

Water System Improvement Program
Quarterly Reports – Fiscal Year 2022-2023

Table of Contents

- WSIP Quarter 1 - Fiscal Year 2022-2023
- WSIP Quarter 2 - Fiscal Year 2022-2023
- WSIP Quarter 3 - Fiscal Year 2022-2023



DATE: December 5, 2022

TO: Commissioner Newsha Ajami, President
 Commissioner Sophie Maxwell, Vice President
 Commissioner Tim Paulson
 Commissioner Tony Rivera
 Commissioner Kate Stacy

FROM: Dennis J. Herrera, General Manager *DJH*

SUBJECT: Water System Improvement Program
 Quarterly Report (1st Quarter / FY 2022-2023)

Enclosed please find the Water System Improvement Program (WSIP) Quarterly Report for the 1st Quarter (Q1) of Fiscal Year (FY) 2022-2023. The primary intent of the report is to provide the Commission, stakeholders, and the public with a status summary of the Water System Improvement Program based on data for the period of July 1, 2022 to September 30, 2022. This quarterly report provides a summary update on the Regional WSIP projects. The Local WSIP was completed in June 2020.

Quarterly Report Format Changes

In response to the Commission’s request for improved tracking of program history and project performance status reporting for greater accountability, starting with the WSIP Q1 FY22-23 Quarterly Report, staff have made the following revisions to the format of the report to be more consistent with reporting of all capital programs:

- This report includes an Executive Summary, which provides a high-level summary of the program current status and key updates that may be newsworthy or noticeable to the Commission, stakeholders, and the public.
- This report will no longer contain the former “Table 3.3. Details on Transactions Out of and Into Contingency;” this information is no longer as valuable since there are only three projects remaining in construction.
- The Cost Summary Table 3.1 in Section 3 of this report contains a new “Cost Variance Over Reporting Period” column intended to highlight forecasted budget changes during the reporting period and to provide new quarterly information “at a glance.”

London N. Breed
Mayor

Newsha Ajami
President

Sophie Maxwell
Vice President

Tim Paulson
Commissioner

Tony Rivera
Commissioner

Kate Stacy
Commissioner

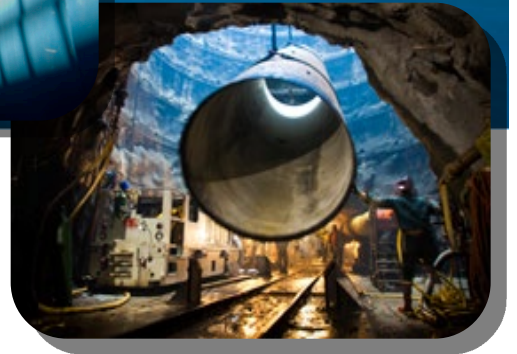
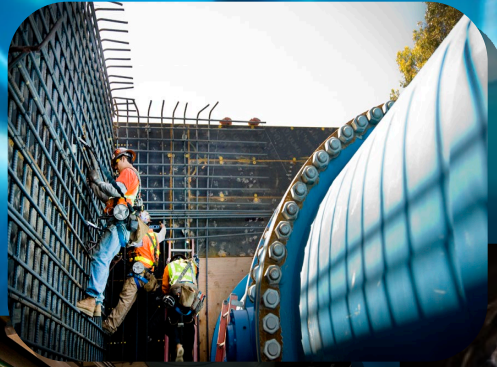
Dennis J. Herrera
General Manager



- The Project Performance Summary Table 5, in Section 5 of the report, includes an additional column titled “% Cost Changes.” To move away from “traffic light” indicators but still provide useful information, projects with a forecasted cost overrun greater than 10%, or forecasted delay of greater than 6 months or 10%, will be highlighted to visually draw attention to these projects.
- Project Status Reports are now provided in Section 6 of the report, combining the former Section 6 (“Projects Not Within Budget and/or Schedule”) and the former Appendix E (“Projects Within Budget and Schedule”).
- Former Appendices of the Report B (“WSIP Budget and Expenditures Histogram”) and C (“WSIP Regional Program Staffing Plan”) are no longer provided.



HETCH HETCHY
WATER SYSTEM IMPROVEMENT PROGRAM



QUARTERLY REPORT

Regional Projects
Q1 FY 2022 | 2023
July 2022 — September 2022

Rebuilding Today for a Better Tomorrow

Published: December 5, 2022

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EXECUTIVE SUMMARY

This quarterly report provides a summary update on the regional projects in the Water System Improvement Program (WSIP) for the 1st Quarter (Q1) of Fiscal Year (FY) 2022-2023. The primary intent of the report is to provide the San Francisco Public Utilities Commission (“Commission”), stakeholders, and the public with a status summary of the program’s regional projects for the period of July 1, 2022 through September 30, 2022.

This quarterly report incorporates program and project changes from the March 2022 Proposed Revised WSIP that was approved by the Commission on April 26, 2022 by resolution No. 22-0080.

Program Current Status:

Overall, WSIP Regional projects are 98.7% complete as of September 30, 2022. As of the end of the reporting period, planning, environmental, design, and construction activities are 100%, 99.9%, 99.9%, and 98.4% complete, respectively. Figure A and Table A show the number of WSIP Regional projects and the total approved value of these projects that are active in various project phases.

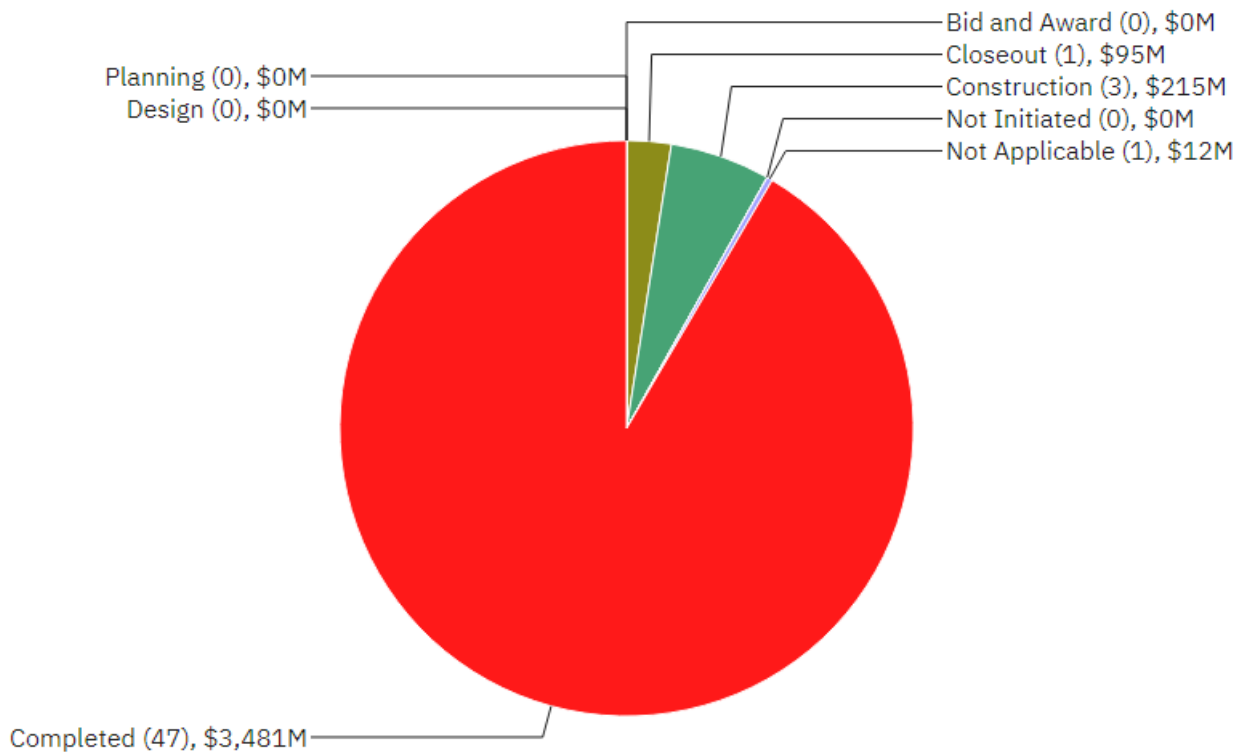


Figure A. Total Current Approved Budget for Regional Projects Active in Each Phase

Table A. Status of WSIP Regional Projects (as of September 30, 2022)

Project Phase	No. of Projects	Percent by No. of Projects	Total Project Value (\$M)	Percent by Project Value
Planning	0	0%	\$0	0%
Design	0	0%	\$0	0%
Bid & Award	0	0%	\$0	0%
Construction	3	6%	\$215	6%
Close-Out	1	2%	\$95	2%
Completed	47	90%	\$3,481	92%
Not Applicable ¹	1	2%	\$12	0%
Total	52	100%	\$3,803	100%

Notes: (1) “Not Applicable” category is for the two projects that do not include construction: Long-Term Mitigation Endowment and Watershed and Environmental Improvement Program.

As of the end of the reporting period, three (3) regional projects with a total value of \$215M are in construction and forty-eight (48) projects with a total value of \$3,576M are in close-out or have been completed. Forty-one (41) out of forty-three (43) Regional WSIP projects with specific Level of Service (LOS) goals have achieved their LOS goals to date.

Tables B and C provide an overall program-level cost and scheduled summary of the WSIP Regional Program. The total Current Approved WSIP Budget (including Regional and Local Programs, Local Water Supply Projects, and Financing Costs) and Current Forecasted Cost at completion are \$4,787.8 million. The Current Approved WSIP Budget and Forecasted Cost at completion for only the Regional Program (including construction contingency) are each \$3,803.1 million.

Table B Program Cost Summary

Cost Categories	Expenditures To Date (\$ Million) (A)	2005 Baseline Budget (\$ Million) (B)	2022 Approved Budget (\$ Million) (C)	Current Approved Budget ⁽⁷⁾ (\$ Million) (D)	Q1/FY22-23 Forecasted Costs (\$ Million) (E)	Cost Variance (\$ Million) (F = D - E)
REGIONAL PROGRAM	\$3,714	\$3,407	\$3,803.1	\$3,803.1	\$3,803.1	-
Local Improvement Projects	\$332	\$383	\$331.9	\$331.9	\$331.9	-
Local Water Supply Projects	\$221	-	\$280.9	\$280.9	\$280.9	-
Finance	\$372.0	\$552.0	\$372.0	\$372.0	\$372.0	-
PROGRAM TOTAL	\$4,639	\$4,343	\$4,787.8	\$4,787.8	\$4,787.8	-

The Current Approved and Forecasted Schedule completion for the Regional WSIP (Local WSIP was completed in June 2020) are both February 2027.

Table C 2022 Approved vs. Q1/FY22-23 Forecasted Schedule Dates

Category	2005 Baseline Start	2022 Approved Start	Current* Approved Start	Actual Start	2005 Baseline Finish	2022 Approved Finish	Current* Approved Finish	Q1/FY22-23 Forecasted Finish	Schedule Variance (Months)
Regional Program	03/01/03	03/31/03	03/31/03	03/01/03☐	06/30/14	05/05/23	02/01/27	02/01/27	-
Local** Program	03/01/03	03/31/03	03/31/03	03/01/03☐	06/28/13	7/31/18	06/03/20	06/03/20☐	Completed (-)
Overall WSIP	03/01/03	03/01/03	03/01/03	03/01/03☐	06/30/14	05/05/23	02/01/27	02/01/27	-

* The budget and schedule approved as part of the March 2022 WSIP, plus any additional budget and schedule changes approved by the Commission as part of additional contingencies on construction contracts.

** Excluding Local Water Supply projects

As of the end of the reporting period, the forecasted total program cost (regional and local projects) is \$4,787.8M, which is same as the current Commission Approved Budget. As of the end of the reporting period, \$6M was transferred to the Construction Contingency from the program’s Director’s Reserve budget. All approved change orders (COs) in contracts total \$21.20M, and the current remaining construction contingency is \$11.98M. Also, as of the end of the reporting period, all pending and potential COs, and trends total \$5.87M. Therefore, assuming all pending and proposed COs and trends become approved COs, the current forecasted remaining construction contingency is \$6.11M.

UPDATE ON PROJECTS IN CONSTRUCTION

As of the end of September 2022, WSIP regional construction contracts (including active, completed, and future contracts) are 99.0% complete overall, the same rounded percentage complete as last quarter.

As of the end of September 2022, monitored exposure hours on WSIP regional projects totaled 9.9 million construction person-hours. Since the implementation of the WSIP Safety Approach in April 2009, the total lost time incidence rate is 0.51, compared to the U.S. Bureau of Labor Statistics (BLS) industry average rate (2018) of 1.5.

The following is a summary of the progress made, issues encountered, and/or milestones achieved on the remaining WSIP Regional projects currently active in construction.

Regional Groundwater Storage and Recovery

The Regional Groundwater Storage and Recovery (RGSR) Phase 1 construction contract (Contract B) reached final completion on September 2, 2022. For Phase 2A (Contract C), the groundwater pumps at Millbrae Yard and Benjamin Franklin Well Stations were pulled by the contractor for inspection, rehabilitation, and installation of cathodic protection systems. For Phase 2B (Contract D), the 100% design phase and procurement of easements and permits continued during the quarter.

Alameda Creek Recapture Project

Construction of the Alameda Creek Recapture Facility is 22% complete as of the end of this quarter. During the quarter, design modifications were completed for the water pipeline realignment due to bank

erosion conditions and for relocation the pipeline tie-in location due to existing pipeline corrosion. On September 13, the SFPUC Commission resolved to increase the construction contract cost contingency by \$2.6M and the construction contract duration contingency by 252 days for repairs to the Sunol Pipeline, materials procurement for the realignment work, and to address cost and schedule delays related to the Department of Water Resource (DWR) permit. The contractor continued to report notices of material shortages, longer lead-time estimates, and cost increases related to COVID-19. Coordination with the quarry operator on erosion repairs continued.

WSIP Closeout Project- Sunol Region

The subproject Alameda Creek Diversion Dam Power and Communication Facilities has completed two of its three job order contracts (JOCs 70-09, 70-14) by the end of this quarter. This subproject has also extended for 6 months due to delay in sluice way repair and debris removal under JOC 70-15 due to environmental conditions.

Quarterly Report - Q1 FY 2022/2023


Water System Improvement Program - Regional Projects

TABLE OF CONTENTS


- 1. Program Description**
- 2. Program Status**
- 3. Program Cost Summary**
- 4. Program Schedule Summary**
- 5. Project Performance Summary**
- 6. Project Status Report**
- 7. On-Going Construction**
- 8. Projects in Closeout**
- 9. Completed Projects**

APPENDICES

- A. Project Descriptions**
- B. WSIP Approved Project-Level Schedule**
- C. List of Acronyms**



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1. PROGRAM DESCRIPTION

The Water System Improvement Program (WSIP) is a \$4.8 billion, multi-year capital program to upgrade the City of San Francisco's regional and local drinking water systems. The program will deliver improvements that enhance the City's ability to provide reliable, affordable, high quality drinking water to its 26 wholesale customers and regional retail customers in Alameda, Santa Clara, and San Mateo Counties, and to 800,000 retail customers in San Francisco, in an environmentally sustainable manner. The WSIP is structured to cost-effectively meet water quality requirements, improve seismic and delivery reliability, and achieve water supply goals.

Built in the early to mid-1900s, the water system has many components nearing the end of their working life, with crucial facilities crossing or in close proximity to, three major earthquake faults. The San Francisco Public Utilities Commission (SFPUC) initiated the WSIP to repair, replace, and seismically upgrade the system's deteriorating pipelines, tunnels, dams, reservoirs, pump stations, storage tanks, and treatment facilities.

The program consists of 35 local projects located within San Francisco and 52 regional projects spread over seven different counties from the Sierra foothills to San Francisco. Local projects only benefit San Francisco residents whereas regional projects benefit both City residents and the 26 wholesale agencies that receive water from the SFPUC. The management of regional projects is divided into 6 regions – San Joaquin, Sunol Valley, Bay Division, Peninsula, San Francisco Regional, and Support Projects.

The WSIP is funded through the issuance of revenue bonds. Local Measures A and E, which were approved by San Francisco voters in November 2002, allowed for the financing of improvements to the City's water system using revenue bonds and/or other forms of revenue financing. Increases in the water rates of retail and wholesale customers are used to pay back the debt service on the bonds.

The program budget and schedule were originally adopted by the San Francisco Public Utilities Commission on March 1, 2003. The program at the time was referred to as the Capital Improvement Program (CIP). The scope of the CIP was changed significantly following the adoption of Level of Service (LOS) goals in early 2005. The program changes were so substantial that the program was renamed the WSIP and a new program budget and schedule were adopted on November 29, 2005. Since the scope of the 2005 Revised WSIP is in general representative of the program that is in the end stage of being implemented today, the 2005 budget and schedule are considered the "Baseline Budget and Schedule."

Subsequently, the WSIP Baseline Budget and Schedule were revised in 2007, 2009, 2011, 2013, 2014, 2015, 2016, 2017, 2018, 2020, and 2022, and these revisions were approved by the San Francisco Public Utilities Commission on February 26, 2008, July 28, 2009, July 12, 2011, April 23, 2013, April 22, 2014, December 8, 2015, April 26, 2016, February 14, 2017, April 10, 2018, April 14, 2020, and April 26, 2022, respectively. Refer to Appendix A for a scope description of all the regional projects included in the WSIP.

Program Revision	Commission Approval	Budget (\$Million)	Schedule ^(*)
2003 (Original)	March 1, 2003	\$3,628	03/15/16
2005 (Baseline)	November 29, 2005	\$4,343	06/30/14
2007 (Revised)	February 26, 2008	\$4,392	12/18/14
2009 (Revised)	July 28, 2009	\$4,586	12/04/15
2011 (Revised)	July 12, 2011	\$4,586	07/29/16
2013 (Revised)	April 23, 2013	\$4,640	04/11/19
2014 (Revised)	April 22, 2014	\$4,765	05/24/19
2015 (Revised)	December 8, 2015	\$4,765	05/24/19
2016 (Revised)	April 26, 2016	\$4,845	12/20/19
2017 (Revised)	February 14, 2017	\$4,845	12/20/19
2018 (Revised)	April 10, 2018	\$4,788	12/30/21
2020 (Revised)	April 14, 2020	\$4,788	05/05/23
2022 (Revised)	April 26, 2022	\$4,788	02/01/27

* Final Program Completion Date

2. PROGRAM STATUS

This first (1st) Quarterly Report for Fiscal Year (FY) 2022-2023 presents the progress made on the WSIP Regional Program between July 1, 2022 and September 30, 2022. The program’s schedule and budget were last approved by the San Francisco Public Utilities Commission (SFPUC or Commission) on April 26, 2022. The WSIP Local Program was completed on June 3, 2020.

Figure 2.1 shows the total Current Approved Budget for the regional projects remaining in each phase of the program as of September 30, 2022. The number of projects currently active in each phase is shown in parentheses.

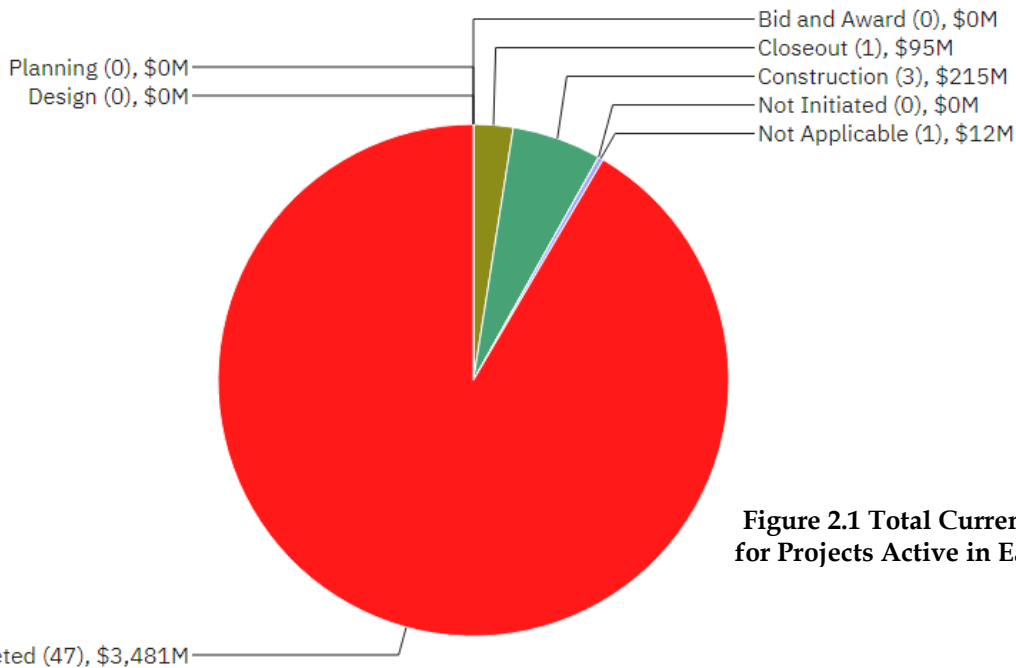


Figure 2.1 Total Current Approved Budget for Projects Active in Each Phase (\$Million)

Figure 2.2 shows the number of regional projects in the following stages of the program as of September 30, 2022: Pre-construction, Construction, and Post-construction.

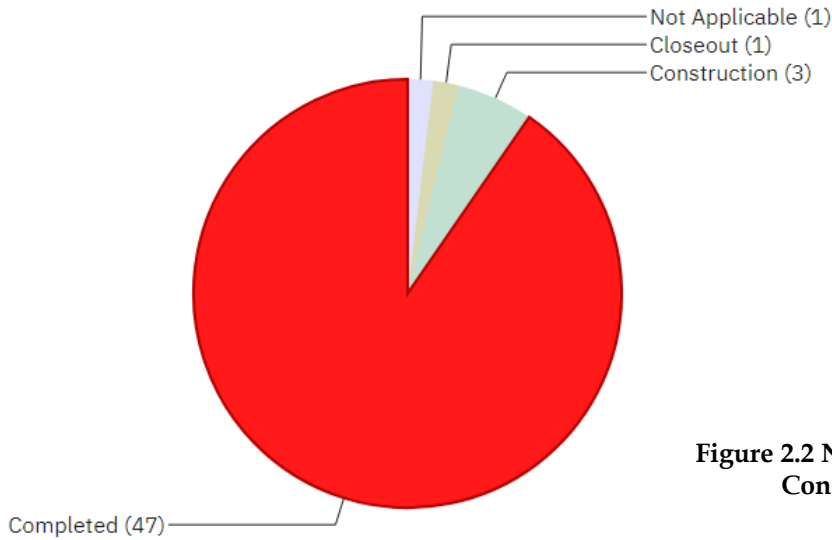


Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-construction

Figure 2.3 summarizes the environmental review and permitting status of the WSIP’s 52 regional projects as of September 30, 2022.

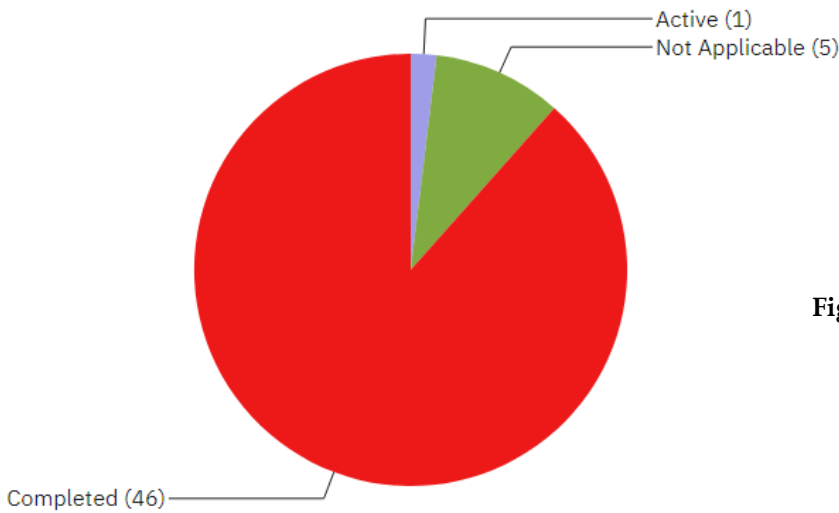


Figure 2.3 Program Environmental and Permitting Status

2.1 Progress Towards Meeting Level of Service (LOS) Goals

The scope of the WSIP is based on the following Level of Service (LOS) goals for the Regional Water System: Seismic Reliability, Delivery Reliability, Water Quality Reliability, and Water Supply Reliability. Each project that reaches construction substantial completion contributes to increasing the overall reliability of the system and achieving progress towards meeting the overall LOS goals for the system.

Table 2.1 lists the projects with their individual Primary (P) and Secondary (S) contributions towards LOS goals, and indicates which projects have met their respective LOS goals. As can be seen in Table 2.1, the actual operational service start dates indicate that 41 of the 43 Regional WSIP projects with specific LOS goals have achieved their LOS goals to date. The other 9 Regional WSIP projects do not have specific LOS goals. The WSIP team remains committed to achieving the overall LOS goals established for the system.

Table 2.1 Progress Towards Meeting LOS Goals ⁽¹⁾

Project No.	Project Name / Construction Contract	Actual / Approved Substantial Completion Date	LOS Goals (P =Primary, S =Secondary)				Actual Operational Service Start	Construction Progress Toward LOS Goals
			Water Quality	Seismic Reliability	Delivery Reliability	Water Supply		
San Joaquin Projects								
CUW36401	Lawrence Livermore Water Quality Improvement <i>(Completed)</i>	08/31/10	P				08/31/10	100%
CUW37301	San Joaquin Pipeline System <i>(Completed)</i> (A) HH935A Crossovers (B) HH935B Western Segment (C) HH935C Eastern Segment	(A) 01/06/12 (B) 05/27/13 (C) 06/21/13			P		(A) 01/06/12 (B) 05/27/13 (C) 06/21/13	100%
CUW37302	Rehabilitation of Existing San Joaquin Pipelines (Roselle Crossover; <i>Completed</i>)	05/13/11			P		05/13/11	100%
CUW38401	Tesla Treatment Facility <i>(Completed)</i> (A) DB116 Tesla Treatment Facility Design-Build Contract (B) HH953 Tesla Portal Protection	(A) 06/24/11 (B) 08/05/13	P	S	S		(A) 06/24/11 (B) 08/05/13	100%
Sunol Valley Projects								
CUW35201	Alameda Creek Recapture	11/18/22				P		22%
CUW35501	Standby Power Facilities - Various Locations <i>(Completed)</i> (A) WD-2553 East Bay - Standby Power Facilities (B) WD-2511 Peninsula - Standby Power Facilities	(A) 09/11/08 (B) 04/15/10		P	S		(A) 09/11/08 (B) 04/15/10	100%
CUW35901	New Irvington Tunnel <i>(Completed)</i>	09/19/15		S	P		02/27/15	100%
CUW35902	Alameda Siphon #4 <i>(Completed)</i>	12/16/11		P	S		12/16/11	100%
CUW37001	Pipeline Repair & Readiness Improvements <i>(Completed)</i> (A) WD-2530 Phase A 8 Pipe Storage Sites (B) WD-2530 Phase B Pipe Rolling Machine Facility @ Sunol Yard	(A) 02/09/07 (B) 07/14/08		P	S		(A) 02/09/07 (B) 07/14/08	100%
CUW37401	Calaveras Dam Replacement <i>(Completed)</i> (A) WD-2551 Calaveras Dam Replacement (B) WD-2729 Alameda Creek Diversion Dam	(A) 04/12/19 (B) 02/15/19		S	P	S	(A) 04/12/19 (B) 02/15/19	(A) 100% (B) 100%
CUW37402	Calaveras Reservoir Upgrades <i>(Completed)</i>	10/06/05	P				10/06/05	100%
CUW37403	San Antonio Backup Pipeline <i>(Completed)</i>	12/31/14			P		12/31/14	100%
CUW38101	SWWTP Expansion & Treated Water Reservoir <i>(Completed)</i>	05/17/13	P		P		05/17/13	100%
CUW38601	San Antonio Pump Station Upgrade <i>(Completed)</i>	06/30/11			P		06/30/11	100%
Bay Division Projects								
CUW35301	BDPL Nos. 3 & 4 Crossover/Isolation Valves <i>(Completed)</i>	11/15/07		P			11/15/07	100%
CUW35302	Seismic Upgrade of BDPL Nos. 3 & 4 <i>(Completed)</i>	10/26/15		P			06/20/14	100%
CUW36301	SCADA System - Phase II <i>(Completed)</i>	11/29/10			P		11/29/10	100%
CUW36801	BDPL Reliability Upgrade – Tunnel <i>(Completed)</i>	05/20/15		P	S		10/15/14	100%
CUW36802	BDPL Reliability Upgrade – Pipeline <i>(Completed)</i> (A) WD-2541 East Bay (B) WD-2542 Peninsula (C) WD-2665 Cordilleras	(A) 12/09/11 (B) 06/13/12 (C) 03/05/13		P	S		(A) 12/09/11 (B) 06/13/12 (C) 03/05/13	100%
CUW36803	BDPL Reliability Upgrade - Relocation of BDPL Nos. 1 & 2 <i>(Completed)</i>	05/28/10			P		05/28/10	100%
CUW38001	BDPL Nos. 3 & 4 - Crossovers <i>(Completed)</i>	08/15/12		P	S		08/15/12	100%

Project No.	Project Name / Construction Contract	Actual / Approved Substantial Completion Date	LOS Goals (P =Primary, S =Secondary)				Actual Operational Service Start	Construction Progress Toward LOS Goals
			Water Quality	Seismic Reliability	Delivery Reliability	Water Supply		
CUW38901	SFPUC/EBMUD Intertie <i>(Completed)</i>	09/07/07			P		09/07/07	100%
CUW39301	BDPL No. 4 Condition Assessment PCCP Sections <i>(Completed)</i>	02/06/09		P	S		02/06/09	100%
Peninsula Projects								
CUW35401	Lower Crystal Springs Dam Improvements <i>(Completed)</i>	11/20/11			P	S	11/20/11	100%
CUW35601	New Crystal Springs Bypass Tunnel <i>(Completed)</i>	07/14/11		P	S		07/14/11	100%
CUW35701	Adit Leak Repair - Crystal Springs/Calaveras <i>(Completed)</i>	11/30/07			P		11/30/07	100%
CUW36101	Pulgas Balancing - Inlet/Outlet Work <i>(Completed)</i>	02/02/06	P		S		02/02/06	100%
CUW36102	Pulgas Balancing - Discharge Channel Modifications <i>(Completed)</i>	10/23/09			P		10/23/09	100%
CUW36103	Pulgas Balancing - Structural Rehabilitation & Roof Replacement <i>(Completed)</i>	07/26/11	P		S		07/26/11	100%
CUW36105	Pulgas Balancing - Modifications of the Existing Dechloramination Facility <i>(Completed)</i>	08/27/12	P		S		08/27/12	100%
CUW36501	Cross Connection Controls <i>(Completed)</i>	11/26/08	P				11/26/08	100%
CUW36601	HTWTP Short-Term Improvements - Demo Filters <i>(Completed)</i>	01/11/06		P	S		01/11/06	100%
CUW36603	HTWTP Short-Term Improvements - Coagulation & Flocculation/Remaining Filters <i>(Completed)</i>	12/21/09		P	S		12/21/09	100%
CUW36701	HTWTP Long -Term Improvements <i>(Completed)</i>	09/08/15		P	S		09/08/15	100%
CUW36702	Peninsula Pipelines Seismic Upgrade <i>(Completed)</i>	10/30/15		P			10/30/15	100%
CUW36901	Capuchino Valve Lot Improvements <i>(Completed)</i>	02/14/08			P		02/14/08	100%
CUW37101	Crystal Springs/San Andreas Transmission Upgrade <i>(Completed)</i>	06/30/14		P	S		09/02/14	100%
CUW37801	Crystal Springs Pipeline No. 2 Replacement <i>(Completed)</i>	01/31/13		P	S		01/31/13	100%
CUW37901	San Andreas Pipeline No. 3 Installation <i>(Completed)</i>	03/29/11		P	S		03/29/11	100%
CUW39101	Baden & San Pedro Valve Lots Improvements <i>(Completed)</i>	03/31/11		P	S		03/31/11	100%
San Francisco Regional Projects								
CUW30103	Regional Groundwater Storage and Recovery (A) WD-2600 Test Well Drilling (B) WD-2668 Regional Groundwater Storage and Recovery (Phase 1) (C) Regional Groundwater Storage and Recovery (Phase 2A) (D) Regional Groundwater Storage and Recovery (Phase 2B)	(A) 07/23/12 (B) 12/31/17 (C) 08/31/23 (D) 10/31/25				P	(A) 07/23/12 (B) 07/27/22	(A) 100% (B) 100% (C) 5% (D) 0%
CUW35801	Sunset Reservoir - North Basin <i>(Completed)</i>	09/19/08		P	S		09/19/08	100%
CUW37201	University Mound Reservoir - North Basin <i>(Completed)</i>	05/25/11		P	S		05/25/11	100%

Notes:

- 1 Support projects and WSIP Closeout projects are not listed in the table above since these projects do not have specific Level of Service (LOS) goals.

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall program-level cost summary of the WSIP Regional Program. It shows the Expenditures to Date; the 2005 Baseline, 2022 Approved, Current Approved and Q1/FY22-23 Forecasted Budgets; and the Cost Variance between the Current Approved and Forecasted Budgets.

The total Current Approved WSIP Budget (including Regional and Local Programs, Local Water Supply Projects, and Financing Costs) and Current Forecasted Cost at completion are \$4,787.8 million. The Current Approved WSIP Budget and Forecasted Cost at completion for only the Regional Program (including construction contingency) are \$3,803.1 million. The Current Approved Budget and final expenditures for the Local Improvement Projects are each \$331.9 million.

