,949
2014	3,010,683	79,990	3,090,674	1,077,259	203,219	0	270,945	203,188	270,922	67,726
2015	9,052,843	37,215	9,090,057	708,309	91,309	0	1,520,944	91,309	121,745	30,436
2016	3,269,487	22,186	3,291,674	110,663	35,846	0	641,765	30,678	38,755	11,825
2017	2,659,274	26,791	2,686,064	259,599	56,571	0	57,238	52,359	69,053	18,770
2018	5,461,172	18,630	5,479,802	539,133	23,056	0	29,293	14,238	17,393	7,504
2019	3,202,390	2,407,175	5,609,565	241,282	26,578	0	32,987	11,660	12,856	8,552
2020	4,610,001	1,122,274	5,732,274	225,685	142,348	0	178,564	144,457	118,610	81,594
2021	7,755,965	87,412	7,843,377	1,494,811	352,652	0	401,015	418,352	370,882	172,712
2022	10,208,251	67,033	10,275,285	502,083	234,786	0	243,081	314,822	225,557	136,076
2023	18,031,642	118,119	18,149,761	317,168	147,238	0	126,890	249,568	136,351	111,139
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	356,981,609	58,819,982	415,801,591	56,794,061	25,488,295	759,941	22,534,719	19,755,376	10,471,898	13,717,682

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 22B	Reach 23	Reach 24	Subtotal	Reach 25	Reach 26A	Reach 28G*	Reach 28H	Reach 28J	Subtotal
1952	[50] 2,013	[51] 2,074	[52] 2,413	[53] 21,386	[54] 3,334	[55] 5,599	[56] 4,785	[57] 4,055	[58] 3,020	[59] 20,793
1953	5,752	6,886	7,438	65,936	10,275	17,264	15,580	11,511	9,476	64,106
1954	8,560	7,849	9,820	87,036	13,566	22,790	18,015	18,100	12,160	84,631
1955	2,754	2,725	3,313	29,357	4,575	7,687	6,052	6,081	4,151	28,546
1956	2,905	2,961	3,561	31,562	4,917	8,264	6,496	6,525	4,480	30,682
1957	10,757	10,962	13,177	116,825	18,205	30,586	24,044	24,156	16,585	113,576
1958	18,717	18,578	22,627	199,237	31,001	52,019	40,844	41,033	28,470	193,367
1959	25,421	20,372	45,646	255,388	39,325	58,137	45,746	45,946	44,331	233,485
1960	136,751	17,152	109,816	449,110	65,655	93,700	59,102	58,548	118,969	395,974
1961	215,859	9,546	373,473	777,154	26,979	56,734	32,226	34,382	674,787	825,108
1962	164,168	4,336	279,421	817,994	9,964	36,235	21,383	20,530	47,484	135,596
1963	237,695	7,228	358,503	1,205,145	31,013	112,271	43,884	41,698	1,506,440	1,735,306
1964	262,996	6,863	244,003	1,495,651	69,669	202,642	89,710	45,762	98,569	506,352
1965	827,655	11,836	621,566	2,916,174	279,237	206,356	96,956	76,899	146,095	805,543
1966	1,746,245	31,078	1,018,628	6,629,975	415,066	364,004	170,878	308,756	589,107	1,847,811
1967	3,146,128	62,135	2,331,106	11,009,612	3,184,296	638,539	233,968	283,126	987,832	5,327,761
1968	4,588,850	102,207	2,600,293	21,078,184	8,264,126	1,268,194	871,337	266,295	780,587	11,450,539
1969	7,750,478	260,659	11,131,406	37,268,731	6,807,783	1,768,456	1,117,873	1,444,654	756,442	11,895,208
1970	23,451,612	1,240,798	16,885,193	59,277,133	2,169,051	7,229,429	1,843,621	1,013,468	2,829,523	15,085,092
1971	16,772,680	1,922,115	5,385,721	29,292,507	1,135,248	9,811,736	16,095,702	6,401,303	12,111,623	45,555,612
1972	3,788,894	48,049	788,479	7,085,469	1,095,740	5,528,987	1,537,880	11,960,791	21,542,747	41,666,145
1973	1,623,274	24,333	4,225,877	6,247,801	136,994	1,810,729	209,664	247,769	3,673,344	6,078,500
1974	5,699,605	130,567	766,562	7,248,472	68,180	1,922,999	162,178	101,638	1,980,991	4,235,986
1975	4,793,580	19,467	373,783	5,731,466	166,653	3,787,797	157,365	124,399	1,626,274	5,862,488
1976	3,103,916	84,188	204,705	3,837,735	475,176	1,494,750	178,287	118,748	1,497,465	3,764,426
1977	1,654,122	60,112	232,230	2,708,024	76,255	776,085	127,106	89,036	323,091	1,391,573
1978	677,448	36,484	210,198	1,711,657	57,463	131,076	147,112	153,867	347,482	837,000
1979	560,506	10,634	103,615	1,754,670	29,960	80,482	29,723	19,225	225,947	385,337
1980	2,239,224	60,229	559,963	5,914,309	31,462	181,638	137,833	154,821	1,077,900	1,583,654
1981	(774,614)	138,917	203,941	1,737,796	5,864	69,031	28,815	22,654	61,349	187,713
1982	432,274	346,905	79,819	8,717,975	9,224	159,280	16,069	58,900	55,841	299,314
1983	451,428	2,029,405	58,989	13,652,234	4,304	528,764	18,213	89,581	(264,804)	376,058
1984	(83,811)	1,290,740	34,764	10,799,037	3,850	270,455	14,462	12,259	49,547	350,573
1985	608,583	966,160	51,634	8,422,737	5,555	62,571	17,816	11,481	54,070	151,493
1986	1,097,122	230,510	51,994	7,713,451	9,927	114,561	31,564	25,037	86,794	267,883
1987	3,631,282	146,850	91,223	5,552,802	4,908	27,208	17,141	8,005	45,528	102,790
1988	552,546	558,557	197,761	2,039,009	7,358	161,957	41,892	21,113	90,784	323,104
1989	4,161,037	1,496,776	433,072	7,382,673	8,092	(2,297,399)	28,708	12,619	51,556	(2,196,424)
1990	8,794,258	1,394,698	344,367	8,620,068	176,854	(1,657,576)	27,478	12,817	55,408	1,439,213
1991	7,985,326	3,624,824	139,105	11,753,895	202,286	(1,316,160)	142,139	15,524	62,794	(893,417)
1992	4,849,560	8,364,426	127,829	14,808,798	333,934	(1,878,502)	34,185	13,422	69,479	(1,427,482)
1993	2,094,764	15,390,366	159,211	19,571,092	1,506,787	3,979,221	44,300	27,047	162,854	5,720,209
1994	933,021	8,082,401	81,869	10,577,079	2,104,588	2,493,097	16,351	11,673	54,581	4,680,290
1995	1,096,953	5,924,175	123,653	8,050,530	3,310,564	500,791	35,402	28,202	164,254	4,039,213
1996	1,736,686	2,181,669	96,339	4,344,851	19,019,751	(100,474)	76,723	73,629	344,747	19,414,376
1997	809,666	(342,563)	102,390	1,000,244	7,645,602	(662,524)	50,662	20,720	268,293	7,322,753
1998	273,139	3,392,776	36,135	3,880,497	993,619	1,613,505	10,268	8,970	479,138	3,105,500
1999	1,006,721	2,208,657	123,472	3,792,421	224,119	843,638	84,683	45,293	324,223	1,521,955
2000	724,837	1,251,684	83,871	2,495,486	129,156	1,285,637	64,095	41,331	114,224	1,634,443
2001	550,843	342,964	26,780	1,773,369	73,031	447,282	20,193	13,635	88,656	642,797
2002	270,386	269,139	71,793	264,008	54,815	1,753,554	53,787	12,619	196,949	2,071,724
2003	382,025	146,659	30,255	599,147	86,731	350,997	1,096,665	2,482,179	179,466	4,196,038
2004	262,810	48,570	12,285	411,358	13,577	275,709	1,736,308	856,587	24,559	2,906,739
2005	62,967	104,838	144,149	433,303	16,962	120,279	2,049,655	410,021	270,894	2,867,810
2006	15,163	294,318	577,859	917,747	21,932	16,665	2,302,259	406,071	2,544,382	5,291,309
2007	151,063	919,040	69,935	1,368,052	12,905	55,918	(246)	1,099,958	3,664,344	4,832,879
2008	346,638	3,113,899	2,019,852	5,600,869	2,481	82,555	835,530	899,508	682,829	2,502,902
2009	940,063	448,123	1,834,293	3,369,615	2,907	260,913	4,202,482	976,816	2,819,007	8,262,125
2010	2,207,072	26,729	1,373,244	3,646,603	(15)	119,952	43,378	930,155	3,865,713	4,959,184
2011	5,924,592	6,284	99,888	6,061,401	4	35,402	1,173,977	571	1,955,675	3,165,630
2012	10,149,651	95,175	28,760	10,942,016	8,715	477,006	2,750,751	214,702	2,760,048	6,211,222
2013	6,331,413	334,524	74,035	8,548,463	36,624	1,113,282	3,313,512	1,342,565	6,139,955	11,945,937
2014	2,576,361	184,199	28,491	4,882,310	15,952	2,420,591	79,084	64,672	3,933,527	6,513,827
2015	1,890,532	120,722	15,298	4,590,604	10,156	1,200,361	19,721	20,406	20,412,533	21,663,177
2016	678,408	162,124	14,072	1,724,136	1,685	994,199	5,407	3,186	40,378,169	41,382,646
2017	797,721	(245,792)	8,746	1,074,264	130,932	(270,389)	3,447	1,513	19,544,309	19,409,812
2018	465,948	1,304,760	205,060	2,606,384	202,596	2,513,291	7,216	3,168	10,128,870	12,855,140
2019	503,273	950,023	3,261,686	5,048,896	108,417	1,331,099	52,994	5,358	8,447,583	9,945,452
2020	2,241,056	997,037	7,494,315	11,623,666	17,499	4,804,445	902,214	1,221,581	8,866,879	15,812,618
2021	3,051,861	1,585,208	2,809,289	10,656,781	17,115	12,891,533	649,450	642,043	12,283,973	26,484,114
2022	5,205,642	465,080	1,219,770	8,546,897	10,176	4,080,539	600,700	1,465,970	22,420,378	28,577,763
2023	4,024,585	252,090	2,634,775	7,999,803	10,067	4,581,036	22,310	3,549,004	23,147,430	31,309,846
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	172,929,418	74,826,070	75,588,606	472,866,066	61,282,774	81,558,486	46,247,110	40,305,686	250,152,157	479,546,213

* Includes excess capacity costs (not shown in Table B-9) allocated to Metropolitan 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)

Calendar Year	CALIFORNIA AQUEDUCT (continued)									
	WEST BRANCH							COASTAL BRANCH		
	Reach 29A	Reach 29F	Reach 29G	Reach 29H	Reach 29J	Reach 30	Subtotal	Reach 31A	Reach 33A	Reach 33B
	[60]	[61]	[62]	[63]	[64]	[65]	[66]	[67]	[68]	[69]
1952	2,924	136	175	459	553	1,408	5,655	0	0	0
1953	9,093	344	237	1,754	1,683	4,346	17,457	0	0	0
1954	7,389	1,201	2,229	2,350	4,162	5,743	23,074	0	0	0
1955	1,019	585	1,086	1,147	2,029	1,943	7,809	0	0	0
1956	490	698	1,297	1,366	2,420	2,077	8,348	0	0	0
1957	1,809	2,583	4,792	5,057	8,952	7,684	30,877	0	0	0
1958	3,256	4,516	8,714	8,878	15,847	13,931	55,142	0	0	0
1959	7,953	9,150	19,414	18,243	35,583	44,384	134,727	28,046	49,114	0
1960	21,753	14,990	34,447	29,764	69,752	84,703	255,409	34,404	70,450	0
1961	22,442	12,775	21,559	20,086	39,761	123,330	239,953	13,801	17,868	0
1962	40,237	28,729	86,938	58,215	108,961	348,366	671,447	10,121	7,798	0
1963	91,959	69,162	163,347	110,015	211,592	521,491	1,167,566	20,470	14,299	0
1964	150,670	66,420	207,977	143,340	291,404	1,372,464	2,232,275	315,418	26,963	0
1965	361,811	77,914	403,115	127,430	589,638	3,383,950	4,943,858	747,023	36,178	0
1966	489,512	203,497	1,233,640	348,918	3,231,797	9,364,753	14,872,117	2,258,915	35,864	0
1967	1,589,715	882,096	1,117,243	891,607	31,088,491	17,618,827	53,187,979	6,310,419	38,331	0
1968	3,899,363	300,921	396,190	1,104,832	36,157,768	15,736,691	57,595,765	2,707,580	30,784	0
1969	6,592,580	336,480	693,348	1,184,454	9,655,871	16,228,175	34,690,908	423,797	26,549	0
1970	7,986,733	6,089,401	2,624,747	3,002,968	8,463,475	22,330,328	50,497,652	269,194	24,368	0
1971	4,247,037	3,768,699	1,120,231	8,244,651	5,844,024	16,890,503	40,115,145	164,446	32,230	0
1972	1,871,831	28,732	985,512	18,787,722	(23,015,734)	3,818,001	2,874,264	131,321	17,601	0
1973	775,824	168,064	399,856	9,408,706	1,821,206	13,426,222	25,999,878	182,493	16,154	0
1974	560,657	168,878	169,717	3,901,261	(3,454,239)	2,988,318	4,334,592	190,866	18,799	0
1975	353,670	421,176	925,693	664,113	609,891	1,808,235	4,782,778	64,582	36,012	0
1976	396,809	650,417	1,274,484	706,244	650,209	1,253,067	4,931,230	198,266	68,898	0
1977	390,637	3,018,637	2,152,961	196,012	1,135,148	345,023	7,238,418	918,473	81,305	0
1978	1,427,190	2,219,135	6,694,615	57,817	149,932	763,445	11,312,134	52,994	83,300	0
1979	940,013	2,168,382	19,813,742	597,858	331,313	282,145	24,133,453	38,182	108,951	0
1980	1,276,793	4,108,143	24,537,814	550,337	204,751	2,055,206	32,733,044	189,070	376,036	0
1981	(711,751)	2,699,873	19,806,531	94,944	28,852	275,460	22,193,909	19,897	(157,537)	0
1982	(465,217)	351,251	17,964,617	215,678	42,587	351,376	18,460,292	(16,381)	(96,449)	0
1983	100,394	180,971	6,751,649	220,029	24,295	566,545	7,843,883	85,496	67,106	0
1984	71,759	68,930	2,870,259	335,942	17,285	1,118,954	4,483,129	28,568	54,074	0
1985	142,244	25,386	2,126,670	102,366	21,971	284,243	2,702,880	36,834	54,314	0
1986	133,914	62,294	274,660	141,894	36,149	213,353	862,264	82,358	223,134	0
1987	13,936	453,949	711,773	192,511	27,931	158,313	1,558,413	53,817	1,061,939	0
1988	427,544	118,010	1,660,959	203,130	95,930	222,068	2,727,641	183,853	1,141,272	0
1989	207,067	430,662	584,186	241,811	97,472	148,674	1,709,872	84,678	893,765	0
1990	197,428	355,480	386,882	813,211	54,269	119,438	1,926,708	133,868	1,100,167	0
1991	219,321	344,386	453,336	1,132,520	55,176	229,315	2,434,054	164,610	1,635,283	0
1992	541,026	295,312	464,421	4,402,524	47,182	206,495	5,956,960	183,240	1,220,510	1,495,646
1993	464,987	320,182	643,189	3,361,457	74,198	296,349	5,160,362	344,928	5,274,657	5,052,431
1994	203,666	231,527	362,717	306,148	33,758	168,426	1,306,242	282,150	15,905,886	21,341,196
1995	344,358	392,647	536,253	468,656	34,007	304,983	2,080,904	1,196,326	45,172,271	62,947,362
1996	150,901	161,394	427,223	203,201	15,357	98,522	1,056,598	948,730	42,987,442	54,300,990
1997	298,002	71,310	432,940	276,180	50,095	233,956	1,362,483	562,583	11,209,633	13,893,576
1998	346,973	21,003	2,028,979	181,951	49,377	67,874	2,696,157	248,671	2,355,322	4,159,441
1999	296,520	37,641	1,080,682	125,373	51,213	118,013	1,709,442	288,236	2,906,010	4,398,935
2000	212,174	33,747	238,676	116,588	13,241	187,926	802,352	132,435	228,901	2,965,936
2001	43,281	6,448	104,127	110,850	10,737	23,847	299,290	103,281	(7,057)	568,968
2002	171,190	30,767	252,912	60,146	7,881	62,684	585,581	98,021	147,827	105,972
2003	50,519	9,141	103,160	57,712	51,000	34,282	305,814	42,075	43,753	31,706
2004	47,768	6,780	27,718	107,695	215,925	16,535	422,421	26,667	13,644	21,479
2005	273,482	12,706	54,409	6,642	52,413	594,136	993,789	29,337	(261,476)	38,618
2006	660,664	3,017	115,825	1,557	2,299,565	164,739	3,245,367	7,046	6,303	37,583
2007	107,460	23,817	1,958,512	269,569	347	31,047	2,390,752	37,460	32,702	42,774
2008	2,090,139	13,683	103,704	1,001,788	2,089	60,186	3,271,589	41,227	34,997	10,865
2009	1,931,357	16,656	22,763	1,463,455	395	46,904	3,481,529	19,419	17,140	2,357
2010	864,327	1,982	24,650	231,950	(54)	16,969	1,139,825	633,614	3,110	0
2011	426,178	3,476	3,867	40,720	15	3,492	477,747	894,062	39,626	0
2012	615,441	76,325	91,531	55,362	18,910	79,163	936,732	337,039	271,933	0
2013	182,443	231,925	230,217	172,032	51,955	257,967	1,126,538	840,207	1,113,962	0
2014	300,223	264,332	332,856	96,090	39,531	1,677,183	2,710,216	1,316,201	1,327,525	0
2015	154,787	112,785	473,011	48,982	27,813	3,378,758	4,196,137	829,729	1,259,985	0
2016	177,114	128,685	287,933	30,648	32,746	2,427,910	3,085,035	1,193,427	918,450	0
2017	246,387	85,850	1,721,122	245,217	23,458	1,769,317	4,091,353	1,474,823	717,086	0
2018	153,515	1,868,391	1,530,815	654,698	14,928	1,555,633	5,777,979	2,139,134	142,347	0
2019	1,345,005	3,531,971	1,181,797	1,766,357	26,659	2,341,299	10,193,088	1,287,189	664,400	459
2020	593,127	66,348	1,650,867	12,324,467	14,952	3,140,236	17,789,996	2,324,138	1,059,045	5,564
2021	945,498	174,667	1,854,645	2,613,137	41,486	10,345,192	15,974,626	2,150,480	4,023,037	35,921
2022	853,181	92,613	463,625	7,190,766	34,705	15,480,336	24,115,227	2,988,298	1,846,599	0
2023	485,568	160,425	227,962	11,025,823	162,981	7,805,745	19,868,505	5,657,596	6,186,295	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	49,435,069	38,798,807	137,719,750	102,887,385	78,257,022	187,508,602	594,606,635	44,785,258	154,056,782	171,457,778

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)						GRAND TOTAL
	COASTAL BRANCH (continued)					Total	
	Reach 34	Reach 35	Reach 37	Reach 38	Subtotal		
	[70]	[71]	[72]	[73]	[74]	[75]	[76]
1952	0	0	0	0	0	98,857	99,353
1953	0	0	0	0	0	309,387	311,812
1954	0	0	0	0	0	394,688	402,143
1955	0	0	0	0	0	159,842	169,342
1956	0	0	0	0	0	255,679	351,551
1957	0	0	0	0	0	708,753	1,464,452
1958	0	0	0	0	0	1,331,616	2,286,623
1959	7,441	8,236	0	0	92,837	2,096,392	2,967,412
1960	8,507	14,265	0	0	127,626	2,937,049	4,660,833
1961	1,501	3,931	0	0	37,101	4,650,264	8,545,244
1962	524	1,689	0	0	20,132	5,827,774	8,875,171
1963	880	2,943	0	0	38,592	18,981,487	24,610,278
1964	1,687	5,639	0	0	349,707	31,550,813	41,736,060
1965	2,118	7,060	0	0	792,379	57,936,405	62,664,743
1966	1,736	5,764	0	0	2,302,279	124,748,128	129,110,330
1967	1,891	6,213	0	0	6,356,854	187,465,580	194,146,365
1968	1,324	4,369	0	0	2,744,057	192,593,079	197,978,911
1969	907	2,905	0	0	454,158	182,530,023	184,473,490
1970	851	2,787	0	0	297,200	206,720,774	207,082,650
1971	1,315	3,804	0	0	201,795	158,414,033	158,624,739
1972	522	1,660	0	0	151,115	68,228,670	68,362,291
1973	542	1,758	0	0	200,947	45,110,823	45,263,853
1974	463	1,405	0	0	211,533	24,036,199	24,402,166
1975	2,255	6,656	0	0	109,505	21,065,768	21,318,838
1976	5,088	14,988	0	0	287,240	17,183,961	17,492,910
1977	1,834	5,387	0	0	1,006,999	15,165,801	15,544,382
1978	1,302	3,852	0	0	141,448	18,661,117	19,119,151
1979	1,505	4,433	0	0	153,071	31,202,118	31,857,362
1980	1,152	3,449	0	0	569,707	73,891,101	74,986,833
1981	1,427	4,261	0	0	(131,952)	15,246,649	15,742,773
1982	588	1,787	0	0	(110,455)	38,256,580	39,705,931
1983	794	2,398	0	0	155,794	34,705,281	38,044,649
1984	986	2,959	0	0	86,587	24,454,091	30,382,250
1985	2,111	6,263	0	0	99,522	14,914,930	28,537,556
1986	17,458	51,279	0	0	374,229	13,435,351	43,155,828
1987	92,506	272,968	0	0	1,481,230	11,711,428	34,331,982
1988	99,456	293,612	0	0	1,718,193	11,026,370	18,123,243
1989	77,283	228,038	0	0	1,283,764	30,302,112	33,130,497
1990	103,785	277,889	0	0	1,615,709	32,589,619	34,435,721
1991	123,603	363,889	0	0	2,287,385	38,320,942	39,811,664
1992	566,230	240,553	102,051	74,162	3,882,392	34,312,996	35,041,233
1993	1,345,211	688,935	268,937	358,367	13,333,466	53,122,384	53,921,787
1994	8,915,445	2,363,238	678,753	1,315,559	50,802,227	73,751,564	74,225,377
1995	23,975,738	20,849,939	7,029,197	7,117,197	168,287,941	191,033,090	191,525,571
1996	26,475,298	18,790,572	7,213,823	6,616,310	157,333,165	187,776,347	188,025,325
1997	10,456,863	4,149,105	545,378	798,606	41,615,744	62,137,369	62,583,537
1998	3,368,320	952,615	192,567	280,779	11,557,715	27,083,446	27,217,157
1999	2,616,574	356,318	36,680	51,648	10,654,402	24,085,343	24,556,053
2000	2,746,120	17,830	0	0	6,091,222	13,504,773	13,742,557
2001	3,960	(1,112)	0	0	668,039	5,130,617	7,470,505
2002	77,266	13,119	0	0	442,204	9,921,954	18,223,863
2003	25,734	6,272	0	0	149,540	7,090,347	14,855,165
2004	3,142	1,942	0	0	66,873	5,724,375	10,829,600
2005	526	327	0	0	(192,669)	9,654,977	12,130,085
2006	4	18,012	0	0	68,949	16,031,812	18,522,243
2007	0	152	0	0	113,088	13,670,587	20,478,263
2008	24	14,163	0	0	101,277	15,861,831	30,324,188
2009	19	19,626	0	0	58,560	26,226,360	40,889,836
2010	(6)	(5,643)	0	0	631,075	23,052,168	45,955,128
2011	2	1,568	0	0	935,257	17,925,976	37,813,089
2012	96	1,455	0	0	610,523	23,976,419	37,907,075
2013	209	1,590	0	0	1,955,967	41,613,214	49,495,208
2014	114	1,113	0	0	2,644,952	34,951,859	35,309,231
2015	1,286	0	0	0	2,091,000	52,194,104	55,555,029
2016	2,899	0	0	0	2,114,775	79,394,112	80,523,292
2017	2,412	0	0	0	2,194,321	47,632,026	48,368,101
2018	242	0	0	0	2,281,723	52,754,111	55,877,008
2019	183	0	0	0	1,952,232	52,775,022	55,216,477
2020	0	0	0	0	3,388,747	81,147,800	84,148,941
2021	0	0	0	0	6,209,438	121,275,867	133,517,203
2022	270	0	0	0	4,835,167	126,519,704	146,403,394
2023	3,557	0	0	0	11,847,447	163,743,158	174,065,804
2024	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0
2030	0	0	0	0	0	0	0
2031	0	0	0	0	0	0	0
2032	0	0	0	0	0	0	0
2033	0	0	0	0	0	0	0
2034	0	0	0	0	0	0	0
2035	0	0	0	0	0	0	0
TOTAL	81,153,079	50,100,223	16,067,297	16,612,628	534,233,045	3,454,295,245	3,789,028,706

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]	[10]
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	669,423	327,111	296,607	286,741	1,579,881	3,702,046	472,805	429,092	446,226
2000	505	921,145	255,241	658,337	414,732	2,249,455	3,819,656	542,912	442,523	552,798
2001	314	1,072,602	229,536	456,017	181,422	1,939,577	2,907,864	272,655	289,843	390,435
2002	3,627	1,588,193	416,716	411,335	399,228	2,815,473	3,864,254	342,960	468,135	542,366
2003	393	1,776,808	545,849	567,701	354,209	3,244,568	2,347,693	365,740	575,369	963,063
2004	455	1,601,844	635,523	738,142	818,262	3,793,771	3,340,788	510,418	746,881	698,740
2005	452	1,059,792	322,702	767,313	412,453	2,562,259	3,309,596	262,582	427,600	807,588
2006	3,900	785,570	233,554	602,287	431,930	2,053,342	3,478,759	377,976	754,014	590,771
2007	(8)	1,081,246	232,503	467,676	275,805	2,057,230	5,023,798	691,586	588,725	790,472
2008	3,578	823,548	217,788	526,410	602,717	2,170,463	5,217,268	679,696	744,219	926,968
2009	88	1,229,747	276,666	619,451	554,226	2,680,090	4,041,198	678,768	715,061	1,362,533
2010	25	2,671,470	111,842	1,104,059	275,902	4,163,272	4,490,592	578,352	804,400	717,652
2011	63	2,639,192	584,088	1,238,782	415,722	4,877,785	5,165,636	838,752	874,821	501,976
2012	(24)	2,614,255	143,191	1,452,289	1,125,656	5,335,391	5,308,707	1,113,972	749,828	832,618
2013	277	3,328,419	133,835	476,853	371,961	4,311,068	6,182,473	1,217,983	685,049	1,105,534
2014	111	4,065,718	176,356	610,595	548,856	5,401,525	7,348,027	627,118	640,537	1,307,634
2015	114	2,881,654	251,148	1,224,921	1,084,166	5,441,889	8,559,354	664,586	633,014	855,605
2016	5,401	4,877,284	324,910	599,337	1,026,935	6,828,465	6,914,928	686,224	665,312	1,222,060
2017	111	2,581,218	400,933	694,828	833,146	4,510,125	7,287,599	1,196,792	1,692,132	1,271,915
2018	47,578	3,478,925	244,348	947,546	1,459,909	6,130,728	11,374,669	1,207,500	715,004	1,804,924
2019	11,998	2,879,611	1,085,779	344,443	983,894	5,293,728	8,575,878	1,817,769	803,829	2,191,219
2020	209	3,644,747	170,362	989,093	2,610,687	7,414,889	10,126,536	1,283,005	695,267	1,761,319
2021	17,052	4,946,184	772,662	983,170	2,518,386	9,220,402	13,922,193	1,515,371	808,714	2,166,549
2022	13,886	4,370,222	594,060	894,189	2,140,904	7,999,375	10,479,004	1,613,266	799,404	2,058,778
2023	13,908	3,610,878	588,995	753,284	1,758,620	6,711,777	9,614,136	1,867,043	784,360	1,983,049
2024	15,098	4,352,186	658,425	885,650	2,160,696	8,056,957	11,451,828	1,681,879	805,468	2,090,153
2025	15,249	4,395,708	665,009	894,506	2,182,303	8,137,526	11,566,347	1,698,698	813,523	2,111,054
2026	15,402	4,439,665	671,659	903,451	2,204,126	8,218,901	11,682,010	1,715,685	821,658	2,132,165
2027	15,556	4,484,062	678,376	912,486	2,226,167	8,301,091	11,798,830	1,732,842	829,874	2,153,486
2028	15,712	4,528,902	685,160	921,611	2,248,429	8,384,102	11,916,819	1,750,170	838,173	2,175,021
2029	15,869	4,574,191	692,011	930,827	2,270,913	8,467,942	12,035,987	1,767,672	846,555	2,196,771
2030	16,027	4,619,933	698,931	940,135	2,293,622	8,552,621	12,156,347	1,785,349	855,020	2,218,739
2031	16,188	4,666,132	705,921	949,536	2,316,559	8,638,148	12,277,910	1,803,202	863,571	2,240,926
2032	16,350	4,712,794	712,980	959,032	2,339,724	8,724,530	12,400,689	1,821,234	872,206	2,263,336
2033	16,513	4,759,922	720,110	968,622	2,363,121	8,811,775	12,524,696	1,839,447	880,928	2,285,969
2034	16,678	4,807,521	727,311	978,308	2,386,753	8,899,893	12,649,943	1,857,841	889,738	2,308,829
2035	16,845	4,855,596	734,584	988,091	2,410,620	8,988,891	12,776,443	1,876,419	898,635	2,331,917
TOTAL	383,124	121,521,043	20,027,407	31,718,226	54,946,069	228,212,745	353,559,994	48,142,941	36,369,036	60,384,353

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	629,825	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	15,691	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	49,763	34,831	426,698	2,030,610	7,592,069	11,449,859	1,394,537	1,309,732	14,154,128
2000	135,901	87,817	185,990	641,451	6,409,049	12,640,879	905,469	648,297	14,194,644
2001	112,954	188,920	197,678	1,047,945	5,408,295	17,554,493	1,378,254	753,349	19,686,097
2002	143,863	171,451	501,546	2,781,294	8,815,868	14,425,861	865,656	623,390	15,914,907
2003	77,999	97,783	247,719	987,204	5,662,570	16,518,135	1,742,176	753,175	19,013,487
2004	156,596	179,074	205,223	453,847	6,291,567	13,891,972	1,211,276	679,370	15,782,618
2005	143,052	202,176	135,131	223,699	5,511,424	12,444,218	1,941,698	873,183	15,259,099
2006	144,002	120,668	74,912	378,425	5,919,527	13,744,638	1,921,872	1,254,192	16,920,703
2007	78,627	115,099	67,469	242,249	7,598,024	11,991,012	1,702,726	627,244	14,320,982
2008	171,735	156,674	233,875	235,693	8,366,128	15,564,449	1,454,049	808,773	17,827,271
2009	84,717	141,922	114,597	619,772	7,758,568	13,696,235	1,067,699	864,355	15,628,290
2010	52,326	572,894	23,825	453,466	7,693,507	12,838,958	2,054,832	1,410,711	16,304,501
2011	82,635	77,126	58,547	472,662	8,072,156	16,658,230	2,808,698	1,443,459	20,910,388
2012	56,148	133,311	61,978	2,498,771	10,755,333	15,617,953	1,324,201	1,309,176	18,251,330
2013	82,458	175,233	98,865	1,184,319	10,731,915	16,731,989	1,743,019	2,419,102	20,894,111
2014	185,738	169,939	58,246	2,042,934	12,380,174	23,467,126	2,749,220	1,990,388	28,206,734
2015	122,064	194,385	144,459	3,166,945	14,340,412	24,874,581	1,643,573	1,917,166	28,435,320
2016	137,092	306,373	76,490	8,933,218	18,941,699	24,399,495	2,630,011	2,200,290	29,229,796
2017	92,160	143,309	137,361	4,913,632	16,734,900	24,513,144	847,000	879,264	26,239,408
2018	78,551	174,566	70,231	3,213,225	18,638,672	27,154,771	1,126,901	2,099,898	30,381,571
2019	84,786	326,518	21,082	1,023,538	14,844,621	29,464,949	1,979,287	1,969,438	33,413,675
2020	69,896	133,157	124,964	945,825	15,139,970	31,801,616	1,866,044	1,718,696	35,386,356
2021	86,799	237,904	69,518	1,282,036	20,089,084	31,645,174	2,059,081	2,270,293	35,974,548
2022	86,425	237,448	69,517	1,277,129	16,620,971	30,502,314	1,945,785	2,185,205	34,633,304
2023	84,755	232,884	68,282	1,252,455	15,886,964	31,066,639	1,920,885	2,157,685	35,145,209
2024	86,853	238,440	69,796	1,283,245	17,707,662	31,382,090	1,995,003	2,226,438	35,603,531
2025	87,721	240,824	70,494	1,296,078	17,884,739	31,695,911	2,014,953	2,248,702	35,959,566
2026	88,599	243,232	71,199	1,309,039	18,063,587	32,012,870	2,035,102	2,271,189	36,319,161
2027	89,485	245,665	71,911	1,322,129	18,244,222	32,332,998	2,055,453	2,293,901	36,682,352
2028	90,380	248,121	72,630	1,335,350	18,426,664	32,656,328	2,076,008	2,316,840	37,049,176
2029	91,283	250,603	73,356	1,348,704	18,610,931	32,982,892	2,096,768	2,340,009	37,419,669
2030	92,196	253,109	74,090	1,362,191	18,797,041	33,312,721	2,117,735	2,363,409	37,793,865
2031	93,118	255,640	74,831	1,375,813	18,985,011	33,645,848	2,138,913	2,387,043	38,171,804
2032	94,049	258,196	75,579	1,389,571	19,174,860	33,982,306	2,160,302	2,410,913	38,553,521
2033	94,990	260,778	76,335	1,403,467	19,366,610	34,322,129	2,181,905	2,435,022	38,939,056
2034	95,940	263,386	77,098	1,417,501	19,560,276	34,665,351	2,203,724	2,459,373	39,328,448
2035	96,899	266,020	77,869	1,431,676	19,755,878	35,012,004	2,225,761	2,483,966	39,721,731
TOTAL	4,069,843	9,091,255	6,134,743	65,067,039	582,819,205	1,036,133,363	91,963,681	81,742,936	1,209,839,979

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	Reach 10A
	[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	120,038	428,308	130,105	44,591	104,033	827,075	0	0	0	0
1969	90,033	460,907	184,467	35,696	235,322	1,006,425	22,013	134,760	86,103	83,706
1970	89,547	484,300	226,002	66,070	192,582	1,058,501	26,207	156,981	128,273	118,046
1971	99,917	541,574	175,592	64,193	158,170	1,039,446	32,312	190,753	118,372	129,811
1972	116,708	647,979	174,519	73,670	154,783	1,167,659	35,031	187,242	130,396	117,625
1973	116,791	611,705	158,145	58,344	153,955	1,098,940	51,150	225,747	127,530	117,706
1974	120,309	671,455	150,835	63,905	150,230	1,156,734	34,752	199,127	131,298	141,658
1975	133,593	839,285	178,974	81,478	157,586	1,390,916	78,523	250,377	159,006	207,908
1976	54,938	883,956	220,832	90,305	174,835	1,424,866	39,348	133,933	123,424	139,134
1977	73,331	1,114,465	270,734	98,132	196,311	1,752,973	38,086	121,348	178,078	194,086
1978	45,867	898,992	203,261	106,938	203,079	1,458,137	45,552	178,805	129,928	168,634
1979	223,973	842,508	144,055	99,670	180,734	1,490,940	69,973	150,679	129,756	175,107
1980	243,507	1,176,463	222,942	127,625	281,860	2,052,397	57,726	274,848	185,155	284,207
1981	265,766	1,065,358	193,048	90,533	1,612,157	3,226,862	80,121	198,256	144,187	199,927
1982	279,250	1,241,285	209,371	114,421	1,433,180	3,277,507	59,424	269,086	233,494	264,947
1983	214,468	1,949,017	339,809	131,377	2,143,678	4,778,349	49,448	383,476	223,078	308,801
1984	241,273	2,233,969	335,166	163,858	2,111,386	5,085,652	42,062	458,489	300,924	396,448
1985	322,068	2,882,583	360,431	176,577	1,603,532	5,345,191	58,820	495,500	213,368	298,337
1986	416,027	2,996,792	472,551	252,188	601,250	4,738,808	90,730	478,786	596,800	422,493
1987	362,738	3,104,592	424,107	236,349	439,232	4,567,018	113,962	412,042	446,067	488,226
1988	365,209	2,954,186	456,864	231,754	639,242	4,647,255	96,728	379,073	417,991	532,489
1989	263,171	3,182,472	393,589	332,986	633,419	4,805,637	83,282	389,698	400,853	733,030
1990	397,353	4,011,110	579,073	464,639	729,132	6,181,307	111,019	436,849	515,611	651,465
1991	256,473	4,388,184	543,760	728,156	765,765	6,682,338	104,414	496,794	465,940	716,328
1992	302,021	3,792,401	795,587	363,134	815,590	6,068,733	118,315	511,982	417,871	574,145
1993	439,725	4,337,616	1,008,394	551,849	734,796	7,072,380	230,338	745,885	490,159	723,450
1994	282,579	4,376,461	816,129	396,768	492,860	6,364,797	125,398	602,404	572,557	703,493
1995	107,995	5,026,076	1,066,971	440,006	1,356,668	7,997,716	185,681	657,282	432,072	881,902
1996	1,003,229	4,738,221	931,944	683,323	1,034,376	8,391,093	112,062	416,294	472,350	984,784
1997	859,665	5,761,996	924,289	254,934	646,209	8,447,093	128,190	449,316	728,436	1,864,113
1998	690,845	5,520,206	1,242,589	534,931	654,538	8,643,109	115,748	457,845	429,433	1,011,284
1999	580,648	5,679,663	1,208,499	527,963	664,564	8,661,336	104,994	406,555	419,492	1,136,477
2000	712,148	5,852,710	1,034,123	528,595	876,101	9,003,678	104,382	467,202	513,691	924,071
2001	(566,076)	7,151,927	850,787	372,374	677,824	8,486,836	58,346	553,100	602,903	870,228
2002	1,079,092	5,188,597	669,981	253,784	736,677	7,928,130	55,211	731,568	418,636	1,311,307
2003	1,033,869	6,035,487	744,447	301,820	617,486	8,733,109	62,400	676,784	645,931	819,094
2004	620,332	6,869,945	680,657	338,440	579,217	9,088,591	35,465	474,482	334,864	605,336
2005	552,813	5,984,685	984,807	401,962	799,334	8,723,601	28,347	403,773	296,545	898,064
2006	(93,381)	6,141,455	1,589,806	635,747	903,560	9,177,187	46,878	532,446	791,814	482,844
2007	1,137,787	7,698,226	1,963,762	688,185	935,892	12,423,852	242,814	856,923	536,527	633,896
2008	896,827	10,652,441	2,157,579	666,261	973,735	15,346,844	72,296	458,402	563,120	950,208
2009	971,092	8,137,795	1,233,553	511,335	1,151,133	12,004,910	36,810	769,896	478,039	933,554
2010	1,009,086	9,613,526	1,575,458	558,986	1,296,450	14,053,506	66,908	742,932	549,794	726,024
2011	1,234,146	7,636,959	2,867,710	602,233	1,663,997	14,005,045	12,939	600,194	794,875	1,163,621
2012	1,675,157	10,874,790	2,402,630	638,287	1,233,508	16,824,372	36,210	662,294	807,974	814,839
2013	1,833,556	11,575,007	2,886,847	1,357,036	3,282,440	20,934,887	39,520	614,462	611,789	1,014,940
2014	1,354,511	11,567,674	2,452,414	784,857	1,301,168	17,460,623	4,016	1,132,448	251,658	1,959,501
2015	1,169,732	11,873,889	2,415,727	861,361	2,078,181	18,398,889	7,012	569,449	267,773	1,455,966
2016	1,605,582	12,315,511	2,085,164	692,825	2,072,806	18,771,888	90,127	214,166	264,844	1,111,952
2017	987,538	9,495,335	1,942,689	735,607	2,532,560	15,693,729	34,429	478,207	359,032	1,147,541
2018	875,781	10,679,201	2,467,736	804,117	2,386,655	17,213,489	196,282	452,435	329,144	485,905
2019	1,648,005	11,652,739	2,402,285	794,906	1,887,715	18,385,650	69,331	910,869	883,591	1,671,754
2020	1,794,892	13,831,052	2,736,542	948,143	3,268,483	22,579,112	126,195	1,954,396	1,187,549	1,934,628
2021	2,083,596	12,629,637	2,781,100	950,214	2,930,238	21,374,785	160,292	1,560,596	980,672	1,712,046
2022	2,100,293	13,407,309	2,693,433	930,029	2,754,293	21,885,357	149,874	1,442,814	898,286	1,582,494
2023	2,063,123	12,574,809	2,686,116	927,380	2,748,163	20,999,591	147,183	1,417,244	882,707	1,554,523
2024	2,103,160	12,999,291	2,747,418	945,234	2,839,007	21,634,110	153,975	1,488,287	929,761	1,632,519
2025	2,124,192	13,129,284	2,774,892	954,686	2,867,397	21,850,451	155,514	1,503,169	939,058	1,648,844
2026	2,145,434	13,260,577	2,802,641	964,233	2,896,071	22,068,956	157,069	1,518,201	948,449	1,665,332
2027	2,166,888	13,393,182	2,830,668	973,875	2,925,032	22,289,645	158,640	1,533,383	957,933	1,681,985
2028	2,188,557	13,527,114	2,858,974	983,614	2,954,282	22,512,541	160,226	1,548,717	967,513	1,698,805
2029	2,210,443	13,662,385	2,887,564	993,450	2,983,825	22,737,667	161,829	1,564,204	977,188	1,715,793
2030	2,232,547	13,799,009	2,916,440	1,003,385	3,013,663	22,965,044	163,447	1,579,846	986,960	1,732,951
2031	2,254,873	13,936,999	2,945,604	1,013,419	3,043,800	23,194,695	165,082	1,595,645	996,829	1,750,281
2032	2,277,421	14,076,369	2,975,060	1,023,553	3,074,238	23,426,641	166,732	1,611,601	1,006,797	1,767,784
2033	2,300,196	14,217,133	3,004,811	1,033,788	3,104,980	23,660,908	168,400	1,627,717	1,016,865	1,785,461
2034	2,323,197	14,359,304	3,034,859	1,044,126	3,136,030	23,897,516	170,084	1,643,994	1,027,034	1,803,316
2035	2,346,429	14,502,897	3,065,207	1,054,567	3,167,390	24,136,490	171,784	1,660,434	1,037,304	1,821,349
TOTAL	63,631,894	473,148,334	95,892,124	35,958,777	97,148,385	765,779,514	6,377,456	48,402,492	35,691,452	62,238,524

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 11B	Reach 12D	Reach 12E	Reach 13B	Reach 14A	Reach 14B	Reach 14C	Reach 15A	Reach 16A	Subtotal
	[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	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	59,077	0	0	0	0	0	0	0	0	385,659
1970	85,758	94,171	123,374	152,424	0	0	0	0	0	885,234
1971	80,282	95,075	91,389	167,142	691,791	151,979	111,623	529,723	10,291	2,400,543
1972	84,287	98,647	115,592	146,096	877,535	124,831	101,479	609,058	1,106,884	3,734,703
1973	92,257	74,238	114,843	221,385	961,855	120,106	99,429	692,748	1,243,941	4,142,935
1974	98,103	74,914	193,523	141,540	898,272	143,866	115,649	853,098	1,343,972	4,369,772
1975	124,105	61,799	117,194	108,154	1,156,757	180,614	119,889	988,045	1,537,862	5,090,233
1976	69,715	33,655	147,908	134,063	1,124,051	177,086	114,133	1,037,799	1,727,428	5,001,677
1977	108,644	91,547	175,039	137,975	1,397,006	203,837	119,467	1,339,196	1,961,081	6,065,390
1978	106,702	72,585	170,578	151,120	1,254,043	139,662	132,224	1,265,813	1,922,950	5,738,596
1979	85,942	56,331	174,147	150,029	1,490,461	201,935	260,981	1,216,126	1,798,566	5,960,033
1980	120,896	123,120	167,249	164,749	1,988,619	189,132	238,607	1,437,614	2,231,456	7,463,378
1981	76,965	33,322	113,202	171,669	1,741,488	163,934	161,182	1,799,832	2,762,773	7,646,858
1982	158,178	142,631	224,170	224,051	1,793,867	195,086	15,768	1,933,859	2,961,383	8,475,944
1983	136,350	124,724	203,733	217,324	2,421,794	199,708	181,879	2,550,842	4,302,165	11,303,322
1984	163,331	108,212	188,724	245,764	3,312,127	329,490	204,332	3,215,901	5,077,824	14,043,628
1985	198,368	154,995	194,327	360,308	3,463,178	237,127	180,068	3,427,049	5,683,454	14,964,899
1986	248,170	242,660	346,410	349,369	3,781,427	320,984	360,156	3,574,451	5,780,666	16,593,102
1987	334,059	325,697	469,378	322,824	3,731,912	463,757	238,813	4,080,465	5,636,043	17,063,245
1988	290,881	220,658	374,653	318,253	3,451,893	411,110	313,806	3,746,920	5,150,238	15,704,693
1989	268,025	207,487	595,433	380,883	3,512,884	333,996	220,978	3,751,081	5,458,633	16,336,263
1990	363,652	225,171	480,738	677,729	4,021,727	439,953	212,851	4,381,643	6,440,643	18,959,051
1991	328,683	269,873	371,312	433,313	4,309,082	424,704	273,169	4,566,702	5,805,189	18,565,503
1992	334,579	270,768	409,314	423,717	4,734,368	729,211	571,412	4,270,793	6,471,964	19,838,439
1993	413,722	278,375	496,851	594,201	5,182,830	664,063	423,780	5,266,124	7,583,165	23,092,943
1994	346,600	239,873	482,301	445,909	4,012,614	414,899	254,393	3,727,019	7,142,378	19,069,838
1995	405,045	242,253	622,654	507,102	4,607,154	309,283	315,905	3,973,757	6,540,575	19,680,665
1996	367,570	238,622	519,560	604,736	4,892,967	214,773	187,784	4,331,630	7,065,052	20,408,184
1997	309,696	254,080	516,115	429,771	5,094,202	261,221	275,610	4,011,366	7,387,904	21,710,020
1998	295,927	170,556	384,226	484,072	4,752,549	309,440	248,178	4,694,822	7,530,927	20,885,007
1999	380,476	181,358	405,991	514,188	5,033,413	344,801	226,819	4,776,199	8,722,855	22,653,618
2000	407,003	329,623	651,632	567,643	5,959,445	343,747	141,270	5,385,187	12,485,886	28,280,782
2001	415,298	895,341	520,889	660,008	4,700,135	(133,493)	(94,172)	6,003,710	15,778,861	30,831,154
2002	382,203	297,572	960,688	864,102	5,962,071	34,549	252,703	5,606,914	11,476,678	28,354,200
2003	339,986	236,306	691,422	613,937	6,164,628	(137,397)	18,246	6,989,179	11,502,301	28,622,818
2004	245,541	176,537	625,209	586,536	7,241,729	(139,395)	(165,604)	8,916,615	14,638,053	33,575,369
2005	211,307	118,697	849,743	466,701	6,233,884	(183,948)	(193,071)	5,885,076	13,848,942	28,864,061
2006	190,864	53,965	764,253	502,669	5,096,107	(183,333)	(183,906)	8,402,592	13,753,674	30,250,866
2007	258,934	292,954	552,476	552,021	6,687,507	(435,480)	(343,687)	10,918,265	8,494,376	29,247,524
2008	429,574	238,467	425,884	726,437	11,116,200	(265,027)	(205,911)	13,038,644	10,922,368	38,570,663
2009	413,944	212,072	623,256	551,958	7,838,367	591,237	(46,849)	8,761,973	13,345,514	34,509,771
2010	446,496	116,204	423,672	703,628	7,870,528	(150,521)	(50,268)	6,648,718	9,689,381	27,783,496
2011	622,763	312,681	874,050	1,583,607	8,800,970	(231,289)	(41,944)	6,234,277	15,904,917	36,631,662
2012	794,416	280,546	1,049,510	3,227,879	11,223,874	395,959	451,771	8,837,126	12,819,958	41,402,356
2013	484,292	454,595	901,720	827,946	11,798,746	278,756	166,476	9,552,847	14,513,582	41,259,669
2014	113,763	75,439	559,825	333,788	15,049,168	208,238	329,364	10,342,848	15,933,534	46,293,589
2015	691,469	302,419	644,710	864,498	11,100,807	106,136	207,859	11,950,065	16,425,713	44,593,876
2016	645,420	67,482	1,309,418	840,657	10,090,811	(55,636)	(347,323)	12,393,198	19,010,140	45,635,255
2017	606,345	62,554	939,531	597,616	7,970,150	(124,605)	631,121	10,866,639	16,074,008	39,642,569
2018	395,356	329,686	1,590,157	1,088,137	13,678,963	29,121	247,364	10,032,645	17,237,554	46,092,750
2019	649,523	760,348	966,133	1,125,059	17,036,319	75,101	(49,695)	12,336,237	20,965,136	57,399,706
2020	1,075,145	589,434	790,415	650,225	14,470,417	402,821	357,475	12,440,548	19,527,606	55,506,853
2021	854,321	682,942	1,323,239	1,103,163	18,462,581	513,032	431,584	12,627,679	22,535,305	62,947,452
2022	788,896	618,206	1,229,670	1,018,651	18,797,227	463,543	392,158	12,808,742	19,026,536	59,217,097
2023	775,231	608,035	1,207,614	1,000,755	17,741,026	456,221	385,825	12,485,723	17,536,389	56,198,476
2024	814,210	642,759	1,266,043	1,051,266	18,516,947	482,375	407,221	12,767,122	19,896,404	60,048,889
2025	822,353	649,187	1,278,704	1,061,778	18,702,117	487,199	411,293	12,894,793	20,095,368	60,649,377
2026	830,576	655,678	1,291,491	1,072,396	18,889,138	492,071	415,406	13,023,741	20,296,322	61,255,870
2027	838,882	662,235	1,304,405	1,083,120	19,078,029	496,991	419,560	13,153,979	20,499,285	61,868,427
2028	847,271	668,858	1,317,450	1,093,951	19,268,809	501,961	423,756	13,285,519	20,704,278	62,487,114
2029	855,743	675,546	1,330,624	1,104,891	19,461,498	506,981	427,993	13,418,374	20,911,321	63,111,985
2030	864,301	682,302	1,343,930	1,115,940	19,656,112	512,051	432,273	13,552,557	21,120,434	63,743,104
2031	872,944	689,125	1,357,370	1,127,099	19,852,674	517,171	436,596	13,688,083	21,331,638	64,380,537
2032	881,673	696,016	1,370,943	1,138,370	20,051,200	522,343	440,962	13,824,964	21,544,955	65,024,340
2033	890,490	702,976	1,384,653	1,149,754	20,251,712	527,566	445,371	13,963,213	21,760,404	65,674,582
2034	899,395	710,006	1,398,499	1,161,251	20,454,229	532,842	449,825	14,102,846	21,978,008	66,331,329
2035	908,389	717,106	1,412,484	1,172,864	20,658,772	538,171	454,323	14,243,874	22,197,788	66,994,642
TOTAL	29,100,362	21,071,297	45,521,638	43,770,161	571,624,762	16,376,646	13,735,728	473,434,189	744,170,879	2,111,515,585

