California
WATER COMMISSION

California Water Commission
2016 ANNUAL REVIEW

of the construction and operation of the State Water Project

CALIFORNIA WATER COMMISSION

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Background and Authority

The California Water Commission consists of nine members appointed by the Governor and confirmed by the State Senate. Seven members are chosen for their general expertise related to the control, storage, and beneficial use of water and two are chosen for their knowledge of the environment. The Commission provides a public forum to discuss water issues, advises the Director of the Department of Water Resources (DWR), and takes appropriate statutory actions to further the development of policies that support integrated and sustainable water resource management and a healthy environment.

The roles and responsibilities of the Commission are defined in the Water Code, sections of the Government Code, and the Code of Civil Procedures. The California Water Commission conducts an annual review of the construction and operation of the State Water Project (SWP), and makes a report on its findings to the Department and Legislature, with any recommendations it may have (Water Code §165).

KEY ISSUES IN THE WATER COMMISSION'S ANNUAL REVIEW OF THE STATE WATER PROJECT

In 2016, the California Water Commission coordinated with the Department of Water Resources to identify issues and challenges, and to ensure the integrity and sound operation of the SWP.

In May 2016, DWR's Acting Deputy Director for the SWP, Mark Andersen, briefed the Commission on key issues and activities of the SWP. The Commission received updates on several topics, including:

- Operational Availability: Due to a variety of improvements in recent years, DWR has been able to increase the percentage of time that SWP infrastructure is available for full use.
- 2016 Water Supply: Precipitation in the Northern Sierras was above average in water year 2016, but reservoir conditions generally remained below long-term averages. Hydrologic conditions allowed DWR to provide close to average deliveries to SWP contractors.
- Forced Outages: The SWP experienced several major forced outages in 2016, and DWR was quick to respond and correct the problems in order to avoid major disruptions in service. These outages are discussed at length in the Status of Construction Projects section.
- Refurbishments and Improvements: DWR is pursuing a variety of refurbishment and improvement projects for the SWP. These include improvements to infrastructure at the Alamo Powerplant, fire cleanup and refurbishment at the Ronald B. Robie Thermalito Powerplant, and repairs to the Oroville Dam River Valve Outlet System. This work is discussed at length in the Status of Construction Projects Section.
- SWP Workforce: The SWP has experienced significant improvements in worker recruitment and retention due to efforts to raise wages in recent years. This is discussed further in the Findings and Recommendations section.
- Solar Power: DWR is working to increase solar power acquisition and use for the SWP and negotiated several significant acquisition agreements during 2016. This work is discussed at length in the Status of Construction Projects section.

The Commission's review and consideration of this information is consistent with the statutory responsibility of the Commission to conduct an annual review of the progress and construction of the Project (Water Code §165).

FINDINGS AND RECOMMENDATIONS

From the Commission's discussion during the May 2016 briefing on the State Water Project and subsequent meetings, several key concerns emerged. These concerns and the Commission's recommended actions are summarized below.

Impacts to the State Water Project and Water Deliveries During Severe Droughts

Despite recent increases in precipitation, California remains in a multi-year drought that has severely reduced water supplies statewide. Several consecutive years of below-average precipitation and snowpack have left most SWP reservoirs at consistently low levels and have prevented DWR from delivering SWP contractors' maximum entitlements. SWP allocations take current and projected hydrological conditions, water supply contracts, and environmental factors into account. In December 2015, DWR announced an initial SWP allocation of 10% of contractors' requested amounts. After several subsequent increases, a final allocation of 60% was announced in April 2016.

Finding: The Commission commends DWR on its ability to continue providing vital water supplies during the ongoing drought. The Commission also recommends that DWR continue to incorporate the SWP into overall state drought planning in order to maximize water supply reliability for municipal, agricultural, industrial, and recreational uses and for protecting and enhancing fish and wildlife.