Table 3.1 Program Cost Summary

Cost Categories	Expenditures To Date (\$ Million) (A)	2005 Baseline Budget (\$ Million) (B)	2022 Approved Budget (\$ Million) (C)	Current Approved Budget ⁽⁷⁾ (\$ Million) (D)	Q1/FY22-23 Forecasted Costs (\$ Million) (E)	Cost Variance (\$ Million) (F = D - E)
Regional Improvement Projects	\$3,456.9	\$3,181.4	\$3,513.9	\$3,513.9	\$3,510.5	\$3.4
Construction Costs ⁽¹⁾	\$2,456.1	\$2,322.3	\$2,495.1	\$2,495.1	\$2,493.8	\$1.4
Program Delivery Costs ⁽²⁾	\$971.5	\$758.0	\$984.3	\$984.3	\$984.3	-
Other Costs ⁽³⁾	\$29.4	\$101.0	\$34.5	\$34.5	\$32.5	\$2.0
Support Projects ⁽⁴⁾	\$237.9	\$32.8	\$262.0	\$262.0	\$259.4	\$2.6
Construction Contingency for Regional & Support Projects ⁽⁵⁾	\$19.0	\$193.2	\$27.2	\$27.1	\$33.1	(\$6.0)
REGIONAL PROGRAM WITH CONTINGENCY	\$3,713.9	\$3,407.4	\$3,803.1	\$3,803.1	\$3,803.1	-
Local Improvement Projects	\$331.9	\$383.2	\$331.9	\$331.9	\$331.9	-
Local Water Supply Projects ⁽⁶⁾⁽⁸⁾	\$221.1	-	\$280.9	\$280.9	\$280.9	-
Finance ^(9,10,11)	\$372.0	\$552.0	\$372.0	\$372.0	\$372.0	-
PROGRAM TOTAL	\$4,638.8	\$4,342.6	\$4,787.8	\$4,787.8	\$4,787.8	-

Notes:

- Construction Costs** include the Construction Base Bid and owner-provided equipment/material for all regional and support projects. Those costs do not include any construction contingency. That contingency is reflected as a separate cost category.
- Delivery Costs** include project management, planning, environmental (CEQA, permitting, construction compliance), design, construction management, and engineering support during construction.
- Other Costs** include environmental mitigation, art enrichment, security improvements, and real estate expenses.
- Support Projects** include (1) System Security Upgrades, (2) Programmatic EIR, (3) Bioregional Habitat Restoration, (4) Vegetation Restoration of WSIP Construction Sites, (5) Long Term Mitigation Endowment, (6) Program Management, and (7) Watershed and Environmental Improvement Program. Please note that the cost reflected above for support projects only includes "Delivery" and "Other" costs, and "Construction" cost for these projects is included in "Construction Costs" under the Regional Improvement Projects.
- Expenditures to Date for Construction Contingency for Regional and Support projects correspond to the Total Approved Change Orders on those projects. For projects with ongoing or completed construction, the 2022 Approved Budget for construction contingency includes all change orders and trends as identified at the time of the March 2022 Revised WSIP, or projects in pre-construction, the 2022 Approved Budget for construction contingency includes 10% of the estimated construction base bid.
- Local Water Supply Projects managed as part of the Water Enterprise Capital Improvement Program (CIP) are (1) Lake Merced Water Level Restoration, (2) San Francisco Groundwater Supply, (3) San Francisco Westside Recycled Water, (4) Harding Park Recycled Water, and (5) San Francisco Eastside Recycled Water.
- The budget approved as part of the March 2022 Revised WSIP, plus any additional budget changes approved by the Commission as part of additional contingencies on construction contracts.
- The WSIP Local Water Supply projects underwent a September 2013 re-baseline. Only the original WSIP portion of the re-baselined costs is reported here. The remaining budget is funded under the Water Enterprise CIP and is managed outside the purview of the WSIP.

9. The original \$522M estimate of financing cost was based on a memorandum to the Commission dated November 23, 2005.
10. The financing cost budget of \$372M that was included in the March 2022 Revised WSIP includes all financing costs appropriated to date.
11. The actual financing cost is assumed to match the budgeted financing cost. Final reconciliation of all associated financing costs will occur upon WSIP completion.

Table 3.2 provides the current remaining construction contingency. For each region, it shows the Forecasted Construction Contingency as of Q4/FY21-22; the Total Approved Change Orders prior to the reporting quarter; Change Orders Approved during the reporting quarter; Total Approved Change Orders through the reporting quarter; Project Savings Moved to Contingency/ Funds Moved out of Contingency during the Reporting Quarter; the Q1/FY22-23 Forecasted Construction Contingency; and the Forecasted Remaining Contingency as of the end of the reporting quarter. As of September 30, 2022, the Forecasted Construction Contingency is \$33.18 million, and the Remaining Contingency is \$11.98 million.

The total costs of Change Orders approved in Q1/FY22-23 are shown in Table 3.2.

Table 3.2 Current Remaining Construction Contingency

Region	Q4/FY21-22 Forecasted Construction Contingency ⁽¹⁾ (\$ Million) (A)	Total Approved Change Orders as of Q4/FY21-22 ^(2,3) (\$ Million) (B)	Change Orders Approved in Q1/FY22-23 ⁽²⁾ (\$ Million) (C)	Total Approved Change Orders as of Q1/FY22-23 (\$ Million) (D = B+C)	Project Savings or Director's Reserves (+) Moved to Contingency/ Funds (-) Moved out of Contingency during Q1/FY22-23 ⁽⁴⁾ (\$ Million) (E)	Q1/FY22-23 Forecasted Construction Contingency (\$ Million) (F = A + E)	Q1/FY22-23 Forecasted Remaining Contingency (\$ Million) (G = F - D)
San Joaquin Region	-	-	-	-	-	-	-
Sunol Valley Region	\$1.95	\$0.20	\$0.39	\$0.60	\$6.00	\$7.95	\$7.36
Bay Division Region	-	-	-	-	-	-	-
Peninsula Region	-	-	-	-	-	-	-
San Francisco Regional Region	\$25.23	\$20.26	\$0.34	\$20.60	-	\$25.23	\$4.63
Support Projects	-	-	-	-	-	-	-
Regional Total	\$27.18	\$20.46	\$0.74	\$21.20	\$6.00	\$33.18	\$11.98

Notes:

1. Construction Contingency approved as part of the March 2022 Revised WSIP, plus any regional projects' savings moved to contingency.
2. Approved Change Orders are changes that have received all required approvals, including that of the City Controller.
3. This table only reports change orders for the active construction contracts as of this reporting cycle.
4. Values only reflect savings realized after the Commission adopted the March 2022 Revised WSIP.

Table 3.3 provides the forecasted remaining construction contingency. For each region as of Q1/FY22-23, it shows the Remaining Construction Contingency, Pending Change Orders, Potential Change Orders, Trends, and Forecasted Remaining Construction Contingency. As of September 30, 2022, the Total Forecasted Remaining Construction Contingency for the Regional WSIP is \$6.11 million. This amount does not include funds that are currently held in Director's Reserve.

Table 3.3 Forecasted Remaining Construction Contingency

Region	Q1/FY22-23 Remaining Construction Contingency ⁽¹⁾ (\$ Million) (A)	Pending Change Orders as of Q1/FY22-23 ⁽²⁾ (\$ Million) (B)	Potential Change Orders as of Q1/FY22-23 ⁽³⁾ (\$ Million) (C)	Trends as of Q1/FY22-23 ⁽⁴⁾ (\$ Million) D	Q1/FY22-23 Forecasted Remaining Construction Contingency (\$ Million) (E =A-B-C-D)
San Joaquin Region	-	-	-	-	-
Sunol Valley Region	\$7.36	-	\$2.55	\$4.81	-
Bay Division Region	-	-	-	-	-
Peninsula Region	-	-	-	-	-
San Francisco Regional Region	\$4.63	(\$0.91)	(\$0.58)	-	\$6.11
Support Projects	-	-	-	-	-
Regional Total	\$11.98	(\$0.91)	\$1.97	\$4.81	\$6.11

Notes:

1. Same as Column G in Table 3.2.
2. Pending Change Orders are changes that have been negotiated and approved by the SFPUC but have to be approved by the City Controller.
3. Potential Change Orders are changes that have been requested and entered into the construction contract management database but are still being negotiated.
4. Trends are any expected impact that the CM team believes may become a change order but are yet to be entered into the construction contract management database as a Potential Change Order.

The Program Management project includes programmatic activities that span multiple regions and benefit several WSIP projects (Table 3.4). The project provides funding for the following functions and resources: SFPUC Staff assigned to the management of the overall program; consultants supporting SFPUC staff at the program level (program, project and pre-construction management consultant, program construction management consultant, program control consultant); labor relations, including management of the project labor agreement; communication and public outreach; programmatic legal support; real estate acquisitions; program controls, including the tracking and reporting of all WSIP efforts; and program-level construction management activities associated with quality assurance, risk management, the Supplier Quality Surveillance (SQS) Program, operations assistance, safety, and training.

The activities under the Program Management project are organized into five categories that are tracked and monitored on a monthly basis. These categories are Management Support, Project Labor Agreement, Planning and Project Development, Program Control, and Program Construction Management.

The spending pattern for the project is very similar from month to month as the project primarily funds program-level positions occupied by SFPUC staff and consultants. The Forecasted Total Program Management Cost is \$113.4 million, which is \$3.9 million under the Current Approved Budget of \$117.3 million. The cost variance is due to the transfer of the Director's Reserve to Alameda Creek Recapture Project construction contingency. The remaining balance in the Director's Reserve is \$2.9M.

Table 3.4 Status of Program Management Project Cost Breakdown

Category	Expenditures To Date (\$ Million) (A)	2022 Approved Budget (\$ Million) (B)	Current Approved Budget (\$ Million) (C)	Q1/FY22-23 Forecasted Cost (\$ Million) (D)	Cost Variance (\$ Million) (E = C-D)
Management Support	\$37.81	\$46.47	\$46.47	\$42.53	\$3.94
Project Labor Agreement	\$3.74	\$3.84	\$3.84	\$3.84	-
Planning and Project Development	\$17.97	\$18.33	\$18.33	\$18.33	-
Program Controls	\$20.81	\$20.86	\$20.86	\$20.86	-
Program Construction Management	\$27.79	\$27.80	\$27.80	\$27.80	-
Program Management Total	\$108.13	\$117.30	\$117.30	\$113.36	\$3.94

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2005 Baseline, 2022 Approved, Current Approved, and Q1/FY22-23 Forecasted Schedules for the WSIP Regional Program. Refer to the “Cost and Schedule Status” notes in Section 5 for the criteria associated with the three color-coded Forecast Status levels in Figure 4.1 – Meet Requirements, Need Attention, and Exceed Limits. The Current Approved and the Forecasted Schedule completion for the Regional WSIP (Local WSIP was completed in June 2020) are each February 2027. Refer to Appendix D for a graphical presentation of the WSIP Approved Project-Level Schedule.

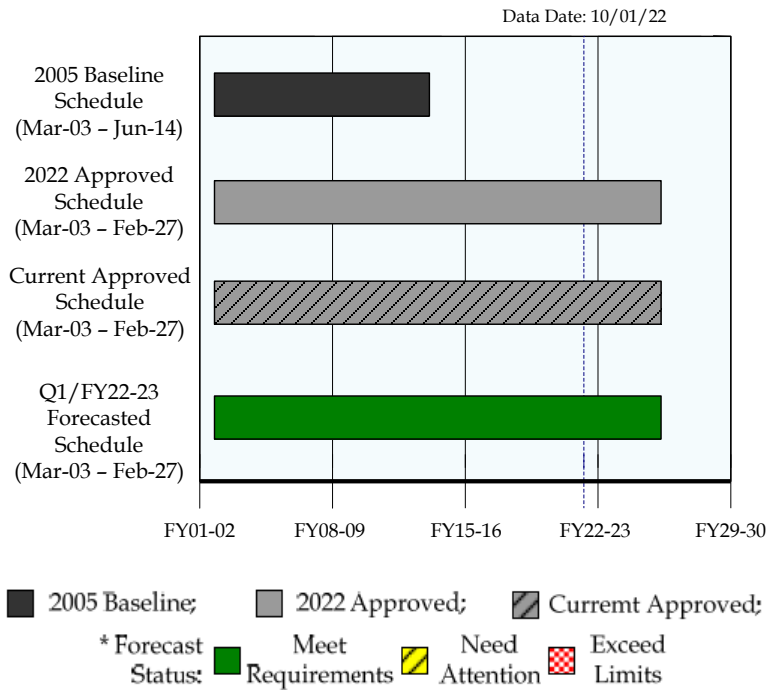


Figure 4.1 Program Schedule Summary

Table 4.1 2022 Approved vs. Q1/FY22-23 Forecasted Schedule Dates

Category	2005 Baseline Start	2022 Approved Start	Current* Approved Start	Actual Start	2005 Baseline Finish	2022 Approved Finish	Current* Approved Finish	Q1/FY22-23 Forecasted Finish	Schedule Variance (Months)
Regional Program	03/01/03	03/31/03	03/31/03	03/01/03✓	06/30/14	05/05/23	02/01/27	02/01/27	-
Local** Program	03/01/03	03/31/03	03/31/03	03/01/03✓	06/28/13	7/31/18	06/03/20	06/03/20A	Completed
Overall WSIP	03/01/03	03/01/03	03/01/03	03/01/03✓	06/30/14	05/05/23	02/01/27	02/01/27	-

* The budget and schedule approved as part of the March 2022 WSIP, plus any additional budget and schedule changes approved by the Commission as part of additional contingencies on construction contracts.

** Excluding Local Water Supply Projects

5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in \$1,000s

Project Name	Active Phase (a) (**)	CIP Approved Budget (b) (+)	Current Approved Budget (c) (++)	Current Forecast Cost (d)	Expenditures to Date (e)	Cost Variance (f=c-d) (+++)	% Cost Changes (g=f/c) (+++)	CIP Completion Date (h) (+)	Approved Completion Date (i) (++)	Forecast Completion Date (j)	Schedule Variance (Days) (k=i-j) (+++)
Sunol Valley Region											
10015281 Alameda Creek Recapture Project	CN	\$18,809	\$43,967	\$47,968	\$23,079	(\$4,001)	(9%)	05/25/2012	06/18/2024	06/18/2024	0
10015492 WSIP Closeout - Sunol Valley	CN		\$5,990	\$5,990	\$4,983	\$0	0%		06/30/2022	12/31/2022	(184)
San Francisco Regional Region											
10015241 Regional Groundwater Storage and Recovery	CN	\$39,233	\$158,350	\$158,350	\$122,596	\$0	0%	02/27/2014	02/01/2027	02/01/2027	0
Support Projects											
10015337 Long Term Mitigation Endowment	N/A		\$12,000	\$12,000	\$0	\$0	0%		10/01/2024	10/01/2024	0

* Does not include projects in closeout, completed, not initiated, on hold, deleted projects, and projects combined with other projects.

** Phase Status Legend	
PL Planning	DS Design
BA Bid & Award	CN Construction

Footnotes:

- (+) **CIP Approved Budget and Project Completion Date:** The budget and schedule approved as part of 10-year CIP for FY21-30.
- (++) **Current Approved Budget and Schedule:** The budget and schedule approved as part of 10-year CIP for FY21-30, plus any additional budget and schedule changes approved by the Commission as part of construction contract award.
- (+++) **Negative number reflects cost overrun (or schedule delay) and positive number reflects cost underrun (or ahead of schedule). Projects with a forecasted cost overrun greater than 10%, or forecasted delay of greater than 6 months or 10%, will be highlighted in grey.**

6. PROJECT STATUS REPORT

10015281 - Alameda Creek Recapture Project

Project Description: The planned facilities include the following components: four (4) identical vertical turbine pumps mounted on floating barges located in existing Pond F2; four (4) flexible discharge pipelines extending from each pump to a new pipe manifold located on shore; a pipeline connection between the new pipe manifold and the existing Sunol Pipeline to discharge the recaptured water to the SFPUC system; throttling valves and a flow meter; electrical control building; power lines from the existing Hetch Hetchy Water & Power Calaveras Electrical Substation installed on new power poles; and general site improvements.

Program: Sunol Valley Region	Project Status: Construction	Environmental Status: Completed (EIR)
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Project Cost:		Project Schedule:	
Approved	\$ 43.97 M	Approved Sep-03	Jun-24
Forecast	\$ 47.97 M	Forecast Sep-03	Jun-24
Actual	\$ 23.08 M	Project Percent Complete: 54.3%	

Key Milestones	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	04/28/2020 A	12/18/2020 A	06/21/2021 A	02/29/2024

Progress and Status:

During the reporting period, design modifications were completed for the water pipeline realignment around the Pond F2 due to erosion conditions. In addition, design was completed for relocation of the tie-in point between the effluent pipeline and the existing 36-inch diameter Sunol Pipeline due to corrosion at the original tie-in location. Also, during the quarter, the design was initiated for repairing the existing 36-inch diameter Sunol Pipeline due to the corrosion found on the pipe and the environmental permit modification for the alternate access roads work was approved. On September 13, the SFPUC Commission resolved to increase the construction contract cost contingency by \$2.6M and the construction contract duration contingency by 252 days for repairs to the Sunol Pipeline, to procure pipes for the realignment work, and to address cost and schedule delays related to the Department of Water Resource (DWR) permit. The Sunol Pipeline repair work is estimated to cost \$1.6M and will be performed under the construction contract but funded from Water Enterprise Capital Improvement Program budget. The remaining approximately \$1M will be funded from the project. The contractor continued to report notices of material shortages, longer lead-time estimates, and cost increases related to COVID-19. Coordination with the quarry operator on erosion repairs continued.



Inspection of the Vertical Pump



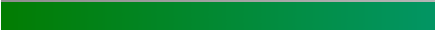


Issues and Challenges:

The cost variance is due to the forecasted trends related to the pipe realignment design changes and delays, Sunol pipeline repairs, DWR permit delays, barge, and pier changes. The construction contractor started evaluating the cost and schedule impacts of the issues; actual costs will be reported in the future.

10015492 - WSIP Closeout - Sunol Valley

Project Description: This project consists of the following sub-projects: Alameda Siphon No. 4 Carrier Water System Modifications will make modifications of the current chemical injection system. Erosion Repair at Pond F3 East will repair the erosion and restore the drainage pipe on the east bank of Pond F3 East. SVWTP Basin Polymer Feed Facility is to build a polymer feed facility that will serve all five (5) Basins to allow this facility to better meet its LOS goals. Miscellaneous Work at Alameda West Portal, Irvington Portal and San Antonio Back-Up Pipeline will install security doors at Alameda West Portal (AWP) and Irvington Portal (IVP), couplings between the valve stem and actuator, refurbishment of uninterruptible power supply (UPS) and install enclosures for the UPS at AWP and IVP, and other related appurtenances. New Irvington Tunnel Water Quality Equipment Relocation is to relocate the water quality monitoring equipment to Building B10 for Irvington Portal 1 (IP1) and install a pump from Irvington Tunnel 2 (IT2) to Irvington Tunnel 1 (IT1). San Antonio Backup Pipeline Carrier Water System Modifications is to modify the carrier water and chemical injection system to ensure the chemicals will be injected properly. Fish Passage Facilities at the Alameda Creek Diversion Dam is to modify the VSAT power supply system, replace the main photovoltaic battery bank and realign several valves and actuator drive stems.

Program: Sunol Valley Region	Project Status: Construction	Environmental Status: Completed
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Project Cost:		Project Schedule:	
Approved	 \$ 5.99 M	Approved Jul-16	 Jun-22
Forecast	 \$ 5.99 M	Forecast Jul-16	 Dec-22
Actual	 \$ 4.98 M	Project Percent Complete: 88.8%	

Key Milestones	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	Various	Various	Various	Various

Progress and Status:

Subprojects (1) JOC-60-14, (2) JOC-59-20, (4) JOC-54-02, (5) JOC 60-20, (6) JOC-60-23, and (7) SVWTP Polymer Feed Facility were all completed previously. The final sub-project, Alameda Creek Diversion Dam Power and Communication Facilities is being accomplished under three job order contracts (JOCs). Replacement of the main photovoltaic battery bank under JOC 77-09 was completed last quarter, and the modification of the satellite communication system's power supply system under JOC 70-14 was completed this quarter. Realignment of several valves and actuator drive stems under JOC 70-15 were also completed last quarter. Remaining work under JOC 70-15, including sluice way channel repair and final debris removal has not yet occurred due to the presence of a protected species at the site, but is anticipated to be completed in the next quarter, allowing closeout of this project.

Issues and Challenges:

As reported last quarter, the variance of six (6) months in the project schedule was to complete JOC 70-15, specifically modification of the satellite communication system's power supply system and additional time for the creekbed to dry in order to complete the sluice way repair and debris removal.



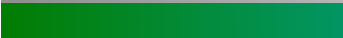




ACDD VSAT Enclosure complete with new solar system

10015241 - Regional Groundwater Storage and Recovery

Project Description: The current scope was planned to be constructed in two (2) phases. Phase 1 included construction of 13 wells to produce 6.2 mgd of dry year supply over 7.5 years. Operating the wells during drought will provide data and insights into how much water can be reasonably expected to be produced, and if additional well stations are needed to reach the desired drought period pumping capacity. Phase 2 included construction of two (2) installed test wells, completion of the South San Francisco (SSF) Main well, pipeline, and other work. The test wells which would not be converted to production wells at this time will allow for determination as to whether the identified sites could be viable production wells, and will provide information to water quality and pumping capacities that can be used for future planning. Phase 2 has been separated into two contracts due to the long lead-time required for easements and permits for work at the SSF Main Well site. Phase 2A includes installation of cathodic protection, well rehabilitation, and other mechanical work. Phase 2B consists of work at the SSF Main Well and pipeline installation to connect the well to Cal Water’s treatment facility.

Program: San Francisco Regional Region	Project Status: Construction	Environmental Status: Active (Various)
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Project Cost:		Project Schedule:	
Approved	 \$ 158.35 M	Approved Jun-03	 Feb-27
Forecast	 \$ 158.35 M	Forecast Jun-03	 Feb-22
Actual	 \$ 122.6 M	Project Percent Complete: 83.6%	

Key Milestones	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	A	09/07/2009 A	09/07/2011 A	01/30/2012 A	09/05/2012 A
	B	08/07/2014 A	09/22/2014 A	04/06/2015 A	09/02/2022 A
	C	11/10/2020 A	09/27/2021 A	06/23/2022 A	02/20/2024
	D	06/30/2023	08/01/2023	02/01/2024	01/31/2026

Progress and Status:

Project includes multiple construction contracts: (A) WD-2600 Test well drilling; (B) WD-2668 Well station (13 wells) Phase 1; (C) WD-2878A RGSR Phase 2A; (D) RGSR Phase 2B. For Phase 1 (Contract B) WD-2668 Well station (13 wells), final completion for construction was achieved on September 2. It is anticipated that the contract will be closed out in the next quarter. On September 13, the SFPUC Commission approved Amendment No. 6 to the professional services design contract, extending it by four years and two months to allow consultant services for engineering support during construction to continue to the forecast completion of this project in February 2027. For Phase 2A (Contract C) WD-2878A RGSR Phase 2A, the groundwater pumps at Millbrae Yard and Benjamin Franklin Well Stations have been pulled for inspection, rehabilitation, and installation of cathodic protection systems. For Phase 2B (Contract D), the 100% design and procurement of easements and permits continued to progress during the quarter. On September 20, PG&E issued the preliminary design and the proposed service agreement for providing power to the SSF Main Well.



Ben Franklin Well groundwater pump pulled for inspection

Issues and Challenges:

None at this time.

7. On-Going Construction

Construction Contract	Schedule			Budget		Variance (Approved -		Actual % Complete
	NTP Date	Approved Construction Final Completion*	Q1/FY22-23 Forecasted Construction Final Completion**	Approved Contract Cost +	Q1/FY22-23 Forecasted Cost++	Schedule (Cal. Days)	Cost	
Sunol Valley Region								
10015281 - Alameda Creek Recapture Project	06/21/21	12/19/22	02/29/24	\$ 20,107,271	\$ 22,653,409	(437)	(\$2,546,138)	22.0%
San Francisco Regional Region								
10015241 - Regional GW Storage and Recovery (Contract C)	06/23/22	02/20/24	02/20/24	\$ 6,850,000	\$ 6,529,718	-	\$ 320,282	4.7%

Program Total for On-Going Construction	Approved Contract Cost	Q1/FY22-23 Forecasted	Variance	
			Cost	Percent
	\$ 26,957,271	\$ 29,183,128	(\$2,225,856)	(8.3%)

Note:

* Approved Construction Final Completion Date includes approved change orders.

** The Forecasted Construction Final Completion Date includes all approved, pending, and potential change orders and trends.

+ Approved Contract Cost includes awarded contract amount and approved change orders.

++ The Forecasted Cost includes awarded contract amount and all approved, pending, and potential change orders.

8. PROJECTS IN CLOSEOUT

Project Title	2005 Baseline Construction Phase Completion	2022 Approved Construction Phase Completion	2005 Approved Project Completion	Current Approved Construction Phase Completion	Actual Construction Phase Completion	2022 Approved Project Completion	Current Approved Project Completion	Forecast Project Completion	2005 Construction Budget	2022 Approved Construction Phase Budget	Current Approved Construction Phase Budget	Construction Phase Expenditures To Dates
Support Projects												
10015335 - Bioregional Habitat Restoration		5/31/2018		5/31/2018	5/31/2018	10/1/2024	10/1/2024	10/1/2024		50,723,009	\$50,723,009	\$50,686,848

9. COMPLETED PROJECTS

Project Title	2005 Baseline Project Completion	2022 Approved Project Completion	Current Approved Project Completion	Actual Project Completion	2005 Baseline Project Budget	2022 Approved Project Budget	Current Approved Project Budget	Project Expenditures To Date
San Joaquin Region								
10015301 - Lawrence Livermore Water Quality Improvement	11/07/2011	07/31/2013	07/31/2013	07/31/2013	\$4,235,258	\$4,198,247	\$4,198,247	\$4,198,247
10015315 - San Joaquin Pipeline System	03/25/2014	03/31/2016	03/31/2016	03/31/2016	\$352,732,000	\$203,178,014	\$203,178,014	\$203,178,014
10015316 - Rehabilitation of Existing San Joaquin Pipelines	06/30/2014	10/31/2014	10/31/2014	10/31/2014	\$80,000,000	\$21,153,622	\$21,153,622	\$21,153,622
10015330 - Tesla Treatment Facility	07/01/2011	01/30/2015	01/30/2015	01/30/2015	\$101,643,001	\$113,211,607	\$113,211,607	\$113,211,607
10015487 - WSIP Closeout - San Joaquin		03/31/2021	03/31/2021	03/31/2021	\$0	\$3,376,376	\$3,376,376	\$2,011,197
Sunol Valley Region								
10015286 - Standby Power Facilities - Various Locations	12/06/2010	12/22/2010	12/22/2010	12/22/2010	\$9,949,735	\$12,950,566	\$12,950,566	\$12,950,566
10015290 - New Irvington Tunnel	09/17/2013	03/31/2018	03/31/2018	03/31/2018	\$214,650,004	\$340,406,358	\$340,406,358	\$339,901,806
10015291 - Alameda Siphon #4	04/14/2011	06/28/2013	06/28/2013	06/28/2013	\$78,577,000	\$64,950,507	\$64,950,507	\$64,950,507
10015312 - Pipeline Repair & Readiness Improvements	03/30/2007	04/16/2009	04/16/2009	04/16/2009	\$5,591,770	\$5,195,381	\$5,195,381	\$5,195,381
10015317 - Calaveras Dam Replacement	05/25/2012	03/31/2022	03/31/2022	03/31/2022	\$256,511,407	\$794,066,323	\$794,066,323	\$793,277,120
10015318 - Calaveras Reservoir Upgrades	02/17/2006	07/28/2006	07/28/2006	07/28/2006	\$1,740,055	\$1,690,552	\$1,690,552	\$1,690,552
10015319 - San Antonio Backup Pipeline	06/29/2012	06/30/2016	06/30/2016	06/30/2016	\$7,677,000	\$53,594,683	\$53,594,683	\$53,594,683
10015325 - SVWTP Expansion & Treated Water Reservoir	07/09/2013	10/31/2014	10/31/2014	10/31/2014	\$133,108,002	\$129,593,674	\$129,593,674	\$129,593,674
10015332 - San Antonio Pump Station Upgrade	12/12/2011	06/29/2012	06/29/2012	06/29/2012	\$41,854,000	\$12,894,592	\$12,894,592	\$12,894,592
Bay Division Region								
10015282 - BDPL Nos. 3 & 4 Crossover/Isolation Valves	09/30/2008	07/31/2009	07/31/2009	07/31/2009	\$27,600,158	\$27,039,149	\$27,039,149	\$27,037,926
10015283 - Seismic Upgrade of BDPL Nos. 3 & 4	10/15/2012	07/30/2018	07/30/2018	07/30/2018	\$66,792,849	\$72,194,219	\$72,194,219	\$70,530,532
10015299 - SCADA System - Phase II	02/24/2012	05/28/2013	05/28/2013	05/28/2013	\$36,098,999	\$9,470,922	\$9,470,922	\$9,470,923
10015308 - BDPL Reliability Upgrade / Tunnel	01/31/2014	08/30/2016	08/30/2016	08/30/2016	\$572,022,634	\$272,364,089	\$272,364,089	\$271,823,525
10015309 - BDPL Reliability Upgrade - Pipeline		03/31/2016	03/31/2016	03/31/2016	\$0	\$216,722,172	\$216,722,172	\$216,722,172
10015310 - BDPL Reliability Upgrade - Relocation of BDPL Nos. 1 & 2		05/28/2010	05/28/2010	05/28/2010	\$0	\$3,046,981	\$3,046,981	\$3,046,981
10015324 - BDPL Nos. 3 & 4 Crossovers	04/24/2013	06/30/2014	06/30/2014	06/30/2014	\$36,616,911	\$29,910,449	\$29,910,449	\$29,910,449
10015338 - SFPUC/EBMUD Intertie	02/07/2007	03/20/2014	03/20/2014	03/20/2014	\$8,598,851	\$9,167,306	\$9,167,306	\$9,167,306
10015341 - BDPL No. 4 Condition Assessment PCCP Sections	05/01/2008	02/06/2009	02/06/2009	02/06/2009	\$2,000,000	\$1,937,599	\$1,937,599	\$1,937,599
10015484 - WSIP Closeout - Bay Division		03/31/2021	03/31/2021	03/31/2021	\$0	\$3,597,500	\$3,597,500	\$3,322,156
Peninsula Region								
10015285 - Lower Crystal Springs Dam Improvements	08/16/2011	12/28/2012	12/28/2012	12/28/2012	\$27,752,222	\$34,859,040	\$34,859,040	\$34,859,040
10015287 - New Crystal Springs Bypass Tunnel	10/28/2010	08/17/2012	08/17/2012	08/17/2012	\$83,222,790	\$81,466,732	\$81,466,732	\$81,466,732
10015288 - Adit Leak Repair - Crystal Springs/Calaveras	07/03/2008	07/31/2008	07/31/2008	07/31/2008	\$3,748,452	\$2,787,322	\$2,787,322	\$2,787,322

Project Title	2005 Baseline Project Completion	2022 Approved Project Completion	Current Approved Project Completion	Actual Project Completion	2005 Baseline Project Budget	2022 Approved Project Budget	Current Approved Project Budget	Project Expenditures To Date
10015293 - Pulgas Balancing - Inlet/Outlet Work	05/11/2006	05/11/2006	05/11/2006	05/11/2006	\$1,667,532	\$1,765,938	\$1,765,938	\$1,765,938
10015294 - Pulgas Balancing - Discharge Channel Modifications	08/05/2013	07/30/2010	07/30/2010	07/30/2010	\$8,111,422	\$2,910,007	\$2,910,007	\$2,910,007
10015295 - Pulgas Balancing - Structural Rehabilitation and Roof Replacement	01/29/2013	12/28/2012	12/28/2012	12/28/2012	\$36,712,846	\$20,238,716	\$20,238,716	\$20,238,716
10015297 - Pulgas Balancing - Modifications of the Existing Dechloramination Facility		03/20/2013	03/20/2013	03/20/2013	\$0	\$5,390,031	\$5,390,031	\$5,390,031
10015302 - Cross Connection Controls	05/15/2009	02/27/2009	02/27/2009	02/27/2009	\$6,111,779	\$3,948,943	\$3,948,943	\$3,948,943
10015303 - HTWTP Short-Term Improvements (Demo Filters)	07/03/2006	11/14/2006	11/14/2006	11/14/2006	\$4,381,375	\$3,067,903	\$3,067,903	\$3,067,903
10015305 - HTWTP Short-Term Improvements - Coagulation & Flocculation/ Remaining Filters	09/08/2010	07/28/2010	07/28/2010	07/28/2010	\$9,741,617	\$18,604,937	\$18,604,937	\$18,604,937
10015306 - HTWTP Long-Term Improvements	04/08/2014	12/30/2016	12/30/2016	12/30/2016	\$167,570,000	\$274,081,969	\$274,081,969	\$273,833,162
10015307 - Peninsula Pipelines Seismic Upgrade		07/06/2016	07/06/2016	07/06/2016	\$0	\$38,825,346	\$38,825,346	\$38,773,912
10015311 - Capuchino Valve Lot Improvements	07/24/2009	08/19/2008	08/19/2008	08/19/2008	\$3,573,782	\$2,803,153	\$2,803,153	\$2,803,153
10015313 - Crystal Springs/San Andreas Transmission Upgrade	04/01/2014	06/30/2015	06/30/2015	06/30/2015	\$148,582,655	\$190,309,453	\$190,309,453	\$189,816,066
10015322 - Crystal Springs Pipeline No. 2 Replacement	04/27/2012	12/31/2014	12/31/2014	12/31/2014	\$93,926,000	\$56,070,509	\$56,070,509	\$56,070,509
10015323 - San Andreas Pipeline No. 3 Installation	06/09/2011	08/30/2012	08/30/2012	08/30/2012	\$42,029,941	\$27,495,558	\$27,495,558	\$27,495,558
10015339 - Baden and San Pedro Valve Lots Improvements	10/12/2011	03/29/2013	03/29/2013	03/29/2013	\$47,319,999	\$24,990,803	\$24,990,803	\$24,990,803
10015486 - WSIP Closeout - Peninsula		12/30/2021	12/30/2021	12/30/2021	\$0	\$13,579,680	\$13,579,680	\$13,479,266
San Francisco Regional Region								
10015289 - Sunset Reservoir - North Basin	05/06/2009	09/10/2010	09/10/2010	09/10/2010	\$61,975,999	\$64,270,725	\$64,270,725	\$64,270,725
10015314 - University Mound Reservoir - North Basin	03/10/2011	03/29/2013	03/29/2013	03/29/2013	\$102,882,610	\$43,266,552	\$43,266,552	\$43,266,552
Support Projects								
10015300 - System Security Upgrades		04/19/2019	04/19/2019	04/19/2019	\$0	\$14,700,669	\$14,700,669	\$14,429,323
10015334 - Programmatic EIR	06/20/2007	06/30/2009	06/30/2009	06/30/2009	\$9,271,001	\$10,730,684	\$10,730,684	\$10,730,684
10015336 - Vegetation Restoration of WSIP Construction Sites		06/30/2016	06/30/2016	06/30/2016	\$0	\$2,111,546	\$2,111,546	\$2,099,755
10015342 - Watershed and Environmental Improvement Program	06/28/2013	06/30/2022	06/30/2022	06/30/2022	\$20,000,000	\$20,000,000	\$20,000,000	\$19,918,451
TOTAL					\$2,916,581,656	\$3,364,187,104	\$3,364,187,104	\$3,357,788,630

APPENDICES

- A. PROJECT DESCRIPTIONS**
- B. WSIP APPROVED PROJECT-LEVEL SCHEDULE**
- C. LIST OF ACRONYMS**

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APPENDIX A. PROJECT DESCRIPTIONS**SAN JOAQUIN REGION****10015301 - Lawrence Livermore Water Quality Improvement (Completed)**

The project consists of:

- Ultraviolet (UV) disinfection, including two (2) 150-gallon-per-minute, parallel UV units and ancillary facilities. The units will be installed in the existing Thomas Shaft building.
- Two (2) pumps that will pump water from the Coast Range Tunnel to the new disinfection system.