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)								
	TEHACHAPI DIVISION			MOJAVE DIVISION					
	Reach 17E	Reach 17F	Subtotal	Reach 18A	Reach 19	Reach 20A	Reach 20B	Reach 21	Reach 22A
	[40]	[41]	[42]	[43]	[44]	[45]	[46]	[47]	[48]
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	3,471	0	3,471	0	0	0	0	0	0
1972	1,424,782	28,127	1,452,909	36,699	135,675	130,711	120,271	75,768	80,436
1973	1,777,260	49,949	1,827,209	36,207	146,739	161,838	148,631	60,641	66,539
1974	2,298,091	16,259	2,314,350	30,525	90,404	115,571	88,200	65,007	77,667
1975	2,403,430	35,193	2,438,623	40,588	122,584	137,684	118,898	135,462	77,825
1976	2,776,194	126,653	2,902,847	118,610	201,215	182,927	151,555	106,314	131,007
1977	3,845,464	83,936	3,929,400	93,565	226,906	180,884	112,589	98,757	86,279
1978	2,954,313	42,637	2,996,950	91,815	200,759	215,673	120,584	109,271	71,763
1979	3,539,402	45,997	3,585,399	99,670	307,386	261,205	194,104	203,078	121,586
1980	4,749,245	54,806	4,804,051	116,487	446,175	290,719	237,250	156,794	117,274
1981	5,485,957	64,886	5,550,843	316,590	585,003	325,112	292,081	181,062	119,602
1982	6,349,080	55,997	6,405,077	447,739	638,615	275,763	330,502	186,109	125,429
1983	14,153,033	96,397	14,249,430	345,229	564,698	368,139	326,767	219,943	140,523
1984	18,448,383	77,201	18,525,584	267,497	563,588	413,443	329,933	266,919	146,866
1985	18,134,698	137,928	18,272,626	298,932	475,028	450,444	388,327	799,514	125,780
1986	19,297,129	109,938	19,407,067	703,413	350,906	347,690	315,566	242,158	178,847
1987	17,398,908	98,355	17,497,263	1,261,056	558,996	818,475	357,971	298,190	236,263
1988	17,697,838	138,405	17,836,243	1,242,139	560,911	585,014	400,005	331,099	149,876
1989	17,641,151	88,488	17,729,639	1,049,615	283,065	366,590	345,614	194,047	138,825
1990	19,995,760	99,868	20,095,628	1,298,537	229,083	469,502	202,412	273,748	49,174
1991	19,903,346	131,558	20,034,904	1,432,360	665,443	1,025,089	516,257	478,555	231,223
1992	18,194,788	279,610	18,474,398	1,167,898	738,238	666,181	696,623	585,072	168,251
1993	19,051,939	199,640	19,251,579	1,868,745	606,763	1,232,409	818,675	509,309	207,818
1994	17,354,702	204,963	17,559,665	1,699,479	763,493	1,145,700	957,350	873,215	241,679
1995	19,360,033	191,516	19,551,549	1,284,146	614,314	1,941,939	2,411,412	355,198	179,930
1996	19,041,451	237,846	19,279,297	1,163,708	576,674	1,335,804	1,713,145	790,618	136,397
1997	19,724,881	176,120	19,901,001	1,330,450	730,628	1,401,562	2,043,179	640,177	189,241
1998	23,227,152	182,754	23,409,906	1,513,656	309,052	7,568,901	508,030	297,621	115,100
1999	19,705,431	154,779	19,860,211	3,109,479	654,678	5,334,349	1,607,475	1,356,848	166,142
2000	23,273,837	244,966	23,518,803	1,876,319	739,748	1,381,859	1,436,449	973,896	165,586
2001	24,052,191	617,689	24,669,880	2,438,339	2,543,535	1,838,031	1,521,485	1,068,195	474,308
2002	20,783,080	473,014	21,256,094	1,405,595	803,650	760,787	586,475	1,158,565	282,426
2003	20,832,780	283,154	21,115,934	3,732,959	677,475	710,041	624,601	469,225	279,922
2004	26,595,905	245,959	26,841,863	1,822,916	1,375,981	1,322,889	1,045,309	1,054,908	413,454
2005	16,373,205	1,498,563	17,871,768	2,840,786	1,503,138	1,541,599	880,561	677,638	353,610
2006	14,723,341	273,033	14,996,374	4,460,222	1,313,604	1,201,851	2,921,902	963,501	758,401
2007	15,893,697	346,280	16,239,977	5,904,482	1,632,121	1,798,303	1,823,995	830,889	655,511
2008	23,010,813	319,939	23,330,752	2,269,337	1,372,737	1,261,361	829,163	500,069	709,390
2009	22,756,256	156,856	22,913,112	2,555,951	1,547,074	1,347,674	1,173,040	781,266	540,952
2010	14,662,660	262,469	14,925,129	3,375,017	1,603,154	2,605,498	1,725,362	785,074	694,882
2011	18,662,153	139,112	18,801,264	2,545,981	1,772,468	2,315,210	2,216,453	624,379	579,320
2012	21,030,790	219,026	21,249,816	5,060,551	1,461,264	1,600,996	2,700,934	1,804,822	651,966
2013	33,824,190	263,214	34,087,404	5,815,609	1,658,322	1,288,456	3,042,774	1,397,322	528,733
2014	38,067,676	221,953	38,289,629	3,928,791	2,613,424	1,356,469	2,957,130	621,225	753,651
2015	27,072,628	146,583	27,219,211	4,660,997	2,079,933	2,851,824	869,453	2,593,134	1,111,181
2016	27,131,213	127,509	27,258,722	4,300,070	2,291,722	1,409,746	1,232,836	878,386	274,270
2017	26,784,206	157,723	26,941,929	4,208,191	2,636,520	1,575,763	1,263,762	714,442	386,025
2018	23,825,377	280,999	24,106,376	5,192,782	2,674,621	2,419,149	1,534,356	930,242	539,161
2019	26,832,739	1,132,743	27,965,482	5,672,178	333,572	1,918,824	272,317	530,738	67,779
2020	28,034,057	1,170,743	29,204,799	4,920,688	625,431	221,753	198,197	290,535	252,366
2021	30,206,297	1,035,896	31,242,193	6,601,045	2,344,376	2,363,779	1,471,052	1,080,538	653,766
2022	33,204,355	1,009,075	34,213,430	6,876,246	2,249,961	2,334,243	1,409,597	1,054,677	625,811
2023	32,322,712	996,713	33,319,425	6,780,289	2,231,595	2,309,534	1,398,552	1,044,708	620,815
2024	32,230,232	1,024,034	33,254,266	6,820,052	2,298,064	2,359,211	1,440,664	1,070,574	639,799
2025	32,552,535	1,034,274	33,586,809	6,888,253	2,321,045	2,382,803	1,455,071	1,081,279	646,197
2026	32,878,060	1,044,617	33,922,677	6,957,135	2,344,255	2,406,631	1,469,621	1,092,092	652,659
2027	33,206,840	1,055,063	34,261,903	7,026,707	2,367,698	2,430,697	1,484,318	1,103,013	659,185
2028	33,538,909	1,065,614	34,604,523	7,096,974	2,391,375	2,455,004	1,499,161	1,114,043	665,777
2029	33,874,298	1,076,270	34,950,568	7,167,943	2,415,288	2,479,554	1,514,152	1,125,184	672,435
2030	34,213,041	1,087,033	35,300,074	7,239,623	2,439,441	2,504,350	1,529,294	1,136,436	679,159
2031	34,555,171	1,097,903	35,653,074	7,312,019	2,463,836	2,529,393	1,544,587	1,147,800	685,951
2032	34,900,723	1,108,882	36,009,605	7,385,139	2,488,474	2,554,687	1,560,033	1,159,278	692,810
2033	35,249,730	1,119,971	36,369,701	7,458,991	2,513,359	2,580,234	1,575,633	1,170,871	699,738
2034	35,602,228	1,131,171	36,733,399	7,533,581	2,538,492	2,606,036	1,591,389	1,182,579	706,736
2035	35,958,250	1,142,482	37,100,732	7,608,916	2,563,877	2,632,097	1,607,303	1,194,405	713,803
TOTAL	1,354,653,487	27,820,330	1,382,473,817	208,205,507	81,577,648	97,405,653	69,260,386	46,296,424	24,364,877

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 22B	Reach 23	Reach 24	Subtotal	Reach 25	Reach 26A	Reach 28G	Reach 28H	Reach 28J	Subtotal
	[49]	[50]	[51]	[52]	[53]	[54]	[55]	[56]	[57]	[58]
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	1,036,831	51,520	362,153	2,030,064	26	578	109	30	0	743
1973	1,283,816	65,475	353,262	2,323,148	20,541	679,328	136,352	79	0	836,300
1974	1,477,946	96,340	334,302	2,375,962	24,380	799,400	155,262	34,693	854,637	1,868,372
1975	1,630,554	111,141	419,450	2,794,186	29,337	885,021	110,729	69,082	723,814	1,817,983
1976	1,598,071	107,787	304,638	2,902,124	51,356	1,103,139	138,575	100,400	635,853	2,029,323
1977	1,882,080	71,228	48,359	2,800,647	62,584	1,412,740	127,543	92,647	825,880	2,521,394
1978	2,211,965	72,179	637,401	3,731,410	67,186	1,159,950	166,919	68,363	835,082	2,297,500
1979	2,104,832	76,960	202,566	3,571,387	84,462	1,235,189	142,586	92,812	265,525	1,820,574
1980	2,670,387	147,009	688,605	4,870,700	72,651	1,532,535	158,340	129,897	1,120,131	3,013,554
1981	3,030,407	134,895	47,750	5,032,502	35,662	1,575,444	160,053	111,722	333,550	2,216,431
1982	3,248,883	299,712	623,755	6,176,507	26,852	1,822,250	205,350	135,463	1,518,759	3,708,674
1983	3,899,769	223,626	384,292	6,472,986	19,017	1,663,599	244,720	124,651	412,806	2,464,793
1984	4,783,997	59,337	1,104,149	7,935,729	11,319	2,325,661	240,496	190,924	769,068	3,537,468
1985	5,330,501	261,135	811,346	8,941,007	17,764	2,707,662	451,600	182,242	871,492	4,230,760
1986	6,190,812	156,053	515,945	9,001,390	31,012	2,768,728	439,048	256,526	982,332	4,477,646
1987	5,731,239	151,796	732,607	10,146,593	19,362	2,847,390	278,094	218,717	1,118,529	4,482,092
1988	6,910,472	253,833	970,052	11,403,401	36,576	3,087,873	271,868	200,811	1,176,659	4,773,787
1989	5,963,386	349,544	1,242,144	9,932,830	30,881	3,190,809	230,953	281,861	1,130,035	4,864,539
1990	6,905,442	436,785	1,891,053	11,755,736	25,518	3,330,913	437,812	308,144	1,538,449	5,640,836
1991	7,488,366	263,723	1,561,051	13,662,067	32,172	3,847,589	843,388	632,912	1,630,321	6,986,382
1992	7,076,997	317,042	622,116	12,038,418	55,819	4,043,878	281,864	5,636,464	1,102,519	11,120,544
1993	7,765,751	359,632	1,708,915	15,078,017	72,464	5,638,325	382,195	570,563	994,721	7,658,268
1994	7,691,548	1,220,795	1,245,936	15,839,195	105,373	5,139,991	617,136	415,603	1,022,412	7,300,515
1995	6,994,639	842,041	746,371	15,369,990	96,781	4,357,648	1,308,828	704,154	894,338	7,361,749
1996	8,590,347	889,842	(78,782)	15,117,753	156,395	4,051,744	1,001,063	1,041,697	1,316,493	7,567,392
1997	8,138,580	1,586,227	3,355,446	19,415,490	177,217	4,585,198	493,841	949,188	953,590	7,159,034
1998	8,887,728	1,924,868	1,134,837	22,259,793	142,703	4,856,225	379,997	991,426	(67,444)	6,302,907
1999	9,532,127	2,027,488	1,131,534	24,920,121	189,880	5,968,108	493,503	1,964,144	906,587	9,522,223
2000	9,545,979	1,712,016	1,520,535	19,352,386	353,641	4,204,605	844,572	1,004,579	1,130,000	7,537,396
2001	7,695,659	1,891,901	31,234	19,502,687	296,461	2,442,119	1,667,660	810,577	5,658,124	10,874,941
2002	11,272,123	1,694,700	942,548	18,906,870	509,212	3,409,739	1,252,645	424,235	2,242,690	7,838,520
2003	13,350,815	2,095,918	(452,530)	21,488,425	368,521	3,729,470	545,107	375,520	1,281,528	6,300,147
2004	10,504,452	2,128,380	1,088,345	20,756,633	427,791	5,437,257	1,238,443	439,997	3,579,824	11,123,311
2005	7,604,037	2,414,926	2,243,430	20,059,725	452,675	5,606,198	1,518,256	683,607	(1,916,769)	6,343,967
2006	10,111,792	1,924,426	573,584	24,229,283	301,178	5,203,442	638,263	320,547	5,212,633	11,676,063
2007	10,023,850	2,957,603	650,825	26,277,579	227,833	8,078,905	823,731	705,613	3,281,231	13,117,313
2008	14,689,100	2,414,813	1,009,057	25,055,025	307,375	6,667,077	808,869	780,204	4,570,082	13,133,607
2009	12,250,583	3,494,124	1,519,962	25,210,626	509,167	7,248,564	629,994	681,317	2,770,724	11,839,765
2010	12,897,810	3,226,278	2,497,248	29,410,322	605,860	6,524,007	472,877	422,032	3,548,804	11,573,580
2011	13,500,979	4,104,748	3,060,699	30,720,238	432,297	5,573,238	884,689	565,634	4,855,209	12,311,067
2012	13,585,956	2,845,293	4,691,805	34,403,587	244,672	6,415,031	1,708,432	546,617	3,967,633	12,882,385
2013	14,565,541	3,500,863	3,602,236	35,399,857	439,183	7,913,895	857,878	733,766	2,328,911	12,273,633
2014	17,923,884	4,318,586	2,885,517	37,358,678	316,530	9,065,979	1,171,054	330,766	9,690,728	20,575,057
2015	19,339,105	4,542,001	2,744,237	40,791,864	178,396	11,934,915	823,952	497,201	2,377,182	15,811,646
2016	21,237,358	5,164,807	4,343,970	41,133,165	499,735	10,937,050	598,717	644,907	2,732,884	15,413,293
2017	17,487,723	5,243,683	4,845,533	38,361,641	561,211	9,353,093	1,439,013	648,730	(4,384,317)	7,617,730
2018	13,440,161	6,264,225	5,661,154	38,655,851	305,420	12,218,471	1,084,716	925,738	8,782,502	23,316,847
2019	17,774,885	6,706,463	2,589,812	35,866,568	558,935	10,853,557	2,689,631	1,637,937	2,287,843	18,027,902
2020	18,932,484	8,177,754	5,247,572	38,866,779	1,171,782	13,600,404	1,917,120	1,760,893	7,154,941	25,605,140
2021	21,041,120	8,231,474	5,247,567	49,034,717	499,790	15,663,025	1,896,273	1,137,505	6,098,060	25,294,653
2022	19,989,791	8,582,840	5,328,338	48,451,504	496,990	15,326,769	1,981,232	1,135,794	5,601,513	24,542,298
2023	19,867,447	8,461,899	5,145,287	47,860,126	690,491	15,120,856	1,939,355	1,121,403	5,582,520	24,454,625
2024	20,502,448	8,509,658	5,292,801	48,933,271	568,048	15,523,919	1,958,343	1,142,883	5,818,305	25,011,498
2025	20,707,472	8,594,755	5,345,729	49,422,604	573,729	15,679,158	1,977,926	1,154,311	5,876,488	25,261,612
2026	20,914,547	8,680,702	5,399,186	49,916,828	579,466	15,835,950	1,997,705	1,165,855	5,935,253	25,514,229
2027	21,123,692	8,767,509	5,453,178	50,415,997	585,261	15,994,309	2,017,682	1,177,513	5,994,605	25,769,370
2028	21,334,929	8,855,184	5,507,710	50,920,157	591,113	16,154,253	2,037,859	1,189,288	6,054,551	26,027,064
2029	21,548,278	8,943,736	5,562,787	51,429,357	597,024	16,315,795	2,058,238	1,201,181	6,115,097	26,287,335
2030	21,763,761	9,033,173	5,618,415	51,943,652	602,995	16,478,953	2,078,820	1,213,193	6,176,248	26,550,209
2031	21,981,399	9,123,505	5,674,599	52,463,089	609,025	16,643,743	2,099,608	1,225,325	6,238,010	26,815,711
2032	22,201,213	9,214,740	5,731,345	52,987,719	615,115	16,810,180	2,120,604	1,237,578	6,300,391	27,083,868
2033	22,423,225	9,306,888	5,788,658	53,517,597	621,266	16,978,282	2,141,810	1,249,954	6,363,394	27,354,706
2034	22,647,457	9,399,957	5,846,545	54,052,772	627,479	17,148,065	2,163,228	1,262,453	6,427,028	27,628,253
2035	22,873,932	9,493,956	5,905,011	54,593,300	633,753	17,319,545	2,184,861	1,275,078	6,491,299	27,904,536
TOTAL	748,712,459	222,581,495	157,245,181	1,655,649,630	19,654,710	476,026,731	64,167,387	48,334,945	186,091,287	794,275,060

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 - EAST BRANCH EXTENSION										
	Reach 1	Reach 2A	Reach 2B	Reach 2C	Reach 2D	Reach 2E	Reach 3A	Reach 3B	Reach 3C	Reach 3D	Reach 3E
	[59]	[60]	[61]	[62]	[63]	[64]	[65]	[66]	[67]	[68]	[69]
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	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	0
2001	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0
2003	1,022	84,351	375,153	2,329	0	0	627,038	0	360	0	0
2004	10,740	40,841	509,089	2,340	0	0	276,019	0	337	0	0
2005	9,849	15,079	526,273	4,153	0	0	496,547	0	9,036	0	0
2006	10,215	10,235	547,652	9,253	57,553	0	403,157	0	1,274	0	0
2007	27,124	9,281	658,433	5,083	125,317	0	616,360	0	58,543	0	0
2008	77,266	29,070	854,241	1,330	208,975	0	1,320,481	0	93,096	0	0
2009	79,970	11,317	1,005,220	919	230,886	0	1,015,588	0	24,880	0	0
2010	53,052	5,434	808,475	15,658	261,397	0	1,261,486	0	9,349	0	0
2011	21,407	5,124	700,813	4,440	117,224	0	1,102,193	0	10,973	0	0
2012	5,707	15,511	750,295	15,694	171,113	0	1,604,996	0	26,651	0	0
2013	1,121	5,212	627,537	171,472	293,202	0	1,629,788	0	4,281	0	0
2014	8,278	9,524	829,281	104,882	167,033	0	1,838,721	0	3,984	0	0
2015	(140)	7,379	824,321	11,288	89,609	0	1,509,687	0	105,508	0	0
2016	0	12,816	706,387	116,849	34,192	0	1,861,763	0	31,203	0	0
2017	1,233	7,139	1,077,118	160,825	29,140	1,448,093	1,901,271	0	56,307	0	0
2018	7,914	13,652	828,031	41,324	24,139	920,099	3,806,696	327,211	12,211	0	5,311
2019	266	9,641	745,731	112,851	79,251	2,801,825	3,606,438	1,556,093	39,089	0	46,699
2020	204	44,053	723,534	2,633	7,448	3,329,544	2,072,479	1,410,633	117,500	204	6,680
2021	3,536	23,810	831,136	66,753	42,425	3,965,201	3,843,321	1,344,919	61,205	324	24,892
2022	3,591	24,491	845,880	68,815	41,642	3,607,265	4,027,262	1,032,024	63,096	273	25,617
2023	3,455	23,507	826,749	66,026	40,300	3,524,686	3,819,461	900,645	60,539	272	24,586
2024	3,563	24,175	842,934	67,870	41,871	3,736,042	3,935,648	1,103,454	62,229	293	25,281
2025	3,599	24,417	851,363	68,549	42,289	3,773,402	3,975,004	1,114,489	62,851	296	25,534
2026	3,635	24,661	859,877	69,234	42,712	3,811,136	4,014,754	1,125,634	63,480	299	25,789
2027	3,671	24,908	868,476	69,927	43,139	3,849,247	4,054,902	1,136,890	64,115	302	26,047
2028	3,708	25,157	877,160	70,626	43,571	3,887,740	4,095,451	1,148,259	64,756	305	26,308
2029	3,745	25,409	885,932	71,332	44,006	3,926,617	4,136,405	1,159,742	65,403	308	26,571
2030	3,782	25,663	894,791	72,045	44,446	3,965,883	4,177,769	1,171,339	66,057	311	26,837
2031	3,820	25,919	903,739	72,766	44,891	4,005,542	4,219,547	1,183,052	66,718	314	27,105
2032	3,859	26,178	912,777	73,493	45,340	4,045,598	4,261,743	1,194,883	67,385	317	27,376
2033	3,897	26,440	921,904	74,228	45,793	4,086,054	4,304,360	1,206,832	68,059	320	27,650
2034	3,936	26,705	931,123	74,971	46,251	4,126,914	4,347,404	1,218,900	68,740	324	27,926
2035	3,975	26,972	940,435	75,720	46,714	4,168,183	4,390,878	1,231,089	69,427	327	28,206
TOTAL	370,997	714,070	26,291,860	1,845,677	2,551,869	66,979,070	88,554,617	20,566,088	1,578,640	4,789	454,415

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 Year	CALIFORNIA AQUEDUCT (continued)									
	SANTA ANA DIVISION - EAST BRANCH EXTENSION (cont.)			WEST BRANCH						
	Reach 4A	Reach 4B	Subtotal	Reach 29A	Reach 29F	Reach 29G	Reach 29H	Reach 29J	Reach 30	Subtotal
	[70]	[71]	[72]	[73]	[74]	[75]	[76]	[77]	[78]	[79]
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	0	0	0	719,255	159,249	199,145	234,196	88,198	420,789	1,820,832
1973	0	0	0	779,949	339,363	122,664	264,850	119,743	621,431	2,248,000
1974	0	0	0	883,312	158,366	112,458	350,160	(4,525)	723,949	2,223,720
1975	0	0	0	1,049,990	176,676	194,724	801,457	75,870	841,991	3,140,708
1976	0	0	0	1,220,429	215,588	202,591	624,614	98,268	(650,944)	1,710,546
1977	0	0	0	1,268,813	116,939	218,129	684,679	184	634,581	2,923,325
1978	0	0	0	1,174,708	342,479	267,308	415,641	17,764	3,088,954	5,306,854
1979	0	0	0	1,366,942	285,575	284,188	972,584	29,850	958,068	3,897,207
1980	0	0	0	1,698,215	224,472	455,619	874,259	288,303	222,549	3,763,417
1981	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	1,919,979	190,500	702,265	2,208,264	414,230	978,624	6,413,862
1983	0	0	0	2,739,814	149,333	888,475	745,939	579,882	3,698,681	8,802,124
1984	0	0	0	3,463,038	81,260	2,358,495	537,207	719,282	755,136	7,914,418
1985	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	3,791,427	457,604	2,893,171	1,480,015	1,032,216	1,338,657	10,993,090
1987	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	3,447,403	255,113	3,017,463	883,714	446,468	1,452,589	9,502,750
1989	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	4,088,481	383,655	3,232,445	3,153,869	777,713	847,500	12,483,663
1991	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	4,286,050	327,802	3,892,480	1,014,551	872,953	2,259,032	12,652,868
1993	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	3,649,861	293,376	3,359,381	1,879,417	872,624	1,674,576	11,729,235
1995	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	4,511,858	966,044	3,593,671	4,208,195	877,111	1,574,098	15,730,977
1997	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	4,871,761	464,376	3,473,405	2,398,630	1,996,114	1,291,185	14,495,471
1999	0	0	0	4,776,929	4,194,461	4,924,246	1,517,091	1,000,376	1,954,109	18,367,212
2000	0	0	0	5,461,198	782,277	4,278,784	2,354,420	171,269	1,530,358	14,578,307
2001	0	0	0	5,905,961	1,526,938	5,136,328	4,375,496	240,595	(923,056)	16,262,262
2002	0	0	0	5,340,367	1,492,047	4,081,169	4,482,544	(51,825)	3,478,036	18,822,338
2003	93,305	33,614	1,217,171	4,454,323	1,314,151	3,721,548	3,350,502	(628,046)	951,874	13,164,353
2004	13,434	71,444	924,242	8,915,307	1,377,196	3,483,839	5,122,025	(615,862)	1,507,626	19,790,130
2005	27,330	216,418	1,304,685	5,759,119	2,598,983	7,383,506	(605,465)	2,649,206	(1,254,893)	16,530,456
2006	14,842	72,655	1,126,834	6,925,627	2,300,545	5,115,005	3,570,341	(560,871)	(4,319,166)	13,031,481
2007	39,200	138,358	1,677,699	5,707,676	2,723,022	10,420,367	7,835,210	356,041	12,063,981	39,106,296
2008	76,668	231,149	2,892,276	8,312,243	835,162	16,214,786	7,456,094	(114,790)	429,337	33,132,833
2009	140,919	231,789	2,741,489	7,875,311	891,732	8,682,659	5,662,295	246,215	2,846,217	26,204,431
2010	162,803	356,240	2,933,893	10,050,360	789,729	8,844,421	6,210,114	429,116	5,289,586	31,613,326
2011	75,147	545,213	2,582,534	6,949,489	935,484	9,611,840	8,034,092	43,741	(255,761)	25,318,885
2012	18,388	198,588	2,806,943	7,480,441	2,892,019	9,430,464	6,174,434	107,721	6,515,820	32,600,899
2013	6,155	187,559	2,926,327	8,802,453	3,752,894	12,292,156	7,183,042	401,341	3,654,003	36,085,889
2014	2,439	322,684	3,286,825	10,789,735	3,099,681	7,291,587	7,268,601	396,860	5,415,774	34,262,238
2015	19,708	388,026	2,955,386	9,349,000	3,749,493	7,579,683	8,889,741	296,775	288,614	30,153,305
2016	5,660	496,640	3,265,510	11,711,989	3,739,450	8,295,133	8,773,220	1,268,443	(5,606,066)	28,182,169
2017	59,786	305,822	5,046,734	10,015,763	2,116,914	8,728,872	9,136,793	(207,352)	16,158,032	45,949,021
2018	7,904	239,265	6,233,755	9,235,761	5,573,304	8,897,219	5,940,167	(5,178)	6,834,755	36,476,028
2019	175	423,325	9,421,382	11,476,342	6,907,918	7,691,213	8,672,310	1,020,592	6,539,924	42,308,299
2020	79,310	853,885	8,648,107	12,004,767	7,056,509	11,162,015	9,802,327	703,119	10,134,581	50,863,318
2021	34,790	599,124	10,841,436	13,327,301	3,265,983	10,445,822	13,861,101	927,986	(29,456,933)	12,371,260
2022	35,788	614,861	10,390,605	12,824,796	3,730,225	10,248,921	12,386,116	926,119	36,233,946	76,350,123
2023	34,350	592,998	9,917,574	13,396,808	4,087,003	10,167,402	11,603,963	1,078,370	6,779,089	47,112,635
2024	35,326	608,351	10,487,037	13,314,798	3,731,348	10,390,256	12,743,231	987,266	4,563,888	45,730,787
2025	35,679	614,435	10,591,907	13,447,946	3,768,662	10,494,158	12,870,663	997,139	4,609,527	46,188,095
2026	36,036	620,579	10,697,826	13,582,425	3,806,348	10,599,100	12,999,370	1,007,110	4,655,622	46,649,975
2027	36,396	626,785	10,804,805	13,718,249	3,844,412	10,705,091	13,129,363	1,017,181	4,702,178	47,116,474
2028	36,760	633,053	10,912,854	13,855,432	3,882,856	10,812,142	13,260,657	1,027,353	4,749,200	47,587,640
2029	37,128	639,383	11,021,981	13,993,986	3,921,684	10,920,263	13,393,263	1,037,626	4,796,692	48,063,514
2030	37,499	645,777	11,132,199	14,133,926	3,960,901	11,029,466	13,527,196	1,048,003	4,844,659	48,544,151
2031	37,874	652,235	11,243,522	14,275,265	4,000,510	11,139,761	13,662,468	1,058,483	4,893,106	49,029,593
2032	38,253	658,757	11,355,959	14,418,018	4,040,515	11,251,158	13,799,093	1,069,068	4,942,037	49,519,889
2033	38,635	665,345	11,469,517	14,562,198	4,080,920	11,363,670	13,937,084	1,079,758	4,991,457	50,015,087
2034	39,022	671,998	11,584,214	14,707,820	4,121,730	11,477,306	14,076,454	1,090,556	5,041,372	50,515,238
2035	39,412	678,718	11,700,056	14,854,888	4,162,947	11,592,080	14,217,219	1,101,461	5,091,785	51,020,390
TOTAL	1,396,122	14,835,071	226,143,284	462,256,482	128,243,081	389,950,427	367,682,943	37,819,388	176,610,134	1,562,562,455

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)							GRAND TOTAL
	COASTAL BRANCH						Total	
	Reach 31A*	Reach 33A	Reach 33B	Reach 34	Reach 35	Subtotal		
	[80]	[81]	[82]	[83]	[84]	[85]	[86]	[87]
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	4,186,160	1,957,943	16,646	184,325	87,373	6,432,446	124,571,294	133,743,660
2000	2,888,269	2,533,879	20,786	253,538	109,328	5,805,801	122,271,796	130,930,806
2001	3,114,729	2,233,473	14,426	151,374	57,878	5,571,880	135,885,737	143,233,923
2002	3,184,840	2,686,500	49,511	189,458	81,857	6,192,165	125,213,225	136,848,192
2003	3,333,349	2,780,276	44,211	200,986	85,015	6,443,837	126,099,281	135,006,812
2004	3,537,690	2,673,184	69,895	240,426	109,830	6,631,026	144,513,783	154,599,576
2005	3,837,275	2,980,035	120,379	292,354	137,878	7,367,920	122,325,281	130,399,416
2006	2,521,830	3,183,690	56,543	151,861	71,250	5,985,174	127,393,965	135,370,734
2007	3,221,065	2,947,785	24,929	10,052	6,341	6,210,171	158,621,394	168,276,640
2008	5,643,314	4,241,709	10,299	4,748	3,344	9,903,413	179,192,682	189,732,852
2009	5,222,380	3,732,888	20,503	8,205	6,678	8,990,654	160,043,046	170,481,793
2010	6,455,964	5,189,988	11,608	4,207	3,897	11,665,664	160,263,418	172,120,222
2011	6,179,264	5,473,488	23,778	9,535	6,392	11,692,457	172,973,540	185,923,544
2012	5,324,113	6,432,226	24,824	10,251	5,573	11,796,987	192,218,674	208,309,374
2013	5,966,545	7,967,498	54,228	24,056	16,670	14,028,997	217,890,773	232,934,032
2014	7,915,286	4,193,303	20,054	7,400	11,139	12,147,183	237,880,556	255,662,366
2015	10,286,713	6,627,254	429	999	2,664	16,918,058	225,277,555	245,059,970
2016	4,893,354	10,743,858	0	0	1,242	15,638,454	224,528,251	250,303,816
2017	5,277,012	14,492,089	0	0	393	19,769,493	225,262,253	246,507,389
2018	7,952,906	12,550,436	0	0	0	20,503,342	242,980,008	267,796,985
2019	7,311,557	9,520,580	0	0	1,421	16,833,558	259,622,221	279,772,568
2020	8,288,829	9,494,756	442	212	17,949	17,802,188	284,462,653	307,017,720
2021	9,501,739	9,896,534	0	0	0	19,398,273	268,479,317	297,805,855
2022	9,406,084	9,768,739	0	0	0	19,174,823	328,858,541	353,492,773
2023	9,492,659	9,895,621	0	0	0	19,388,280	294,395,941	317,008,590
2024	9,561,495	9,952,167	0	0	0	19,513,662	300,217,051	325,996,768
2025	9,657,110	10,051,689	0	0	0	19,708,799	303,219,220	329,256,734
2026	9,753,681	10,152,206	0	0	0	19,905,887	306,251,409	332,549,299
2027	9,851,218	10,253,728	0	0	0	20,104,946	309,313,919	335,874,788
2028	9,949,730	10,356,265	0	0	0	20,305,995	312,407,064	339,233,542
2029	10,049,228	10,459,828	0	0	0	20,509,056	315,531,132	342,625,874
2030	10,149,720	10,564,426	0	0	0	20,714,146	318,686,444	346,052,133
2031	10,251,217	10,670,070	0	0	0	20,921,287	321,873,312	349,512,659
2032	10,353,729	10,776,771	0	0	0	21,130,500	325,092,042	353,007,782
2033	10,457,267	10,884,539	0	0	0	21,341,806	328,342,960	356,537,858
2034	10,561,839	10,993,384	0	0	0	21,555,223	331,626,392	360,103,239
2035	10,667,458	11,103,318	0	0	0	21,770,776	334,942,653	363,704,267
TOTAL	318,106,383	282,342,275	584,876	1,904,680	912,880	603,851,094	10,312,090,418	11,123,505,493

* 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 Charge¹ (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) ²		South Bay and Del Valle Pumping Plants ³	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	1,203,681
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	32,592	26,104	11,921	70,617	422,816	6,881,085	2,368,056	1,639,887
2000	58,200	42,262	14,978	115,441	903,391	7,901,803	3,012,840	2,925,486
2001	356,682	247,499	211,786	815,967	4,022,683	23,537,500	9,608,845	14,398,956
2002	190,460	104,564	61,470	356,494	2,324,926	17,025,395	6,894,223	8,423,374
2003	181,041	118,387	97,762	397,190	2,568,901	21,144,026	8,873,171	10,393,208
2004	251,516	139,241	107,251	498,008	2,555,185	21,511,700	9,305,291	12,251,722
2005	285,779	148,222	149,332	583,333	2,840,740	28,362,247	12,483,038	11,530,722
2006	236,634	117,460	148,249	502,343	2,783,970	23,509,751	10,557,553	11,330,985
2007	452,829	228,602	257,457	938,888	4,246,055	25,246,954	10,916,144	16,166,923
2008	424,401	196,012	302,391	922,805	3,338,056	17,301,735	6,127,334	11,219,859
2009	218,928	103,298	163,097	485,323	2,488,316	9,222,581	4,052,672	6,864,611
2010	260,437	112,275	215,341	588,052	2,374,767	21,167,225	9,473,369	10,604,628
2011	270,039	115,853	228,034	613,926	3,404,860	35,543,413	15,146,928	14,404,786
2012	264,258	119,755	184,383	568,396	3,422,038	26,615,683	11,633,798	13,273,025
2013	432,594	206,271	320,687	959,551	5,409,835	22,329,707	8,520,898	12,207,847
2014	362,691	185,664	447,565	995,919	4,124,446	11,313,773	3,542,879	7,034,863
2015	392,317	241,043	361,719	995,079	5,802,117	17,029,328	5,392,269	9,982,468
2016	278,327	159,315	257,353	694,995	4,406,630	29,733,500	11,797,519	15,871,418
2017	297,153	185,234	186,086	668,473	3,603,869	45,074,329	21,574,838	22,576,239
2018	502,488	313,909	318,026	1,134,423	5,478,895	27,231,378	10,825,836	13,964,022
2019	461,629	265,853	316,226	1,043,708	2,808,687	40,800,986	17,075,237	18,067,278
2020	589,546	371,216	391,125	1,351,887	4,503,479	19,319,350	7,090,425	8,906,130
2021	594,606	251,810	389,935	1,236,351	5,629,789	25,248,870	6,398,190	12,144,928
2022	596,166	0	569,432	1,165,598	5,299,678	42,578,365	16,190,677	20,729,249
2023	695,677	0	664,479	1,360,156	5,463,511	41,607,016	16,626,767	21,377,216
2024	643,418	0	421,634	1,065,052	5,683,378	49,976,609	19,650,398	24,740,507
2025	644,718	0	422,487	1,067,205	5,694,864	32,709,752	19,718,860	24,843,700
2026	644,676	0	422,459	1,067,135	5,694,491	47,920,165	19,417,863	24,301,199
2027	644,806	0	422,544	1,067,350	5,695,642	26,567,905	19,765,904	24,927,752
2028	644,559	0	422,382	1,066,941	5,693,456	45,851,648	19,510,649	24,469,810
2029	644,700	0	422,475	1,067,175	5,694,707	51,379,571	19,689,735	24,791,123
2030	644,699	0	422,474	1,067,173	5,694,695	38,060,121	19,446,706	24,352,560
2031	644,690	0	422,468	1,067,158	5,694,616	45,306,635	20,448,636	26,192,154
2032	644,702	0	422,476	1,067,178	5,694,724	40,842,493	18,947,942	23,467,116
2033	644,779	0	422,526	1,067,305	5,695,397	44,036,714	20,425,871	26,147,759
2034	644,544	0	422,372	1,066,916	5,693,325	37,058,336	19,063,854	23,673,591
2035	644,848	0	422,572	1,067,420	5,700,930	65,555,536	21,842,036	28,890,907
TOTAL	16,713,895	4,275,564	11,925,394	32,914,853	176,393,797	1,230,830,284	524,458,203	646,403,986

¹ Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."² Costs for the period 1968 through 1987 are for an interim facility.³ 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 Charge¹ (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 ⁴
	[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	1,349,435	3,454,259	13,349,865	(2,851,993)	1,933,516	(2,533,429)	76,199
2000	2,995,367	6,892,863	24,868,765	(5,070,499)	3,889,138	(4,371,978)	0
2001	14,749,926	33,210,381	122,677,209	(3,276,174)	18,689,339	(3,621,886)	919,165
2002	8,731,692	19,721,183	72,471,745	(4,919,131)	10,667,928	(5,247,076)	95,265
2003	10,814,071	24,634,664	90,645,519	(3,362,477)	14,524,245	(6,610,346)	231,996
2004	12,863,080	29,368,759	107,972,655	(6,248,061)	16,993,152	(7,691,613)	0
2005	11,794,232	26,730,922	94,583,646	(5,791,742)	17,589,303	(6,359,950)	0
2006	11,506,108	26,216,830	82,299,778	(4,022,339)	16,076,966	(6,347,742)	0
2007	16,696,376	37,745,762	125,906,671	(2,976,651)	19,535,884	(5,872,118)	0
2008	12,277,758	24,909,320	77,923,925	(3,305,736)	10,681,335	(3,203,162)	321,126
2009	7,295,413	15,760,598	71,020,298	(3,096,612)	9,127,461	(2,225,065)	2,054
2010	10,771,635	24,316,069	88,890,130	(4,913,035)	16,723,144	(5,543,596)	0
2011	14,442,662	32,396,776	113,544,712	(6,340,454)	23,118,118	(7,675,700)	495,237
2012	13,351,126	30,196,561	105,700,702	(2,424,628)	16,734,913	(8,836,129)	0
2013	12,411,732	28,098,822	98,795,130	(1,989,602)	11,979,764	(4,750,469)	0
2014	7,247,553	16,399,032	57,358,698	(1,305,981)	5,126,154	(1,023,443)	137,628
2015	10,972,498	24,673,518	89,213,932	(2,190,877)	8,981,891	(2,009,231)	861,715
2016	16,636,283	37,276,860	137,659,912	(7,658,808)	23,738,634	(8,562,408)	0
2017	23,387,831	51,355,672	190,628,103	(14,211,439)	39,395,014	(21,146,267)	628,859
2018	14,087,128	31,308,559	114,846,389	(5,257,816)	19,731,079	(6,327,632)	0
2019	18,736,621	41,554,227	153,525,719	(6,869,820)	32,047,247	(12,482,481)	1,839,176
2020	10,355,733	23,188,803	83,955,964	(4,628,733)	10,015,799	(3,613,514)	0
2021	11,426,054	25,654,961	93,868,714	(2,174,825)	7,674,881	(2,570,709)	0
2022	21,049,270	47,636,477	174,088,106	(10,189,863)	33,590,808	(17,394,464)	0
2023	21,675,267	49,019,513	179,130,348	(10,190,516)	34,528,490	(17,375,734)	0
2024	25,531,348	58,182,078	212,592,632	(12,678,300)	37,691,172	(16,130,886)	0
2025	25,640,518	58,433,028	213,518,043	(13,062,137)	39,053,502	(16,701,158)	0
2026	25,052,394	57,069,817	208,447,309	(12,770,273)	38,079,077	(16,270,074)	0
2027	25,731,588	58,644,088	214,303,014	(12,997,475)	38,843,030	(16,605,387)	0
2028	25,235,304	57,493,867	210,024,954	(12,875,363)	38,421,444	(16,424,938)	0
2029	25,583,491	58,300,819	213,026,159	(12,933,651)	38,623,941	(16,511,006)	0
2030	25,107,980	57,198,586	208,925,993	(12,822,667)	38,254,540	(16,347,234)	0
2031	27,108,421	61,840,484	226,212,678	(13,302,229)	39,855,083	(17,058,079)	0
2032	24,150,569	54,981,471	200,687,206	(12,422,361)	36,928,695	(15,760,187)	0
2033	27,059,762	61,727,264	225,789,833	(13,390,516)	40,156,847	(17,189,856)	0
2034	24,373,805	55,498,391	202,607,917	(12,594,275)	37,487,801	(16,011,600)	0
2035	30,070,647	68,737,202	251,988,900	(13,535,459)	40,648,693	(17,406,814)	0
TOTAL	665,276,119	1,497,055,593	5,418,098,840	(294,781,608)	928,590,106	(375,625,872)	8,047,103

¹ Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."⁴ 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 Charge¹ (in dollars)

Sheet 3 of 4

Calendar Year	CALIFORNIA AQUEDUCT (continued)							
	Reach 26A	Reach EBX2B	Reach EBX2E	Reach EBX3A	Reach EBX4B	Reach 28J	Reach 29A	Reach 29G
	Devil Canyon Powerplant	Greenspot Pump Station	Citrus Pump Station	Crafton Hills Pump Station	Cherry Valley Pump Station	Lake Perris ⁴	Oso Pumping Plant	Warne Powerplant
	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]
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	(3,024)	0	0	0	0	0	79,315	0
1973	(461,268)	0	0	0	0	0	122,787	0
1974	(546,156)	0	0	0	0	0	157,511	0
1975	(1,095,523)	0	0	0	0	0	314,636	0
1976	(1,566,056)	0	0	0	0	0	326,967	0
1977	(1,222,866)	0	0	0	0	0	75,335	0
1978	(3,085,094)	0	0	0	0	0	89,383	0
1979	(3,466,481)	0	0	0	0	0	102,584	0
1980	(3,318,152)	0	0	0	0	0	236,768	0
1981	(3,842,971)	0	0	0	0	0	444,280	0
1982	(2,736,072)	0	0	0	0	0	539,245	(783,626)
1983	(5,478,830)	0	0	0	0	0	214,069	(1,488,439)
1984	(7,350,989)	0	0	0	0	0	484,239	(4,088,209)
1985	(10,748,103)	0	0	0	0	0	874,069	(5,930,176)
1986	(11,484,996)	0	0	0	0	0	1,269,590	(5,579,301)
1987	(10,814,483)	0	0	0	0	53,242	1,323,472	(6,292,822)
1988	(14,495,967)	0	0	0	0	0	1,421,372	(6,994,588)
1989	(18,688,631)	0	0	0	0	0	2,046,005	(8,368,716)
1990	(20,911,839)	0	0	0	0	147,163	2,857,442	(11,011,193)
1991	(4,884,013)	0	0	0	0	0	535,456	(3,604,791)
1992	(9,513,281)	0	0	0	0	(61,233)	686,984	(5,272,726)
1993	(7,502,549)	0	0	0	0	0	51,327	(3,380,473)
1994	(11,815,745)	0	0	0	0	80,824	1,210,469	(5,835,219)
1995	(9,742,248)	0	0	0	0	0	151,109	(1,179,155)
1996	(12,358,465)	0	0	0	0	0	895,929	(4,248,531)
1997	(13,293,791)	0	0	0	0	111,776	897,657	(4,797,589)
1998	(10,108,555)	0	0	0	0	0	(27,767)	(746,113)
1999	(14,952,833)	0	0	0	0	(41,318)	680,911	(5,341,364)
2000	(25,522,757)	0	0	0	0	(110,900)	1,206,908	(9,464,490)
2001	(19,510,278)	0	0	0	0	0	6,074,627	(7,614,510)
2002	(24,676,763)	0	0	0	0	0	3,806,295	(10,286,903)
2003	(27,490,216)	0	0	0	0	1,149,466	4,337,249	(9,899,070)
2004	(31,246,167)	78,555	0	68,914	7,290	0	5,407,923	(11,835,098)
2005	(28,682,474)	69,675	0	49,010	2,548	5,167,763	3,429,557	(6,683,632)
2006	(34,389,659)	123,850	0	144,846	16,318	0	2,562,118	(6,870,988)
2007	(28,529,045)	249,247	0	256,954	11,191	591,884	6,209,802	(9,522,236)
2008	(16,403,544)	243,120	0	327,206	7,446	0	4,426,897	(7,184,125)
2009	(13,474,182)	360,469	0	391,372	7,531	418,845	4,330,960	(6,578,744)
2010	(24,427,811)	313,518	0	431,030	19,506	0	3,283,585	(5,697,650)
2011	(31,980,782)	371,784	0	499,615	33,108	0	3,277,052	(5,505,320)
2012	(23,571,258)	436,935	0	533,579	48,171	220,412	5,006,252	(8,230,796)
2013	(14,097,814)	460,795	0	557,947	36,868	0	6,259,263	(8,740,718)
2014	(3,836,008)	317,659	0	440,998	16,594	0	4,422,948	(4,122,547)
2015	(6,410,003)	345,261	0	461,141	15,152	771,806	6,860,947	(6,280,593)
2016	(21,855,057)	705,640	0	781,683	49,119	0	6,134,233	(6,658,921)
2017	(37,596,036)	370,732	1,050,753	1,235,207	86,117	7,963,884	5,175,886	(5,788,402)
2018	(17,953,848)	7,946	1,225,939	968,007	44,318	0	4,842,262	(5,500,049)
2019	(31,031,131)	154,185	1,539,458	1,054,944	52,540	3,101,060	4,158,852	(4,970,310)
2020	(8,500,040)	215,603	652,160	825,191	77,427	0	5,548,865	(5,674,664)
2021	(4,239,772)	5,549	151,515	132,620	13,178	0	8,840,437	(6,698,681)
2022	(28,470,946)	0	571,213	502,771	85,382	0	5,590,345	(5,922,033)
2023	(28,438,194)	0	531,337	467,734	79,043	0	5,676,303	(6,047,218)
2024	(27,564,147)	0	632,457	555,988	98,772	0	7,461,014	(6,736,363)
2025	(27,446,427)	0	633,735	557,112	98,971	0	6,996,144	(6,315,183)
2026	(27,700,070)	0	633,694	557,076	98,965	0	6,807,203	(6,144,206)
2027	(27,561,951)	0	633,822	557,188	98,985	0	7,171,216	(6,473,142)
2028	(27,746,641)	0	633,578	556,974	98,947	0	6,850,846	(6,185,705)
2029	(27,496,937)	0	633,718	557,097	98,968	0	7,112,588	(6,421,010)
2030	(27,575,435)	0	633,716	557,096	98,968	0	6,792,560	(6,130,704)
2031	(27,644,179)	0	633,708	557,088	98,967	0	8,222,555	(7,429,087)
2032	(27,029,515)	0	633,720	557,099	98,969	0	6,393,698	(5,769,756)
2033	(28,309,585)	0	633,794	557,164	98,980	0	8,013,354	(7,237,987)
2034	(26,948,049)	0	633,564	556,962	98,944	0	6,395,411	(5,772,004)
2035	(28,566,222)	0	633,863	557,225	98,991	0	12,482,085	(11,309,379)
TOTAL	(1,079,411,924)	4,830,523	13,325,744	16,814,838	1,896,273	19,564,674	225,629,383	(338,645,255)

¹ Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."⁴ 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 Charge¹ (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 ⁴	Castaic Powerplant	Castaic Lake ⁴	Las Perillas and Badger Hill Pumping Plants	Devil's Den, Bluestone, and Polonio Pass Pumping Plants		
	[24]	[25]	[26]	[27]	[28]	[29]	[30]
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	6,701,444
1988	54,038	(12,295,001)	(210,845)	214,519	0	5,286,197	6,239,206
1989	84,370	(14,812,039)	89,852	282,180	0	23,321,280	24,585,082
1990	0	(20,116,741)	245,034	416,832	0	46,159,454	48,154,174
1991	432,382	(6,579,194)	0	3,610	0	2,015,735	2,462,222
1992	29,879	(9,167,653)	(1,141,229)	101,665	0	(5,884,783)	(5,509,967)
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	0	12,583,232	13,500,210
1995	544,099	(4,049,615)	0	243,434	0	(497,940)	(142,957)
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	13,156,005	14,336,879
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	164,612	235,962	(3,259,953)	(2,766,520)
2000	0	(17,958,033)	0	229,350	378,042	(8,198,096)	(7,179,264)
2001	988,149	(13,495,346)	2,379,745	1,070,732	2,140,040	202,926,420	207,765,070
2002	0	(18,455,025)	0	544,053	1,351,160	86,147,416	88,828,837
2003	833,202	(16,903,355)	963,704	636,922	1,525,171	126,441,150	129,407,241
2004	222,007	(21,110,644)	685,188	672,547	1,778,968	141,056,166	144,109,359
2005	4,767,261	(12,763,664)	4,563,293	847,724	1,717,623	163,407,102	166,831,175
2006	533,044	(11,822,176)	6,138,516	854,837	1,433,647	129,852,245	133,138,558
2007	0	(19,017,327)	0	1,309,284	2,318,385	197,244,082	202,429,025
2008	0	(14,961,833)	1,324,089	1,129,260	1,735,720	124,897,730	129,158,591
2009	408,246	(15,570,055)	0	695,409	1,211,315	90,225,176	93,198,814
2010	0	(10,738,810)	0	902,173	1,484,370	137,059,478	140,022,297
2011	0	(11,102,175)	1,987,450	1,110,306	2,125,280	195,892,795	199,911,580
2012	179,889	(15,133,885)	0	975,135	1,967,281	168,676,766	172,667,200
2013	76,352	(15,520,329)	456,770	1,352,516	2,039,956	160,485,437	166,854,823
2014	0	(7,773,330)	2,182,152	1,566,740	2,115,200	101,161,562	106,281,927
2015	199,049	(11,048,588)	5,015,064	1,598,084	1,941,396	156,376,226	163,173,423
2016	429,032	(11,849,796)	10,855,663	1,533,194	3,048,942	239,666,644	244,768,269
2017	0	(10,665,326)	0	1,603,193	2,555,210	325,254,399	329,526,740
2018	1,869,287	(9,835,493)	120,323	1,946,519	3,607,632	201,751,788	208,365,106
2019	0	(8,670,822)	1,317,734	1,747,871	2,330,360	275,078,931	278,931,326
2020	579,974	(10,165,610)	0	1,919,690	1,994,173	142,062,724	147,918,091
2021	0	(12,540,284)	0	880,985	848,388	165,064,999	171,931,138
2022	0	(9,965,407)	0	1,136,787	3,861,655	295,668,392	302,133,668
2023	0	(10,035,391)	0	1,170,310	3,978,574	303,780,865	310,604,532
2024	0	(10,168,866)	0	904,789	5,978,827	370,718,029	377,466,459
2025	0	(9,952,477)	0	907,389	5,997,809	355,631,181	362,393,250
2026	0	(9,676,152)	0	907,329	5,997,415	362,728,731	369,490,357
2027	0	(10,208,112)	0	907,512	5,998,627	350,304,564	357,067,556
2028	0	(9,741,918)	0	907,164	5,996,326	363,076,946	369,837,343
2029	0	(10,123,707)	0	907,363	5,997,642	373,215,904	379,977,786
2030	0	(9,654,347)	0	907,361	5,997,630	353,803,430	360,565,298
2031	0	(11,762,374)	0	907,349	5,997,548	386,185,358	392,947,132
2032	0	(9,071,174)	0	907,366	5,997,661	344,541,012	351,302,914
2033	0	(11,450,676)	0	907,473	5,998,370	383,974,565	390,737,267
2034	0	(9,075,968)	0	907,142	5,996,187	343,950,009	350,710,250
2035	0	(18,200,736)	0	907,571	5,999,018	439,394,064	446,162,414
TOTAL	10,669,656	(637,435,745)	31,956,121	43,363,012	121,793,424	8,682,703,479	8,892,012,129

¹ Excludes extra peaking costs assigned directly to contractors. Refer to Appendix B text discussion of Table B-17 under "Project Water Charges."⁴ 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-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 ^{1,6}	Total
	Capital Costs ¹	Capital Cost Credits ²	Operating Costs ³	Application of Oroville Power Revenues to:			
				Capital Costs ⁴	Operating Costs ⁵		
	[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	9,099,967	(479,280)	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)	4,818,634	(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	4,662,255	(196,361)	5,393,011	(14,650,000)	(1,500,000)	287,374	(6,003,721)
1973	4,090,078	(136,997)	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	6,189,618	(204,944)	7,067,037	(14,650,000)	(1,500,000)	205,234	(2,893,055)
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	17,479,059	0	16,154,872	(14,650,000)	(1,500,000)	4,594,682	22,078,613
1983	12,763,378	0	22,251,331	(34,705,000)	(8,735,000)	3,751,993	(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	21,586,488	0	26,479,379	(14,650,000)	(9,107,000)	1,602,419	25,911,286
1987	32,734,633	0	23,479,839	(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	32,280,229	(14,650,000)	(8,526,000)	1,707,822	39,981,185
1993	22,366,873	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	15,120,856	0	46,162,374	(14,650,000)	(4,976,939)	2,042,481	43,698,773
1996	11,015,317	0	50,885,567	(14,650,000)	(5,503,289)	2,448,692	44,196,287
1997	15,293,815	0	51,788,497	(14,650,000)	(5,740,515)	1,699,730	48,391,527
1998	3,879,387	0	54,726,293	(14,650,000)	(8,155,000)	1,193,198	36,993,878
1999	7,781,008	0	54,318,638	(14,650,000)	(9,198,000)	9,686	38,261,332
2000	10,862,329	0	56,234,261	(14,688,338)	(10,297,482)	13,491	42,124,261
2001	10,963,284	0	75,778,041	(16,223,803)	(14,328,482)	23,866	56,212,905
2002	20,404,917	0	68,206,261	(19,498,891)	(20,826,560)	24,426	48,310,152
2003	23,673,783	0	77,724,423	(20,605,664)	(29,982,088)	9,833	50,820,287
2004	21,667,832	0	91,197,978	(17,530,688)	(35,845,422)	7,548	59,497,248
2005	6,626,203	0	104,238,542	(15,354,462)	(22,004,805)	0	73,505,479
2006	11,463,233	0	102,565,895	(15,210,585)	(21,412,577)	0	77,405,965
2007	8,477,421	0	87,038,283	(14,734,855)	(17,033,961)	0	63,746,888
2008	7,380,969	0	104,309,910	(14,968,129)	(19,570,602)	0	77,152,149
2009	7,622,169	0	114,460,262	(15,959,419)	(20,921,647)	0	85,201,364
2010	8,261,384	0	123,147,336	(15,958,194)	(20,222,025)	0	95,228,500
2011	12,939,706	0	127,339,358	(15,958,715)	(18,804,228)	0	105,516,121
2012	28,238,078	0	124,686,683	(16,032,565)	(22,105,563)	0	114,786,633
2013	101,186,489	0	133,898,747	(16,034,532)	(20,672,157)	0	198,378,547
2014	83,053,552	0	146,452,851	(15,841,275)	(17,712,411)	0	195,952,718
2015	41,518,876	0	155,330,700	(20,657,953)	(17,587,782)	0	158,603,840
2016	84,989,978	0	191,794,091	(20,646,145)	(16,898,173)	0	239,239,752
2017	302,488,445	0	160,676,611	(21,072,456)	(19,503,596)	0	422,589,004
2018	382,302,827	0	201,963,718	(23,135,691)	(21,101,689)	0	540,029,165
2019	163,306,757	0	202,433,469	(29,562,263)	(21,040,527)	0	315,137,436
2020	160,237,511	0	210,155,912	(32,885,819)	(22,125,629)	0	315,381,975
2021	144,024,749	0	256,290,869	(34,035,007)	(24,819,244)	0	341,461,367
2022	192,733,531	0	248,260,852	(36,618,255)	(29,480,332)	0	374,895,797
2023	128,674,530	0	264,025,429	(37,302,711)	(47,283,344)	0	308,113,903
2024	425,509	0	244,825,471	(37,349,688)	(34,977,042)	0	172,924,250
2025	425,509	0	249,387,470	(38,337,036)	(35,319,037)	0	176,156,906
2026	425,509	0	254,680,807	(38,185,429)	(35,664,453)	0	181,256,434
2027	425,509	0	249,887,702	(38,177,553)	(36,013,323)	0	176,122,335
2028	425,509	0	267,317,883	(38,192,129)	(36,365,682)	0	193,185,581
2029	425,509	0	258,170,671	(38,094,335)	(36,721,564)	0	183,780,281
2030	425,509	0	264,150,198	(42,925,560)	(37,081,005)	0	184,569,142
2031	425,509	0	265,272,609	(42,956,315)	(37,444,041)	0	185,297,762
2032	425,509	0	270,245,641	(43,153,690)	(37,810,706)	0	189,706,754
2033	425,509	0	264,219,671	(43,146,479)	(38,181,039)	0	183,317,662
2034	425,509	0	283,793,773	(43,144,208)	(38,555,075)	0	202,519,999
2035	425,509	0	267,601,463	(43,138,724)	(38,932,851)	0	185,955,397
TOTAL	2,948,985,694	(11,528,320)	7,343,563,009	(1,462,130,563)	(1,133,100,887)	57,085,905	7,742,874,838

¹ Reimbursed through the capital cost component of the Delta Water Charge.² Negotiated settlements as to the magnitude of SWP planning costs from 1952 through 1978.³ Reimbursed through the minimum OMP&R component of the Delta Water Charge. Credits for Gianelli Pumping-Generating Plant power generation are reflected in these net costs.⁴ Revenues credited through the capital cost component of the Delta Water Charge.⁵ Revenues credited through the minimum OMP&R component of the Delta Water Charge.⁶ Under amendments of Articles 22(e) and 22(g), planning and pre-operating costs of additional Project Conservation Facilities incurred through the previous year 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)

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa	Solano ¹	Total	Alameda-Zone 7	Alameda County	Santa Clara	Total	San Luis Obispo	Santa Barbara	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
1952	0	0	0	83	114	410	608	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	1,199
1955	0	0	0	977	1,570	6,297	8,844	211	390	601
1956	0	0	0	8,844	14,459	63,816	87,120	227	418	645
1957	15,199	11,436	26,634	21,564	35,240	649,596	706,401	291	536	827
1958	33,420	16,591	50,011	67,764	71,717	733,414	872,896	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	115,048
1961	6,950	7,445	14,395	853,506	802,675	1,914,709	3,570,890	10,163	36,681	46,843
1962	(194)	(926)	(1,120)	545,123	615,141	1,686,041	2,846,306	17,281	39,570	56,851
1963	1,319	1,111	2,430	657,426	1,281,271	3,243,838	5,182,534	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	4,381,262	250,706	497,152	747,859
1966	461,619	49,917	511,536	592,714	592,598	2,245,215	3,430,528	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	241,550
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	79,189
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	224,720	108,324	264,720	373,044
1978	69,319	81,717	151,036	71,234	66,008	174,898	312,140	21,415	103,822	125,237
1979	191,273	282,907	474,180	45,468	42,943	110,665	199,077	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	609,175	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	96,319
1986	10,565,937	16,926,630	27,492,567	32,034	31,581	88,070	151,684	44,135	306,452	350,588
1987	7,979,832	12,599,507	20,579,339	50,153	48,675	138,959	237,787	126,995	1,342,116	1,469,110
1988	2,312,909	4,343,513	6,656,422	116,181	112,294	302,461	530,935	156,473	1,479,545	1,636,018
1989	1,224,538	1,553,352	2,777,890	108,320	102,804	260,092	471,217	152,173	1,210,940	1,363,112
1990	443,002	824,055	1,267,057	224,283	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	2,482,487
1992	57,045	62,083	119,128	182,231	169,968	442,055	794,255	361,210	3,504,755	3,865,965
1993	122,423	128,634	251,057	129,344	125,312	342,416	597,071	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	50,662,331
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	156,693,959
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	54,185	27,445	28,844	80,346	136,635	488,160	5,529,102	6,017,261
2001	6,598	13,750	20,347	140,394	270,055	1,856,845	2,267,294	72,358	539,206	611,564
2002	19,917	45,940	65,857	809,721	1,193,494	5,886,086	7,889,301	69,122	387,295	456,418
2003	54,235	20,712	74,947	1,157,357	1,331,716	4,620,228	7,109,301	19,610	118,117	137,728
2004	153,240	20,534	173,774	360,395	346,065	4,106,509	4,812,969	12,286	52,406	64,692
2005	60,543	62,997	123,541	358,153	339,995	1,541,971	2,240,119	(1,979)	(161,490)	(163,469)
2006	887,892	20,086	907,978	349,395	329,656	801,023	1,480,075	8,438	65,059	73,497
2007	3,237,236	43,135	3,280,372	793,095	732,240	1,756,072	3,281,407	16,262	84,170	100,432
2008	7,903,036	61,877	7,964,914	1,466,734	1,352,530	3,236,019	6,055,283	28,452	99,415	127,867
2009	1,196,389	18,516	1,214,905	2,984,936	2,797,462	6,670,882	12,453,281	8,700	49,599	58,300
2010	396,691	3,243	399,934	3,858,678	3,511,644	8,785,770	16,156,093	75,709	136,242	211,951
2011	192,850	40,149	232,999	4,038,267	3,836,600	9,247,564	17,122,431	109,860	232,486	342,346
2012	485,208	426,760	911,967	2,717,470	2,649,415	6,713,706	12,080,591	76,346	336,174	412,520
2013	652,391	679,649	1,332,041	1,160,446	1,251,281	3,887,891	6,299,619	258,819	1,273,101	1,531,920
2014	587,364	658,937	1,246,300	(252,836)	(174,519)	(198,598)	(625,953)	335,420	1,566,054	1,901,474
2015	187,630	266,930	454,560	956,892	547,412	1,373,109	2,877,413	255,077	1,369,578	1,624,654
2016	88,532	162,844	251,375	286,716	175,035	433,462	895,213	269,002	1,153,240	1,422,242
2017	26,944	98,292	125,236	217,034	152,879	467,134	837,047	305,970	1,077,531	1,383,501
2018	24,552	60,120	84,672	837,001	496,660	1,621,109	2,954,770	349,727	746,850	1,096,577
2019	36,454	90,920	127,375	660,325	348,017	1,379,869	2,388,210	295,312	1,018,772	1,314,084
2020	300,276	438,694	738,970	723,097	452,935	1,368,439	2,544,470	472,366	1,630,163	2,102,529
2021	1,489,200	2,455,957	3,945,157	2,621,729	1,424,174	4,236,492	8,282,395	830,992	4,426,199	5,257,191
2022	1,211,141	3,716,311	4,927,452	5,080,777	2,659,496	6,638,942	14,379,214	704,834	2,616,509	3,321,344
2023	219,933	1,301,857	1,521,790	2,692,969	1,526,632	3,731,637	7,951,239	1,419,697	7,030,728	8,450,425
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	58,529,644	61,102,192	119,631,836	42,499,194	37,868,575	114,352,925	194,720,694	44,811,400	466,845,737	511,657,136

Note: Allocated capital costs as a result of permanent water transfers under the Monterey Amendment are not reflected in this table.