Increased Reliability of the SWP and Other Water Systems Through Investments in Water Storage

Since the passage of Proposition 1 in November 2014, the Commission has spent a considerable amount of time and energy developing the Water Storage Investment Program in order to allocate the $2.7 billion dedicated for the public benefits of water storage projects. One eligibility requirement for the program is that all projects funded by the Commission must improve the operation of the state water system. California's state and local water supply systems are extremely interdependent, and additional water storage will have far-reaching effects.

In 2016, the Commission released draft regulations for the Water Storage Investment Program and conducted an extensive public process to gain input and refine the regulations. The draft regulations were adopted by the Commission on December 14, 2016 and will soon be submitted to the Office of Administrative Law (OAL). Once the regulations are reviewed and approved by OAL, the Commission will begin the process of accepting and reviewing proposals for projects that will provide an array of benefits to Californians and improve the operation of California's water system. The Commission's regulations encourage project proponents to consider integration and system-wide benefits when formulating water storage projects.

Finding: Water supply reliability is of critical importance to the SWP and the Commission will continue to collaborate with DWR and other organizations and support actions taken to improve reliability. These actions include prioritizing investments in water storage that maximize operational benefits to California's water supply system.

Efforts to Maintain and Improve State Water Project Operations and Facilities

Much of the SWP infrastructure is now more than 50 years old and requires significant maintenance to remain in working condition. The Commission's May 2016 briefing on the SWP included updates on the status of several maintenance projects:

- At the Alamo Powerplant on the SWP's East Branch, DWR is seeking to install a second hydroelectric generation unit, which would allow the SWP to generate more clean hydropower for its own needs. DWR is pursuing Cap and Trade funds to offset the costs of installing a second unit.
- DWR has completed clean-up efforts after a 2012 fire at the Ronald B. Robie Thermalito Pumping-Generating Plant and is in the process of refurbishing the plant to bring it back into service. The project requires replacing one hydroelectric unit and refurbishing the other three that were damaged. Some mechanical and electrical upgrades, including a new fire suppression system, are also being made during the refurbishment process, which will be completed by late 2018.
- Following an accident at Oroville Dam's low level outlet in 2009, DWR entered into a 2012 Agreement with CalOSHA to hire a third party expert to improve the safety of the River Valve Outlet System (RVOS) and make it operational again. In 2014, DWR embarked on an accelerated refurbishment program to respond to concerns about operational needs during the ongoing drought. The system was mostly refurbished and was

used during 2014 and 2015 to meet Endangered Species Act temperature requirements for the Feather River. Some additional refurbishments are being made to portions of the RVOS and are expected to conclude in early 2017.

The briefing included information about several emergency projects that were undertaken in response to unplanned outages:

- In January 2016, DWR detected a boil in Pool 30 of the California Aqueduct in Kern County that was causing water to leak into an adjacent canal. DWR repaired the leak and used the dewatering of the canal as an opportunity to conduct additional planned repairs in the area.
- On the East Branch of the California Aqueduct, severe thunderstorms in late 2015 resulted in debris flow that damaged the aqueduct's concrete liner. This required the removal and repair of large sections of concrete liner, which was completed in January 2016.
- DWR also performed emergency repairs on the North Bay Aqueduct Travis Surge Tank in March 2016 when the tank began leaking due to the deterioration of the interior coating.

Finding: These improvements are crucial to the continued operation of the SWP. The Commission fully supports DWR's efforts to improve and maintain all SWP facilities through investments and regular repairs and refurbishment. The Commission also commends DWR for its timely response to unplanned outages. In addition, the Commission recommends that DWR prioritize the installation of a second unit at the Alamo Powerplant and evaluate potential alternate funding sources available to complete the project.

Ongoing Efforts to Address Long-Term State Water Project Staffing Needs

In 2012 and 2013, the Commission strongly supported action to alleviate the staff recruitment and retention crisis facing the SWP. The Commission also encouraged DWR to consider SWP governance solutions to improve DWR's ability to respond to similar problems in the future. In 2012, the Governor's Office announced wage increases averaging nearly 30% for SWP trades and crafts personnel.