10015315 - San Joaquin Pipeline System (Completed)

This project consists of:

- Pipeline crossover facilities at Emery Road (including 10 valves) and Pelican Road (including 12 valves).
- Installation of a portion of new pipeline, the Western Segment, from the San Joaquin River to the Tesla Portal. The pipeline will be 78-inches in diameter, approximately 10.3 miles in length and will include tunneled crossings of several highways, railroads, and irrigation canals. The pipeline will cross over the top of the California Aqueduct.
- Installation of a portion of new pipeline, the Eastern Segment, from the Oakdale Portal to a new connection point approximately 6.7 miles downstream on SJPL No. 3. This segment will also be 78-inches in diameter.
- Installation of valve facilities on SJPL Nos. 3 and 4 along the Eastern Segment to provide for operational needs to divide and isolate segments of these lines for maintenance and to regulate flow and control pressure in the system.
- Security-related site improvements at Oakdale Portal.

10015316 - Rehabilitation of Existing San Joaquin Pipelines (Completed)

The project scope is to assure that existing San Joaquin Pipelines will meet Delivery Reliability LOS goals by establishing a program of routine maintenance, repair and replacement activities for long-term implementation and by addressing the highest priority rehabilitation measures identified during the timeframe of the WSIP:

- Rehabilitation of and security-related site improvements at the existing Roselle Crossover.
- Establishment of a program of pipelines conditions assessment, including upgrading and renewal as required, of pipe coating and lining systems.
- Upgrade of the existing SJPL cathodic protection system.
- Upgrade of the existing SJPL Supervisory Control and Data Acquisition (SCADA) system.

10015330 - Tesla Treatment Facility (Completed)

The project consists of:

- Isolation valves and piping to divert SJPL flow to the new treatment facility, large-diameter piping and valves located within the treatment facilities, and a single discharge pipeline to tie back into the existing SJPLs.
- A disinfection building housing 12 UV reactors, cleaning equipment, and ancillary equipment.
- A chemical storage and feed building for sodium hypochlorite, hydrofluosilicic acid (i.e., fluoride), and carbon dioxide.
- Office, laboratory, and control facilities, emergency engine generators, and security-related site and access road improvements.

10015487- WSIP Closeout - San Joaquin (Completed)

• **Supplemental Solar Panel Installations** – The 10015315 San Joaquin Pipeline System, including the western segment, eastern segment and facilities, and crossover pipeline projects achieved final completion in 2013, 2014 and 2015, respectively. During the initial course of operations, it was noted

the solar panel arrays designed to provide power for the facility equipment were not sufficient to meet all modes of operational demands. This sub-project will provide additional solar panels to cover power shortfalls and allow the facility to better meet its water delivery reliability LOS goal. This sub-project consists of three (3) job order contracts at three (3) sites: Oakdale, Knight Ferry Throttling Station, and San Joaquin Junction No. 4. The scope of work as noted in the March 2016 Notice of Change includes:

- o Minor site preparation and grading work
- o Furnishing and installing new supplemental solar arrays mounted on concrete pads within security fence enclosures
- o Connections and integration of the new solar panels into the existing power system and controls
- o Installation of batteries for solar power storage on-site
- o Minor site preparation and grading work

• **Tesla Portal Facility Interior Floor Slab** – The Tesla Portal Facility, a sub-project of the 10015330 Tesla Treatment Facility, was completed in January 2015. During construction, the concrete interior floor slab was deleted from the project construction documents to allow easier access to repair corrosion of the existing pipelines discovered during construction beneath the new Tesla Portal Facility. Due to drainage issues at the site, the Operations staff at the facility has now requested the interior slab be incorporated into the structure with a small access opening for future maintenance and corrosion repairs of the existing buried pipelines. As noted in the March 2016 Notice of Change, this sub-project will be constructed through use of a job order contract including:

- o A new interior concrete slab slope to drain to a new catch basin
- o A new catch basin with grating and sump
- o A small sump pump and drain through the slab or existing concrete wall to a discharge point

SUNOL VALLEY REGION

10015281 - Alameda Creek Recapture Project

The planned facilities for this project are based on Alternative 4-1 from the Updated Alternatives Analysis Report (AAR) dated January 30, 2009, with some refinements described below. The planned facilities include the following components: four (4) identical vertical turbine pumps mounted on floating barges located in existing Pond F2 (including a mooring system); four (4) flexible discharge pipelines extending from each pump to a new pipe manifold located on shore; approximately 100-feet of 36-inch pipeline connection between the new pipe manifold and the existing Sunol Pipeline to discharge the recaptured water to the SFPUC system; throttling valves and a flow meter; electrical control building; 1,600 feet of power lines from the existing Hetch Hetchy Water & Power Calaveras Electrical Substation installed on 10 new power poles; and general site improvements. In addition, the scope includes conveyance of the water to various existing storage sites within the Sunol Valley or the Sunol Valley Water Treatment Plant, as necessary.

10015286 - Standby Power Facilities - Various Locations (Completed)

Standby power requirements are provided at six (6) sites in the East Bay and on the Peninsula. Each site is either provided with an emergency generator or the electrical receptacles to accommodate a portable emergency generator.

The facilities at the six (6) sites include:

- Alameda West Portal: standby power improvements include installing a permanent 20- kilowatt (kW) emergency generator in a sound-attenuated masonry wall enclosure.
- San Antonio Reservoir and Dam: standby power improvements include providing electrical receptacles for a portable 37-kW emergency generator at two (2) locations.
- Harry Tracy Water Treatment Plant (HTWTP): standby power improvements include removing the four (4) existing, smaller emergency generators and providing two (2) permanently installed 2-megawatt (MW) emergency generators.
- Millbrae Yard: standby power improvements include replacing the existing emergency generator with a permanently installed 300-kW unit to enable this facility to function as an emergency operations

center.

- San Pedro Valve Lot: standby power improvements include installing a permanent 20-kW emergency generator in a sound-attenuated masonry wall enclosure.
- Capuchino Valve Lot: standby power improvements include providing an electrical receptacle for a portable 30-kW engine generator.
- The project will also provide the trailer mounted engine generator that will be stored at the Millbrae Yard.

10015290 - New Irvington Tunnel (Completed)

The NIT alignment will be located just to the south of the existing tunnel. It will be 18,660 feet long and have a horseshoe shape with excavated dimensions of approximately 13 feet by 14 feet. The final tunnel lining will be mortar-lined, welded steel pipe, resulting in a finished diameter of 8.5 feet. Extra thick steel liner segments will also be used at low cover areas near the portals and beneath Interstate 680, and where it intersects inactive fault zones or in locations of poor ground conditions.

The NIT project is currently in construction and approximately 99% complete. Major project elements are listed below.

- Conventional mining methods were used for excavation in a westward direction from the Alameda West Portal, in both an eastward and westward direction from an intermediate shaft located near Vargas Road, just off Interstate 680, and in an eastward direction from Irvington Portal. Tunneling was completed by multiple road header tunneling machines, and limited, controlled detonation in areas of hard rock. Spoils disposal was taken to fill sites just north of the San Antonio Pump Station (SAPS) near the intersection of Calaveras Road and Interstate 680. The completed spoils fills will create a visual barrier to new quarry operation located near Calaveras Road. Potentially contaminated spoils were screened, separated, and if found to contain contaminants, hauled to a permitted landfill.
- At the Irvington Portal, tunnel connections were made to Bay Division Pipeline (BDPL) Nos. 1, 2, and 5 and to BDPL Nos. 3 and 4. Control valves were directly buried with instrumentation and electrical gear in a small control building. At the Alameda West Portal, the tunnel was connected to the discharge of the new mixing manifold to be constructed as part of the Alameda Siphons # 4 Project and to the existing overflow shaft. The project includes a new isolation valve between the mixing manifold and the portal.
- A new access bridge was constructed across Alameda Creek to accommodate temporary construction traffic and on-going SFPUC Alameda West Portal operations.
- A Groundwater Management Program was developed that includes two (2) years of pre- construction monitoring of wells, springs, creeks, ponds, and wetlands; environmental habitat construction mitigation measures; and two (2) years of monitoring after construction to minimize the impact to the local groundwater.
- At both the existing Irvington and Alameda West Portal facilities, other security-related site improvements were constructed, including undergrounding of portal structures and new card access controlled gates and security fences.
- In the March 2014 Notice of Change, simplifications were made to the design of the new security structure for the existing Alameda West Portal. The design changes included a more secure structure with a smaller footprint and removal of pipe manifolds that will no longer be in service.

10015291 - Alameda Siphon #4 (Completed)

The Alameda Siphon #4 Project extends approximately 3,000 feet from the Alameda East Portal across both the Calaveras Fault and Alameda Creek to the Alameda West Portal.

The project primarily consists of:

- A 66-inch-diameter welded steel pipeline with 310 feet of special trench design and thicker-walled pipe in the fault rupture zone, and a tunneled crossing of Alameda Creek.
- A 96-inch-diameter “blending structure” consisting of a pipe and valve manifold near the Alameda West Portal that will blend SVWTP and Hetch Hetchy water so that the existing and new Irvington Tunnels will receive a uniform quality of water.

- New isolation/throttling valves on Alameda Siphons No. 3 and 4 and new isolation valves on Alameda Siphons No. 1 and 2. The valves will be installed upstream of the blending structure.
- Ventilation improvements at Alameda East Portal for the Coast Range Tunnel required for construction access.
- New chemical injection facilities on Alameda Siphon No. 4.
- Relocation and extension of the existing overflow pipe from the Alameda East Portal about 500 feet to an existing quarry, and site fencing at Alameda East Portal. The overflow to the existing quarry includes a grouted rock riprap channel down the side of the quarry for erosion protection.
- Road improvements at the intersection with Calaveras Road for construction access.

10015312 - Pipeline Repair & Readiness Improvements (Completed)

This project is 100% complete and has been closed out. The project was separated into the three (3) following implementation phases:

- Phase A: Procurement of varied lengths and sizes of welded steel pipe and fittings for stockpiling at new storage facilities at seven (7) locations along the transmission system, west of the Coast Range Tunnel.
- Phase B: Procurement and installation of a pipe rolling machine at the Sunol Yard. The rolling machine, which has the capability to roll pipe sections up to 9 feet in diameter, will be housed in a new building with an emergency power supply.
- Phase C: Development of a pipeline repair prioritization plan, on-call emergency repair procedures and contracts, and mutual assistance agreements.

10015317 - Calaveras Dam Replacement (Completed)

Project elements primarily include:

- Constructing a new 210-foot-high earth and rock fill dam designed to accommodate a maximum credible earthquake on the Calaveras Fault. The dam will be constructed immediately downstream of the existing dam and will have a crest length of 1,210 feet, a base thickness of 1,180 feet, and a crest thickness of 80 feet. The total volume of the dam will be approximately 2.8 million cubic yards.
- The materials for construction will primarily originate from onsite sources, while surplus excavated material will be placed at disposal sites around the rim of the Calaveras Reservoir, including two (2) in-water disposal sites and several upland disposal sites.
- The existing spillway will be removed, and a new spillway and stilling basin will be constructed. The overflow weir of the new spillway will be 307 feet long. The spillway will vary from 60 to 80 feet wide and will be 1,100 feet long. The stilling basin below the spillway will be 80 feet wide and 155 feet long.
- A new intake tower and shaft will be constructed. The drain line and three (3) adits from the existing facility will be connected to the new shaft. The existing outlet conduit from the tower will be extended 1,250 feet downstream (beneath the replacement dam) and will be equipped with a high capacity fixed-cone discharge valve (relocated from the existing facility) to accommodate water releases from the reservoir. Fish screens will be added to the existing adits of the intake tower.
- The existing dam will largely remain in place. The downstream face will, however, be partially removed and re-graded and a channel will be excavated through the dam to form the approach to the new spillway.
- A new 525-foot long fish ladder and flow bifurcation systems at ACDD will be used in conjunction with new low-flow capacity valves to be added at the base of the replacement Calaveras Dam to provide flows downstream of these facilities to support native aquatic resources and future populations of steelhead trout that are being restored to the Alameda Creek Watershed.
- The fish ladder and a total of four (4) new fish protection screens will be added on the right abutment (looking downstream) of the ACDD. In addition, conveyance pipes will be installed to allow water from Alameda Creek to be delivered to the Calaveras Reservoir via the ACDT.
- Landslide A removal beneath the northern half of the left abutment slope located on the left side of the valley (when looking downstream) as well as other associated changes as previously noted in the March 2013 Notice of Change.

- Landslide B removal within the lower left abutment slope as well as other associated changes as previously noted in the March 2014 Notice of Change.
- Additional slope reinforcement in Borrow Area B and import of offsite rockfill as noted in the March 2016 Notice of Change.
- Repairs to the landslide portion of Calaveras Road and restoration of the West Haul Road as noted in the scope refinements listed below for this March 2018 Notice of Change.
- For the ACDD fish ladder, to address the potential landslide hazard and further protect the fish passage structure, as noted in the scope refinements listed below for this March 2018 Notice of Change, an extension to the contract landslide stabilization wall and an additional reinforced concrete panel wall with tie-backs to reinforce a section of the soil nail wall.

10015318 - Calaveras Reservoir Upgrades (Completed)

The project consists of installing a hypolimnetic oxygenation system and associated cryogenic (oxygen generation) equipment near the dam. The addition of oxygen into the reservoir will limit the negative effects of algal blooms and may promote a healthier fish habitat. The system will continue to be usable following completion of the replacement Calaveras Dam. The project primarily consists of the new cryogenic equipment, two (2) diffuser systems in the reservoir, and miscellaneous site work.

10015319 - San Antonio Backup Pipeline (Completed)

The SABPL consists of 6,600 feet of 66-inch-diameter steel pipe and extends from the Alameda Siphons at the SAPS to Sunol quarry, SMP-24, near the intersection of Calaveras Road and San Antonio Creek. There are three (3) tie-in facilities with air gap provisions from the SABPL: one connecting to Alameda Siphon No. 3, a second to the SAPL near SAPS, and a third to the SAPL on the west side of Calaveras Road before the SAPL alignment turns and heads west to quarry SMP-24. The alignment of the SABPL parallels that of the existing SAPL, terminating with a control valve and concrete energy dissipation structure to quarry SMP-24. The project includes new chemical storage, feed and water quality monitoring facilities for de-chlorination and pH adjustment of any discharges through the SABPL, the existing SAPL, and the Alameda East Portal overflow pipe. Water discharged into the SMP-24 quarry pond will be recovered with two submersible pumps and a short section of 24-inch diameter steel pipe which will connect to the existing SAPL to convey water to San Antonio Reservoir. Power to the water recovery pumps will be supplied from the nearby Calaveras Substation, which is owned and operated by Hetch Hetchy Water & Power. Construction of a slurry wall is included around the quarry pond to minimize groundwater intrusion and to ensure slope stability.

10015325 - SVWTP Expansion & Treated Water Reservoir (Completed)

The project primarily consists of:

- The expansion improvements, which increase the sustainable capacity to 160 mgd, include the addition of a new flocculation/sedimentation basin and the retrofit of six (6) of the twelve (12) existing filters. Design of improvements to the remaining six (6) filters was performed under the project, and was included as an optional bid item in the construction contract. As a result, upgrades to all 12 filters were able to be performed under the construction contract, providing an additional factor of safety for reliable and sustainable production of 160 mgd required to meet the LOS goals established for the system.
- A single 17.5-million-gallon (mg) circular TWR which was constructed along with a new 3.5-MG rectangular chlorine contact tank on the northern portion of the existing plant site. Roughly 400,000 cubic yards of excavated material was hauled to a disposal site immediately east of the plant for disposal.
- New chemical storage and feed facilities for disinfection are constructed including sodium hypochlorite and ammonia. New fluoride facilities were also added.
- Construction of approximately 2,700 feet of 78-inch-diameter pipe that connects the new TWR to the existing plant discharge pipeline. This included a tunneled crossing of Alameda Creek.
- Nine (9) existing chemical tanks and associated electrical and instrumentation components were

replaced under the construction contract. The existing chemical tanks and the associated electrical and instrumentation had reached the end of their useful life and were in jeopardy of failure.

- Miscellaneous plant improvements include a new emergency generator and improvements to the plant electrical system, substation, electrical panels, and motor control centers; an upgrade of the instrumentation and controls; a new filter washwater recovery basin; improvements to the flow distribution structure and associated facilities; replacement of the plant's existing boiler; improvements to the influent chemical mixing system; and repaving of the existing plant access road.

10015332 - San Antonio Pump Station Upgrade (Completed)

The project consists of:

- Replacement of the three (3) 1,000-horsepower electrical pumps.
- Addition of two (2) 1.5-megawatt emergency generators. The generators are sized to power the three (3) electric pumps.
- Seismic retrofit of the pump station, including reinforcement of the walls, foundation improvements, and connection of the roof to the walls.

10015492- WSIP Closeout - Sunol Valley

- **Alameda Siphon No. 4 Carrier Water System Modifications** – The 10015291 Alameda Siphon No. 4 Project was completed in 2013. Since that time, new facilities that have been brought on-line as well as other changes have occurred in water operations, have resulted in an apparent drop in water pressures and volumes at the Sunol Valley Chloramination Facility. This has reduced the available water needed for the current carrier water system to pump the necessary water treatment chemicals into the system. This new sub-project is designed to resolve the deficiency and allow the facility to better meet its water delivery reliability LOS goal. This sub-project will be constructed by a job order contract including:

- o Modifications of the current chemical injection system of overcome lack of water system pressure and volume

- o New supplemental water facilities, including possible new storage tanks, and monitoring and regulating equipment as needed

- o Plumbing and control connections between the new facilities and the current system

- **Erosion Repair at Pond F3 East** – The completed 10015319 San Antonio Backup Pipeline Project included drainage improvements on the east side bank of Quarry Pond F3 East. After completion of construction, it was noted that the rock riprap below a 12- inch drainage pipe had eroded away and undermined the downstream section of the pipe. This sub-project will repair the erosion and restore the drainage pipe through a job order contract including:

- o New rockfill on the east back of the quarry pond from the current drainpipe to the toe of the bank

- o Excavation and grading to remove loose bank debris and prepare the subgrade slope to receive new rockfill

- o Extension of the existing drainpipe downslope to the water line of the pond

- o Temporary access improvements at the side bank of the pond for a crane and other equipment to deliver to, and place new rockfill and other materials into, the repair area

- **Sunol Valley Water Treatment Plant Basin Polymer Feed Facility.** The Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir Project was completed in 2014 and included addition of a new fifth flocculation sedimentation basin (Basin 5) to the existing four (4) basins at the plant. During operations after completion, it was noted that Basin 5 was not able to achieve the optimal water production goal of 40 million gallons per day consistently. This sub-project is to build a polymer feed facility that will serve not only Basin 5, but also the four (4) older basins (Basins 1 to 4), to optimize plant water production, and allow this facility to better meet its water quality and delivery reliability LOS goals. The portion of the facility cost attributed to Basin 5 will be funded under the WSIP; the portion of the facility cost attributed to Basins 1 to 4 will be funded under the Water 10- Year Capital Improvement Program. This sub-project will be constructed by a bid contract including:

- o Addition of new flocculant aid polymer to Basin 5

- o Water testing to develop a range of polymer doses for the range of different water quality expected at the plant
- o Construction of new structures and facilities to store, monitor and control the application of the new polymer
- o Possible extension of the new polymer to optimize water production from the four (4) older basins
- **Miscellaneous Work at Alameda West Portal, Irvington Portal and San Antonio Back-Up Pipeline** – The CUW 35901 New Irvington Tunnel (NIT) was completed in 2017, and the CUW 37403 San Antonio Backup Pipeline (SABPL) was completed in 2016. This subproject will include the following work:
 - o Installation of new security doors at Alameda West Portal (AWP) and Irvington Portal (IVP)
 - o Installation of new couplings between the valve stem and actuator for the cathodic protection at AWP and IVP
 - o Refurbishment of uninterruptible power supply (UPS) and installation of new enclosures for the UPS at AWP and IVP
 - o Installation of discharge pipe lateral supports, safety railings, ladder stiffening supports, and sunshades for electrical equipment on SABPL
- **New Irvington Tunnel Water Quality Equipment Relocation** – The 10015290 New Irvington Tunnel (NIT) project installed new water quality monitoring equipment in an underground vault to monitor water quality on Irvington Portal 2 (IP2). After the equipment was installed, problems were noted that related to safe access and water drainage. This sub-project is to relocate the water quality monitoring equipment to Building B10 for Irvington Portal 1 (IP1), and install a new pump to pump water from Irvington Tunnel 2 (IT2) to Irvington Tunnel 1 (IT1) to provide IT2 water for the water quality monitoring.
- **San Antonio Backup Pipeline Carrier Water System Modifications** – The 10015319 San Antonio Back Pipeline was completed in 2016. Since that time, changes in operations have resulted in an apparent drop in water pressure in the carrier water system for two (2) chemicals including Calcium Thiosulfate for dechlorination and Hydrofluorosilicic acid for pH adjustment. The purpose of this sub-project is to modify the carrier water and chemical injection system to ensure the chemicals will be injected properly. Fish Passage facilities at the Alameda Creek Diversion Dam is to modify the VSAT power supply system, replace the main photovoltaic battery bank and realign several valves and actuator drive stems.
- **Alameda Creek Diversion Dam Power and Communication Facilities** (new sub-project addition in 2022) – The 10015317 Alameda Creek Diversion Dam Fish Passage Facilities (WD-2729 contract) is a sub-project to the Calaveras Dam Replacement Project, which will close out on 3/31/2022. After operating the fish passage facility for over one year, a few deficiencies were discovered in the power system for the communication facilities, the main power system, and a few of the valves and gates. Job Order Contracts (small contracts less than one million dollars in value) will be used to address these issues under this new sub-project. This subproject is to modify the VSAT power supply system, replace the main photovoltaic battery bank and realign several valves and actuator drive stems.

BAY DIVISION REGION

10015282 - BDPL Nos. 3 & 4 Crossover/ Isolation Valves (Completed)

The project consists of:

- Two (2) large vaults that are primarily below-ground installations with only the top 30 inches of the structure exposed. Above-ground facilities include security fencing and satellite communication dishes. The vaults are approximately 2,400 feet apart along the BDPL Nos. 3 and 4.
- Each vault includes four (4) mainline isolation valves and a crossover valve. The isolation valves are hydraulically operated, while the crossover valves are electrically operated.
- The existing BDPL No. 3 is a 78-inch-diameter reinforced concrete pipe, and BDPL No. 4 is a 96-inch-diameter PCCP. At each vault, approximately 170 feet of each pipeline will be replaced with welded steel pipe.

- Each facility will be equipped with connections for portable electric generators, and a battery system will provide immediate emergency power to operate the hydraulic system.
- Valve actuators will have remote monitoring and operating capability through the SFPUC SCADA system.

10015283 - Seismic Upgrade of BDPL Nos. 3 & 4 (Completed)

The existing pipeline fault crossing between the two (2) crossover/isolation valve vaults constructed under the BDPL Nos. 3 & 4 Crossover/Isolation Valves Project is about 2,400 feet in length, and consists of BDPL No. 3, a 78-inch-diameter reinforced concrete cylinder pipe, and BDPL No. 4, a 96-inch-diameter PCCP. These vaults are located east and west of I-680 near the intersection of Mission Boulevard. The current project scope includes replacement of about 2,300 feet of BDPL No. 3. Ongoing investigations have determined that improvements to BDPL No. 4 are also required to facilitate the failure of BDPL No. 4 in a controlled manner that does not cause the failure of BDPL No. 3. It is planned that about 400 feet of the new BDPL No. 3 will cross Trace A under I-680 in an existing oversized corrugated metal pipe; about 300 feet that crosses Trace B under Mission Blvd. will be in a newly constructed concrete vault ("box culvert"); and the remaining new pipeline will be buried. All new construction will be in the SFPUC's existing right-of-way (ROW).

The project primarily consists of:

BDPL No. 3:

- A new 300-foot-long concrete vault will be constructed under Mission Boulevard near the I- 680 Interchange where Fault Trace B is located. A new 300-foot segment of 72-inch welded steel BDPL No. 3 will be installed inside the vault. Within the vault and on either end of the fault trace zone, 72-inch-diameter ball joints and slip joints will be installed that will accommodate pipeline displacement during a seismic event.
- For the crossing under I-680 at Trace A, about 400 feet of 78-inch-diameter welded steel pipe will be installed in an existing, unused corrugated metal pipe. About 1,450 feet of additional new 78-inch diameter welded steel pipe will connect the existing and new segments between the two (2) vaults, and will be buried.

BDPL No. 4:

- About 400 feet of new 80-inch steel liner will be installed inside BDPL No. 4 at Hayward Fault Trace C.
- BDPL No. 4 will be encased with concrete outside the existing slip joint vault at Hayward Fault Trace B.
- Modifications to the existing slip joint vault will be made including enlarging BDPL No. 4 pipe penetrations in the vault, new drainage systems, new roof panels and adjustments to the existing slip joint.
- Modifications to the existing BDPL No. 3 (to be abandoned in place) to collect and divert water from the area and prevent the undermining of the new BDPL No. 3.
- About 400 feet of new 90-inch diameter welded steel pipe will be installed at Trace A of the Hayward Fault.
- Relocation of the following utilities: two (2) Alameda County Water District water pipelines, one (1) Union Sanitary District sewer pipeline, one (1) conduit of AT&T phone lines, and one (1) six-inch diameter PG&E gas pipeline.

10015299 - SCADA System - Phase II (Completed)

The project primarily consists of:

- Establish a common software platform and migrate all elements to this platform.
- Connect existing flow meters and new pressure transmitters, and provide communication to SCADA master station at five (5) major Bay Area Water Supply and Conservation Agency (BAWSCA) customer sites.
- Install pressure transmitters, perform piping modifications, and provide communication to SCADA

master station at seven (7) existing regulating valves in the City of San Francisco distribution system.

- Install new flow and pressure monitoring devices at 23 key locations in the City distribution system.

10015308 - BDPL Reliability Upgrade – Tunnel (Completed)

The tunnel extends 5 miles under San Francisco Bay and is adjacent to the marshlands between the vicinity of the Ravenswood Valve Lot and the Newark Valve Lot. The tunnel will be constructed with a Tunnel Boring Machine (TBM). The final tunnel lining will consist of a 9-foot- diameter welded steel pipeline. The tunnel will terminate on each end with vertical shafts and a connection to the BDPL Nos. 1, 2, and 5 piping manifolds. The two (2) piping manifolds are provided under the BDPL Reliability Upgrade - Pipeline Project. The tunnel spoils are anticipated to be used as part of the conversion of adjacent salt ponds to marshland. The portion of the existing BDPL Nos. 1 and 2 that are replaced by the tunnel will be capped on each end and will be abandoned in place.

Two (2) facilities were added to the original scope of work as part of the March 2014 Revised WSIP and are necessary to ensure the project will meet LOS goals:

- SCADA Communications system at Newark Valve Lot - This added scope provides for the installation of a SCADA communications system and integrating such system into the existing water quality monitoring equipment located in the Newark Valve Lot Control Building. The work consists of installing communications equipment, telephone line, wires, conduits, and electrical cabinets.
- 42-inch diameter Bay Division Pipeline No. 2 (BDPL2) Bypass - The supply from the Newark Valve Lot to the City of Hayward is currently being fed from both Bay Division Pipelines (BDPL) No. 1 and No. 2. Upon the completion of the Bay Tunnel Project, Hayward supply will be fed only by BDPL2. BDPL2, built in the mid-1930s, is a mixture of reinforced concrete cylinder pipe and wrought steel pipe. Thus, with the original scope of the Bay Tunnel project, the reliability of the Hayward service line could be reduced when the project is completed. The scope of work for this change provides for the installation 640 lineal feet of new 42-inch diameter welded steel pipe, replacing a portion of BDPL2, thereby increasing the reliability of the Hayward service.

10015309 - BDPL Reliability Upgrade – Pipeline (Completed)

The project primarily consists of:

- In the East Bay, 7 miles of 72-inch-diameter pipe will be constructed between the Irvington Portal and the Newark Portal of the new Bay Tunnel. On the Peninsula, 9 miles of 60-inch- diameter pipe will be constructed between the Ravenswood Portal of the new Bay Tunnel and the portal of the Pulgas Tunnel.
- A seismically resistant crossing of the Hayward Fault will be constructed. The crossing will include a new crossover valve vault on each side of the fault. The valves will be hydraulically actuated and will include emergency batteries. The pipe between the vaults will be higher strength and will be installed on a special foundation or trench section.
- Isolation valves and an interconnecting pipe manifold will be constructed at each portal of the new Bay Tunnel. The facilities will include new or rehabilitated control buildings with new emergency generators.
- New crossover valves between BDPL Nos. 2 and 5 will be installed at a location in Redwood City. The crossover facility will include a new or rehabilitated control building and connections for a portable emergency generator.
- A new throttling valve will also be added on BDPL No. 5 at the Pulgas Valve Lot. The throttling valve will include a new or rehabilitated control building.
- The project originally included underground concrete vaults for crossover facilities at Newark, Ravenswood, and Redwood City Valve Lots. The current project eliminates the concrete vaults and directly buries the valves with full access to valve actuators at these facilities.

10015310 - BDPL Reliability Upgrade - Relocation of BDPL Nos. 1 & 2 (Completed)

The project includes relocation of approximately 600 feet of each pipeline (BDPL Nos. 1 and 2) at the BART/railroad crossings. The pipe segments to be relocated will be installed inside new casings that

will be placed by the construction contractor doing the other development work in the area. The encased pipes are being installed in accordance with a utility agreement between the City of Fremont and the SFPUC.

10015324 - BDPL Nos. 3 & 4 Crossovers (Completed)

The three (3) proposed crossover facilities are located near the Guadalupe River in Santa Clara, near Barron Creek in Palo Alto, and near Bear Gulch in Atherton. The facilities include vaults that are largely below-ground, with only the top 30 inches exposed. They are very similar to one another, consisting of four (4) mainline valves and a crossover valve. Emergency engine generators will be included as an optional bid item.

10015338 - SFPUC/EBMUD Intertie (Completed)

The project primarily consists of:

- Providing new 36-inch-diameter piping and valving at the Newark Turnout to provide an additional connection between BDPL Nos. 1 and 2 to the existing City of Hayward system.
- Using the existing City of Hayward system for conveyance and providing six (6) new valves for isolation.
- Providing 1.3 miles of new 36-inch-diameter pipe to connect the City of Hayward system to the EBMUD system and providing a new pump station along this alignment.

10015341 - BDPL No. 4 Condition Assessment PCCP Sections (Completed)

This project is 100% complete and has been closed out. This project includes a detailed condition assessment of the two PCCP segments along BDPL No. 4. The first reach of concern (Reach 1) is 8.6 miles long and 96-inches in diameter. The second reach of concern (Reach 4) is 8.0 miles long and 84-inches in diameter. The condition assessment consists of an electromagnetic survey, seismic risk analysis, corrosion survey, visual inspection, and field investigations.

The assessment identified six (6) reaches of pipe (144 feet total out of 16 miles) that are potentially distressed. During initial investigations, the condition of one (1) distressed pipe segment (Pipe 1558) was determined visually to be particularly deteriorated, and immediate emergency repair was recommended. The project funded and completed emergency repair, using post-tension exterior tendon repair, for this segment. For the other five (5) potentially distressed pipe segments that were identified using electromagnetic survey, and determined to be of lower priority, recommendations were made for future excavation to confirm pipe condition in these areas, and repair if needed. A number of future follow-up investigations were recommended, including monitoring of groundwater acidity for a period of one (1) year in the area of Edgewood Road, and additional excavations of lower priority pipe pieces. Any additional required repairs will be scheduled based on urgency and funded through the Water Enterprise's Repair and Replacement (R&R) Program.

10015484- WSIP Closeout - Bay Division (Completed)

- **Site Drainage and Pipe Coating Repairs** - This sub-project will focus on providing a drainage system solely within SFPUC's Right-of-Way to address an erosion issue that developed after the construction of the 10015283 Seismic Upgrades of BDPL Nos. 3 & 4. In addition, this sub-project will include repairs to coatings on the pipe and pipe supports of the Bay Division Pipeline (BDPL) No. 3 to address issues that developed inside the articulated vault after construction was completed. The sub-project includes design, construction, and management of the drainage system work.
- **Bay Tunnel Warranty Inspection and BDPL 1 & 2 EIR Mitigation** – This sub-project advances the planning for a decommissioning study of the existing BDPL Nos. 1 and 2 until such time that the funding for a new Water 10-Year Capital Improvement Project (CIP) to further study mitigation alternatives and pursue removal of the BDPL Nos. 1 and 2 within the Don Edwards San Francisco Bay National Wildlife Refuge becomes available in FY2020-21.
- **Hydro-seeding at Bay Tunnel Project** - Due to the drought conditions and timing of hydro-seeding performed for the Bay Tunnel Project outside of the typical seasonal window, it may not be possible to

file the Notice of Termination (NOT) to close out the storm water permit prior to the Bay Tunnel Project closeout date, as the 70% growth take requirement, with less than 10% noxious weeds, may not be achieved by that time. Accordingly, the scope of this sub-project provides for monitoring of the hydro-seeded areas, removal of noxious weeds and potentially re-seeding some of the areas at the tunnel portals in Menlo Park and Newark if the storm water performance objectives are not met.