¹ 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 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	Empire ²	Future Contractor San Joaquin Valley	Kern			Kings	Oak Flat	Tulare	Total
				Municipal and Industrial	Municipal and Industrial ³	Agricultural				
	[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	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	29,575
1957	932	38	139	6,048	494	49,932	39	29	1,707	59,359
1958	2,308	102	344	14,374	1,153	119,049	104	61	4,368	141,862
1959	7,384	364	2,517	26,218	2,597	253,891	372	381	14,757	308,481
1960	12,940	630	3,666	34,054	4,155	352,166	644	498	25,696	434,448
1961	21,848	1,063	3,954	51,407	6,500	538,707	1,087	598	43,377	668,542
1962	49,320	2,410	7,867	94,933	13,834	1,017,146	2,465	1,879	98,141	1,287,996
1963	208,757	10,687	32,172	364,014	55,715	3,934,636	10,932	5,990	425,330	5,048,232
1964	328,286	16,961	64,890	600,152	88,904	6,636,279	17,350	11,942	672,013	8,436,776
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	28,995,045
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	7,398,361
1970	54,344	2,720	21,686	414,659	15,520	4,145,046	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	1,912,264
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	572,828
1975	13,329	677	5,246	36,467	3,710	382,743	692	425	27,048	470,338
1976	17,506	837	12,615	53,085	5,621	654,026	856	1,152	34,455	780,152
1977	9,672	436	47,790	36,478	3,753	886,672	446	494	18,497	1,004,236
1978	23,499	(30,406)	6,178	54,219	6,579	575,169	1,209	1,402	47,446	685,296
1979	25,051	1,295	5,664	53,866	6,610	559,746	1,325	1,862	51,293	706,711
1980	144,980	(4,617)	31,160	321,890	38,126	3,211,810	7,682	7,144	297,215	4,055,391
1981	(5,427)	(15,464)	200	(44,773)	(1,223)	(385,275)	(296)	(11,324)	(461,830)	
1982	49,916	2,584	6,600	83,283	13,142	654,692	2,638	1,252	102,287	916,395
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	966,110
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	4,760,133
1990	292,361	15,142	50,360	553,394	87,199	6,094,021	15,487	22,729	599,233	7,729,927
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	3,421,943
1993	86,113	4,375	30,245	174,630	23,840	2,059,168	4,474	4,698	174,772	2,562,314
1994	64,762	3,323	23,894	124,518	17,633	1,488,418	3,398	2,173	132,095	1,860,213
1995	82,969	(1,000)	72,734	167,698	24,390	2,472,332	4,355	2,824	169,318	2,995,621
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	2,166,903
2000	21,089	1,073	9,822	45,704	6,013	547,927	1,096	(1,081)	42,826	674,466
2001	17,776	907	7,862	36,078	5,062	432,671	927	781	36,153	538,217
2002	93,258	4,801	18,852	163,537	25,021	1,835,443	4,909	1,470	190,549	2,337,839
2003	19,993	1,020	5,083	37,987	5,481	435,030	1,038	422	40,670	546,724
2004	18,558	958	4,113	34,437	4,911	374,948	980	1,518	37,972	478,394
2005	56,091	2,902	9,832	96,815	14,744	1,025,877	2,964	561	114,896	1,324,682
2006	10,670	551	1,947	30,110	2,812	197,248	564	732	21,841	266,475
2007	15,261	772	4,166	36,509	4,188	324,461	789	921	30,898	417,965
2008	62,504	3,233	11,391	104,213	16,434	1,151,588	3,304	2,079	128,030	1,482,775
2009	15,005	764	3,218	48,244	4,067	302,002	782	996	30,490	405,567
2010	27,175	1,409	36,027	67,589	7,106	847,559	1,442	317	55,738	1,044,363
2011	36,668	1,898	50,584	71,528	9,661	1,181,522	1,941	1,449	75,133	1,430,383
2012	42,554	2,101	23,353	90,014	11,882	1,139,946	2,149	3,019	85,122	1,400,140
2013	184,417	9,212	69,901	381,331	52,792	4,547,844	9,422	13,022	371,087	5,639,029
2014	199,568	10,183	96,199	371,692	54,320	4,716,909	10,419	15,319	405,928	5,880,537
2015	128,498	6,507	61,036	265,181	35,635	3,137,082	6,656	11,412	260,356	3,912,362
2016	160,353	8,124	84,134	519,963	43,881	6,352,222	8,309	6,108	324,989	7,508,082
2017	248,915	12,797	111,531	448,694	66,797	5,720,487	13,085	13,173	508,262	7,143,741
2018	350,535	18,047	160,238	623,080	94,167	7,971,497	18,462	7,135	716,271	9,959,432
2019	295,598	15,079	109,017	540,813	82,256	6,492,447	15,417	10,259	601,180	8,162,067
2020	382,681	19,304	174,337	732,504	108,695	9,000,648	19,740	21,053	773,859	11,232,821
2021	621,581	31,365	201,187	1,374,410	193,744	15,498,796	32,073	31,147	1,257,171	19,241,474
2022	649,687	33,049	247,663	1,271,640	179,252	14,963,847	33,796	35,906	1,319,427	18,734,267
2023	631,976	31,776	379,703	1,724,307	184,413	19,575,415	32,491	21,243	1,275,891	23,857,215
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	9,861,413	161,624	3,730,358	22,018,951	2,853,168	251,184,051	506,019	457,814	19,887,838	310,661,236

² 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.

³ Costs related to maximum annual Table A of 15,000 acre-feet under Amendment 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									
	AVEK	Coachella	Crestline	Desert	Littlerock	Mojave	Palmdale	San Bernardino	San Gabriel	San Geronio
	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]
1952	3,158	850	254	1,402	70	1,695	418	6,079	1,550	962
1953	10,026	2,668	799	4,401	222	5,318	1,328	19,058	4,852	3,011
1954	12,742	3,465	1,031	5,714	285	6,908	1,691	24,608	6,290	3,904
1955	5,411	1,374	401	2,267	115	2,756	715	9,229	2,377	1,474
1956	9,775	2,196	612	3,622	191	4,449	1,267	13,138	3,438	2,127
1957	26,306	6,343	1,816	10,461	540	12,767	3,450	40,646	10,534	6,526
1958	49,204	11,581	3,290	19,099	991	23,360	6,414	72,708	18,898	11,701
1959	70,247	15,869	4,616	26,171	1,347	31,759	9,030	98,596	25,519	15,815
1960	84,552	22,068	6,797	36,395	1,547	43,260	10,772	147,170	37,469	23,307
1961	126,542	34,613	12,530	57,086	2,245	63,709	16,437	236,164	57,707	36,153
1962	198,558	43,719	13,861	72,102	3,344	84,709	24,943	253,435	64,330	40,012
1963	580,138	116,797	33,149	192,624	9,828	234,926	73,256	610,277	160,624	99,266
1964	1,094,365	209,462	55,445	345,446	18,442	429,605	137,769	1,026,066	276,118	170,012
1965	1,908,076	385,533	103,757	635,825	32,819	786,986	244,587	1,913,090	512,862	316,082
1966	3,960,302	812,655	215,858	1,340,235	69,325	1,664,584	517,269	3,943,586	1,062,417	654,194
1967	4,976,538	1,077,422	296,069	1,776,892	88,301	2,182,240	653,250	5,821,681	1,550,239	958,406
1968	5,924,474	1,350,742	368,156	2,227,646	107,350	2,738,009	783,940	7,982,824	2,122,940	1,314,841
1969	5,822,708	1,690,259	539,851	2,787,631	121,303	3,256,507	865,455	10,898,185	2,769,647	1,726,891
1970	5,032,959	2,050,788	695,345	3,382,251	106,381	3,872,367	736,775	13,795,809	3,457,109	2,160,122
1971	2,577,507	1,071,523	338,581	1,767,179	48,337	2,087,223	347,057	8,137,053	1,987,120	1,237,573
1972	973,436	331,759	92,079	547,138	19,134	668,550	134,360	2,691,137	697,957	434,507
1973	354,407	158,759	82,223	261,557	6,304	238,094	46,102	1,760,570	403,582	256,711
1974	451,450	259,175	74,113	427,433	8,143	518,453	59,145	1,617,394	425,927	264,349
1975	253,438	193,632	52,821	319,337	4,954	392,110	33,995	1,533,664	407,913	253,838
1976	237,539	136,751	37,235	225,529	4,245	277,807	31,002	962,280	255,901	158,850
1977	199,554	91,384	25,858	150,711	3,757	183,609	26,834	591,445	155,537	96,517
1978	302,111	78,573	22,226	129,584	5,233	157,815	38,654	428,989	111,769	69,152
1979	357,678	81,807	21,795	134,915	5,965	166,931	44,410	403,569	108,408	66,847
1980	1,867,517	423,755	113,166	698,855	32,435	864,104	240,899	2,040,757	548,085	337,811
1981	(158,728)	(47,102)	(8,865)	(77,678)	(2,576)	(102,568)	(19,588)	(143,875)	(43,557)	(26,356)
1982	1,557,934	298,770	78,903	492,728	26,237	613,587	196,672	1,421,407	388,261	238,792
1983	2,062,512	396,033	115,678	653,134	34,699	803,945	259,939	2,126,313	581,672	357,812
1984	1,518,361	297,559	85,097	490,731	27,272	606,124	188,562	1,546,628	423,408	260,327
1985	896,226	217,115	62,532	358,064	13,104	441,299	107,533	1,116,949	305,291	187,699
1986	841,555	221,194	58,152	364,790	9,038	454,702	93,309	1,048,625	286,302	176,057
1987	333,052	166,099	43,992	273,928	5,566	340,485	40,716	783,725	213,202	131,163
1988	259,234	65,831	22,723	108,570	3,384	128,339	26,743	429,498	113,644	70,260
1989	1,045,999	323,138	97,036	532,920	16,777	649,616	125,344	1,375,722	372,048	227,772
1990	678,053	332,566	97,789	548,468	7,335	672,344	67,179	1,509,745	409,710	251,185
1991	831,687	367,196	120,925	605,579	11,966	733,443	92,625	1,979,364	540,210	331,235
1992	633,272	270,826	131,328	446,647	9,556	501,634	76,760	2,093,387	573,386	351,492
1993	634,283	222,347	171,095	366,700	10,194	353,470	73,955	3,848,084	1,046,752	646,980
1994	467,409	132,599	93,839	218,685	7,255	218,494	53,209	2,347,599	637,733	394,936
1995	459,990	132,690	78,390	218,835	7,436	232,377	54,544	1,961,308	530,656	332,713
1996	299,764	110,520	44,965	182,270	4,885	211,872	35,808	4,246,828	972,829	1,342,109
1997	438,898	103,382	24,640	170,497	7,397	214,534	54,452	3,947,228	397,103	3,160,731
1998	234,379	62,492	41,136	103,063	3,989	106,009	29,551	5,710,657	303,255	5,614,235
1999	268,224	89,312	40,069	147,294	4,812	167,592	35,399	9,768,138	235,054	10,654,574
2000	139,035	54,795	23,903	90,369	2,665	103,194	19,150	25,569,109	171,107	29,560,816
2001	130,754	50,816	15,641	83,805	2,989	102,254	20,949	33,763,992	96,254	39,529,043
2002	199,807	40,293	12,884	66,452	3,001	80,478	22,664	17,121,707	133,675	19,719,408
2003	76,592	24,945	7,688	41,140	1,245	50,028	9,409	7,154,545	54,302	8,181,827
2004	81,688	23,476	6,416	38,716	1,445	48,028	10,585	3,694,786	42,507	4,101,099
2005	232,323	47,108	14,116	77,691	4,011	93,862	29,628	1,569,017	71,539	1,454,471
2006	334,422	68,325	25,180	112,684	5,626	126,956	42,114	3,375,192	113,701	3,385,371
2007	258,891	57,769	22,068	95,272	4,567	111,771	33,367	3,615,481	108,623	3,865,032
2008	159,067	70,874	60,890	116,900	2,792	83,144	20,471	5,425,622	263,890	5,235,314
2009	577,477	153,560	60,337	253,262	9,826	275,417	73,122	7,871,341	271,508	7,905,557
2010	644,764	193,723	62,817	319,495	10,809	371,033	81,051	9,286,649	285,792	9,811,577
2011	341,088	230,769	59,398	380,581	5,742	474,797	42,964	14,197,480	287,922	15,631,867
2012	257,613	343,375	87,824	566,289	5,062	708,509	35,082	22,092,715	445,112	24,287,392
2013	785,308	347,981	91,200	573,887	15,207	716,458	106,131	66,958,096	487,472	77,096,675
2014	879,140	248,896	64,584	410,477	16,045	513,686	115,256	60,030,520	410,545	69,390,571
2015	1,064,308	272,669	69,997	449,682	20,133	563,020	148,788	32,998,079	387,926	37,546,289
2016	1,351,042	274,472	70,747	452,658	23,544	567,511	175,977	37,124,722	383,220	42,441,536
2017	802,684	170,740	41,458	281,584	13,758	355,742	101,945	12,453,493	195,754	13,991,085
2018	1,153,924	229,068	69,570	377,780	19,411	462,296	145,363	7,835,353	443,016	7,597,109
2019	987,903	230,268	97,598	379,781	16,623	402,089	124,517	2,121,561	474,933	504,053
2020	1,238,060	377,331	177,142	622,345	21,482	616,635	158,972	3,417,024	922,871	3,241
2021	2,577,745	613,593	194,726	1,011,954	45,278	1,202,090	332,764	5,821,176	1,413,097	1,119,273
2022	2,380,121	610,088	169,819	1,006,162	41,252	1,235,651	305,318	3,710,183	967,232	635,349
2023	3,892,354	858,583	245,138	1,415,988	66,089	1,721,364	493,438	5,330,777	1,328,341	999,994
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	71,318,930	20,021,425	6,364,300	33,019,683	1,270,080	39,333,920	9,332,961	506,735,156	35,294,416	459,418,625

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
	Santa Clarita ^{4,5}	Metropolitan ⁶	Ventura	Total	Yuba City	Butte	Plumas	Total		
	[31]	[32]	[33]	[34]	[35]	[36]	[37]	[38]	[39]	[40]
1952	1,042	69,020	370	86,871	0	0	0	0	59	99,353
1953	3,327	217,634	1,187	273,833	0	0	0	0	264	311,812
1954	4,193	279,967	1,496	352,294	0	0	0	0	766	402,143
1955	1,881	111,602	670	140,272	0	0	0	0	969	169,342
1956	3,590	179,335	1,299	225,040	0	0	0	0	9,172	351,551
1957	9,255	516,050	3,367	648,059	0	0	0	0	23,172	1,464,452
1958	17,599	945,684	6,390	1,186,917	0	0	2	2	32,888	2,286,623
1959	29,740	1,364,298	9,894	1,702,901	0	0	14	14	57,918	2,967,412
1960	38,760	1,914,521	12,798	2,379,418	0	0	28	28	123,202	4,660,833
1961	54,262	3,212,125	18,770	3,928,343	0	0	10	10	316,220	8,545,244
1962	85,352	3,543,471	29,069	4,456,905	0	0	32	32	228,202	8,875,171
1963	255,252	11,185,928	86,807	13,638,873	0	0	51	51	528,496	24,610,278
1964	501,858	18,065,455	164,709	22,494,750	0	0	7,791	7,791	590,034	41,736,060
1965	947,523	33,763,577	307,475	41,858,192	0	0	3,139	3,139	332,680	62,664,743
1966	2,150,972	74,485,027	681,898	91,558,323	0	0	(48)	(48)	783,728	129,110,330
1967	4,100,531	130,599,417	1,279,076	155,360,062	0	0	47	47	1,479,421	194,146,365
1968	3,998,942	147,502,290	1,360,687	177,782,842	0	0	51,573	51,573	1,254,192	197,978,911
1969	3,079,426	140,096,646	1,085,026	174,739,535	0	0	234,232	234,232	398,183	184,473,490
1970	3,277,778	161,983,078	1,147,609	201,698,371	0	0	16,227	16,227	74,028	207,082,650
1971	2,146,954	133,903,316	738,822	156,388,246	0	0	27,204	27,204	12,457	158,624,739
1972	283,257	43,931,880	66,878	50,872,072	0	0	9	9	13,182	51,936,917
1973	914,303	39,723,010	290,020	44,495,462	0	0	25	25	8,099	45,263,853
1974	280,861	18,896,593	86,362	23,369,399	0	0	45	45	28,570	24,402,166
1975	246,492	16,732,939	83,975	20,509,109	0	0	21	21	8,226	21,318,838
1976	255,238	13,545,451	84,623	16,212,450	0	0	51	51	16,486	17,492,910
1977	371,469	11,769,352	110,833	13,776,859	0	0	28	28	21,181	15,544,382
1978	470,176	15,781,696	174,876	17,770,853	0	0	38	38	28,876	19,073,475
1979	938,985	27,627,424	343,361	30,302,093	0	0	23	23	26,668	31,857,362
1980	1,777,294	59,493,774	641,586	69,080,039	0	0	26	26	59,169	74,974,704
1981	610,795	15,661,179	224,257	15,865,338	0	0	34	34	(6,746)	15,727,602
1982	861,928	30,873,857	316,107	37,365,183	0	0	11	11	16,086	39,705,931
1983	521,349	25,056,047	187,121	33,156,253	0	0	19	19	72,225	38,006,645
1984	295,783	16,317,441	103,160	22,160,455	0	0	26	26	83,252	30,414,886
1985	158,810	10,243,779	56,162	14,164,564	0	0	29	29	16,338	28,581,730
1986	104,860	8,365,310	34,777	12,058,671	0	0	31	31	16,248	41,035,899
1987	105,625	6,955,356	36,142	9,429,050	0	0	32	32	29,062	32,523,660
1988	174,155	6,626,545	57,117	8,086,041	0	0	55	55	50,083	18,140,686
1989	434,394	18,531,680	153,200	23,885,645	0	0	44	44	43,324	33,301,366
1990	374,313	17,430,869	125,376	22,504,929	0	0	63	63	96,419	34,453,743
1991	401,961	20,792,168	132,558	26,940,915	0	0	54	54	149,922	39,811,664
1992	356,952	21,196,762	116,999	26,758,999	0	0	42	42	80,900	35,041,233
1993	332,089	29,471,748	105,693	37,283,389	0	0	30	30	59,324	53,921,787
1994	165,607	16,392,019	50,941	21,180,326	0	0	14	14	34,208	74,225,377
1995	293,308	16,078,395	72,214	20,452,857	0	0	3	3	42,395	191,527,744
1996	206,742	23,237,696	49,282	30,945,569	0	0	0	0	21,388	189,313,700
1997	249,699	13,530,777	72,335	22,371,673	0	0	3	3	34,976	67,960,684
1998	202,650	11,284,364	65,745	23,761,523	0	0	7	7	11,234	37,111,632
1999	175,939	9,063,618	54,504	30,704,530	0	0	2	2	34,616	43,960,817
2000	77,889	5,393,221	24,010	61,229,262	0	0	24	24	16,912	68,128,743
2001	44,790	2,988,800	13,047	76,843,134	0	0	20	20	68,013	80,348,589
2002	121,849	5,787,234	39,607	43,349,059	0	0	14	14	382,151	54,480,638
2003	42,072	5,783,732	13,689	21,441,217	0	0	0	0	590,294	29,900,210
2004	46,992	4,555,521	15,942	12,667,201	0	0	0	0	156,414	18,353,444
2005	126,137	7,322,277	42,941	11,085,122	0	0	0	0	123,949	14,733,944
2006	246,722	13,867,322	90,203	21,793,819	0	0	5	5	120,330	24,642,180
2007	182,329	11,723,751	65,425	20,144,347	0	0	0	0	266,740	27,491,263
2008	175,464	11,885,796	60,480	23,560,704	0	0	4	4	493,279	39,684,825
2009	339,521	22,108,510	122,280	40,021,717	0	0	6	6	1,018,818	55,172,594
2010	340,756	18,059,829	107,451	39,575,748	0	0	(2)	(2)	6,354,636	63,742,722
2011	219,260	12,727,509	55,576	44,654,952	0	0	0	0	2,566,258	66,349,370
2012	144,365	17,420,517	42,735	66,436,590	0	0	0	0	1,004,833	82,246,641
2013	375,675	28,282,290	110,104	175,946,481	0	0	0	0	546,046	191,295,137
2014	465,121	21,909,177	126,763	154,580,782	0	0	0	0	(16,925)	162,966,216
2015	533,858	41,075,322	163,548	115,293,619	0	0	0	0	277,916	124,440,524
2016	702,471	64,493,170	217,151	148,278,220	0	0	0	0	98,270	158,453,403
2017	557,177	35,292,552	154,696	64,412,667	0	0	0	0	77,988	73,980,180
2018	799,231	35,724,097	223,197	55,079,415	0	0	0	0	223,703	69,398,569
2019	825,812	37,022,501	254,371	43,442,008	0	0	0	0	162,624	55,596,367
2020	1,183,282	57,158,197	339,776	66,236,358	0	0	0	0	223,048	83,078,197
2021	1,590,924	80,304,297	485,855	96,712,769	0	0	0	0	728,655	134,167,641
2022	1,864,886	90,252,838	545,964	103,724,864	0	0	0	0	1,416,496	146,503,637
2023	2,546,572	111,803,967	737,123	131,439,725	0	0	0	0	1,327,632	174,548,027
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	45,826,425	2,171,492,595	14,885,556	3,414,314,072	0	0	341,139	341,139	25,569,842	4,576,895,954

⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.⁵ Costs from Table B-10 allocated to Santa Clarita Valley Water Agency are reduced herein by \$14,088 in 1978 in accordance with a letter of agreement with the agency.⁶ Costs from Table B-10 allocated to The Metropolitan Water District of Southern California are reduced herein by \$16,425,374 in 1972 under provisions of Amendment 7 to its water supply contract.

TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor (in dollars)^{1,2,3}

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa	Solano	Total	Alameda-Zone 7	Alameda County	Santa Clara	Total	San Luis Obispo	Santa Barbara	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	147,972	105,673	364,827	618,472	0	0	0
1964	0	0	0	208,371	170,929	530,036	909,335	6,696	21,667	28,363
1965	0	0	0	274,717	259,943	899,371	1,434,031	13,756	36,029	49,785
1966	18,063	0	18,063	310,035	290,808	1,073,270	1,674,113	26,524	61,349	87,873
1967	41,574	0	41,574	380,137	320,989	1,187,619	1,888,745	56,469	118,263	174,731
1968	121,509	0	121,509	496,442	361,935	1,309,946	2,168,323	104,160	208,037	312,197
1969	165,289	0	165,289	598,214	397,386	1,411,701	2,407,300	122,043	242,426	364,469
1970	169,077	0	169,077	632,392	412,322	1,450,660	2,495,374	125,963	250,808	376,771
1971	171,286	0	171,286	639,451	415,439	1,457,564	2,512,454	128,402	256,371	384,773
1972	172,649	0	172,649	641,308	416,368	1,461,847	2,519,522	129,861	260,482	390,343
1973	173,649	31,366	205,015	642,884	417,018	1,465,086	2,524,988	130,843	263,040	393,883
1974	176,527	32,938	209,466	644,082	417,636	1,467,092	2,528,810	132,015	265,901	397,916
1975	184,973	36,291	221,264	646,805	418,879	1,470,816	2,536,499	133,290	269,028	402,318
1976	189,650	40,836	230,485	648,295	419,684	1,472,924	2,540,902	134,041	272,155	406,196
1977	192,592	45,096	237,688	651,157	421,449	1,478,507	2,551,113	135,754	278,799	414,553
1978	195,860	49,178	245,038	654,962	423,747	1,485,299	2,564,008	141,271	292,281	433,552
1979	199,390	53,340	252,730	660,424	427,108	1,494,207	2,581,739	142,362	297,569	439,930
1980	209,132	67,748	276,880	664,469	429,296	1,499,843	2,593,608	143,530	303,969	447,499
1981	222,599	87,408	310,007	674,754	435,629	1,515,357	2,625,740	148,789	327,544	476,333
1982	234,191	106,918	341,110	673,078	434,108	1,512,014	2,619,200	148,004	320,657	468,660
1983	262,160	151,259	413,419	674,737	434,532	1,513,393	2,622,662	148,213	317,658	465,870
1984	326,072	224,245	550,317	685,744	441,230	1,530,671	2,657,645	149,853	323,275	473,127
1985	455,836	364,305	820,141	698,164	448,410	1,548,594	2,695,168	151,658	328,761	480,419
1986	819,636	692,479	1,512,115	700,385	449,390	1,551,318	2,701,093	152,545	332,779	485,324
1987	1,360,688	1,559,243	2,919,931	703,248	451,007	1,555,828	2,710,084	154,805	348,472	503,277
1988	1,771,651	2,208,121	3,979,772	707,693	453,514	1,562,985	2,724,191	161,346	417,591	578,937
1989	1,891,484	2,433,160	4,324,645	716,571	459,332	1,578,655	2,754,558	169,453	494,247	663,699
1990	1,955,330	2,514,151	4,469,481	724,750	464,692	1,592,216	2,781,658	177,387	557,384	734,771
1991	1,978,582	2,557,403	4,535,985	741,583	476,459	1,625,032	2,843,073	189,050	639,235	828,285
1992	1,983,860	2,562,121	4,545,981	771,359	496,722	1,675,047	2,943,128	204,822	754,678	959,500
1993	1,986,897	2,565,427	4,552,324	785,370	505,773	1,698,585	2,989,729	224,056	941,300	1,165,356
1994	1,993,467	2,572,330	4,565,797	795,495	512,498	1,716,961	3,024,954	286,874	1,585,162	1,872,040
1995	1,997,323	2,576,836	4,574,159	799,837	515,639	1,729,387	3,044,862	517,412	4,095,799	4,613,211
1996	1,998,994	2,578,433	4,577,427	807,489	520,936	1,743,439	3,071,864	1,187,010	12,569,247	13,756,257
1997	2,000,110	2,579,484	4,579,594	811,413	523,583	1,750,461	3,085,457	1,808,545	20,578,178	22,386,724
1998	2,001,225	2,585,478	4,586,703	817,952	527,976	1,762,113	3,108,041	1,985,644	22,700,288	24,685,933
1999	2,002,204	2,586,690	4,588,893	820,117	529,331	1,765,656	3,115,104	2,035,260	23,293,767	25,329,027
2000	2,006,043	2,592,730	4,598,773	984,546	533,508	1,777,485	3,295,540	2,088,005	23,838,744	25,926,748
2001	2,328,373	2,785,135	5,113,508	1,044,814	535,165	1,782,101	3,362,080	2,116,046	24,156,352	26,272,398
2002	2,328,812	2,785,975	5,114,787	1,056,931	550,866	1,890,059	3,497,857	2,120,253	24,187,702	26,307,955
2003	2,330,156	2,788,784	5,118,941	1,129,494	621,150	2,236,683	3,987,327	2,124,324	24,210,510	26,334,833
2004	2,333,840	2,790,078	5,123,918	1,246,701	700,643	2,512,474	4,459,818	2,125,494	24,217,560	26,343,054
2005	2,344,388	2,791,416	5,135,804	1,636,062	721,599	2,761,150	5,118,811	2,126,238	24,220,734	26,346,972
2006	2,348,640	2,795,649	5,144,288	2,080,567	742,505	2,855,962	5,679,034	2,126,116	24,210,804	26,336,921
2007	2,411,675	2,797,019	5,208,694	2,979,488	763,106	2,906,021	6,648,615	2,126,644	24,214,870	26,341,514
2008	2,645,490	2,800,016	5,445,506	5,185,827	809,662	3,017,673	9,013,163	2,127,678	24,220,221	26,347,899
2009	3,226,865	2,804,341	6,031,206	7,619,492	897,252	3,227,237	11,743,981	2,129,520	24,226,659	26,356,180
2010	3,316,620	2,805,677	6,122,297	9,110,964	1,081,998	3,667,787	13,860,749	2,130,095	24,229,935	26,360,030
2011	3,347,008	2,805,916	6,152,925	11,735,497	1,318,810	4,260,266	17,314,573	2,135,200	24,239,123	26,374,323
2012	3,362,131	2,808,942	6,171,074	13,752,795	1,583,384	4,897,983	20,234,163	2,142,776	24,255,155	26,397,931
2013	3,401,236	2,841,785	6,243,021	15,070,007	1,664,841	5,007,350	21,742,198	2,148,169	24,278,899	26,427,068
2014	3,455,206	2,895,158	6,350,363	15,633,193	1,690,262	5,123,884	22,447,339	2,160,229	24,349,490	26,509,719
2015	3,505,154	2,948,047	6,453,201	16,108,272	1,588,247	4,739,755	22,436,274	2,178,155	24,451,787	26,629,942
2016	3,501,022	2,969,852	6,470,874	16,624,797	1,599,389	4,671,223	22,895,408	2,184,960	24,531,563	26,716,523
2017	3,482,317	2,983,493	6,465,810	16,943,834	1,583,076	4,591,219	23,118,129	2,176,330	24,566,024	26,742,353
2018	3,394,040	2,991,905	6,385,945	16,901,451	1,554,670	4,507,208	22,963,329	2,153,735	24,564,634	26,718,369
2019	3,346,684	2,997,307	6,343,991	16,929,039	1,561,517	4,543,513	23,034,069	2,165,636	24,593,849	26,759,485
2020	3,346,065	3,005,811	6,351,876	17,036,256	1,577,455	4,626,970	23,240,680	2,187,915	24,675,848	26,863,761
2021	3,375,339	3,049,000	6,424,338	17,146,319	1,616,353	4,747,005	23,509,677	2,229,293	24,821,503	27,050,796
2022	3,539,385	3,300,607	6,839,992	17,476,222	1,754,154	5,155,402	24,385,778	2,308,782	25,248,551	27,557,333
2023	3,680,490	3,661,105	7,341,595	18,142,841	2,026,899	5,834,642	26,004,382	2,380,257	25,514,968	27,895,225
2024	3,704,768	3,805,817	7,510,585	18,580,598	2,192,858	6,239,810	27,013,266	2,533,994	26,279,258	28,813,251
2025	3,695,153	3,802,240	7,497,393	18,578,342	2,191,615	6,236,086	27,006,043	2,532,718	26,276,132	28,808,850
2026	3,689,809	3,797,486	7,487,295	18,577,071	2,190,810	6,233,978	27,001,859	2,531,968	26,273,004	28,804,971
2027	3,686,438	3,793,052	7,479,489	18,574,500	2,189,045	6,228,395	26,991,940	2,530,254	26,266,360	28,796,615
2028	3,682,698	3,788,792	7,471,490	18,571,067	2,186,747	6,221,603	26,979,416	2,524,738	26,252,878	28,777,616
2029	3,678,660	3,784,425	7,463,085	18,565,968	2,183,385	6,212,695	26,962,048	2,523,647	26,247,591	28,771,237
2030	3,667,504	3,768,962	7,436,466	18,562,294	2,181,198	6,207,059	26,950,551	2,522,478	26,241,190	28,763,669
2031	3,652,087	3,747,896	7,399,983	18,552,429	2,174,865	6,191,545	26,918,839	2,517,220	26,217,615	28,734,834
2032	3,638,790	3,726,952	7,365,742	18,554,491	2,176,385	6,194,888	26,925,764	2,518,005	26,224,503	28,742,507
2033	3,606,731	3,679,501	7,286,231	18,553,271	2,175,962	6,193,509	26,922,742	2,517,796	26,227,502	28,745,297
2034	3,533,634	3,602,884	7,136,518	18,542,543	2,169,264	6,176,231	26,888,038	2,516,156	26,221,885	28,738,041
2035	3,385,491	3,456,582	6,842,073	18,530,511	2,162,084	6,158,308	26,850,903	2,514,351	26,216,398	28,730,749
TOTAL	145,602,274	148,412,620	294,014,893	489,970,345	70,858,098	219,743,485	780,571,927	93,982,881	995,593,994	1,089,576,876

¹ Unadjusted for prior overpayments or underpayments of charges.² Determined at the current Project Interest Rate of 4.610 percent per annum.³ Reflects the transfers of permanent aqueduct capacity among contractors.

TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor (in dollars)^{1,2,3}

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA									
	Dudley Ridge	Empire	Future Contractor San Joaquin Valley	Kern			Kings	Oak Flat	Tulare	Total
				Municipal and Industrial	Municipal and Industrial ⁴	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	83,904	2,076	48,950	335,771	48,966	453,814	9,407	5,168	70,810	1,058,866
1969	84,051	6,227	57,418	392,005	52,536	931,990	10,158	5,617	267,921	1,807,922
1970	92,119	6,227	59,224	423,404	53,922	1,133,580	10,446	5,842	198,267	1,983,031
1971	105,027	6,227	60,329	444,522	54,712	1,505,590	10,612	6,291	210,984	2,404,294
1972	117,349	6,227	60,945	454,227	55,075	2,254,491	10,694	12,057	650,872	3,621,936
1973	129,084	6,227	61,370	458,449	55,248	2,600,212	10,736	6,965	251,748	3,580,039
1974	195,914	6,227	61,890	460,485	55,349	2,911,853	10,770	7,799	417,859	4,128,145
1975	237,954	6,227	62,452	462,798	55,490	3,487,596	10,812	8,035	498,605	4,829,969
1976	181,427	6,227	62,720	464,655	55,679	3,759,601	10,853	9,075	356,691	4,906,927
1977	178,370	6,227	63,362	467,359	55,965	4,119,441	10,914	8,314	341,043	5,250,995
1978	190,692	0	65,796	469,216	56,156	4,579,107	11,019	8,763	365,899	5,746,649
1979	226,155	6,227	66,111	471,978	56,491	5,028,061	11,086	8,988	411,801	6,286,898
1980	240,565	6,227	66,399	474,721	56,828	5,486,747	11,157	12,807	414,454	6,769,905
1981	240,565	6,227	67,986	491,115	58,770	6,004,835	11,565	9,662	439,310	7,330,035
1982	240,565	6,227	67,996	488,835	58,707	6,483,013	11,552	10,111	463,587	7,830,594
1983	251,713	6,227	68,332	493,076	59,377	7,027,401	11,685	8,471	55,191	7,981,474
1984	264,622	6,227	68,950	498,702	60,083	7,375,956	11,834	10,785	361,916	8,659,075
1985	276,943	6,227	69,678	506,586	61,243	7,854,119	12,069	11,010	263,291	9,061,167
1986	289,265	6,227	69,966	508,983	61,587	7,980,356	12,141	11,459	561,854	9,501,838
1987	301,587	6,227	70,471	512,652	62,116	8,811,429	12,251	11,684	586,132	10,374,549
1988	313,908	6,227	70,832	515,513	62,526	9,262,330	12,334	12,133	610,409	10,866,211
1989	326,230	6,227	71,717	519,169	63,150	9,587,594	12,501	12,583	635,265	11,234,436
1990	169,276	6,227	73,153	537,527	65,389	9,925,532	12,936	12,807	684,976	11,487,824
1991	313,386	6,227	75,796	566,573	69,966	9,925,532	13,762	12,807	684,976	11,669,026
1992	338,551	6,227	78,990	597,260	74,817	9,925,532	14,756	12,807	684,976	11,733,916
1993	338,551	6,227	80,482	610,123	76,657	9,925,532	15,124	12,807	684,976	11,750,479
1994	338,551	6,227	82,105	619,494	77,936	9,925,532	15,397	12,807	684,976	11,763,025
1995	338,551	6,227	83,398	626,231	78,890	9,925,532	15,608	12,807	684,976	11,772,220
1996	313,145	6,227	87,367	635,384	80,221	9,584,311	15,961	12,807	684,976	11,420,400
1997	313,145	6,227	90,231	639,177	80,707	9,514,790	16,133	12,807	684,976	11,358,192
1998	313,144	6,227	92,940	652,602	82,732	9,262,762	16,588	12,807	684,976	11,124,779
1999	313,144	6,227	94,237	659,509	83,778	9,262,762	16,823	12,807	684,976	11,134,264
2000	313,144	6,227	95,750	667,629	85,008	8,612,517	17,096	12,807	684,976	10,495,155
2001	313,144	6,227	96,315	670,255	85,354	8,471,657	17,172	12,807	684,976	10,357,906
2002	336,904	6,227	96,772	672,352	85,648	8,471,657	17,237	12,807	643,348	10,342,951
2003	336,904	6,227	97,882	681,983	87,121	8,471,657	17,536	12,807	640,973	10,353,090
2004	336,904	6,227	98,185	684,250	87,449	8,458,771	47,283	12,807	552,521	10,284,397
2005	336,904	6,227	98,434	686,336	87,746	8,458,771	47,346	12,807	552,521	10,287,091
2006	336,904	6,227	99,039	692,288	88,653	8,458,771	49,341	12,807	550,711	10,294,741
2007	336,904	6,227	99,161	694,170	88,828	8,458,771	49,377	12,807	550,711	10,296,956
2008	336,904	6,227	99,425	696,491	89,095	8,458,771	49,432	12,807	550,711	10,299,863
2009	336,904	6,227	100,163	703,240	90,159	8,458,771	49,650	12,807	550,711	10,308,632
2010	295,832	6,227	100,376	706,426	90,427	8,273,297	49,704	12,807	509,156	10,044,253
2011	295,832	6,227	102,805	710,984	90,907	8,273,297	49,877	12,807	509,156	10,051,892
2012	295,832	6,227	106,293	715,917	91,573	8,273,297	50,120	12,807	509,156	10,061,222
2013	295,832	6,227	107,943	722,275	92,412	8,273,297	50,314	12,807	509,156	10,070,262
2014	284,138	6,227	110,284	749,908	96,238	8,273,297	51,104	12,807	500,543	10,084,546
2015	266,537	6,227	114,145	713,312	91,000	8,273,297	52,054	12,807	500,543	10,029,922
2016	266,537	6,227	112,819	677,689	85,946	8,273,297	52,677	12,807	500,543	9,988,542
2017	266,537	6,227	105,267	605,882	72,146	8,273,297	53,503	12,807	500,543	9,896,209
2018	266,537	6,227	91,723	540,177	63,008	8,273,297	45,384	12,807	500,543	9,799,702
2019	266,537	6,227	96,901	537,007	67,458	8,273,297	46,527	12,807	500,543	9,807,305
2020	243,067	6,227	104,766	553,586	73,370	8,273,297	47,809	12,807	500,543	9,815,472
2021	243,067	6,227	119,834	600,416	82,662	8,273,297	49,856	12,807	500,543	9,888,709
2022	268,474	6,227	138,816	724,593	101,172	8,673,400	53,270	12,807	500,543	10,479,302
2023	268,474	6,227	163,850	851,096	119,426	8,673,400	57,246	12,807	500,543	10,653,068
2024	268,474	6,227	204,761	1,037,206	139,447	8,673,400	61,849	12,807	500,543	10,904,714
2025	268,474	6,227	204,199	1,034,893	139,306	8,673,400	61,807	12,807	500,543	10,901,655
2026	268,474	6,227	203,931	1,033,036	139,117	8,673,400	61,766	12,807	500,543	10,899,301
2027	268,474	6,227	203,289	1,030,332	138,831	8,673,400	61,704	12,807	500,543	10,895,607
2028	268,474	6,227	200,855	1,028,474	138,640	8,673,400	61,599	12,807	500,543	10,891,019
2029	268,474	6,227	200,540	1,025,713	138,305	8,673,400	61,533	12,807	500,543	10,887,542
2030	268,474	6,227	200,252	1,022,969	137,968	8,673,400	61,462	12,807	500,543	10,884,102
2031	268,474	6,227	198,665	1,006,576	136,026	8,673,400	61,053	12,807	500,543	10,863,771
2032	268,474	6,227	198,655	1,008,856	136,089	8,673,400	61,067	12,807	500,543	10,866,117
2033	268,474	6,227	198,318	1,004,614	135,419	8,673,400	60,934	12,807	500,543	10,860,737
2034	268,474	6,227	197,701	998,988	134,713	8,673,400	60,785	12,807	500,543	10,853,638
2035	268,474	6,227	196,972	991,104	133,553	8,673,400	60,549	12,807	500,543	10,843,631
TOTAL	18,023,894	413,058	7,273,728	45,356,929	5,831,996	511,304,211	2,206,706	792,741	34,294,398	625,497,661

¹ Unadjusted for prior overpayments or underpayments of charges.² Determined at the current Project Interest Rate of 4.610 percent per annum.³ Reflects the transfers of permanent aqueduct capacity among contractors.⁴ Charges under Amendment 18 of the water supply contract with Kern County Water Agency.

TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor (in dollars)^{1,2,3}

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	AVEK	Coachella	Crestline	Desert	Littlerock	Mojave	Palmdale	San Bernardino	San Gabriel	San Geronio
	[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	34,411	0	0	726	0	0	0	51,729	0	0
1964	64,494	19,542	4,370	38,211	1,143	31,079	8,205	82,811	34,987	21,735
1965	121,484	34,348	7,194	42,701	2,082	55,096	15,222	135,069	35,344	21,866
1966	221,012	62,476	12,478	76,886	3,753	99,564	27,679	232,502	61,465	37,964
1967	427,622	121,269	23,472	148,839	7,284	193,330	54,023	433,350	115,574	71,283
1968	689,327	206,952	38,551	245,877	11,781	322,186	87,293	729,849	194,527	120,094
1969	1,003,797	318,583	57,301	368,426	17,249	485,639	127,219	1,136,415	302,649	187,059
1970	1,312,832	451,031	84,796	520,243	23,427	676,238	171,297	1,691,461	443,708	275,010
1971	1,581,850	595,102	120,210	700,914	28,845	895,402	208,821	2,394,083	619,778	385,025
1972	1,720,363	671,098	137,454	795,465	31,306	1,015,731	226,497	2,808,504	720,983	448,055
1973	1,772,377	696,065	142,143	825,044	32,281	1,055,313	233,340	2,945,564	756,530	470,185
1974	1,791,355	707,278	146,331	839,031	32,602	1,070,289	235,688	3,035,230	777,084	483,259
1975	1,815,881	724,295	150,105	861,611	33,017	1,100,945	238,700	3,117,604	798,777	496,722
1976	1,829,760	736,112	152,796	878,290	33,269	1,122,996	240,431	3,195,714	819,552	509,650
1977	1,842,615	744,718	154,692	890,124	33,485	1,139,418	242,010	3,244,723	832,585	517,741
1978	1,853,320	750,463	156,009	898,031	33,676	1,151,146	243,377	3,274,845	840,506	522,656
1979	1,869,355	756,140	157,141	904,987	33,943	1,161,821	245,346	3,296,693	846,199	526,178
1980	1,888,324	762,012	158,251	912,220	34,247	1,173,020	247,607	3,317,247	851,720	529,583
1981	1,987,339	796,384	164,015	950,529	35,899	1,225,689	259,877	3,421,183	879,634	546,787
1982	1,978,809	789,720	163,563	945,667	35,768	1,220,142	258,879	3,413,856	877,416	545,445
1983	2,061,590	809,319	167,582	971,692	37,104	1,255,810	268,895	3,486,248	897,190	557,607
1984	2,171,231	834,564	173,473	1,006,034	38,871	1,296,933	282,134	3,594,542	926,815	575,830
1985	2,251,676	851,720	177,807	1,031,452	40,260	1,330,729	291,738	3,673,311	948,379	589,089
1986	2,299,323	863,875	180,992	1,049,921	40,927	1,364,424	297,214	3,730,198	963,927	598,648
1987	2,344,046	876,261	183,970	1,068,826	41,390	1,381,384	301,992	3,783,895	978,588	607,664
1988	2,362,143	885,509	186,235	1,083,080	41,677	1,401,058	304,089	3,824,257	989,568	614,418
1989	2,376,030	889,631	187,412	1,088,857	41,852	1,409,365	305,475	3,846,509	995,456	618,059
1990	2,432,706	912,986	192,472	1,118,024	42,727	1,447,925	312,010	3,918,238	1,014,854	629,934
1991	2,469,661	932,659	197,604	1,147,282	43,112	1,484,360	315,536	3,997,480	1,036,359	643,118
1992	2,514,880	953,475	203,996	1,179,589	43,744	1,523,854	320,432	4,102,102	1,064,912	660,626
1993	2,549,874	969,784	210,989	1,203,773	44,253	1,551,540	324,519	4,213,571	1,095,444	679,343
1994	2,585,113	983,985	220,171	1,223,934	44,800	1,571,681	328,488	4,420,076	1,151,617	714,062
1995	2,611,217	992,587	225,248	1,236,069	45,193	1,584,240	331,367	4,547,097	1,186,123	735,431
1996	2,637,094	1,001,843	229,526	1,248,440	45,599	1,597,963	334,344	4,654,140	1,215,084	753,590
1997	2,654,359	1,010,118	232,003	1,258,944	45,868	1,610,763	336,316	4,888,049	1,268,666	827,511
1998	2,679,335	1,017,568	233,373	1,268,786	46,279	1,636,494	339,344	5,107,565	1,290,750	1,003,288
1999	2,692,811	1,022,130	235,684	1,274,800	46,503	2,143,923	341,005	5,428,405	1,307,788	1,138,711
2000	2,708,447	1,028,194	237,960	1,283,376	46,776	2,154,825	406,463	5,983,155	1,321,137	1,923,803
2001	2,716,761	1,032,076	239,333	1,288,723	46,930	2,161,775	407,667	7,451,923	1,330,966	3,621,868
2002	2,742,479	1,035,440	240,242	1,293,682	47,103	2,168,285	408,941	9,414,983	1,336,562	5,920,111
2003	2,754,417	1,038,552	241,001	1,297,752	47,280	2,174,046	410,376	10,423,259	1,344,434	7,081,362
2004	2,759,153	1,099,222	241,460	1,300,295	47,354	2,177,603	410,995	10,850,329	1,347,676	7,569,753
2005	2,764,265	6,719,937	241,849	2,061,704	47,442	2,181,228	411,711	11,074,072	1,350,250	7,818,101
2006	2,778,937	6,788,944	242,717	2,075,530	47,688	2,189,155	413,758	11,170,547	1,354,649	7,907,533
2007	2,800,735	6,918,223	244,290	2,099,752	48,040	2,202,442	416,955	11,381,474	1,361,754	8,119,096
2008	2,817,874	7,043,020	245,693	2,122,376	48,330	2,213,299	419,470	11,611,349	1,368,660	8,364,837
2009	2,828,370	7,134,821	249,637	2,141,770	48,511	2,219,476	420,877	11,962,711	1,385,750	8,703,875
2010	2,868,275	7,528,911	253,621	2,244,651	49,160	2,288,497	426,734	12,482,540	1,403,681	9,225,963
2011	2,913,882	7,703,190	257,857	2,288,574	49,889	2,324,456	433,353	13,108,796	1,422,953	9,887,619
2012	2,939,075	7,850,972	261,954	2,332,917	50,285	2,362,406	436,864	14,087,863	1,442,809	10,965,602
2013	2,924,802	8,038,359	268,157	2,381,008	50,643	2,415,140	439,617	15,596,558	1,461,146	12,672,886
2014	2,974,247	8,355,912	270,396	2,454,969	50,602	2,438,384	439,079	20,417,711	1,488,291	18,254,774
2015	2,984,864	8,510,149	272,383	2,487,785	50,858	2,473,467	440,766	24,837,268	1,504,811	23,415,183
2016	2,969,873	9,028,935	272,470	2,559,882	50,731	2,477,968	439,954	27,271,982	1,508,458	26,280,245
2017	2,874,154	9,957,779	267,081	2,655,468	49,066	2,436,334	427,739	30,012,634	1,484,713	29,609,693
2018	2,679,830	10,207,395	255,403	2,625,336	45,697	2,319,419	399,632	30,737,629	1,421,816	30,708,495
2019	2,465,892	10,170,854	242,578	2,543,087	41,883	2,170,482	367,040	30,998,351	1,351,423	31,288,532
2020	2,246,562	9,988,089	223,742	2,416,005	37,180	2,009,285	328,213	30,631,520	1,252,499	31,245,295
2021	2,095,234	9,868,263	204,760	2,292,339	33,755	1,826,457	300,805	30,245,869	1,162,035	31,135,580
2022	2,215,001	9,856,030	206,484	2,298,705	35,703	1,838,548	315,247	30,398,492	1,198,482	31,181,580
2023	2,414,605	10,339,037	219,252	2,434,479	38,970	1,952,130	341,808	30,642,837	1,262,366	31,224,764
2024	2,835,168	11,724,863	241,812	2,755,533	45,860	2,204,214	401,042	31,134,833	1,386,752	31,320,803
2025	2,810,642	11,609,609	238,037	2,719,684	45,445	2,172,444	397,466	31,052,459	1,365,059	31,307,339
2026	2,796,763	11,505,740	235,347	2,690,571	45,193	2,149,727	395,447	30,974,350	1,344,284	31,294,411
2027	2,783,908	11,429,388	233,451	2,669,585	44,977	2,133,289	393,635	30,925,341	1,331,251	31,286,321
2028	2,773,203	11,392,171	232,134	2,657,427	44,785	2,122,428	392,118	30,895,218	1,323,330	31,281,405
2029	2,757,168	11,359,841	231,002	2,646,871	44,519	2,112,042	389,905	30,873,370	1,317,637	31,277,884
2030	2,738,199	11,333,254	229,892	2,636,840	44,215	2,101,143	387,392	30,852,816	1,312,116	31,274,479
2031	2,639,184	11,194,643	224,128	2,584,452	42,563	2,039,147	373,229	30,748,880	1,284,202	31,257,274
2032	2,647,713	11,207,446	224,580	2,590,143	42,694	2,050,375	374,862	30,756,208	1,286,420	31,258,617
2033	2,564,933	11,125,915	220,561	2,555,752	41,358	2,012,964	364,196	30,683,815	1,266,646	31,246,455
2034	2,455,292	11,013,359	214,670	2,509,617	39,591	1,964,886	350,207	30,575,522	1,237,021	31,228,232
2035	2,374,847	10,929,433	210,336	2,475,180	38,202	1,931,202	340,310	30,496,752	1,215,457	31,214,973
TOTAL	164,914,170	328,819,566	14,105,677	113,775,140	2,824,493	119,456,456	22,930,286	925,937,530	77,678,032	788,217,965

¹ Unadjusted for prior overpayments or underpayments of charges.² Determined at the current Project Interest Rate of 4.610 percent per annum.³ Reflects the transfers of permanent aqueduct capacity among contractors.