At the Commission's May 2016 meeting, DWR described its efforts to address workforce issues. Several key bargaining units, including those that represent Professional Engineers and Scientists, have reached agreements with the State for pay increases through 2018. The agreement with the bargaining unit 12, representing operating engineers, expired in July 2015, but remains in effect until the tentative agreement that was reached between Unit 12 and the State in December 2016 is ratified. The SWP experienced significant improvements in recruitment and retention following the previous increases; reaching new agreements for SWP staff is critical to continued operation.

Finding: While the Commission applauds these significant improvements, it recognizes that pay parity for SWP employees remains a critical issue. The Commission recommends that DWR continue to focus on renewing and negotiating new agreements with the bargaining units representing SWP staff. The Commission also supports DWR's attention to recruitment, retention, and succession planning for SWP staff. These efforts will contribute to the ongoing capability of the SWP to meet operational and regulatory requirements. The Commission will continue to support DWR's efforts to ensure the SWP has the appropriate personnel and fiscal resources to safely operate and maintain critical facilities that provide reliable water supplies for California.

Sustainable Energy Use

The SWP requires significant amounts of energy to transport and deliver millions of acre-feet of water to its contractors. These energy demands are largely met by hydroelectric power generation at SWP facilities and supplemented by power contracts. However, California is committed to reducing greenhouse gas emissions, including those related to power generation. In response, DWR is increasing solar energy procurement for the SWP. DWR has entered into several solar power purchase agreements that will soon help to run SWP operations.

Finding: The Commission commends DWR's efforts to increase solar power utilization in order to reduce the greenhouse gas emissions attributed to the SWP. The Commission will remain engaged in this effort and will request future updates from DWR on progress toward reducing greenhouse gas emissions.

The SWP, some parts of which are now more than 50 years old, faces unique opportunities and significant challenges to continue serving the millions of California families, farms, businesses, and communities that rely on it for a safe and reliable water supply. The California Water Commission looks forward to continuing to work with DWR, the Brown Administration, the State Legislature, State Water Contractors and water agencies, and the many stakeholders to support this mission in 2017.

OVERVIEW OF THE STATE WATER PROJECT

In 1960, California voters approved the Burns-Porter Act which authorized $1.75 billion to finance construction of the SWP and authorized DWR to design, construct, and operate the SWP. Since then, the SWP has served California's growing needs. Today, the SWP:

- Serves 25 million Californians and 750,000 acres of farmland
- Operates to provide water, water quality benefits, flood control, fish and wildlife preservation and habitat enhancement, and recreation.
- Consists of 20 pumping plants, 4 pumping-generating plants, 5 power plants, 23 dams, 36 storage reservoirs, and over 700 miles of canals and pipelines
- Is the third largest hydropower generator in California
- Produces about 14% of California's hydroelectric generation

The SWP is the largest state-owned and operated water and power utility in the United States. The SWP delivers water to 29 contracting public agencies in Northern California, the San Francisco Bay Area, the Central Coast, the San Joaquin Valley, and Southern California. These water deliveries supplement surface and groundwater resources for these 29 agencies. Approximately 70% of the contracted water supplies are used for Municipal and Industrial demand and 30% are used for agricultural demand. The SWP is one of California's largest energy producers and generates a substantial portion of its own energy needs. These energy operations help support and stabilize the state's electrical grid. The SWP also provides flood control, operates to help protect the environment, and provides recreation at SWP facilities, including all lakes and reservoirs.

The SWP's water supply capability depends on rainfall, snowpack, runoff, reservoir storage, pumping capacity from the Delta, and legal constraints on project operations for environmental purposes. The SWP water supply comes from storage at Lake Oroville and high runoff flows through the Delta. SWP water deliveries have ranged from a low of 1.0 million acre-feet to over 4.0 million acre-feet.

California's State Water Projects

THE STATE WATER PROJECT - 2016 ANNUAL REVIEW

Water Project Operations

Although the state experienced an increase in precipitation in 2016 relative to the previous years, California remains in a drought. This drought has produced some of the driest years on record, and the amount of water the SWP has been able to deliver reflects those conditions. In April, DWR increased the final 2016 allocation to 60% of the SWP Contractors' requested amount of 4.2 million acre-feet. Ultimately, deliveries were just over 1.8 million ace-feet.