- **Newark Valve Lot Additional Gravel Placement** - The Bay Tunnel Project design plans call for a portion of the Newark Valve Lot to be landscaped and hydro-seeded. However, based on recent discussions, Operations staff are requesting that gravel be placed in this area since it will be a high traffic area during shutdowns and other maintenance work. Accordingly, this sub-project provides for the purchase and placement of the gravel.

- **Corrosion Protection for Valve E50U** – The E50U Valve was installed in 2011 as part of the 10015309 BDPL Reliability Upgrade – Pipeline Project. Immediately prior to the Bay Tunnel Project in-service/commissioning date in early Fall 2015, the Bay Tunnel Contractor completed the flanged connection of the manifold to the existing E50U Valve. However, during the installation and testing of the new flanged connection, the Bay Tunnel Contractor discovered an inconsistency in the corrosion protection isolation system of the existing valve E50U (high corrosion potential). It was decided to not authorize a Change Order to fix the corrosion problem of the E50U Valve at that time due to the risk of potential delays to the Bay Tunnel Project, at high cost, if leaks were to occur after the solution was implemented. Accordingly, this sub-project includes excavating and shoring the area around the valve, and removal of one bolt at a time for testing and replacing of the bolts (if necessary). A gasket will be purchased and may be installed if there are leaks that develop after the bolts are removed, cleaned and replaced. The proposed work on the valve will be done during the shutdown of the Bay Tunnel for warranty inspection in Winter 2016/2017.

- **Ventilation and Sump Pump Systems Installation (new sub-project in 2018)** - This sub-project provides improvements for inspection, monitoring and maintenance associated with the construction of the 10015283 Seismic Upgrades of BDPL Nos. 3 and 4. The BDPL No. 3 pipe, slip joint, ball joints and pipe supports and seismic monitoring equipment inside the articulated vault require on-going inspection, monitoring and maintenance. The type and frequency of inspection and maintenance were not well defined during the design phase; it is now clear that a fixed ventilation system is required for the BDPL No. 3 vault. Furthermore, the BDPL No. 4 expansion joint vault also requires access for inspection and monitoring; installation of a sump pump is required to remove water from the vault prior to inspections. Accordingly, the scope of this sub- project is to install a fixed ventilation system and a sump pump system to eliminate the need for removing access hatches and installing temporary fans and sump pump prior to accessing the vaults for frequent inspection and maintenance needs.

PENINSULA REGION

10015285 - Lower Crystal Springs Dam Improvements (Completed)

The project consists of:

- Spillway modifications that include widening the spillway, constructing two (2) bridge piers within the spillway to accommodate rebuilding of a San Mateo County Bridge, removing the existing timber stop-log system, constructing a new weir system within the spillway, installing access cat-walks for operation and maintenance, and eliminating water ponding on top of the dam.
- Parapet wall modifications that include raising the wall that is located on top of the upstream face of the dam and raising the approach walls to the spillway.
- Stilling basin modifications at the base of the spillway that include removing the existing basin, constructing a new larger basin, and adding downstream riprap protection at the toe of the basin.

10015287 - New Crystal Springs Bypass Tunnel (Completed)

The project consists of:

- A 4,200-foot-long tunnel with an 8-foot-diameter welded steel liner.
- Vertical shafts on each end of the tunnel to accommodate the TBM and future maintenance.

- The southern shaft will include a connection to the existing CSBPL near the north end of the existing Crystal Springs Bypass Tunnel; the existing pipeline has been determined to be seismically reliable in this area.
- The northern shaft of the new tunnel will tie into the southern ends of both the Crystal Springs Pipeline (CSPL) No. 2 and the Sunset Supply Pipeline (SSPL). The connecting segment and tie-in to the SSPL will be provided by this project. However, the connecting segment and a blind flange for CSPL No. 2 will be provided by the Crystal Springs Pipeline No. 2 Replacement Project, and this project will tie into the blind flange. This contractual arrangement is used to prevent two (2) shutdowns of the CSPL No. 2.
- New isolation valves and valve vaults.
- Standby power near valve vault G40.
- The existing pipeline will remain in service to provide redundancy for inspection of the tunnel.

10015288 - Adit Leak Repair - Crystal Springs/Calaveras (Completed)

The project consists of:

- Crystal Springs Outlet Tower No. 1: repairing leaks inside the tower, blasting and recoating piping and valves, replacing the roof, structurally retrofitting the access footbridge, and installing a marine hatch at the tower drain.
- Crystal Springs Outlet Tower No. 2: installing a marine hatch at the tower drain.
- Calaveras Outlet Tower: installing a dewatering pump, replacing a deteriorated valve actuator, and providing ladder fall protection.
- San Antonio Outlet Tower: installing a dewatering pump and repairing leaks inside the tower.

10015293 - Pulgas Balancing - Inlet/Outlet Work (Completed)

The project includes new inlet and outlet piping designed to direct the path of the water in such a manner as to promote better mixing. The shutdowns associated with construction of these improvements also provided an opportunity to perform a condition assessment of the reservoir interior that has been used to help identify work associated with the Pulgas Balancing - Structural Rehabilitation & Roof Replacement Project.

10015294 - Pulgas Balancing - Discharge Channel Modifications (Completed)

The discharge channel modifications to be built under this project will accommodate the anticipated maximum flow of 250 mgd. Project components include raising the channel walls, repairing concrete cracks and exposed reinforcing steel, strengthening and interconnecting the channel floor sections, and strengthening the tall tapered wall near the Pulgas Tunnel.

10015295 - Pulgas Balancing - Structural Rehabilitation and Roof Replacement (Completed)

The project includes structural rehabilitation of the reservoir, which consists of seismic retrofit of the walls, installation of a new steel frame roof, and repairs of concrete cracks and exposed reinforcing steel. The general rehabilitation also includes the installation of a new ventilation system and sampling ports, the replacement of utility piping, and the upgrade of the electrical system.

10015297 - Pulgas Balancing - Modifications of the Existing Dechloramination Facility (Completed)

Improvements to the dechloramination and pH control facilities are necessary to address immediate compliance issues. The modifications are anticipated to primarily be made to the flow measurement and control system, and to the various process control and chemical feed systems. Emphasis will be placed on chlorine removal and pH adjustment first to comply with existing regulations, with consideration towards the interdependent secondary goal of maximizing ammonia removal for nutrient control in the reservoirs. The scope of this project will be refined further as design efforts continue to move forward.

10015302 - Cross Connection Controls (Completed)

The project consists of providing improvements at the 304 sites identified to address potential cross connections. The work varies from site to site due to specific site conditions. The major work elements typically include:

- Install air gaps at blow-off locations and at air valves
- Install backflow protection devices
- Reconstruct or raise existing vaults
- Install new vault covers
- Replace existing air valves
- Modify, relocate, or remove existing blow-off facilities

10015303/ 10015304/ 10015305, Harry Tracy Water Treatment Plant Short-Term Improvements (Completed)

The projects consist of:

- 10015303 (HTWTP Short-Term Improvements - Demo Filters): Retrofit of two (2) filters and full-scale performance demonstration testing (project has been completed).
- 10015304 (HTWTP Short-Term Improvements - Remaining Filters): Scope of that project combined with Project 10015304.
- 10015305 (HTWTP Short-Term Improvements – Coagulation & Flocculation/Remaining Filters):
 - o Coagulation improvements that include restoring and improving operation of the pumped-jet flash-mix system, increasing capacity of the flash-mix pumps, providing the pumps with variable speed controls to improve efficiency, providing an automated dilution water system, and reconfiguring the chemical injectors to improve performance.
 - o Flocculation improvements that include reconfiguring the baffling system to reduce headloss by widening the channels, adding new mechanical mixers with variable speed controls to improve performance and efficiency, and seismically retrofitting the walkways and basin walls.
 - o Filtration modifications to eight (8) of the ten (10) existing filters (two (2) were replaced in Project 10015303), replacing effluent control valves and backwash supply valves, providing a filter to waste system, installing new underdrains and media, and seismically retrofitting the basin walls. The project consists of retrofitting two filters and performing full-scale performance demonstration testing of the retrofitted filters. The project was successfully completed in November 2006.

10015306 - HTWTP Long-Term Improvements (Completed)

The project consists of:

- Hydraulic improvements in the various treatment units to reduce headloss and increase capacity.
- Improvements to the disinfection process by upgrading the ozone generation system and backup oxygen supply.
- Expansion of the filtration process capacity by adding five (5) new filters.
- Improvements to the sludge handling system, including the addition of improved thickening and dewatering systems.
- Improvements to the washwater system, including the addition of a second washwater tank, associated equipment and piping.
- Seismic upgrade to all critical process units.
- Electrical upgrade, including a new substation, switchgear, and motor control center. New emergency generators are being provided as part of the Standby Power Facilities - Various Locations Project.
- Interim seismic response improvements, such as automated valves, to minimize seismic hazards until the long-term improvements are complete.
- New 11.0 mg TWR and subsequent abandonment of the existing 6.5 mg and 8.0 mg TWRs.
- New seismically reliable pipelines just east of the existing TWRs.
- Miscellaneous improvements to chemical feed systems, site piping, drainage, and roads.
- Addition of a third 2-megawatt generator set to satisfy emergency power needs of new facilities added as part of the project;

- Replacement of parallel switchgear and motor control center to accommodate addition of third generator set and to provide additional operational flexibility;
- Improvements to plant's recloser to increase reliability of PG&E power to the plant;
- Additional seismic anchorage of existing equipment; and
- Hydraulic modifications to coagulation and flocculation basins.

10015307 - Peninsula Pipelines Seismic Upgrade (Completed)

The scope of this project includes geotechnical investigations to characterize the Serra Fault in the vicinity of the pipelines and to confirm assumptions about sub-surface conditions along the length of the pipelines (SAPL2 and SAPL3 from HTWTP to San Pedro Valve Lot, SSBPL from HTWTP to Capuchino Valve Lot, and Sunset Supply Pipeline (SSPL) from Capuchino Valve Lot to San Pedro Valve Lot). In addition, hydraulic modeling has been performed to review system/facility requirements to meet system goals. The objectives of the investigations were: 1) to determine the potential fault offset at the Serra Fault crossings and the potential response from the three (3) pipelines to these offsets, and 2) to determine potential for pipeline rupture due to displacement from liquefaction, landslides, and other seismically-triggered hazards along the pipeline alignments.

The extensive geotechnical and modeling analyses performed to date have been carefully reviewed to identify specific project recommendations. The refined project scope currently includes the following components: The refined project scope (Phase 1) currently includes the following components at five (5) locations on the San Francisco Peninsula to address Serra Fault Crossing locations and liquefaction hazard potential in the Colma Creek area:

- Colma Site – Replacement of an approximately 700-ft segment of SAPL2
- South San Francisco Site – Replacement of an approximately 720-ft segment of SAPL2
- San Bruno North Site – Stabilization of SAPL2 where it extends through a tunnel
- San Bruno South Site – Replacement of an approximately 1,170-ft segment of SAPL2 and an approximately 1,050-ft segment of SAPL3; and
- Millbrae Site – Replacement of an approximately 900-ft segment of SSBPL A common staging area is planned to be located at SFPUC Baden Valve Lot in South San Francisco on El Camino Real. Phase 2 of the project will include installation of two (2) new isolation valves near the Baden Valve Lot on SAPL No. 2 and No. 3 in the City of South San Francisco.

The WSIP construction contract will include both Phases 1 and 2.

Phase 3 has been identified as a non-WSIP project, and includes condition assessment and improvements to SAPL2, installation of new isolation valves, and the potential addition of flexible connections along the alignment within the City of San Francisco.

10015311 - Capuchino Valve Lot Improvements (Completed)

This project is 100% complete and has been closed out. The project primarily consists of replacing two (2) existing isolation valves; providing new electric actuators for valve operation; performing concrete crack repair to prevent water leakage into the vault; providing new instrumentation and control systems for valve operation and pressure monitoring; and relocating the existing electrical and instrumentation systems outside the vault.

10015313 - Crystal Springs/San Andreas Transmission Upgrade (Completed)

Improvements will be made to the Upper Crystal Springs Dam discharge culverts, the Lower Crystal Springs outlet structures, the Crystal Springs Pump Station (CSPS), the CSSA Pipeline, and the San Andreas outlet structures.

The project primarily consists of:

- The Upper Crystal Springs Dam includes two (2) discharge culverts. During geotechnical investigations, it was confirmed that the lower culvert crosses the 1906 San Andreas Fault. Improvements will be made to the lower culvert to ensure its operation following a San Andreas Event. This will involve lining the culvert to provide operational and seismic protection and providing a second discharge riser on the east side of the San Andreas Fault.

- The Lower Crystal Springs Outlet Structures Nos. 1 and 2 improvements include removal of all equipment from the outlet towers and installation of new submerged adit valves; removal of the free-standing portion of the towers and bridge to address seismic concerns; installation of reliable adit selection system; and installation of fish screens. Additionally, the tunnels and pipe systems leading from the outlet structures to the CSPS will be improved.
- A new CSPS, together with site piping and valving, will be constructed with increased capacity to meet LOS goals and other functionalities, similar to those provided by the existing pump station. Additionally, a new electrical substation; emergency backup electrical generators for emergency demands, yard valves and small auxiliary pump (but not for large pumps); and security-related site improvements will be provided.
- The emergency chlorination system at the existing CSPS will be replaced with a portable chlorination system to provide more reliable response during an emergency.
- The CSSA Pipeline improvements include improvements to the first 800 feet of pipeline (upstream end of pipeline) to provide reliable operation at a higher operating pressure; replacement of the last 1,400 feet of the pipeline (downstream end of pipeline) to address seismic hazards; replacement and refurbishment of all appurtenances and lining to provide a 50-year life and protect against surge and seismic hazards; improvements, installation, and repair to 31 drainages that cross the pipeline alignment; and road improvements to provide access for maintenance and emergency response.
- The San Andreas Reservoir Outlet Structure Nos. 2 and 3 improvements include seismic retrofit to the structures; construction of an approach channel; modifications to the adits; replacement of all equipment in the towers; and installation of emergency isolation valves, reliable adit selection systems, and fish screens.
- The pipe in the tunnel leading from the San Andreas Outlet Structure No. 2 to the raw water pump station at the HTWTP will be replaced with a tunnel liner system.
- The tunnel portal of San Andreas Outlet Structure No. 3 will be retrofitted to protect the pipeline from the Serra Fault crossing.
- The isolation valves at Upper Crystal Springs Dam were removed from the contract per direction from DSOD. The concern was that the installation of these valves would bring the Upper Crystal Springs Dam (Hwy 92) under DSOD's jurisdiction.
- Part of one segment of pipeline from the Crystal Springs Pipeline No. 2 project was added to this contract. This segment runs along the access road to the pump station and was added to avoid conflict between different Contractors.

10015322 - Crystal Springs Pipeline No. 2 Replacement (Completed)

The major project elements consist of:

- Seismic reliability improvements, which include replacing or relocating a total of 1.7 miles of pipe at 12 different locations, sliplining 3.5 miles of pipe, retrofitting pipe bridge pier supports at two (2) creek crossings, providing a new connection at the CSPS, and providing a connecting segment with a blind flange for later connection to the NCSBT. The tie-in to the NCSBT will be performed under the NCSBT Project, eliminating the need for a second shutdown of the CSPL No. 2.
- Installing a new isolation valve near the CSPS area.
- Performing site improvements, including the installing fences and enclosures for exposed facilities, concealing exposed portions of pipe, and painting exposed portions of pipe.
- Upgrading the cathodic protection system along the length of the pipeline.

10015323 - San Andreas Pipeline No. 3 Installation (Completed)

This project is 100% complete and has been closed out. The major project elements include:

- Installation of 4.4 miles of 36-inch-diameter pipe with three (3) bore-and-jack street crossings along 19th Avenue and John Daly Boulevard.
- Installation of five (5) service connections.
- Installation of one (1) altitude valve at Merced Manor Reservoir, six (6) isolation valves, and a flow meter.

- Installation of a new cathodic protection system.
- Installation of three (3) connections to the San Andreas Pipeline No. 2 (SAPL2).

10015339 - Baden and San Pedro Valve Lots Improvements (Completed)

The project includes a general mechanical and seismic upgrade of existing facilities and the addition of a pressure-reducing station. Miscellaneous work will also be performed at the Pulgas Pump Station and the Pulgas Tunnel Air Shaft to facilitate moving flow southward through the system at higher pressures than normal.

The major work elements at the various sites primarily include:

- The Baden Valve Lot improvements include installation of a new pressure-reducing valve to allow water to flow from the HTWTP high-pressure zone to the low-pressure supply zone, installation of five (5) new isolation valves, replacement of three (3) existing valves, seismic retrofit of eight (8) existing vaults, replacement of onsite piping segments, replacement of the existing electrical switchgear and transformer, replacement of three (3) pumps, installation of variable frequency drives, and other miscellaneous improvements
- The San Pedro Valve Lot improvements include seismic retrofit of two (2) valve vaults, modification of the electric valve operators, installation of a new air valve, and miscellaneous site drainage improvements
- The Pulgas Pump Station improvements include replacement of one (1) isolation valve
- The Pulgas Tunnel Air Shaft improvements include site work to stabilize slopes

10015486- WSIP Closeout – Peninsula (Completed)

• **LCSD Stilling Basin Modifications & Dissipation Structure Riprap** – This sub-project is provided in response to concerns that fish may be “trapped” in the Lower Crystal Springs Dam (LCSD) stilling basin during low flow summer periods, and that high flow discharges from the new LCSD dissipation structure and potential high water levels in Pool 2 may cause erosion of the bank adjacent to the dissipation structure. The dissipation structure includes 60-inch diameter pipes with a maximum flow of 600 cubic feet per second (cfs) each and two (2) 8-inch diameter pipes with maximum flow of 7 cfs each. During flow testing of the dissipation structure, released water could be observed flowing over the dissipation structure, potentially eroding the bank adjacent to the structure. It was also observed that during summer periods, due to low flow in the channel downstream of the stilling basin, fish trapped in the basin were dying due to warm water temperatures. The purposes of this sub-project are to hydraulically connect the stilling basin with Pool 2 in order to allow fish to escape the basin in summer, and to add rip-rap behind the dissipation structure to prevent erosion. Specifically, this sub-project consists of:

- o A new deeper channel between the dissipation structure and the Pool 2, which would prevent fish from being trapped in the stilling basin
- o Installation of a new SCADA controls to the existing 8-in discharge pipeline and re-routing one (1) line to the stilling basin
- o Installation of additional rip-rap around the dissipation structure
- o Installation of a new 24-inch HDPE pipeline through an existing abandoned 60- inch pipe directed to the stilling basin
- o Coordination and facilitation of access for a piezometer drilling contractor during periods of concurrent work in the stilling basin
- o Addition of tree, shrub, and grass plantings along the creek bank in accordance with the approved re-vegetation plan

• **LCSD Valve H53 / Pipeline Investigation & Fisheries Release Valve** – As stipulated by the US Army Corps of Engineers 404 permit and the associated biological opinion by NOAA’s National Marine Fisheries Service (NMFS) covering the SFPUC activities at the Crystal Springs Pump Station (CSPS), the SFPUC is to take measures to protect the threatened Central California Coast (CCC) steelhead present in San Mateo Creek at CSPS site. One measure requires the release of fresh water at a rate of

3 to 17 cubic feet per second (cfs) depending on the season in recorded dry and wet years. This sub-project will utilize modification of an existing pipeline to release the required flows to the LCSD stilling basin feeding San Mateo Creek. Specifically, this sub-project consists of:

- o Condition assessment of the existing 60-in diameter pipeline from Valve H-53 to the stilling basin. In addition, valve H-53 will be exposed and visually inspected to determine its condition, requiring excavation and shoring of a pit approximately 20 feet long by 20 feet wide by 20 feet deep.
- o Depending on the verified condition, viable alternatives, including abandonment of the option to use H-53 pipeline, will be evaluated.
- o The approved option will include a SCADA controlled 12-inch valve installed at the discharge end of the pipeline. Depending on the condition of the pipeline, the approved option may also include repairs to the pipeline lining. Options may also include slip-lining the existing line with a smaller diameter pipeline such as 12 to 24-in diameter flexible polypropylene pipe.
- o Use of a temporary pipeline “line stop” and associated shoring upstream of Valve H-53 to allow for potential installation of a permanent blind flange.
- o Replacement of leaking plug valves that discharge from an existing concrete vault to the stilling basin with new knife gate valves.
- o Installation of new flow control valves, isolation valves and appurtenances for Pool 2.
- o Connections to the existing 72-inch pipeline using hot taps.
- o Construction of a new concrete walkway from the access road to the existing stairs at the flow dissipation structure adjacent to the stilling basin.

• **New Crystal Springs Bypass Tunnel Electrical Modifications** – The New Crystal Springs Bypass Tunnel (CUW35601) was commissioned in July 2011 and the project administratively closed in August 2012. Various inspections of the above ground facilities discovered excessive groundwater intrusion and resultant corrosion of equipment and electrical components. Preliminary inspections identified the following in the South Shaft: groundwater seepage into the venturi meter and valve G32 vaults through pipe/conduit wall penetrations, resulting in coating failure and localized corrosion. In the North Shaft, preliminary investigations identified surface runoff is entering electrical boxes. In addition, groundwater was seeping through wall penetrations into G36 and G38 vaults. Due to the high moisture, some electrical switches and two (2) actuators failed and required replacement. This sub-project developed a thorough documentation of the above ground facilities at the north and south shafts and designed and implemented repairs as warranted. Repairs included replacement of damaged equipment and electrical components, water proofing of the affected vaults, and rechanneling of surface runoff as necessary. This subproject is 100% complete and has been closed out.

• **Closeout of DSOD Permit Applications for LCSDI and CSSA Projects** – California Department of Water Resources, Division of Safety of Dams (DSOD) issued Alteration Permits allowing the start of construction of CUW35401, Lower Crystal Springs Dam Improvements (LCSDI) Project (Application No. 10-6) and the construction of 10015313, Crystal Springs / San Andreas Transmission Upgrade (CSSA) Project (Application No.10-10). In June 2015, DSOD issued an approval of the completed work and requested the SFPUC to submit the final documentation of each project. Under this sub-project, the following information and documents will be extracted from the project files and submitted in a format acceptable to DSOD: affidavit of actual costs of construction and design; full size as-built drawings stamped and signed by a California registered Civil Engineer; and final concrete testing summary reports.

• **Coordination with San Mateo County Bridge Construction over LCS** - The implementation of the CUW35401 Lower Crystal Springs Dam Improvement (LCSDI) Project required the demolition of an existing San Mateo County (SMC) Bridge that spanned over the LCSD crest. With the completion of the LCSDI Project, SMC awarded the construction contract for the new bridge and gave notice-to-proceed to the construction contractor in January 2016. To support this, SMC and the SFPUC executed a Memorandum of Understanding outlining the roles and responsibilities and expectations of both organizations. Accordingly, this sub-project will support the coordination between the SFPUC and SMC Bridge Project team. Typical activities may include response to relevant Requests for Information (RFI) such as existing site conditions, existing dam design, coordination with SFPUC Operations and

Watershed groups; field inspection of placement of the bridge piers over the dam and the construction of the SFPUC funded catwalk; and attendance of construction meetings and participating in other activities concerning the water quality in Lower Crystal Springs Reservoir, security measures, and other aspects affecting SFPUC assets.

• **Harry Tracy Water Treatment Plant (HTWTP) Improvements (new sub-project in 2018)** - The Harry Tracy Long-Term Improvements Project (10015306) was completed in 2014. Since 2014, the following needs were identified to address construction issues and improve operations at the plant to fully meet the LOS goals and objectives:

- o Automate the 12-inch gate valve at the High Rate Clarifiers' filter to waste manhole to eliminate the need for Operations to manually operate the valve on a frequent basis
- o Modify Sludge Tank No. 1 piping to eliminate cavitation in the washwater pumps
- o Upgrade the filters of three (3) emergency generators from passive filters to active filters to increase the effectiveness of the exhaust filtration and to reduce the need for Operations to constantly clean the filters
- o Repair leaks in the filter gallery channels where stainless steel angle plates were added to support several concrete walls
- o Automate flushing of the sludge transfer pumps and piping to eliminate the need for Operations to manually flush on a frequent basis
- o Replace and relocate failed variable frequency drives (VFDs) for the wash water and sludge transfer pumps to address an over-heating issue
- o Install double containment for the diesel fuel supply lines for the exterior generator to protect against leaks into the environment
- o Provide training and programming modifications to the Raw Water Pump Station switchgear equipment to enable remote SCADA control
- o Install vibration control monitoring system on the electrical panels at the Raw Water Pump Station to replace the existing obsolete system
- o Evaluate/Assess condition of failed mixers in the equalization basin

• **Crystal Springs/San Andreas Pipeline (CSSA) Erosion Repairs (new sub-project in 2018)** - The heavy winter storms of 2017 exacerbated erosion at two (2) watershed culvert locations, OW-13 and OW-18, along the CSSA Pipeline. Erosion has caused the CSSA Pipeline to be exposed and potentially undermined. The scope of this sub-project is to repair the erosion with systems consistent with the requirements of permitting agencies such as the State Water Resources Control Board.

SAN FRANCISCO REGIONAL REGION

10015241 - Regional Groundwater Storage and Recovery

The original scope of the Regional Groundwater Storage and Recovery (RGWSR) project was planned to be constructed in two (2) phases. The original scope of Phase 1 included construction of 13 new deep groundwater wells, and the original scope of Phase 2 included construction of 2 to 3 additional wells, depending upon well yield. Based on the modelling data inputs and results, it is projected that the 13 new wells constructed in Phase 1 would produce approximately 6.2 mgd of dry year supply over 7.5 years. Operating the RGSR Project during times of drought will provide data and insights into how much water can be reasonably expected to be produced by the project and if additional well stations are needed to reach the desired drought period pumping capacity. In addition to the need for collecting operational data to determine the pumping capacity of the 13 new wells, the Daly City Recycled Water Expansion Project proposes to serve recycled water to existing irrigated properties (gold courses and cemeteries) in the Colma area for irrigation use. Replacing groundwater with recycled water for irrigation use will decrease or eliminate the cemeteries' use of the aquifer, creating more in lieu storage in the aquifer for water supply use. The SFPUC will identify potential benefits to the aquifer resulting from the Daly City Recycled Water Expansion Project during project planning and design, as well as monitor operation of the project. Given the considerations noted above, the SFPUC modified the scope of Phase 2 in 2018 to install up to three (3) test wells (Ludeman North, Ludeman South, and Centennial

Trail), complete the South San Francisco Main well and pipeline, and complete other Phase 1 scope items, including chemical system monitoring, sampling, and storage at various sites. The test wells will allow for determination as to whether the identified sites could be viable production wells, and will provide valuable information related to water quality and potential pumping capacities that can be used for future planning and decision making. The test wells would not be converted to production wells at this time. Proceeding with these changes to Phase 2 will allow all 13 new Phase 1 RGWSR wells to be operated to gain experience and insight into the pumping capacities of each individual well in addition to how the wells work in combination with each other and existing municipal and irrigation wells. Staff will gain valuable experience regarding the relationship of RGWSR drought year pumping to the management of the groundwater basin. Operational experience will allow refinement of the modelled dry year water supply yield of the RGWSR project. The changes to RGWSR Phase 2 also allows for the collection of test well data at up to 3 locations for use in future planning if the operational experience with the 13 wells shows the need for more pumping capacity. This option also allows for the basin effects of the Daly City Recycled Water Expansion Project to be identified and may provide greater flexibility in the future to utilize the basin for water supply.

The approved scope for the RGWSR remains the same as approved in April 2018. However, since 2018 several scope refinements and some additions have been required for successful implementation of the project. Two out of three of the proposed test wells, Ludeman North and Centennial Trail, were installed. The third well, Ludeman South, was not built due to siting and constructability issues. The initial test results from the two test wells indicated that the combined yield of the two wells might be up to 0.6MGD. Based on the relatively low yield from both locations and additional costs required to upsize the Millbrae treatment facility in order to accept and treat these additional flows, it was decided that the test wells would not be converted to production wells at this time. However, these wells will provide valuable information related to water quality and potential pumping capacities that can be used for future planning and decision making.

Below are the Phase 1 modifications and additional work that increased the contract cost for the Phase 1 construction contract:

- Several modifications resulted during the installation of the sodium hydroxide treatment systems (for pH control):
 1. Potential water quality issues were anticipated in blending groundwater with distribution system water at two of the well stations that were planned to connect to Daly City's and Cal Water's systems; these two well stations were subsequently returned to the SFPUC and were connected to the SFPUC's water system. Sodium hydroxide systems needed to be added for these two wells in order to raise the pH to be consistent with SFPUC's water quality.
 2. At five of the well stations, to prevent potential scaling and plugging of the groundwater pipeline after sodium hydroxide addition, modifications to the chemical injection systems were made to improve mixing by moving the injection point closer to the transmission line.
 3. Miscellaneous modifications were implemented including addition of chemical piping double-containment systems; retrofits to the chemical rooms to accommodate the revised sodium hydroxide injection systems; restoration of landscape and hardscape; and installation of new fencing at several well stations.
- During construction, the decision was made to change the ammonia chemical (used to create chloramine for disinfection) from aqueous ammonia to liquid ammonium sulfate, which has been found to be much safer for worker handling. This change required revisions to engineering, operational, and maintenance requirements and documents; revisions to the application for the conditional Division of Drinking Water permit; and modifications to the chemical metering pumps, chemical piping and feed systems, and programming and controls systems.
- Seven (7) remote water quality analyzer stations were installed to replace manual water sample stations in order to collect real time data needed for water quality compliance at key monitoring point locations.
- Poor pump performance at three locations was investigated and found to be due to internal corrosion and/or presence of a foreign object. The modifications to correct performance issues included

investigations and forensic testing, installation of cathodic protection systems, replacement of damaged well column pipes and shafts, and well rehabilitation.

- Modification to the existing access road through Bay Area Rapid Transit's (BART's) right of way into one of the well stations was required to accommodate the turning radius of chemical delivery trucks and Fire Department emergency vehicles. The acquisition of the access permit from BART was significantly delayed while easement negotiations were ongoing. Additionally, Town of Colma required changes to the access design for traffic control requirements.

10015289 - Sunset Reservoir - North Basin (Completed)

This project is 100% complete and has been closed out. The project primarily consists of:

- Seismic rehabilitation, which includes stabilization of the soil dam embankment; a retrofit of the walls and roof using seismic joints, shear walls, diagonal bracing, and struts; and foundation improvements.
- General rehabilitation, which includes repairs of deteriorated concrete, replacement of part of the reservoir lining material, replacement of the inlet piping, installation of security fencing, landscaping upgrades, and other miscellaneous site improvements.

10015314 - University Mound Reservoir - North Basin (Completed)

The project primarily consists of:

- Seismic rehabilitation of the reservoir walls and roof using seismic joints, shear walls, diagonal bracing, and struts and foundation improvements. A geotechnical investigation was conducted that verified that the reservoir embankments are not subject to seismically induced failure.
- General rehabilitation, which includes repairs of deteriorated concrete; replacement of the reservoir lining material; replacement of the inlet/outlet, drain, and overflow piping; replacement of outlet and drain valves; landscaping upgrades and other miscellaneous site improvements.

SUPPORT PROJECTS

10015300 - System Security Upgrades (Completed)

The purpose of this project is to develop and integrate security components at critical water system facilities including those identified in previous vulnerability assessments and to ensure that security functions such as deterrence, detection, assessment, delay, and response will be effective. As part of this project, SFPUC Security has evaluated all WSIP projects. The project includes the identification of all necessary security components including security fencing, intrusion detection, and vehicle barriers for applicable WSIP projects. The project provides for the necessary planning and design of these facilities, while the individual WSIP projects will fund the installation and construction of civil security work such as conduit lay out, fencing, gate installation. This project will however fund the furnishing and installing Access Control and Alarm Monitoring System (ACAMS) and Digital Video Surveillance System (DVSS) equipment, and necessary security systems.

10015334 - Programmatic EIR (Completed)

This project includes the preparation of a Programmatic Environmental Impact Report (PEIR) in compliance with the California Environmental Quality Act (CEQA). The WSIP establishes LOS goals and system performance objectives and includes a number of projects that will improve the Regional Water System in respect to water quality, seismic reliability, delivery reliability, and water supply to meet delivery needs through the year 2030. The PEIR will (1) identify and analyze, at a programmatic level, the potential environmental impacts of proposed system improvements, (2) describe and evaluate feasible alternatives to the proposed program, and (3) propose mitigation measures.

The PEIR was certified by the San Francisco Planning Commission on October 30, 2008. On that same day the SFPUC approved the WSIP Goals and Objectives and adopted the CEQA Findings, including a statement of overriding consideration and the Mitigation Monitoring and Reporting Program (MMRP).

10015335 - Bioregional Habitat Restoration

The Bioregional Habitat Restoration project was created to provide a coordinated and consolidated approach to compensate for habitat impacts that may result from implementation of the WSIP projects in the San Joaquin, Sunol Valley, Bay Division, and Peninsula Regions of the SFPUC Regional Water System. The previously approved scope of the Bioregional Habitat Restoration project included projects to preserve, enhance, restore, or create approximately 2,350 acres of tidal marsh, vernal pools, white alder riparian forest, sycamore alluvial woodland, arroyo willow riparian habitat, oak woodland and savannah, sage scrub habitat, serpentine grasslands, coastal live oak woodland, annual grasslands, and oak riparian forest.

The project description includes development of compensation sites to preserve, enhance, restore, or create approximately 2,350 acres of tidal marsh, vernal pools, sycamore and oak riparian woodland, oak woodland and savannah, and serpentine and annual grasslands. The project includes design, environmental permitting, construction, construction management, maintenance and performance monitoring during a 3-year plant establishment period.

The wide variety of the types of impacts from WSIP projects resulted in the need for development of 18 compensation sites on SFPUC property and contracting with 7 property owners to secure compensation on property outside the Alameda and Peninsula watersheds. There are 7 compensation sites on SFPUC property in the Alameda watershed with an average size of 250 acres, demonstrating a significant commitment to the continued protection of species habitat. Although the average size of the 11 Peninsula compensation sites is 15 acres, the projects have been strategically placed to best benefit the San Francisco garter snake and the fountain thistle. The increase in habitat compensation addresses the addition of mitigation for the fountain thistle and changes in the Calaveras Dam Replacement Project.