TABLE B-15 Capital Cost Component of Transportation Charge for Each Contractor (in dollars)^{1,2,3}

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	Grand Total
	Santa Clarita ⁵	Metropolitan	Ventura	Total	Yuba City	Butte	Plumas	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	777,678	0	0	0	0	0	1,396,150
1964	27,447	1,260,513	9,378	1,603,916	0	0	0	0	0	2,544,339
1965	53,007	2,180,589	17,766	2,721,767	0	0	405	405	0	4,285,586
1966	101,264	3,900,172	33,426	4,870,643	0	0	565	565	0	6,800,626
1967	210,814	7,693,703	68,155	9,568,718	0	0	562	562	0	11,968,199
1968	421,199	14,345,147	133,299	17,546,083	0	0	564	564	0	21,207,541
1969	626,495	21,857,456	202,599	26,690,887	0	0	3,191	3,191	0	31,439,058
1970	784,016	28,992,595	257,859	35,684,512	0	0	15,121	15,121	0	40,723,886
1971	952,221	37,242,413	316,307	46,040,971	0	0	15,947	15,947	0	51,529,726
1972	1,064,115	44,062,125	353,935	54,055,631	0	0	17,332	17,332	0	60,777,413
1973	1,079,720	46,299,581	357,342	56,665,483	0	0	17,333	17,333	0	63,386,742
1974	1,127,346	48,322,678	372,112	58,940,283	0	0	17,334	17,334	0	66,221,954
1975	1,143,611	49,285,084	376,511	60,142,863	0	0	17,337	17,337	0	68,150,249
1976	1,157,092	50,137,295	380,788	61,193,743	0	0	17,338	17,338	0	69,295,592
1977	1,171,315	50,827,166	385,097	62,025,690	0	0	17,340	17,340	0	70,497,379
1978	1,191,800	51,426,581	390,742	62,733,152	0	0	17,342	17,342	0	71,739,741
1979	1,217,274	52,230,344	399,649	63,645,069	0	0	17,344	17,344	0	73,223,710
1980	1,266,660	53,637,412	417,136	65,195,438	0	0	17,345	17,345	0	75,300,675
1981	1,358,941	56,667,437	449,812	68,743,526	0	0	17,346	17,346	0	79,502,987
1982	1,391,677	57,465,063	461,234	69,547,238	0	0	17,348	17,348	0	80,824,149
1983	1,437,429	59,037,472	477,333	71,465,272	0	0	17,348	17,348	0	82,966,045
1984	1,465,155	60,313,580	486,863	73,166,023	0	0	17,349	17,349	0	85,523,537
1985	1,481,848	61,144,629	492,117	74,304,754	0	0	17,351	17,351	0	87,378,998
1986	1,491,551	61,666,346	494,977	75,042,324	0	0	17,352	17,352	0	89,260,046
1987	1,498,566	62,094,710	496,758	75,658,050	0	0	17,354	17,354	0	92,183,245
1988	1,505,541	62,452,912	498,619	76,149,108	0	0	17,355	17,355	0	94,315,575
1989	1,515,672	62,796,236	501,579	76,572,134	0	0	17,358	17,358	0	95,566,830
1990	1,539,471	63,762,459	509,566	77,833,372	0	0	17,360	17,360	0	97,324,466
1991	1,559,118	64,677,355	516,147	79,019,791	0	0	17,364	17,364	0	98,913,524
1992	1,580,364	65,776,353	523,154	80,447,481	0	0	17,367	17,367	0	100,647,373
1993	1,599,371	66,905,041	529,383	81,876,886	0	0	17,369	17,369	0	102,352,143
1994	1,617,193	68,486,622	535,055	83,882,797	0	0	17,370	17,370	0	105,125,984
1995	1,626,153	69,373,540	537,812	85,032,076	0	0	17,371	17,371	0	109,053,900
1996	1,642,161	70,251,056	541,753	86,152,593	0	0	17,371	17,371	0	118,995,912
1997	1,653,548	71,530,953	544,467	87,861,565	0	0	17,371	17,371	0	129,288,904
1998	1,667,435	72,283,436	548,490	89,622,144	0	0	0	0	0	133,127,599
1999	1,678,820	72,917,423	552,184	90,960,187	0	0	0	0	0	135,127,475
2000	2,832,777	73,432,162	555,279	93,914,354	0	0	0	0	0	138,230,570
2001	2,838,718	73,741,965	556,658	97,435,363	0	0	0	0	0	142,541,255
2002	2,842,011	73,915,736	557,417	101,922,994	0	0	0	0	0	147,186,544
2003	2,850,526	74,256,539	559,749	104,479,293	0	0	17,375	17,375	0	150,290,859
2004	2,853,749	74,601,782	560,566	105,819,939	0	0	17,375	17,375	0	152,048,502
2005	2,857,678	68,499,909	561,532	106,589,677	0	0	17,375	17,375	0	153,495,731
2006	2,868,430	68,876,841	564,172	107,278,902	0	0	17,375	17,375	0	154,751,262
2007	2,894,041	69,605,880	569,809	108,662,491	0	0	17,376	17,376	0	157,175,646
2008	2,912,700	70,216,830	573,969	109,958,408	0	0	17,376	17,376	0	161,082,215
2009	2,928,523	70,888,202	577,886	111,490,409	0	0	17,376	17,376	0	165,947,784
2010	2,964,908	72,113,606	585,961	114,436,509	0	0	17,376	17,376	0	170,841,214
2011	3,001,181	73,157,328	593,207	117,142,287	0	0	17,376	17,376	0	177,053,376
2012	3,022,572	73,889,550	597,040	120,239,907	0	0	17,376	17,376	0	183,121,673
2013	3,036,062	74,246,181	600,058	124,130,616	0	0	17,376	17,376	0	188,630,542
2014	3,034,318	75,377,648	598,659	136,154,990	0	0	17,376	17,376	0	201,564,333
2015	3,045,694	75,924,413	599,714	146,547,354	0	0	16,972	16,972	0	212,113,665
2016	3,044,160	76,770,426	596,604	153,271,688	0	0	16,812	16,812	0	219,359,848
2017	2,975,161	77,008,225	579,080	160,337,128	0	0	16,814	16,814	0	226,576,443
2018	2,743,034	72,892,965	526,626	157,563,277	0	0	16,812	16,812	0	223,447,433
2019	2,532,074	68,369,036	476,334	153,017,561	0	0	14,185	14,185	0	218,976,597
2020	2,398,181	64,607,452	443,640	147,827,662	0	0	2,256	2,256	0	214,101,709
2021	2,283,715	61,682,656	416,711	143,548,178	0	0	1,429	1,429	0	210,423,127
2022	2,310,077	62,707,397	426,410	144,988,155	0	0	44	44	0	214,250,605
2023	2,531,499	69,268,598	479,128	153,149,472	0	0	43	43	0	225,043,785
2024	2,816,223	78,031,396	544,788	165,443,287	0	0	42	42	0	239,685,146
2025	2,798,359	77,180,496	540,390	164,237,430	0	0	40	40	0	238,451,411
2026	2,780,111	76,432,772	536,113	163,180,829	0	0	39	39	0	237,374,295
2027	2,761,600	75,819,796	531,803	162,344,344	0	0	36	36	0	236,508,031
2028	2,733,764	75,256,107	526,158	161,630,248	0	0	35	35	0	235,749,824
2029	2,695,451	74,482,595	517,252	160,705,537	0	0	33	33	0	234,789,481
2030	2,618,237	73,099,041	499,764	159,127,386	0	0	32	32	0	233,162,206
2031	2,475,184	70,187,334	467,088	155,517,308	0	0	30	30	0	229,434,766
2032	2,423,679	69,382,741	455,667	154,701,143	0	0	29	29	0	228,601,302
2033	2,351,128	67,880,629	439,567	152,753,918	0	0	28	28	0	226,568,953
2034	2,308,891	66,703,626	430,037	151,030,949	0	0	27	27	0	224,647,211
2035	2,287,170	65,948,365	424,783	149,887,010	0	0	26	26	0	223,154,391
TOTAL	141,556,994	4,380,450,519	33,239,025	7,113,905,855	0	0	781,778	781,778	0	9,904,348,990

¹ Unadjusted for prior overpayments or underpayments of charges.² Determined at the current Project Interest Rate of 4.610 percent per annum.³ Reflects the transfers of permanent aqueduct capacity among contractors.⁵ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

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	Solano	Total	Alameda-Zone 7	Alameda County	Santa Clara	Total	San Luis Obispo	Santa Barbara	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	349,937	0	0	0
1966	0	0	0	79,753	78,779	218,543	377,076	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	580,128	11,800	21,770	33,571
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	565,250	75,714	139,683	215,398
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	885,086	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	286,617
1980	81,769	0	81,769	389,575	372,185	1,010,830	1,772,591	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	3,170,677	242,935	448,233	691,167
1986	203,704	0	203,704	613,273	583,077	1,784,056	2,980,407	233,000	429,904	662,905
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	3,326,335	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	3,904,605	346,220	736,477	1,082,698
1993	524,000	708,129	1,232,129	1,280,736	1,261,431	3,338,742	5,880,908	386,060	734,138	1,120,197
1994	573,814	658,274	1,232,087	1,368,665	1,312,746	3,560,310	6,241,720	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	1,359,251
1996	604,992	1,011,298	1,616,291	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	4,666,319	406,652	749,805	1,156,456
1998	461,844	661,193	1,123,037	1,064,729	1,174,897	3,502,733	5,742,360	810,087	3,051,492	3,861,579
1999	605,763	995,604	1,601,367	1,226,160	1,267,416	5,086,852	7,580,428	788,275	3,087,473	3,875,748
2000	777,217	1,495,413	2,272,630	2,181,030	1,299,206	3,763,997	7,244,233	701,204	3,086,687	3,787,891
2001	651,209	1,444,040	2,095,249	4,194,363	1,038,206	3,544,596	8,777,165	723,649	2,906,725	3,630,374
2002	1,098,725	1,874,074	2,972,799	8,265,317	1,360,212	6,066,367	15,691,897	756,677	3,288,267	4,044,944
2003	1,168,611	2,247,438	3,416,049	4,901,790	1,057,275	3,547,976	9,507,041	803,484	3,440,305	4,243,789
2004	1,618,500	2,346,304	3,964,803	2,575,939	1,277,496	3,530,065	7,383,500	799,416	3,354,831	4,154,247
2005	916,734	1,796,614	2,713,348	2,391,501	1,129,780	2,947,359	6,468,641	848,882	3,682,184	4,531,065
2006	817,694	1,387,010	2,204,704	2,484,947	1,206,246	3,274,333	6,965,526	747,553	3,625,703	4,373,256
2007	775,551	1,515,578	2,291,129	3,227,789	1,569,976	4,009,541	8,807,307	828,262	3,591,135	4,419,396
2008	1,053,328	1,425,675	2,479,003	3,632,691	1,768,813	4,489,982	9,891,486	1,250,663	5,329,293	6,579,955
2009	1,122,116	1,794,992	2,917,108	3,283,890	1,489,943	4,215,097	9,888,929	1,108,731	4,705,507	5,814,237
2010	1,192,509	3,193,258	4,385,767	3,136,151	1,537,941	4,235,609	8,909,701	1,410,863	6,257,901	7,668,764
2011	1,571,203	3,660,267	5,231,470	3,520,180	1,698,289	4,536,998	9,755,467	1,450,158	6,575,392	8,025,550
2012	2,065,437	3,562,774	5,628,211	3,711,511	1,772,372	6,749,427	12,233,310	1,443,013	7,245,884	8,688,898
2013	1,508,323	3,071,700	4,580,023	4,220,278	1,993,388	5,971,455	12,185,121	1,690,766	8,790,557	10,481,323
2014	1,940,801	3,785,853	5,726,654	4,746,021	2,196,841	7,318,446	14,261,309	1,537,290	5,830,017	7,367,306
2015	2,173,423	3,624,541	5,797,965	5,822,398	2,158,532	8,343,133	16,324,063	2,033,397	8,475,915	10,509,312
2016	2,698,217	4,402,720	7,100,937	5,210,984	1,947,619	13,613,621	20,772,223	1,886,195	11,136,873	13,023,067
2017	1,850,845	2,896,103	4,746,948	5,879,444	2,251,284	10,321,972	18,452,701	2,263,857	14,504,135	16,767,992
2018	2,698,918	3,730,799	6,429,717	7,718,752	2,842,980	10,042,834	20,604,566	2,383,446	13,340,636	15,724,082
2019	2,404,572	3,196,575	5,601,147	7,096,052	2,594,360	7,269,174	16,959,585	2,035,651	10,539,824	12,575,475
2020	3,886,973	3,876,000	7,762,974	7,381,643	2,684,561	7,399,649	17,465,852	2,177,558	10,783,605	12,961,162
2021	4,439,536	5,158,306	9,597,843	9,413,187	3,460,318	9,592,961	22,466,466	2,344,966	11,378,211	13,723,176
2022	3,816,927	4,555,873	8,372,799	7,883,212	2,871,457	8,181,806	18,936,475	2,317,040	11,235,618	13,552,658
2023	3,184,251	3,831,848	7,016,099	7,499,023	2,723,449	7,802,308	18,024,780	2,314,039	11,321,076	13,635,115
2024	3,834,121	4,531,562	8,365,683	8,298,946	3,023,145	8,550,360	19,872,451	2,333,455	11,397,191	13,730,646
2025	3,872,462	4,576,877	8,449,339	8,381,936	3,053,377	8,635,864	20,071,176	2,356,789	11,511,163	13,867,953
2026	3,911,187	4,622,646	8,533,833	8,465,755	3,083,910	8,722,223	20,271,889	2,380,357	11,626,275	14,006,632
2027	3,950,299	4,668,873	8,619,172	8,550,412	3,114,749	8,809,445	20,474,606	2,404,161	11,742,538	14,146,699
2028	3,989,802	4,715,562	8,705,364	8,635,917	3,145,897	8,897,539	20,679,352	2,428,202	11,859,963	14,288,165
2029	4,029,699	4,762,717	8,792,416	8,722,276	3,177,356	8,986,515	20,886,146	2,452,485	11,978,563	14,431,048
2030	4,069,996	4,810,344	8,880,340	8,809,499	3,209,130	9,076,380	21,095,008	2,477,009	12,098,348	14,575,358
2031	4,110,697	4,858,447	8,969,144	8,897,594	3,241,221	9,167,144	21,305,958	2,501,779	12,219,332	14,721,111
2032	4,151,804	4,907,032	9,058,836	8,986,569	3,273,633	9,258,814	21,519,017	2,526,797	12,341,525	14,868,322
2033	4,193,322	4,956,103	9,149,424	9,076,435	3,306,369	9,351,403	21,734,208	2,552,065	12,464,941	15,017,006
2034	4,235,256	5,005,663	9,240,919	9,167,200	3,339,433	9,444,917	21,951,550	2,577,586	12,589,590	15,167,176
2035	4,277,607	5,055,720	9,333,327	9,258,872	3,372,827	9,539,366	22,171,065	2,603,362	12,715,486	15,318,848
TOTAL	102,438,768	135,718,737	238,157,506	243,968,426	102,260,783	311,140,197	657,369,406	73,349,992	337,413,807	410,763,799

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	Empire	Future Contractor San Joaquin Valley	Kern		Kings	Oak Flat	Tulare	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	1,450,698
1970	46,969	2,292	35,450	96,673	1,381,493	2,344	2,158	93,408	1,660,786
1971	47,997	2,314	35,366	106,654	1,643,163	2,366	2,288	94,874	1,935,021
1972	49,866	2,414	37,844	122,313	1,729,169	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	2,037,076
1974	52,818	2,556	36,570	135,661	1,823,065	2,614	2,529	104,609	2,160,424
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	4,148,116
1982	134,083	6,711	67,061	311,879	3,848,922	6,862	6,382	270,061	4,651,960
1983	184,902	9,242	80,869	426,485	5,030,031	9,450	8,494	372,182	6,121,656
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	7,670,450
1988	203,711	10,223	122,903	516,432	6,388,497	10,455	10,341	410,868	7,673,430
1989	224,049	11,269	116,197	564,169	6,747,046	11,526	11,102	452,406	8,137,763
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	11,732,427
1995	395,441	19,918	220,899	898,339	11,190,121	20,373	21,551	799,070	13,565,713
1996	362,623	19,968	301,835	902,162	11,872,821	20,424	21,664	796,711	14,298,209
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	15,114,543
1999	377,156	20,793	272,057	962,625	10,908,175	21,266	21,567	829,117	13,412,755
2000	386,090	21,231	207,591	1,026,678	9,987,766	21,734	22,882	847,556	12,521,529
2001	463,709	25,514	231,713	1,211,557	11,265,338	26,105	31,783	1,018,354	14,274,074
2002	427,983	21,663	224,572	1,084,631	10,267,062	22,173	25,718	817,061	12,890,861
2003	494,752	25,202	242,078	1,177,971	11,268,413	25,794	30,739	944,655	14,209,603
2004	442,383	22,653	244,434	1,124,933	10,643,526	61,739	25,476	732,208	13,297,353
2005	427,294	21,930	257,152	1,013,691	10,307,808	59,689	24,397	708,195	12,820,155
2006	464,498	23,756	196,420	1,109,725	10,328,670	71,730	26,401	765,770	12,986,972
2007	526,638	26,707	234,971	1,268,212	11,676,926	82,393	27,121	863,603	14,706,572
2008	627,248	32,334	372,161	1,529,342	15,123,628	101,726	32,601	1,039,299	18,858,338
2009	514,796	26,167	337,170	1,264,182	12,740,240	83,940	26,765	845,444	15,838,703
2010	500,901	29,103	406,670	1,318,223	13,166,433	94,388	27,725	869,462	16,412,906
2011	602,412	35,279	403,873	1,641,938	15,524,215	111,582	39,512	1,051,322	19,410,133
2012	570,865	33,341	361,581	1,611,475	15,259,987	104,093	31,094	994,405	18,966,841
2013	650,841	38,140	411,668	1,713,683	16,643,645	118,114	30,974	1,136,300	20,743,366
2014	684,763	41,353	520,533	1,826,199	18,741,452	131,391	43,928	1,215,556	23,205,173
2015	649,733	42,371	641,425	1,822,677	19,558,598	137,485	44,332	1,240,620	24,137,241
2016	662,494	43,547	372,162	1,862,320	17,746,879	130,659	45,258	1,271,958	22,135,277
2017	580,265	37,870	375,877	1,616,141	15,897,340	115,910	42,342	1,108,561	19,774,306
2018	659,926	43,154	525,790	1,825,078	18,970,494	135,356	47,234	1,262,486	23,469,518
2019	722,163	46,835	505,293	2,075,817	20,998,689	145,270	52,570	1,373,635	25,920,271
2020	750,385	52,512	573,612	2,281,568	23,177,139	164,586	56,275	1,547,840	28,603,918
2021	737,828	51,972	632,124	2,325,470	23,887,557	164,565	56,344	1,528,836	29,384,696
2022	802,341	51,242	624,889	2,269,776	24,497,726	162,159	54,241	1,506,546	29,968,919
2023	796,283	50,868	628,110	2,163,191	24,197,477	161,227	55,138	1,495,451	29,547,746
2024	812,645	51,874	634,658	2,227,476	24,805,422	164,277	55,793	1,525,381	30,277,526
2025	820,771	52,393	641,005	2,249,751	25,053,476	165,920	56,351	1,540,634	30,580,301
2026	828,979	52,917	647,415	2,272,249	25,304,010	167,579	56,915	1,556,041	30,886,104
2027	837,269	53,446	653,889	2,294,971	25,557,050	169,255	57,484	1,571,601	31,194,964
2028	845,641	53,981	660,428	2,317,921	25,812,621	170,947	58,059	1,587,317	31,506,914
2029	854,098	54,521	667,032	2,341,100	26,070,748	172,657	58,639	1,603,190	31,821,984
2030	862,639	55,066	673,702	2,364,511	26,331,455	174,383	59,226	1,619,222	32,140,204
2031	871,265	55,616	680,439	2,388,156	26,594,770	176,127	59,818	1,635,414	32,461,607
2032	879,978	56,173	687,244	2,412,038	26,860,716	177,888	60,416	1,651,768	32,786,221
2033	888,778	56,734	694,116	2,436,158	27,129,324	179,667	61,020	1,668,286	33,114,084
2034	897,665	57,302	701,057	2,460,520	27,400,617	181,464	61,631	1,684,969	33,445,225
2035	906,642	57,875	708,068	2,485,125	27,674,623	183,278	62,247	1,701,819	33,779,676
TOTAL	30,388,952	1,806,844	21,112,296	80,811,797	873,692,260	4,828,370	1,912,291	57,766,739	1,072,319,549

TABLE B-16A Minimum OMP&R Component of Transportation Charge for Each Contractor (in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	AVEK	Coachella	Crestline	Desert	Littlerock	Mojave	Palmdale	San Bernardino	San Gabriel	San Gorgonio
	[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	11,697	2,958	19,291	1,089	24,380	8,173	52,315	14,399	8,821
1969	86,339	15,522	3,925	25,598	1,445	32,348	10,844	69,419	19,106	11,704
1970	107,807	19,392	4,904	31,981	1,804	40,391	13,540	86,727	23,865	14,623
1971	178,820	32,228	8,150	53,151	2,992	66,999	22,459	144,136	39,636	24,302
1972	363,555	106,740	30,967	176,037	6,601	213,032	48,102	548,123	144,113	89,131
1973	404,661	121,341	34,674	200,116	7,346	243,320	53,975	724,535	190,156	117,779
1974	434,868	130,627	37,062	215,432	7,677	262,735	56,383	786,107	207,019	128,169
1975	504,791	151,031	43,176	249,082	9,082	303,108	65,580	905,424	238,842	147,899
1976	559,013	160,686	44,454	265,004	10,030	325,512	73,253	964,524	256,570	158,664
1977	675,504	184,813	47,743	304,792	11,890	381,161	87,355	1,069,446	289,793	178,774
1978	600,343	187,028	54,156	308,449	10,711	373,192	78,304	1,148,279	300,751	186,384
1979	661,123	196,264	52,211	323,677	12,124	401,469	87,126	1,125,452	302,508	186,688
1980	858,039	253,090	71,921	417,398	15,435	508,379	112,853	1,518,405	401,223	248,399
1981	1,001,503	284,970	73,534	469,970	18,046	588,024	131,992	1,548,350	420,523	259,244
1982	1,128,643	320,938	89,560	529,292	20,193	649,204	148,012	1,870,559	497,871	307,955
1983	1,744,932	450,049	119,275	742,218	30,643	922,072	225,793	2,373,149	639,682	394,524
1984	2,105,780	548,784	150,179	905,055	36,810	1,112,196	271,187	3,018,294	803,394	496,808
1985	2,157,936	584,697	157,841	964,282	38,972	1,191,309	277,250	3,230,403	860,780	531,765
1986	2,311,841	618,750	162,748	1,020,438	40,051	1,268,806	295,987	3,318,638	893,069	551,066
1987	2,366,343	628,222	167,262	1,036,061	41,773	1,283,836	307,844	3,400,838	913,933	564,352
1988	2,303,274	649,276	175,694	1,070,784	40,604	1,321,553	298,438	3,587,873	960,968	593,787
1989	2,280,051	613,266	169,993	1,011,401	39,501	1,240,888	292,775	3,499,964	932,519	576,852
1990	2,636,186	708,829	201,242	1,169,006	45,472	1,424,445	336,069	4,084,211	1,078,392	667,887
1991	2,737,441	763,989	210,644	1,259,974	48,936	1,546,583	358,165	4,348,900	1,150,633	711,803
1992	2,781,586	750,248	198,232	1,237,307	49,829	1,538,733	362,844	4,131,745	1,115,632	688,558
1993	3,109,819	850,589	234,719	1,402,796	56,125	1,722,415	411,539	5,023,595	1,338,111	828,208
1994	2,825,193	794,991	225,121	1,311,100	51,259	1,634,886	376,180	4,794,820	1,267,565	783,691
1995	3,121,440	848,101	231,718	1,398,686	58,749	1,766,297	444,998	4,828,432	1,272,345	785,191
1996	3,093,678	862,720	228,008	1,422,789	56,813	1,817,427	423,444	4,707,473	1,256,549	773,653
1997	3,250,394	918,428	281,067	1,514,687	59,547	1,853,224	446,127	5,705,741	1,477,757	917,372
1998	3,876,512	1,070,517	299,639	1,765,491	73,835	3,207,848	561,246	6,076,375	1,634,942	1,000,558
1999	3,765,163	1,097,913	306,076	1,810,672	74,506	3,181,859	540,087	6,353,733	1,712,224	1,050,772
2000	3,764,355	1,038,523	292,482	1,712,733	68,662	3,008,461	596,615	5,890,416	1,575,862	966,592
2001	4,461,346	1,111,786	298,240	1,833,547	80,861	3,287,877	700,113	5,761,358	1,556,933	950,095
2002	3,651,746	1,020,593	283,190	1,683,161	62,766	3,008,560	551,276	5,645,507	1,514,835	924,879
2003	4,067,155	1,123,306	298,428	1,852,545	68,043	3,294,891	608,571	6,599,195	1,603,982	1,514,563
2004	4,447,321	1,442,509	323,076	1,909,809	76,842	3,427,748	677,248	7,224,977	1,765,936	1,435,981
2005	3,835,102	5,890,245	289,421	2,246,647	66,848	2,910,063	581,790	6,801,437	1,600,318	1,587,833
2006	4,077,931	8,420,935	307,878	2,811,005	74,610	3,150,008	639,630	7,007,886	1,689,293	1,456,824
2007	4,478,882	8,629,509	328,235	2,900,634	78,716	3,338,108	682,189	8,087,194	1,891,329	1,840,626
2008	4,922,517	9,719,225	371,893	3,294,948	81,956	4,109,281	745,685	9,319,195	2,038,175	2,499,489
2009	4,548,973	8,685,600	355,016	2,992,673	77,711	3,711,447	688,814	9,046,865	1,987,285	2,388,809
2010	4,158,247	9,299,804	360,128	3,204,041	73,294	3,783,317	622,773	8,929,821	1,962,387	2,577,734
2011	4,890,047	10,748,951	411,494	3,647,146	85,867	4,331,722	763,310	9,484,032	2,159,877	2,657,614
2012	5,437,105	11,282,622	454,518	3,926,082	97,144	4,573,436	834,224	10,766,373	2,363,846	2,639,447
2013	6,333,212	11,865,462	490,994	4,284,581	111,581	5,186,636	969,357	11,804,135	2,632,325	2,729,191
2014	6,953,618	15,364,355	528,575	5,011,192	116,445	5,844,154	1,040,481	12,785,441	2,863,180	3,090,067
2015	6,457,165	13,243,729	524,146	4,717,087	110,417	6,008,337	938,563	12,805,322	2,956,507	3,112,070
2016	6,414,569	12,956,803	541,810	4,604,732	104,876	5,473,709	932,988	13,128,732	2,986,038	3,309,920
2017	5,883,592	9,801,300	500,447	3,906,402	97,434	4,963,621	858,606	13,629,527	2,725,260	3,506,533
2018	6,441,226	14,754,526	521,051	4,636,197	108,199	5,328,537	946,367	15,039,279	2,914,065	4,150,276
2019	6,986,687	14,073,727	525,369	4,736,944	112,354	5,803,190	1,009,996	17,073,213	2,942,055	5,296,024
2020	6,960,215	16,180,474	570,681	5,080,811	108,765	6,133,528	993,259	17,574,176	3,246,999	5,462,842
2021	8,098,667	17,582,057	658,323	5,805,579	133,698	7,079,277	1,181,423	20,990,517	3,724,649	6,316,819
2022	8,066,779	17,255,903	652,647	5,705,310	133,001	6,975,988	1,175,331	20,523,125	3,681,988	6,160,689
2023	7,716,022	16,969,095	633,301	5,596,278	129,373	6,760,016	1,123,411	19,885,966	3,615,620	5,915,040
2024	7,952,336	17,441,709	651,057	5,759,413	133,344	6,953,403	1,158,750	20,609,038	3,710,827	6,181,676
2025	8,031,860	17,616,126	657,568	5,817,007	134,678	7,022,937	1,170,338	20,815,128	3,747,935	6,243,493
2026	8,112,178	17,792,287	664,144	5,875,177	136,024	7,093,167	1,182,041	21,023,279	3,785,414	6,305,928
2027	8,193,300	17,970,209	670,785	5,933,929	137,385	7,164,098	1,193,862	21,233,513	3,823,269	6,368,987
2028	8,275,233	18,149,912	677,493	5,993,268	138,758	7,235,739	1,205,800	21,445,848	3,861,501	6,432,677
2029	8,357,985	18,331,411	684,268	6,053,201	140,146	7,308,097	1,217,858	21,660,306	3,900,116	6,497,003
2030	8,441,565	18,514,725	691,111	6,113,733	141,548	7,381,178	1,230,037	21,876,908	3,939,117	6,561,973
2031	8,525,981	18,699,872	698,022	6,174,870	142,963	7,454,989	1,242,337	22,095,678	3,978,509	6,627,593
2032	8,611,241	18,886,871	705,002	6,236,619	144,393	7,529,539	1,254,761	22,316,635	4,018,294	6,693,870
2033	8,697,353	19,075,740	712,052	6,298,985	145,837	7,604,835	1,267,308	22,539,801	4,058,477	6,760,808
2034	8,784,326	19,266,497	719,172	6,361,975	147,295	7,680,883	1,279,981	22,765,200	4,099,061	6,828,417
2035	8,872,170	19,459,162	726,364	6,425,595	148,768	7,757,692	1,292,781	22,992,852	4,140,052	6,896,700
TOTAL	288,005,659	474,601,293	22,897,236	185,775,875	4,930,490	232,126,097	41,785,799	622,223,860	127,716,185	164,874,262

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
	Santa Clarita ¹	Metropolitan	Ventura	Total	Yuba City	Butte	Plumas	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	378,874
1966	0	0	0	0	0	0	0	0	31,321	408,397
1967	0	0	0	0	0	0	0	0	47,718	634,505
1968	28,085	972,734	9,504	1,218,520	0	0	0	0	46,945	2,745,160
1969	70,342	1,295,607	12,610	1,654,810	0	0	0	0	52,963	4,074,939
1970	84,577	1,624,569	15,746	2,069,923	0	0	0	0	69,744	4,676,282
1971	105,979	2,716,584	26,118	3,421,555	0	0	54	54	55,532	6,185,714
1972	202,625	8,038,463	68,369	10,035,857	0	0	40	40	80,412	12,998,869
1973	222,765	9,890,316	78,313	12,289,296	0	0	1	1	54,219	15,194,233
1974	235,528	11,581,491	83,453	14,166,551	0	0	143	143	76,783	17,372,561
1975	289,501	13,584,548	101,893	16,593,957	0	0	1,069	1,069	84,547	20,517,423
1976	262,420	12,862,489	94,799	16,037,419	0	0	139	139	106,717	20,027,213
1977	335,749	16,203,699	121,966	19,892,683	0	0	892	892	98,618	24,213,489
1978	376,946	17,811,770	132,435	21,568,747	0	0	39	39	100,786	26,012,786
1979	349,072	16,414,289	126,756	20,238,761	0	0	3,235	3,235	119,352	24,675,598
1980	415,571	20,926,898	154,096	25,901,706	0	0	416	416	178,812	32,038,398
1981	511,087	23,731,024	186,592	29,224,860	0	0	3,847	3,847	185,347	35,516,366
1982	557,494	27,994,510	209,141	34,323,374	0	0	11,075	11,075	173,894	41,611,655
1983	832,687	38,953,367	326,258	47,754,649	0	0	1,928	1,928	220,926	56,802,781
1984	943,524	45,597,671	382,104	56,371,786	0	0	3,765	3,765	225,959	67,072,552
1985	1,055,744	50,064,444	416,652	61,532,075	0	0	2,888	2,888	340,322	73,228,724
1986	1,102,466	52,858,915	442,334	64,885,109	0	0	2,787	2,787	279,227	76,682,113
1987	1,032,918	50,737,631	411,276	62,892,287	0	0	2,388	2,388	345,116	75,240,981
1988	1,042,113	51,262,231	406,248	63,712,844	0	0	545	545	365,207	76,126,695
1989	1,088,176	52,638,942	431,020	64,815,349	0	0	1,800	1,800	422,329	78,708,338
1990	1,275,150	61,053,824	494,721	75,175,234	0	0	788	788	474,284	91,448,066
1991	1,454,172	60,874,529	470,139	75,935,908	0	0	3,654	3,654	214,683	91,098,893
1992	1,579,025	67,460,598	502,131	82,396,469	0	0	647	647	443,676	100,077,320
1993	1,689,775	68,749,547	538,751	85,955,990	0	0	3,630	3,630	599,571	107,321,034
1994	1,608,731	63,898,029	473,897	80,045,461	0	0	2,279	2,279	609,966	101,233,250
1995	1,720,649	68,079,888	523,512	85,080,005	0	0	2,906	2,906	534,971	107,378,966
1996	1,966,634	72,757,439	561,100	89,927,727	0	0	8,007	8,007	571,857	113,585,948
1997	1,810,292	75,655,465	564,455	94,454,555	0	0	7,449	7,449	428,638	114,939,131
1998	2,050,254	80,540,695	608,294	102,766,204	0	0	0	0	465,095	129,072,817
1999	2,074,144	84,762,748	626,644	107,356,541	0	0	0	0	571,720	134,398,558
2000	3,391,361	82,712,917	637,765	105,656,744	0	0	0	0	0	131,483,026
2001	3,773,156	92,945,584	709,090	117,469,986	0	0	0	0	0	146,246,848
2002	3,506,435	85,660,194	659,466	108,172,608	0	0	0	0	0	143,773,109
2003	3,392,356	82,357,577	621,295	107,401,907	0	0	3,425	3,425	0	138,781,814
2004	4,034,122	99,584,709	762,014	127,112,293	0	0	3,455	3,455	0	155,915,652
2005	3,547,757	74,162,876	652,173	104,172,510	0	0	3,452	3,452	0	130,709,171
2006	3,236,833	76,359,546	600,707	109,833,086	0	0	3,905	3,905	0	136,367,449
2007	4,393,620	105,262,437	864,671	142,776,152	0	0	3,517	3,517	0	173,004,072
2008	5,290,135	113,696,305	982,288	157,071,092	0	0	5,035	5,035	0	194,884,910
2009	4,472,648	99,961,325	829,012	139,746,175	0	0	844	844	0	173,305,997
2010	4,300,764	98,237,283	792,067	138,301,660	0	0	1,062	1,062	0	175,679,860
2011	4,715,815	105,513,839	849,450	150,259,165	0	0	2,751	2,751	0	192,684,535
2012	5,145,774	118,333,861	954,982	166,809,416	0	0	1,092	1,092	0	212,327,767
2013	5,995,187	132,814,572	1,123,389	186,340,622	0	0	288	288	0	234,330,742
2014	6,413,842	145,753,405	1,170,667	206,935,423	0	0	115	115	0	257,495,980
2015	6,007,504	131,905,305	1,047,957	189,834,108	0	0	114	114	0	246,602,803
2016	5,716,927	131,623,582	1,062,551	188,857,238	0	0	5,401	5,401	0	251,894,144
2017	5,799,489	134,678,999	1,126,249	187,477,461	0	0	111	111	0	247,219,518
2018	6,057,100	140,346,901	1,102,698	202,346,422	0	0	47,578	47,578	0	268,621,882
2019	6,908,204	152,765,061	1,286,640	219,519,463	0	0	11,998	11,998	0	280,587,939
2020	7,476,567	169,923,246	1,396,161	241,107,724	0	0	211	211	0	307,901,840
2021	6,583,510	144,715,535	1,118,514	223,988,568	0	0	17,052	17,052	0	299,177,802
2022	8,609,019	204,610,733	1,657,522	285,208,035	0	0	13,886	13,886	0	356,052,773
2023	7,458,739	171,585,448	1,382,633	248,770,942	0	0	13,908	13,908	0	317,008,590
2024	7,568,247	174,215,476	1,400,085	253,735,363	0	0	15,098	15,098	0	325,996,768
2025	7,643,930	175,957,630	1,414,086	256,272,716	0	0	15,249	15,249	0	329,256,734
2026	7,720,369	177,717,205	1,428,227	258,835,440	0	0	15,402	15,402	0	332,549,299
2027	7,797,572	179,494,373	1,442,509	261,423,791	0	0	15,556	15,556	0	335,874,788
2028	7,875,548	181,289,321	1,456,935	264,038,034	0	0	15,712	15,712	0	339,233,542
2029	7,954,304	183,102,212	1,471,504	266,678,411	0	0	15,869	15,869	0	342,625,874
2030	8,033,847	184,933,236	1,486,219	269,345,196	0	0	16,027	16,027	0	346,052,133
2031	8,114,185	186,782,570	1,501,081	272,038,651	0	0	16,188	16,188	0	349,512,659
2032	8,195,327	188,650,394	1,516,092	274,759,036	0	0	16,350	16,350	0	353,007,782
2033	8,277,280	190,536,896	1,531,253	277,506,623	0	0	16,513	16,513	0	356,537,858
2034	8,360,053	192,442,266	1,546,565	280,281,692	0	0	16,678	16,678	0	360,103,239
2035	8,443,654	194,366,687	1,562,031	283,084,507	0	0	16,845	16,845	0	363,704,267
TOTAL	250,585,376	6,336,594,463	50,747,878	8,802,864,471	0	0	397,098	397,098	8,735,974	11,190,607,802

¹ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-16B Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities^{1,2,3} (in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa	Solano	Total	Alameda-Zone 7	Alameda County	Santa Clara	Total	San Luis Obispo	Santa Barbara	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	28,759	128,393	157,152	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	404,755	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	121,673	145,499	267,172	685,604	372,699	1,174,038	2,232,341	147,645	829,034	976,679
2012	130,199	185,005	315,204	830,163	319,227	1,135,648	2,285,038	186,059	920,215	1,106,274
2013	114,869	172,310	287,179	609,808	327,688	1,046,787	1,984,283	121,826	607,752	729,578
2014	97,013	94,810	191,823	317,446	235,476	541,866	1,094,788	83,501	442,785	526,286
2015	35,066	47,874	82,940	140,365	92,557	306,876	539,798	38,476	155,225	193,701
2016	4,534	8,280	12,814	30,111	17,686	63,625	111,422	5,487	33,137	38,624
2017	3,166	6,232	9,398	20,284	13,600	45,497	79,381	3,418	19,553	22,971
2018	2,351	4,574	6,925	14,868	9,854	33,347	58,069	2,488	14,447	16,935
2019	2,195	4,266	6,461	13,930	9,199	30,707	53,836	2,338	13,279	15,617
2020	2,254	4,447	6,701	14,426	9,726	32,411	56,563	2,427	13,596	16,023
2021	3,879	7,652	11,531	24,822	16,736	55,770	97,328	4,176	23,395	27,571
2022	4,958	9,782	14,740	31,729	21,394	71,289	124,412	5,338	29,906	35,244
2023	18,954	8,848	27,802	67,910	33,753	96,792	198,454	48,712	106,799	155,511
2024	10,219	4,771	14,990	36,614	18,198	52,186	106,998	26,424	57,582	84,005
2025	1,892	883	2,776	6,780	3,370	9,664	19,814	4,911	10,663	15,574
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	2,690,070	4,988,800	7,678,870	16,427,489	11,824,586	39,804,612	68,056,687	2,472,089	13,120,632	15,592,721

¹ For years 1983 through 2018, changes are debt service only and do not include bond cover.² For years 2009 through 2020, charges include Reid Gardner separation costs that are allocated to SWP water contractors based on theoretical energy use over the facility service life, 1983–2013.³ 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-16B Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities^{1,2,3} (in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA							
	Dudley Ridge	Empire	Kern		Kings	Oak Flat	Tulare	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	5,126,981
2010	250,194	27,117	96,128	5,774,210	40,474	16,580	488,098	6,692,801
2011	362,592	11,506	290,168	7,797,111	39,939	11,233	338,448	8,850,997
2012	139,042	16,387	281,108	5,881,018	53,747	16,121	654,940	7,042,363
2013	174,617	9,247	247,481	4,100,710	25,730	11,818	300,486	4,870,089
2014	121,811	4,353	114,780	2,211,296	10,098	7,131	151,394	2,620,863
2015	57,355	2,365	89,264	1,214,150	5,119	3,182	93,155	1,464,590
2016	14,059	654	23,321	308,938	1,447	850	26,898	376,167
2017	11,439	483	19,972	241,980	1,103	687	21,598	297,262
2018	8,180	347	14,164	173,270	790	495	15,497	212,743
2019	7,715	330	13,368	164,789	749	464	14,869	202,284
2020	8,141	345	14,344	171,798	779	492	15,483	211,382
2021	14,009	594	24,681	295,614	1,340	846	26,641	363,725
2022	17,907	759	31,549	377,875	1,713	1,082	34,055	464,940
2023	15,726	1,082	49,690	418,506	3,425	1,402	31,541	521,371
2024	8,479	583	26,791	225,641	1,847	756	17,005	281,102
2025	1,570	108	4,961	41,785	342	140	3,149	52,055
2026	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0
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	9,549,905	427,078	19,113,103	206,310,299	856,331	605,476	18,073,079	254,935,271

¹ For years 1983 through 2018, charges are debt service only and do not include bond cover.

² For years 2009 through 2020, charges include Reid Gardner separation costs that are allocated to SWP water contractors based on theoretical energy use over the facility service life, 1983–2013.

³ 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-16B Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities^{1,2,3} (in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	AVEK	Coachella	Crestline	Desert	Littlerock	Mojave	Palmdale	San Bernardino	San Gabriel	San Geronio
	[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	565,798	35,432	894,572	1,250	0	0	233,134	28,548	0
1984	2,499,848	1,427,428	102,114	2,263,172	77	0	0	502,967	693,074	0
1985	3,749,257	2,032,672	170,137	3,230,451	0	0	157,601	884,188	601,583	0
1986	3,159,857	2,097,408	173,460	3,340,188	15,873	0	301,486	739,563	1,088,901	0
1987	3,167,759	1,991,841	190,149	3,230,424	95,994	1,786	258,719	1,951,799	1,091,691	0
1988	2,688,113	1,940,156	187,156	3,194,137	30,395	846	126,639	2,000,664	839,774	0
1989	2,357,669	1,326,863	132,076	2,218,516	50,948	13,206	493,424	1,257,332	792,087	0
1990	2,528,625	1,463,452	115,746	2,413,745	110,678	0	545,342	1,192,997	1,054,762	0
1991	1,048,414	1,022,405	125,256	1,686,304	65,111	473,291	488,207	540,119	796,531	0
1992	2,760,199	1,124,775	55,985	1,855,065	22,891	1,130,876	367,996	362,232	853,047	0
1993	3,559,487	2,256,338	29,498	3,721,492	60,615	1,101,799	640,919	425,969	1,406,255	0
1994	3,963,982	1,345,145	74,879	2,218,411	88,549	1,371,116	678,876	871,358	1,452,741	0
1995	4,324,009	2,498,462	44,237	4,120,837	43,892	881,146	636,541	75,278	1,397,623	0
1996	3,572,856	4,652,945	77,384	7,674,388	31,691	760,763	723,670	458,246	1,201,941	0
1997	3,411,379	4,294,703	42,135	4,319,206	24,319	891,191	648,652	625,340	1,175,556	0
1998	3,977,988	7,554,910	16,624	6,174,031	30,365	508,248	657,806	166,952	827,650	0
1999	3,696,973	3,195,685	71,662	3,678,076	18,305	501,486	710,674	815,001	1,375,575	0
2000	2,372,130	1,420,806	40,083	1,954,947	0	374,972	257,146	617,664	508,258	0
2001	2,680,895	460,256	53,460	759,169	0	213,385	445,872	1,339,699	119,363	0
2002	1,668,457	567,521	74,145	936,215	0	140,035	529,674	2,414,011	841,746	0
2003	1,445,146	411,258	44,506	678,236	0	405,376	277,984	780,631	624,561	3,303
2004	1,813,317	554,874	71,974	760,283	0	465,965	368,929	2,072,770	449,963	44,648
2005	2,047,638	1,721,141	32,667	1,987,091	0	542,366	400,828	1,568,493	566,063	41,448
2006	2,845,985	5,071,235	26,843	2,093,821	0	1,417,777	442,278	1,533,665	681,916	265,078
2007	2,990,954	3,225,680	77,880	1,331,802	0	2,023,088	710,515	2,639,102	177,256	248,328
2008	3,547,772	4,059,802	74,029	2,237,582	1,845	2,200,333	1,052,126	3,410,480	629,597	616,986
2009	3,350,539	4,067,070	79,671	1,633,327	3,263	2,559,670	1,152,062	3,948,007	1,025,723	819,589
2010	4,321,133	7,385,867	31,714	2,730,993	177	3,304,241	810,142	4,668,858	1,673,291	1,048,807
2011	4,952,954	5,605,548	13,018	2,290,872	407	309,065	551,068	2,185,513	1,468,910	954,501
2012	5,401,397	8,864,502	48,852	3,451,280	495	848,848	1,072,349	7,388,666	1,677,958	1,225,982
2013	2,563,236	3,520,765	77,123	1,425,559	3,270	475,946	512,798	1,986,377	591,150	679,437
2014	1,148,978	1,021,712	56,389	644,953	3,804	273,011	348,413	787,781	231,637	284,110
2015	530,003	828,767	25,589	460,870	2,214	205,015	131,952	568,141	185,603	90,577
2016	153,406	165,508	3,945	121,267	746	46,118	29,017	118,424	48,184	18,721
2017	119,205	110,299	2,891	95,545	657	29,311	20,939	70,192	34,110	8,651
2018	85,967	85,377	2,116	70,388	469	20,361	15,186	50,970	24,858	6,898
2019	80,915	73,828	1,939	64,042	463	20,012	14,322	49,234	23,603	6,301
2020	84,198	77,648	2,069	68,300	476	20,314	14,855	48,035	24,108	5,495
2021	144,880	133,609	3,560	117,524	818	34,954	25,561	82,654	41,483	9,455
2022	185,196	170,788	4,551	150,228	1,046	44,680	32,674	105,654	53,026	12,086
2023	463,426	522,886	21,921	210,704	7,349	311,218	104,079	387,771	108,848	96,747
2024	249,875	281,918	11,819	113,603	3,962	167,796	56,115	209,070	58,686	52,162
2025	46,274	52,206	2,189	21,037	734	31,073	10,391	38,716	10,868	9,659
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	96,844,171	91,251,857	2,528,872	82,642,653	723,149	24,120,683	16,823,827	52,173,717	28,558,108	6,548,969

¹ For years 1983 through 2018, charges are debt service only and do not include bond cover.² For years 2009 through 2020, charges include Reid Gardner separation costs that are allocated to SWP water contractors based on theoretical energy use over the facility service life, 1983–2013.³ 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-16B Minimum OMP&R Component of Transportation Charge for Each Contractor for Off-Aqueduct Power Facilities^{1,2,3} (in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				Total State Water Project
	Santa Clarita ⁴	Metropolitan	Ventura	Total	Yuba City	Butte	Plumas	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	411,247	12,791,358	0	16,045,220	0	0	0	0	20,182,468
1984	1,122,640	39,229,567	0	47,840,887	0	0	0	0	60,556,781
1985	1,572,025	77,446,523	0	89,844,437	0	0	0	0	108,590,343
1986	1,694,487	77,581,287	0	90,192,510	0	0	0	0	107,702,921
1987	1,694,698	68,939,195	0	82,614,055	0	0	0	0	99,411,597
1988	1,776,471	79,936,309	0	92,720,660	0	0	0	0	108,898,833
1989	1,348,806	68,311,546	0	78,302,473	0	0	0	0	89,857,307
1990	1,335,341	83,964,409	277,885	95,002,982	0	0	0	0	104,000,038
1991	531,160	54,214,229	132,209	61,123,236	0	0	0	0	64,233,890
1992	1,548,472	72,401,054	0	82,482,592	0	0	0	0	92,173,695
1993	1,332,392	55,312,615	0	69,847,379	0	0	0	0	87,174,348
1994	1,450,328	72,838,621	0	86,354,006	0	0	0	0	97,722,979
1995	1,901,361	40,862,813	0	56,786,199	0	0	0	0	74,988,898
1996	1,507,542	36,536,259	401	57,198,086	0	0	0	0	71,940,675
1997	1,468,949	37,121,379	108,559	54,131,368	0	0	0	0	65,536,671
1998	1,599,394	30,341,609	149,170	52,004,747	0	0	0	0	65,310,733
1999	1,694,851	42,257,580	106,226	58,122,094	0	0	0	0	72,133,666
2000	994,396	43,977,877	123,318	52,641,597	0	0	0	0	60,213,003
2001	1,418,179	49,405,276	84,868	56,980,422	0	0	0	0	62,827,875
2002	1,384,832	45,412,974	153,549	54,123,159	0	0	0	0	59,683,427
2003	1,353,956	41,917,356	129,134	48,071,447	0	0	0	0	53,245,891
2004	1,677,090	58,676,035	170,851	67,126,699	0	0	0	0	73,135,768
2005	1,443,555	56,220,579	61,131	66,633,000	0	0	0	0	75,946,420
2006	1,617,750	60,701,335	70,268	76,767,951	0	0	0	0	85,894,802
2007	1,864,667	61,354,857	119,861	76,763,990	0	0	0	0	83,828,015
2008	3,303,503	72,144,765	300,729	93,579,549	0	0	0	0	102,461,628
2009	3,010,931	71,530,603	313,357	93,493,812	0	0	0	0	102,494,682
2010	2,663,067	88,263,837	322,003	117,224,130	0	0	0	0	128,041,374
2011	1,811,301	80,381,761	225,564	100,750,482	0	0	0	0	113,077,671
2012	2,619,529	78,031,475	299,385	110,930,718	0	0	0	0	121,679,597
2013	2,266,914	49,351,291	144,019	63,597,885	0	0	0	0	71,469,014
2014	1,191,895	24,242,063	30,070	30,264,816	0	0	0	0	34,698,576
2015	545,173	14,384,861	27,465	17,986,230	0	0	0	0	20,267,259
2016	94,339	3,266,601	7,114	4,073,390	0	0	0	0	4,612,417
2017	68,403	2,367,279	5,183	2,932,665	0	0	0	0	3,341,677
2018	50,099	1,692,245	3,471	2,108,405	0	0	0	0	2,403,077
2019	46,927	1,617,666	4,133	2,003,385	0	0	0	0	2,281,583
2020	48,331	1,676,232	3,418	2,073,479	0	0	0	0	2,364,148
2021	83,163	2,884,303	5,881	3,567,845	0	0	0	0	4,068,000
2022	106,304	3,686,913	7,518	4,560,664	0	0	0	0	5,200,000
2023	290,764	6,502,589	68,560	9,096,861	0	0	0	0	10,000,000
2024	165,009	3,505,925	36,965	4,912,905	0	0	0	0	5,400,000
2025	30,557	649,233	6,845	909,781	0	0	0	0	1,000,000
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	54,140,798	1,873,932,284	3,499,110	2,333,788,198	0	0	0	0	2,680,051,747

¹ For years 1983 through 2018, charges are debt service only and do not include bond cover.