Through September 2016, the SWP generated 3,348 gigawatt hours (GWh) of energy. During the same period, the SWP used an estimated 6,217 GWh of energy. Nearly 70% of this power is used by the "Valley String" pumping plants (Dos Amigos to Edmonston pumping plants) to lift water more than 3,000 feet from the floor of the southern San Joaquin Valley, over the Tehachapi Mountains, and into Southern California. Table 1 shows the power generated, power used, and water delivered by the SWP in recent years.

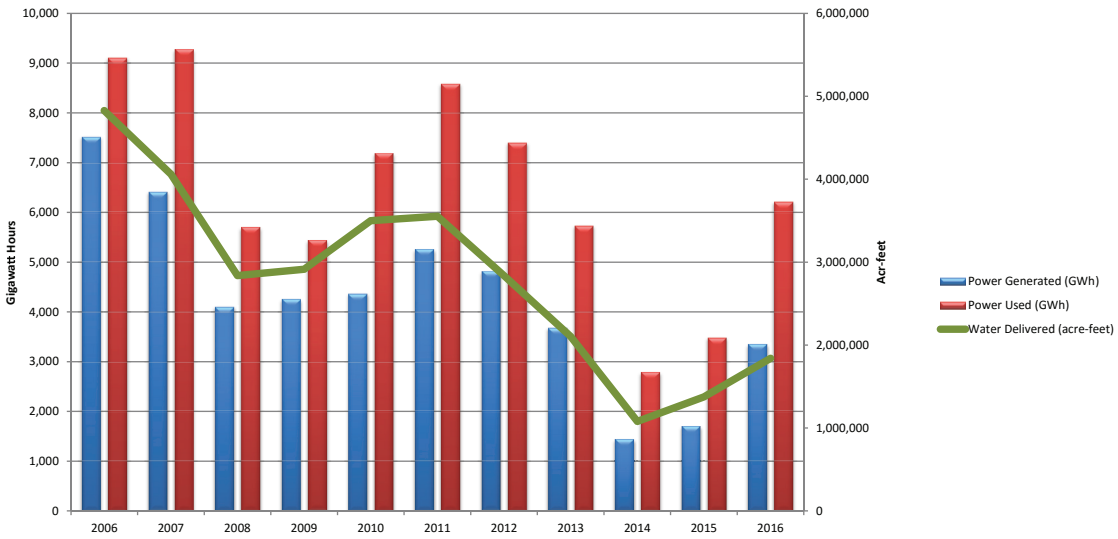
Table 1. SWP Power Generation, Usage, and Water Deliveries

Year	Power Generated (GWh/year)	Power Used (GWh/year)	Water Delivered (acre-feet)[1]
2006	7,515	9,109	4,828,580
2007	6,410	9,276	4,061,696
2008	4,100	5,701	2,838,128
2009	4,255	5,438	2,913,829
2010	4,368	7,184	3,500,891
2011	5,258	8,583	3,553,218
2012	4,810	7,404	2,836,272
2013	3,679	5,733	2,103,230
2014	1,438	2,787	1,078,905
2015	1,699	3,483	1,375,538
2016[2]	3,348	6,217	1,839,821

[1]Source: Department of Water Resources' State Water Project Analysis Office. (In addition to Table A, reported deliveries include Carryover, Article 21, other SWP deliveries such as Settlement, Permit and Flexible Storage, and other non-SWP deliveries such as Dry Purchase, Temporary Transfer and Water Bank Recoveries.)
[2]Through September 2016.

As expected, SWP power usage increases with SWP water deliveries. Moreover, DWR's divestiture of Reid Gardner Unit 4 coal–fired power plant in 2013 resulted in a reduction in SWP power generation of about 1,500 GWh annually, most of which has been replaced by power purchase agreements. The following chart displays the data from Table 1 to demonstrate the parallel relationship between SWP power generation and water deliveries.

Chart 1. SWP Power Generation, Usage, and Water Deliveries



Status of Construction Projects

This section highlights key projects and projects of particular interest to the Commission - it is not a comprehensive list of SWP construction projects. The following information has been provided to the Commission by the Department of Water Resources.