10015336 - Vegetation Restoration of WSIP Construction Sites (Completed)

The purpose of this project is to provide maintenance, monitoring and reporting of onsite habitat restoration installed at the various WSIP construction sites after project construction work is completed.

10015337 - Long Term Mitigation Endowment

The scope of work and budget for this Long Term Mitigation Endowment was previously included and reported within the WSIP Regional project 10015335 Bioregional Habitat Restoration; however, the office of the City Controller has established a separate project, specific for this endowment fund in project 10015337 Long Term Mitigation Endowment.

This perpetual endowment fund was requested by the United States Army Corps of Engineers and California Department of Fish and Wildlife to provide a secure source of funds for the perpetual monitoring and maintenance of the Bioregional Habitat Restoration sites constructed in the SFPUC watershed.

10015342 - Watershed and Environmental Improvement Program (Completed)

The Watershed and Environmental Improvement Program (WEIP) includes the comprehensive identification and protection of critical watershed lands and ecosystem restoration needs within the hydrologic boundaries of the Alameda Creek, Peninsula (San Mateo and Pilarcitos Creeks) and Tuolumne River watersheds, and prioritizes the protection and/or restoration of these lands. Projects under this program will protect source water quality, native species and their habitat; and identify critical watershed lands for protection by purchasing fee title and/or perpetual conservation easements. The program also supports projects that enhance public awareness and provide education opportunities related to water quality, water supply, conservation, and environmental stewardship issues. These projects include construction of the proposed Alameda Creek Watershed Center and improved public access (e.g., trail connections) compatible with watershed management plans and policies.

Initially, specific projects were identified, including the Repair or Replacement of Niles Gage and Watershed Road Management Plan and Improvements – both in the Alameda Creek watershed. After

further research and planning, the program's focus has shifted towards permanently protecting Alameda Creek watershed lands through conservation easements and/or fee title purchase of property from willing landowners and providing education opportunities that will further the goals of the Water Enterprise Environmental Stewardship Policy. Opportunities that are consistent with the WEIP description and purpose in the Peninsula and Tuolumne watersheds will be considered as well.

APPENDIX C. LIST OF ACRONYMS


BDPL	Bay Division Pipeline
BHR	Bioregional Habitat Restoration
BLS	Bureau of Labor Statistics
CDRP	Calaveras Dam Replacement Project
CEQA	California Environmental Quality Act
CIP	Capital Improvement Program
CM	Construction Management
CO	Change Order
COVID-19	Coronavirus Disease of 2019
DB	Design, Build
EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
FC	Final Completion
FTE	Full-Time Equivalent
FY	Fiscal Year
HH	Hetch Hetchy
HTWTP	Harry Tracy Water Treatment Plant
JOC	Job Order Contract
LOS	Levels of Service
N/A	Not Applicable
NTP	Notice to Proceed
PCCP	Pre-stressed Concrete Cylinder Pipe
PG&E	Pacific Gas and Electric Company
ROW	Right-of-Way
SAPL	San Antonio Pipeline
SCADA	Supervisory Control and Data Acquisition
SFPUC	San Francisco Public Utilities Commission
SJPL	San Joaquin Pipeline
SQS	Supplier Quality Surveillance
SVWTP	Sunol Valley Water Treatment Plant
TWR	Treated Water Reservoir
UM	University Mound
UV	Ultra Violet
WSIP	Water System Improvement Program

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DATE: February 23, 2023

TO: Commissioner Newsha Ajami, President
 Commissioner Sophie Maxwell, Vice President
 Commissioner Tim Paulson
 Commissioner Anthony Rivera
 Commissioner Kate Stacy

FROM: Dennis J. Herrera, General Manager 

SUBJECT: Water System Improvement Program
 Quarterly Report (2nd Quarter / FY 2022-2023)

Enclosed please find the Water System Improvement Program (WSIP) Quarterly Report for the 2nd Quarter (Q2) of Fiscal Year (FY) 2022-2023. The primary intent of the report is to provide the Commission, stakeholders, and the public with a status summary of the Water System Improvement Program based on data for the period of October 1, 2022 to December 31, 2022. This quarterly report provides a summary update on the Regional WSIP projects. The Local WSIP was completed in June 2020.

- London N. Breed**
Mayor
- Newsha K. Ajami**
President
- Sophie Maxwell**
Vice President
- Tim Paulson**
Commissioner
- Anthony Rivera**
Commissioner
- Kate H. Stacy**
Commissioner
- Dennis J. Herrera**
General Manager



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HETCH HETCHY
WATER SYSTEM IMPROVEMENT PROGRAM



QUARTERLY REPORT

Regional Projects
Q2 FY 2022 | 2023
October 2022 — December 2022

Rebuilding Today for a Better Tomorrow

Published: February 23 , 2023

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EXECUTIVE SUMMARY

This quarterly report provides a summary update on the regional projects in the Water System Improvement Program (WSIP) for the 2nd Quarter (Q2) of Fiscal Year (FY) 2022-2023. The primary intent of the report is to provide the San Francisco Public Utilities Commission (“Commission”), stakeholders, and the public with a status summary of the program’s regional projects for the period of October 1, 2022 through December 31, 2022.

This quarterly report incorporates program and project changes from the March 2022 Proposed Revised WSIP that was approved by the Commission on April 26, 2022 by Resolution No. 22-0080.

Program Current Status:

Figure A and Table A show the number of WSIP Regional projects and the total approved value of these projects that are active in various project phases.

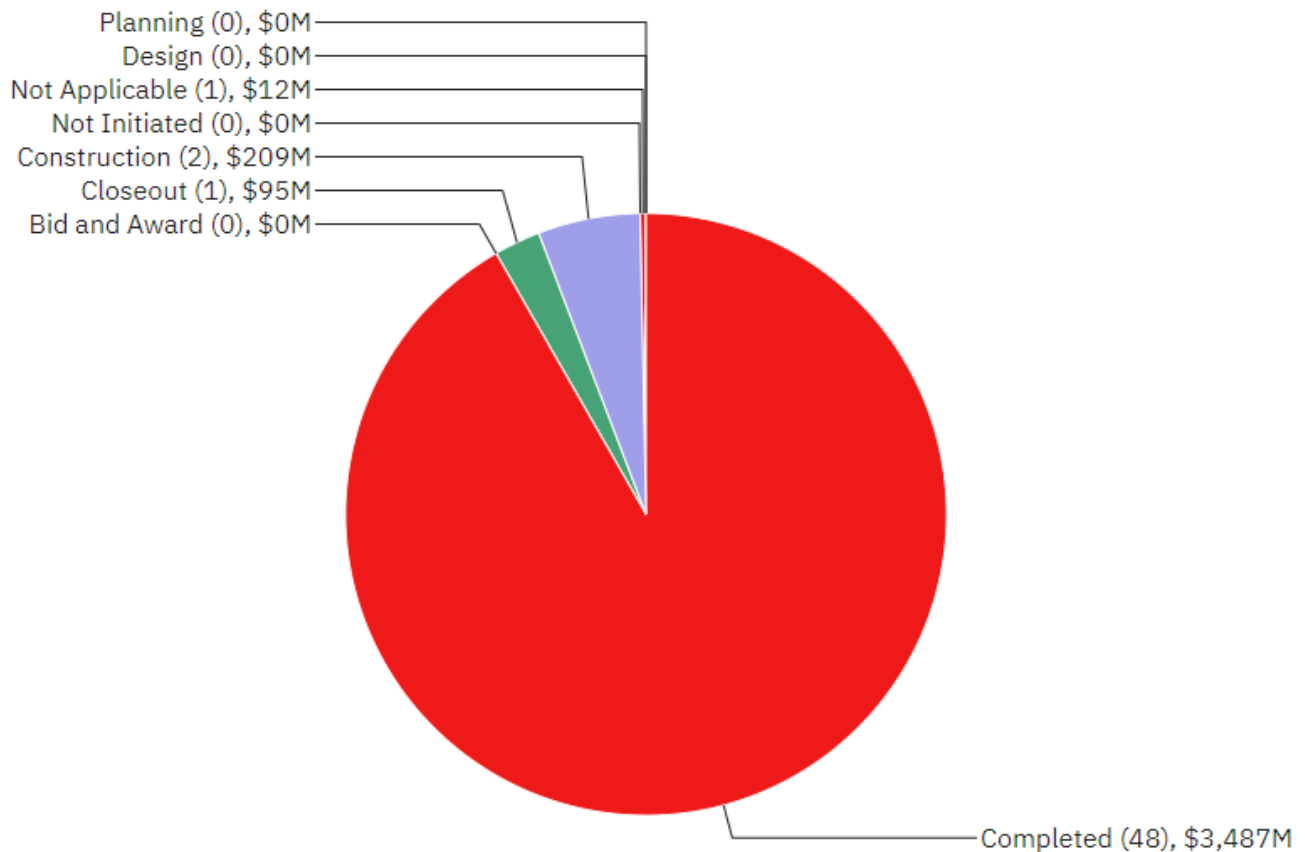


Figure A. Total Current Approved Budget for Regional Projects Active in Each Phase

Table A. Status of WSIP Regional Projects (as of December 31, 2022)

Project Phase	No. of Projects	Percent by No. of Projects	Total Project Value (\$M)	Percent by Project Value
Planning	0	0%	\$0	0%
Design	0	0%	\$0	0%
Bid & Award	0	0%	\$0	0%
Construction	2	4%	\$209	5%
Close-Out	1	2%	\$95	3%
Completed	48	92%	\$3,487	92%
Not Applicable ¹	1	2%	\$12	0%
Total	52	100%	\$3,803	100%

Notes: (1) “Not Applicable” category is for the two projects that do not include construction: Long-Term Mitigation Endowment and Watershed and Environmental Improvement Program.

As of the end of the reporting period, two (2) regional projects with a total value of \$209M are in construction and forty-nine (49) projects with a total value of \$3,582M are in close-out or have been completed. Forty-one (41) out of forty-three (43) Regional WSIP projects with specific Level of Service (LOS) goals have achieved their LOS goals to date.

Tables B and C provide an overall program-level cost and schedule summary of the WSIP Regional Program. The total Current Approved WSIP Budget (including Regional and Local Programs, Local Water Supply Projects, and Financing Costs) and the Current Forecasted Cost at completion are each \$4,787.8 million. The Current Approved WSIP Budget and Forecasted Cost at completion for only the Regional Program (including construction contingency) are each \$3,803.1 million.

Table B. Program Cost Summary

Cost Categories	Expenditures To Date (\$ Million) (A)	2005 Baseline Budget (\$ Million) (B)	2022 Approved Budget (\$ Million) (C)	Current Approved Budget ⁽⁷⁾ (\$ Million) (D)	Q2/FY22-23 Forecasted Costs (\$ Million) (E)	Cost Variance (\$ Million) (F = D - E)
REGIONAL PROGRAM	\$3,717.2	\$3,407.3	\$3,803.1	\$3,803.1	\$3,803.1	-
Local Improvement Projects	\$331.9	\$383.2	\$331.9	\$331.9	\$331.9	-
Local Water Supply Projects	\$222.9	-	\$280.9	\$280.9	\$280.9	-
Finance	\$372.0	\$552.0	\$372.0	\$372.0	\$372.0	-
PROGRAM TOTAL	\$4,643.9	\$4,342.5	\$4,787.8	\$4,787.8	\$4,787.8	-

The Current Approved and Forecasted Schedule completion for the Regional WSIP (Local WSIP was completed in June 2020) are both February 2027.

Table C. 2022 Approved vs. Q2/FY22-23 Forecasted Schedule Dates

Category	2005 Baseline Start	2022 Approved Start	Current* Approved Start	Actual*** Start	2005 Baseline Finish	2022 Approved Finish	Current* Approved Finish	Q2/FY22-23 Forecasted Finish	Schedule Variance (Months)
Regional Program	03/01/03	03/31/03	03/31/03	03/01/03 A	06/30/14	05/05/23	02/01/27	02/01/27	-
Local** Program	03/01/03	03/31/03	03/31/03	03/01/03 A	06/28/13	7/31/18	06/03/20	06/03/20 A	Completed (-)
Overall WSIP	03/01/03	03/01/03	03/01/03	03/01/03 A	06/30/14	05/05/23	02/01/27	02/01/27	-

* The budget and schedule approved as part of the March 2022 WSIP, plus any additional budget and schedule changes approved by the Commission as part of additional contingencies on construction contracts.

** Excluding Local Water Supply projects.

*** "A" represents the actual date.

As of the end of the reporting period, the forecasted total program cost (regional and local projects) is \$4,787.8M, which is the same as the current Commission Approved Budget. As of the end of the reporting period, \$2.66M was transferred to the Construction Contingency from the program’s Director’s Reserve budget. All approved change orders (COs) in contracts total \$22.90M, and the current remaining construction contingency is \$12.94M. Also, as of the end of the reporting period, all pending and potential COs, and trends total \$6.61M. Therefore, assuming all pending and proposed COs and trends become approved COs, the current forecasted remaining construction contingency is \$6.33M.

UPDATE ON PROJECTS IN CONSTRUCTION

As of the end of December 2022, WSIP regional construction contracts (including active, completed, and future contracts) are 99.0% complete overall, the same rounded percentage complete as last quarter.

As of the end of December 2022, monitored exposure hours on WSIP regional projects totaled 9.9 million construction person-hours. Since the implementation of the WSIP Safety Approach in April 2009, the total lost time incidence rate is 0.51, compared to the U.S. Bureau of Labor Statistics (BLS) industry average rate (2018) of 1.5.

The following is a summary of the progress made, issues encountered, and/or milestones achieved on the remaining WSIP Regional projects currently active in construction.

Regional Groundwater Storage and Recovery

The Phase 1 construction contract (Contract B) is being closed out and the agenda item for closeout will be presented to the Commission next quarter. For Phase 2A (Contract C), the groundwater pump at Park Plaza Well Station has been pulled for inspection, rehabilitation, and installation of cathodic protection system, and video inspections of the well shafts were completed at seven wells. There is a delay of one year for procurement of the variable frequency drives for the pumps. For Phase 2B (Contract D), coordination with Cal Water continued regarding the requirements for the use of their

property as construction staging area, and technical design continued regarding point of connection, SCADA, security, communications and controls systems.

Alameda Creek Recapture Project

Construction of the Alameda Creek Recapture Facility is 24% complete as of the end of this quarter. During the reporting period, price quotes were received from the contractor for changes to the pipeline alignment due to pond bank erosion and changes to the pipeline tie-in point due to corrosion on the existing pipeline; costs are being evaluated for further negotiation of the changes. The contractor continued to report notices of material shortages, longer lead-time estimates, and cost increases related to COVID-19. The quarry operator completed field borings for the erosion repair investigation.

WSIP Closeout Project- Sunol Region

The final subproject, Alameda Creek Diversion Dam Power and Communication Facilities, was completed with finalization of the last job order contract, JOC 70-15, within the quarter, and the entire project is now closed.

Quarterly Report - Q2 FY 2022/2023

Water System Improvement Program - Regional Projects

TABLE OF CONTENTS

- 1. Program Description**
- 2. Program Status**
- 3. Program Cost Summary**
- 4. Program Schedule Summary**
- 5. Project Performance Summary**
- 6. Project Status Report**
- 7. On-Going Construction**
- 8. Projects in Closeout**
- 9. Completed Projects**

APPENDICES

- A. Project Descriptions**
- B. WSIP Approved Project-Level Schedule**
- C. List of Acronyms**

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1. PROGRAM DESCRIPTION

The Water System Improvement Program (WSIP) is a \$4.8 billion, multi-year capital program to upgrade the City of San Francisco's regional and local drinking water systems. The program will deliver improvements that enhance the City's ability to provide reliable, affordable, high quality drinking water to its 26 wholesale customers and regional retail customers in Alameda, Santa Clara, and San Mateo Counties, and to 800,000 retail customers in San Francisco, in an environmentally sustainable manner. The WSIP is structured to cost-effectively meet water quality requirements, improve seismic and delivery reliability, and achieve water supply goals.

Built in the early to mid-1900s, the water system has many components nearing the end of their working life, with crucial facilities crossing or in close proximity to, three major earthquake faults. The San Francisco Public Utilities Commission (SFPUC) initiated the WSIP to repair, replace, and seismically upgrade the system's deteriorating pipelines, tunnels, dams, reservoirs, pump stations, storage tanks, and treatment facilities.

The program consists of 35 local projects located within San Francisco and 52 regional projects spread over seven different counties from the Sierra foothills to San Francisco. Local projects only benefit San Francisco residents whereas regional projects benefit both City residents and the 26 wholesale agencies that receive water from the SFPUC. The management of regional projects is divided into 6 regions – San Joaquin, Sunol Valley, Bay Division, Peninsula, San Francisco Regional, and Support Projects.

The WSIP is funded through the issuance of revenue bonds. Local Measures A and E, which were approved by San Francisco voters in November 2002, allowed for the financing of improvements to the City's water system using revenue bonds and/or other forms of revenue financing. Increases in the water rates of retail and wholesale customers are used to pay back the debt service on the bonds.

The program budget and schedule were originally adopted by the San Francisco Public Utilities Commission on March 1, 2003. The program at the time was referred to as the Capital Improvement Program (CIP). The scope of the CIP was changed significantly following the adoption of Level of Service (LOS) goals in early 2005. The program changes were so substantial that the program was renamed the WSIP and a new program budget and schedule were adopted on November 29, 2005. Since the scope of the 2005 Revised WSIP is in general representative of the program that is in the end stage of being implemented today, the 2005 budget and schedule are considered the "Baseline Budget and Schedule."

Subsequently, the WSIP Baseline Budget and Schedule were revised in 2007, 2009, 2011, 2013, 2014, 2015, 2016, 2017, 2018, 2020, and 2022, and these revisions were approved by the San Francisco Public Utilities Commission on February 26, 2008, July 28, 2009, July 12, 2011, April 23, 2013, April 22, 2014, December 8, 2015, April 26, 2016, February 14, 2017, April 10, 2018, April 14, 2020, and April 26, 2022, respectively. Refer to Appendix A for a scope description of all the regional projects included in the WSIP.

Program Revision	Commission Approval	Budget (\$Million)	Schedule ^(*)
2003 (Original)	March 1, 2003	\$3,628	03/15/16
2005 (Baseline)	November 29, 2005	\$4,343	06/30/14
2007 (Revised)	February 26, 2008	\$4,392	12/18/14
2009 (Revised)	July 28, 2009	\$4,586	12/04/15
2011 (Revised)	July 12, 2011	\$4,586	07/29/16
2013 (Revised)	April 23, 2013	\$4,640	04/11/19
2014 (Revised)	April 22, 2014	\$4,765	05/24/19
2015 (Revised)	December 8, 2015	\$4,765	05/24/19
2016 (Revised)	April 26, 2016	\$4,845	12/20/19
2017 (Revised)	February 14, 2017	\$4,845	12/20/19
2018 (Revised)	April 10, 2018	\$4,788	12/30/21
2020 (Revised)	April 14, 2020	\$4,788	05/05/23
2022 (Revised)	April 26, 2022	\$4,788	02/01/27

* Final Program Completion Date

2. PROGRAM STATUS

This second (2nd) Quarterly Report for Fiscal Year (FY) 2022-2023 presents the progress made on the WSIP Regional Program between October 1, 2022 and December 31, 2022. The program’s schedule and budget were last approved by the San Francisco Public Utilities Commission (SFPUC or Commission) on April 26, 2022. The WSIP Local Program was completed on June 3, 2020.

Figure 2.1 shows the total Current Approved Budget for the regional projects remaining in each phase of the program as of December 31, 2022. The number of projects currently active in each phase is shown in parentheses.

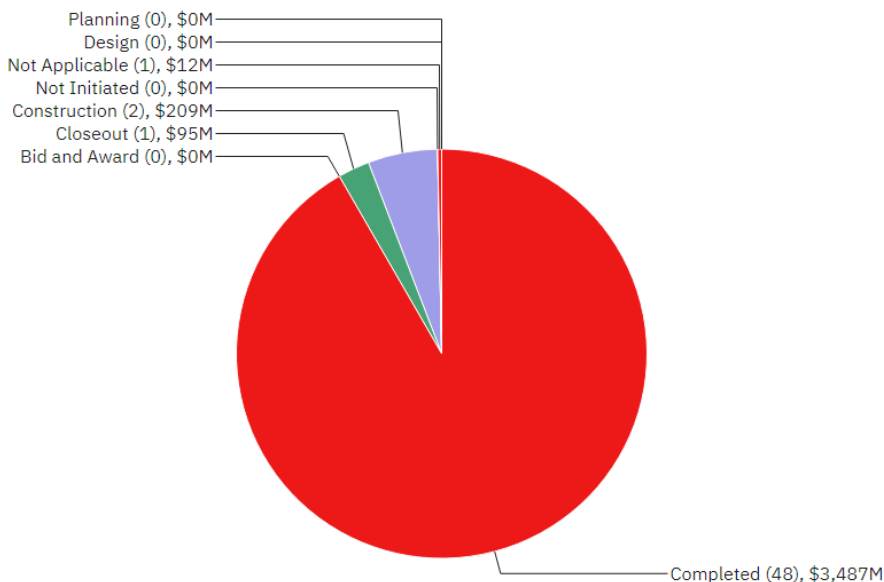


Figure 2.1 Total Current Approved Budget for Projects Active in Each Phase (\$Million)

Figure 2.2 shows the number of regional projects in the following stages of the program as of December 31, 2022: Pre-construction, Construction, and Post-construction.

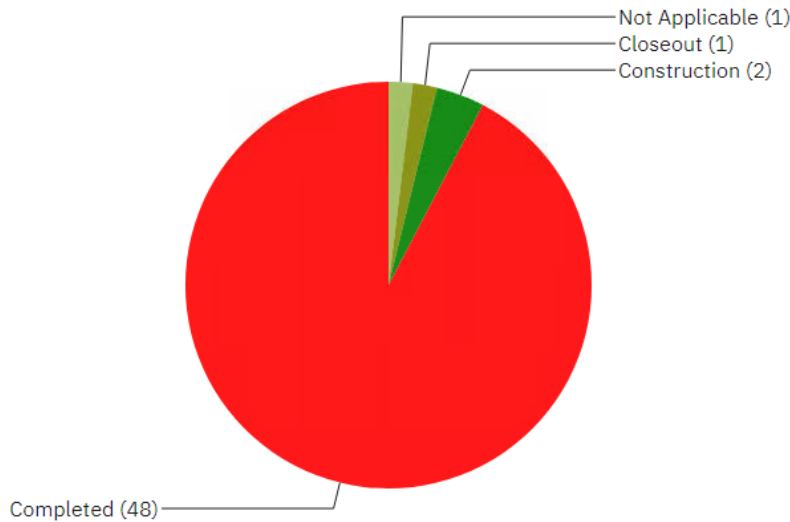


Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-construction

Figure 2.3 summarizes the environmental review and permitting status of the WSIP’s 52 regional projects as of December 31, 2022.

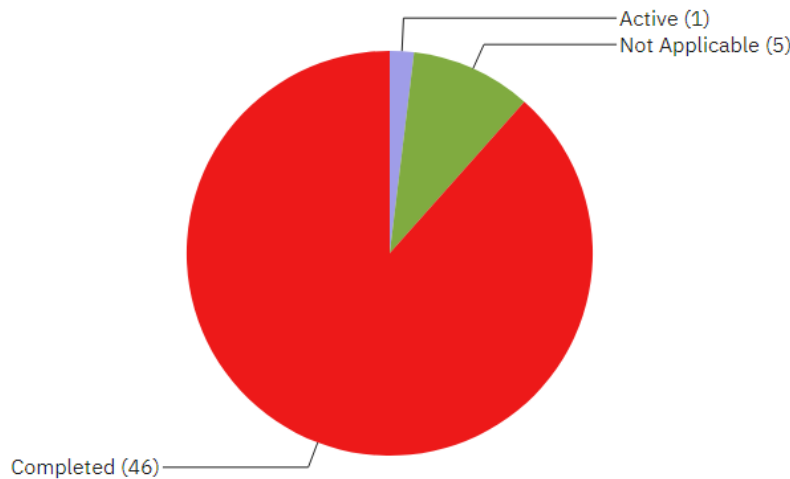


Figure 2.3 Program Environmental and Permitting Status

2.1 Progress Towards Meeting Level of Service (LOS) Goals

The scope of the WSIP is based on the following Level of Service (LOS) goals for the Regional Water System: Seismic Reliability, Delivery Reliability, Water Quality Reliability, and Water Supply Reliability. Each project that reaches construction substantial completion contributes to increasing the overall reliability of the system and achieving progress towards meeting the overall LOS goals for the system.

Table 2.1 lists the projects with their individual Primary (P) and Secondary (S) contributions towards LOS goals, and indicates which projects have met their respective LOS goals. As can be seen in Table 2.1, the actual operational service start dates indicate that 41 of the 43 Regional WSIP projects with specific LOS goals have achieved their LOS goals to date. The other 9 Regional WSIP projects do not

have specific LOS goals. The WSIP team remains committed to achieving the overall LOS goals established for the system.

Table 2.1 Progress Towards Meeting LOS Goals ⁽¹⁾

Project No.	Project Name / Construction Contract	Actual / Approved Substantial Completion Date	LOS Goals (P =Primary, S =Secondary)				Actual Operational Service Start	Construction Progress Toward LOS Goals
			Water Quality	Seismic Reliability	Delivery Reliability	Water Supply		
San Joaquin Projects								
CUW36401	Lawrence Livermore Water Quality Improvement <i>(Completed)</i>	08/31/10	P				08/31/10	100%
CUW37301	San Joaquin Pipeline System <i>(Completed)</i> (A) HH935A Crossovers (B) HH935B Western Segment (C) HH935C Eastern Segment	(A) 01/06/12 (B) 05/27/13 (C) 06/21/13			P		(A) 01/06/12 (B) 05/27/13 (C) 06/21/13	100%
CUW37302	Rehabilitation of Existing San Joaquin Pipelines (Roselle Crossover; <i>Completed</i>)	05/13/11			P		05/13/11	100%
CUW38401	Tesla Treatment Facility <i>(Completed)</i> (A) DB116 Tesla Treatment Facility Design-Build Contract (B) HH953 Tesla Portal Protection	(A) 06/24/11 (B) 08/05/13	P	S	S		(A) 06/24/11 (B) 08/05/13	100%
Sunol Valley Projects								
CUW35201	Alameda Creek Recapture	11/18/22				P		24%
CUW35501	Standby Power Facilities - Various Locations <i>(Completed)</i> (A) WD-2553 East Bay - Standby Power Facilities (B) WD-2511 Peninsula - Standby Power Facilities	(A) 09/11/08 (B) 04/15/10		P	S		(A) 09/11/08 (B) 04/15/10	100%
CUW35901	New Irvington Tunnel <i>(Completed)</i>	09/19/15		S	P		02/27/15	100%
CUW35902	Alameda Siphon #4 <i>(Completed)</i>	12/16/11		P	S		12/16/11	100%
CUW37001	Pipeline Repair & Readiness Improvements <i>(Completed)</i> (A) WD-2530 Phase A 8 Pipe Storage Sites (B) WD-2530 Phase B Pipe Rolling Machine Facility @ Sunol Yard	(A) 02/09/07 (B) 07/14/08		P	S		(A) 02/09/07 (B) 07/14/08	100%
CUW37401	Calaveras Dam Replacement <i>(Completed)</i> (A) WD-2551 Calaveras Dam Replacement (B) WD-2729 Alameda Creek Diversion Dam	(A) 04/12/19 (B) 02/15/19		S	P	S	(A) 04/12/19 (B) 02/15/19	(A) 100% (B) 100%
CUW37402	Calaveras Reservoir Upgrades <i>(Completed)</i>	10/06/05	P				10/06/05	100%
CUW37403	San Antonio Backup Pipeline <i>(Completed)</i>	12/31/14			P		12/31/14	100%
CUW38101	SVWTP Expansion & Treated Water Reservoir <i>(Completed)</i>	05/17/13	P		P		05/17/13	100%
CUW38601	San Antonio Pump Station Upgrade <i>(Completed)</i>	06/30/11			P		06/30/11	100%
Bay Division Projects								
CUW35301	BDPL Nos. 3 & 4 Crossover/Isolation Valves <i>(Completed)</i>	11/15/07		P			11/15/07	100%
CUW35302	Seismic Upgrade of BDPL Nos. 3 & 4 <i>(Completed)</i>	10/26/15		P			06/20/14	100%
CUW36301	SCADA System - Phase II <i>(Completed)</i>	11/29/10			P		11/29/10	100%
CUW36801	BDPL Reliability Upgrade – Tunnel <i>(Completed)</i>	05/20/15		P	S		10/15/14	100%
CUW36802	BDPL Reliability Upgrade – Pipeline <i>(Completed)</i> (A) WD-2541 East Bay (B) WD-2542 Peninsula (C) WD-2665 Cordilleras	(A) 12/09/11 (B) 06/13/12 (C) 03/05/13		P	S		(A) 12/09/11 (B) 06/13/12 (C) 03/05/13	100%

Project No.	Project Name / Construction Contract	Actual / Approved Substantial Completion Date	LOS Goals (P =Primary, S =Secondary)				Actual Operational Service Start	Construction Progress Toward LOS Goals
			Water Quality	Seismic Reliability	Delivery Reliability	Water Supply		
CUW36803	BDPL Reliability Upgrade - Relocation of BDPL Nos. 1 & 2 <i>(Completed)</i>	05/28/10			P		05/28/10	100%
CUW38001	BDPL Nos. 3 & 4 - Crossovers <i>(Completed)</i>	08/15/12		P	S		08/15/12	100%
CUW38901	SFPUC/EBMUD Intertie <i>(Completed)</i>	09/07/07			P		09/07/07	100%
CUW39301	BDPL No. 4 Condition Assessment PCCP Sections <i>(Completed)</i>	02/06/09		P	S		02/06/09	100%
Peninsula Projects								
CUW35401	Lower Crystal Springs Dam Improvements <i>(Completed)</i>	11/20/11			P	S	11/20/11	100%
CUW35601	New Crystal Springs Bypass Tunnel <i>(Completed)</i>	07/14/11		P	S		07/14/11	100%
CUW35701	Adit Leak Repair - Crystal Springs/Calaveras <i>(Completed)</i>	11/30/07			P		11/30/07	100%
CUW36101	Pulgas Balancing - Inlet/Outlet Work <i>(Completed)</i>	02/02/06	P		S		02/02/06	100%
CUW36102	Pulgas Balancing - Discharge Channel Modifications <i>(Completed)</i>	10/23/09			P		10/23/09	100%
CUW36103	Pulgas Balancing - Structural Rehabilitation & Roof Replacement <i>(Completed)</i>	07/26/11	P		S		07/26/11	100%
CUW36105	Pulgas Balancing - Modifications of the Existing Dechloramination Facility <i>(Completed)</i>	08/27/12	P		S		08/27/12	100%
CUW36501	Cross Connection Controls <i>(Completed)</i>	11/26/08	P				11/26/08	100%
CUW36601	HTWTP Short-Term Improvements - Demo Filters <i>(Completed)</i>	01/11/06		P	S		01/11/06	100%
CUW36603	HTWTP Short-Term Improvements - Coagulation & Flocculation/Remaining Filters <i>(Completed)</i>	12/21/09		P	S		12/21/09	100%
CUW36701	HTWTP Long -Term Improvements <i>(Completed)</i>	09/08/15		P	S		09/08/15	100%
CUW36702	Peninsula Pipelines Seismic Upgrade <i>(Completed)</i>	10/30/15		P			10/30/15	100%
CUW36901	Capuchino Valve Lot Improvements <i>(Completed)</i>	02/14/08			P		02/14/08	100%
CUW37101	Crystal Springs/San Andreas Transmission Upgrade <i>(Completed)</i>	06/30/14		P	S		09/02/14	100%
CUW37801	Crystal Springs Pipeline No. 2 Replacement <i>(Completed)</i>	01/31/13		P	S		01/31/13	100%
CUW37901	San Andreas Pipeline No. 3 Installation <i>(Completed)</i>	03/29/11		P	S		03/29/11	100%
CUW39101	Baden & San Pedro Valve Lots Improvements <i>(Completed)</i>	03/31/11		P	S		03/31/11	100%
San Francisco Regional Projects								
CUW30103	Regional Groundwater Storage and Recovery (A) WD-2600 Test Well Drilling (B) WD-2668 Regional Groundwater Storage and Recovery (Phase 1) (C) Regional Groundwater Storage and Recovery (Phase 2A) (D) Regional Groundwater Storage and Recovery (Phase 2B)	(A) 07/23/12 (B) 12/31/17 (C) 08/31/23 (D) 10/31/25				P	(A) 07/23/12 (B) 07/27/22	(A) 100% (B) 100% (C) 14% (D) 0%
CUW35801	Sunset Reservoir - North Basin <i>(Completed)</i>	09/19/08		P	S		09/19/08	100%
CUW37201	University Mound Reservoir - North Basin <i>(Completed)</i>	05/25/11		P	S		05/25/11	100%

Notes:

1 Support projects and WSIP Closeout projects are not listed in the table above since these projects do not have specific Level of Service (LOS) goals.

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall program-level cost summary of the WSIP Regional Program. It shows the Expenditures to Date; the 2005 Baseline, 2022 Approved, Current Approved and Q2/FY22-23 Forecasted Budgets; and the Cost Variance between the Current Approved and Forecasted Budgets.

The total Current Approved WSIP Budget (including Regional and Local Programs, Local Water Supply Projects, and Financing Costs) and the Current Forecasted Cost at completion are each \$4,787.8 million. The Current Approved WSIP Budget and Forecasted Cost at Completion for only the Regional Program (including construction contingency) are each \$3,803.1 million. The Current Approved Budget and final expenditures for the Local Improvement Projects are each \$331.9 million.