² For years 2009 through 2020, charges include Reid Gardner separation costs that are allocated to SWP water contractors based on theoretical energy use over the facility service life, 1983–2013.

³ 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.

⁴ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

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		Reach 3A		Reach 3B		Reach 1		Reach 1	
	Barker Slough Pumping Plant		Cordelia Pumping Plant Solano		Cordelia Pumping Plant Napa ¹		South Bay and Del Valle Pumping Plants ²		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	0.2445431	0.2445431
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	4.4256141	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	3.5788850	3.5788850	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	6.5309908	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	5.8810391	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	0.8686401	1.7143948	0.8457546	0.8457546
1984	0	0	0	0	1.6496750	1.6496750	2.7674018	3.9368186	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	5.5522552	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	9.6521246	12.6148370	2.9627125	2.9627125
1998	-0.3253238	-0.3253238	-0.5570754	-0.8823992	-0.9104311	-1.2357549	-1.8866894	-1.7684350	0.1182544	0.1182544
1999	0.8136316	0.8136316	1.3344157	2.1480473	2.2476094	3.0612409	4.1251508	6.5396327	2.4144819	2.4144819
2000	1.3866159	1.3866159	1.9633803	3.3499962	3.0210750	4.4076910	6.3105300	8.6058809	2.2953510	2.2953510
2001	8.1191305	8.1191305	12.5398434	20.6589739	22.6630508	30.7821813	42.1952424	54.9383080	12.7430656	12.7430656
2002	4.1919309	4.1919309	5.3026984	9.4946293	8.9411156	13.1330465	18.1280636	24.2060285	6.0779649	6.0779649
2003	4.3522704	4.3522704	7.0890449	11.4413153	12.8010552	17.1533258	19.2857696	26.0112488	6.7254792	6.7254792
2004	4.9185632	4.9185632	6.4207890	11.3393522	12.6192952	17.5378585	19.8727176	27.1452671	7.2725495	7.2725495
2005	6.2825152	6.2825152	7.7243202	14.0068354	18.6455213	24.9280365	26.0020232	34.1325784	8.1305553	8.1305553
2006	5.4643637	5.4643637	6.2978001	11.7621638	18.3453434	23.8097071	22.9801792	29.8291644	6.8489852	6.8489852
2007	7.7729574	7.7729574	8.2251545	15.9981120	22.8302678	30.6032252	31.6892501	40.9364665	9.2472164	9.2472164
2008	7.7712063	7.7712063	10.0850134	17.8562197	22.0080859	29.7792922	28.6376013	41.0218578	12.3842566	12.3842566
2009	5.2307641	5.2307641	6.6759943	11.9067584	14.3356641	19.5664281	21.2200326	27.1252620	5.9052294	5.9052294
2010	6.0240210	6.0240210	8.7796927	14.8037137	16.7619335	22.7859545	24.7882865	34.2228072	9.4345207	9.4345207
2011	6.8696533	6.8696533	9.0284149	15.8980682	20.2247175	27.0943708	29.9210149	40.7362625	10.8152476	10.8152476
2012	6.7319945	6.7319945	9.2934146	16.0254090	18.7001369	25.4321314	30.5386453	40.7547865	10.2161412	10.2161412
2013	8.9365933	8.9365933	10.6303355	19.5669288	25.7001699	34.6367632	36.2847047	49.0911967	12.8064920	12.8064920
2014	10.7168590	10.7168590	15.0140628	25.7309218	31.6904879	42.4073469	45.2658760	64.9042288	19.6383528	19.6383528
2015	11.1978550	11.1978550	15.7328654	26.9307204	32.4907231	43.6885781	48.0526192	68.8615073	20.8088882	20.8088882
2016	8.5381757	8.5381757	12.3990287	20.9372044	28.7641321	37.3023078	36.9618577	52.0654473	15.1035896	15.1035896
2017	8.1434086	8.1434086	12.7527497	20.8961584	22.6906268	30.8340354	43.3224098	56.9406160	13.6182063	13.6182063
2018	10.7474922	10.7474922	16.0100454	26.7575376	27.2749254	38.0224176	40.5927885	56.3865384	15.7937499	15.7937499
2019	10.7940478	10.7940478	15.0267386	25.8207864	28.0814874	38.8755352	34.0905610	48.8333635	14.7428025	14.7428025
2020	11.8494621	11.8494621	18.0140758	29.8635379	32.5097772	44.3592394	44.0903788	61.0842229	16.9938441	16.9938441
2021	11.8106199	11.8106199	9.7642406	21.5748605	29.8366223	41.6472422	52.5598319	98.9676503	46.4078184	46.4078184
2022	12.9407199	12.9407199	0.0000000	12.9407199	32.6977612	45.6384811	45.3914416	62.8209258	17.4294842	17.4294842
2023	15.1007589	15.1007589	0.0000000	15.1007589	38.1555683	53.2563272	46.7946645	63.8262615	17.0315969	17.0315969
2024	13.9663920	13.9663920	0.0000000	13.9663920	24.2109644	38.1773564	48.6778086	69.1348145	20.4570060	20.4570060
2025	13.9946227	13.9946227	0.0000000	13.9946227	24.2599311	38.2545538	48.7761937	62.1650771	13.3888834	13.3888834
2026	13.9937121	13.9937121	0.0000000	13.9937121	24.2583238	38.2520358	48.7729906	68.3878599	19.6148693	19.6148693
2027	13.9965308	13.9965308	0.0000000	13.9965308	24.2632032	38.2597340	48.7828490	59.6577276	10.8748786	10.8748786
2028	13.9911752	13.9911752	0.0000000	13.9911752	24.2539036	38.2450788	48.7641279	67.5323036	18.7681757	18.7681757
2029	13.9942324	13.9942324	0.0000000	13.9942324	24.2592423	38.2534747	48.7748411	69.8057278	21.0308867	21.0308867
2030	13.9942108	13.9942108	0.0000000	13.9942108	24.2591849	38.2533956	48.7747415	64.3536589	15.5789174	15.5789174
2031	13.9940156	13.9940156	0.0000000	13.9940156	24.2588404	38.2528560	48.7740693	67.3191583	18.5450890	18.5450890
2032	13.9942758	13.9942758	0.0000000	13.9942758	24.2592997	38.2535755	48.7749905	65.4927995	16.7178090	16.7178090
2033	13.9959454	13.9959454	0.0000000	13.9959454	24.2621699	38.2581153	48.7807578	66.8060375	18.0252797	18.0252797
2034	13.9908500	13.9908500	0.0000000	13.9908500	24.2533295	38.2441795	48.7630077	63.9318704	15.1688627	15.1688627
2035	13.9974415	13.9974415	0.0000000	13.9974415	24.2648106	38.2622520	48.8281413	75.6615893	26.8334480	26.8334480

¹ For the period 1968 through 1987, rates are for an interim facility.² 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		Reach 14A		Reach 15A		Reach 16A		Reach 17E	
	Dos Amigos Pumping Plant		Buena Vista Pumping Plant		Teerink Pumping Plant		Chrisman Pumping Plant		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	0	0	0	0	0	0	0
1969	0.7028165	1.8095316	0	0	0	0	0	0	0	0
1970	0.7813430	1.7278778	0.3333333	2.0612111	0	0	0	0	0	0
1971	0.4125312	1.2933749	1.1407617	2.4341366	0.7218469	3.1559834	0	0	0	0
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	2.6186586	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	17.2862572
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	0.8326785	2.5948359	1.2041660	3.7990019	1.3723736	5.1713756	2.8986491	8.0700247	10.2096358	18.2796606
1983	0.3647859	1.2105406	0.7590265	1.9695670	0.8857383	2.8553053	1.7623405	4.6176458	5.5086367	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	8.8397871	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	3.326417	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	1.4945529	5.6692662	3.1250716	8.7943378	10.7461772	19.5405149
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	0.8634492	3.2779311	1.4586807	4.7366118	1.3440477	6.0806594	3.5713752	9.6520347	14.2047038	23.8567384
2000	0.9235333	3.2188842	1.6219853	4.8408695	1.7828715	6.6237410	4.2029220	10.8266630	15.3882971	26.2149601
2001	6.0480004	18.7910696	11.1462381	29.9373077	12.2218485	42.1591562	28.2483594	70.4075156	103.7300557	176.1375712
2002	2.6241935	8.7021584	4.6014533	13.3036118	5.0195728	18.3231845	11.6145173	29.9377018	43.1577241	73.0954260
2003	3.1186984	9.8441776	5.5847107	15.4288883	6.0840848	21.5129731	14.1510704	35.6640435	52.6131846	88.2772280
2004	3.3307184	10.6032678	5.8667696	16.4700374	6.3726502	22.8426876	14.8454678	37.6881554	55.1910093	92.8791647
2005	3.8404797	11.9710350	6.8919336	18.8629686	7.4708789	26.3338474	17.3710070	43.7048544	62.2136403	105.9184947
2006	3.1304521	9.9794374	5.8156675	15.7951048	6.2588030	22.0539078	14.6287519	36.6826597	46.5155773	83.1982370
2007	4.5235888	13.7708052	8.0959250	21.8667302	8.7648333	30.6315634	20.3203176	50.9518811	68.7599408	119.7118218
2008	4.7891758	17.1734324	8.9151286	26.0885610	10.3636881	36.4522491	21.6290386	58.0812876	68.9957991	127.0770868
2009	3.0971133	9.0023427	5.6829687	14.6853114	6.2915516	20.9768629	13.8696395	34.8465025	63.6534319	98.4999340
2010	4.1046451	13.5391658	7.0457731	20.5849389	7.6442173	28.2291561	17.4937007	45.7228568	64.2646308	110.6474876
2011	4.5655551	15.3808027	8.0295979	23.4104006	8.6501186	32.0605192	19.9059635	51.9664827	70.7123833	122.6788660
2012	4.5884313	14.8045725	7.9535354	22.7599279	8.7048110	31.4647389	20.0475227	51.5122616	71.2771280	122.7893896
2013	5.5133566	18.3198486	9.6020369	27.9218855	10.4617288	38.3836143	24.2512836	62.6348978	86.8762318	149.5111296
2014	8.4009024	28.0392551	13.7446113	41.7838665	15.1827311	56.9665976	34.7045230	91.6711207	126.3797167	218.0508374
2015	7.7933326	28.6022207	14.1501362	42.7523569	15.5598316	58.3121885	35.2207624	93.5329509	130.8279476	224.3608984
2016	6.5670011	21.6705907	11.6875457	33.3581363	12.8544122	46.2125485	29.0803807	75.2929292	109.3186220	184.6115512
2017	6.2769738	19.8951801	11.1321471	31.0273272	12.3607667	43.3880939	27.8119892	71.2000831	104.7566595	175.9567426
2018	6.4950171	22.2887670	11.9455270	34.2342940	13.2440142	47.4783082	29.9127412	77.3910495	112.5862207	189.9772701
2019	6.0874654	20.8302680	10.9234240	31.7536919	12.1220921	43.8757841	27.5106288	71.3864129	103.2599237	174.6463366
2020	6.8256704	23.8195145	10.5091297	34.3286441	13.5296191	47.8582632	30.8305990	78.6888622	114.6280134	193.3168756
2021	17.1864066	63.5942250	22.3931561	85.9873811	24.7499875	110.7373686	57.9651295	168.7024981	224.4503158	393.1528139
2022	6.9744774	24.4039616	12.8474923	37.2514539	13.7067539	50.9582077	31.5727193	82.5309270	117.4430779	199.9740049
2023	7.1622149	24.1938118	13.2245798	37.4183917	14.0869598	51.5053515	32.4251165	83.9304680	120.6014029	204.5318709
2024	8.4644096	28.9214155	15.2769534	44.1983690	16.5608815	60.7592504	38.4099445	99.1691949	142.8426902	242.0118851
2025	8.4937315	21.8826148	15.3406739	27.2232888	16.6316944	53.8549832	38.5756139	92.4305971	143.4644819	235.8950790
2026	8.3640797	27.9789490	15.0056863	42.9846352	16.2502083	59.2348435	37.6756653	96.9105088	140.0574138	236.9679226
2027	8.5139953	19.3888739	15.3925752	34.7814491	16.6907670	51.4722161	38.7149490	90.1871651	143.9919084	234.1790735
2028	8.4040461	27.1722218	15.1098019	42.2820236	16.3688528	58.6508765	37.9556098	96.6064863	141.1174457	237.7239320
2029	8.4811861	29.5120729	15.3082085	44.8202814	16.5947039	61.4149853	38.4883337	99.9033190	143.1339809	243.0372998
2030	8.3765036	23.9554210	15.0374015	38.9928224	16.2862646	57.2790871	37.7606748	93.0397619	140.3790447	233.4188066
2031	8.8080764	27.3531654	16.1733276	43.5264930	17.5838484	61.1103414	40.8251067	101.9354481	151.9941064	253.9295545
2032	8.1616650	24.8794740	14.4906508	39.3701247	15.6652410	55.0353657	36.2970064	91.3323721	134.8433384	226.1757105
2033	8.7982702	26.8235499	16.1459140	42.9694639	17.5522854	60.5217493	40.7503625	101.2721118	151.7099965	252.9821083
2034	8.2115933	23.3804561	14.6181465	37.9986025	15.8100423	53.8086448	36.6382604	90.4469052	136.1338798	226.5807850
2035	9.4082716	36.2417196	17.8397735	54.0814932	19.5052931	73.5867862	45.3780993	118.9648855	169.3133587	288.2782442

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		Reach 22B		Reach 23		Reach 26A	
	Alamo Powerplant		Pearblossom Pumping Plant		Mojave Siphon Powerplant		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	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	1.9331104	14.2279695	0	0	-2.3717647	11.8562048
1973	0	0	3.8751940	16.5877053	0	0	-8.9027252	7.6849801
1974	0	0	3.1602116	15.0844343	0	0	-5.3440968	9.7403376
1975	0	0	3.0210558	15.0873353	0	0	-5.7803309	9.3070043
1976	0	0	3.7579009	17.4290378	0	0	-6.6439666	10.7850713
1977	0	0	3.0796474	20.4102211	0	0	-12.0911833	8.3190378
1978	0	0	4.0233030	16.9382236	0	0	-8.2569506	8.6812730
1979	0	0	5.0776468	22.3639040	0	0	-9.7140035	12.6499005
1980	0	0	4.3918283	23.5904804	0	0	-8.3797007	15.2107797
1981	0	0	3.9973528	22.6475824	0	0	-6.7528590	15.8947235
1982	0	0	3.6829998	21.9626604	0	0	-6.9238898	15.0387706
1983	0	0	1.7205305	11.8468130	0	0	-23.7923457	-11.9455328
1984	0	0	2.4763871	17.3513877	0	0	-29.2940447	-11.9426570
1985	0	0	3.4967556	24.3337274	0	0	-30.7672356	-6.4335082
1986	-2.3583180	34.0359544	5.9864597	40.0224141	0	0	-29.2499580	10.7724561
1987	-2.5482255	29.3442686	5.0535029	34.3977715	0	0	-29.7006534	4.6971181
1988	-1.3847067	28.6178385	4.7392460	33.3570844	0	0	-29.0334518	4.3236326
1989	-1.1019487	38.3465243	6.4066114	44.7531357	0	0	-28.3706997	16.3824360
1990	-1.0673268	51.7406253	8.9787944	60.7194197	0	0	-28.8797266	31.8396931
1991	-1.5206590	33.9038630	6.0785417	39.9824047	0	0	-30.3294563	9.6529484
1992	-2.6080003	19.4065859	3.6219501	23.0285360	0	0	-29.7938993	-6.7653633
1993	-0.1885524	-4.4223656	-1.0192774	-5.4416430	0	0	-30.6629489	-36.1045919
1994	-0.1279266	37.4728379	6.4513573	43.9241952	0	0	-30.4781656	13.4460296
1995	-3.4425314	16.0979836	3.3643070	19.4622905	0	0	-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	18.9577198	3.8823748	22.8400946	-5.1563836	17.6837110	-30.2385322	-12.5548211
2000	-5.3488706	20.8660895	4.5542443	25.4203338	-5.1804371	20.2398967	-30.2852311	-10.0453343
2001	-4.6452108	171.4923604	29.6368741	201.1292345	-5.7699537	195.3592808	-30.9018397	164.4574412
2002	-5.4660286	67.6293974	12.9716072	80.6010046	-6.4072101	74.1937944	-30.1661590	44.0276354
2003	-3.3142156	84.9630124	15.4234144	100.3864268	-7.1779336	93.2084932	-30.3892607	62.8192325
2004	-5.5767140	87.3024508	16.2222541	103.5247049	-7.4292488	96.0954561	-30.2389380	65.8565181
2005	-5.5017080	100.4167867	17.9460159	118.3628026	-6.6110924	111.7517103	-30.2939296	81.4577807
2006	-3.1387155	80.0595215	13.5370501	93.5965716	-5.4976224	88.0989491	-29.8005787	58.2983704
2007	-2.7809944	116.9308274	20.1415397	137.0723671	-6.1785168	130.8938504	-30.0961198	100.7977306
2008	-5.4028716	121.6742151	19.4997782	141.1739933	-6.0198040	135.1541893	-30.7631237	104.3910656
2009	-6.3446584	92.1552760	21.4425748	113.5978508	-5.4878092	108.1100416	-33.3163094	74.7937322
2010	-5.1343883	105.5130993	18.8695769	124.3826762	-6.4564845	117.9261917	-38.6783430	89.2478487
2011	-5.2103711	117.4684949	20.8125082	138.2810032	-7.1272044	131.1537988	-29.9982569	101.1555419
2012	-2.7221204	120.0672692	21.0412588	141.1085280	-11.4254128	129.6831152	-30.6216868	99.0614284
2013	-3.7638094	145.7473202	25.7024082	171.4497284	-10.3251093	161.1246192	-30.7664075	130.3582117
2014	-8.1801225	209.8707149	38.5993980	248.4701129	-7.8617556	240.6083573	-29.6636049	210.9447523
2015	-9.0636991	215.2971993	40.4252791	255.7224784	-9.3774506	246.3450278	-29.6064491	216.7385787
2016	-9.7489045	174.8626467	32.2787529	207.1413996	-11.8723142	195.2690854	-30.7102289	164.5588565
2017	-10.1318567	165.8248859	30.8877789	196.7126648	-16.8845410	179.8281237	-30.2238617	149.6042621
2018	-7.9692616	182.0080085	33.3422532	215.3502617	-10.7765089	204.5737528	-30.6516186	173.9221342
2019	-5.9659854	168.6803511	30.3103146	198.9906657	-12.0064957	186.9841700	-29.7056642	157.2785059
2020	-13.9506239	179.3662518	34.9572057	214.3234574	-12.7608463	201.5626111	-30.0932162	171.4693950
2021	-12.7295895	380.4232245	50.4305941	430.8538185	-17.7786865	413.0751320	-29.9389315	383.1362005
2022	-9.5568640	190.4171409	35.0215071	225.4386480	-18.7596812	206.6789668	-31.4372377	175.2417292
2023	-9.5575299	194.9743410	35.9986763	230.9730173	-18.7394815	212.2335358	-31.4010736	180.8324622
2024	-11.8909190	230.1209661	39.2950382	269.4160043	-17.3969300	252.0190743	-30.4359622	221.5831121
2025	-12.2509873	223.6440917	40.7148298	264.3589215	-18.0119601	246.3469615	-30.3059782	216.0409833
2026	-11.9772473	224.9906754	39.6989535	264.6896289	-17.5470426	247.1425864	-30.5860468	216.5565395
2027	-12.1903401	221.9887334	40.4954040	262.4841374	-17.9086723	244.5754651	-30.4335380	214.1419270
2028	-12.0758111	225.6481208	40.0558841	265.7040049	-17.7140610	247.9899439	-30.6374706	217.3524733
2029	-12.1304800	230.9068198	40.2669950	271.1738148	-17.8068845	253.3669303	-30.3617508	223.0051794
2030	-12.0263875	231.3924191	39.8818798	261.2742989	-17.6302589	243.6440400	-30.4484268	213.1956131
2031	-12.4761690	241.4533855	41.5505097	283.0038952	-18.3968947	264.6070005	-30.5243329	234.0826676
2032	-11.6509408	214.5247696	38.4996344	253.0244040	-16.9971371	236.0272669	-29.8456288	206.1816381
2033	-12.5589741	240.4231342	41.8651110	282.2882452	-18.5390142	263.7492310	-31.2590658	232.4901652
2034	-11.8121792	214.7686058	39.0825247	253.8511305	-17.2682820	236.5828485	-29.7556756	206.8271729
2035	-12.6949161	275.5833281	42.3778795	317.9612076	-18.7730006	299.1882070	-31.5424404	267.6457666

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 EBX2B Greenspot Pump Station ³		Reach EBX2E Citrus Pump Station		Reach EBX3A Crafton Hills Pump Station		Reach EBX4B Cherry Valley Pump Station	
	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	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	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	0	0
1995	0	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0	0
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
2003	0	0	0	0	0	0	0	0
2004	20.6831806	86.5396987	0.0000000	0.0000000	21.4551370	107.9948357	8.6683948	116.6632305
2005	18.9026723	100.3604529	0.0000000	0.0000000	17.9720829	118.3325358	3.6826445	122.0151803
2006	15.9293183	74.2276888	0.0000000	0.0000000	21.0165830	95.2442718	20.2208674	115.4651392
2007	20.4837738	121.2815045	0.0000000	0.0000000	28.4303950	149.7118995	63.2274011	212.9393006
2008	16.8739520	121.2650176	0.0000000	0.0000000	23.8349468	145.0999644	7.1460269	152.2459912
2009	17.5479106	92.3416428	0.0000000	0.0000000	23.7727941	116.1144369	3.9676080	120.0820450
2010	17.0436537	106.2915024	0.0000000	0.0000000	24.2451243	130.5366267	3.4310537	133.9676803
2011	18.0600345	119.2155764	0.0000000	0.0000000	25.1226812	144.3382575	3.5638138	147.9020713
2012	18.3655399	117.4269684	0.0000000	0.0000000	25.8843213	143.3112897	4.3752116	147.6865013
2013	22.4122237	152.7704354	0.0000000	0.0000000	31.8353926	184.6058280	3.9034336	188.5092615
2014	32.2725826	243.2173349	0.0000000	0.0000000	46.5776827	289.7950176	3.2898236	293.0848412
2015	35.2630732	252.0016520	0.0000000	0.0000000	49.0106122	301.0122642	4.3527636	305.3650277
2016	30.8193702	195.3782267	0.0000000	0.0000000	40.6132597	235.9914864	4.5412833	240.5327697
2017	55.4822029	205.0864650	33.0810327	182.6852948	38.8882439	221.5735387	5.7619049	227.3354436
2018	1.8736076	175.7957418	54.6489226	228.5710568	43.1510324	271.7220892	3.5111963	275.2332855
2019	11.3188357	168.5973416	60.5085406	217.7870465	41.4646490	259.2516955	3.7125141	262.9642096
2020	91.7851469	263.2545419	36.2653445	207.7347395	45.8872852	253.6220247	6.7568479	260.3788726
2021	67.6707317	450.8069322	54.2481203	437.3843208	47.4829932	484.8673140	6.3877848	491.2550988
2022	0.0000000	175.2417292	55.0301541	230.2718833	48.4365125	278.7083958	8.2256262	286.9340220
2023	0.0000000	180.8324622	51.1885357	232.0209979	45.0610790	277.0820769	7.6149326	284.6970095
2024	0.0000000	221.5831121	60.9303468	282.5134589	53.5633911	336.0768500	9.5156069	345.5924569
2025	0.0000000	216.0409833	61.0534682	277.0944515	53.6716763	330.7661278	9.5347784	340.3009062
2026	0.0000000	216.5565395	61.0495183	277.6060578	53.6682081	331.2742659	9.5342004	340.8084663
2027	0.0000000	214.1419270	61.0618497	275.2037767	53.6789981	328.8827748	9.5361272	338.4189020
2028	0.0000000	217.3524733	61.0383430	278.3908163	53.6583815	332.0491978	9.5324663	341.5816641
2029	0.0000000	223.0051794	61.0518304	284.0570099	53.6702312	337.7272411	9.5344894	347.2617305
2030	0.0000000	213.1956131	61.0516378	274.2472509	53.6701349	327.9173858	9.5344894	337.4518752
2031	0.0000000	234.0826676	61.0508671	295.1335347	53.6693642	348.8028989	9.5343931	358.3372920
2032	0.0000000	206.1816381	61.0520231	267.2336612	53.6704239	320.9040851	9.5345857	330.4386708
2033	0.0000000	232.4901652	61.0591522	293.5493174	53.6766859	347.2260033	9.5356455	356.7616488
2034	0.0000000	206.8271729	61.0369942	267.8641671	53.6572254	321.5213925	9.5321773	331.0535698
2035	0.0000000	267.6457666	61.0657996	328.7115662	53.6825626	382.3941288	9.5367052	391.9308340

³ Citrus Pump Station began operation during 2017. No planned water deliveries are scheduled for 2020–2035 at Reach EBX-R2C, so no costs or rates are shown for Greenspot Pump Station. All deliveries through Crafton and Cherry Valley Pump Stations (2019–2035) are assumed to flow through Citrus Pump Station.

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 29A		Reach 29G		Reach 29J		Reach 31A		Reach 33A	
	Oso Pumping Plant		Warne Powerplant		Castaic Powerplant		Las Perillas and Badger Hill Pumping Plants		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	Unit Rate	Cumulative Unit Rate
	[37]	[38]	[39]	[40]	[41]	[42]	[43]	[44]	[45]	[46]
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	1.5014866	4.1182219	0	0
1969	0	0	0	0	0	0	1.2624066	3.0719381	0	0
1970	0	0	0	0	0	0	1.6309699	3.3588477	0	0
1971	0	0	0	0	0	0	1.4985537	2.7919286	0	0
1972	1.1017349	13.3965941	0	0	-2.9350830	10.4615111	1.9517720	3.4211474	0	0
1973	0.7905574	13.5030687	0	0	-6.8099448	6.6931239	1.5374531	3.0757814	0	0
1974	0.7530214	12.6772442	0	0	-7.4013274	5.2759168	1.5168982	2.9878282	0	0
1975	0.8405850	12.9068644	0	0	-6.5604921	6.3463723	1.1130304	2.6699305	0	0
1976	0.7771828	14.4483197	0	0	-6.7213324	7.7269873	1.5685447	3.2790543	0	0
1977	0.6152458	17.9458194	0	0	-30.4985994	-12.5527800	1.7573375	4.1392043	0	0
1978	0.5222831	13.4372037	0	0	-9.0130187	4.4241850	1.9429506	4.0089431	0	0
1979	0.7045701	17.9908273	0	0	-19.0478097	-1.0569824	1.5600341	4.3608941	0	0
1980	1.4269064	20.6255585	0	0	-20.5438586	0.0816999	1.5124754	3.6770034	0	0
1981	1.5684309	20.2186605	0	0	-10.0059379	10.2127225	1.5414199	4.7045073	0	0
1982	1.4942585	19.7739190	-2.1714430	17.6024760	-9.5987314	8.0037446	1.7581649	4.3530008	0	0
1983	1.2818887	11.4081712	-8.9130752	2.4950960	-39.8193120	-37.3242160	0.1782765	1.3888171	0	0
1984	1.7796296	16.6546302	-15.0246012	1.6300290	-17.3126964	-15.6826674	0.8546712	2.6822403	0	0
1985	2.1683838	23.0053556	-14.7115359	8.2938197	-38.9450629	-30.6512432	1.2014351	3.6785929	0	0
1986	3.2288411	39.6231134	-14.1893653	25.4337481	-28.1596224	-2.7258742	2.2635886	6.9752505	0	0
1987	3.1272967	35.0197908	-14.8696165	20.1501743	-27.0536484	-6.9034741	1.9135072	5.9486162	0	0
1988	2.9878581	32.9904032	-14.7032843	18.2871189	-25.6857024	-7.3985835	1.7733386	5.6554272	0	0
1989	3.5262089	42.9746819	-14.4231503	28.5515316	-25.3986130	3.1529186	2.4159040	7.4317239	0	0
1990	3.6810660	56.4890182	-14.1850383	42.3039798	-26.0776142	16.2263657	3.7962150	9.8240367	0	0
1991	2.1853025	37.6098245	-14.7118704	22.8979541	-25.0234633	-2.1255092	2.4131016	7.1520492	0	0
1992	1.9048343	23.9194204	-14.6199430	9.2994774	-25.1951357	-15.8956583	1.2766372	4.5092789	0	0
1993	0.1569728	-4.0768404	-10.3386607	-14.4155011	-21.1218973	-35.5373984	-1.1726172	-0.7762411	0	0
1994	3.0638504	40.6646149	-14.7696788	25.8949361	-26.7437304	-0.8487943	2.3645104	7.0748798	0	0
1995	1.5724835	21.1129984	-12.2705974	8.8424010	-25.6907993	-16.8483983	2.5750402	5.4022971	0	0
1996	3.1318961	42.5378346	-14.8515762	27.6862584	-29.5639188	-1.8776604	2.5837041	7.6010922	0	0
1997	2.7928728	41.5836062	-14.9272063	26.6563999	-27.1541858	-0.4977859	2.7029648	6.9426653	24.4572499	31.3999152
1998	-0.3226129	-6.1639346	-8.6695834	-14.8335180	-22.2303491	-37.0638671	-0.5072304	-0.6085333	-4.1828906	-4.7914239
1999	1.9037719	25.7605103	-14.9340263	10.8264840	-27.0443818	-16.2178978	1.3710724	4.6490034	9.8811650	14.5301684
2000	1.8064079	28.0213680	-14.1657261	13.8556418	-26.9670096	-13.1113678	1.9062744	5.1251586	14.1572786	19.2824372
2001	13.3506231	189.4881943	-16.7349304	172.7532639	-29.2914159	143.4618480	12.1791731	30.9702427	92.1279543	123.0981970
2002	4.8843487	77.9797747	-13.2004543	64.7793204	-23.7780808	41.0012396	5.4523577	14.1545162	42.2356425	56.3901587
2003	6.1234197	94.4006477	-13.9757172	80.4249305	-23.8496317	56.5752988	6.2991083	16.1432859	48.5398663	64.6831522
2004	6.4691088	99.3482735	-14.1574758	85.1907977	-25.2967499	59.8940478	6.4578566	17.0611245	52.5234071	69.5845316
2005	7.3345862	113.2530808	-14.2938796	98.9592012	-24.7472457	74.2119556	8.2161336	20.1871686	62.2439815	82.4311501
2006	5.2527061	88.4509431	-14.0865037	74.3644394	-23.8861273	50.4783121	7.4054795	17.3849169	52.1629592	69.5478761
2007	8.1627364	127.8745582	-12.5169061	115.3576522	-25.0603889	90.2972633	9.9497197	23.7205248	73.5621548	97.2826796
2008	8.5535144	135.6306012	-13.8809446	121.7496566	-29.0198140	92.7298426	10.5303147	27.7037471	79.6384293	107.3421766
2009	6.9000813	105.4000157	-10.4812488	94.9187668	-24.7607898	70.1579771	6.7838810	15.7862237	62.9156433	78.7018670
2010	7.9652264	118.6127140	-13.8211960	104.7915180	-26.2504816	78.5410364	8.4639527	22.0031185	68.9378650	90.9409836
2011	8.4278727	131.1067387	-14.1584994	116.9482393	-28.7386599	88.2095794	9.7697761	25.1505788	85.4589931	110.6095719
2012	8.4530651	131.2424548	-13.8982775	117.3441773	-25.6245942	91.7195831	8.9148718	23.7194443	84.0072128	107.7266571
2013	10.2850969	159.7962265	-14.3636831	145.4325434	-25.5768325	119.8557109	12.2163090	30.5361575	94.0115337	124.5476913
2014	15.0335064	233.0843438	-14.0124517	219.0718921	-26.4213846	192.6505076	16.6022731	44.6415282	105.9560101	150.5975384
2015	15.5860469	239.9469453	-14.2676550	225.6792904	-25.0847717	200.5945186	16.9599385	45.5621592	128.4756945	174.0378537
2016	12.9510657	197.5626168	-14.0588274	183.5037895	-24.9945598	158.5092297	12.8588071	34.5293978	97.1588605	131.6882583
2017	12.4099953	188.3667379	-13.8955888	174.4711491	-25.7687520	148.7023971	12.1275781	32.0227582	78.4167513	110.4395095
2018	13.4390428	203.4163129	-15.2646424	188.1516705	-26.6439108	161.5077598	16.3738165	38.6625835	120.7575605	159.4201440
2019	12.4037096	187.0500462	-14.8238687	172.2261775	-27.3405902	144.8855873	15.7812736	36.6115416	112.1443691	148.7559107
2020	13.8504508	207.1673264	-14.1644563	193.0028701	-25.6056178	167.3972523	18.3992903	42.2188048	134.2064042	176.4252090
2021	35.7379986	428.8908125	-27.0798202	401.8109924	-51.2168158	350.5941766	12.7304411	76.3246661	142.5862527	218.9109188
2022	13.4356167	213.4096216	-14.2420249	199.1675967	-24.0754501	175.0921465	12.0748566	36.4788182	97.2659962	133.7448144
2023	13.5446759	218.0765468	-14.4392565	203.6372903	-24.0706505	179.5666398	12.4259115	36.6197233	100.1150880	136.7348114
2024	17.6766938	259.6885789	-15.9707416	243.7178373	-24.2171211	219.5007162	9.5989655	38.5203810	150.1614230	188.6818040
2025	16.5750830	252.4701620	-14.9721977	237.4979643	-23.7017921	213.7961722	9.6218516	31.5044664	150.4643295	181.9687960
2026	16.1274508	253.0953734	-14.5668417	238.5285317	-23.0437247	215.4848071	9.6212198	37.6001687	150.4544385	188.0546072
2027	16.9898604	251.1689383	-15.3466897	235.8222443	-24.3105851	211.5116592	9.6231573	29.0120311	150.4848379	179.4968690
2028	16.2308474	253.9547794	-14.6652273	239.2895521	-23.2003459	216.0892062	9.6194718	36.7916936	150.4271191	187.2188127
2029	16.8509611	259.8882610	-15.2230957	244.6651653	-24.1095761	220.5555891	9.6215778	39.1336507	150.4601477	189.5937984
2030	16.0927576	249.5115642	-14.5348298	234.9767344	-22.9917953	211.9849391	9.6215567	33.5769777	150.4598473	184.0368250
2031	19.4806654	273.4102200	-17.6130691	255.7971509	-28.0120540	227.7850969	9.6214304	36.9745958	150.4577689	187.4323646
2032	15.1477836	241.3234941	-13.6790861	227.6444080	-21.6029703	206.0414376	9.6216094	34.5010833	150.4606235	184.9617068
2033	18.9850307	271.9671390	-17.1600055	254.8071335	-27.2697469	227.5373866	9.6227466	36.4462965	150.4784024	186.9246989
2034	15.1518419	241.7326269	-13.6844135	228.0482134	-21.6143888	206.4338246	9.6192402	32.9996963	150.4236384	183.4233347
2035	29.5722335	317.8504777	-26.8125655	291.0379122	-43.3449930	247.6929193	9.6237891	45.8655087	150.4946538	196.3601625

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 Contractor¹ (in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa	Solano	Total	Alameda-Zone 7	Alameda County	Santa Clara	Total	San Luis Obispo	Santa Barbara	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	16,237	54,380	70,617	258,207	193,717	444,579	896,503	54,386	292,594	346,980
2000	21,853	93,587	115,441	375,486	237,544	749,863	1,362,894	76,397	438,502	514,899
2001	287,659	528,307	815,967	1,675,681	989,109	2,451,313	5,116,103	527,230	2,332,218	2,859,448
2002	90,290	266,205	356,494	1,067,734	640,899	1,453,943	3,162,576	245,579	1,558,398	1,803,978
2003	131,103	266,087	397,190	1,076,990	647,811	2,301,219	4,026,020	288,034	1,744,375	2,032,409
2004	141,816	356,192	498,008	1,325,729	624,583	1,614,003	3,564,314	289,820	2,067,009	2,356,828
2005	189,426	393,907	583,333	1,486,725	850,784	2,499,318	4,836,827	350,415	1,924,273	2,274,688
2006	182,948	319,395	502,343	1,306,684	740,195	2,186,379	4,233,258	292,727	1,618,727	1,911,454
2007	332,691	606,197	938,888	1,614,267	901,674	2,710,161	5,226,102	367,339	2,698,622	3,065,961
2008	395,206	527,598	922,805	1,567,709	767,748	1,941,383	4,276,840	365,178	1,974,345	2,339,523
2009	213,146	272,177	485,323	843,243	501,080	1,552,127	2,896,450	299,134	1,215,989	1,515,123
2010	282,374	305,677	588,052	1,351,323	627,657	1,947,175	3,926,156	341,665	1,616,476	1,958,141
2011	306,109	307,816	613,926	1,748,638	948,748	2,961,421	5,658,807	422,418	2,511,286	2,933,704
2012	251,514	316,882	568,396	1,724,257	654,336	2,348,233	4,726,826	424,874	2,097,869	2,522,743
2013	433,372	526,180	959,551	2,128,755	1,087,237	3,112,143	6,328,135	458,460	2,244,100	2,702,560
2014	599,974	395,945	995,919	1,545,098	1,202,782	2,169,620	4,917,500	480,184	2,505,378	2,985,562
2015	488,162	506,917	995,079	1,480,045	941,195	3,145,832	5,567,072	597,780	2,027,653	2,625,433
2016	334,707	360,288	694,995	2,384,152	798,340	4,093,734	7,276,226	552,959	3,921,783	4,474,742
2017	253,371	415,101	668,473	2,103,390	938,277	4,134,457	7,176,124	314,200	4,303,787	4,617,988
2018	443,930	690,493	1,134,423	2,228,565	912,592	4,809,343	7,950,500	386,913	4,395,824	4,782,737
2019	438,397	605,311	1,043,708	2,024,531	689,569	2,393,608	5,107,708	393,013	2,943,537	3,336,551
2020	535,418	816,469	1,351,887	1,575,549	1,107,910	2,760,830	5,444,289	473,525	2,147,977	2,621,502
2021	544,309	692,041	1,236,350	3,129,062	2,373,625	5,923,300	11,425,986	687,599	614,921	1,302,520
2022	794,794	370,803	1,165,598	2,654,541	1,321,237	3,769,256	7,745,034	1,659,773	3,650,163	5,309,937
2023	927,459	432,697	1,360,156	2,691,016	1,338,287	3,829,576	7,858,878	1,702,075	3,731,766	5,433,841
2024	664,859	400,193	1,065,052	2,941,986	1,468,103	4,148,089	8,558,178	2,363,051	5,149,504	7,512,555
2025	666,203	401,002	1,067,205	2,604,162	1,291,995	3,729,905	7,626,062	2,287,348	4,966,292	7,253,640
2026	666,159	400,976	1,067,135	2,903,900	1,447,947	4,103,272	8,455,119	2,363,846	5,132,386	7,496,233
2027	666,293	401,057	1,067,350	2,483,015	1,228,902	3,579,464	7,291,381	2,256,276	4,898,829	7,155,104
2028	666,038	400,903	1,066,941	2,863,004	1,426,720	4,051,938	8,341,662	2,353,340	5,109,576	7,462,916
2029	666,184	400,991	1,067,175	2,973,636	1,484,463	4,188,344	8,646,443	2,383,194	5,174,394	7,557,588
2030	666,183	400,990	1,067,173	2,708,868	1,346,358	3,861,220	7,916,446	2,313,343	5,022,733	7,336,076
2031	666,173	400,985	1,067,158	2,856,635	1,424,035	4,039,150	8,319,819	2,356,025	5,115,404	7,471,429
2032	666,186	400,992	1,067,178	2,761,819	1,373,598	3,929,568	8,064,985	2,324,969	5,047,975	7,372,944
2033	666,265	401,040	1,067,305	2,831,650	1,410,992	4,008,362	8,251,004	2,349,643	5,101,549	7,451,192
2034	666,022	400,894	1,066,916	2,686,934	1,334,685	3,835,912	7,857,531	2,305,631	5,005,990	7,311,621
2035	666,337	401,083	1,067,420	3,265,628	1,637,986	4,539,695	9,443,310	2,468,247	5,359,062	7,827,309
TOTAL	17,174,211	15,754,184	32,928,395	78,886,451	42,754,539	132,207,809	253,848,799	40,194,815	117,803,007	157,997,822

¹ 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 Contractor¹ (in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge	Empire	Future Contractor San Joaquin Valley	Kern		Kings	Oak Flat	Tulare	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	769,054	4,785	6,353	158,419	999,455
1972	62,365	8,515	0	0	1,151,788	2,057	7,375	379,686	1,611,786
1973	33,931	4,615	0	0	770,121	2,307	3,017	77,630	891,621
1974	49,114	4,413	0	46,752	677,660	2,206	3,114	106,332	889,591
1975	63,140	4,671	0	34,580	848,249	2,491	3,920	134,295	1,091,346
1976	70,851	5,132	0	94,653	966,820	2,737	4,910	100,597	1,245,701
1977	26,565	1,758	0	84,875	498,624	3,644	2,602	43,067	661,135
1978	108,944	938	0	190,675	1,616,975	4,319	6,294	24,901	1,953,046
1979	107,956	4,871	0	194,048	2,371,175	5,602	13,172	434,472	3,131,297
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	263,077	2,398,339	7,275	8,904	263,922	3,089,737
1982	108,561	937	0	145,246	2,375,404	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	216,437	1,996,259	5,946	7,475	10,496	2,319,036
1985	114,571	12,938	0	242,645	2,567,184	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	504,168	4,230,949	16,140	15,529	375,604	5,339,753
1988	188,170	14,894	0	524,965	4,250,194	15,528	11,928	374,528	5,380,207
1989	285,261	15,450	0	681,238	6,158,648	20,063	21,693	649,604	7,831,957
1990	218,786	7,710	0	845,877	4,778,185	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	227,332	1,699,824	6,059	5,222	151,055	2,170,758
1993	20,064	4,843	0	78,585	340,588	2,090	1,467	123,913	571,550
1994	135,626	7,854	0	471,316	3,417,815	9,967	10,102	293,748	4,346,428
1995	181,772	4,611	0	409,656	3,437,735	11,619	10,492	288,010	4,343,895
1996	286,064	9,577	0	715,404	6,328,965	21,039	16,403	1,196,303	8,573,755
1997	308,515	0	0	650,416	5,627,735	0	15,559	94,838	6,697,063
1998	16,993	(54)	0	(16,341)	91,651	(2)	1,171	(2,095)	91,324
1999	195,683	10,411	0	473,993	4,043,627	13,112	11,761	956,653	5,705,239
2000	194,868	5,791	0	150,870	4,259,519	11,588	10,347	638,347	5,271,330
2001	787,383	25,556	0	156,315	11,851,444	29,314	45,773	1,119,234	14,015,019
2002	425,666	12,227	0	183,569	8,013,811	24,836	29,691	839,776	9,529,575
2003	453,639	14,136	0	493,523	9,967,581	36,345	28,691	1,041,918	12,035,833
2004	520,408	37,769	0	1,406,548	8,941,409	95,991	33,665	861,595	11,897,384
2005	979,573	45,897	0	838,412	17,679,307	237,098	34,100	1,675,969	21,490,356
2006	719,318	32,753	0	995,639	13,811,204	95,104	29,053	1,079,845	16,762,915
2007	621,545	28,698	0	773,722	12,139,655	79,615	32,985	1,199,203	14,875,423
2008	380,804	16,263	0	758,463	7,720,180	65,877	24,583	582,248	9,548,418
2009	191,017	9,308	0	65,782	5,123,834	30,527	11,769	331,321	5,763,560
2010	403,762	44,124	0	144,037	9,138,524	65,686	27,417	785,379	10,608,929
2011	933,415	29,454	0	710,131	19,628,670	103,162	29,363	851,153	22,285,349
2012	271,131	33,192	0	533,877	11,599,272	109,628	32,773	1,321,365	13,901,238
2013	495,479	28,707	0	620,817	11,996,975	85,096	36,114	808,436	14,071,623
2014	524,070	14,468	0	218	7,092,279	35,178	29,850	250,346	7,946,410
2015	445,070	17,848	0	498,828	9,334,046	35,152	22,411	495,827	10,849,183
2016	453,089	39,484	0	279,749	13,592,988	79,314	28,017	918,551	15,391,192
2017	1,082,258	33,782	0	830,915	25,664,346	152,869	39,397	1,203,620	29,007,187
2018	903,877	35,461	0	107,985	14,507,757	82,758	36,152	879,075	16,553,065
2019	688,024	40,369	0	302,042	22,334,989	108,148	32,198	2,011,743	25,517,514
2020	618,479	29,727	0	204,186	11,582,602	75,484	36,367	435,146	12,981,991
2021	466,555	9,539	0	145,414	4,070,699	152,057	38,147	1,183,308	6,065,721
2022	638,603	43,927	0	1,948,838	16,512,812	138,457	59,609	1,280,793	20,623,040
2023	633,104	43,549	0	1,950,251	16,496,198	137,348	58,248	1,269,764	20,588,461
2024	756,816	52,059	0	2,321,324	19,361,237	163,225	69,963	1,517,883	24,242,505
2025	572,624	39,389	0	1,906,363	15,586,455	123,931	45,790	1,148,465	19,423,018
2026	732,153	50,362	0	2,254,067	18,794,835	157,967	67,083	1,468,419	23,524,886
2027	507,368	34,900	0	1,760,590	14,255,292	110,009	37,192	1,017,586	17,722,937
2028	711,043	48,910	0	2,210,546	18,383,392	153,463	64,187	1,426,080	22,997,620
2029	772,272	53,122	0	2,357,599	19,687,164	166,527	71,926	1,548,882	24,657,491
2030	626,865	43,120	0	2,016,705	16,635,481	135,504	53,280	1,257,252	20,768,207
2031	715,778	49,236	0	2,265,666	18,716,295	154,473	63,424	1,435,576	23,400,447
2032	651,046	44,783	0	2,048,832	17,012,389	140,663	57,175	1,305,749	21,260,637
2033	701,919	48,282	0	2,233,095	18,425,112	151,517	61,646	1,407,780	23,029,352
2034	611,820	42,085	0	1,965,199	16,233,283	132,293	51,878	1,227,076	20,263,634
2035	948,373	65,235	0	2,863,134	23,872,904	204,099	91,770	1,902,074	29,947,590
TOTAL	25,838,191	1,429,157	0	48,081,214	582,256,283	4,074,700	1,780,288	47,278,003	710,737,836

¹ 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 Contractor¹ (in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	AVEK	Coachella	Crestline	Desert	Littlerock	Mojave	Palmdale	San Bernardino	San Gabriel	San Geronio
	[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	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	780	0	12,785	0	4,496	1,515	0	32,107	0	0
1973	286	102,812	6,896	159,536	3,855	0	0	301,444	0	0
1974	15,558	100,955	9,890	157,742	4,932	221	0	177,173	5,961	0
1975	99,186	108,253	12,758	170,111	6,391	0	0	136,066	50,723	0
1976	385,090	135,276	17,835	213,594	8,164	0	0	139,354	65,476	0
1977	199,166	0	23,598	0	1,974	1,702	0	239,663	74,838	0
1978	581,729	174,116	20,875	264,178	2,731	0	0	37,043	67,462	0
1979	1,058,904	228,437	28,603	340,510	2,328	90,803	0	236	3,668	0
1980	1,390,117	256,759	29,229	401,038	3,667	94,362	0	0	16,504	0
1981	1,480,362	274,149	33,632	430,304	23,861	90,590	0	254,649	57,523	0
1982	923,973	292,674	27,190	461,216	0	230,608	0	126,461	189,895	0
1983	333,772	172,336	10,792	272,477	385	0	0	(71,602)	(8,768)	0
1984	485,847	273,597	19,572	433,785	15	0	0	(66,353)	(91,433)	0
1985	821,069	413,406	34,603	657,011	0	0	32,464	(47,544)	(32,348)	0
1986	1,109,047	728,808	60,274	1,160,650	5,548	0	105,375	69,170	101,843	0
1987	1,019,605	668,383	63,601	1,083,530	32,651	585	157,843	88,076	49,930	0
1988	1,019,793	688,891	66,914	1,134,141	11,991	300	50,654	92,465	38,688	0
1989	1,736,901	978,885	97,114	1,633,489	38,269	8,951	350,953	340,460	210,334	0
1990	2,442,558	1,402,619	110,934	2,313,410	90,472	0	446,408	599,573	530,099	0
1991	286,485	277,078	33,945	456,999	17,978	128,405	132,700	35,339	52,116	0
1992	587,340	240,119	11,952	396,022	4,871	241,338	78,306	(22,718)	(53,500)	0
1993	(190,611)	(809,033)	(2,389)	(1,334,429)	(3,246)	(61,112)	(29,466)	(157,452)	(519,798)	0
1994	1,841,902	189,616	34,480	312,714	41,201	731,185	315,446	122,829	204,783	0
1995	761,209	(251,547)	7,960	(414,889)	7,727	165,622	114,342	(7,579)	(140,714)	0
1996	1,883,530	508,274	18,313	838,330	16,510	289,044	385,745	49,537	133,848	0
1997	2,121,818	365,342	24,076	330,153	15,099	414,596	438,212	61,553	115,882	0
1998	(577,005)	(3,979,131)	(2,991)	(3,279,862)	(4,405)	(46,209)	(84,367)	(87,188)	(432,227)	0
1999	1,309,467	(633,767)	20,018	(729,435)	6,484	180,423	263,297	(161,631)	(222,717)	0
2000	1,743,925	(425,149)	24,166	(584,980)	0	283,085	189,047	(184,824)	(152,086)	0
2001	10,748,924	1,496,563	206,495	2,468,506	0	850,559	1,788,151	4,356,149	388,120	0
2002	3,940,517	737,683	162,410	1,216,924	0	332,521	1,250,873	3,146,998	1,094,131	0
2003	5,100,245	907,298	145,685	1,496,291	0	1,429,259	981,068	1,640,399	1,377,877	7,287
2004	5,218,767	1,018,471	192,767	1,395,500	0	1,344,202	1,061,772	3,812,245	825,907	98,114
2005	6,008,037	3,463,503	90,184	3,998,681	0	1,584,002	1,176,081	2,655,846	1,139,106	91,179
2006	6,435,505	7,059,933	56,471	2,914,919	0	3,169,772	1,000,104	2,155,121	949,331	438,917
2007	9,390,046	7,381,216	231,420	3,047,519	0	6,190,010	2,227,985	6,074,439	405,610	618,123
2008	5,837,461	4,833,042	114,611	2,615,449	3,042	3,538,967	1,734,466	4,009,847	752,868	760,805
2009	4,116,185	3,415,150	96,644	1,365,958	3,871	3,229,714	1,413,481	3,402,548	861,600	782,106
2010	6,171,356	7,525,268	42,100	2,783,016	0	4,662,917	1,157,373	4,795,987	1,711,774	1,111,183
2011	11,047,442	9,132,221	62,167	3,679,937	0	659,640	1,268,372	3,567,845	2,386,360	1,564,825
2012	10,123,877	11,589,118	80,922	4,467,769	0	1,559,144	2,005,754	9,802,898	2,185,097	1,649,531
2013	7,440,013	8,371,628	220,418	2,710,278	0	1,249,652	1,540,112	4,628,208	1,206,074	1,813,699
2014	3,672,568	2,574,663	296,572	643,171	0	849,317	1,763,898	2,507,832	253,016	1,507,624
2015	2,758,646	7,876,783	308,650	2,431,157	0	2,216,654	1,256,412	5,660,368	1,248,393	1,199,573
2016	6,842,657	11,066,440	211,672	3,602,687	0	4,484,836	1,838,856	10,817,066	2,647,423	2,754,289
2017	15,565,434	12,445,620	161,306	4,732,880	0	6,636,389	2,305,004	13,132,022	3,299,672	3,562,907
2018	10,025,875	23,731,266	244,056	8,304,086	0	1,149,307	1,858,302	8,485,907	2,966,242	3,586,366
2019	10,668,762	5,439,949	75,355	2,192,148	79,269	4,295,137	2,042,723	13,627,957	3,652,007	3,734,008
2020	6,753,065	19,578,141	144,117	6,720,229	273,534	718,133	1,258,434	4,662,686	1,353,408	2,943,188
2021	5,757,325	5,988,258	743,122	1,068,184	35,379	3,747,458	1,298,384	5,296,500	551,716	937,138
2022	16,571,831	14,546,816	719,243	5,861,836	262,776	10,801,299	3,721,322	10,792,345	3,028,177	2,978,375
2023	16,968,960	15,010,903	738,573	6,048,846	269,065	11,075,096	3,810,384	11,136,505	3,124,785	2,955,155
2024	20,028,156	18,393,614	877,026	7,411,955	317,567	12,998,610	4,497,254	13,644,978	3,828,956	3,587,250
2025	19,466,474	17,933,562	857,287	7,226,571	308,629	12,737,665	4,370,676	13,303,786	3,733,188	3,532,323
2026	19,582,740	17,976,358	860,056	7,243,816	310,487	12,762,376	4,396,993	13,335,564	3,742,097	3,537,592
2027	19,322,599	17,775,921	851,123	7,163,047	306,344	12,646,892	4,338,326	13,186,899	3,700,373	3,512,788
2028	19,640,128	18,042,429	863,005	7,270,440	311,394	12,809,489	4,409,841	13,384,569	3,755,851	3,545,618
2029	20,097,453	18,511,660	881,717	7,459,523	318,651	13,078,081	4,512,612	13,732,510	3,853,530	3,604,577
2030	19,270,133	17,697,368	847,881	7,131,393	305,522	12,592,126	4,326,672	13,128,646	3,684,020	3,502,750
2031	21,015,581	19,431,202	920,832	7,830,065	333,206	13,651,983	4,718,724	14,414,463	4,044,949	3,719,541
2032	18,672,158	17,115,138	821,375	6,896,776	296,044	12,195,897	4,192,458	12,696,780	3,562,819	3,429,953
2033	20,926,094	19,299,009	917,847	7,776,796	331,784	13,614,064	4,698,589	14,316,533	4,017,430	3,703,186
2034	18,693,712	17,168,724	823,308	6,918,369	296,381	12,231,864	4,197,223	12,736,506	3,573,974	3,436,336
2035	23,985,155	22,217,275	1,041,175	8,952,751	380,305	15,372,453	5,385,725	16,480,752	4,624,919	4,068,242
TOTAL	452,735,683	409,234,350	16,764,220	172,324,818	5,087,198	235,311,501	96,751,363	306,626,009	83,846,779	78,274,550