State Water Project – Oroville Field Division

Hyatt Pump Generating Plant Unit 1 Turbine Refurbishment

The Edward Hyatt Powerplant, constructed between 1964 and 1967, is an underground hydroelectric pumping-generating facility located at Lake Oroville. Hyatt Powerplant maximizes power production through a pumped-storage operation where water, released for power production in excess of local and downstream requirements, is returned to storage in Lake Oroville during off-peak periods and is used for generation during peak power demands. Of the six units, three can pump water or generate power.

The existing Hyatt Unit 1, 3, and 5 turbine generators have exhibited numerous thrust bearing failures over the years. As a result, DWR issued an order to design and furnish new robust thrust bearings and a new turbine runner for Unit 1, which have been received at the Hyatt Powerplant.

In addition to many other components required to maintain efficiency, the turbine shaft has been refurbished and delivery was expected in late 2016.

Work is continuing on the Hyatt Unit 1 turbine casing embedded surfaces. Final machining is scheduled for completion in the spring of 2017.

Hyatt Unit 1 Turbine Shut-off Valve Refurbishment

The Hyatt turbine shut-off valves (TSV) have been in service for over 40 years and the TSV seats are worn and in need of replacement to ensure the future reliability of the valves. The refurbishment work includes retrofitting the TSV with mechanical locks, replacing portions of the TSV, designing new valve seats, and pressure testing the refurbished TSV.

Hyatt Unit 1 testing and commissioning with the new turbine runner, new thrust bearing, and refurbished TSV is currently scheduled for summer 2017.

Hyatt Fire Protection Modernization

The Hyatt Fire Protection Modernization project will increase personnel safety and protect equipment by modernizing the fire protection systems and improving emergency egress at Hyatt Powerplant, Oroville Field Division Operations and Maintenance Center, Thermalito Diversion Dam Powerplant, Hyatt intake, the spillway control structure, and the Area Control Center by the end of 2017.

The project is nearly 50% complete and is currently projected to finish on time and within budget.

Oroville Dam River Valve Outlet System

DWR began work to refurbish the Oroville Dam River Valve Outlet System (RVOS) in 2012 and accelerated the work in 2014 to allow for drought operations. The system was mostly refurbished at that time, but some work remains to be done. Both of the fixed-cone valves for the RVOS are currently being repaired and reworked by the manufacturer. The manufacturer has procured all materials and is in the process of fabricating replacement parts.

The latest schedule shows that both fixed-cone valves will be ready for shipment back to DWR in early 2017.

Ronald B. Robie Thermalito Powerplant

On November 22, 2012, the Ronald B. Robie Thermalito Pumping–Generating Plant (THPP), part of the Oroville complex, suffered a catastrophic fire rendering the plant inoperable. A fire clean-up project removed damaged plant components and removed the acidic/caustic residue resulting from the mixture of the fire's smoke and the water used to suppress the fire. A thorough assessment of plant systems was performed to determine what plant equipment could be salvaged and to provide a cost estimate for returning the plant to service. The fire clean-up project, which consisted of the removal of all hazardous materials and cleaning and decontaminating the plant to make it safe for occupancy, was completed in April 2014.

The THPP Restoration Project commenced in April 2015 to restore the plant's electrical, protection, controls, and communications systems. THPP will be modernized to maximize fire protection and life safety, enhance reliability, reduce maintenance, and minimize unplanned outages. Full operation of THPP will provide as much as 300,000 MWh annually and potentially restore SWP pump-back operational flexibility.

Completion of the Restoration Project is scheduled to occur on or before January 1, 2019 with all four units fully operational. The project is currently on-schedule and on-budget.