Table 3.1 Program Cost Summary

Cost Categories	Expenditures To Date (\$ Million) (A)	2005 Baseline Budget (\$ Million) (B)	2022 Approved Budget (\$ Million) (C)	Current Approved Budget ⁽⁷⁾ (\$ Million) (D)	Q2/FY22-23 Forecasted Costs (\$ Million) (E)	Cost Variance (\$ Million) (F = D - E)
Regional Improvement Projects	\$3,459.6	\$3,181.3	\$3,513.9	\$3,513.9	\$3,507.8	\$6.2
Construction Costs ⁽¹⁾	\$2,457.6	\$2,322.3	\$2,495.1	\$2,495.1	\$2,491.5	\$3.6
Program Delivery Costs ⁽²⁾	\$972.6	\$758.0	\$984.3	\$984.3	\$983.7	\$0.6
Other Costs ⁽³⁾	\$29.4	\$101.0	\$34.5	\$34.5	\$32.5	\$2.0
Support Projects ⁽⁴⁾	\$238.4	\$32.8	\$262.0	\$262.0	\$259.5	\$2.5
Construction Contingency for Regional & Support Projects ⁽⁵⁾	\$19.1	\$193.2	\$27.2	\$27.2	\$35.8	(\$8.6)
REGIONAL PROGRAM WITH CONTINGENCY	\$3,717.2	\$3,407.3	\$3,803.1	\$3,803.1	\$3,803.1	-
Local Improvement Projects	\$331.9	\$383.2	\$331.9	\$331.9	\$331.9	-
Local Water Supply Projects ⁽⁶⁾⁽⁸⁾	\$222.9	-	\$280.9	\$280.9	\$280.9	-
Finance ^(9,10,11)	\$372.0	\$552.0	\$372.0	\$372.0	\$372.0	-
PROGRAM TOTAL	\$4,643.9	\$4,342.5	\$4,787.8	\$4,787.8	\$4,787.8	-

Notes:

- Construction Costs** include the Construction Base Bid and owner-provided equipment/material for all regional and support projects. Those costs do not include any construction contingency. That contingency is reflected as a separate cost category.
- Delivery Costs** include project management, planning, environmental (CEQA, permitting, construction compliance), design, construction management, and engineering support during construction.
- Other Costs** include environmental mitigation, art enrichment, security improvements, and real estate expenses.
- Support Projects** include (1) System Security Upgrades, (2) Programmatic EIR, (3) Bioregional Habitat Restoration, (4) Vegetation Restoration of WSIP Construction Sites, (5) Long Term Mitigation Endowment, (6) Program Management, and (7) Watershed and Environmental Improvement Program. Please note that the cost reflected above for support projects only includes "Delivery" and "Other" costs, and "Construction" cost for these projects is included in "Construction Costs" under the Regional Improvement Projects.
- Expenditures to Date for Construction Contingency for Regional and Support projects correspond to the Total Approved Change Orders on those projects. For projects with ongoing or completed construction, the 2022 Approved Budget for construction contingency includes all change orders and trends as identified at the time of the March 2022 Revised WSIP, or projects in pre-construction, the 2022 Approved Budget for construction contingency includes 10% of the estimated construction base bid
- Local Water Supply Projects managed as part of the Water Enterprise Capital Improvement Program (CIP) are (1) Lake Merced Water Level Restoration, (2) San Francisco Groundwater Supply, (3) San Francisco Westside Recycled Water, (4) Harding Park Recycled Water, and (5) San Francisco Eastside Recycled Water.
- The budget approved as part of the March 2022 Revised WSIP, plus any additional budget changes approved by the Commission as part of additional contingencies on construction contracts.
- The WSIP Local Water Supply projects underwent a September 2013 re-baseline. Only the original WSIP portion of the re-baselined costs is reported here. The remaining budget is funded under the Water Enterprise CIP and is managed outside the purview of the WSIP.
- The original \$522M estimate of financing cost was based on a memorandum to the Commission dated November 23, 2005.

10. The financing cost budget of \$372M that was included in the March 2022 Revised WSIP includes all financing costs appropriated to date.
11. The actual financing cost is assumed to match the budgeted financing cost. Final reconciliation of all associated financing costs will occur upon WSIP completion.

Table 3.2 provides the current remaining construction contingency. For each region, it shows the Forecasted Construction Contingency as of Q1/FY22-23; the Total Approved Change Orders prior to the reporting quarter; Change Orders Approved during the reporting quarter; Total Approved Change Orders through the reporting quarter; Project Savings Moved to Contingency/ Funds Moved out of Contingency during the Reporting Quarter; the Q2/FY22-23 Forecasted Construction Contingency; and the Forecasted Remaining Contingency as of the end of the reporting quarter. As of December 31, 2022, the Forecasted Construction Contingency is \$35.8 million, and the Forecasted Remaining Contingency is \$12.9 million.

The total costs of Change Orders approved in Q2/FY22-23 are shown in Table 3.2.

Table 3.2 Current Remaining Construction Contingency

Region	Q1/FY22-23 Forecasted Construction Contingency ⁽¹⁾ (\$ Million) (A)	Total Approved Change Orders as of Q1/FY22-23 ^(2,3) (\$ Million) (B)	Change Orders Approved in Q2/FY22-23 ⁽²⁾ (\$ Million) (C)	Total Approved Change Orders as of Q2/FY22-23 (\$ Million) (D = B+C)	Project Savings or Director's Reserves (+) Moved to Contingency/ Funds (-) Moved out of Contingency during Q2/FY22-23 ⁽⁴⁾ (\$ Million) (E)	Q2/FY22-23 Forecasted Construction Contingency (\$ Million) (F = A + E)	Q2/FY22-23 Forecasted Remaining Contingency (\$ Million) (G = F - D)
San Joaquin Region	-	-	-	-	-	-	-
Sunol Valley Region	\$7.95	\$0.60	\$1.44	\$2.04	\$2.66	\$10.61	\$8.57
Bay Division Region	-	-	-	-	-	-	-
Peninsula Region	-	-	-	-	-	-	-
San Francisco Regional Region	\$25.23	\$20.60	\$0.26	\$20.86	-	\$25.23	\$4.37
Support Projects	-	-	-	-	-	-	-
Regional Total	\$33.18	\$21.20	\$1.70	\$22.90	\$2.66	\$35.84	\$12.94

Notes:

1. Construction Contingency approved as part of the March 2022 Revised WSIP, plus any regional projects' savings moved to contingency.
2. Approved Change Orders are changes that have received all required approvals, including that of the City Controller.
3. This table only reports change orders for the active construction contracts as of this reporting cycle.
4. Values only reflect savings realized after the Commission adopted the March 2022 Revised WSIP.

Table 3.3 provides a breakdown of forecast change orders and trends comprising the forecasted remaining construction contingency. For each region as of Q2/FY22-23, it shows the Remaining Construction Contingency, Pending Change Orders, Potential Change Orders, Trends, and Forecasted Remaining Construction Contingency. As of December 31, 2022, the Total Forecasted Remaining Construction Contingency for the Regional WSIP is \$6.3 million. This amount does not include funds that are currently held in Director's Reserve.

Table 3.3 Forecasted Remaining Construction Contingency

Region	Q2/FY22-23 Remaining Construction Contingency ⁽¹⁾ (\$ Million) (A)	Pending Change Orders as of Q2/FY22-23 ⁽²⁾ (\$ Million) (B)	Potential Change Orders as of Q2/FY22-23 ⁽³⁾ (\$ Million) (C)	Trends as of Q2/FY22-23 ⁽⁴⁾ (\$ Million) D	Q2/FY22-23 Forecasted Remaining Construction Contingency (\$ Million) (E =A-B-C-D)
San Joaquin Region	-	-	-	-	-
Sunol Valley Region	\$8.57	\$0.12	\$6.83	\$1.62	-
Bay Division Region	-		-	-	-
Peninsula Region	-		-	-	-
San Francisco Regional Region	\$4.37	(\$1.96)	-	-	\$6.33
Support Projects	-		-	-	-
Regional Total	\$12.94	(\$1.84)	\$6.83	\$1.62	\$6.33

Notes:

1. Same as Column G in Table 3.2.
2. Pending Change Orders are changes that have been negotiated and approved by the SFPUC but have to be approved by the City Controller.
3. Potential Change Orders are changes that have been requested and entered into the construction contract management database but are still being negotiated.
4. Trends are any expected impact that the CM team believes may become a change order but are yet to be entered into the construction contract management database as a Potential Change Order.

The Program Management project includes programmatic activities that span multiple regions and benefit several WSIP projects (Table 3.4). The project provides funding for the following functions and resources: SFPUC Staff assigned to the management of the overall program; consultants supporting SFPUC staff at the program level (program, project and pre-construction management consultant, program construction management consultant, program control consultant); labor relations, including management of the project labor agreement; communication and public outreach; programmatic legal support; real estate acquisitions; program controls, including the tracking and reporting of all WSIP efforts; and program-level construction management activities associated with quality assurance, risk management, the Supplier Quality Surveillance (SQS) Program, operations assistance, safety, and training.

The activities under the Program Management project are organized into five categories that are tracked and monitored on a monthly basis. These categories are Management Support, Project Labor Agreement, Planning and Project Development, Program Controls, and Program Construction Management. The remaining balance in the Director’s Reserve is \$2.9M.

Table 3.4 Status of Program Management Project Cost Breakdown

Category	Expenditures To Date (\$ Million) (A)	2022 Approved Budget (\$ Million) (B)	Current Approved Budget (\$ Million) (C)	Q2/FY22-23 Forecasted Cost (\$ Million) (D)	Cost Variance (\$ Million) (E = C-D)
Management Support	\$37.85	\$46.47	\$46.47	\$42.53	\$3.95
Project Labor Agreement	\$3.74	\$3.84	\$3.84	\$3.84	-
Planning and Project Development	\$17.97	\$18.33	\$18.33	\$18.33	-
Program Controls	\$20.73	\$20.86	\$20.86	\$20.87	(\$0.01)
Program Construction Management	\$27.79	\$27.80	\$27.80	\$27.80	-
Program Management Total	\$108.09	\$117.30	\$117.30	\$113.36	\$3.94

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2005 Baseline, 2022 Approved, Current Approved, and Q2/FY22-23 Forecasted Schedules for the WSIP Regional Program. The Current Approved and the Forecasted Schedule completion for the Regional WSIP (Local WSIP was completed in June 2020) are each February 2027. Refer to Appendix B for a graphical presentation of the WSIP Approved Project-Level Schedule.

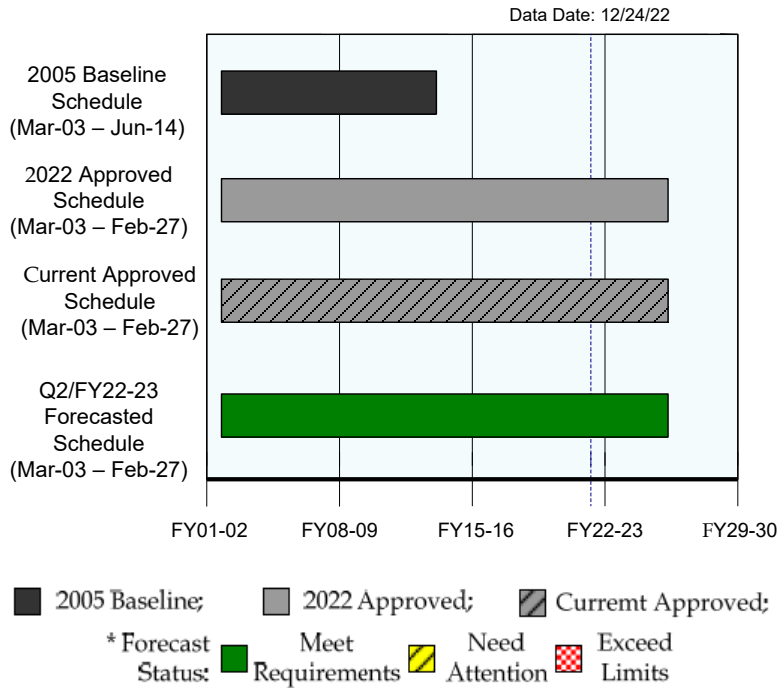


Figure 4.1 Program Schedule Summary

Table 4.1 2022 Approved vs. Q2/FY22-23 Forecasted Schedule Dates

Category	2005 Baseline Start	2022 Approved Start	Current* Approved Start	Actual Start	2005 Baseline Finish	2022 Approved Finish	Current* Approved Finish	Q2/FY22-23 Forecasted Finish	Schedule Variance (Months)
Regional Program	03/01/03	03/31/03	03/31/03	03/01/03✓	06/30/14	05/05/23	02/01/27	02/01/27	-
Local** Program	03/01/03	03/31/03	03/31/03	03/01/03✓	06/28/13	7/31/18	06/03/20	06/03/20A	Completed
Overall WSIP	03/01/03	03/01/03	03/01/03	03/01/03✓	06/30/14	05/05/23	02/01/27	02/01/27	-

* The budget and schedule approved as part of the March 2022 WSIP, plus any additional budget and schedule changes approved by the Commission as part of additional contingencies on construction contracts.

** Excluding Local Water Supply Projects

5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in \$1,000s

Project Name	Active Phase (a) (**)	CIP Approved Budget (b) (+)	Current Approved Budget (c) (++)	Current Forecast Cost (d)	Expenditures to Date (e)	Cost Variance (f=c-d) (+++)	% Cost Changes (g=f/c) (+++)	CIP Completion Date (h) (+)	Approved Completion Date (i) (++)	Forecast Completion Date (j)	Schedule Variance (Days) (k=i-j) (+++)
Sunol Valley Region											
10015281 Alameda Creek Recapture Project	CN	\$18,809	\$43,967	\$53,507	\$24,587	(\$9,540)	(22%)	05/25/12	06/18/24	06/18/24	0
San Francisco Regional Region											
10015241 Regional Groundwater Storage and Recovery	CN	\$39,233	\$158,350	\$158,350	\$123,925	\$0	0%	02/27/14	02/01/27	02/01/27	0
Support Projects											
10015337 Long Term Mitigation Endowment	N/A		\$12,000	\$12,000	\$0	\$0	0%		10/01/24	10/01/24	0

* Does not include projects in closeout, completed, not initiated, on hold, deleted projects, and projects combined with other projects.

** Phase Status Legend			
PL	Planning	DS	Design
BA	Bid & Award	CN	Construction

Footnotes:

- (+) **CIP Approved Budget and Project Completion Date:** The budget and schedule approved as part of 10-year CIP for FY21-30.
- (++) **Current Approved Budget and Schedule:** The budget and schedule approved as part of 10-year CIP for FY21-30, plus any additional budget and schedule changes approved by the Commission as part of construction contract award.
- (+++) **Negative number reflects cost overrun (or schedule delay) and positive number reflects cost underrun (or ahead of schedule). Projects with a forecasted cost overrun greater than 10%, or forecasted delay of greater than 6 months or 10%, will be highlighted in grey.**

6. PROJECT STATUS REPORT

10015281 - Alameda Creek Recapture Project

Project Description: The planned facilities include the following components: four (4) identical vertical turbine pumps mounted on floating barges located in existing Pond F2; four (4) flexible discharge pipelines extending from each pump to a new pipe manifold located on shore; a pipeline connection between the new pipe manifold and the existing Sunol Pipeline to discharge the recaptured water to the SFPUC system; throttling valves and a flow meter; electrical control building; power lines from the existing Hetch Hetchy Water & Power Calaveras Electrical Substation installed on new power poles; and general site improvements.

Program: Sunol Valley Region	Project Status: Construction	Environmental Status: Completed (Various)
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<p>Project Cost:</p> <table style="width: 100%;"> <tr> <td style="width: 30%;">Approved</td> <td style="width: 30%;"></td> <td style="width: 30%; text-align: right;">\$ 43.97 M</td> </tr> <tr> <td>Forecast</td> <td></td> <td style="text-align: right;">\$ 53.51 M</td> </tr> <tr> <td>Actual</td> <td></td> <td style="text-align: right;">\$ 24.59 M</td> </tr> </table>	Approved		\$ 43.97 M	Forecast		\$ 53.51 M	Actual		\$ 24.59 M	<p>Project Schedule:</p> <table style="width: 100%;"> <tr> <td style="width: 30%;">Approved 09/30/03</td> <td style="width: 30%;"></td> <td style="width: 30%; text-align: right;">06/18/24</td> </tr> <tr> <td>Forecast 09/30/03</td> <td></td> <td style="text-align: right;">06/18/24</td> </tr> <tr> <td colspan="3">Project Percent Complete: 54.7%</td> </tr> </table>	Approved 09/30/03		06/18/24	Forecast 09/30/03		06/18/24	Project Percent Complete: 54.7%		
Approved		\$ 43.97 M																	
Forecast		\$ 53.51 M																	
Actual		\$ 24.59 M																	
Approved 09/30/03		06/18/24																	
Forecast 09/30/03		06/18/24																	
Project Percent Complete: 54.7%																			

Key Milestones	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	04/28/20 A	12/18/20 A	06/21/21 A	02/29/24

Progress and Status:

During the reporting period, the contractor submitted price quotes for 1) the water pipeline realignment around the Pond F2 due to erosion conditions, and 2) relocation of the tie-in point between the effluent pipeline and the existing 36-inch diameter Sunol Pipeline due to corrosion at the original tie-in location. An evaluation of the quotes and back up documentation is on-going. The contractor continued work on the updated schedule. Additionally, during the quarter, work continued on the design for repairing the existing 36-inch diameter Sunol Pipeline due to the corrosion found on the pipe and on the environmental permit modification for the alternate access roads. The draft mooring analysis report was received, and it indicated higher loading on the barge and mooring system due to the water pipe realignment. The report is being reviewed. The contractor continued to report notices of material shortages, longer lead-time estimates, and cost increases related to COVID-19. The quarry operator completed field borings for the erosion repair investigation.



Pond F2 Bank Erosion Area



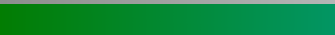


Issues and Challenges:

The cost variance is due to the pipe realignment design changes and Sunol pipeline tie-in point changes. The schedule impacts related to the changes are being determined by the contractor, and will be reported next quarter. A request for additional cost and duration contingency will be submitted to the Commission in the next reporting period.

10015241 - Regional Groundwater Storage and Recovery

Project Description: The current scope was planned to be constructed in two (2) phases. Phase 1 included construction of 13 wells to produce 6.2 mgd of dry year supply over 7.5 years. Operating the wells during drought will provide data and insights into how much water can be reasonably expected to be produced, and if additional well stations are needed to reach the desired drought period pumping capacity. Phase 2 included construction of two (2) installed test wells, completion of the South San Francisco (SSF) Main well, pipeline, and other work. The test wells which would not be converted to production wells at this time will allow for determination as to whether the identified sites could be viable production wells, and will provide information to water quality and pumping capacities that can be used for future planning. Phase 2 has been separated into two contracts due to the long lead-time required for easements and permits for work at the SSF Main Well site. Phase 2A includes installation of cathodic protection, well rehabilitation, and other mechanical work. Phase 2B consists of work at the SSF Main Well and pipeline installation to connect the well to Cal Water’s treatment facility.

Program: San Francisco Regional Region	Project Status: Construction	Environmental Status: Active (Various)
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Project Cost:		Project Schedule:	
Approved		\$ 158.35 M	Approved 06/01/03  02/01/27
Forecast		\$ 158.35 M	Forecast 06/01/03  02/01/27
Actual		\$ 123.92 M	Project Percent Complete: 84.0%

Key Milestones	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	A	09/07/09 A	09/07/11 A	01/30/12 A	09/05/12 A
	B	08/07/14 A	09/22/14 A	04/06/15 A	09/02/22 A
	C	11/10/20 A	09/27/21 A	06/23/22 A	02/20/24
	D	06/30/23	08/01/23	02/01/24	01/31/26

Progress and Status:

Project includes multiple construction contracts: (A) WD-2600 Test well drilling; (B) WD-2668 Well station (13 wells) Phase 1; (C) WD-2878A RGSR Phase 2A; (D) RGSR Phase 2B. For Phase 1 (Contract B) WD-2668, Commission approval of contract closeout will be sought early next quarter. Preparation of the administrative closeout documents such as as-builts, and remaining O&M manuals (those related to Tesco controls) continued during the quarter. For Phase 2A (Contract C) WD-2878A, the groundwater pump at Park Plaza Well Station has been pulled for inspection, rehabilitation, and installation of cathodic protection system. Initial inspection using video of the well shafts at seven well stations, and disinfection of the well casings at four well stations have been completed. The manufacturer of the variable frequency drives (VFD) that were ordered for the pump motors submitted notification that the lead time for the variable frequency drives delivery has increased several months due to supply chain issues and is now likely one year. The schedule will be reviewed to assess the impact to the overall construction completion. For Phase 2B (Contract D), coordination with Cal Water continued regarding the requirements for the use of their property for the construction staging area, and also for technical design regarding point of connection, SCADA, security, communications and controls.



Column pipe removal for well rehabilitation at Colma BART Well Station

Issues and Challenges:

None at this time.

7. On-Going Construction

Construction Contract	Schedule			Budget		Variance (Approved - Forecast)		Actual % Complete
	NTP Date	Approved Construction Final Completion*	Q2/FY22-23 Forecasted Construction Final Completion**	Approved Contract Cost +	Q2/FY22-23 Forecasted Cost++	Schedule (Cal. Days)	Cost	
Sunol Valley Region								
10015281 - Alameda Creek Recapture Project (WD-2825R)	06/21/21	12/19/22	02/29/24	\$ 21,533,500	\$ 28,501,094	(437)	(\$6,967,595)	24.0%
San Francisco Regional Region								
10015241 - Regional GW Storage and Recovery (Contract C, WD-2878A)	06/23/22	02/20/24	02/20/24	\$ 7,105,229	\$ 6,561,394	-	\$ 543,835	14.0%

Program Total for On-Going Construction	Approved Contract Cost	Q2/FY22-23 Forecasted Cost	Variance	
			Cost	Percent
	\$ 28,638,729	\$ 35,062,489	(\$6,423,760)	(22.4%)

Note:

* Approved Construction Final Completion Date includes approved change orders.
 ** The Forecasted Construction Final Completion Date includes all approved, pending, and potential change orders and trends.

+ Approved Contract Cost includes awarded contract amount and approved change orders.
 ++ The Forecasted Cost includes awarded contract amount and all approved, pending, and potential change orders.

8. PROJECTS IN CLOSEOUT

Project Title	2005 Baseline Construction Phase Completion	2022 Approved Construction Phase Completion	2005 Approved Project Completion	Current Approved Construction Phase Completion	Actual Construction Phase Completion	2022 Approved Project Completion	Current Approved Project Completion	Forecast Project Completion	2005 Construction Budget	2022 Approved Construction Phase Budget	Current Approved Construction Phase Budget	Construction Phase Expenditures To Dates
Support Projects												
10015335 - Bioregional Habitat Restoration		05/31/18		05/31/18	05/31/18	10/01/24	10/01/24	10/01/24		51,367,076	\$51,367,076	\$51,287,090

9. COMPLETED PROJECTS

Project Title	2005 Baseline Project Completion	2022 Approved Project Completion	Current Approved Project Completion	Actual Project Completion	2005 Baseline Project Budget	2022 Approved Project Budget	Current Approved Project Budget	Project Expenditures To Date
San Joaquin Region								
10015301 - Lawrence Livermore Water Quality Improvement	11/07/2011	07/31/2013	07/31/2013	07/31/2013	\$4,235,258	\$4,198,247	\$4,198,247	\$4,198,247
10015315 - San Joaquin Pipeline System	03/25/2014	03/31/2016	03/31/2016	03/31/2016	\$352,732,000	\$203,178,014	\$203,178,014	\$203,178,014
10015316 - Rehabilitation of Existing San Joaquin Pipelines	06/30/2014	10/31/2014	10/31/2014	10/31/2014	\$80,000,000	\$21,153,622	\$21,153,622	\$21,153,622
10015330 - Tesla Treatment Facility	07/01/2011	01/30/2015	01/30/2015	01/30/2015	\$101,643,001	\$113,211,607	\$113,211,607	\$113,211,607
10015487 - WSIP Closeout - San Joaquin		03/31/2021	03/31/2021	03/31/2021	\$0	\$3,376,376	\$3,376,376	\$2,011,197
Sunol Valley Region								
10015286 - Standby Power Facilities - Various Locations	12/06/2010	12/22/2010	12/22/2010	12/22/2010	\$9,949,735	\$12,950,566	\$12,950,566	\$12,950,566
10015290 - New Irvington Tunnel	09/17/2013	03/31/2018	03/31/2018	03/31/2018	\$214,650,004	\$340,406,358	\$340,406,358	\$339,901,806
10015291 - Alameda Siphon #4	04/14/2011	06/28/2013	06/28/2013	06/28/2013	\$78,577,000	\$64,950,507	\$64,950,507	\$64,950,507
10015312 - Pipeline Repair & Readiness Improvements	03/30/2007	04/16/2009	04/16/2009	04/16/2009	\$5,591,770	\$5,195,381	\$5,195,381	\$5,195,381
10015317 - Calaveras Dam Replacement	05/25/2012	03/31/2022	03/31/2022	03/31/2022	\$256,511,407	\$794,066,323	\$794,066,323	\$793,129,363
10015318 - Calaveras Reservoir Upgrades	02/17/2006	07/28/2006	07/28/2006	07/28/2006	\$1,740,055	\$1,690,552	\$1,690,552	\$1,690,552
10015319 - San Antonio Backup Pipeline	06/29/2012	06/30/2016	06/30/2016	06/30/2016	\$7,677,000	\$53,594,683	\$53,594,683	\$53,594,683
10015325 - SVWTP Expansion & Treated Water Reservoir	07/09/2013	10/31/2014	10/31/2014	10/31/2014	\$133,108,002	\$129,593,674	\$129,593,674	\$129,593,674
10015332 - San Antonio Pump Station Upgrade	12/12/2011	06/29/2012	06/29/2012	06/29/2012	\$41,854,000	\$12,894,592	\$12,894,592	\$12,894,592
10015492 - WSIP Closeout - Sunol Valley		06/30/2022	06/30/2022	12/31/2022	\$0	\$5,989,845	\$5,989,845	\$5,061,409
Bay Division Region								
10015282 - BDPL Nos. 3 & 4 Crossover/Isolation Valves	09/30/2008	07/31/2009	07/31/2009	07/31/2009	\$27,600,158	\$27,039,149	\$27,039,149	\$27,037,926
10015283 - Seismic Upgrade of BDPL Nos. 3 & 4	10/15/2012	07/30/2018	07/30/2018	07/30/2018	\$66,792,849	\$72,194,219	\$72,194,219	\$70,530,532
10015299 - SCADA System - Phase II	02/24/2012	05/28/2013	05/28/2013	05/28/2013	\$36,098,999	\$9,470,922	\$9,470,922	\$9,470,923
10015308 - BDPL Reliability Upgrade / Tunnel	01/31/2014	08/30/2016	08/30/2016	08/30/2016	\$572,022,634	\$272,364,089	\$272,364,089	\$271,823,525
10015309 - BDPL Reliability Upgrade - Pipeline		03/31/2016	03/31/2016	03/31/2016	\$0	\$216,722,172	\$216,722,172	\$216,722,172
10015310 - BDPL Reliability Upgrade - Relocation of BDPL Nos. 1 & 2		05/28/2010	05/28/2010	05/28/2010	\$0	\$3,046,981	\$3,046,981	\$3,046,981
10015324 - BDPL Nos. 3 & 4 Crossovers	04/24/2013	06/30/2014	06/30/2014	06/30/2014	\$36,616,911	\$29,910,449	\$29,910,449	\$29,910,449
10015338 - SFPUC/EBMUD Intertie	02/07/2007	03/20/2014	03/20/2014	03/20/2014	\$8,598,851	\$9,167,306	\$9,167,306	\$9,167,306
10015341 - BDPL No. 4 Condition Assessment PCCP Sections	05/01/2008	02/06/2009	02/06/2009	02/06/2009	\$2,000,000	\$1,937,599	\$1,937,599	\$1,937,599
10015484 - WSIP Closeout - Bay Division		03/31/2021	03/31/2021	03/31/2021	\$0	\$3,597,500	\$3,597,500	\$3,322,156
Peninsula Region								
10015285 - Lower Crystal Springs Dam Improvements	08/16/2011	12/28/2012	12/28/2012	12/28/2012	\$27,752,222	\$34,859,040	\$34,859,040	\$34,859,040
10015287 - New Crystal Springs Bypass Tunnel	10/28/2010	08/17/2012	08/17/2012	08/17/2012	\$83,222,790	\$81,466,732	\$81,466,732	\$81,466,732

Project Title	2005 Baseline Project Completion	2022 Approved Project Completion	Current Approved Project Completion	Actual Project Completion	2005 Baseline Project Budget	2022 Approved Project Budget	Current Approved Project Budget	Project Expenditures To Date
10015288 - Adit Leak Repair - Crystal Springs/Calaveras	07/03/2008	07/31/2008	07/31/2008	07/31/2008	\$3,748,452	\$2,787,322	\$2,787,322	\$2,787,322
10015293 - Pulgas Balancing - Inlet/Outlet Work	05/11/2006	05/11/2006	05/11/2006	05/11/2006	\$1,667,532	\$1,765,938	\$1,765,938	\$1,765,938
10015294 - Pulgas Balancing - Discharge Channel Modifications	08/05/2013	07/30/2010	07/30/2010	07/30/2010	\$8,111,422	\$2,910,007	\$2,910,007	\$2,910,007
10015295 - Pulgas Balancing - Structural Rehabilitation and Roof Replacement	01/29/2013	12/28/2012	12/28/2012	12/28/2012	\$36,712,846	\$20,238,716	\$20,238,716	\$20,238,716
10015297 - Pulgas Balancing - Modifications of the Existing Dechloramination Facility		03/20/2013	03/20/2013	03/20/2013	\$0	\$5,390,031	\$5,390,031	\$5,390,031
10015302 - Cross Connection Controls	05/15/2009	02/27/2009	02/27/2009	02/27/2009	\$6,111,779	\$3,948,943	\$3,948,943	\$3,948,943
10015303 - HTWTP Short-Term Improvements (Demo Filters)	07/03/2006	11/14/2006	11/14/2006	11/14/2006	\$4,381,375	\$3,067,903	\$3,067,903	\$3,067,903
10015305 - HTWTP Short-Term Improvements - Coagulation & Flocculation/ Remaining Filters	09/08/2010	07/28/2010	07/28/2010	07/28/2010	\$9,741,617	\$18,604,937	\$18,604,937	\$18,604,937
10015306 - HTWTP Long-Term Improvements	04/08/2014	12/30/2016	12/30/2016	12/30/2016	\$167,570,000	\$274,081,969	\$274,081,969	\$273,833,162
10015307 - Peninsula Pipelines Seismic Upgrade		07/06/2016	07/06/2016	07/06/2016	\$0	\$38,825,346	\$38,825,346	\$38,773,912
10015311 - Capuchino Valve Lot Improvements	07/24/2009	08/19/2008	08/19/2008	08/19/2008	\$3,573,782	\$2,803,153	\$2,803,153	\$2,803,153
10015313 - Crystal Springs/San Andreas Transmission Upgrade	04/01/2014	06/30/2015	06/30/2015	06/30/2015	\$148,582,655	\$190,309,453	\$190,309,453	\$189,816,066
10015322 - Crystal Springs Pipeline No. 2 Replacement	04/27/2012	12/31/2014	12/31/2014	12/31/2014	\$93,926,000	\$56,070,509	\$56,070,509	\$56,070,509
10015323 - San Andreas Pipeline No. 3 Installation	06/09/2011	08/30/2012	08/30/2012	08/30/2012	\$42,029,941	\$27,495,558	\$27,495,558	\$27,495,558
10015339 - Baden and San Pedro Valve Lots Improvements	10/12/2011	03/29/2013	03/29/2013	03/29/2013	\$47,319,999	\$24,990,803	\$24,990,803	\$24,990,803
10015486 - WSIP Closeout - Peninsula		12/30/2021	12/30/2021	12/30/2021	\$0	\$13,579,680	\$13,579,680	\$13,479,266
San Francisco Regional Region								
10015289 - Sunset Reservoir - North Basin	05/06/2009	09/10/2010	09/10/2010	09/10/2010	\$61,975,999	\$64,270,725	\$64,270,725	\$64,270,725
10015314 - University Mound Reservoir - North Basin	03/10/2011	03/29/2013	03/29/2013	03/29/2013	\$102,882,610	\$43,266,552	\$43,266,552	\$43,266,552
Support Projects								
10015300 - System Security Upgrades		04/19/2019	04/19/2019	04/19/2019	\$0	\$14,700,669	\$14,700,669	\$14,429,323
10015334 - Programmatic EIR	06/20/2007	06/30/2009	06/30/2009	06/30/2009	\$9,271,001	\$10,730,684	\$10,730,684	\$10,730,684
10015336 - Vegetation Restoration of WSIP Construction Sites		06/30/2016	06/30/2016	06/30/2016	\$0	\$2,111,546	\$2,111,546	\$2,099,755
10015342 - Watershed and Environmental Improvement Program	06/28/2013	06/30/2022	06/30/2022	06/30/2022	\$20,000,000	\$20,000,000	\$20,000,000	\$20,064,220
TOTAL					\$2,916,581,656	\$3,370,176,949	\$3,370,176,949	\$3,362,848,051

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APPENDICES

- A. PROJECT DESCRIPTIONS**
 - B. WSIP APPROVED PROJECT-LEVEL SCHEDULE**
 - C. LIST OF ACRONYMS**
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APPENDIX A. PROJECT DESCRIPTIONS**SAN JOAQUIN REGION****10015301 - Lawrence Livermore Water Quality Improvement (Completed)**

The project consists of:

- Ultraviolet (UV) disinfection, including two (2) 150-gallon-per-minute, parallel UV units and ancillary facilities. The units will be installed in the existing Thomas Shaft building.
- Two (2) pumps that will pump water from the Coast Range Tunnel to the new disinfection system.

10015315 - San Joaquin Pipeline System (Completed)

This project consists of:

- Pipeline crossover facilities at Emery Road (including 10 valves) and Pelican Road (including 12 valves).
- Installation of a portion of new pipeline, the Western Segment, from the San Joaquin River to the Tesla Portal. The pipeline will be 78-inches in diameter, approximately 10.3 miles in length and will include tunneled crossings of several highways, railroads, and irrigation canals. The pipeline will cross over the top of the California Aqueduct.
- Installation of a portion of new pipeline, the Eastern Segment, from the Oakdale Portal to a new connection point approximately 6.7 miles downstream on SJPL No. 3. This segment will also be 78-inches in diameter.
- Installation of valve facilities on SJPL Nos. 3 and 4 along the Eastern Segment to provide for operational needs to divide and isolate segments of these lines for maintenance and to regulate flow and control pressure in the system.
- Security-related site improvements at Oakdale Portal.