¹ 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 Contractor¹ (in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	Grand Total
	Santa Clarita	Metropolitan	Ventura	Total	Yuba City	Butte	Plumas	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	30,401	0	0	30,401	0	0	0	0	0	1,117,912
1969	30,627	0	0	30,627	0	0	0	0	0	773,646
1970	39,430	0	0	39,430	0	0	0	0	0	1,103,799
1971	34,871	0	0	34,871	0	0	0	0	0	1,513,434
1972	47,571	848,011	0	947,266	0	0	0	0	0	3,297,202
1973	28,968	1,083,328	0	1,687,126	0	0	0	0	0	3,174,991
1974	28,982	1,872,297	0	2,373,712	0	0	0	0	0	3,926,489
1975	28,568	3,887,152	0	4,499,209	0	0	0	0	0	6,057,701
1976	38,365	5,485,263	0	6,488,418	0	0	0	0	0	8,477,311
1977	21,006	(796,686)	0	(234,739)	0	0	0	0	0	1,152,444
1978	45,550	3,696,428	0	4,890,112	0	0	0	0	0	7,632,606
1979	83,940	4,021,960	0	5,859,389	0	0	0	0	0	9,873,798
1980	51,143	5,362,245	0	7,605,064	0	0	0	0	0	10,425,875
1981	118,583	10,862,932	0	13,626,585	0	0	0	0	0	17,576,025
1982	132,575	7,685,168	0	10,069,760	0	0	0	0	0	13,566,611
1983	(335,712)	(8,994,497)	0	(8,620,817)	0	0	0	0	0	(7,441,457)
1984	(142,910)	(7,633,741)	0	(6,721,621)	0	0	0	0	0	(4,008,601)
1985	(335,343)	(15,739,366)	0	(14,196,048)	0	0	0	0	0	(10,310,371)
1986	54,812	1,135,478	0	4,531,005	0	0	0	0	0	11,629,559
1987	(40,745)	(3,007,097)	0	116,362	0	0	0	0	0	6,746,470
1988	(74,006)	(3,407,929)	0	(378,098)	0	0	0	0	0	6,351,151
1989	178,359	9,488,536	0	15,062,251	0	0	0	0	0	24,661,302
1990	422,502	30,759,725	204,582	39,322,882	0	0	0	0	0	48,184,400
1991	(3,054)	184,870	22,623	1,625,484	0	0	0	0	0	2,463,685
1992	(208,900)	(9,471,028)	0	(8,196,198)	0	0	0	0	0	(5,499,060)
1993	(491,161)	(21,473,875)	0	(25,072,572)	0	0	0	0	0	(24,652,636)
1994	66,338	4,059,683	0	7,920,177	0	0	0	0	0	13,514,307
1995	(247,735)	(4,895,977)	0	(4,901,581)	0	0	0	0	0	(99,701)
1996	72,171	1,859,275	0	6,054,577	0	0	0	0	0	15,893,938
1997	22,440	2,428,729	(921)	6,336,979	0	0	0	0	0	14,932,641
1998	(733,387)	(14,593,773)	(68,568)	(23,889,113)	0	0	0	0	0	(24,030,879)
1999	(448,290)	(9,194,693)	(30,003)	(9,640,848)	0	0	0	0	0	(2,621,509)
2000	(360,679)	(14,982,560)	6,226	(14,443,828)	0	0	0	0	0	(7,179,265)
2001	4,442,763	157,946,899	265,404	184,958,532	0	0	0	0	0	207,765,068
2002	1,972,925	59,841,457	279,778	73,976,216	0	0	0	0	0	88,828,838
2003	3,152,927	94,319,451	358,003	110,915,789	0	0	0	0	0	129,407,240
2004	3,252,013	107,156,248	416,820	125,792,825	0	0	0	0	0	144,109,361
2005	3,021,174	114,294,615	123,563	137,645,971	0	0	0	0	0	166,831,175
2006	2,267,127	83,188,003	93,385	109,728,588	0	0	0	0	0	133,138,558
2007	4,251,809	138,191,973	318,256	178,328,407	0	0	0	0	0	202,434,780
2008	3,787,162	83,673,640	409,647	112,071,007	0	0	0	0	0	129,158,592
2009	2,596,698	60,903,427	350,975	82,538,359	0	0	0	0	0	93,198,814
2010	2,755,830	89,821,474	402,744	122,941,021	0	0	0	0	0	140,022,299
2011	2,817,663	131,808,061	425,260	168,419,794	0	0	0	0	0	199,911,580
2012	3,549,371	103,454,541	479,973	150,947,997	0	0	0	0	0	172,667,200
2013	5,686,557	107,522,589	403,726	142,792,953	0	0	0	0	0	166,854,823
2014	5,146,067	70,203,891	17,917	89,436,535	0	0	0	0	0	106,281,926
2015	5,454,777	112,508,845	216,398	143,136,654	0	0	0	0	0	163,173,422
2016	5,015,534	167,126,887	522,767	216,931,113	0	0	0	0	0	244,768,269
2017	7,406,300	216,621,270	2,188,167	288,056,970	0	0	0	0	0	329,526,741
2018	6,786,849	110,494,122	312,000	177,944,380	0	0	0	0	0	208,365,105
2019	6,319,695	188,471,830	3,327,006	243,925,846	0	0	0	0	0	278,931,326
2020	7,608,031	72,164,876	1,340,581	125,518,422	0	0	0	0	0	147,918,092
2021	15,572,762	109,596,168	1,308,166	151,900,561	0	0	0	0	0	171,931,138
2022	8,503,462	187,355,970	2,146,608	267,290,060	0	0	0	0	0	302,133,668
2023	9,176,997	192,847,635	2,200,293	275,363,195	0	0	0	0	0	310,604,532
2024	11,771,892	236,051,132	2,679,779	336,088,170	0	0	0	0	0	377,466,459
2025	11,440,597	229,502,215	2,610,350	327,023,326	0	0	0	0	0	362,393,251
2026	11,555,210	231,014,324	2,629,370	328,946,984	0	0	0	0	0	369,490,357
2027	11,309,246	227,133,138	2,584,087	323,830,783	0	0	0	0	0	357,067,555
2028	11,583,916	231,714,603	2,636,919	329,968,202	0	0	0	0	0	369,837,342
2029	11,830,279	237,476,262	2,692,234	338,049,089	0	0	0	0	0	379,977,786
2030	11,353,141	227,050,470	2,587,274	323,477,396	0	0	0	0	0	360,565,298
2031	12,204,548	247,616,821	2,786,364	352,688,279	0	0	0	0	0	392,947,132
2032	11,041,943	220,102,503	2,513,327	313,537,171	0	0	0	0	0	351,302,914
2033	12,189,240	246,365,853	2,781,988	350,938,415	0	0	0	0	0	390,737,267
2034	11,056,559	220,559,536	2,518,057	314,210,548	0	0	0	0	0	350,710,250
2035	13,296,288	279,017,509	3,054,237	397,876,787	0	0	0	0	0	446,162,415
TOTAL	259,332,637	5,573,648,096	50,115,363	7,740,052,566	0	0	0	0	0	8,895,565,419

¹ B-18 includes Extra Peaking Charges for additional power shown in Table 9.

TABLE B-19 Total Transportation Charge for Each Contractor¹ (in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa	Solano	Total	Alameda-Zone 7	Alameda County	Santa Clara	Total	San Luis Obispo	Santa Barbara	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	193,920	190,272	447,723	831,915	0	0	0
1964	0	0	0	255,449	277,455	621,356	1,154,260	6,696	21,667	28,363
1965	0	0	0	364,163	404,324	1,158,090	1,926,577	13,756	36,029	49,785
1966	18,063	0	18,063	409,118	421,723	1,412,954	2,243,794	26,524	61,349	87,873
1967	41,574	0	41,574	527,991	498,441	1,686,098	2,712,530	56,469	118,263	174,731
1968	128,628	0	128,628	652,399	603,483	1,985,220	3,241,102	115,961	229,807	345,768
1969	254,715	0	254,715	775,484	539,340	2,083,253	3,398,077	185,156	358,861	544,017
1970	277,547	0	277,547	811,072	532,567	2,202,767	3,546,406	200,150	387,675	587,825
1971	227,474	0	227,474	776,364	552,113	2,169,897	3,498,374	202,413	392,912	595,325
1972	224,978	0	224,978	818,552	678,520	2,320,421	3,817,493	209,057	406,589	615,646
1973	221,091	31,366	252,457	784,020	549,393	2,338,620	3,672,033	206,557	402,724	609,281
1974	240,498	32,938	273,437	808,016	564,593	2,506,358	3,878,967	208,545	407,090	615,635
1975	237,459	36,291	273,750	858,298	605,731	2,409,923	3,873,952	225,895	439,873	665,768
1976	271,292	40,836	312,127	949,233	734,812	2,500,506	4,184,550	228,976	447,299	676,275
1977	293,627	45,096	338,723	913,604	713,558	2,476,399	4,103,562	238,699	468,721	707,420
1978	273,870	49,178	323,048	969,175	692,587	2,785,987	4,447,749	245,331	484,259	729,590
1979	289,479	53,340	342,819	1,034,511	736,358	2,813,578	4,584,447	243,110	483,437	726,547
1980	310,846	67,748	378,594	1,152,787	866,372	3,028,204	5,047,363	269,858	537,074	806,932
1981	347,781	87,408	435,189	1,118,599	879,357	2,917,582	4,915,537	288,997	586,257	875,254
1982	438,335	106,918	545,254	1,158,937	850,483	3,262,104	5,269,524	290,049	582,757	872,806
1983	354,787	151,259	506,046	1,168,917	900,363	3,795,446	5,864,726	319,214	633,181	952,395
1984	467,336	224,245	691,581	1,460,974	1,097,480	5,737,801	8,296,256	351,620	695,559	1,047,179
1985	736,074	364,305	1,100,379	1,911,429	1,789,369	6,551,546	10,252,344	394,593	776,994	1,171,586
1986	1,084,728	692,479	1,777,207	1,738,966	1,528,732	6,863,230	10,130,928	583,545	762,684	1,148,229
1987	1,773,801	1,559,243	3,333,044	2,229,117	2,011,876	6,675,355	10,916,348	385,289	812,310	1,197,599
1988	2,231,563	2,333,792	4,565,355	2,230,983	2,210,523	6,368,850	10,810,355	420,153	978,621	1,398,774
1989	2,397,272	3,326,436	5,723,708	2,147,288	1,872,030	5,916,714	9,936,032	414,224	1,162,723	1,576,947
1990	2,746,135	3,433,320	6,179,455	2,566,722	2,261,914	6,668,440	11,497,076	487,609	1,234,409	1,722,018
1991	2,748,636	3,682,311	6,430,947	1,746,075	1,621,188	4,527,928	7,895,191	491,419	1,476,387	1,967,806
1992	2,554,528	3,528,958	6,083,486	2,066,433	2,003,328	5,385,858	9,455,619	551,042	1,491,156	2,042,198
1993	2,592,888	3,504,240	6,097,128	2,871,327	2,011,222	6,511,865	11,394,414	610,115	1,675,438	2,285,553
1994	2,718,329	3,537,459	6,255,788	2,897,772	2,642,460	7,314,515	12,854,746	767,900	2,473,449	3,241,348
1995	2,649,273	3,509,935	6,159,208	3,025,999	2,289,027	5,893,667	11,208,694	995,341	4,977,122	5,972,462
1996	2,699,210	3,891,715	6,590,926	2,574,889	2,137,443	6,675,492	11,387,823	1,837,384	13,766,531	15,603,915
1997	2,641,891	3,631,175	6,273,066	2,648,019	2,007,332	6,551,469	11,206,820	2,294,917	21,860,553	24,155,470
1998	2,538,764	3,478,062	6,016,827	2,254,225	2,064,166	6,296,050	10,614,440	2,976,896	26,690,793	29,667,689
1999	2,682,220	3,832,236	6,514,456	2,864,384	2,437,119	8,336,659	13,638,161	3,025,125	27,465,780	30,490,905
2000	2,833,873	4,310,123	7,143,996	3,915,871	2,307,396	7,040,166	13,263,433	2,948,233	27,838,201	30,786,434
2001	3,348,907	4,914,678	8,263,585	7,311,198	2,795,685	8,451,441	18,558,324	3,501,499	29,990,590	33,492,089
2002	3,558,063	5,054,004	8,612,066	10,773,347	2,781,258	9,930,188	23,484,793	3,214,148	29,618,300	32,832,449
2003	3,667,488	5,395,044	9,062,533	7,409,931	2,507,040	8,729,606	18,646,577	3,294,613	29,872,238	33,166,850
2004	4,144,445	5,620,754	9,765,198	5,596,171	2,812,814	8,202,885	16,611,870	3,307,566	30,301,509	33,609,075
2005	3,504,002	5,131,265	8,635,268	5,967,184	2,967,415	8,980,247	17,914,847	3,432,436	30,414,226	33,846,662
2006	3,408,521	4,629,762	8,038,283	6,348,493	2,966,249	9,114,772	18,429,515	3,275,894	30,060,736	33,336,630
2007	3,602,641	5,101,749	8,704,389	8,266,795	3,481,618	10,365,934	22,114,347	3,425,576	31,263,740	34,689,316
2008	4,294,209	5,057,792	9,352,001	11,247,795	3,774,961	10,524,013	25,546,769	3,928,019	32,521,366	36,449,385
2009	4,729,312	5,109,080	9,838,392	12,455,035	3,306,730	10,273,902	26,035,667	3,747,069	31,001,298	34,748,367
2010	4,978,007	6,526,098	11,504,105	14,474,530	3,655,145	11,116,841	29,246,516	4,086,045	33,067,434	37,153,479
2011	5,345,993	6,919,499	12,265,492	17,689,920	4,338,546	12,932,723	34,961,189	4,155,421	34,154,835	38,310,256
2012	5,809,282	6,873,603	12,682,885	20,018,726	4,329,320	15,131,291	39,479,337	4,196,722	34,519,123	38,715,846
2013	5,457,799	6,611,975	12,069,774	22,028,848	5,073,154	15,137,735	42,239,737	4,419,221	35,921,308	40,340,530
2014	6,092,994	7,171,766	13,264,760	22,241,758	5,325,362	15,153,816	42,720,936	4,261,203	33,127,670	37,388,873
2015	6,201,806	7,127,379	13,329,185	23,551,080	4,780,531	16,535,596	44,867,208	4,847,808	35,110,580	39,958,388
2016	6,538,480	7,741,141	14,279,621	24,250,043	4,363,034	22,442,203	51,055,280	4,629,601	39,623,356	44,252,957
2017	5,589,700	6,300,929	11,890,629	24,946,952	4,786,237	19,093,145	48,826,334	4,757,805	43,393,499	48,151,304
2018	6,539,239	7,417,771	13,957,009	26,863,636	5,320,096	19,392,732	51,576,464	4,926,581	42,315,541	47,242,122
2019	6,191,848	6,803,459	12,995,307	26,063,552	4,854,644	14,237,002	45,155,198	4,596,638	38,090,490	42,687,128
2020	7,770,710	7,702,728	15,473,438	26,007,873	5,379,651	14,819,860	46,207,384	4,841,425	37,621,025	42,462,450
2021	8,363,063	8,906,999	17,270,063	29,713,390	7,467,032	20,319,035	57,499,457	5,266,034	36,838,029	42,104,063
2022	8,156,064	8,237,064	16,393,129	28,045,704	5,968,243	17,177,752	51,191,700	6,290,934	40,164,238	46,455,172
2023	7,811,154	7,934,498	15,745,652	28,400,789	6,122,389	17,563,317	52,086,494	6,445,083	40,674,610	47,119,692
2024	8,213,967	8,742,343	16,956,310	29,858,144	6,702,304	18,990,445	55,550,893	7,256,923	42,883,535	50,140,458
2025	8,235,711	8,781,003	17,016,713	29,571,221	6,540,356	18,611,518	54,723,095	7,181,767	42,764,251	49,946,017
2026	8,267,155	8,821,108	17,088,263	29,946,727	6,722,667	19,059,472	55,728,866	7,276,171	43,031,665	50,307,837
2027	8,303,030	8,862,981	17,166,011	29,607,928	6,532,696	18,617,304	54,757,928	7,190,691	42,907,727	50,098,418
2028	8,338,538	8,905,257	17,243,795	30,069,988	6,759,364	19,171,079	56,000,431	7,306,280	43,222,417	50,528,697
2029	8,374,544	8,948,132	17,322,676	30,261,880	6,845,204	19,387,553	56,494,637	7,359,325	43,400,548	50,759,873
2030	8,403,683	8,980,296	17,383,979	30,080,661	6,736,686	19,144,658	55,962,005	7,312,831	43,362,272	50,675,102
2031	8,428,958	9,007,328	17,436,286	30,306,658	6,840,120	19,397,838	56,544,616	7,375,024	43,552,351	50,927,374
2032	8,456,780	9,034,976	17,491,756	30,302,880	6,823,616	19,383,270	56,509,766	7,369,771	43,614,003	50,983,773
2033	8,466,317	9,036,643	17,502,961	30,461,356	6,893,323	19,553,275	56,907,953	7,419,505	43,793,991	51,213,496
2034	8,434,912	9,009,441	17,444,353	30,396,677	6,843,381	19,457,061	56,697,119	7,399,373	43,817,464	51,216,837
2035	8,329,436	8,913,384	17,242,820	31,055,011	7,172,897	20,237,369	58,465,277	7,585,960	44,290,946	51,876,905
TOTAL	267,905,323	304,874,341	572,779,664	829,252,712	227,698,006	702,896,102	1,759,846,819	209,999,778	1,463,931,440	1,673,931,218

¹ Capital charges repaid through bond debt service prior to 2019 exclude bond cover; 2020 and after includes both bond debt service and bond cover.

TABLE B-19 Total Transportation Charge for Each Contractor ¹ (in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge	Empire	Future Contractor San Joaquin Valley	Kern		Kings	Oak Flat	Tulare	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	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	267,611	0	0	0	0	293,869
1968	190,687	9,215	54,588	445,439	1,572,822	13,770	12,001	214,081	2,512,602
1969	186,304	8,563	87,576	525,094	2,450,503	12,625	11,040	376,650	3,658,356
1970	208,906	15,330	94,675	573,998	2,985,940	12,790	13,595	308,225	4,213,458
1971	206,121	16,288	95,695	605,889	3,917,807	17,763	14,932	464,277	5,338,771
1972	229,580	17,156	98,788	631,615	5,135,448	15,220	21,686	1,129,335	7,278,828
1973	213,021	13,227	97,550	639,250	5,090,205	15,483	12,292	427,708	6,508,736
1974	297,846	13,196	98,460	698,247	5,412,578	15,590	13,442	628,800	7,178,160
1975	368,057	14,141	106,703	715,606	6,571,087	16,620	15,146	765,563	8,572,922
1976	318,782	14,687	108,084	774,291	6,942,420	16,993	16,904	591,228	8,783,389
1977	280,530	11,797	112,554	797,859	7,140,355	18,457	14,624	536,948	8,913,124
1978	370,324	4,441	115,521	890,945	8,623,245	18,921	18,701	532,472	10,574,570
1979	402,990	14,534	114,253	896,194	9,777,552	20,202	25,652	984,766	12,236,142
1980	425,209	12,884	125,950	888,893	10,364,905	20,749	25,350	769,337	14,633,277
1981	488,700	30,725	134,169	1,079,315	11,843,731	24,939	23,753	942,555	14,567,888
1982	483,209	13,875	135,057	1,004,667	12,707,339	22,955	23,256	781,785	15,172,143
1983	657,249	15,469	149,202	1,027,258	15,950,800	39,971	29,870	432,324	18,302,144
1984	930,791	15,883	164,505	2,063,179	24,103,858	54,427	60,555	811,905	28,205,104
1985	1,120,160	88,444	184,905	2,350,593	28,441,942	69,483	71,104	2,190,975	34,517,607
1986	1,285,221	34,900	180,445	2,365,159	31,018,740	80,769	77,002	2,225,726	37,267,962
1987	1,144,620	51,695	179,872	2,804,776	29,868,878	78,018	75,268	2,286,563	36,489,690
1988	1,131,050	62,490	193,735	2,750,424	29,811,071	74,168	61,181	2,246,030	36,330,148
1989	1,167,392	50,172	187,913	2,435,635	29,894,271	67,048	69,684	2,491,282	36,363,397
1990	878,494	35,334	221,392	2,541,316	28,031,895	51,058	50,131	1,921,901	33,731,519
1991	606,575	24,239	220,282	2,055,250	18,231,287	27,930	27,900	1,282,466	22,475,929
1992	977,910	40,075	241,455	2,369,788	26,529,408	55,795	51,954	1,959,606	32,225,992
1993	1,190,200	54,602	264,959	2,799,482	32,043,577	72,889	70,637	2,693,194	39,189,540
1994	1,045,290	44,728	306,359	2,808,829	29,919,388	60,460	58,404	2,169,124	36,412,581
1995	1,541,978	47,586	304,297	3,499,611	37,042,943	88,875	81,227	2,823,234	45,429,752
1996	1,369,751	49,218	389,203	3,560,139	37,005,188	86,092	74,875	4,369,125	46,903,591
1997	1,411,280	26,375	276,681	3,107,763	33,172,314	36,715	69,735	1,723,202	39,824,065
1998	1,255,164	35,330	381,847	2,654,434	29,929,150	41,835	61,031	1,853,446	36,212,236
1999	1,246,537	56,612	366,294	3,054,852	31,938,447	75,360	66,200	4,220,671	41,024,973
2000	1,087,997	39,011	303,341	2,322,844	27,075,574	61,948	55,884	2,838,006	33,784,605
2001	1,764,722	63,860	328,028	2,237,334	34,536,526	80,120	102,185	3,109,973	42,222,746
2002	1,343,859	44,656	321,344	2,334,754	29,550,445	73,468	78,983	2,600,124	36,347,633
2003	1,410,484	49,466	339,960	2,741,740	32,334,037	89,704	80,141	2,915,076	39,960,608
2004	1,467,701	78,842	342,620	3,760,286	30,957,818	236,003	82,755	2,424,528	39,350,552
2005	2,058,913	88,860	355,586	2,984,191	42,055,844	420,623	82,351	3,477,365	51,523,734
2006	1,808,697	75,848	295,459	3,287,808	38,087,313	254,250	79,821	2,828,639	46,717,835
2007	1,674,771	70,390	334,132	3,067,185	35,937,757	235,665	83,137	2,979,492	44,382,529
2008	1,529,638	62,711	471,586	3,455,255	35,232,646	248,984	81,267	2,454,638	43,536,723
2009	1,223,917	50,520	437,333	2,186,445	30,841,684	192,944	62,936	2,042,097	37,037,876
2010	1,450,689	106,571	507,046	2,355,241	36,352,465	250,252	84,529	2,652,095	43,758,888
2011	2,194,251	82,466	506,678	3,444,127	51,223,294	304,560	92,915	2,750,080	60,598,371
2012	1,276,869	89,147	467,874	3,233,950	41,013,574	317,588	92,795	3,479,866	49,971,664
2013	1,616,769	82,322	519,611	3,396,667	41,014,627	279,253	91,714	2,754,378	49,755,340
2014	1,614,782	66,401	630,817	2,787,343	36,318,324	227,771	93,716	2,117,838	43,856,992
2015	1,418,695	68,811	755,570	3,215,082	38,380,091	229,810	82,732	2,330,145	46,480,937
2016	1,396,179	89,911	484,982	2,929,025	39,922,103	264,097	86,933	2,717,950	47,891,179
2017	1,940,499	78,362	481,144	3,145,055	50,076,963	323,384	95,234	2,834,323	58,974,964
2018	1,838,520	85,190	617,513	2,550,412	41,924,818	264,288	96,688	2,657,601	50,035,028
2019	1,684,438	93,761	602,195	2,995,692	51,771,763	300,695	98,039	3,900,790	61,447,374
2020	1,620,072	88,811	678,379	3,127,053	43,204,837	288,658	105,941	2,499,013	51,612,763
2021	1,461,460	68,333	751,957	3,178,644	36,527,167	367,818	108,144	3,239,328	45,702,851
2022	1,727,325	102,155	763,705	5,075,929	50,061,813	355,599	127,739	3,321,937	61,536,201
2023	1,713,587	101,726	791,960	5,133,654	49,785,581	359,246	127,595	3,297,298	61,310,647
2024	1,846,413	110,743	839,419	5,752,244	53,065,699	391,197	139,319	3,560,812	65,705,847
2025	1,663,440	98,117	845,203	5,335,275	49,355,115	352,000	115,088	3,192,792	60,957,029
2026	1,829,606	109,506	851,346	5,698,469	52,772,245	387,312	136,805	3,525,003	65,310,291
2027	1,613,111	94,573	857,178	5,224,724	48,485,741	340,968	107,483	3,089,730	59,813,509
2028	1,825,158	109,118	861,283	5,695,580	52,869,413	386,009	135,053	3,513,940	65,395,553
2029	1,894,844	113,869	867,572	5,862,717	54,431,312	400,716	143,372	3,652,615	67,367,017
2030	1,757,978	104,412	873,954	5,542,153	51,640,336	371,349	125,313	3,377,018	63,792,513
2031	1,855,517	111,079	879,104	5,796,424	53,984,465	391,654	136,049	3,571,534	66,725,825
2032	1,799,498	107,183	885,898	5,605,814	52,546,505	379,618	130,398	3,458,061	64,912,975
2033	1,859,170	111,244	892,435	5,809,287	54,227,836	392,118	135,474	3,576,610	67,004,172
2034	1,777,959	105,613	898,758	5,559,420	52,307,300	374,542	126,315	3,412,589	64,562,496
2035	2,123,489	129,337	905,040	6,472,917	60,220,927	447,927	166,824	4,104,436	74,570,896
TOTAL	83,800,942	4,076,137	28,386,025	199,195,040	2,173,563,053	11,966,106	5,090,796	157,412,218	2,663,490,317

¹ Capital charges repaid through bond debt service prior to 2019 exclude bond cover; 2020 and after includes both bond debt service and bond cover.

TABLE B-19 Total Transportation Charge for Each Contractor¹ (in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	AVEK	Coachella	Crestline	Desert	Littlerock	Mojave	Palmdale	San Bernardino	San Gabriel	San Geronio
	[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	34,411	0	0	726	0	0	0	51,729	0	0
1964	64,494	19,542	4,370	38,211	1,143	31,079	8,205	82,811	34,987	21,735
1965	121,484	34,348	7,194	42,701	2,082	55,096	15,222	135,069	35,344	21,866
1966	221,012	62,476	12,478	76,886	3,753	99,564	27,679	232,502	61,465	37,964
1967	427,622	121,269	23,472	148,839	7,284	193,330	54,023	433,350	115,574	71,283
1968	754,401	218,649	41,509	265,168	12,870	346,566	95,466	782,163	208,927	128,915
1969	1,090,136	334,105	61,226	394,024	18,693	517,986	138,063	1,205,834	321,755	198,764
1970	1,420,639	470,423	89,700	552,223	25,231	716,628	184,837	1,778,187	467,573	289,633
1971	1,760,670	627,331	128,360	754,065	31,837	962,401	231,280	2,538,219	659,414	409,327
1972	2,084,699	777,838	181,206	971,501	42,404	1,230,278	274,599	3,388,734	865,095	537,186
1973	2,177,324	920,218	183,713	1,184,696	43,482	1,298,633	287,315	3,971,543	946,686	587,963
1974	2,241,780	938,860	193,283	1,212,205	45,212	1,333,244	292,071	3,998,510	990,064	611,428
1975	2,419,858	983,580	206,040	1,280,804	48,490	1,404,053	304,281	4,159,094	1,088,341	644,621
1976	2,773,862	1,032,075	215,084	1,356,888	51,463	1,448,508	313,685	4,299,592	1,141,598	668,315
1977	2,717,286	929,532	226,032	1,194,916	47,348	1,522,281	329,365	4,553,831	1,197,216	696,515
1978	3,035,392	1,111,606	231,040	1,470,658	47,118	1,524,338	321,681	4,460,167	1,208,720	709,040
1979	3,589,381	1,180,841	237,955	1,569,175	48,396	1,654,093	332,472	4,422,382	1,152,375	712,866
1980	4,136,480	1,271,861	259,401	1,730,656	53,348	1,775,760	360,461	4,835,652	1,269,447	777,981
1981	4,469,204	1,355,504	271,181	1,850,802	77,806	1,904,303	391,869	5,224,182	1,357,680	806,031
1982	4,031,426	1,403,332	280,313	1,936,175	55,961	2,099,954	406,891	5,410,876	1,565,182	853,400
1983	5,224,176	1,997,502	333,081	2,880,959	69,381	2,177,882	494,688	6,020,929	1,556,652	952,131
1984	7,262,706	3,084,372	445,339	4,608,046	75,773	2,409,128	553,321	7,049,449	2,331,849	1,072,639
1985	8,979,937	3,882,496	540,388	5,883,196	79,232	2,522,037	759,052	7,740,359	2,378,394	1,120,854
1986	8,880,068	4,308,841	577,474	6,571,197	102,400	2,633,230	1,000,062	7,857,569	3,047,741	1,149,714
1987	8,897,753	4,164,707	604,982	6,418,841	211,809	2,667,591	1,026,398	9,224,608	3,034,142	1,172,015
1988	8,373,323	4,163,832	615,999	6,482,143	124,667	2,723,757	779,820	9,505,259	2,828,998	1,208,206
1989	8,750,651	3,808,646	586,595	5,952,262	170,570	2,672,410	1,442,627	8,944,266	2,930,395	1,194,911
1990	10,040,074	4,487,886	620,394	7,014,185	289,349	2,872,370	1,639,830	9,795,019	3,678,107	1,297,621
1991	6,542,001	2,996,131	567,450	4,550,559	175,137	3,632,639	1,294,608	8,921,839	3,035,638	1,354,921
1992	8,644,005	3,068,616	470,165	4,667,984	121,335	4,434,800	1,129,578	8,573,361	2,980,091	1,349,184
1993	9,028,570	3,267,678	472,817	4,993,632	157,747	4,314,642	1,347,511	9,505,683	3,320,012	1,507,550
1994	11,216,190	3,313,737	554,651	5,066,159	225,809	5,308,867	1,698,990	10,209,083	4,076,706	1,497,753
1995	10,817,875	4,087,603	509,163	6,340,703	155,561	4,397,305	1,527,248	9,443,228	3,715,377	1,520,622
1996	11,187,158	7,025,782	553,232	11,183,947	150,612	4,465,197	1,867,203	9,869,395	3,807,422	1,527,243
1997	11,437,950	6,588,591	579,281	7,422,990	144,833	4,769,773	1,869,307	11,280,683	4,037,862	1,744,883
1998	9,956,830	5,663,864	546,645	5,928,447	146,074	5,806,381	1,474,029	11,263,703	3,321,115	2,003,846
1999	11,464,413	4,681,960	633,440	6,034,112	145,798	6,007,692	1,855,062	12,435,508	4,172,870	2,369,483
2000	10,588,857	3,062,374	594,691	4,366,076	115,438	5,821,343	1,449,271	12,306,410	3,253,171	2,890,395
2001	20,607,925	4,100,681	797,527	6,349,945	127,791	6,513,596	3,341,803	18,909,129	3,395,382	4,571,962
2002	12,003,199	3,361,237	759,988	5,129,982	109,869	5,649,401	2,740,764	20,621,499	4,787,274	6,844,991
2003	13,366,962	3,480,415	729,620	5,324,825	115,323	7,303,572	2,277,999	19,443,483	4,950,854	8,606,514
2004	14,238,559	4,115,076	829,278	5,365,886	124,197	7,415,518	2,518,944	23,960,321	4,389,481	9,148,496
2005	14,655,042	17,794,827	654,120	10,294,124	114,290	7,217,659	2,570,411	22,099,848	4,655,736	9,538,561
2006	16,138,358	27,341,047	633,909	9,895,275	122,299	9,926,713	2,495,770	21,867,220	4,675,188	10,068,352
2007	19,660,618	26,154,628	881,826	9,379,706	126,756	13,753,649	4,037,644	28,182,209	3,835,949	10,826,173
2008	17,125,624	25,655,089	806,226	10,270,355	135,174	12,061,880	3,951,747	28,350,870	4,789,301	12,242,117
2009	14,844,067	23,302,642	780,968	8,133,728	133,355	11,720,307	3,675,234	28,360,131	5,260,358	12,694,379
2010	17,519,010	31,739,849	687,563	10,962,701	122,631	14,038,972	3,017,022	30,877,207	6,751,132	13,963,688
2011	23,804,325	33,189,910	744,537	11,906,530	136,163	7,624,883	3,016,103	28,346,186	7,438,101	15,064,560
2012	23,901,454	39,587,214	846,246	14,178,049	147,924	9,343,835	4,349,191	42,045,800	7,669,710	16,480,562
2013	19,261,263	31,796,213	1,056,693	10,801,425	165,493	9,327,373	3,461,884	34,015,278	5,890,695	17,895,213
2014	14,749,411	27,316,641	1,151,932	8,754,285	170,851	9,404,867	3,591,871	36,498,765	4,836,123	23,136,575
2015	12,730,678	30,459,427	1,130,767	10,096,899	163,489	10,903,472	2,767,693	43,871,099	5,895,314	27,817,403
2016	16,380,505	33,217,685	1,029,897	10,888,568	156,353	12,482,631	3,240,815	51,336,204	7,190,103	32,363,175
2017	24,442,385	32,314,998	931,725	11,390,296	147,157	14,065,656	3,612,288	56,844,375	7,543,755	36,687,784
2018	19,232,898	48,778,564	1,022,626	15,636,008	154,365	8,817,624	3,219,487	54,313,785	7,326,981	38,452,035
2019	20,202,256	29,758,357	845,240	9,536,221	233,969	12,288,821	3,434,081	61,748,754	7,969,088	40,324,861
2020	16,044,041	45,824,352	940,609	14,285,345	419,954	8,881,259	2,594,760	52,916,417	5,877,014	39,656,820
2021	16,096,106	33,572,187	1,609,765	9,283,626	203,650	12,688,146	2,806,174	56,615,540	5,479,884	38,398,992
2022	27,038,806	41,829,537	1,582,925	14,016,078	432,526	19,660,515	5,244,574	61,819,616	7,961,673	40,332,729
2023	27,563,012	42,841,921	1,613,047	14,290,307	444,756	20,098,460	5,379,681	62,053,079	8,111,619	40,191,706
2024	31,065,535	47,842,104	1,781,715	16,040,504	500,733	22,324,023	6,113,161	65,597,920	8,985,221	41,141,890
2025	30,355,249	47,211,502	1,755,082	15,784,299	489,485	21,964,119	5,948,872	65,210,090	8,857,050	41,092,815
2026	30,491,681	47,274,385	1,759,547	15,809,564	491,704	22,005,270	5,974,481	65,333,193	8,871,795	41,137,931
2027	30,299,807	47,175,519	1,755,359	15,766,562	488,706	21,944,278	5,925,822	65,345,752	8,854,892	41,168,096
2028	30,688,564	47,584,511	1,772,632	15,921,135	494,938	22,167,656	6,007,760	65,725,636	8,940,681	41,259,700
2029	31,212,606	48,202,911	1,796,987	16,159,596	503,316	22,498,220	6,120,376	66,266,186	9,071,283	41,379,464
2030	30,449,897	47,545,347	1,768,884	15,881,966	491,284	22,074,446	5,944,101	65,858,370	8,935,253	41,339,202
2031	32,180,746	49,325,717	1,842,982	16,589,387	518,732	23,146,119	6,334,290	67,259,021	9,307,659	41,604,409
2032	29,931,112	47,209,454	1,750,957	15,723,537	483,131	21,775,812	5,822,080	65,769,623	8,867,533	41,382,440
2033	32,188,380	49,500,663	1,850,461	16,631,533	518,978	23,231,863	6,330,094	67,540,149	9,342,553	41,710,449
2034	29,933,330	47,448,579	1,757,151	15,789,961	483,266	21,877,633	5,827,411	66,077,228	8,910,056	41,492,984
2035	35,232,172	52,605,870	1,977,875	17,853,525	567,275	25,061,347	7,018,816	69,970,356	9,980,428	42,179,915
TOTAL	1,002,499,684	1,303,907,065	56,296,005	554,518,488	13,565,329	611,014,736	178,291,274	1,906,961,116	317,799,103	1,037,915,746

¹ Capital charges repaid through bond debt service prior to 2019 exclude bond cover; 2020 and after includes both bond debt service and bond cover.

TABLE B-19 Total Transportation Charge for Each Contractor¹ (in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	Grand Total
	Santa Clarita ²	Metropolitan	Ventura	Total	Yuba City	Butte	Plumas	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	777,678	0	0	0	0	12,626	1,622,219
1964	27,447	1,260,513	9,378	1,603,916	0	0	0	0	13,938	2,803,202
1965	53,007	2,180,589	17,766	2,721,767	0	0	405	405	28,937	4,807,069
1966	101,264	3,900,172	33,426	4,870,643	0	0	565	565	31,321	7,401,629
1967	210,814	7,693,703	68,155	9,568,718	0	0	562	562	47,718	12,839,702
1968	479,685	15,317,881	142,803	18,795,004	0	0	564	564	46,945	25,070,613
1969	727,464	23,153,064	215,209	28,376,324	0	0	3,191	3,191	52,963	36,287,643
1970	908,024	30,617,164	273,605	37,793,866	0	0	15,121	15,121	69,744	46,503,967
1971	1,093,071	39,958,997	342,425	49,497,398	0	0	16,001	16,001	55,532	59,228,874
1972	1,314,311	52,948,599	422,304	65,038,754	0	0	17,372	17,372	80,412	77,073,483
1973	1,331,453	57,273,225	435,655	70,641,905	0	0	17,334	17,334	54,219	81,755,965
1974	1,391,857	61,776,466	455,565	75,480,546	0	0	17,477	17,477	76,783	87,521,005
1975	1,461,679	66,756,784	478,403	81,236,028	0	0	18,406	18,406	84,547	94,725,373
1976	1,457,877	68,485,047	475,587	83,719,580	0	0	17,477	17,477	106,717	97,800,116
1977	1,528,070	66,234,179	507,063	81,683,634	0	0	18,232	18,232	98,618	95,863,312
1978	1,614,296	72,934,779	523,177	89,192,011	0	0	17,381	17,381	100,786	105,385,134
1979	1,650,286	72,666,594	526,405	89,743,220	0	0	20,579	20,579	119,352	107,773,106
1980	1,733,373	79,926,555	571,232	98,702,208	0	0	17,761	17,761	178,812	117,764,948
1981	1,988,612	91,261,394	636,404	111,594,971	0	0	21,193	21,193	185,347	132,595,378
1982	2,081,746	93,144,741	670,375	113,940,372	0	0	28,423	28,423	173,894	136,002,415
1983	2,345,652	101,787,700	803,591	126,644,325	0	0	19,276	19,276	220,926	152,509,837
1984	3,388,409	137,507,077	868,967	170,657,075	0	0	21,114	21,114	225,959	209,144,269
1985	3,774,275	172,916,230	908,769	211,485,218	0	0	20,239	20,239	340,322	258,887,694
1986	4,343,316	193,242,026	937,311	234,650,948	0	0	20,139	20,139	279,227	285,274,639
1987	4,185,436	178,764,439	908,034	221,280,754	0	0	19,742	19,742	345,116	273,582,293
1988	4,250,119	190,243,523	904,868	232,204,514	0	0	17,900	17,900	365,207	285,692,254
1989	4,131,013	193,235,261	932,599	234,752,206	0	0	19,158	19,158	422,329	288,793,777
1990	4,572,464	239,540,417	1,486,755	287,334,470	0	0	18,148	18,148	474,284	340,956,970
1991	3,541,396	179,950,983	1,141,118	217,704,419	0	0	21,018	21,018	214,683	256,709,992
1992	4,498,962	196,166,977	1,025,285	237,130,344	0	0	18,014	18,014	443,676	287,399,328
1993	4,130,377	169,493,328	1,068,135	212,607,683	0	0	20,999	20,999	599,571	272,194,889
1994	4,742,589	209,282,955	1,008,952	258,202,441	0	0	19,649	19,649	609,966	317,596,520
1995	5,000,428	173,420,265	1,061,324	221,996,699	0	0	20,277	20,277	534,971	291,322,063
1996	5,188,508	181,404,029	1,103,254	239,332,983	0	0	25,378	25,378	571,857	320,416,473
1997	4,955,229	186,736,527	1,216,560	242,784,467	0	0	24,820	24,820	428,638	324,697,346
1998	4,583,696	168,571,967	1,237,386	220,503,982	0	0	0	0	465,095	303,480,270
1999	4,999,525	190,743,059	1,255,051	246,797,974	0	0	0	0	571,720	339,038,190
2000	6,857,855	185,140,396	1,322,589	237,768,866	0	0	0	0	0	322,747,334
2001	12,472,816	374,039,724	1,616,021	456,844,302	0	0	0	0	0	559,381,046
2002	9,706,203	264,830,361	1,650,209	338,194,977	0	0	0	0	0	439,471,918
2003	10,749,765	292,850,922	1,668,182	370,868,436	0	0	20,800	20,800	0	471,725,804
2004	11,816,975	340,018,775	1,910,251	425,851,756	0	0	20,830	20,830	0	525,209,282
2005	10,870,164	313,177,979	1,398,398	415,041,159	0	0	20,827	20,827	0	526,982,496
2006	9,990,140	289,125,726	1,328,532	403,608,527	0	0	21,281	21,281	0	510,152,070
2007	13,404,138	374,415,147	1,872,597	506,531,039	0	0	20,893	20,893	0	616,442,513
2008	15,293,501	339,731,539	2,266,633	472,680,056	0	0	22,411	22,411	0	587,587,345
2009	13,008,800	303,283,557	2,071,230	427,268,755	0	0	18,220	18,220	0	534,947,277
2010	12,684,570	348,436,200	2,102,775	492,903,320	0	0	18,439	18,439	0	614,584,747
2011	12,345,961	390,860,990	2,093,481	536,571,729	0	0	20,127	20,127	0	682,727,163
2012	14,337,246	373,709,428	2,331,380	548,928,037	0	0	18,468	18,468	0	689,796,236
2013	16,984,719	363,934,633	2,271,193	516,862,076	0	0	17,664	17,664	0	661,285,120
2014	15,786,123	315,577,007	1,817,313	462,791,763	0	0	17,491	17,491	0	600,040,815
2015	15,053,147	334,723,424	1,891,533	497,504,345	0	0	17,085	17,085	0	642,157,148
2016	13,870,960	378,787,497	2,189,036	563,133,430	0	0	22,212	22,212	0	720,634,678
2017	16,249,352	430,675,773	3,898,679	638,804,223	0	0	16,925	16,925	0	806,664,379
2018	15,637,082	325,426,233	1,944,795	539,962,484	0	0	64,390	64,390	0	702,837,498
2019	15,806,900	411,223,593	5,094,113	618,466,255	0	0	26,184	26,184	0	780,777,445
2020	17,531,110	308,371,806	3,183,800	516,527,287	0	0	2,467	2,467	0	672,285,789
2021	24,523,150	318,878,662	2,849,272	523,005,152	0	0	18,481	18,481	0	685,600,067
2022	19,528,862	458,361,013	4,238,058	702,046,915	0	0	13,930	13,930	0	877,637,046
2023	19,458,000	440,204,270	4,130,615	686,380,471	0	0	13,951	13,951	0	862,656,907
2024	22,321,372	491,803,930	4,661,617	760,179,726	0	0	15,140	15,140	0	948,548,373
2025	21,913,443	483,289,575	4,571,671	748,443,253	0	0	15,289	15,289	0	931,101,396
2026	22,055,690	485,164,301	4,593,710	750,963,253	0	0	15,441	15,441	0	939,413,950
2027	21,868,419	482,447,307	4,558,399	747,598,918	0	0	15,592	15,592	0	929,450,375
2028	22,193,229	488,260,030	4,620,012	755,636,485	0	0	15,747	15,747	0	944,820,708
2029	22,480,033	495,061,069	4,680,990	765,433,036	0	0	15,902	15,902	0	957,393,141
2030	22,005,225	485,082,747	4,573,257	751,949,979	0	0	16,059	16,059	0	939,779,637
2031	22,793,917	504,586,725	4,754,533	780,244,238	0	0	16,218	16,218	0	971,894,557
2032	21,660,948	478,135,638	4,485,085	742,997,350	0	0	16,379	16,379	0	932,911,999
2033	22,817,648	504,783,378	4,752,809	781,198,956	0	0	16,541	16,541	0	973,844,079
2034	21,725,503	479,705,428	4,494,660	745,523,190	0	0	16,705	16,705	0	935,460,701
2035	24,027,111	539,332,561	5,041,051	830,848,303	0	0	16,871	16,871	0	1,033,021,073
TOTAL	705,615,806	18,164,625,362	137,601,376	25,990,611,091	0	0	1,178,876	1,178,876	8,735,974	32,670,573,959

¹ Capital charges repaid through bond debt service prior to 2019 exclude bond cover; 2020 and after includes both bond debt service and bond cover.² Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

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 2021 at 4.610 percent per annum)

Procedure	Capital Cost Component		Minimum Operation, Maintenance, Power and Replacement Component ¹		Total Delta Water Rate	
	[1]		[2]		[3]	
Commencing in 2022						
Total Costs of "Initial" Project Conservation Facilities to be Reimbursed and Project Water Table A Amounts During the Project Repayment Period	\$11,739.79 ^a	583.93 af	\$10,330.68 ^b	583.93 af	\$22,070.46	583.93 af
Less, Project Power Revenues to be Realized During the Project Repayment Period	(\$3,950.38)		(\$1,846.13)		(\$5,796.51)	
Less, Delta Water Charges Paid and Project Water Table A Amounts, Prior to 2022	(\$5,956.61) ^c	(541.57) af	(\$6,018.23)	(541.57) af	(\$11,974.85)	(541.57) af
TOTAL	\$1,832.79	42.35 af	\$2,466.31	42.35 af	\$4,299.10	42.35 af
Rate Applicable in 2022	\$43.27 per acre-foot		\$58.23 per acre-foot		\$101.50 per acre-foot	

Calculation Under Original Provisions, without the Monterey Amendment
(for Plumas and Empire)

Procedure	Capital Cost Component		Minimum Operation, Maintenance, Power and Replacement Component ¹		Total Delta Water Rate	
	[4]		[5]		[6]	
Commencing in 2022						
Total Costs of "Initial" Project Conservation Facilities to be Reimbursed and Project Water Table A Amounts during the Project Repayment Period	\$11,715.06 ^a	583.93 af	\$10,288.34 ^b	583.93 af	\$22,003.40	583.93 af
Less, Project Power Revenues to be Realized During the Project Repayment Period	(\$3,950.38)		(\$1,846.13)		(\$5,796.51)	
Less, Delta Water Charges Paid and Project Water Table A Amounts, Prior to 2022	(\$5,956.61) ^c	(541.57) af	(\$6,018.23)	(541.57) af	(\$11,974.85)	(541.57) af
TOTAL	\$1,808.06	42.35 af	\$2,423.98	42.35 af	\$4,232.04	42.35 af
Rate Applicable in 2022	\$42.69 per acre-foot		\$57.23 per acre-foot		\$99.92 per acre-foot	

¹ 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 Replacement Accounting System.

^a 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.

^b Includes conservation power costs and credits at San Luis Reservoir.