State Water Project – Delta

North Bay Aqueduct Alternate Intake

The environmental review process is currently underway for the North Bay Aqueduct Alternate Intake Project (NBA AIP), a new facility that will improve water quality and provide reliable delivery of SWP water to the Solano County Water Agency (SCWA)

and the Napa County Flood Control and Water Conservation District (Napa County FC&WCD). SCWA and Napa County FC&WCD initially requested DWR study the feasibility of changing the location of the NBA intake in 2007. The NBA AIP will include the construction and operation of an alternate intake that will draw up to 240 cubic feet per second (cfs) (peak capacity) of water from the Sacramento River, and connect to the existing North Bay Aqueduct (NBA) system, near the North Bay Regional Water Treatment Plant. The proposed alternate intake may be operated in conjunction with the existing NBA intake at Barker Slough.

The final EIR is expected to be completed by spring 2018. If approval to proceed with construction is granted, permitting and preliminary design would start in summer 2018, and construction and testing of equipment should be completed in 2026.

State Water Project – Southern Field Division

Perris Dam Remediation

Lake Perris is located in northern Riverside County. It is the southernmost SWP facility and the southern terminus of the East Branch of the California Aqueduct. In 2005, DWR identified potential seismic safety risks in the foundation of Perris Dam. While there was no imminent threat to life or property, in the interest of ensuring the maximum public safety, DWR lowered the water level of Lake Perris until repairs are made.

The remediation of Perris Dam facilities is a major capital improvement program and comprises three projects:

• The Perris Dam Remediation Project includes design and construction of a stabilizing berm and a deep soil cement mixing system to strengthen a portion of the dam's foundation.

• The Outlet Tower Improvements Project includes a seismic analysis of the existing outlet facilities and the design and construction of remedial modifications to the tower's access bridge and controls, and a major modification to the Emergency Outlet Structure.

• The Emergency Release Facility Project includes design and construction of infrastructure to convey emergency release flows safely into the existing downstream Perris Valley Channel facilities.

The EIR was certified in November 2011 and the first two projects listed were approved to move forward with design. The construction contract for the Perris Dam Remediation Project was advertised in April 2014 and awarded in July 2014. The dam embankment repairs are expected to be completed by the end of 2017. Analysis review is currently underway for the Outlet Tower Retrofit.

The Emergency Outlet Extension project will follow. A Notice of Preparation of the EIR for the Emergency Outlet Extension was filed in September 2013.

State Water Project – Southern Field Division - East Branch

East Branch Extension - Phase I Improvements

The East Branch Extension is a cooperative effort among DWR, San Bernardino Valley Municipal Water District (SBVMWD), and San Gorgonio Pass Water Agency (SGPWA) to deliver SWP water to the east side of SBVMWD's and SGPWA's service

areas in Riverside and San Bernardino counties. The project conveys water from the Devil Canyon Powerplant Afterbay to Cherry Valley through a series of existing and new facilities. Construction for Phase I was completed in 2003, however, construction of Phase I Improvements, including tree-planting as part of environmental mitigation, is scheduled for completion by December 2017.

East Branch Extension - Pase II

The East Branch Extension Phase II Project will add facilities that bypass a segment of the East Branch Extension Phase I Project and provide additional pumping capacity to convey the full contracted amount of SWP water (17,300 acre-feet) to the SGPWA. In addition, the project will allow the SBVMWD to increase its distribution system capacity to the Redlands and Yucaipa Valley service areas. Principal features of this project will consist of approximately six miles of a new large diameter pipeline, a new reservoir (Citrus Reservoir) with a capacity of 400 acre-feet, a new 160 cfs pump station (Citrus Pump Station), expansion of the existing Crafton Hills Pump Station from 60 cfs to 135 cfs, and installation of an additional pump at the existing Cherry Valley Pump Station to increase the capacity from 32 cfs to 52 cfs. Phase II construction is scheduled for completion in 2017.

Alamo Powerplant Unit 2

Installing a second generating unit at Alamo Powerplant would capture the hydroelectric power generating potential of flows that are currently diverted through the spillway during outages on Alamo Unit 1 and during high flow conditions. The estimated design and construction cost of Alamo Unit 2 is $55 million. The estimated generation value of Alamo Unit 2 is $40 million over 30 years. Cap and Trade funds are being sought for a portion of the design and construction to bridge the gap between the cost to the SWP and the benefits the SWP will receive. DWR submitted a Cap and Trade funding package in April 2016. In October, the California Air Resources Board deferred the funding request and requested that DWR resubmit in the spring of 2017.