10015316 - Rehabilitation of Existing San Joaquin Pipelines (Completed)

The project scope is to assure that existing San Joaquin Pipelines will meet Delivery Reliability LOS goals by establishing a program of routine maintenance, repair and replacement activities for long-term implementation and by addressing the highest priority rehabilitation measures identified during the timeframe of the WSIP:

- Rehabilitation of and security-related site improvements at the existing Roselle Crossover.
- Establishment of a program of pipelines conditions assessment, including upgrading and renewal as required, of pipe coating and lining systems.
- Upgrade of the existing SJPL cathodic protection system.
- Upgrade of the existing SJPL Supervisory Control and Data Acquisition (SCADA) system.

10015330 - Tesla Treatment Facility (Completed)

The project consists of:

- Isolation valves and piping to divert SJPL flow to the new treatment facility, large-diameter piping and valves located within the treatment facilities, and a single discharge pipeline to tie back into the existing SJPLs.
- A disinfection building housing 12 UV reactors, cleaning equipment, and ancillary equipment.
- A chemical storage and feed building for sodium hypochlorite, hydrofluosilicic acid (i.e., fluoride), and carbon dioxide.
- Office, laboratory, and control facilities, emergency engine generators, and security-related site and access road improvements.

10015487- WSIP Closeout - San Joaquin (Completed)

• **Supplemental Solar Panel Installations** – The 10015315 San Joaquin Pipeline System, including the western segment, eastern segment and facilities, and crossover pipeline projects achieved final completion in 2013, 2014 and 2015, respectively. During the initial course of operations, it was noted

the solar panel arrays designed to provide power for the facility equipment were not sufficient to meet all modes of operational demands. This sub-project will provide additional solar panels to cover power shortfalls and allow the facility to better meet its water delivery reliability LOS goal. This sub-project consists of three (3) job order contracts at three (3) sites: Oakdale, Knight Ferry Throttling Station, and San Joaquin Junction No. 4. The scope of work as noted in the March 2016 Notice of Change includes:

- o Minor site preparation and grading work
- o Furnishing and installing new supplemental solar arrays mounted on concrete pads within security fence enclosures
- o Connections and integration of the new solar panels into the existing power system and controls
- o Installation of batteries for solar power storage on-site
- o Minor site preparation and grading work

• **Tesla Portal Facility Interior Floor Slab** – The Tesla Portal Facility, a sub-project of the 10015330 Tesla Treatment Facility, was completed in January 2015. During construction, the concrete interior floor slab was deleted from the project construction documents to allow easier access to repair corrosion of the existing pipelines discovered during construction beneath the new Tesla Portal Facility. Due to drainage issues at the site, the Operations staff at the facility has now requested the interior slab be incorporated into the structure with a small access opening for future maintenance and corrosion repairs of the existing buried pipelines. As noted in the March 2016 Notice of Change, this sub-project will be constructed through use of a job order contract including:

- o A new interior concrete slab slope to drain to a new catch basin
- o A new catch basin with grating and sump
- o A small sump pump and drain through the slab or existing concrete wall to a discharge point

SUNOL VALLEY REGION

10015281 - Alameda Creek Recapture Project

The planned facilities for this project are based on Alternative 4-1 from the Updated Alternatives Analysis Report (AAR) dated January 30, 2009, with some refinements described below. The planned facilities include the following components: four (4) identical vertical turbine pumps mounted on floating barges located in existing Pond F2 (including a mooring system); four (4) flexible discharge pipelines extending from each pump to a new pipe manifold located on shore; approximately 100-feet of 36-inch pipeline connection between the new pipe manifold and the existing Sunol Pipeline to discharge the recaptured water to the SFPUC system; throttling valves and a flow meter; electrical control building; 1,600 feet of power lines from the existing Hetch Hetchy Water & Power Calaveras Electrical Substation installed on 10 new power poles; and general site improvements. In addition, the scope includes conveyance of the water to various existing storage sites within the Sunol Valley or the Sunol Valley Water Treatment Plant, as necessary.

10015286 - Standby Power Facilities - Various Locations (Completed)

Standby power requirements are provided at six (6) sites in the East Bay and on the Peninsula. Each site is either provided with an emergency generator or the electrical receptacles to accommodate a portable emergency generator.

The facilities at the six (6) sites include:

- Alameda West Portal: standby power improvements include installing a permanent 20- kilowatt (kW) emergency generator in a sound-attenuated masonry wall enclosure.
- San Antonio Reservoir and Dam: standby power improvements include providing electrical receptacles for a portable 37-kW emergency generator at two (2) locations.
- Harry Tracy Water Treatment Plant (HTWTP): standby power improvements include removing the four (4) existing, smaller emergency generators and providing two (2) permanently installed 2-megawatt (MW) emergency generators.
- Millbrae Yard: standby power improvements include replacing the existing emergency generator with a permanently installed 300-kW unit to enable this facility to function as an emergency operations

center.

- San Pedro Valve Lot: standby power improvements include installing a permanent 20-kW emergency generator in a sound-attenuated masonry wall enclosure.
- Capuchino Valve Lot: standby power improvements include providing an electrical receptacle for a portable 30-kW engine generator.
- The project will also provide the trailer mounted engine generator that will be stored at the Millbrae Yard.

10015290 - New Irvington Tunnel (Completed)

The NIT alignment will be located just to the south of the existing tunnel. It will be 18,660 feet long and have a horseshoe shape with excavated dimensions of approximately 13 feet by 14 feet. The final tunnel lining will be mortar-lined, welded steel pipe, resulting in a finished diameter of 8.5 feet. Extra thick steel liner segments will also be used at low cover areas near the portals and beneath Interstate 680, and where it intersects inactive fault zones or in locations of poor ground conditions.

The NIT project is currently in construction and approximately 99% complete. Major project elements are listed below.

- Conventional mining methods were used for excavation in a westward direction from the Alameda West Portal, in both an eastward and westward direction from an intermediate shaft located near Vargas Road, just off Interstate 680, and in an eastward direction from Irvington Portal. Tunneling was completed by multiple road header tunneling machines, and limited, controlled detonation in areas of hard rock. Spoils disposal was taken to fill sites just north of the San Antonio Pump Station (SAPS) near the intersection of Calaveras Road and Interstate 680. The completed spoils fills will create a visual barrier to new quarry operation located near Calaveras Road. Potentially contaminated spoils were screened, separated, and if found to contain contaminants, hauled to a permitted landfill.
- At the Irvington Portal, tunnel connections were made to Bay Division Pipeline (BDPL) Nos. 1, 2, and 5 and to BDPL Nos. 3 and 4. Control valves were directly buried with instrumentation and electrical gear in a small control building. At the Alameda West Portal, the tunnel was connected to the discharge of the new mixing manifold to be constructed as part of the Alameda Siphons # 4 Project and to the existing overflow shaft. The project includes a new isolation valve between the mixing manifold and the portal.
- A new access bridge was constructed across Alameda Creek to accommodate temporary construction traffic and on-going SFPUC Alameda West Portal operations.
- A Groundwater Management Program was developed that includes two (2) years of pre- construction monitoring of wells, springs, creeks, ponds, and wetlands; environmental habitat construction mitigation measures; and two (2) years of monitoring after construction to minimize the impact to the local groundwater.
- At both the existing Irvington and Alameda West Portal facilities, other security-related site improvements were constructed, including undergrounding of portal structures and new card access controlled gates and security fences.
- In the March 2014 Notice of Change, simplifications were made to the design of the new security structure for the existing Alameda West Portal. The design changes included a more secure structure with a smaller footprint and removal of pipe manifolds that will no longer be in service.

10015291 - Alameda Siphon #4 (Completed)

The Alameda Siphon #4 Project extends approximately 3,000 feet from the Alameda East Portal across both the Calaveras Fault and Alameda Creek to the Alameda West Portal.

The project primarily consists of:

- A 66-inch-diameter welded steel pipeline with 310 feet of special trench design and thicker-walled pipe in the fault rupture zone, and a tunneled crossing of Alameda Creek.
- A 96-inch-diameter “blending structure” consisting of a pipe and valve manifold near the Alameda West Portal that will blend SVWTP and Hetch Hetchy water so that the existing and new Irvington Tunnels will receive a uniform quality of water.

- New isolation/throttling valves on Alameda Siphons No. 3 and 4 and new isolation valves on Alameda Siphons No. 1 and 2. The valves will be installed upstream of the blending structure.
- Ventilation improvements at Alameda East Portal for the Coast Range Tunnel required for construction access.
- New chemical injection facilities on Alameda Siphon No. 4.
- Relocation and extension of the existing overflow pipe from the Alameda East Portal about 500 feet to an existing quarry, and site fencing at Alameda East Portal. The overflow to the existing quarry includes a grouted rock riprap channel down the side of the quarry for erosion protection.
- Road improvements at the intersection with Calaveras Road for construction access.

10015312 - Pipeline Repair & Readiness Improvements (Completed)

This project is 100% complete and has been closed out. The project was separated into the three (3) following implementation phases:

- Phase A: Procurement of varied lengths and sizes of welded steel pipe and fittings for stockpiling at new storage facilities at seven (7) locations along the transmission system, west of the Coast Range Tunnel.
- Phase B: Procurement and installation of a pipe rolling machine at the Sunol Yard. The rolling machine, which has the capability to roll pipe sections up to 9 feet in diameter, will be housed in a new building with an emergency power supply.
- Phase C: Development of a pipeline repair prioritization plan, on-call emergency repair procedures and contracts, and mutual assistance agreements.

10015317 - Calaveras Dam Replacement (Completed)

Project elements primarily include:

- Constructing a new 210-foot-high earth and rock fill dam designed to accommodate a maximum credible earthquake on the Calaveras Fault. The dam will be constructed immediately downstream of the existing dam and will have a crest length of 1,210 feet, a base thickness of 1,180 feet, and a crest thickness of 80 feet. The total volume of the dam will be approximately 2.8 million cubic yards.
- The materials for construction will primarily originate from onsite sources, while surplus excavated material will be placed at disposal sites around the rim of the Calaveras Reservoir, including two (2) in-water disposal sites and several upland disposal sites.
- The existing spillway will be removed, and a new spillway and stilling basin will be constructed. The overflow weir of the new spillway will be 307 feet long. The spillway will vary from 60 to 80 feet wide and will be 1,100 feet long. The stilling basin below the spillway will be 80 feet wide and 155 feet long.
- A new intake tower and shaft will be constructed. The drain line and three (3) adits from the existing facility will be connected to the new shaft. The existing outlet conduit from the tower will be extended 1,250 feet downstream (beneath the replacement dam) and will be equipped with a high capacity fixed-cone discharge valve (relocated from the existing facility) to accommodate water releases from the reservoir. Fish screens will be added to the existing adits of the intake tower.
- The existing dam will largely remain in place. The downstream face will, however, be partially removed and re-graded and a channel will be excavated through the dam to form the approach to the new spillway.
- A new 525-foot long fish ladder and flow bifurcation systems at ACDD will be used in conjunction with new low-flow capacity valves to be added at the base of the replacement Calaveras Dam to provide flows downstream of these facilities to support native aquatic resources and future populations of steelhead trout that are being restored to the Alameda Creek Watershed.
- The fish ladder and a total of four (4) new fish protection screens will be added on the right abutment (looking downstream) of the ACDD. In addition, conveyance pipes will be installed to allow water from Alameda Creek to be delivered to the Calaveras Reservoir via the ACDT.
- Landslide A removal beneath the northern half of the left abutment slope located on the left side of the valley (when looking downstream) as well as other associated changes as previously noted in the March 2013 Notice of Change.

- Landslide B removal within the lower left abutment slope as well as other associated changes as previously noted in the March 2014 Notice of Change.
- Additional slope reinforcement in Borrow Area B and import of offsite rockfill as noted in the March 2016 Notice of Change.
- Repairs to the landslide portion of Calaveras Road and restoration of the West Haul Road as noted in the scope refinements listed below for this March 2018 Notice of Change.
- For the ACDD fish ladder, to address the potential landslide hazard and further protect the fish passage structure, as noted in the scope refinements listed below for this March 2018 Notice of Change, an extension to the contract landslide stabilization wall and an additional reinforced concrete panel wall with tie-backs to reinforce a section of the soil nail wall.

10015318 - Calaveras Reservoir Upgrades (Completed)

The project consists of installing a hypolimnetic oxygenation system and associated cryogenic (oxygen generation) equipment near the dam. The addition of oxygen into the reservoir will limit the negative effects of algal blooms and may promote a healthier fish habitat. The system will continue to be usable following completion of the replacement Calaveras Dam. The project primarily consists of the new cryogenic equipment, two (2) diffuser systems in the reservoir, and miscellaneous site work.

10015319 - San Antonio Backup Pipeline (Completed)

The SABPL consists of 6,600 feet of 66-inch-diameter steel pipe and extends from the Alameda Siphons at the SAPS to Sunol quarry, SMP-24, near the intersection of Calaveras Road and San Antonio Creek. There are three (3) tie-in facilities with air gap provisions from the SABPL: one connecting to Alameda Siphon No. 3, a second to the SAPL near SAPS, and a third to the SAPL on the west side of Calaveras Road before the SAPL alignment turns and heads west to quarry SMP-24. The alignment of the SABPL parallels that of the existing SAPL, terminating with a control valve and concrete energy dissipation structure to quarry SMP-24. The project includes new chemical storage, feed and water quality monitoring facilities for de-chlorination and pH adjustment of any discharges through the SABPL, the existing SAPL, and the Alameda East Portal overflow pipe. Water discharged into the SMP-24 quarry pond will be recovered with two submersible pumps and a short section of 24-inch diameter steel pipe which will connect to the existing SAPL to convey water to San Antonio Reservoir. Power to the water recovery pumps will be supplied from the nearby Calaveras Substation, which is owned and operated by Hetch Hetchy Water & Power. Construction of a slurry wall is included around the quarry pond to minimize groundwater intrusion and to ensure slope stability.

10015325 - SVWTP Expansion & Treated Water Reservoir (Completed)

The project primarily consists of:

- The expansion improvements, which increase the sustainable capacity to 160 mgd, include the addition of a new flocculation/sedimentation basin and the retrofit of six (6) of the twelve (12) existing filters. Design of improvements to the remaining six (6) filters was performed under the project, and was included as an optional bid item in the construction contract. As a result, upgrades to all 12 filters were able to be performed under the construction contract, providing an additional factor of safety for reliable and sustainable production of 160 mgd required to meet the LOS goals established for the system.
- A single 17.5-million-gallon (mg) circular TWR which was constructed along with a new 3.5-MG rectangular chlorine contact tank on the northern portion of the existing plant site. Roughly 400,000 cubic yards of excavated material was hauled to a disposal site immediately east of the plant for disposal.
- New chemical storage and feed facilities for disinfection are constructed including sodium hypochlorite and ammonia. New fluoride facilities were also added.
- Construction of approximately 2,700 feet of 78-inch-diameter pipe that connects the new TWR to the existing plant discharge pipeline. This included a tunneled crossing of Alameda Creek.
- Nine (9) existing chemical tanks and associated electrical and instrumentation components were

replaced under the construction contract. The existing chemical tanks and the associated electrical and instrumentation had reached the end of their useful life and were in jeopardy of failure.

- Miscellaneous plant improvements include a new emergency generator and improvements to the plant electrical system, substation, electrical panels, and motor control centers; an upgrade of the instrumentation and controls; a new filter washwater recovery basin; improvements to the flow distribution structure and associated facilities; replacement of the plant's existing boiler; improvements to the influent chemical mixing system; and repaving of the existing plant access road.

10015332 - San Antonio Pump Station Upgrade (Completed)

The project consists of:

- Replacement of the three (3) 1,000-horsepower electrical pumps.
- Addition of two (2) 1.5-megawatt emergency generators. The generators are sized to power the three (3) electric pumps.
- Seismic retrofit of the pump station, including reinforcement of the walls, foundation improvements, and connection of the roof to the walls.

10015492- WSIP Closeout - Sunol Valley

- **Alameda Siphon No. 4 Carrier Water System Modifications** – The 10015291 Alameda Siphon No. 4 Project was completed in 2013. Since that time, new facilities that have been brought on-line as well as other changes have occurred in water operations, have resulted in an apparent drop in water pressures and volumes at the Sunol Valley Chloramination Facility. This has reduced the available water needed for the current carrier water system to pump the necessary water treatment chemicals into the system. This new sub-project is designed to resolve the deficiency and allow the facility to better meet its water delivery reliability LOS goal. This sub-project will be constructed by a job order contract including:

- o Modifications of the current chemical injection system of overcome lack of water system pressure and volume

- o New supplemental water facilities, including possible new storage tanks, and monitoring and regulating equipment as needed

- o Plumbing and control connections between the new facilities and the current system

- **Erosion Repair at Pond F3 East** – The completed 10015319 San Antonio Backup Pipeline Project included drainage improvements on the east side bank of Quarry Pond F3 East. After completion of construction, it was noted that the rock riprap below a 12- inch drainage pipe had eroded away and undermined the downstream section of the pipe. This sub-project will repair the erosion and restore the drainage pipe through a job order contract including:

- o New rockfill on the east back of the quarry pond from the current drainpipe to the toe of the bank

- o Excavation and grading to remove loose bank debris and prepare the subgrade slope to receive new rockfill

- o Extension of the existing drainpipe downslope to the water line of the pond

- o Temporary access improvements at the side bank of the pond for a crane and other equipment to deliver to, and place new rockfill and other materials into, the repair area

- **Sunol Valley Water Treatment Plant Basin Polymer Feed Facility.** The Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir Project was completed in 2014 and included addition of a new fifth flocculation sedimentation basin (Basin 5) to the existing four (4) basins at the plant. During operations after completion, it was noted that Basin 5 was not able to achieve the optimal water production goal of 40 million gallons per day consistently. This sub-project is to build a polymer feed facility that will serve not only Basin 5, but also the four (4) older basins (Basins 1 to 4), to optimize plant water production, and allow this facility to better meet its water quality and delivery reliability LOS goals. The portion of the facility cost attributed to Basin 5 will be funded under the WSIP; the portion of the facility cost attributed to Basins 1 to 4 will be funded under the Water 10- Year Capital Improvement Program. This sub-project will be constructed by a bid contract including:

- o Addition of new flocculant aid polymer to Basin 5

- o Water testing to develop a range of polymer doses for the range of different water quality expected at the plant
- o Construction of new structures and facilities to store, monitor and control the application of the new polymer
- o Possible extension of the new polymer to optimize water production from the four (4) older basins
- **Miscellaneous Work at Alameda West Portal, Irvington Portal and San Antonio Back-Up Pipeline** – The CUW 35901 New Irvington Tunnel (NIT) was completed in 2017, and the CUW 37403 San Antonio Backup Pipeline (SABPL) was completed in 2016. This subproject will include the following work:
 - o Installation of new security doors at Alameda West Portal (AWP) and Irvington Portal (IVP)
 - o Installation of new couplings between the valve stem and actuator for the cathodic protection at AWP and IVP
 - o Refurbishment of uninterruptible power supply (UPS) and installation of new enclosures for the UPS at AWP and IVP
 - o Installation of discharge pipe lateral supports, safety railings, ladder stiffening supports, and sunshades for electrical equipment on SABPL
- **New Irvington Tunnel Water Quality Equipment Relocation** – The 10015290 New Irvington Tunnel (NIT) project installed new water quality monitoring equipment in an underground vault to monitor water quality on Irvington Portal 2 (IP2). After the equipment was installed, problems were noted that related to safe access and water drainage. This sub-project is to relocate the water quality monitoring equipment to Building B10 for Irvington Portal 1 (IP1), and install a new pump to pump water from Irvington Tunnel 2 (IT2) to Irvington Tunnel 1 (IT1) to provide IT2 water for the water quality monitoring.
- **San Antonio Backup Pipeline Carrier Water System Modifications** – The 10015319 San Antonio Back Pipeline was completed in 2016. Since that time, changes in operations have resulted in an apparent drop in water pressure in the carrier water system for two (2) chemicals including Calcium Thiosulfate for dechlorination and Hydrofluorosilicic acid for pH adjustment. The purpose of this sub-project is to modify the carrier water and chemical injection system to ensure the chemicals will be injected properly. Fish Passage facilities at the Alameda Creek Diversion Dam is to modify the VSAT power supply system, replace the main photovoltaic battery bank and realign several valves and actuator drive stems.
- **Alameda Creek Diversion Dam Power and Communication Facilities** (new sub-project addition in 2022) – The 10015317 Alameda Creek Diversion Dam Fish Passage Facilities (WD-2729 contract) is a sub-project to the Calaveras Dam Replacement Project, which will close out on 3/31/2022. After operating the fish passage facility for over one year, a few deficiencies were discovered in the power system for the communication facilities, the main power system, and a few of the valves and gates. Job Order Contracts (small contracts less than one million dollars in value) will be used to address these issues under this new sub-project. This subproject is to modify the VSAT power supply system, replace the main photovoltaic battery bank and realign several valves and actuator drive stems.

BAY DIVISION REGION

10015282 - BDPL Nos. 3 & 4 Crossover/ Isolation Valves (Completed)

The project consists of:

- Two (2) large vaults that are primarily below-ground installations with only the top 30 inches of the structure exposed. Above-ground facilities include security fencing and satellite communication dishes. The vaults are approximately 2,400 feet apart along the BDPL Nos. 3 and 4.
- Each vault includes four (4) mainline isolation valves and a crossover valve. The isolation valves are hydraulically operated, while the crossover valves are electrically operated.
- The existing BDPL No. 3 is a 78-inch-diameter reinforced concrete pipe, and BDPL No. 4 is a 96-inch-diameter PCCP. At each vault, approximately 170 feet of each pipeline will be replaced with welded steel pipe.

- Each facility will be equipped with connections for portable electric generators, and a battery system will provide immediate emergency power to operate the hydraulic system.
- Valve actuators will have remote monitoring and operating capability through the SFPUC SCADA system.

10015283 - Seismic Upgrade of BDPL Nos. 3 & 4 (Completed)

The existing pipeline fault crossing between the two (2) crossover/isolation valve vaults constructed under the BDPL Nos. 3 & 4 Crossover/Isolation Valves Project is about 2,400 feet in length, and consists of BDPL No. 3, a 78-inch-diameter reinforced concrete cylinder pipe, and BDPL No. 4, a 96-inch-diameter PCCP. These vaults are located east and west of I-680 near the intersection of Mission Boulevard. The current project scope includes replacement of about 2,300 feet of BDPL No. 3. Ongoing investigations have determined that improvements to BDPL No. 4 are also required to facilitate the failure of BDPL No. 4 in a controlled manner that does not cause the failure of BDPL No. 3. It is planned that about 400 feet of the new BDPL No. 3 will cross Trace A under I-680 in an existing oversized corrugated metal pipe; about 300 feet that crosses Trace B under Mission Blvd. will be in a newly constructed concrete vault ("box culvert"); and the remaining new pipeline will be buried. All new construction will be in the SFPUC's existing right-of-way (ROW).

The project primarily consists of:

BDPL No. 3:

- A new 300-foot-long concrete vault will be constructed under Mission Boulevard near the I- 680 Interchange where Fault Trace B is located. A new 300-foot segment of 72-inch welded steel BDPL No. 3 will be installed inside the vault. Within the vault and on either end of the fault trace zone, 72-inch-diameter ball joints and slip joints will be installed that will accommodate pipeline displacement during a seismic event.
- For the crossing under I-680 at Trace A, about 400 feet of 78-inch-diameter welded steel pipe will be installed in an existing, unused corrugated metal pipe. About 1,450 feet of additional new 78-inch diameter welded steel pipe will connect the existing and new segments between the two (2) vaults, and will be buried.

BDPL No. 4:

- About 400 feet of new 80-inch steel liner will be installed inside BDPL No. 4 at Hayward Fault Trace C.
- BDPL No. 4 will be encased with concrete outside the existing slip joint vault at Hayward Fault Trace B.
- Modifications to the existing slip joint vault will be made including enlarging BDPL No. 4 pipe penetrations in the vault, new drainage systems, new roof panels and adjustments to the existing slip joint.
- Modifications to the existing BDPL No. 3 (to be abandoned in place) to collect and divert water from the area and prevent the undermining of the new BDPL No. 3.
- About 400 feet of new 90-inch diameter welded steel pipe will be installed at Trace A of the Hayward Fault.
- Relocation of the following utilities: two (2) Alameda County Water District water pipelines, one (1) Union Sanitary District sewer pipeline, one (1) conduit of AT&T phone lines, and one (1) six-inch diameter PG&E gas pipeline.

10015299 - SCADA System - Phase II (Completed)

The project primarily consists of:

- Establish a common software platform and migrate all elements to this platform.
- Connect existing flow meters and new pressure transmitters, and provide communication to SCADA master station at five (5) major Bay Area Water Supply and Conservation Agency (BAWSCA) customer sites.
- Install pressure transmitters, perform piping modifications, and provide communication to SCADA

master station at seven (7) existing regulating valves in the City of San Francisco distribution system.

- Install new flow and pressure monitoring devices at 23 key locations in the City distribution system.

10015308 - BDPL Reliability Upgrade – Tunnel (Completed)

The tunnel extends 5 miles under San Francisco Bay and is adjacent to the marshlands between the vicinity of the Ravenswood Valve Lot and the Newark Valve Lot. The tunnel will be constructed with a Tunnel Boring Machine (TBM). The final tunnel lining will consist of a 9-foot- diameter welded steel pipeline. The tunnel will terminate on each end with vertical shafts and a connection to the BDPL Nos. 1, 2, and 5 piping manifolds. The two (2) piping manifolds are provided under the BDPL Reliability Upgrade - Pipeline Project. The tunnel spoils are anticipated to be used as part of the conversion of adjacent salt ponds to marshland. The portion of the existing BDPL Nos. 1 and 2 that are replaced by the tunnel will be capped on each end and will be abandoned in place.

Two (2) facilities were added to the original scope of work as part of the March 2014 Revised WSIP and are necessary to ensure the project will meet LOS goals:

- SCADA Communications system at Newark Valve Lot - This added scope provides for the installation of a SCADA communications system and integrating such system into the existing water quality monitoring equipment located in the Newark Valve Lot Control Building. The work consists of installing communications equipment, telephone line, wires, conduits, and electrical cabinets.
- 42-inch diameter Bay Division Pipeline No. 2 (BDPL2) Bypass - The supply from the Newark Valve Lot to the City of Hayward is currently being fed from both Bay Division Pipelines (BDPL) No. 1 and No. 2. Upon the completion of the Bay Tunnel Project, Hayward supply will be fed only by BDPL2. BDPL2, built in the mid-1930s, is a mixture of reinforced concrete cylinder pipe and wrought steel pipe. Thus, with the original scope of the Bay Tunnel project, the reliability of the Hayward service line could be reduced when the project is completed. The scope of work for this change provides for the installation 640 lineal feet of new 42-inch diameter welded steel pipe, replacing a portion of BDPL2, thereby increasing the reliability of the Hayward service.

10015309 - BDPL Reliability Upgrade – Pipeline (Completed)

The project primarily consists of:

- In the East Bay, 7 miles of 72-inch-diameter pipe will be constructed between the Irvington Portal and the Newark Portal of the new Bay Tunnel. On the Peninsula, 9 miles of 60-inch- diameter pipe will be constructed between the Ravenswood Portal of the new Bay Tunnel and the portal of the Pulgas Tunnel.
- A seismically resistant crossing of the Hayward Fault will be constructed. The crossing will include a new crossover valve vault on each side of the fault. The valves will be hydraulically actuated and will include emergency batteries. The pipe between the vaults will be higher strength and will be installed on a special foundation or trench section.
- Isolation valves and an interconnecting pipe manifold will be constructed at each portal of the new Bay Tunnel. The facilities will include new or rehabilitated control buildings with new emergency generators.
- New crossover valves between BDPL Nos. 2 and 5 will be installed at a location in Redwood City. The crossover facility will include a new or rehabilitated control building and connections for a portable emergency generator.
- A new throttling valve will also be added on BDPL No. 5 at the Pulgas Valve Lot. The throttling valve will include a new or rehabilitated control building.
- The project originally included underground concrete vaults for crossover facilities at Newark, Ravenswood, and Redwood City Valve Lots. The current project eliminates the concrete vaults and directly buries the valves with full access to valve actuators at these facilities.

10015310 - BDPL Reliability Upgrade - Relocation of BDPL Nos. 1 & 2 (Completed)

The project includes relocation of approximately 600 feet of each pipeline (BDPL Nos. 1 and 2) at the BART/railroad crossings. The pipe segments to be relocated will be installed inside new casings that

will be placed by the construction contractor doing the other development work in the area. The encased pipes are being installed in accordance with a utility agreement between the City of Fremont and the SFPUC.

10015324 - BDPL Nos. 3 & 4 Crossovers (Completed)

The three (3) proposed crossover facilities are located near the Guadalupe River in Santa Clara, near Barron Creek in Palo Alto, and near Bear Gulch in Atherton. The facilities include vaults that are largely below-ground, with only the top 30 inches exposed. They are very similar to one another, consisting of four (4) mainline valves and a crossover valve. Emergency engine generators will be included as an optional bid item.

10015338 - SFPUC/EBMUD Intertie (Completed)

The project primarily consists of:

- Providing new 36-inch-diameter piping and valving at the Newark Turnout to provide an additional connection between BDPL Nos. 1 and 2 to the existing City of Hayward system.
- Using the existing City of Hayward system for conveyance and providing six (6) new valves for isolation.
- Providing 1.3 miles of new 36-inch-diameter pipe to connect the City of Hayward system to the EBMUD system and providing a new pump station along this alignment.

10015341 - BDPL No. 4 Condition Assessment PCCP Sections (Completed)

This project is 100% complete and has been closed out. This project includes a detailed condition assessment of the two PCCP segments along BDPL No. 4. The first reach of concern (Reach 1) is 8.6 miles long and 96-inches in diameter. The second reach of concern (Reach 4) is 8.0 miles long and 84-inches in diameter. The condition assessment consists of an electromagnetic survey, seismic risk analysis, corrosion survey, visual inspection, and field investigations.

The assessment identified six (6) reaches of pipe (144 feet total out of 16 miles) that are potentially distressed. During initial investigations, the condition of one (1) distressed pipe segment (Pipe 1558) was determined visually to be particularly deteriorated, and immediate emergency repair was recommended. The project funded and completed emergency repair, using post-tension exterior tendon repair, for this segment. For the other five (5) potentially distressed pipe segments that were identified using electromagnetic survey, and determined to be of lower priority, recommendations were made for future excavation to confirm pipe condition in these areas, and repair if needed. A number of future follow-up investigations were recommended, including monitoring of groundwater acidity for a period of one (1) year in the area of Edgewood Road, and additional excavations of lower priority pipe pieces. Any additional required repairs will be scheduled based on urgency and funded through the Water Enterprise's Repair and Replacement (R&R) Program.

10015484- WSIP Closeout - Bay Division (Completed)

- **Site Drainage and Pipe Coating Repairs** - This sub-project will focus on providing a drainage system solely within SFPUC's Right-of-Way to address an erosion issue that developed after the construction of the 10015283 Seismic Upgrades of BDPL Nos. 3 & 4. In addition, this sub-project will include repairs to coatings on the pipe and pipe supports of the Bay Division Pipeline (BDPL) No. 3 to address issues that developed inside the articulated vault after construction was completed. The sub-project includes design, construction, and management of the drainage system work.
- **Bay Tunnel Warranty Inspection and BDPL 1 & 2 EIR Mitigation** – This sub-project advances the planning for a decommissioning study of the existing BDPL Nos. 1 and 2 until such time that the funding for a new Water 10-Year Capital Improvement Project (CIP) to further study mitigation alternatives and pursue removal of the BDPL Nos. 1 and 2 within the Don Edwards San Francisco Bay National Wildlife Refuge becomes available in FY2020-21.
- **Hydro-seeding at Bay Tunnel Project** - Due to the drought conditions and timing of hydro-seeding performed for the Bay Tunnel Project outside of the typical seasonal window, it may not be possible to

file the Notice of Termination (NOT) to close out the storm water permit prior to the Bay Tunnel Project closeout date, as the 70% growth take requirement, with less than 10% noxious weeds, may not be achieved by that time. Accordingly, the scope of this sub-project provides for monitoring of the hydro-seeded areas, removal of noxious weeds and potentially re-seeding some of the areas at the tunnel portals in Menlo Park and Newark if the storm water performance objectives are not met.

• **Newark Valve Lot Additional Gravel Placement** - The Bay Tunnel Project design plans call for a portion of the Newark Valve Lot to be landscaped and hydro-seeded. However, based on recent discussions, Operations staff are requesting that gravel be placed in this area since it will be a high traffic area during shutdowns and other maintenance work. Accordingly, this sub-project provides for the purchase and placement of the gravel.

• **Corrosion Protection for Valve E50U** – The E50U Valve was installed in 2011 as part of the 10015309 BDPL Reliability Upgrade – Pipeline Project. Immediately prior to the Bay Tunnel Project in-service/commissioning date in early Fall 2015, the Bay Tunnel Contractor completed the flanged connection of the manifold to the existing E50U Valve. However, during the installation and testing of the new flanged connection, the Bay Tunnel Contractor discovered an inconsistency in the corrosion protection isolation system of the existing valve E50U (high corrosion potential). It was decided to not authorize a Change Order to fix the corrosion problem of the E50U Valve at that time due to the risk of potential delays to the Bay Tunnel Project, at high cost, if leaks were to occur after the solution was implemented. Accordingly, this sub-project includes excavating and shoring the area around the valve, and removal of one bolt at a time for testing and replacing of the bolts (if necessary). A gasket will be purchased and may be installed if there are leaks that develop after the bolts are removed, cleaned and replaced. The proposed work on the valve will be done during the shutdown of the Bay Tunnel for warranty inspection in Winter 2016/2017.

• **Ventilation and Sump Pump Systems Installation (new sub-project in 2018)** - This sub-project provides improvements for inspection, monitoring and maintenance associated with the construction of the 10015283 Seismic Upgrades of BDPL Nos. 3 and 4. The BDPL No. 3 pipe, slip joint, ball joints and pipe supports and seismic monitoring equipment inside the articulated vault require on-going inspection, monitoring and maintenance. The type and frequency of inspection and maintenance were not well defined during the design phase; it is now clear that a fixed ventilation system is required for the BDPL No. 3 vault. Furthermore, the BDPL No. 4 expansion joint vault also requires access for inspection and monitoring; installation of a sump pump is required to remove water from the vault prior to inspections. Accordingly, the scope of this sub- project is to install a fixed ventilation system and a sump pump system to eliminate the need for removing access hatches and installing temporary fans and sump pump prior to accessing the vaults for frequent inspection and maintenance needs.