^c 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 ¹	168.97	108.16	277.13
Less, Oroville Power Revenues	-89.65	-43.59	-133.23
<i>Subtotal</i>	<u>79.33</u>	<u>64.57</u>	<u>143.90</u>
Delta Facilities ²	50.36	86.16	136.52
California Aqueduct portion			
Reach 1	9.74	17.78	27.52
Reach 2A	5.27	2.06	7.33
Reach 2B	2.74	1.53	4.27
Reach 3	1.87	0.84	2.71
<i>Subtotal</i>	<u>19.62</u>	<u>22.21</u>	<u>41.83</u>
San Luis Facilities	30.15	26.39	56.53
Planning and Preoperating Costs through 2020	7.49	0.00	7.49
45,000 acre-feet Relinquished Costs	0.58	1.00	1.58
Less, Capital Cost Credits	-3.62	0.00	-3.62
Less, Delta Water Charges paid prior to 2022	-140.64	-142.09	-282.73
Rate Applicable in 2022	<u>43.27</u>	<u>58.23</u>	<u>101.50</u>

¹Includes revenue received from non-SWP water contractors.²Includes: 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	Solano	Total	Alameda Zone 7	Alameda County	Santa Clara	Total	San Luis Obispo	Santa Barbara	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	469,768	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	713,497	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	1,856,232	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	647,091	1,322,240	1,969,331	2,248,610	1,171,457	2,789,182	6,209,249	697,295	1,268,688	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	3,070,686	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	1,048,166	1,907,076	2,955,242
2012	1,270,523	2,083,876	3,354,399	3,528,968	1,838,483	4,377,339	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	1,945,825	4,632,915	10,313,750	1,158,229	2,107,328	3,265,557
2014	1,276,099	2,097,420	3,373,519	3,544,457	1,846,552	4,396,552	9,787,561	1,099,138	1,999,815	3,098,953
2015	1,736,721	2,857,498	4,594,219	4,823,867	2,513,086	5,983,536	13,320,489	1,495,884	2,721,671	4,217,555
2016	2,075,875	3,415,521	5,491,396	5,765,891	3,003,850	7,152,025	15,921,766	1,788,006	3,253,170	5,041,176
2017	1,999,142	3,289,270	5,288,412	5,552,760	2,892,816	6,887,657	15,333,233	1,721,914	3,132,919	4,854,833
2018	2,016,381	3,317,632	5,334,013	5,600,640	2,917,760	6,947,047	15,465,447	1,736,761	3,159,934	4,896,695
2019	2,033,904	3,346,465	5,380,369	5,649,314	2,943,117	7,007,422	15,599,853	1,751,856	3,187,396	4,939,252
2020	2,368,518	3,897,017	6,265,535	6,578,726	3,427,312	8,160,269	18,166,307	2,040,067	3,711,780	5,751,847
2021	2,483,174	4,085,666	6,568,840	6,897,192	3,593,223	8,555,293	19,045,708	2,138,823	3,891,460	6,030,283
2022	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2023	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2024	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2025	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2026	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2027	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2028	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2029	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2030	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2031	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2032	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2033	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2034	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
2035	2,946,126	4,847,379	7,793,505	8,183,073	4,263,127	10,150,303	22,596,503	2,537,575	4,616,967	7,154,542
TOTAL	70,025,728	121,445,467	191,471,195	206,997,578	115,849,114	282,251,334	605,098,026	65,932,762	120,579,499	186,512,261

TABLE B-21 Total Delta Water Charge for Each Contractor (in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge	Empire	Future Contractor San Joaquin Valley	Kern		Kings	Oak Flat	Tulare	Total
				Municipal and Industrial	Agricultural				
	[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	782,396	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	158,984	2,675,439	32,632,947
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	390,127	238,982	3,728,203	47,794,583
2012	2,203,684	129,358	0	5,891,899	37,125,531	407,312	249,508	3,892,417	49,899,709
2013	2,332,348	136,898	0	6,235,904	39,293,142	431,093	264,076	4,119,681	52,813,142
2014	2,125,733	129,639	0	5,917,760	37,288,481	409,099	250,603	3,845,708	49,967,023
2015	2,713,534	176,957	0	8,053,840	50,748,164	556,768	341,062	5,233,858	67,824,183
2016	3,243,443	211,761	0	9,626,626	60,658,473	665,496	407,666	6,255,949	81,069,414
2017	3,123,553	203,580	0	9,270,786	58,416,281	640,896	392,596	6,024,702	78,072,394
2018	3,150,486	205,003	0	9,350,725	58,919,991	646,423	395,981	6,076,651	78,745,260
2019	3,177,866	206,735	0	9,431,990	59,432,048	652,040	399,423	6,129,462	79,429,564
2020	3,374,271	240,881	0	10,983,721	69,209,686	759,313	465,136	7,137,868	92,170,876
2021	3,537,614	252,318	0	11,515,425	72,560,010	796,070	487,652	7,483,401	96,632,490
2022	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2023	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2024	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2025	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2026	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2027	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2028	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2029	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2030	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2031	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2032	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2033	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2034	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
2035	4,197,150	299,758	0	13,662,307	86,087,765	944,485	578,567	8,878,572	114,648,604
TOTAL	127,223,956	8,446,929	0	367,995,181	2,398,438,320	23,147,206	15,952,903	257,415,948	3,198,620,443

TABLE B-21 Total Delta Water Charge for Each Contractor (in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	AVEK	Coachella	Crestline	Desert	Littlerock	Mojave	Palmdale	San Bernardino	San Gabriel	San Geronio
	[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	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	160,756	41,797	4,662	64,303	1,367	67,518	13,021	369,739	85,202	0
1973	222,207	51,552	7,279	79,994	2,577	95,104	26,131	54,908	14,338	0
1974	279,090	59,539	10,791	93,030	3,721	121,869	39,631	465,150	114,427	0
1975	319,822	63,964	13,250	100,515	4,752	140,722	50,989	479,733	119,705	0
1976	431,018	74,449	17,045	117,550	6,269	174,366	67,591	538,772	137,142	0
1977	469,922	79,144	19,079	122,180	6,861	189,848	77,255	540,410	139,097	0
1978	600,180	97,313	24,428	147,413	9,687	236,913	98,345	631,768	165,313	0
1979	720,173	115,033	29,836	171,470	11,889	284,640	117,285	714,457	189,760	0
1980	857,818	134,920	35,949	210,736	14,256	337,177	138,590	811,952	215,694	84,294
1981	1,355,100	218,713	57,637	343,292	22,946	534,813	211,396	1,237,658	330,644	140,930
1982	1,551,434	254,298	66,408	400,739	26,335	313,057	235,100	1,341,923	364,482	167,929
1983	1,110,994	184,283	47,759	291,367	19,002	434,517	163,925	943,775	252,096	124,148
1984	450,405	202,914	52,247	321,718	20,719	472,282	174,500	1,003,760	266,383	138,982
1985	565,881	240,344	61,540	381,970	24,474	551,734	200,605	1,152,983	308,405	166,935
1986	635,066	275,347	70,160	438,498	27,822	625,994	223,785	1,285,253	350,799	195,056
1987	652,450	288,131	73,104	467,095	29,064	648,002	228,654	1,319,729	364,779	207,598
1988	711,641	319,496	80,756	525,996	32,024	711,641	248,146	1,438,752	402,232	233,604
1989	2,083,593	362,565	91,333	605,021	36,301	803,932	276,155	1,607,864	454,180	268,530
1990	2,207,667	386,049	96,930	636,731	38,438	848,974	289,119	1,696,277	481,308	289,119
1991	2,454,678	409,704	102,869	675,746	40,793	900,994	306,835	1,819,725	510,800	306,835
1992	2,804,695	468,125	117,538	772,102	46,610	1,029,469	350,587	2,079,203	583,636	350,587
1993	2,811,318	469,230	117,815	773,925	46,720	1,031,900	351,415	2,084,113	585,014	351,415
1994	2,694,116	449,668	112,905	741,661	44,772	988,880	336,766	1,997,227	560,625	336,766
1995	2,883,156	481,220	120,826	793,702	47,914	1,058,269	360,394	2,137,369	599,963	360,394
1996	2,834,460	473,093	118,785	780,296	47,104	1,040,394	354,307	2,101,269	589,830	0
1997	3,133,957	523,081	131,336	862,744	52,082	1,150,325	391,745	2,323,295	652,153	0
1998	3,155,093	526,609	132,222	868,562	52,433	1,728,006	394,387	2,338,963	656,551	0
1999	3,262,870	544,598	136,739	898,233	54,224	1,787,034	407,859	2,418,863	678,979	47,152
2000	3,314,278	553,178	138,893	912,384	55,078	1,815,190	510,073	2,456,972	689,676	71,841
2001	3,315,004	553,299	138,924	912,584	55,090	1,815,587	510,185	2,457,510	689,827	95,809
2002	3,437,351	561,548	140,995	926,188	55,912	1,842,654	517,791	2,494,146	700,112	97,237
2003	3,365,016	549,731	138,028	906,698	54,735	1,803,877	506,894	2,441,659	685,379	118,989
2004	3,686,201	602,201	151,202	993,241	59,960	1,976,053	555,277	2,674,711	750,797	156,416
2005	3,650,179	596,316	149,725	983,535	59,374	1,956,744	549,850	2,648,574	743,459	167,795
2006	3,802,076	3,256,234	155,955	1,344,440	61,844	2,038,171	572,732	2,758,791	774,397	188,222
2007	3,855,524	3,302,008	158,148	1,363,339	62,714	2,066,822	580,783	2,797,573	785,284	204,501
2008	3,943,904	3,377,700	161,772	1,394,591	64,151	2,114,200	594,096	2,861,701	803,284	482,528
2009	4,310,140	3,691,358	176,795	1,524,095	70,109	2,310,528	649,264	3,127,443	877,878	527,337
2010	5,385,764	5,269,593	220,916	2,123,453	87,605	3,153,757	811,293	3,907,916	1,096,959	658,937
2011	5,928,431	5,800,554	243,174	2,337,412	96,432	3,471,528	893,038	4,301,676	1,207,488	725,331
2012	6,189,558	6,056,050	253,886	2,440,367	100,679	3,624,437	932,373	4,491,150	1,260,674	757,280
2013	6,550,942	6,409,638	268,709	2,582,850	106,557	3,836,054	986,811	4,753,371	1,334,279	801,494
2014	6,368,143	6,082,630	255,000	2,451,078	101,120	3,640,346	936,466	4,510,863	1,266,208	760,603
2015	8,666,793	8,278,222	347,045	3,335,822	137,621	5,133,874	1,274,493	6,139,108	1,723,258	1,035,151
2016	10,359,280	9,894,827	414,817	3,987,255	164,497	6,136,437	1,523,381	7,337,978	2,059,784	1,237,301
2017	9,976,357	9,529,073	399,484	3,839,869	158,416	5,909,610	1,467,071	7,066,735	1,983,645	1,191,565
2018	10,062,381	9,611,239	402,928	3,872,979	159,782	5,960,566	1,479,721	7,127,671	2,000,749	1,201,839
2019	10,149,831	9,694,768	406,431	3,906,638	161,170	6,012,368	1,492,581	7,189,615	2,018,138	1,212,284
2020	11,819,659	11,289,731	473,296	4,549,349	187,686	7,327,921	1,738,137	8,372,436	2,350,157	1,411,727
2021	12,391,829	11,836,248	496,207	4,769,576	196,772	7,682,654	1,822,278	8,777,731	2,463,925	1,480,066
2022	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2023	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2024	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2025	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2026	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2027	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2028	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2029	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2030	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2031	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2032	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2033	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2034	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
2035	14,702,105	14,042,944	588,718	5,658,794	233,457	9,114,972	2,162,014	10,414,211	2,923,288	1,756,003
TOTAL	387,777,671	321,192,541	15,885,610	143,367,448	6,296,858	227,547,360	57,307,302	283,429,174	79,364,926	42,938,569

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
	Santa Clarita ¹	Metropolitan	Ventura	Total	Yuba City	Butte	Plumas	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	13,060	0	0	13,060	0	1,050	875	1,925	0	583,631
1969	17,804	0	0	17,804	0	1,225	929	2,154	0	827,578
1970	37,905	0	0	37,905	0	3,848	1,995	5,843	0	2,160,886
1971	48,508	0	0	48,508	0	4,546	3,186	7,732	0	2,696,792
1972	74,751	2,043,211	0	2,926,327	0	4,929	3,778	8,707	0	7,206,052
1973	107,163	2,317,893	0	2,979,146	0	7,059	4,444	11,503	0	7,456,998
1974	143,266	4,231,933	0	5,562,447	0	8,336	4,931	13,267	0	10,683,514
1975	166,307	5,073,286	0	6,533,045	0	9,416	5,117	14,533	0	12,440,851
1976	207,673	6,422,167	0	8,194,042	0	7,004	5,780	12,784	0	15,299,760
1977	226,502	7,104,278	0	8,974,576	0	16,917	5,827	22,744	0	15,869,924
1978	274,819	9,016,389	0	11,302,568	0	12,635	6,844	19,479	0	19,425,531
1979	320,077	10,935,192	0	13,609,812	0	16,575	7,773	24,348	0	23,095,855
1980	376,845	13,102,796	12,396	16,333,423	0	19,834	8,801	28,635	0	27,557,096
1981	592,631	20,910,099	36,136	25,991,995	0	21,682	13,370	35,052	0	43,335,911
1982	664,082	23,998,560	57,248	29,441,595	0	16,117	14,694	30,811	0	49,027,703
1983	472,521	17,203,307	50,672	21,298,366	0	15,202	10,134	25,336	0	34,186,736
1984	509,602	18,766,458	64,344	22,444,314	20,590	15,442	10,681	46,713	0	37,051,405
1985	591,346	22,050,974	84,882	26,382,073	24,050	16,976	12,166	53,192	0	43,235,458
1986	659,259	25,089,658	120,965	29,997,662	31,753	18,145	13,457	63,355	0	49,817,447
1987	676,176	26,095,043	148,284	31,198,109	37,071	17,794	13,642	68,507	0	51,663,899
1988	742,582	28,781,238	201,116	34,429,224	46,722	18,565	14,852	80,139	0	57,062,086
1989	830,453	32,505,376	265,215	40,190,518	61,184	19,891	16,576	97,651	0	65,617,116
1990	869,029	33,616,369	334,242	41,790,252	63,506	20,055	17,381	100,942	0	68,658,631
1991	961,298	35,676,185	354,722	44,521,184	170,267	21,283	19,155	210,705	0	73,265,317
1992	1,098,371	40,763,329	405,303	50,869,555	194,545	24,318	22,697	241,560	0	83,873,685
1993	1,100,964	40,859,579	406,260	50,989,668	195,005	24,376	23,563	242,944	0	84,237,281
1994	1,055,065	39,156,173	389,323	48,863,947	186,875	23,360	23,360	233,595	0	80,866,329
1995	1,129,097	41,903,674	416,641	52,292,619	199,987	24,999	26,040	251,026	0	86,725,209
1996	1,110,027	41,195,923	409,604	51,055,092	196,610	24,576	26,624	247,810	0	83,007,946
1997	1,227,316	45,548,810	447,746	56,444,590	214,918	27,173	30,223	272,314	0	93,062,361
1998	1,235,593	45,855,992	450,529	57,394,940	107,459	27,356	31,537	166,352	0	93,159,618
1999	1,277,800	47,422,430	466,491	59,403,272	226,327	28,291	33,820	288,438	0	96,994,387
2000	2,279,763	48,169,576	478,942	61,445,844	229,892	69,207	35,708	334,807	0	98,699,723
2001	2,280,263	48,180,135	479,047	61,483,264	229,942	83,833	37,187	350,962	0	98,781,493
2002	2,314,256	48,898,394	486,188	62,472,772	233,371	85,083	39,185	357,639	0	100,275,854
2003	2,265,555	47,869,376	475,957	61,181,894	228,460	83,293	39,743	351,496	0	98,210,650
2004	2,481,798	52,438,419	521,386	67,047,662	250,266	92,048	0	342,314	0	107,579,616
2005	2,457,547	51,925,988	516,291	66,405,377	247,820	717,290	0	965,110	0	107,188,794
2006	2,559,814	51,397,939	537,776	69,448,391	258,133	32,606	8,699	299,438	0	110,967,023
2007	2,595,798	52,120,469	545,336	70,438,299	268,738	33,950	19,600	322,288	0	112,569,420
2008	2,655,301	53,315,217	557,837	72,326,282	274,736	794,785	56,138	1,125,659	0	116,229,451
2009	2,901,877	58,266,144	609,638	79,042,606	292,626	844,842	63,417	1,200,885	0	127,004,742
2010	3,626,059	72,806,845	761,778	99,910,875	365,653	1,054,033	81,825	1,501,511	0	158,911,895
2011	3,991,418	80,142,822	838,533	109,977,837	414,001	1,185,940	92,561	1,692,502	0	174,964,623
2012	4,167,227	83,672,846	875,468	114,821,995	424,826	1,216,951	100,037	1,741,814	0	182,648,119
2013	4,410,535	88,558,170	926,583	121,525,993	444,760	1,274,052	109,975	1,828,787	0	193,299,795
2014	4,185,518	84,040,101	879,310	115,477,386	431,273	1,235,416	108,033	1,774,722	0	183,479,164
2015	5,696,327	114,375,290	1,196,707	157,339,711	574,420	1,645,472	153,363	2,373,255	0	249,669,412
2016	6,808,728	136,710,965	1,430,405	188,065,655	686,595	1,966,807	190,584	2,843,986	0	298,433,393
2017	6,557,049	131,657,554	1,377,531	181,113,959	703,970	2,016,581	183,222	2,903,773	0	287,566,604
2018	6,613,589	132,792,806	1,389,410	182,675,660	671,729	1,924,226	184,502	2,780,457	0	289,897,532
2019	6,671,066	133,946,873	1,401,484	184,263,247	687,783	1,970,211	186,062	2,844,056	0	292,456,341
2020	7,768,576	155,983,533	1,632,054	214,904,262	783,386	2,244,074	216,793	3,244,253	0	340,503,080
2021	8,144,639	163,534,433	1,711,058	225,307,416	821,308	2,352,706	227,085	3,401,099	0	356,985,836
2022	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2023	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2024	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2025	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2026	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2027	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2028	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2029	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2030	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2031	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2032	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2033	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2034	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
2035	9,663,088	194,023,043	2,030,061	267,312,698	974,429	2,791,333	269,783	4,035,545	0	423,541,397
TOTAL	247,533,827	5,294,772,819	53,171,692	7,160,585,797	25,142,563	62,521,043	6,344,933	94,008,539	0	11,436,296,261

¹ Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor¹ (in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa	Solano	Total	Alameda-Zone 7	Alameda County	Santa Clara	Total	San Luis Obispo	Santa Barbara	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	126,001	149,377	416,956	692,334	131,675	270,726	402,401
1996	132,305	232,343	364,648	158,514	180,787	505,042	844,343	242,654	534,449	777,103
1997	135,556	237,492	373,048	171,263	187,162	522,127	880,552	141,810	846,617	988,427
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	383,092	455,983	839,075	753,264	330,355	933,048	2,016,667	229,311	1,456,050	1,685,361
2013	416,223	495,679	911,902	820,192	360,039	1,013,496	2,193,727	249,613	1,583,700	1,833,313
2014	454,438	541,511	995,949	894,353	392,064	1,103,675	2,390,092	271,760	1,722,805	1,994,565
2015	436,482	520,709	957,191	854,027	375,378	1,053,325	2,282,730	260,767	1,649,215	1,909,982
2016	435,356	520,887	956,243	851,748	374,332	1,047,728	2,273,808	260,376	1,644,453	1,904,829
2017	401,057	480,649	881,706	843,557	345,672	966,381	2,155,610	240,390	1,517,572	1,757,962
2018	338,720	407,420	746,140	663,813	291,679	815,189	1,770,681	203,076	1,287,864	1,490,940
2019	475,087	572,818	1,047,905	933,259	411,075	1,149,033	2,493,367	285,188	1,802,011	2,087,199
2020	181,804	219,443	401,247	346,972	156,975	438,260	942,207	109,443	692,021	801,464
2021	812,164	980,417	1,792,581	1,549,328	700,813	1,957,771	4,207,912	489,161	3,097,503	3,586,664
2022	866,530	1,047,753	1,914,283	1,654,352	748,668	2,088,769	4,491,789	521,879	3,294,787	3,816,666
2023	881,973	1,066,426	1,948,399	1,683,835	762,010	2,125,994	4,571,839	531,180	3,353,506	3,884,686
2024	869,349	1,051,162	1,920,511	1,659,735	751,104	2,095,565	4,506,044	523,577	3,305,507	3,829,084
2025	841,503	1,017,491	1,858,994	1,606,570	727,045	2,028,440	4,362,055	506,806	3,199,626	3,706,432
2026	815,791	986,403	1,802,194	1,557,483	704,831	1,966,464	4,228,778	491,321	3,101,865	3,593,186
2027	847,187	1,024,365	1,871,552	1,617,423	731,956	2,042,143	4,391,522	510,230	3,221,240	3,731,470
2028	768,728	929,497	1,698,225	1,467,631	664,169	1,853,017	3,984,817	462,976	2,922,916	3,385,892
2029	789,718	954,876	1,744,594	1,507,704	682,303	1,903,613	4,093,620	475,618	3,002,725	3,478,343
2030	598,518	723,690	1,322,208	1,142,673	517,110	1,442,727	3,102,510	360,465	2,275,733	2,636,198
2031	601,975	727,870	1,329,845	1,149,271	520,096	1,451,059	3,120,426	362,547	2,288,875	2,651,422
2032	603,229	729,386	1,332,615	1,151,666	521,180	1,454,082	3,126,928	363,303	2,293,644	2,656,947
2033	603,212	729,366	1,332,578	1,151,634	521,166	1,454,042	3,126,842	363,293	2,293,580	2,656,873
2034	603,736	729,999	1,333,735	1,152,634	521,618	1,455,305	3,129,557	363,608	2,295,572	2,659,180
2035	603,616	729,854	1,333,470	1,152,405	521,514	1,455,015	3,128,934	363,536	2,295,115	2,658,651
TOTAL	18,848,018	24,197,399	43,045,417	36,720,267	17,651,725	49,352,715	103,724,707	12,643,960	76,535,192	89,179,152

¹ For years 1988 through 2020, charges are debt service only and do not include bond cover; 2021 charges and after include bond cover.

TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor¹ (in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge	Empire	Future Contractor San Joaquin Valley	Kern		Kings	Oak Flat	Tulare	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	139,226	6,340	0	317,885	2,894,181	8,599	11,490	284,798	3,662,519
1996	169,333	7,703	0	354,341	2,722,240	10,461	13,978	346,367	3,624,423
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	271,192	12,709	0	666,489	5,450,478	40,125	23,964	510,822	6,975,779
2013	286,050	13,814	0	724,170	5,680,875	43,592	26,041	521,112	7,295,654
2014	302,692	15,056	0	790,204	6,189,586	47,573	28,404	561,312	7,934,827
2015	278,438	14,506	0	758,484	5,949,402	45,814	27,366	540,099	7,614,109
2016	278,950	14,593	0	759,888	5,962,338	46,008	27,523	541,874	7,631,174
2017	258,290	13,525	0	701,525	5,532,979	43,005	25,472	506,783	7,081,579
2018	218,340	11,422	0	591,662	4,666,806	35,882	21,535	424,302	5,969,949
2019	309,576	16,159	0	835,016	6,609,829	50,629	30,431	602,169	8,453,809
2020	117,982	6,197	0	319,782	2,521,416	19,435	11,676	229,698	3,226,186
2021	528,049	27,705	0	1,427,065	11,282,062	86,576	52,128	1,028,505	14,432,090
2022	528,778	29,638	0	1,527,917	12,021,265	92,916	55,882	1,096,892	15,353,288
2023	538,202	30,166	0	1,555,147	12,235,504	94,572	56,878	1,116,440	15,626,909
2024	530,499	29,734	0	1,532,888	12,060,379	93,218	56,064	1,100,461	15,403,243
2025	513,506	28,782	0	1,483,787	11,674,063	90,232	54,268	1,065,211	14,909,849
2026	497,816	27,903	0	1,438,452	11,317,374	87,475	52,610	1,032,665	14,454,295
2027	516,975	28,976	0	1,493,811	11,752,924	90,842	54,635	1,072,407	15,010,570
2028	469,097	26,293	0	1,355,467	10,664,469	82,429	49,575	973,090	13,620,420
2029	481,905	27,011	0	1,392,477	10,955,657	84,680	50,928	999,660	13,992,318
2030	365,231	20,471	0	1,055,343	8,303,172	64,178	38,598	757,631	10,604,624
2031	367,340	20,589	0	1,061,437	8,351,122	64,548	38,821	762,006	10,665,863
2032	368,105	20,632	0	1,063,649	8,368,522	64,683	38,902	763,594	10,688,087
2033	368,095	20,632	0	1,063,620	8,368,291	64,681	38,901	763,573	10,687,793
2034	368,415	20,650	0	1,064,543	8,375,557	64,737	38,935	764,236	10,697,073
2035	368,341	20,646	0	1,064,331	8,373,891	64,724	38,927	764,084	10,694,944
TOTAL	13,762,185	708,197	0	36,231,625	270,741,267	2,032,471	1,328,680	27,341,613	352,146,038

¹ For years 1988 through 2020, charges are debt service only and do not include bond cover; 2021 charges and after include bond cover.

TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor¹ (in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	AVEK	Coachella	Crestline	Desert	Littlerock	Mojave	Palmdale	San Bernardino	San Gabriel	San Geronio
	[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	27,032	7,656	44,492	2,154	55,996	16,240	151,182	39,907	24,019
1989	205,668	46,993	13,263	78,104	3,763	97,138	27,981	259,860	69,104	42,040
1990	185,010	42,449	11,905	69,970	3,385	87,327	24,956	231,650	61,851	38,023
1991	296,854	65,947	18,548	108,704	5,236	135,623	38,641	363,310	96,172	59,122
1992	402,015	89,358	25,192	147,297	7,053	183,813	52,160	491,537	130,372	80,131
1993	424,871	93,981	26,566	154,919	7,437	193,361	55,045	517,379	137,298	84,371
1994	424,023	94,502	26,865	155,776	7,431	194,191	54,968	525,394	139,422	85,698
1995	500,084	111,730	31,822	184,170	8,769	229,530	64,852	623,848	165,593	101,792
1996	606,388	135,428	38,634	223,237	10,640	278,178	78,696	760,333	201,821	124,074
1997	626,151	139,565	39,802	230,058	10,972	286,779	81,146	808,482	207,472	28,259
1998	602,091	134,202	38,273	221,218	10,550	275,761	78,028	777,418	199,501	27,174
1999	826,108	184,524	52,650	304,166	14,475	642,815	107,060	1,041,566	277,200	53,545
2000	940,325	210,453	60,212	346,906	16,486	736,157	121,898	1,191,538	316,860	70,117
2001	925,355	207,102	59,254	341,384	16,224	724,438	135,581	1,172,568	311,816	69,001
2002	974,814	213,483	61,079	351,902	16,724	746,758	139,071	1,208,696	321,423	71,126
2003	1,015,056	222,296	63,601	366,429	17,415	777,586	144,812	1,258,593	334,692	74,063
2004	1,016,092	222,523	63,666	366,803	17,432	778,379	144,960	1,259,877	335,033	74,138
2005	959,268	210,078	60,105	346,290	16,457	734,849	136,853	1,189,420	316,297	69,992
2006	1,038,026	1,213,645	65,040	501,286	17,809	795,182	148,089	1,287,074	342,266	75,738
2007	666,215	1,036,396	41,723	354,543	11,413	520,847	95,550	825,932	219,727	45,192
2008	999,433	1,157,440	61,924	478,719	17,175	757,686	144,009	1,367,672	325,069	250,631
2009	1,080,062	1,262,793	67,674	521,586	18,529	827,383	154,087	1,339,196	356,126	78,805
2010	1,033,467	1,283,384	64,754	524,108	17,731	824,481	147,438	1,281,421	340,762	75,405
2011	1,116,181	1,386,101	69,937	566,054	19,149	890,469	159,239	1,383,979	368,035	81,440
2012	1,090,934	1,073,158	67,263	523,945	18,453	731,452	154,732	1,323,822	351,925	215,055
2013	1,186,869	1,172,413	73,154	570,092	20,052	795,549	168,130	1,438,513	382,372	233,662
2014	1,345,233	1,276,763	79,660	621,395	21,838	866,523	183,142	1,568,301	416,868	254,740
2015	1,288,246	1,228,651	76,255	595,985	20,924	868,542	175,577	1,500,551	398,955	243,775
2016	1,287,598	1,232,122	76,009	595,354	20,895	867,266	175,457	1,495,424	397,690	242,979
2017	1,186,800	1,209,316	70,025	549,319	19,257	799,852	161,746	1,377,995	366,493	223,908
2018	1,000,779	967,480	59,054	464,006	16,235	675,054	136,374	1,161,768	308,992	188,763
2019	1,406,999	1,357,845	82,987	651,764	22,823	948,853	191,687	1,632,103	434,085	265,182
2020	535,543	518,269	31,472	247,847	8,675	375,638	72,934	618,674	164,626	100,544
2021	2,384,196	2,302,386	139,663	1,100,987	38,591	1,671,669	324,423	2,745,788	730,914	446,336
2022	2,541,404	2,441,153	148,480	1,169,893	41,124	1,812,755	345,989	2,917,146	776,752	474,290
2023	2,586,696	2,484,658	151,126	1,190,742	41,857	1,845,061	352,155	2,969,134	790,595	482,743
2024	2,549,673	2,449,096	148,963	1,173,700	41,258	1,818,653	347,115	2,926,638	779,279	475,833
2025	2,468,002	2,370,647	144,192	1,136,104	39,936	1,760,398	335,996	2,832,892	754,318	460,591
2026	2,392,595	2,298,214	139,786	1,101,391	38,716	1,706,611	325,730	2,746,336	731,270	446,519
2027	2,484,674	2,386,661	145,166	1,143,778	40,206	1,772,290	338,266	2,852,029	759,413	463,703
2028	2,254,565	2,165,629	131,722	1,037,851	36,482	1,608,156	306,938	2,587,898	689,083	420,759
2029	2,316,125	2,224,760	135,318	1,066,189	37,479	1,652,066	315,319	2,658,560	707,898	432,247
2030	1,755,366	1,686,122	102,556	808,053	28,405	1,252,083	238,977	2,014,893	536,508	327,595
2031	1,765,503	1,695,859	103,148	812,720	28,569	1,259,313	240,357	2,026,529	539,606	329,487
2032	1,769,181	1,699,392	103,363	814,413	28,628	1,261,937	240,858	2,030,751	540,731	330,174
2033	1,769,132	1,699,345	103,360	814,391	28,627	1,261,902	240,851	2,030,695	540,716	330,165
2034	1,770,668	1,700,821	103,450	815,098	28,652	1,262,998	241,060	2,032,459	541,185	330,451
2035	1,770,316	1,700,482	103,430	814,936	28,647	1,262,747	241,012	2,032,054	541,078	330,386
TOTAL	59,834,920	51,132,647	3,589,747	26,808,074	990,738	41,912,095	8,206,185	70,838,878	18,795,171	9,833,783

¹ For years 1988 through 2020, charges are debt service only and do not include bond cover; 2021 charges and after include bond cover.

TABLE B-22 Water System Revenue Bond Surcharge for Each Contractor¹ (in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	Grand Total
	Santa Clarita ²	Metropolitan	Ventura	Total	Yuba City	Butte	Plumas	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	57,111	2,642,354	18,118	3,150,527	1,336	552	853	2,741	0	4,317,328
1989	98,720	4,587,641	34,565	5,564,840	0	918	1,454	2,372	0	7,583,021
1990	87,808	4,037,980	34,994	4,917,308	2,535	800	1,283	4,618	0	6,750,020
1991	140,371	6,259,893	54,115	7,642,536	9,945	1,243	2,027	13,215	0	10,510,679
1992	234,421	8,435,312	72,892	10,351,553	13,671	1,710	2,806	18,187	0	14,255,669
1993	247,076	8,885,273	76,858	10,904,435	14,608	1,827	3,026	19,461	0	15,068,309
1994	247,222	8,926,755	76,794	10,959,041	14,409	1,801	3,070	19,280	0	15,145,690
1995	290,998	10,539,430	90,436	12,943,054	16,958	2,119	3,705	22,782	0	18,013,188
1996	353,132	12,810,359	109,783	15,730,703	20,640	2,579	4,620	27,839	0	21,369,059
1997	362,776	13,168,230	112,960	16,102,652	21,382	2,674	4,872	28,928	0	21,970,360
1998	348,838	12,662,268	108,619	15,483,941	20,562	2,571	4,685	27,818	0	21,126,192
1999	479,470	17,454,651	149,123	21,587,353	28,348	3,543	6,765	38,656	0	29,200,538
2000	1,150,965	19,805,800	168,259	25,135,976	32,271	9,794	7,996	50,061	0	33,737,389
2001	1,132,642	19,490,499	165,580	24,751,444	31,757	9,638	7,869	49,264	0	33,419,720
2002	1,167,539	20,091,004	170,682	25,534,301	32,736	9,935	8,112	50,783	0	34,452,492
2003	1,215,738	20,920,403	177,728	26,588,412	34,087	10,345	8,446	52,878	0	35,874,763
2004	1,216,978	20,941,743	177,910	26,615,534	34,121	10,356	8,456	52,933	0	35,911,363
2005	1,148,920	19,770,593	167,960	25,127,082	32,213	9,776	7,983	49,972	0	33,903,044
2006	1,243,248	20,330,228	181,750	27,239,381	34,858	10,579	8,638	54,075	0	36,735,870
2007	820,799	12,752,863	116,415	17,507,615	22,362	7,007	5,579	34,948	0	23,537,874
2008	1,167,531	19,303,204	173,561	26,204,054	32,180	9,751	7,973	49,904	0	35,188,221
2009	1,293,596	21,153,536	189,110	28,342,483	36,270	11,008	8,988	56,266	0	38,172,245
2010	1,237,788	20,240,944	180,952	27,252,635	34,705	10,532	8,600	53,837	0	36,525,441
2011	1,336,855	21,860,932	195,434	29,433,805	37,482	11,375	9,289	58,146	0	39,448,763
2012	915,850	22,686,017	191,051	29,343,657	35,313	101,156	12,344	148,813	0	41,009,352
2013	996,745	23,602,562	207,636	30,847,749	38,359	109,882	13,628	161,869	0	43,244,214
2014	1,085,473	25,718,327	226,122	33,664,385	41,861	119,916	15,370	177,147	0	47,156,965
2015	1,039,717	24,614,514	216,476	32,268,168	40,374	115,656	15,317	171,347	0	45,203,527
2016	1,037,955	24,546,439	215,981	32,191,169	40,634	116,401	15,914	172,949	0	45,130,172
2017	957,063	22,620,590	198,956	29,741,320	37,618	107,762	14,712	160,092	0	41,778,269
2018	806,189	19,059,037	167,437	25,011,168	31,806	91,109	12,436	135,351	0	35,124,229
2019	1,132,290	26,781,888	235,142	35,143,648	44,930	128,706	17,513	191,149	0	49,417,077
2020	430,917	10,168,517	89,368	13,363,024	17,271	49,473	6,630	73,374	0	18,807,502
2021	1,919,680	45,221,634	397,585	59,423,852	77,030	220,657	29,542	327,229	0	83,770,328
2022	2,041,440	48,061,597	423,084	63,195,107	82,706	236,920	31,579	351,205	0	89,122,338
2023	2,077,822	48,918,135	430,624	64,321,348	84,180	241,142	32,142	357,464	0	90,710,645
2024	2,048,082	48,217,978	424,461	63,400,729	82,975	237,691	31,682	352,348	0	89,412,319
2025	1,982,478	46,673,466	410,864	61,369,884	80,317	230,077	30,667	341,061	0	86,548,275
2026	1,921,906	45,247,408	398,311	59,494,793	77,863	223,047	29,730	330,640	0	83,903,886
2027	1,995,871	46,988,759	413,640	61,784,456	80,860	231,631	30,874	343,365	0	87,132,935
2028	1,811,030	42,637,059	375,332	56,062,504	73,371	210,180	28,015	311,566	0	79,063,424
2029	1,860,479	43,801,245	385,580	57,593,265	75,375	215,919	28,780	320,074	0	81,222,214
2030	1,410,037	33,196,484	292,227	43,649,306	57,126	163,642	21,812	242,580	0	61,557,426
2031	1,418,180	33,388,188	293,915	43,901,374	57,456	164,587	21,938	243,981	0	61,912,911
2032	1,421,135	33,457,758	294,527	43,992,848	57,575	164,930	21,984	244,489	0	62,041,914
2033	1,421,095	33,456,833	294,519	43,991,631	57,574	164,926	21,983	244,483	0	62,040,200
2034	1,422,329	33,485,881	294,775	44,029,827	57,624	165,069	22,002	244,695	0	62,094,067
2035	1,422,046	33,479,217	294,716	44,021,067	57,612	165,036	21,998	244,646	0	62,081,712
TOTAL	51,656,351	1,163,101,428	10,176,927	1,516,876,944	1,947,246	4,117,948	665,687	6,730,881	0	2,111,703,139

¹ For years 1988 through 2020, charges are debt service only and do not include bond cover; 2021 charges and after include bond cover.² Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor¹ (in dollars)

Sheet 1 of 4

Calendar Year	NORTH BAY AREA			SOUTH BAY AREA				CENTRAL COASTAL AREA		
	Napa	Solano	Total	Alameda-Zone 7	Alameda County	Santa Clara	Total	San Luis Obispo	Santa Barbara	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	193,920	190,272	447,723	831,915	0	0	0
1964	0	0	0	255,449	277,455	621,356	1,154,260	6,696	21,667	28,363
1965	0	0	0	364,163	404,324	1,158,090	1,926,577	13,756	36,029	49,785
1966	18,063	0	18,063	409,118	421,723	1,412,954	2,243,794	26,524	61,349	87,873
1967	41,574	0	41,574	541,991	548,491	1,863,198	2,953,680	56,469	118,263	174,731
1968	128,628	0	128,628	671,555	633,184	2,178,465	3,483,204	115,961	229,807	345,768
1969	254,715	0	254,715	805,808	583,436	2,298,736	3,687,980	185,156	358,861	544,017
1970	277,547	0	277,547	891,980	640,297	2,787,967	4,320,244	200,150	387,675	587,825
1971	227,474	0	227,474	833,684	675,193	2,807,017	4,315,894	202,413	392,912	595,325
1972	224,978	0	224,978	918,220	822,397	3,027,749	4,768,366	209,057	406,589	615,646
1973	221,091	31,366	252,457	904,900	716,492	3,120,787	4,742,179	206,557	402,724	609,281
1974	240,498	32,938	273,437	945,700	746,932	3,325,022	5,017,654	208,545	407,090	615,635
1975	237,459	36,291	273,750	1,004,502	793,055	3,214,046	5,011,603	225,895	439,873	665,768
1976	271,292	40,836	312,127	1,117,722	943,464	3,362,542	5,423,727	228,976	447,299	676,275
1977	293,627	45,096	338,723	1,086,535	922,203	3,303,461	5,312,200	238,699	468,721	707,420
1978	273,870	49,178	323,048	1,175,553	935,818	3,712,581	5,823,952	245,331	484,259	729,590
1979	289,479	53,340	342,819	1,272,282	1,009,566	3,819,533	6,101,381	243,110	483,437	726,547
1980	310,846	86,073	396,919	1,425,504	1,173,798	4,119,071	6,718,373	282,254	540,553	822,807
1981	347,781	112,848	460,629	1,534,163	1,349,125	4,507,566	7,390,853	307,065	596,671	903,736
1982	438,335	141,835	580,171	1,614,925	1,369,536	4,941,393	7,925,854	328,215	682,545	1,010,760
1983	354,787	163,294	518,081	1,485,620	1,260,138	4,910,241	7,655,999	357,218	702,083	1,059,301
1984	467,336	246,698	714,034	1,795,561	1,478,394	6,870,249	10,144,205	409,529	801,057	1,210,586
1985	736,074	386,306	1,122,380	2,293,399	2,225,097	7,796,485	12,314,981	500,696	969,931	1,470,626
1986	1,120,086	714,246	1,834,332	2,162,344	2,014,104	8,193,845	12,370,293	536,751	1,038,031	1,574,782
1987	1,773,801	1,582,227	3,356,028	2,659,141	2,505,662	7,980,255	13,145,058	570,644	1,148,974	1,719,618
1988	2,349,572	2,524,763	4,874,335	2,720,533	2,774,430	7,830,285	13,325,247	673,071	1,439,620	2,112,691
1989	2,548,764	3,701,385	6,250,149	2,704,484	2,515,471	7,578,850	12,798,805	772,570	1,814,759	2,587,329
1990	2,900,024	3,848,934	6,748,958	3,139,916	2,929,775	8,355,392	14,425,083	933,367	2,046,370	2,979,737
1991	2,941,321	4,170,227	7,111,548	2,411,573	2,384,246	6,430,834	11,226,653	979,709	2,366,841	3,346,550
1992	2,797,727	4,144,993	6,942,720	2,885,225	2,927,115	7,656,940	13,469,280	1,118,807	2,526,861	3,645,668
1993	2,855,497	4,172,491	7,027,988	3,741,653	2,977,354	8,849,995	15,569,002	1,185,665	2,726,057	3,911,722
1994	2,987,938	4,225,291	7,213,229	3,778,440	3,586,255	9,613,545	16,978,239	1,335,974	3,518,042	4,854,015
1995	2,961,322	4,405,219	7,366,541	4,026,946	3,313,350	8,393,828	15,734,125	1,647,817	6,195,415	7,843,231
1996	3,045,021	4,898,210	7,943,232	3,634,532	3,178,398	9,228,554	16,041,483	2,592,043	15,232,542	17,824,585
1997	3,028,005	4,734,808	7,762,813	3,860,915	3,145,550	9,338,016	16,344,481	3,002,832	23,737,164	26,739,996
1998	2,936,062	4,588,897	7,524,960	3,467,565	3,201,607	9,077,806	15,746,977	3,254,940	28,393,640	31,648,580
1999	3,155,415	5,072,111	8,227,526	4,175,936	3,675,328	11,386,055	19,237,318	3,803,351	29,662,252	33,465,603
2000	3,463,380	5,623,325	9,086,705	5,805,039	3,598,049	10,229,605	19,632,693	3,765,269	30,291,477	34,056,746
2001	4,080,092	6,371,174	10,451,266	9,741,446	4,082,024	11,628,753	25,452,223	4,315,191	32,422,390	36,737,581
2002	4,328,511	6,571,284	10,899,794	13,279,711	4,091,231	13,167,304	30,538,246	4,043,387	32,107,699	36,151,087
2003	4,446,698	6,915,763	11,362,462	9,901,585	3,807,457	11,948,846	25,657,888	4,120,206	32,395,489	36,515,694
2004	4,982,485	7,259,825	12,242,309	8,265,647	4,208,939	11,650,128	24,124,714	4,190,181	32,929,549	37,119,730
2005	4,331,144	6,736,760	11,067,905	8,659,084	4,335,996	12,355,021	25,350,102	4,295,770	32,950,021	37,245,791
2006	4,289,083	6,319,024	10,608,107	9,177,141	4,403,295	12,662,103	26,242,540	4,183,980	32,757,185	36,941,165
2007	4,404,260	6,663,062	11,067,321	10,906,747	4,824,329	13,643,588	29,374,664	4,259,725	33,479,869	37,739,594
2008	5,195,890	6,766,894	11,962,784	14,270,091	5,234,701	14,116,284	33,621,076	4,848,973	35,159,946	40,008,919
2009	5,731,723	6,989,787	12,721,510	15,600,120	4,907,148	14,215,307	34,722,575	4,754,534	33,920,849	38,675,383
2010	6,356,551	8,750,976	15,107,527	18,203,214	5,561,242	15,780,408	39,544,864	5,273,098	36,266,858	41,539,956
2011	6,857,780	9,362,041	16,219,821	21,780,668	6,430,350	18,048,475	46,259,493	5,457,212	37,646,229	43,103,441
2012	7,462,897	9,413,462	16,876,359	24,300,958	6,498,158	20,441,678	51,240,794	5,520,368	37,966,250	43,486,619
2013	7,218,726	9,315,516	16,534,242	26,584,050	7,379,018	20,848,146	54,747,214	5,827,063	39,612,336	45,439,400
2014	7,823,531	9,810,697	17,634,228	26,680,568	7,563,978	20,654,043	54,898,589	5,632,101	36,850,290	42,482,391
2015	8,375,009	10,505,586	18,880,595	29,228,974	7,668,995	23,572,457	60,470,427	6,604,459	39,481,466	46,085,925
2016	9,049,711	11,677,549	20,727,260	30,867,682	7,741,216	30,641,956	69,250,854	6,677,983	44,520,979	51,198,962
2017	7,989,899	10,070,848	18,060,747	31,343,269	8,024,725	26,947,183	66,315,177	6,720,109	48,043,990	54,764,099
2018	8,894,340	11,142,823	20,037,162	33,128,089	8,529,535	27,154,968	68,812,592	6,866,418	46,763,339	53,629,757
2019	8,700,839	10,722,742	19,423,581	32,646,125	8,208,836	22,393,457	63,248,418	6,633,682	43,079,897	49,713,579
2020	10,321,032	11,819,188	22,140,220	32,933,571	8,963,938	23,418,389	65,315,898	6,990,935	42,024,826	49,015,761
2021	11,658,401	13,973,082	25,631,484	38,159,910	11,761,068	30,832,099	80,753,077	7,894,018	43,826,992	51,721,010
2022	11,968,720	14,132,196	26,100,917	37,883,129	10,980,038	29,416,824	78,279,992	9,350,388	48,075,992	57,426,380
2023	11,639,253	13,848,303	25,487,556	38,267,697	11,147,526	29,839,614	79,254,836	9,513,838	48,645,083	58,158,920
2024	12,029,442	14,640,884	26,670,326	39,700,952	11,716,535	31,236,313	82,653,800	10,318,075	50,806,009	61,124,084
2025	12,023,340	14,645,873	26,669,212	39,360,864	11,530,528	30,790,261	81,681,653	10,226,146	50,580,844	60,806,991
2026	12,029,072	14,654,890	26,683,962	39,687,283	11,690,625	31,176,239	82,554,147	10,305,067	50,750,497	61,055,565
2027	12,096,343	14,734,725	26,831,068	39,408,424	11,527,779	30,809,750	81,745,953	10,238,496	50,745,934	60,984,430
2028	12,053,392	14,682,133	26,735,525	39,720,692	11,686,660	31,174,399	82,581,751	10,306,831	50,762,300	61,069,131
2029	12,110,388	14,750,387	26,860,775	39,952,657	11,790,634	31,441,469	83,184,760	10,372,518	51,020,240	61,392,758
2030	11,948,327	14,551,365	26,499,692	39,406,407	11,516,923	30,737,688	81,661,018	10,210,871	50,254,972	60,465,842
2031	11,977,059	14,582,577	26,559,636	39,639,002	11,623,343	30,999,200	82,261,545	10,275,146	50,458,193	60,733,338
2032	12,006,135	14,611,741	26,617,876	39,637,619	11,607,923	30,987,655	82,233,197	10,270,649	50,524,614	60,795,262
2033	12,015,655	14,613,388	26,629,044	39,796,063	11,677,616	31,157,620	82,631,298	10,320,373	50,704,538	61,024,911
2034	11,984,774	14,586,819	26,571,593	39,732,384	11,628,126	31,062,669	82,423,179	10,300,556	50,730,003	61,030,559
2035	11,879,178	14,490,617	26,369,795	40,390,489	11,957,538	31,842,687	84,190,714	10,487,071	51,203,028	61,690,098
TOTAL	356,779,069	450,517,207	807,296,276	1,072,970,557	361,198,845	1,034,500,151	2,468,669,552	288,576,500	1,661,046,131	1,949,622,631

¹ Capital charges repaid through bond debt service prior to 2020 exclude bond cover; capital charges for 2021 and after include both bond debt service and bond cover.

TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor¹ (in dollars)

Sheet 2 of 4

Calendar Year	SAN JOAQUIN VALLEY AREA								
	Dudley Ridge	Empire	Future Contractor San Joaquin Valley	Kern		Kings	Oak Flat	Tulare	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	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	267,611	0	0	0	0	293,869
1968	231,382	19,684	54,588	445,439	1,738,344	16,947	20,074	312,689	2,839,146
1969	247,571	11,844	87,576	525,094	2,788,189	16,825	19,845	479,128	4,176,073
1970	313,311	35,280	94,675	573,998	3,950,855	21,435	30,885	536,320	5,556,758
1971	335,717	38,008	95,695	605,889	5,295,579	27,175	35,204	728,537	7,161,803
1972	390,336	41,269	98,788	631,615	7,311,283	26,473	64,817	2,034,392	10,598,973
1973	408,562	39,891	97,550	1,025,888	7,463,372	28,816	39,845	801,015	9,904,939
1974	522,048	41,105	98,460	1,144,792	8,194,173	29,544	43,212	1,073,938	11,147,273
1975	697,745	41,554	106,703	1,197,166	9,612,135	31,240	48,848	1,593,154	13,328,544
1976	733,027	44,075	108,084	1,323,840	10,874,205	32,666	52,870	1,468,379	14,637,146
1977	593,062	39,992	112,554	1,367,404	11,211,573	34,434	54,913	1,163,158	14,577,090
1978	712,532	36,029	115,521	1,565,884	13,574,204	38,927	59,766	1,198,988	17,301,851
1979	798,513	48,828	114,253	1,668,951	15,679,538	43,065	71,377	1,756,379	20,180,903
1980	980,550	50,563	125,950	1,770,264	17,348,931	48,021	96,008	1,702,818	22,123,105
1981	1,229,489	84,929	134,169	2,430,802	22,984,461	66,495	101,445	2,315,723	29,347,514
1982	1,265,605	71,123	135,057	2,523,660	25,410,775	70,662	109,129	2,312,228	31,898,239
1983	1,200,711	53,473	149,202	2,085,047	25,092,115	75,442	88,143	510,830	29,254,964
1984	1,511,170	29,455	164,505	3,396,379	33,845,481	94,320	122,325	1,568,037	40,731,673
1985	1,787,900	130,885	184,905	3,891,204	39,845,862	117,583	140,424	2,835,358	48,934,122
1986	2,030,668	80,262	180,445	4,079,838	43,943,853	136,715	154,117	3,695,451	54,301,349
1987	1,906,800	96,180	179,872	4,570,841	43,279,695	137,332	152,376	3,790,164	54,113,260
1988	1,992,705	110,558	193,735	4,734,502	45,245,335	138,278	147,572	3,946,458	56,509,142
1989	2,148,286	102,685	187,913	4,677,357	47,458,084	137,085	167,436	4,429,711	59,308,557
1990	1,896,131	87,889	221,392	4,827,893	46,256,205	121,154	149,757	4,011,402	57,571,821
1991	1,712,201	81,178	220,282	4,535,869	38,131,860	103,909	135,767	3,552,412	48,473,478
1992	2,259,775	105,997	241,455	5,550,167	49,328,956	143,783	176,750	4,591,242	62,398,126
1993	2,481,930	121,000	264,959	5,806,060	55,230,123	161,522	196,315	5,345,096	69,607,005
1994	2,286,753	108,505	306,359	5,210,309	52,700,663	145,625	179,127	5,717,796	65,655,136
1995	2,883,213	116,423	304,297	6,621,491	61,160,818	180,802	211,460	5,576,630	77,055,135
1996	2,073,902	126,112	389,203	6,671,115	59,220,242	178,474	191,072	7,142,396	75,992,516
1997	2,785,165	101,517	276,681	6,521,956	57,995,134	138,117	213,272	4,764,526	72,796,368
1998	2,630,846	120,809	381,847	5,733,156	54,570,636	143,433	204,882	5,017,826	68,803,434
1999	2,723,554	136,959	366,294	6,360,397	58,133,861	184,039	219,747	7,490,403	75,615,254
2000	2,617,392	121,689	303,341	6,103,419	51,916,157	174,236	214,372	6,222,142	67,672,748
2001	3,290,396	146,465	328,028	5,650,458	59,108,056	192,167	260,353	6,486,032	75,461,953
2002	3,011,376	128,681	321,344	6,172,131	54,106,899	187,442	239,853	5,832,939	70,000,665
2003	3,059,958	132,411	339,960	6,533,590	56,591,626	202,324	239,016	6,112,372	73,211,257
2004	3,247,718	169,060	342,620	7,858,474	57,186,999	357,726	254,601	5,865,281	75,282,478
2005	3,808,376	177,727	355,586	7,015,136	67,794,831	692,439	251,445	6,705,469	86,801,010
2006	3,641,860	168,904	295,459	7,509,019	65,036,345	538,976	256,840	5,944,656	83,392,059
2007	3,425,474	159,982	334,132	7,120,758	61,814,649	523,470	253,788	5,880,893	79,513,146
2008	3,400,422	157,734	471,586	7,772,665	62,813,643	549,597	262,345	5,575,882	81,003,872
2009	3,274,916	154,555	437,333	6,915,665	61,046,009	522,615	261,398	5,463,090	78,075,581
2010	3,625,405	232,657	507,046	8,081,336	72,288,689	648,720	325,284	6,479,982	92,189,119
2011	4,582,759	220,061	506,678	9,734,760	90,705,163	742,264	357,439	6,954,525	113,803,649
2012	3,751,745	231,214	467,874	9,792,338	83,589,583	765,025	366,267	7,883,105	106,847,152
2013	4,235,167	233,034	519,611	10,356,741	85,988,644	753,938	381,831	7,395,171	109,864,136
2014	4,043,207	211,096	630,817	9,495,307	79,796,391	684,443	372,723	6,524,858	101,758,842
2015	4,410,667	260,274	755,570	12,027,406	95,077,657	832,392	451,160	8,104,102	121,919,229
2016	4,918,572	316,265	484,982	13,315,539	106,542,914	975,601	522,122	9,515,773	136,591,767
2017	5,322,342	295,467	481,144	13,117,366	114,026,223	1,007,285	513,302	9,365,808	144,128,937
2018	5,207,346	301,615	617,513	12,492,799	105,511,615	946,593	514,204	9,158,554	134,750,237
2019	5,171,880	316,655	602,195	13,262,698	117,813,640	1,003,364	527,893	10,632,421	149,330,747
2020	5,112,325	335,889	678,379	14,430,556	114,935,939	1,067,406	582,753	9,866,579	147,009,825
2021	5,527,123	348,356	751,957	16,121,134	120,369,239	1,250,464	647,924	11,751,234	156,767,431
2022	6,453,253	431,551	763,705	20,266,153	148,170,843	1,393,000	762,188	13,297,401	191,538,093
2023	6,448,939	431,650	791,960	20,351,108	148,108,850	1,398,303	763,040	13,292,310	191,586,160
2024	6,574,062	440,235	839,419	20,947,439	151,213,843	1,428,900	773,950	13,539,845	195,757,694
2025	6,374,096	426,657	845,203	20,481,369	147,116,943	1,386,717	747,923	13,136,575	190,515,482
2026	6,524,572	437,167	851,346	20,799,228	150,177,384	1,419,272	767,982	13,436,240	194,413,190
2027	6,327,236	423,307	857,178	20,380,842	146,326,430	1,376,295	740,685	13,040,709	189,472,683
2028	6,491,405	435,169	861,283	20,713,354	149,621,647	1,412,923	763,195	13,365,602	193,664,577
2029	6,573,899	440,638	867,572	20,917,501	151,474,734	1,429,881	772,867	13,530,847	196,007,939
2030	6,320,359	424,641	873,954	20,259,803	146,031,273	1,380,012	742,478	13,013,221	189,045,741
2031	6,420,007	431,426	879,104	20,520,168	148,423,352	1,400,687	753,437	13,212,112	192,040,292
2032	6,364,753	427,573	885,898	20,331,770	147,002,792	1,388,786	747,867	13,100,227	190,249,666
2033	6,424,415	431,634	892,435	20,535,214	148,683,892	1,401,284	752,942	13,218,755	192,340,569
2034	6,343,524	426,021	898,758	20,286,270	146,770,622	1,383,764	743,817	13,055,397	189,908,173
2035	6,688,980	449,741	905,040	21,199,555	154,682,583	1,457,136	784,318	13,747,092	199,914,444
TOTAL	224,787,083	13,231,263	28,386,025	603,421,846	4,842,742,640	37,145,783	22,372,379	442,169,779	6,214,256,798

¹ Capital charges repaid through bond debt service prior to 2020 exclude bond cover; capital charges for 2021 and after include both bond debt service and bond cover.

TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor¹ (in dollars)

Sheet 3 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA									
	AVEK	Coachella	Crestline	Desert	Littlerock	Mojave	Palmdale	San Bernardino	San Gabriel	San Geronio
	[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	34,411	0	0	726	0	0	0	51,729	0	0
1964	64,494	19,542	4,370	38,211	1,143	31,079	8,205	82,811	34,987	21,735
1965	121,484	34,348	7,194	42,701	2,082	55,096	15,222	135,069	35,344	21,866
1966	221,012	62,476	12,478	76,886	3,753	99,564	27,679	232,502	61,465	37,964
1967	427,622	121,269	23,472	148,839	7,284	193,330	54,023	433,350	115,574	71,283
1968	754,401	218,649	41,509	265,168	12,870	346,566	95,466	782,163	208,927	128,915
1969	1,090,136	334,105	61,226	394,024	18,693	517,986	138,063	1,205,834	321,755	198,764
1970	1,420,639	470,423	89,700	552,223	25,231	716,628	184,837	1,778,187	467,573	289,633
1971	1,760,670	627,331	128,360	754,065	31,837	962,401	231,280	2,538,219	659,414	409,327
1972	2,245,455	819,635	185,868	1,035,804	43,771	1,297,796	287,620	3,758,473	950,297	537,186
1973	2,399,531	971,770	190,992	1,264,690	46,059	1,393,737	313,446	4,026,451	961,024	587,963
1974	2,520,870	998,399	204,074	1,305,235	48,933	1,455,113	331,702	4,463,660	1,104,491	611,428
1975	2,739,680	1,047,544	219,290	1,381,319	53,242	1,544,775	355,270	4,638,827	1,208,046	644,621
1976	3,204,880	1,106,524	232,129	1,474,438	57,732	1,622,874	381,276	4,838,364	1,278,740	668,315
1977	3,187,208	1,008,676	245,111	1,317,096	54,209	1,712,129	406,620	5,094,241	1,336,313	696,515
1978	3,635,572	1,208,919	255,468	1,618,071	56,805	1,761,251	420,026	5,091,935	1,374,033	709,040
1979	4,309,554	1,295,874	267,791	1,740,645	60,285	1,938,733	449,757	5,136,839	1,342,135	712,866
1980	4,994,298	1,406,781	295,350	1,941,392	67,604	2,112,937	499,051	5,647,604	1,485,141	862,275
1981	5,824,304	1,574,217	328,818	2,194,094	100,752	2,439,116	603,265	6,461,840	1,688,324	946,961
1982	5,582,860	1,657,630	346,721	2,336,914	82,296	2,413,011	641,991	6,752,799	1,929,664	1,021,329
1983	6,335,170	2,181,785	380,840	3,172,326	88,383	2,612,399	658,613	6,964,704	1,808,748	1,076,279
1984	7,713,111	3,287,286	497,586	4,929,764	96,492	2,881,410	727,821	8,053,209	2,598,232	1,211,621
1985	9,545,818	4,122,840	601,928	6,265,166	103,706	3,073,771	959,657	8,893,342	2,686,799	1,287,789
1986	9,515,134	4,584,188	647,634	7,009,695	130,222	3,259,224	1,223,847	9,142,822	3,398,540	1,344,770
1987	9,550,203	4,452,838	678,086	6,885,936	240,873	3,315,593	1,255,052	10,544,337	3,398,921	1,379,613
1988	9,149,230	4,510,360	704,411	7,052,631	158,845	3,491,394	1,044,206	11,095,193	3,271,137	1,465,829
1989	11,039,912	4,218,204	691,191	6,635,387	210,634	3,573,480	1,746,763	10,811,990	3,453,679	1,505,481
1990	12,432,751	4,916,384	729,229	7,720,886	331,172	3,808,671	1,953,905	11,722,946	4,221,266	1,624,763
1991	9,293,533	3,471,782	688,867	5,335,009	221,166	4,669,256	1,640,084	11,104,874	3,642,610	1,720,878
1992	11,850,715	3,626,099	612,895	5,587,383	174,998	5,648,082	1,532,325	11,144,101	3,694,099	1,779,902
1993	12,264,759	3,830,889	617,198	5,922,476	211,904	5,539,903	1,753,971	12,107,175	4,042,324	1,943,336
1994	14,334,329	3,857,907	694,421	5,963,596	278,012	6,491,938	2,090,724	12,731,704	4,776,753	1,920,217
1995	14,201,115	4,680,553	661,811	7,318,575	212,244	5,685,104	1,952,494	12,204,445	4,480,933	1,982,808
1996	14,628,006	7,634,303	710,651	12,187,480	208,356	5,783,769	2,300,206	12,730,997	4,599,073	1,651,317
1997	15,198,058	7,251,237	750,419	8,515,792	207,887	6,206,877	2,342,198	14,412,460	4,897,487	1,773,142
1998	13,714,014	6,324,675	717,140	7,018,227	209,057	7,810,148	1,946,444	14,380,084	4,177,167	2,031,020
1999	15,553,391	5,411,082	822,829	7,236,511	214,497	8,437,541	2,369,981	15,895,937	5,129,049	2,470,180
2000	14,843,460	3,826,005	793,796	5,625,366	187,002	8,372,690	2,081,242	15,954,920	4,259,707	3,032,353
2001	24,848,284	4,861,082	995,705	7,603,913	199,105	9,053,621	3,987,569	22,539,207	4,397,025	4,736,772
2002	16,415,364	4,136,268	962,062	6,408,072	182,505	8,238,813	3,397,626	24,324,341	5,808,809	7,013,354
2003	17,747,034	4,252,442	931,249	6,597,952	187,473	9,885,035	2,929,705	23,143,735	5,970,925	8,799,566
2004	18,940,852	4,939,800	1,044,146	6,725,930	201,589	10,169,950	3,219,181	27,894,909	5,475,311	9,379,050
2005	19,264,489	18,601,221	863,950	11,623,949	190,121	9,909,252	3,257,114	25,937,842	5,715,492	9,776,348
2006	20,978,460	31,810,926	854,904	11,741,001	201,952	12,760,066	3,216,591	25,913,085	5,791,851	10,332,312
2007	24,182,357	30,493,032	1,081,697	11,097,588	200,883	16,341,318	4,713,977	31,805,714	4,840,960	11,075,866
2008	22,068,961	30,190,229	1,029,922	12,143,665	216,500	14,933,766	4,689,852	32,580,243	5,917,654	12,975,276
2009	20,234,269	28,256,793	1,025,437	10,179,409	221,993	14,858,218	4,478,585	32,826,770	6,494,362	13,300,521
2010	23,938,241	38,292,826	973,233	13,610,262	227,967	18,017,210	3,975,753	36,066,544	8,188,853	14,698,030
2011	30,848,937	40,376,565	1,057,648	14,809,996	251,744	11,986,880	4,068,380	34,031,841	9,013,624	15,871,331
2012	31,181,946	46,716,422	1,167,395	17,142,361	267,056	13,699,724	5,436,296	47,860,772	9,282,309	17,452,897
2013	26,999,074	39,378,264	1,398,556	13,954,367	292,102	13,958,976	4,616,825	40,207,162	7,607,346	18,930,369
2014	22,462,787	34,676,034	1,486,592	11,826,758	293,809	13,911,736	4,711,479	42,577,929	6,519,199	24,151,918
2015	22,685,717	39,966,300	1,554,067	14,028,706	322,034	16,905,888	4,217,763	51,510,758	8,017,527	29,096,329
2016	28,027,383	44,344,634	1,520,723	15,471,177	341,745	19,486,334	4,939,653	60,169,606	9,647,577	33,843,455
2017	35,605,542	43,053,387	1,401,234	15,779,484	324,830	20,775,118	5,241,105	65,289,105	9,893,893	38,103,257
2018	30,296,058	59,357,283	1,484,608	19,972,993	330,382	15,453,244	4,835,582	62,603,224	9,636,722	39,842,637
2019	31,759,086	40,810,970	1,334,658	14,094,623	417,962	19,250,042	5,118,349	70,570,472	10,421,311	41,802,327
2020	28,399,243	57,632,352	1,445,377	19,082,541	616,315	16,584,818	4,405,831	61,907,527	8,391,797	41,169,091
2021	30,872,131	47,710,821	2,245,635	15,154,189	439,013	22,042,469	4,952,875	68,139,059	8,674,723	40,325,394
2022	44,282,315	58,313,634	2,320,123	20,844,765	707,107	30,588,242	7,752,577	75,150,973	11,661,713	42,563,022
2023	44,851,813	59,369,523	2,352,891	21,139,843	720,070	31,058,493	7,893,850	75,436,424	11,825,502	42,430,452
2024	48,317,313	64,334,144	2,519,396	22,872,998	775,448	33,257,648	8,622,290	78,938,769	12,687,788	43,373,726
2025	47,525,356	63,625,093	2,487,992	22,579,197	762,878	32,839,489	8,446,882	78,457,193	12,534,656	43,309,409
2026	47,586,381	63,615,543	2,488,051	22,569,749	763,877	32,826,853	8,462,225	78,493,740	12,526,353	43,340,453
2027	47,486,586	63,605,124	2,489,243	22,569,134	762,369	32,831,540	8,426,102	78,611,992	12,537,593	43,387,802
2028	47,645,234	63,793,084	2,493,072	22,617,780	764,877	32,890,784	8,476,712	78,727,745	12,553,052	43,436,462
2029	48,230,836	64,470,615	2,521,023	22,884,579	774,252	33,265,258	8,597,709	79,338,957	12,702,469	43,567,714
2030	46,907,368	63,274,413	2,460,158	22,348,813	753,146	32,441,501	8,345,092	78,287,474	12,395,049	43,422,800
2031	48,648,354	65,064,520	2,534,848	23,060,901	780,758	33,520,404	8,736,661	79,699,761	12,770,553	43,689,899
2032	46,402,398	62,951,790	2,443,038	22,196,744	745,216	32,152,721	8,224,952	78,214,585	12,331,552	43,468,617
2033	48,659,617	65,242,952	2,542,539	23,104,718	781,062	33,608,737	8,732,959	79,985,055	12,806,557	43,796,617
2034	46,406,103	63,192,344	2,449,319	22,263,853	745,375	32,255,603	8,230,485	78,523,898	12,374,529	43,579,438
2035	51,704,593	68,349,296	2,670,023	24,327,255	829,379	35,439,066	9,421,842	82,416,621	13,444,794	44,266,304
TOTAL	1,450,112,275	1,676,232,253	75,771,362	724,694,010	20,852,925	880,474,191	243,804,761	2,261,229,168	415,959,200	1,090,688,098

¹ Capital charges repaid through bond debt service prior to 2020 exclude bond cover; capital charges for 2021 and after include both bond debt service and bond cover.

TABLE B-23 Total Transportation and Delta Water Charge for Each Contractor¹ (in dollars)

Sheet 4 of 4

Calendar Year	SOUTHERN CALIFORNIA AREA (continued)				FEATHER RIVER AREA				South Bay Area Future Contractor	Grand Total
	Santa Clarita ²	Metropolitan	Ventura	Total	Yuba City	Butte	Plumas	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	777,678	0	0	0	0	12,626	1,622,219
1964	27,447	1,260,513	9,378	1,603,916	0	0	0	0	13,938	2,803,202
1965	53,007	2,180,589	17,766	2,721,767	0	0	405	405	28,937	4,807,069
1966	101,264	3,900,172	33,426	4,870,643	0	0	565	565	31,321	7,401,629
1967	210,814	7,693,703	68,155	9,568,718	0	0	562	562	47,718	13,080,852
1968	492,745	15,317,881	142,803	18,808,064	0	1,050	1,439	2,489	46,945	25,654,244
1969	745,268	23,153,064	215,209	28,394,128	0	1,225	4,120	5,345	52,963	37,115,221
1970	945,929	30,617,164	273,605	37,831,771	0	3,848	17,116	20,964	69,744	48,664,853
1971	1,141,579	39,958,997	342,425	49,545,906	0	4,546	19,187	23,733	55,532	61,925,666
1972	1,389,062	54,991,810	422,304	67,965,081	0	4,929	21,150	26,079	80,412	84,279,535
1973	1,438,616	59,591,118	435,655	73,621,051	0	7,059	21,778	28,837	54,219	89,212,963
1974	1,535,123	66,008,399	455,565	81,042,993	0	8,336	22,408	30,744	76,783	98,204,519
1975	1,627,986	71,830,070	478,403	87,769,073	0	9,416	23,523	32,939	84,547	107,166,224
1976	1,665,550	74,907,214	475,587	91,913,622	0	7,004	23,257	30,261	106,717	113,099,876
1977	1,754,572	73,338,457	507,063	90,658,210	0	16,917	24,059	40,976	98,618	111,733,236
1978	1,889,115	81,951,168	523,177	100,494,579	0	12,635	24,225	36,860	100,786	124,810,665
1979	1,970,363	83,601,786	526,405	103,353,032	0	16,575	28,352	44,927	119,352	130,868,961
1980	2,110,218	93,029,351	583,628	115,035,631	0	19,834	26,562	46,396	178,812	145,322,044
1981	2,581,243	112,171,493	672,540	137,586,966	0	21,682	34,563	56,245	185,347	175,931,289
1982	2,745,828	117,143,301	727,623	143,381,967	0	16,117	43,117	59,234	173,894	185,030,118
1983	2,818,173	118,991,007	854,263	147,942,691	0	15,202	29,410	44,612	220,926	186,696,573
1984	3,898,011	156,273,535	933,311	193,101,389	20,590	15,442	31,795	67,827	225,959	246,195,674
1985	4,365,621	194,967,204	993,651	237,867,291	24,050	16,976	32,405	73,431	340,322	302,123,152
1986	5,002,575	218,331,684	1,058,276	264,648,610	31,753	18,145	33,596	83,494	279,227	335,092,086
1987	4,861,612	204,859,482	1,056,318	252,478,863	37,071	17,794	33,384	88,249	345,116	325,246,192
1988	5,049,812	221,667,115	1,124,102	269,784,265	48,058	19,117	33,605	100,780	365,207	347,071,668
1989	5,060,186	230,328,278	1,232,379	280,507,564	61,184	20,809	37,188	119,181	422,329	361,993,914
1990	5,529,301	277,194,766	1,855,991	334,042,030	66,041	20,855	36,812	123,708	474,284	416,365,621
1991	4,643,065	221,887,061	1,549,955	269,868,139	180,212	22,526	42,200	244,938	214,683	340,485,988
1992	5,831,754	245,365,618	1,503,480	298,351,452	208,216	26,028	43,517	277,761	443,676	385,528,682
1993	5,478,417	219,238,180	1,551,253	274,501,786	209,613	26,203	47,588	283,404	599,571	371,500,479
1994	6,044,876	257,365,883	1,475,069	318,025,429	201,284	25,161	46,079	272,524	609,966	413,608,539
1995	6,420,523	225,863,369	1,568,401	287,232,372	216,945	27,118	50,022	294,085	534,971	396,060,460
1996	6,651,667	235,410,311	1,622,641	306,118,778	217,250	27,155	56,622	301,027	571,857	424,793,478
1997	6,545,321	245,453,567	1,777,266	315,331,709	236,300	29,847	59,915	326,062	428,638	439,730,067
1998	6,168,127	227,090,227	1,796,534	293,382,863	128,021	29,927	36,222	194,170	465,095	417,766,080
1999	6,756,795	255,620,140	1,870,665	327,788,599	254,675	31,834	40,585	327,094	571,720	465,233,115
2000	10,288,583	253,115,772	1,969,790	324,350,686	262,163	79,001	43,704	384,868	0	455,184,446
2001	15,885,721	441,710,358	2,260,648	543,079,010	261,699	93,471	45,056	400,226	0	691,582,259
2002	13,187,998	333,819,759	2,307,079	426,202,050	266,107	95,018	47,297	408,422	0	574,200,264
2003	14,231,058	361,640,701	2,321,867	458,638,742	262,547	93,638	68,989	425,174	0	605,811,217
2004	15,515,751	413,398,937	2,609,547	519,514,952	284,387	102,404	29,286	416,077	0	668,700,261
2005	14,476,631	384,874,560	2,082,649	506,573,618	280,033	727,066	28,810	1,035,909	0	668,074,334
2006	13,793,202	360,853,893	2,048,058	500,296,299	292,991	43,185	38,618	374,794	0	657,854,963
2007	16,820,735	439,288,479	2,534,348	594,476,953	291,100	40,957	46,072	378,129	0	752,549,807
2008	19,116,333	412,349,960	2,998,031	571,210,392	306,916	804,536	86,522	1,197,974	0	739,005,017
2009	17,204,273	382,703,237	2,869,978	534,653,844	328,896	855,850	90,625	1,275,371	0	700,124,264
2010	17,548,417	441,483,989	3,045,505	620,066,830	400,358	1,064,565	108,864	1,573,787	0	810,022,083
2011	17,674,234	492,864,744	3,127,448	675,983,371	451,483	1,197,315	121,977	1,770,775	0	897,140,549
2012	19,420,323	480,068,291	3,397,899	693,093,689	460,139	1,318,107	130,849	1,909,095	0	913,453,707
2013	22,391,999	476,095,365	3,405,412	669,235,818	483,119	1,383,934	141,267	2,008,320	0	897,829,129
2014	21,057,114	425,335,435	2,922,745	611,933,534	473,134	1,355,332	140,894	1,969,360	0	830,676,944
2015	21,789,191	473,713,228	3,304,716	687,112,224	614,794	1,761,128	185,765	2,561,687	0	937,030,087
2016	21,717,643	540,044,901	3,835,422	783,390,254	727,229	2,083,208	228,710	3,039,147	0	1,064,198,243
2017	23,763,464	584,953,917	5,475,166	849,659,502	741,588	2,124,343	214,859	3,080,790	0	1,136,009,252
2018	23,056,860	477,278,076	3,501,642	747,649,312	703,535	2,015,335	261,328	2,980,198	0	1,027,859,259
2019	23,610,256	571,952,354	6,730,739	837,873,150	732,713	2,098,917	229,759	3,061,389	0	1,122,656,863
2020	25,730,603	474,523,856	4,905,222	744,794,573	800,657	2,293,547	225,890	3,320,094	0	1,031,596,371
2021	34,587,469	527,634,729	4,957,915	807,736,420	898,338	2,573,363	275,108	3,746,809	0	1,126,356,231
2022	31,233,390	700,445,653	6,691,203	1,032,554,720	1,057,135	3,028,253	315,292	4,400,680	0	1,390,300,781
2023	31,198,910	683,145,448	6,591,300	1,018,014,517	1,058,609	3,032,475	315,876	4,406,960	0	1,376,908,949
2024	34,032,542	734,044,951	7,116,139	1,090,893,153	1,057,404	3,029,024	316,605	4,403,033	0	1,461,502,089
2025	33,559,009	723,986,084	7,012,596	1,077,125,835	1,054,746	3,021,410	315,739	4,391,895	0	1,441,191,068
2026	33,640,684	724,434,752	7,022,082	1,077,770,744	1,052,292	3,014,380	314,954	4,381,626	0	1,446,859,233
2027	33,527,378	723,459,109	7,002,100	1,076,696,072	1,055,289	3,022,964	316,249	4,394,502	0	1,440,124,707
2028	33,667,347	724,920,132	7,025,405	1,079,011,687	1,047,800	3,001,513	313,545	4,362,858	0	1,447,425,529
2029	34,003,600	732,885,357	7,096,631	1,090,338,999	1,049,804	3,007,252	314,465	4,371,521	0	1,462,156,752
2030	33,078,350	712,302,274	6,895,545	1,062,911,983	1,031,555	2,954,975	307,654	4,294,184	0	1,424,878,460
2031	33,875,185	731,997,956	7,078,509	1,091,458,310	1,031,885	2,955,920	307,939	4,295,744	0	1,457,348,865
2032	32,745,171	705,616,439	6,809,673	1,054,302,896	1,032,004	2,956,263	308,146	4,296,413	0	1,418,495,310
2033	33,901,831	732,263,254	7,077,389	1,092,503,285	1,032,003	2,956,259	308,307	4,296,569	0	1,459,425,676
2034	32,810,920	707,214,352	6,819,496	1,056,865,715	1,032,053	2,956,402	308,490	4,296,945	0	1,421,096,165
2035	35,112,245	766,834,821	7,365,828	1,142,182,068	1,032,041	2,956,369	308,652	4,297,062	0	1,518,644,182
TOTAL	1,004,805,984	24,622,499,609	200,949,995	34,668,073,832	27,089,809	66,638,991	8,189,496	101,918,296	8,735,974	46,218,573,359

¹ Capital charges repaid through bond debt service prior to 2020 exclude bond cover; capital charges for 2021 and after include both bond debt service and bond cover.² Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-24 Equivalent Unit Charge for Water Supply for Each Contractor¹ (in dollars per acre-foot)

Project Service Area and SWP Water 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								
Yuba City	0.00	0.00	0.00	0.00	0.00	196.57	14.92	211.49
Butte	0.00	0.00	0.00	0.00	0.00	688.92	39.33	728.25
Plumas	45.98	8.50	0.00	0.00	54.47	114.56	11.00	180.03
Feather River Area	9.72	1.80	0.00	0.00	11.52	320.20	21.08	352.80
NORTH BAY AREA								
Napa	184.41	92.15	4.98	14.45	296.00	58.00	16.17	370.17
Solano	107.23	68.38	5.27	8.47	189.34	62.37	12.58	264.30
North Bay Area	135.34	77.04	5.17	10.65	228.18	60.78	13.89	302.85
SOUTH BAY AREA								
Alameda-Zone 7	124.27	67.90	9.20	20.88	222.26	57.46	8.90	288.62
Alameda County	31.88	35.60	7.45	13.54	88.48	38.27	4.75	131.49
Santa Clara	25.56	25.73	6.54	11.43	69.26	24.38	3.20	96.84
South Bay Area	42.66	34.20	7.12	13.31	97.29	32.02	4.38	133.68
SAN JOAQUIN VALLEY AREA								
Kings	6.81	9.68	3.88	8.39	28.76	47.88	3.78	80.41
Dudley Ridge	5.75	5.89	3.33	4.96	19.94	24.71	2.09	46.73
Empire	2.56	5.60	2.56	4.58	15.30	28.36	1.76	45.41
Kern	10.43	11.71	5.07	6.95	34.16	31.36	2.75	68.27
Oak Flat	2.40	3.15	2.06	3.09	10.69	27.14	1.78	39.60
Tulare	6.00	6.09	3.27	4.83	20.19	26.22	2.19	48.61
San Joaquin Valley Area	9.65	10.76	4.77	6.61	31.79	30.52	2.65	64.97
CENTRAL COASTAL AREA								
San Luis Obispo	523.27	360.79	16.63	124.96	1,025.64	312.69	58.19	1,396.52
Santa Barbara	1,158.26	329.07	20.98	100.86	1,609.17	132.56	75.96	1,817.68
Central Coastal Area	1,039.35	335.01	20.17	105.37	1,499.89	166.29	72.63	1,738.81
SOUTHERN CALIFORNIA AREA								
AVEK	60.25	60.61	33.85	66.85	221.55	69.70	9.54	300.80
Coachella	90.24	103.95	44.81	81.27	320.27	70.34	10.89	401.50
Crestline	175.66	167.74	37.23	80.89	461.53	106.43	20.86	588.82
Desert	55.89	58.83	53.59	45.02	213.33	41.96	7.08	262.37
Littlerock	108.03	108.15	33.01	63.10	312.29	120.50	16.47	449.26
Mojave	211.96	236.88	35.64	145.77	630.24	205.44	35.16	870.85
Palmdale	65.10	69.09	42.03	103.65	279.87	84.43	10.56	374.86
San Bernardino	383.38	242.87	32.08	83.80	742.12	118.18	24.82	885.13
San Gabriel	128.07	125.21	48.89	51.28	353.45	73.66	14.76	441.86
San Geronio	2,941.94	711.65	35.14	246.55	3,935.29	196.92	39.59	4,171.80
Santa Clarita ²	64.28	65.88	26.01	45.83	201.99	61.06	12.16	275.21
Metropolitan	94.83	80.92	40.22	44.75	260.73	60.83	11.40	332.96
Ventura	323.30	279.31	23.82	142.56	769.00	234.94	43.01	1,046.95
Southern California Area	104.12	86.53	39.78	49.77	280.21	64.53	11.87	356.60
ALL AREAS	60.04	48.52	20.69	26.89	156.14	46.98	7.33	210.46

¹ 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.

² Castaic Lake Water Agency's SWP Water Supply Contract was transferred to Santa Clarita Valley Water Agency effective November 2, 2018.

TABLE B-25 Equivalent Unit Transportation Costs of Water Delivered from or through Each Aqueduct Reach¹ (in dollars per acre-foot)

Aqueduct Reach	Unit Cost of Reach ²						Cumulative Unit Costs from the Delta					
	Capital Costs	Water System Revenue Bond Surcharge ³	Minimum OMP&R	Off-Aqueduct Costs	Variable OMP&R	Total	Capital Costs	Water System Revenue Bond Surcharge ³	Minimum OMP&R	Off-Aqueduct Costs	Variable OMP&R	Total
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
NBA												
1	46.62	11.66	17.61	2.52	1.46	79.87	46.62	11.66	17.61	2.52	1.46	79.87
2	49.62	12.41	7.70	0.00	0.00	69.73	96.24	24.07	25.31	2.52	1.46	149.60
3A	8.84	2.21	15.31	5.47	2.36	34.19	105.08	26.28	40.62	7.99	3.82	183.79
3B	56.89	14.23	34.61	3.91	5.24	114.88	153.13	38.30	59.92	6.43	6.70	264.48
SBA												
1	8.15	2.04	20.65	5.66	5.46	41.96	10.43	2.61	24.71	8.42	8.01	54.18
2	0.77	0.19	2.33	0.00	0.00	3.29	11.20	2.80	27.04	8.42	8.01	57.47
4	2.56	0.64	3.98	0.00	0.00	7.18	13.76	3.44	31.02	8.42	8.01	64.65
5	5.38	1.35	3.12	0.00	0.00	9.85	19.14	4.79	34.14	8.42	8.01	74.50
6	0.31	0.08	0.33	0.00	0.00	0.72	19.45	4.87	34.47	8.42	8.01	75.22
7	2.38	0.60	0.60	0.00	0.00	3.58	21.83	5.47	35.07	8.42	8.01	78.80
8	3.24	0.81	1.00	0.00	0.00	5.05	25.07	6.28	36.07	8.42	8.01	83.85
9	6.69	1.67	3.75	0.00	0.00	12.11	31.76	7.95	39.82	8.42	8.01	95.96
CA												
1	2.28	0.57	4.06	2.76	2.55	12.22	2.28	0.57	4.06	2.76	2.55	12.22
2A	1.45	0.36	0.80	0.00	0.00	2.61	3.73	0.93	4.86	2.76	2.55	14.83
2B	0.74	0.19	0.40	0.00	0.00	1.33	4.47	1.12	5.26	2.76	2.55	16.16
3	0.65	0.16	0.30	0.00	0.00	1.11	5.12	1.28	5.56	2.76	2.55	17.27
4	1.03	0.26	2.02	1.31	1.15	5.77	6.15	1.54	7.58	4.07	3.70	23.04
5	0.79	0.20	0.40	0.00	0.00	1.39	6.94	1.74	7.98	4.07	3.70	24.43
6	0.20	0.05	0.20	0.00	0.00	0.45	7.14	1.79	8.18	4.07	3.70	24.88
7	1.19	0.30	0.49	0.00	0.00	1.98	8.33	2.09	8.67	4.07	3.70	26.86
8C	0.02	0.01	0.09	0.00	0.00	0.12	8.35	2.10	8.76	4.07	3.70	26.98
8D	0.46	0.12	0.39	0.00	0.00	0.97	8.81	2.22	9.15	4.07	3.70	27.95
9	0.38	0.10	0.36	0.00	0.00	0.84	9.19	2.32	9.51	4.07	3.70	28.79
10A	0.41	0.10	0.47	0.00	0.00	0.98	9.60	2.42	9.98	4.07	3.70	29.77
11B	0.60	0.15	0.30	0.00	0.00	1.05	10.20	2.57	10.28	4.07	3.70	30.82
12D	0.56	0.14	0.27	0.00	0.00	0.97	10.76	2.71	10.55	4.07	3.70	31.79
12E	0.40	0.10	0.46	0.00	0.00	0.96	11.16	2.81	11.01	4.07	3.70	32.75
13B	0.85	0.21	0.53	0.00	0.00	1.59	12.01	3.02	11.54	4.07	3.70	34.34
14A	3.28	0.82	4.08	2.33	2.17	12.68	15.29	3.84	15.62	6.40	5.87	47.02
14B	0.52	0.13	0.50	0.00	0.00	1.15	15.81	3.97	16.12	6.40	5.87	48.17
14C	0.43	0.11	0.37	0.00	0.00	0.91	16.24	4.08	16.49	6.40	5.87	49.08
15A	2.43	0.61	4.25	2.84	2.36	12.49	18.67	4.69	20.74	9.24	8.23	61.57
16A	4.03	1.01	6.58	6.17	5.50	23.29	22.70	5.70	27.32	15.41	13.73	84.86
17E	13.59	3.40	18.49	21.61	20.32	77.41	36.29	9.10	45.81	37.02	34.05	162.27
17F	3.52	0.88	0.23	0.00	0.00	4.63	39.81	9.98	46.04	37.02	34.05	166.90
18A	3.16	0.79	2.22	0.00	-2.14	4.03	42.97	10.77	48.26	37.02	31.91	170.93
19	2.34	0.59	1.35	0.00	0.00	4.28	45.31	11.36	49.61	37.02	31.91	175.21
19C	2.54	0.64	0.00	0.00	0.00	3.18	47.85	12.00	49.61	37.02	31.91	178.39
20A	1.86	0.47	2.22	0.00	0.00	4.55	49.71	12.47	51.83	37.02	31.91	182.94
20B	2.25	0.56	1.46	0.00	0.00	4.27	51.96	13.03	53.29	0.00	31.91	150.19
21	1.14	0.29	1.02	0.00	0.00	2.45	53.10	13.32	54.31	0.00	31.91	152.64
22A	1.19	0.30	0.53	0.00	0.00	2.02	54.29	13.62	54.84	0.00	31.91	154.66
22B	11.65	2.91	14.31	6.42	6.70	41.99	65.94	16.53	69.15	6.42	38.61	196.65
23	3.20	0.80	0.99	0.00	-2.72	2.27	69.14	17.33	70.14	6.42	35.89	198.92
24	6.21	1.55	2.78	0.00	0.00	10.54	75.35	18.88	72.92	6.42	35.89	209.46
25	4.53	1.13	0.16	0.00	0.00	5.82	79.88	20.01	73.08	6.42	35.89	215.28
26A	4.95	1.24	9.27	0.00	-18.58	(3.12)	84.83	21.25	82.35	6.42	17.31	212.16
28G	9.21	2.30	3.51	0.00	0.00	15.02	94.04	23.55	85.86	6.42	17.31	227.18
28H	8.87	2.22	3.68	0.00	0.00	14.77	102.91	25.77	89.54	6.42	17.31	241.95
28J	99.46	24.87	51.12	0.00	0.00	175.45	202.37	50.64	140.66	6.42	17.31	417.40
EBX												
1	N/A	0.00	0.18	0.00	0.00	0.18	N/A	21.25	82.53	6.42	17.31	127.51
2A	N/A	0.00	1.55	0.00	0.00	1.55	N/A	21.25	84.07	6.42	17.31	129.05
2B	N/A	0.00	53.16	10.49	12.74	76.39	N/A	21.25	137.23	16.91	30.05	205.44
2C	N/A	0.00	3.24	0.00	0.00	3.24	N/A	21.25	140.47	16.91	30.05	208.68
2D	N/A	0.00	7.07	0.00	0.00	7.07	N/A	21.25	147.54	16.91	30.05	215.75
2E	N/A	0.00	107.89	0.46	23.55	131.90	N/A	21.25	255.43	17.37	53.60	347.65
3A	N/A	0.00	169.90	8.20	36.62	214.71	N/A	21.25	425.32	25.57	90.22	562.36
3B	N/A	0.00	55.97	0.00	0.00	55.97	N/A	21.25	481.30	25.57	90.22	618.34
3C	N/A	0.00	8.45	0.00	0.00	8.45	N/A	21.25	489.75	25.57	90.22	626.79
3D	N/A	0.00	0.02	0.00	0.00	0.02	N/A	21.25	489.77	25.57	90.22	626.81
3E	N/A	0.00	1.92	0.00	0.00	1.92	N/A	21.25	491.69	25.57	90.22	628.73
4A	N/A	0.00	6.20	0.00	0.00	6.20	N/A	21.25	497.89	25.57	90.22	634.93
4B	N/A	0.00	56.44	1.03	6.59	64.06	N/A	21.25	554.32	26.60	96.81	698.98
WB												
29A	4.61	1.15	10.62	2.90	2.39	21.67	44.42	11.13	56.66	39.92	36.44	188.57
29F	3.37	0.84	1.27	0.00	0.00	5.48	47.79	11.97	57.93	39.92	36.44	194.05
29G	11.18	2.80	6.04	0.00	-8.59	11.43	58.97	14.77	63.97	39.92	27.85	205.48
29H	6.96	1.74	5.72	0.00	0.00	14.42	65.93	16.51	69.69	39.92	27.85	219.90
29J	11.67	2.92	1.65	0.00	-16.07	0.17	77.60	19.43	71.34	39.92	11.78	220.07
30	18.73	4.68	5.14	0.00	0.00	28.55	96.33	24.11	76.48	39.92	11.78	248.62
CB												
31A	8.47	2.12	24.24	2.10	2.05	38.98	17.28	4.34	33.39	6.17	5.75	66.93
33A	316.55	79.16	45.72	15.83	26.84	484.10	333.83	83.50	79.11	22.00	32.59	551.03
34	226.17	56.56	1.27	0.00	0.00	284.00	560.00	140.06	80.38	22.00	32.59	835.03
35	0.00	0.00	0.00	0.00	0.00	0.00	560.00	140.06	80.38	22.00	32.59	835.03

¹ 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 canal side. Includes surplus water prior to May 1, 1973.

² 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.

³ The Water System Revenue Bond (WSRB) Surcharge equivalent unit rate is calculated by multiplying Column 1 by the ratio of the 2021 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 Phase 1 and Phase 2 (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
2003	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	0	4,366	0	22,095	37,971	0	67,871	0
2007	0	34,564	0	174,915	300,601	0	537,312	0
2008	0	67,077	0	339,450	583,367	0	1,042,743	0
2009	0	90,089	0	455,906	783,502	0	1,400,476	0
2010	0	21,120	0	106,881	183,682	0	328,324	0
2011	0	16,403	0	83,011	142,660	0	254,998	0
2012	0	26,143	0	132,299	227,364	0	406,404	0
2013	0	690	0	3,492	6,002	0	10,728	0
2014	0	4,290	0	21,708	37,307	0	66,685	0
2015	0	3,519	0	17,808	30,604	0	54,704	0
2016	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0
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	5,841,000	7,380,261	9,441,000	9,833,565	11,095,061	2,363,000	108,928,245	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 Phase 1 and Phase 2 (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
2003	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	0	0	132,302	0	0	0	0	132,302
2007	0	0	1,047,392	0	0	0	0	1,047,392
2008	0	0	2,032,638	0	0	0	0	2,032,638
2009	0	0	2,729,973	0	0	0	0	2,729,973
2010	0	0	640,008	0	0	0	0	640,008
2011	0	0	497,072	0	0	0	0	497,072
2012	0	0	792,210	0	0	0	0	792,210
2013	0	0	20,913	0	0	0	0	20,913
2014	0	0	129,990	0	0	0	0	129,990
2015	0	0	106,635	0	0	0	0	106,635
2016	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0
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	53,304,000	0	247,016,132	0	143,418,000	8,607,000	152,025,000	399,041,132

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 Phase 1 and Phase 2 (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	1,313,761	0
2001	347	146	183	116	108	48	1,034,428	0
2002	1,639	690	861	546	510	226	1,536,755	0
2003	0	0	0	0	0	0	1,818,330	0
2004	2,132	27,868	18,579	18,731	10,355	8,528	1,474,313	0
2005	1,243	16,250	10,833	10,922	6,038	4,973	1,027,856	0
2006	3,279	42,860	28,573	28,807	15,926	13,116	1,465,303	0
2007	0	0	0	0	0	0	1,410,618	0
2008	0	0	0	0	0	0	2,067,140	0
2009	(4)	(46)	(31)	(31)	(17)	(14)	1,723,867	0
2010	(1)	(8)	(5)	(5)	(3)	(2)	1,815,041	0
2011	0	0	0	0	0	0	1,899,939	0
2012	4	54	36	36	20	17	1,912,028	0
2013	0	0	0	0	0	0	1,994,186	0
2014	231	3,023	2,015	2,032	1,123	925	2,461,152	0
2015	(697)	(9,108)	(6,072)	(6,122)	(3,385)	(2,787)	2,626,141	0
2016	0	0	0	0	0	0	2,907,631	0
2017	0	0	0	0	0	0	2,394,266	0
2018	0	0	0	0	0	0	1,840,110	0
2019	0	0	0	0	0	0	2,433,583	0
2020	0	0	0	0	0	0	2,592,069	0
2021	0	0	0	0	0	0	2,721,070	0
2022	0	0	0	0	0	0	2,627,780	0
2023	0	0	0	0	0	0	2,608,199	0
2024	0	0	0	0	0	0	2,678,873	0
2025	0	0	0	0	0	0	2,705,662	0
2026	0	0	0	0	0	0	2,732,719	0
2027	0	0	0	0	0	0	2,760,046	0
2028	0	0	0	0	0	0	2,787,646	0
2029	0	0	0	0	0	0	2,815,523	0
2030	0	0	0	0	0	0	2,843,678	0
2031	0	0	0	0	0	0	2,872,115	0
2032	0	0	0	0	0	0	2,900,836	0
2033	0	0	0	0	0	0	2,929,844	0
2034	0	0	0	0	0	0	2,959,143	0
2035	0	0	0	0	0	0	2,988,734	0
TOTAL	13,855	84,122	57,959	56,926	32,445	25,812	87,845,739	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 Phase 1 and Phase 2 (in dollars)

Sheet 2 of 2

Calendar Year	CALIFORNIA AQUEDUCT (continued)							GRAND TOTAL
	MOJAVE DIVISION (continued)			SANTA ANA DIVISION				
	Reach 23C	Reach 24	Subtotal	Reach 25	Reach 26A*	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	2,010,227
2000	735,813	0	2,061,726	0	1,409,986	0	1,409,986	3,471,712
2001	812,064	0	1,847,440	0	798,363	0	798,363	2,645,802
2002	727,721	0	2,268,948	0	1,134,663	0	1,134,663	3,403,611
2003	899,530	0	2,717,859	0	1,234,283	0	1,234,283	3,952,142
2004	913,452	0	2,473,958	0	1,807,612	0	1,807,612	4,281,571
2005	1,036,431	0	2,114,547	0	1,849,498	0	1,849,498	3,964,045
2006	838,336	0	2,436,201	0	1,760,915	0	1,760,915	4,197,116
2007	1,308,106	0	2,718,725	0	2,799,388	0	2,799,388	5,518,113
2008	1,068,039	0	3,135,179	0	2,731,800	0	2,731,800	5,866,979
2009	1,545,402	0	3,269,126	0	2,857,684	0	2,857,684	6,126,810
2010	1,426,937	0	3,241,954	0	2,398,820	0	2,398,820	5,640,773
2011	1,815,469	0	3,715,408	0	2,104,260	0	2,104,260	5,819,668
2012	1,258,437	0	3,170,633	0	2,341,694	0	2,341,694	5,512,327
2013	1,506,127	0	3,500,313	0	2,761,256	0	2,761,256	6,261,569
2014	1,858,270	0	4,328,771	0	3,220,765	0	3,220,765	7,549,536
2015	1,954,400	0	4,552,369	0	4,427,902	0	4,427,902	8,980,271
2016	2,222,393	0	5,130,024	0	3,950,789	0	3,950,789	9,080,813
2017	2,256,333	0	4,650,599	0	3,942,847	0	3,942,847	8,593,446
2018	2,695,464	0	4,535,574	0	4,774,961	0	4,774,961	9,310,535
2019	2,885,756	0	5,319,339	0	4,563,999	0	4,563,999	9,883,338
2020	3,518,842	0	6,110,911	0	5,637,285	0	5,637,285	11,748,195
2021	3,541,942	0	6,263,012	0	5,357,643	0	5,357,643	11,620,655
2022	3,693,133	0	6,320,913	0	5,182,828	0	5,182,828	11,503,741
2023	3,641,093	0	6,249,292	0	5,036,254	0	5,036,254	11,285,546
2024	3,661,643	0	6,340,516	0	5,244,164	0	5,244,164	11,584,680
2025	3,698,260	0	6,403,922	0	5,296,606	0	5,296,606	11,700,527
2026	3,735,242	0	6,467,961	0	5,349,572	0	5,349,572	11,817,533
2027	3,772,595	0	6,532,640	0	5,403,067	0	5,403,067	11,935,708
2028	3,810,321	0	6,597,967	0	5,457,098	0	5,457,098	12,055,065
2029	3,848,424	0	6,663,946	0	5,511,669	0	5,511,669	12,175,616
2030	3,886,908	0	6,730,586	0	5,566,786	0	5,566,786	12,297,372
2031	3,925,777	0	6,797,892	0	5,622,454	0	5,622,454	12,420,345
2032	3,965,035	0	6,865,871	0	5,678,678	0	5,678,678	12,544,549
2033	4,004,685	0	6,934,529	0	5,735,465	0	5,735,465	12,669,994
2034	4,044,732	0	7,003,875	0	5,792,820	0	5,792,820	12,796,694
2035	4,085,179	0	7,073,913	0	5,850,748	0	5,850,748	12,924,661
TOTAL	92,485,332	0	180,602,189	0	149,214,818	0	149,214,818	329,817,007

* 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
Phase 1 and Phase 2 (in dollars)**

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	AVEK	Coachella	Desert	Mojave	Palmdale	San Bernardino	Metropolitan	
	[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
2003	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0
2006	1,368	13,170	1,134	11,862	103	0	104,665	132,302
2007	10,827	104,265	8,976	93,908	819	0	828,597	1,047,392
2008	21,011	202,344	17,420	182,243	1,589	0	1,608,031	2,032,638
2009	28,220	271,762	23,397	244,765	2,134	0	2,159,695	2,729,973
2010	6,616	63,711	5,485	57,382	500	0	506,314	640,008
2011	5,138	49,482	4,260	44,567	389	0	393,236	497,072
2012	8,189	78,862	6,789	71,028	619	0	626,723	792,210
2013	216	2,082	179	1,875	16	0	16,545	20,913
2014	1,344	12,940	1,114	11,655	102	0	102,835	129,990
2015	1,102	10,615	914	9,561	83	0	84,360	106,635
2016	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0
2024	0	0	0	0	0	0	0	0
2025	0	0	0	0	0	0	0	0
2026	0	0	0	0	0	0	0	0
2027	0	0	0	0	0	0	0	0
2028	0	0	0	0	0	0	0	0
2029	0	0	0	0	0	0	0	0
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	744,635	44,544,862	13,095,167	18,913,620	127,720	5,870,912	315,744,216	399,041,132

**TABLE B-29 Capital Cost Component of East Branch Enlargement Facilities
Transportation Charge for Each Contractor^{1,2} (in dollars)**

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	AVEK	Coachella	Desert	Mojave	Palmdale	San Bernardino ³	Metropolitan	
	[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	19,966,107	24,854,326
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	44,173	2,924,487	870,981	1,215,968	8,115	0	20,682,969	25,746,693
2005	33,110	2,192,035	652,839	911,423	6,083	0	15,502,813	19,298,303
2006	46,946	3,108,066	925,655	1,292,298	8,625	0	21,981,299	27,362,889
2007	45,254	2,996,035	892,290	1,245,717	8,314	0	21,188,982	26,376,592
2008	42,479	2,812,362	837,587	1,169,348	7,804	0	19,889,980	24,759,560
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	20,995,084	26,135,223
2011	43,190	2,859,419	851,602	1,188,914	7,935	0	20,222,785	25,173,845
2012	43,704	2,893,449	861,737	1,203,063	8,029	0	20,463,459	25,473,441
2013	37,663	2,493,469	742,614	1,036,756	6,919	0	17,634,660	21,952,081
2014	39,985	2,647,224	788,406	1,100,685	7,346	0	18,722,067	23,305,713
2015	44,642	2,955,568	880,238	1,228,892	8,202	0	20,902,785	26,020,327
2016	44,525	2,947,802	877,925	1,225,662	8,180	0	20,847,856	25,951,950
2017	45,830	3,034,222	903,663	1,261,595	8,420	0	21,459,047	26,712,777
2018	43,516	2,880,977	858,023	1,197,877	7,995	0	20,375,245	25,363,633
2019	43,094	2,853,093	849,718	1,186,283	7,917	0	20,178,047	25,118,152
2020	42,629	2,822,295	840,546	1,173,478	7,832	0	19,960,226	24,847,006
2021	62,876	4,236,387	1,271,431	1,730,829	11,552	0	29,898,238	37,211,313
2022	58,792	3,963,175	1,189,691	1,618,395	10,801	0	27,968,390	34,809,244
2023	48,208	3,248,353	974,931	1,327,062	8,857	0	22,925,014	28,532,425
2024	50,678	3,412,403	1,023,869	1,395,019	9,310	0	24,084,708	29,975,987
2025	57,748	3,903,566	1,173,192	1,589,670	10,609	0	27,538,711	34,273,496
2026	22,490	1,530,926	461,495	619,092	4,132	0	10,791,363	13,429,498
2027	23,482	1,589,911	478,177	646,404	4,315	0	11,214,240	13,956,529
2028	15,155	1,022,441	307,035	417,171	2,784	0	7,214,713	8,979,299
2029	15,789	1,066,729	320,529	434,629	2,900	0	7,525,966	9,366,542
2030	3,336	220,850	65,774	91,826	613	0	1,561,924	1,944,323
2031	3,325	220,095	65,549	91,513	611	0	1,556,581	1,937,674
2032	3,332	220,605	65,701	91,725	612	0	1,560,195	1,942,170
2033	3,329	220,375	65,633	91,630	611	0	1,558,572	1,940,150
2034	3,335	220,760	65,748	91,790	613	0	1,561,292	1,943,538
2035	3,330	220,498	65,669	91,680	612	0	1,559,434	1,941,223
TOTAL	1,693,741	112,591,389	33,592,725	46,624,413	311,173	0	795,894,413	990,707,854

¹ For years 1988 through 2018, charges are debt service only and do not include bond cover; 2019 charges and after include both debt service and bond cover.

² East Branch Enlargement Phase 2 debt service schedule started in 2017, and this table is the sum of East Branch Enlargement Phase 1 and Phase 2 capital charges for each contractor.

³ 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 was 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
	AVEK	Coachella	Desert	Mojave	Palmdale	San Bernardino	Metropolitan	
	[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	1,599,082	2,010,227
2000	132	403,587	121,508	120,201	40	57,719	2,768,525	3,471,712
2001	10	307,323	89,527	93,873	3	32,682	2,122,384	2,645,802
2002	49	389,719	108,153	139,732	15	46,448	2,719,495	3,403,611
2003	0	451,900	123,861	164,862	0	50,526	3,160,993	3,952,142
2004	1,278	499,455	153,176	141,346	265	73,996	3,412,055	4,281,571
2005	745	471,807	156,939	97,668	154	75,710	3,161,022	3,964,045
2006	1,965	487,751	147,506	144,658	407	72,084	3,342,745	4,197,116
2007	0	658,942	223,601	127,896	0	114,595	4,393,079	5,518,113
2008	0	686,114	214,561	187,421	0	111,828	4,667,055	5,866,979
2009	(2)	727,864	240,416	156,285	0	116,981	4,885,266	6,126,810
2010	0	664,487	210,990	164,562	0	98,197	4,502,537	5,640,773
2011	0	685,366	213,781	172,261	0	86,139	4,662,122	5,819,669
2012	2	645,738	200,971	173,372	1	95,859	4,396,384	5,512,327
2013	0	738,017	235,746	180,806	0	113,034	4,993,966	6,261,569
2014	139	888,229	280,915	223,977	29	131,844	6,024,403	7,549,536
2015	(418)	1,064,701	351,566	235,595	(87)	181,259	7,147,655	8,980,271
2016	0	1,069,974	340,889	263,625	0	161,728	7,244,597	9,080,813
2017	0	1,021,603	337,579	217,080	0	161,403	6,855,781	8,593,446
2018	0	1,125,856	397,930	166,837	0	195,466	7,424,446	9,310,535
2019	0	1,183,274	400,483	220,645	0	186,830	7,892,106	9,883,338
2020	0	1,414,106	488,972	235,014	0	230,766	9,379,337	11,748,195
2021	0	1,394,953	476,076	246,710	0	219,319	9,283,597	11,620,655
2022	0	1,382,811	472,820	238,252	0	212,163	9,197,695	11,503,741
2023	0	1,355,859	462,343	236,477	0	206,162	9,024,705	11,285,546
2024	0	1,391,653	475,117	242,885	0	214,673	9,260,352	11,584,680
2025	0	1,405,570	479,868	245,313	0	216,820	9,352,956	11,700,527
2026	0	1,419,625	484,667	247,766	0	218,988	9,446,486	11,817,532
2027	0	1,433,822	489,514	250,244	0	221,178	9,540,950	11,935,708
2028	0	1,448,160	494,409	252,747	0	223,390	9,636,359	12,055,065
2029	0	1,462,641	499,353	255,274	0	225,624	9,732,723	12,175,615
2030	0	1,477,268	504,346	257,827	0	227,880	9,830,051	12,297,372
2031	0	1,492,041	509,390	260,405	0	230,159	9,928,351	12,420,346
2032	0	1,506,961	514,484	263,009	0	232,460	10,027,635	12,544,549
2033	0	1,522,031	519,629	265,639	0	234,785	10,127,911	12,669,995
2034	0	1,537,251	524,825	268,296	0	237,133	10,229,190	12,796,695
2035	0	1,552,623	530,073	270,979	0	239,504	10,331,482	12,924,661
TOTAL	3,937	39,310,380	13,081,478	7,988,830	838	6,108,206	263,323,338	329,817,007

TABLE B-31 Total East Branch Enlargement Facilities Transportation Charge for Each Contractor (in dollars)

Calendar Year	SOUTHERN CALIFORNIA AREA							Total
	AVEK	Coachella	Desert	Mojave	Palmdale	San Bernardino	Metropolitan	
	[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	22,881,259	28,511,434
1999	44,775	3,197,893	957,160	1,292,426	8,230	39,144	22,546,557	28,086,185
2000	49,163	3,649,696	1,088,276	1,469,896	9,048	57,719	25,726,111	32,049,909
2001	49,058	3,554,586	1,056,638	1,444,048	9,014	32,682	25,088,132	31,234,158
2002	47,943	3,560,567	1,052,506	1,458,134	8,814	46,448	25,144,813	31,319,225
2003	40,765	3,150,771	927,648	1,287,022	7,489	50,526	22,248,330	27,712,551
2004	45,451	3,423,942	1,024,157	1,357,314	8,380	73,996	24,095,024	30,028,264
2005	33,855	2,663,842	809,778	1,009,091	6,237	75,710	18,663,835	23,262,348
2006	48,911	3,595,817	1,073,161	1,436,956	9,032	72,084	25,324,044	31,560,005
2007	45,254	3,654,977	1,115,891	1,373,613	8,314	114,595	25,582,061	31,894,705
2008	42,479	3,498,476	1,052,148	1,356,769	7,804	111,828	24,557,035	30,626,539
2009	43,668	3,619,046	1,101,478	1,358,406	8,023	116,981	25,332,690	31,580,292
2010	44,839	3,633,106	1,095,115	1,398,880	8,238	98,197	25,497,621	31,775,996
2011	43,190	3,544,785	1,065,383	1,361,175	7,935	86,139	24,884,907	30,993,514
2012	43,706	3,539,187	1,062,708	1,376,435	8,030	95,859	24,859,843	30,985,768
2013	37,663	3,231,486	978,360	1,217,562	6,919	113,034	22,628,626	28,213,650
2014	40,124	3,535,453	1,069,321	1,324,662	7,375	131,844	24,746,470	30,855,249
2015	44,224	4,020,269	1,231,804	1,464,487	8,115	181,259	28,050,440	35,000,598
2016	44,525	4,017,776	1,218,814	1,489,287	8,180	161,728	28,092,453	35,032,763
2017	45,830	4,055,825	1,241,242	1,478,675	8,420	161,403	28,314,828	35,306,223
2018	43,516	4,006,833	1,255,953	1,364,714	7,995	195,466	27,799,691	34,674,168
2019	43,094	4,036,367	1,250,201	1,406,928	7,917	186,830	28,070,152	35,001,489
2020	42,629	4,236,401	1,329,518	1,408,492	7,832	230,766	29,339,563	36,595,201
2021	62,876	5,631,340	1,747,507	1,977,539	11,552	219,319	39,181,835	48,831,968
2022	58,792	5,345,986	1,662,511	1,856,647	10,801	212,163	37,166,085	46,312,985
2023	48,208	4,604,212	1,437,274	1,563,539	8,857	206,162	31,949,719	39,817,971
2024	50,678	4,804,056	1,498,986	1,637,904	9,310	214,673	33,345,060	41,560,667
2025	57,748	5,309,136	1,653,060	1,834,983	10,609	216,820	36,891,667	45,974,023
2026	22,490	2,950,551	946,162	866,858	4,132	218,988	20,237,849	25,247,030
2027	23,482	3,023,733	967,691	896,648	4,315	221,178	20,755,190	25,892,237
2028	15,155	2,470,601	801,444	669,918	2,784	223,390	16,851,072	21,034,364
2029	15,789	2,529,370	819,882	689,903	2,900	225,624	17,258,689	21,542,157
2030	3,336	1,698,118	570,120	349,653	613	227,880	11,391,975	14,241,695
2031	3,325	1,712,136	574,939	351,918	611	230,159	11,484,932	14,358,020
2032	3,332	1,727,566	580,185	354,734	612	232,460	11,587,830	14,486,719
2033	3,329	1,742,406	585,262	357,269	611	234,785	11,686,483	14,610,145
2034	3,335	1,758,011	590,573	360,086	613	237,133	11,790,482	14,740,233
2035	3,330	1,773,121	595,742	362,659	612	239,504	11,890,916	14,865,884
TOTAL	1,697,678	151,901,769	46,674,203	54,613,243	312,011	6,108,206	1,059,217,750	1,320,524,860

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
<p>● When using "dual units," inches are normally converted to millimeters (rather than centimeters).</p> <p>■ 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).</p> <p>◆ 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).</p>				
<p>OTHER COMMON CONVERSION FACTORS</p> <p>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</p> <p>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</p>				



STATE OF CALIFORNIA
CALIFORNIA NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES
715 P Street, P.O. Box 942836
Sacramento, CA 95814