State Water Project – Emergency Repairs

North Bay Aqueduct Travis Surge Tank Emergency Repair

In March 2016, water was leaking from the under the Travis Surge Tank, which is part of the SWP that serves Solano County and Napa. A large volume of water was flowing out between the tank's steel base and the asphalt pad. After emptying the tank, the coated interior surface of the tank was found to be worn, with the majority of the top-coat missing. In addition, blisters were evident throughout the tank, and coating breakdown was occurring at some blisters indicating that the coating has reached its useful service life. The leak was repaired by welding a repair plate to the bottom of the tank and coating interior surfaces with glass reinforced coating.

California Aqueduct Emergency Repair, Pool 30, Kern County

On January 2, 2016, a boil was found at Mile Post 148.97, Pool 30 of the California Aqueduct in Kern County. The boil was found to be SWP water leaking from the aqueduct and flowing into Henry Miller Canal, which is used for deliveries to local agriculture. This boil caused approximately 2,000 gallons per minute to leak from the SWP system. On January 6, 2016, the aqueduct pool level was lowered and the leak was plugged with concrete. Taking advantage of the emergency outage, over six miles

of the aqueduct were inspected, resulting in the repair of approximately 2,600 lineal feet of aqueduct at three major repair sites. Repairs consisted of removing damaged concrete liner, excavating soil, and backfilling the damaged sections. In addition, a non-permeable flexible coating was applied to most of the repaired and replaced concrete liner sections.

After completing all aqueduct repair work, refilling operations at Pool 30 commenced on February 21, 2016.

California Aqueduct Emergency Repair, Pool 49, East Branch

In late 2015, portions of northern Los Angeles County experienced severe thunderstorms. The storms triggered mudflows and flooding from a number of watersheds along pools 47-50 of the California Aqueduct. At Mile Post (MP) 335.80 the flow overwhelmed the underdrain and overtopped the aqueduct. Post-storm inspections indicated approximately 1,700 square feet of the aqueduct's concrete liner were damaged.

The repairs and cleanup efforts have been completed and the aqueduct's concrete liner is free of any cracking or other defects. The emergency repair work was completed on January 8, 2016.

SWP Renewable Energy Procurement

The Global Warming Solutions Act of 2006, or Assembly Bill (AB) 32, along with Executive Order S-3-05 established greenhouse gas emission (GHG) reduction targets for the State. DWR's response was to prepare a comprehensive Climate Action Plan, which set goals for DWR that exceed the legislative targets. A key strategy included in the plan is to replace existing power contracts and purchases with renewable energy resources. In 2016, DWR will begin serving a portion of its SWP pump loads with two new solar resources:

Solverde 1 LLC

In November 2015, DWR executed a new power purchase agreement for the 85-megawatt Solverde Solar Facility, located ten miles west of the City of Lancaster, adjacent to portions of the East Branch of the California Aqueduct. Solverde 1 will provide DWR with 240,000 MWh per year of solar energy through a twenty year power purchase agreement. Solverde 1 achieved commercial operation status in December 2016.

Pearblossom Solar Facility

In response to an initiative by the Governor's Office and DWR to develop renewable projects on state land, DWR and SunPower executed agreements in October 2015 that enable SunPower to lease land at DWR's Pearblossom Pumping Plant site to build, own, operate, and maintain a 9.5 MW solar photovoltaic facility. DWR and SunPower have entered into a 20-year agreement to allow DWR to purchase the estimated 27,400 MWh per year of output from this facility. The facility achieved commercial operation status in December 2016.

Retail Solar on SWP property

To meet the Governor's Executive Order B-18-12, which requires reduction of retail energy use by 20% by 2018 based on a 2003 baseline, DWR is preparing to issue a Request for Proposals for the installation of canopy-mounted solar photovoltaic

parking structures on DWR's property at Oroville Field Division and Lost Hills Sub-center. The generation from this project will help supply the retail energy use at those sites.

California WaterFix

In 2007, state and federal agencies started pursuing an ambitious and comprehensive program to improve the reliability of water delivery and contribute to the recovery of listed species under a single regulatory package. Known as the Bay Delta Conservation Plan (BDCP), the approach relied on obtaining regulatory approvals for new water conveyance facilities under Section 10 of the Endangered Species Act (ESA) and California's Natural Community Conservation Planning Act (NCCPA). DWR and the U.S. Bureau of Reclamation (Reclamation) released a draft BDCP and draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for a public comment period that began in December 2013 and closed in July 2014.

Based on project revisions and comments received on the public draft BDCP EIR/EIS, in April 2015 state and federal agencies announced a change in their approach. Rather than pursuing the project as a Habitat Conservation Plan (HCP) under Section 10 of the federal ESA and a Natural Community Conservation Plan (NCCP) under the state's NCCPA, the state and federal agencies chose to study different alternatives that would rely on compliance with Section 7 of the federal ESA and Section 2081(b) of the California ESA. As a result of this change in the permitting approach and other design modifications, DWR and Reclamation released a joint Partially Recirculated Draft EIR/Supplemental Draft EIS on the revised project for public review and comment from July 10, 2015 through October 30, 2015. The revised Draft EIR/EIS included analysis of three new alternatives, including the new preferred alternative known as California WaterFix

Moving forward with the Section 7 permitting approach, in January 2016 DWR and Reclamation released a draft Biological Assessment, which included a species-by-species analysis and proposed mitigation to offset and avoid potential project impacts. In August 2016, DWR and Reclamation submitted a revised Biological Assessment to the federal regulatory agencies to initiate formal consultation under Section 7 of the federal ESA and begin the process of obtaining incidental take authorization for federally-listed species. Additionally, in October 2016 DWR submitted a 2081(b) application to the California Department of Fish and Wildlife to address incidental take of state-listed species for California ESA compliance. The incidental take analysis included in the 2081(b) application evaluates potential project impacts and provides mitigation necessary to ensure project impacts are fully mitigated.

It is worth noting that the California WaterFix planning and permitting efforts to date have been funded through a special cooperative agreement between and amongst certain CVP and SWP water contracting public agencies. As such, California WaterFix costs to date are not being recovered from the SWP participating water contracting agencies as costs governed by the existing SWP water supply contracts.

California EcoRestore

In addition to the new permitting approach related to California WaterFix, Governor Brown announced the creation of the California EcoRestore program. California EcoRestore is an initiative to help coordinate and advance at least 30,000 acres of critical habitat restoration in the Delta which will be implemented on an accelerated

timeline independent of the proposed water conveyance facilities. This suite of habitat restoration actions under the California EcoRestore program will be implemented by coordination among multiple agencies, and includes specific targets for floodplains, tidal and sub-tidal areas, managed wetlands, and fish passage improvements to benefit native fish species, as well as a commitment to adaptive management. A subset of California EcoRestore targets includes breaking ground on efforts complying with the restoration required by the 2008 and 2009 Biological Opinions for Long Term Operations of the SWP and CVP.

By the end of 2016, two fish passage improvement projects in the Yolo Bypass required by the 2009 Biological Opinion were completed. Construction was underway on the first tidal restoration project counting toward the 2008 Biological Opinion requirement. The first fish passage project was completed in 2015 at the Knights Landing Outfall Gate, which prevents migrating fish access to the Colusa Basin Drain. The second project, the Wallace Weir Fish Rescue Facility, includes creating a permanent fish-friendly weir to help prevent migratory fish from straying into areas with little to no spawning potential, provides better control of drainage releases to avoid attracting salmon, and allows effective capture of stray salmon with the new fish rescue facility. The Tule Red Restoration Project in the Suisun Marsh is the first tidal restoration effort to begin construction counting toward the 8,000 acres required for Delta Smelt mitigation. Additional restoration projects will start construction between 2017 and 2020, including those implemented by external entities under contract with DWR through the first of its kind "Request for Proposals for Tidal Restoration Projects."

California
WATER COMMISSION

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