PENINSULA REGION

10015285 - Lower Crystal Springs Dam Improvements (Completed)

The project consists of:

- Spillway modifications that include widening the spillway, constructing two (2) bridge piers within the spillway to accommodate rebuilding of a San Mateo County Bridge, removing the existing timber stop-log system, constructing a new weir system within the spillway, installing access cat-walks for operation and maintenance, and eliminating water ponding on top of the dam.
- Parapet wall modifications that include raising the wall that is located on top of the upstream face of the dam and raising the approach walls to the spillway.
- Stilling basin modifications at the base of the spillway that include removing the existing basin, constructing a new larger basin, and adding downstream riprap protection at the toe of the basin.

10015287 - New Crystal Springs Bypass Tunnel (Completed)

The project consists of:

- A 4,200-foot-long tunnel with an 8-foot-diameter welded steel liner.
- Vertical shafts on each end of the tunnel to accommodate the TBM and future maintenance.

- The southern shaft will include a connection to the existing CSBPL near the north end of the existing Crystal Springs Bypass Tunnel; the existing pipeline has been determined to be seismically reliable in this area.
- The northern shaft of the new tunnel will tie into the southern ends of both the Crystal Springs Pipeline (CSPL) No. 2 and the Sunset Supply Pipeline (SSPL). The connecting segment and tie-in to the SSPL will be provided by this project. However, the connecting segment and a blind flange for CSPL No. 2 will be provided by the Crystal Springs Pipeline No. 2 Replacement Project, and this project will tie into the blind flange. This contractual arrangement is used to prevent two (2) shutdowns of the CSPL No. 2.
- New isolation valves and valve vaults.
- Standby power near valve vault G40.
- The existing pipeline will remain in service to provide redundancy for inspection of the tunnel.

10015288 - Adit Leak Repair - Crystal Springs/Calaveras (Completed)

The project consists of:

- Crystal Springs Outlet Tower No. 1: repairing leaks inside the tower, blasting and recoating piping and valves, replacing the roof, structurally retrofitting the access footbridge, and installing a marine hatch at the tower drain.
- Crystal Springs Outlet Tower No. 2: installing a marine hatch at the tower drain.
- Calaveras Outlet Tower: installing a dewatering pump, replacing a deteriorated valve actuator, and providing ladder fall protection.
- San Antonio Outlet Tower: installing a dewatering pump and repairing leaks inside the tower.

10015293 - Pulgas Balancing - Inlet/Outlet Work (Completed)

The project includes new inlet and outlet piping designed to direct the path of the water in such a manner as to promote better mixing. The shutdowns associated with construction of these improvements also provided an opportunity to perform a condition assessment of the reservoir interior that has been used to help identify work associated with the Pulgas Balancing - Structural Rehabilitation & Roof Replacement Project.

10015294 - Pulgas Balancing - Discharge Channel Modifications (Completed)

The discharge channel modifications to be built under this project will accommodate the anticipated maximum flow of 250 mgd. Project components include raising the channel walls, repairing concrete cracks and exposed reinforcing steel, strengthening and interconnecting the channel floor sections, and strengthening the tall tapered wall near the Pulgas Tunnel.

10015295 - Pulgas Balancing - Structural Rehabilitation and Roof Replacement (Completed)

The project includes structural rehabilitation of the reservoir, which consists of seismic retrofit of the walls, installation of a new steel frame roof, and repairs of concrete cracks and exposed reinforcing steel. The general rehabilitation also includes the installation of a new ventilation system and sampling ports, the replacement of utility piping, and the upgrade of the electrical system.

10015297 - Pulgas Balancing - Modifications of the Existing Dechloramination Facility (Completed)

Improvements to the dechloramination and pH control facilities are necessary to address immediate compliance issues. The modifications are anticipated to primarily be made to the flow measurement and control system, and to the various process control and chemical feed systems. Emphasis will be placed on chlorine removal and pH adjustment first to comply with existing regulations, with consideration towards the interdependent secondary goal of maximizing ammonia removal for nutrient control in the reservoirs. The scope of this project will be refined further as design efforts continue to move forward.

10015302 - Cross Connection Controls (Completed)

The project consists of providing improvements at the 304 sites identified to address potential cross connections. The work varies from site to site due to specific site conditions. The major work elements typically include:

- Install air gaps at blow-off locations and at air valves
- Install backflow protection devices
- Reconstruct or raise existing vaults
- Install new vault covers
- Replace existing air valves
- Modify, relocate, or remove existing blow-off facilities

10015303/ 10015304/ 10015305, Harry Tracy Water Treatment Plant Short-Term Improvements (Completed)

The projects consist of:

- 10015303 (HTWTP Short-Term Improvements - Demo Filters): Retrofit of two (2) filters and full-scale performance demonstration testing (project has been completed).
- 10015304 (HTWTP Short-Term Improvements - Remaining Filters): Scope of that project combined with Project 10015304.
- 10015305 (HTWTP Short-Term Improvements – Coagulation & Flocculation/Remaining Filters):
 - o Coagulation improvements that include restoring and improving operation of the pumped-jet flash-mix system, increasing capacity of the flash-mix pumps, providing the pumps with variable speed controls to improve efficiency, providing an automated dilution water system, and reconfiguring the chemical injectors to improve performance.
 - o Flocculation improvements that include reconfiguring the baffling system to reduce headloss by widening the channels, adding new mechanical mixers with variable speed controls to improve performance and efficiency, and seismically retrofitting the walkways and basin walls.
 - o Filtration modifications to eight (8) of the ten (10) existing filters (two (2) were replaced in Project 10015303), replacing effluent control valves and backwash supply valves, providing a filter to waste system, installing new underdrains and media, and seismically retrofitting the basin walls. The project consists of retrofitting two filters and performing full-scale performance demonstration testing of the retrofitted filters. The project was successfully completed in November 2006.

10015306 - HTWTP Long-Term Improvements (Completed)

The project consists of:

- Hydraulic improvements in the various treatment units to reduce headloss and increase capacity.
- Improvements to the disinfection process by upgrading the ozone generation system and backup oxygen supply.
- Expansion of the filtration process capacity by adding five (5) new filters.
- Improvements to the sludge handling system, including the addition of improved thickening and dewatering systems.
- Improvements to the washwater system, including the addition of a second washwater tank, associated equipment and piping.
- Seismic upgrade to all critical process units.
- Electrical upgrade, including a new substation, switchgear, and motor control center. New emergency generators are being provided as part of the Standby Power Facilities - Various Locations Project.
- Interim seismic response improvements, such as automated valves, to minimize seismic hazards until the long-term improvements are complete.
- New 11.0 mg TWR and subsequent abandonment of the existing 6.5 mg and 8.0 mg TWRs.
- New seismically reliable pipelines just east of the existing TWRs.
- Miscellaneous improvements to chemical feed systems, site piping, drainage, and roads.
- Addition of a third 2-megawatt generator set to satisfy emergency power needs of new facilities added as part of the project;

- Replacement of parallel switchgear and motor control center to accommodate addition of third generator set and to provide additional operational flexibility;
- Improvements to plant's recloser to increase reliability of PG&E power to the plant;
- Additional seismic anchorage of existing equipment; and
- Hydraulic modifications to coagulation and flocculation basins.

10015307 - Peninsula Pipelines Seismic Upgrade (Completed)

The scope of this project includes geotechnical investigations to characterize the Serra Fault in the vicinity of the pipelines and to confirm assumptions about sub-surface conditions along the length of the pipelines (SAPL2 and SAPL3 from HTWTP to San Pedro Valve Lot, SSBPL from HTWTP to Capuchino Valve Lot, and Sunset Supply Pipeline (SSPL) from Capuchino Valve Lot to San Pedro Valve Lot). In addition, hydraulic modeling has been performed to review system/facility requirements to meet system goals. The objectives of the investigations were: 1) to determine the potential fault offset at the Serra Fault crossings and the potential response from the three (3) pipelines to these offsets, and 2) to determine potential for pipeline rupture due to displacement from liquefaction, landslides, and other seismically-triggered hazards along the pipeline alignments.

The extensive geotechnical and modeling analyses performed to date have been carefully reviewed to identify specific project recommendations. The refined project scope currently includes the following components: The refined project scope (Phase 1) currently includes the following components at five (5) locations on the San Francisco Peninsula to address Serra Fault Crossing locations and liquefaction hazard potential in the Colma Creek area:

- Colma Site – Replacement of an approximately 700-ft segment of SAPL2
- South San Francisco Site – Replacement of an approximately 720-ft segment of SAPL2
- San Bruno North Site – Stabilization of SAPL2 where it extends through a tunnel
- San Bruno South Site – Replacement of an approximately 1,170-ft segment of SAPL2 and an approximately 1,050-ft segment of SAPL3; and
- Millbrae Site – Replacement of an approximately 900-ft segment of SSBPL A common staging area is planned to be located at SFPUC Baden Valve Lot in South San Francisco on El Camino Real. Phase 2 of the project will include installation of two (2) new isolation valves near the Baden Valve Lot on SAPL No. 2 and No. 3 in the City of South San Francisco.

The WSIP construction contract will include both Phases 1 and 2.

Phase 3 has been identified as a non-WSIP project, and includes condition assessment and improvements to SAPL2, installation of new isolation valves, and the potential addition of flexible connections along the alignment within the City of San Francisco.

10015311 - Capuchino Valve Lot Improvements (Completed)

This project is 100% complete and has been closed out. The project primarily consists of replacing two (2) existing isolation valves; providing new electric actuators for valve operation; performing concrete crack repair to prevent water leakage into the vault; providing new instrumentation and control systems for valve operation and pressure monitoring; and relocating the existing electrical and instrumentation systems outside the vault.

10015313 - Crystal Springs/San Andreas Transmission Upgrade (Completed)

Improvements will be made to the Upper Crystal Springs Dam discharge culverts, the Lower Crystal Springs outlet structures, the Crystal Springs Pump Station (CSPS), the CSSA Pipeline, and the San Andreas outlet structures.

The project primarily consists of:

- The Upper Crystal Springs Dam includes two (2) discharge culverts. During geotechnical investigations, it was confirmed that the lower culvert crosses the 1906 San Andreas Fault. Improvements will be made to the lower culvert to ensure its operation following a San Andreas Event. This will involve lining the culvert to provide operational and seismic protection and providing a second discharge riser on the east side of the San Andreas Fault.

- The Lower Crystal Springs Outlet Structures Nos. 1 and 2 improvements include removal of all equipment from the outlet towers and installation of new submerged adit valves; removal of the free-standing portion of the towers and bridge to address seismic concerns; installation of reliable adit selection system; and installation of fish screens. Additionally, the tunnels and pipe systems leading from the outlet structures to the CSPA will be improved.
- A new CSPA, together with site piping and valving, will be constructed with increased capacity to meet LOS goals and other functionalities, similar to those provided by the existing pump station. Additionally, a new electrical substation; emergency backup electrical generators for emergency demands, yard valves and small auxiliary pump (but not for large pumps); and security-related site improvements will be provided.
- The emergency chlorination system at the existing CSPA will be replaced with a portable chlorination system to provide more reliable response during an emergency.
- The CSSA Pipeline improvements include improvements to the first 800 feet of pipeline (upstream end of pipeline) to provide reliable operation at a higher operating pressure; replacement of the last 1,400 feet of the pipeline (downstream end of pipeline) to address seismic hazards; replacement and refurbishment of all appurtenances and lining to provide a 50-year life and protect against surge and seismic hazards; improvements, installation, and repair to 31 drainages that cross the pipeline alignment; and road improvements to provide access for maintenance and emergency response.
- The San Andreas Reservoir Outlet Structure Nos. 2 and 3 improvements include seismic retrofit to the structures; construction of an approach channel; modifications to the adits; replacement of all equipment in the towers; and installation of emergency isolation valves, reliable adit selection systems, and fish screens.
- The pipe in the tunnel leading from the San Andreas Outlet Structure No. 2 to the raw water pump station at the HTWTP will be replaced with a tunnel liner system.
- The tunnel portal of San Andreas Outlet Structure No. 3 will be retrofitted to protect the pipeline from the Serra Fault crossing.
- The isolation valves at Upper Crystal Springs Dam were removed from the contract per direction from DSOD. The concern was that the installation of these valves would bring the Upper Crystal Springs Dam (Hwy 92) under DSOD's jurisdiction.
- Part of one segment of pipeline from the Crystal Springs Pipeline No. 2 project was added to this contract. This segment runs along the access road to the pump station and was added to avoid conflict between different Contractors.

10015322 - Crystal Springs Pipeline No. 2 Replacement (Completed)

The major project elements consist of:

- Seismic reliability improvements, which include replacing or relocating a total of 1.7 miles of pipe at 12 different locations, sliplining 3.5 miles of pipe, retrofitting pipe bridge pier supports at two (2) creek crossings, providing a new connection at the CSPA, and providing a connecting segment with a blind flange for later connection to the NCSBT. The tie-in to the NCSBT will be performed under the NCSBT Project, eliminating the need for a second shutdown of the CSPL No. 2.
- Installing a new isolation valve near the CSPA area.
- Performing site improvements, including the installing fences and enclosures for exposed facilities, concealing exposed portions of pipe, and painting exposed portions of pipe.
- Upgrading the cathodic protection system along the length of the pipeline.

10015323 - San Andreas Pipeline No. 3 Installation (Completed)

This project is 100% complete and has been closed out. The major project elements include:

- Installation of 4.4 miles of 36-inch-diameter pipe with three (3) bore-and-jack street crossings along 19th Avenue and John Daly Boulevard.
- Installation of five (5) service connections.
- Installation of one (1) altitude valve at Merced Manor Reservoir, six (6) isolation valves, and a flow meter.

- Installation of a new cathodic protection system.
- Installation of three (3) connections to the San Andreas Pipeline No. 2 (SAPL2).

10015339 - Baden and San Pedro Valve Lots Improvements (Completed)

The project includes a general mechanical and seismic upgrade of existing facilities and the addition of a pressure-reducing station. Miscellaneous work will also be performed at the Pulgas Pump Station and the Pulgas Tunnel Air Shaft to facilitate moving flow southward through the system at higher pressures than normal.

The major work elements at the various sites primarily include:

- The Baden Valve Lot improvements include installation of a new pressure-reducing valve to allow water to flow from the HTWTP high-pressure zone to the low-pressure supply zone, installation of five (5) new isolation valves, replacement of three (3) existing valves, seismic retrofit of eight (8) existing vaults, replacement of onsite piping segments, replacement of the existing electrical switchgear and transformer, replacement of three (3) pumps, installation of variable frequency drives, and other miscellaneous improvements
- The San Pedro Valve Lot improvements include seismic retrofit of two (2) valve vaults, modification of the electric valve operators, installation of a new air valve, and miscellaneous site drainage improvements
- The Pulgas Pump Station improvements include replacement of one (1) isolation valve
- The Pulgas Tunnel Air Shaft improvements include site work to stabilize slopes

10015486- WSIP Closeout – Peninsula (Completed)

• **LCSD Stilling Basin Modifications & Dissipation Structure Riprap** – This sub-project is provided in response to concerns that fish may be “trapped” in the Lower Crystal Springs Dam (LCSD) stilling basin during low flow summer periods, and that high flow discharges from the new LCSD dissipation structure and potential high water levels in Pool 2 may cause erosion of the bank adjacent to the dissipation structure. The dissipation structure includes 60-inch diameter pipes with a maximum flow of 600 cubic feet per second (cfs) each and two (2) 8-inch diameter pipes with maximum flow of 7 cfs each. During flow testing of the dissipation structure, released water could be observed flowing over the dissipation structure, potentially eroding the bank adjacent to the structure. It was also observed that during summer periods, due to low flow in the channel downstream of the stilling basin, fish trapped in the basin were dying due to warm water temperatures. The purposes of this sub-project are to hydraulically connect the stilling basin with Pool 2 in order to allow fish to escape the basin in summer, and to add rip-rap behind the dissipation structure to prevent erosion. Specifically, this sub-project consists of:

- o A new deeper channel between the dissipation structure and the Pool 2, which would prevent fish from being trapped in the stilling basin
- o Installation of a new SCADA controls to the existing 8-in discharge pipeline and re-routing one (1) line to the stilling basin
- o Installation of additional rip-rap around the dissipation structure
- o Installation of a new 24-inch HDPE pipeline through an existing abandoned 60- inch pipe directed to the stilling basin
- o Coordination and facilitation of access for a piezometer drilling contractor during periods of concurrent work in the stilling basin
- o Addition of tree, shrub, and grass plantings along the creek bank in accordance with the approved re-vegetation plan

• **LCSD Valve H53 / Pipeline Investigation & Fisheries Release Valve** – As stipulated by the US Army Corps of Engineers 404 permit and the associated biological opinion by NOAA’s National Marine Fisheries Service (NMFS) covering the SFPUC activities at the Crystal Springs Pump Station (CSPS), the SFPUC is to take measures to protect the threatened Central California Coast (CCC) steelhead present in San Mateo Creek at CSPS site. One measure requires the release of fresh water at a rate of

3 to 17 cubic feet per second (cfs) depending on the season in recorded dry and wet years. This sub-project will utilize modification of an existing pipeline to release the required flows to the LCSD stilling basin feeding San Mateo Creek. Specifically, this sub-project consists of:

- o Condition assessment of the existing 60-in diameter pipeline from Valve H-53 to the stilling basin. In addition, valve H-53 will be exposed and visually inspected to determine its condition, requiring excavation and shoring of a pit approximately 20 feet long by 20 feet wide by 20 feet deep.
- o Depending on the verified condition, viable alternatives, including abandonment of the option to use H-53 pipeline, will be evaluated.
- o The approved option will include a SCADA controlled 12-inch valve installed at the discharge end of the pipeline. Depending on the condition of the pipeline, the approved option may also include repairs to the pipeline lining. Options may also include slip-lining the existing line with a smaller diameter pipeline such as 12 to 24-in diameter flexible polypropylene pipe.
- o Use of a temporary pipeline “line stop” and associated shoring upstream of Valve H-53 to allow for potential installation of a permanent blind flange.
- o Replacement of leaking plug valves that discharge from an existing concrete vault to the stilling basin with new knife gate valves.
- o Installation of new flow control valves, isolation valves and appurtenances for Pool 2.
- o Connections to the existing 72-inch pipeline using hot taps.
- o Construction of a new concrete walkway from the access road to the existing stairs at the flow dissipation structure adjacent to the stilling basin.

• **New Crystal Springs Bypass Tunnel Electrical Modifications** – The New Crystal Springs Bypass Tunnel (CUW35601) was commissioned in July 2011 and the project administratively closed in August 2012. Various inspections of the above ground facilities discovered excessive groundwater intrusion and resultant corrosion of equipment and electrical components. Preliminary inspections identified the following in the South Shaft: groundwater seepage into the venturi meter and valve G32 vaults through pipe/conduit wall penetrations, resulting in coating failure and localized corrosion. In the North Shaft, preliminary investigations identified surface runoff is entering electrical boxes. In addition, groundwater was seeping through wall penetrations into G36 and G38 vaults. Due to the high moisture, some electrical switches and two (2) actuators failed and required replacement. This sub-project developed a thorough documentation of the above ground facilities at the north and south shafts and designed and implemented repairs as warranted. Repairs included replacement of damaged equipment and electrical components, water proofing of the affected vaults, and rechanneling of surface runoff as necessary. This subproject is 100% complete and has been closed out.

• **Closeout of DSOD Permit Applications for LCSDI and CSSA Projects** – California Department of Water Resources, Division of Safety of Dams (DSOD) issued Alteration Permits allowing the start of construction of CUW35401, Lower Crystal Springs Dam Improvements (LCSDI) Project (Application No. 10-6) and the construction of 10015313, Crystal Springs / San Andreas Transmission Upgrade (CSSA) Project (Application No.10-10). In June 2015, DSOD issued an approval of the completed work and requested the SFPUC to submit the final documentation of each project. Under this sub-project, the following information and documents will be extracted from the project files and submitted in a format acceptable to DSOD: affidavit of actual costs of construction and design; full size as-built drawings stamped and signed by a California registered Civil Engineer; and final concrete testing summary reports.

• **Coordination with San Mateo County Bridge Construction over LCS** - The implementation of the CUW35401 Lower Crystal Springs Dam Improvement (LCSDI) Project required the demolition of an existing San Mateo County (SMC) Bridge that spanned over the LCSD crest. With the completion of the LCSDI Project, SMC awarded the construction contract for the new bridge and gave notice-to-proceed to the construction contractor in January 2016. To support this, SMC and the SFPUC executed a Memorandum of Understanding outlining the roles and responsibilities and expectations of both organizations. Accordingly, this sub-project will support the coordination between the SFPUC and SMC Bridge Project team. Typical activities may include response to relevant Requests for Information (RFI) such as existing site conditions, existing dam design, coordination with SFPUC Operations and

Watershed groups; field inspection of placement of the bridge piers over the dam and the construction of the SFPUC funded catwalk; and attendance of construction meetings and participating in other activities concerning the water quality in Lower Crystal Springs Reservoir, security measures, and other aspects affecting SFPUC assets.

• **Harry Tracy Water Treatment Plant (HTWTP) Improvements (new sub-project in 2018)** - The Harry Tracy Long-Term Improvements Project (10015306) was completed in 2014. Since 2014, the following needs were identified to address construction issues and improve operations at the plant to fully meet the LOS goals and objectives:

- o Automate the 12-inch gate valve at the High Rate Clarifiers' filter to waste manhole to eliminate the need for Operations to manually operate the valve on a frequent basis
- o Modify Sludge Tank No. 1 piping to eliminate cavitation in the washwater pumps
- o Upgrade the filters of three (3) emergency generators from passive filters to active filters to increase the effectiveness of the exhaust filtration and to reduce the need for Operations to constantly clean the filters
- o Repair leaks in the filter gallery channels where stainless steel angle plates were added to support several concrete walls
- o Automate flushing of the sludge transfer pumps and piping to eliminate the need for Operations to manually flush on a frequent basis
- o Replace and relocate failed variable frequency drives (VFDs) for the wash water and sludge transfer pumps to address an over-heating issue
- o Install double containment for the diesel fuel supply lines for the exterior generator to protect against leaks into the environment
- o Provide training and programming modifications to the Raw Water Pump Station switchgear equipment to enable remote SCADA control
- o Install vibration control monitoring system on the electrical panels at the Raw Water Pump Station to replace the existing obsolete system
- o Evaluate/Assess condition of failed mixers in the equalization basin

• **Crystal Springs/San Andreas Pipeline (CSSA) Erosion Repairs (new sub-project in 2018)** - The heavy winter storms of 2017 exacerbated erosion at two (2) watershed culvert locations, OW-13 and OW-18, along the CSSA Pipeline. Erosion has caused the CSSA Pipeline to be exposed and potentially undermined. The scope of this sub-project is to repair the erosion with systems consistent with the requirements of permitting agencies such as the State Water Resources Control Board.

SAN FRANCISCO REGIONAL REGION

10015241 - Regional Groundwater Storage and Recovery

The original scope of the Regional Groundwater Storage and Recovery (RGWSR) project was planned to be constructed in two (2) phases. The original scope of Phase 1 included construction of 13 new deep groundwater wells, and the original scope of Phase 2 included construction of 2 to 3 additional wells, depending upon well yield. Based on the modelling data inputs and results, it is projected that the 13 new wells constructed in Phase 1 would produce approximately 6.2 mgd of dry year supply over 7.5 years. Operating the RGSR Project during times of drought will provide data and insights into how much water can be reasonably expected to be produced by the project and if additional well stations are needed to reach the desired drought period pumping capacity. In addition to the need for collecting operational data to determine the pumping capacity of the 13 new wells, the Daly City Recycled Water Expansion Project proposes to serve recycled water to existing irrigated properties (gold courses and cemeteries) in the Colma area for irrigation use. Replacing groundwater with recycled water for irrigation use will decrease or eliminate the cemeteries' use of the aquifer, creating more in lieu storage in the aquifer for water supply use. The SFPUC will identify potential benefits to the aquifer resulting from the Daly City Recycled Water Expansion Project during project planning and design, as well as monitor operation of the project. Given the considerations noted above, the SFPUC modified the scope of Phase 2 in 2018 to install up to three (3) test wells (Ludeman North, Ludeman South, and Centennial

Trail), complete the South San Francisco Main well and pipeline, and complete other Phase 1 scope items, including chemical system monitoring, sampling, and storage at various sites. The test wells will allow for determination as to whether the identified sites could be viable production wells, and will provide valuable information related to water quality and potential pumping capacities that can be used for future planning and decision making. The test wells would not be converted to production wells at this time. Proceeding with these changes to Phase 2 will allow all 13 new Phase 1 RGWSR wells to be operated to gain experience and insight into the pumping capacities of each individual well in addition to how the wells work in combination with each other and existing municipal and irrigation wells. Staff will gain valuable experience regarding the relationship of RGWSR drought year pumping to the management of the groundwater basin. Operational experience will allow refinement of the modelled dry year water supply yield of the RGWSR project. The changes to RGWSR Phase 2 also allows for the collection of test well data at up to 3 locations for use in future planning if the operational experience with the 13 wells shows the need for more pumping capacity. This option also allows for the basin effects of the Daly City Recycled Water Expansion Project to be identified and may provide greater flexibility in the future to utilize the basin for water supply.

The approved scope for the RGWSR remains the same as approved in April 2018. However, since 2018 several scope refinements and some additions have been required for successful implementation of the project. Two out of three of the proposed test wells, Ludeman North and Centennial Trail, were installed. The third well, Ludeman South, was not built due to siting and constructability issues. The initial test results from the two test wells indicated that the combined yield of the two wells might be up to 0.6MGD. Based on the relatively low yield from both locations and additional costs required to upsize the Millbrae treatment facility in order to accept and treat these additional flows, it was decided that the test wells would not be converted to production wells at this time. However, these wells will provide valuable information related to water quality and potential pumping capacities that can be used for future planning and decision making.

Below are the Phase 1 modifications and additional work that increased the contract cost for the Phase 1 construction contract:

- Several modifications resulted during the installation of the sodium hydroxide treatment systems (for pH control):
 1. Potential water quality issues were anticipated in blending groundwater with distribution system water at two of the well stations that were planned to connect to Daly City's and Cal Water's systems; these two well stations were subsequently returned to the SFPUC and were connected to the SFPUC's water system. Sodium hydroxide systems needed to be added for these two wells in order to raise the pH to be consistent with SFPUC's water quality.
 2. At five of the well stations, to prevent potential scaling and plugging of the groundwater pipeline after sodium hydroxide addition, modifications to the chemical injection systems were made to improve mixing by moving the injection point closer to the transmission line.
 3. Miscellaneous modifications were implemented including addition of chemical piping double-containment systems; retrofits to the chemical rooms to accommodate the revised sodium hydroxide injection systems; restoration of landscape and hardscape; and installation of new fencing at several well stations.
- During construction, the decision was made to change the ammonia chemical (used to create chloramine for disinfection) from aqueous ammonia to liquid ammonium sulfate, which has been found to be much safer for worker handling. This change required revisions to engineering, operational, and maintenance requirements and documents; revisions to the application for the conditional Division of Drinking Water permit; and modifications to the chemical metering pumps, chemical piping and feed systems, and programming and controls systems.
- Seven (7) remote water quality analyzer stations were installed to replace manual water sample stations in order to collect real time data needed for water quality compliance at key monitoring point locations.
- Poor pump performance at three locations was investigated and found to be due to internal corrosion and/or presence of a foreign object. The modifications to correct performance issues included

investigations and forensic testing, installation of cathodic protection systems, replacement of damaged well column pipes and shafts, and well rehabilitation.

- Modification to the existing access road through Bay Area Rapid Transit's (BART's) right of way into one of the well stations was required to accommodate the turning radius of chemical delivery trucks and Fire Department emergency vehicles. The acquisition of the access permit from BART was significantly delayed while easement negotiations were ongoing. Additionally, Town of Colma required changes to the access design for traffic control requirements.

10015289 - Sunset Reservoir - North Basin (Completed)

This project is 100% complete and has been closed out. The project primarily consists of:

- Seismic rehabilitation, which includes stabilization of the soil dam embankment; a retrofit of the walls and roof using seismic joints, shear walls, diagonal bracing, and struts; and foundation improvements.
- General rehabilitation, which includes repairs of deteriorated concrete, replacement of part of the reservoir lining material, replacement of the inlet piping, installation of security fencing, landscaping upgrades, and other miscellaneous site improvements.

10015314 - University Mound Reservoir - North Basin (Completed)

The project primarily consists of:

- Seismic rehabilitation of the reservoir walls and roof using seismic joints, shear walls, diagonal bracing, and struts and foundation improvements. A geotechnical investigation was conducted that verified that the reservoir embankments are not subject to seismically induced failure.
- General rehabilitation, which includes repairs of deteriorated concrete; replacement of the reservoir lining material; replacement of the inlet/outlet, drain, and overflow piping; replacement of outlet and drain valves; landscaping upgrades and other miscellaneous site improvements.

SUPPORT PROJECTS

10015300 - System Security Upgrades (Completed)

The purpose of this project is to develop and integrate security components at critical water system facilities including those identified in previous vulnerability assessments and to ensure that security functions such as deterrence, detection, assessment, delay, and response will be effective. As part of this project, SFPUC Security has evaluated all WSIP projects. The project includes the identification of all necessary security components including security fencing, intrusion detection, and vehicle barriers for applicable WSIP projects. The project provides for the necessary planning and design of these facilities, while the individual WSIP projects will fund the installation and construction of civil security work such as conduit lay out, fencing, gate installation. This project will however fund the furnishing and installing Access Control and Alarm Monitoring System (ACAMS) and Digital Video Surveillance System (DVSS) equipment, and necessary security systems.

10015334 - Programmatic EIR (Completed)

This project includes the preparation of a Programmatic Environmental Impact Report (PEIR) in compliance with the California Environmental Quality Act (CEQA). The WSIP establishes LOS goals and system performance objectives and includes a number of projects that will improve the Regional Water System in respect to water quality, seismic reliability, delivery reliability, and water supply to meet delivery needs through the year 2030. The PEIR will (1) identify and analyze, at a programmatic level, the potential environmental impacts of proposed system improvements, (2) describe and evaluate feasible alternatives to the proposed program, and (3) propose mitigation measures.

The PEIR was certified by the San Francisco Planning Commission on October 30, 2008. On that same day the SFPUC approved the WSIP Goals and Objectives and adopted the CEQA Findings, including a statement of overriding consideration and the Mitigation Monitoring and Reporting Program (MMRP).

10015335 - Bioregional Habitat Restoration

The Bioregional Habitat Restoration project was created to provide a coordinated and consolidated approach to compensate for habitat impacts that may result from implementation of the WSIP projects in the San Joaquin, Sunol Valley, Bay Division, and Peninsula Regions of the SFPUC Regional Water System. The previously approved scope of the Bioregional Habitat Restoration project included projects to preserve, enhance, restore, or create approximately 2,350 acres of tidal marsh, vernal pools, white alder riparian forest, sycamore alluvial woodland, arroyo willow riparian habitat, oak woodland and savannah, sage scrub habitat, serpentine grasslands, coastal live oak woodland, annual grasslands, and oak riparian forest.

The project description includes development of compensation sites to preserve, enhance, restore, or create approximately 2,350 acres of tidal marsh, vernal pools, sycamore and oak riparian woodland, oak woodland and savannah, and serpentine and annual grasslands. The project includes design, environmental permitting, construction, construction management, maintenance and performance monitoring during a 3-year plant establishment period.

The wide variety of the types of impacts from WSIP projects resulted in the need for development of 18 compensation sites on SFPUC property and contracting with 7 property owners to secure compensation on property outside the Alameda and Peninsula watersheds. There are 7 compensation sites on SFPUC property in the Alameda watershed with an average size of 250 acres, demonstrating a significant commitment to the continued protection of species habitat. Although the average size of the 11 Peninsula compensation sites is 15 acres, the projects have been strategically placed to best benefit the San Francisco garter snake and the fountain thistle. The increase in habitat compensation addresses the addition of mitigation for the fountain thistle and changes in the Calaveras Dam Replacement Project.

10015336 - Vegetation Restoration of WSIP Construction Sites (Completed)

The purpose of this project is to provide maintenance, monitoring and reporting of onsite habitat restoration installed at the various WSIP construction sites after project construction work is completed.

10015337 - Long Term Mitigation Endowment

The scope of work and budget for this Long Term Mitigation Endowment was previously included and reported within the WSIP Regional project 10015335 Bioregional Habitat Restoration; however, the office of the City Controller has established a separate project, specific for this endowment fund in project 10015337 Long Term Mitigation Endowment.

This perpetual endowment fund was requested by the United States Army Corps of Engineers and California Department of Fish and Wildlife to provide a secure source of funds for the perpetual monitoring and maintenance of the Bioregional Habitat Restoration sites constructed in the SFPUC watershed.

10015342 - Watershed and Environmental Improvement Program (Completed)

The Watershed and Environmental Improvement Program (WEIP) includes the comprehensive identification and protection of critical watershed lands and ecosystem restoration needs within the hydrologic boundaries of the Alameda Creek, Peninsula (San Mateo and Pilarcitos Creeks) and Tuolumne River watersheds, and prioritizes the protection and/or restoration of these lands. Projects under this program will protect source water quality, native species and their habitat; and identify critical watershed lands for protection by purchasing fee title and/or perpetual conservation easements. The program also supports projects that enhance public awareness and provide education opportunities related to water quality, water supply, conservation, and environmental stewardship issues. These projects include construction of the proposed Alameda Creek Watershed Center and improved public access (e.g., trail connections) compatible with watershed management plans and policies.

Initially, specific projects were identified, including the Repair or Replacement of Niles Gage and Watershed Road Management Plan and Improvements – both in the Alameda Creek watershed. After

further research and planning, the program's focus has shifted towards permanently protecting Alameda Creek watershed lands through conservation easements and/or fee title purchase of property from willing landowners and providing education opportunities that will further the goals of the Water Enterprise Environmental Stewardship Policy. Opportunities that are consistent with the WEIP description and purpose in the Peninsula and Tuolumne watersheds will be considered as well.

APPENDIX C. LIST OF ACRONYMS

AAR	Alternatives Analysis Report
AWP	Alameda West Portal
BAWSCA	Bay Area Water Supply and Conservation Agency
BDPL	Bay Division Pipeline
BHR	Bioregional Habitat Restoration
BLS	Bureau of Labor Statistics
CDRP	Calaveras Dam Replacement Project
CEQA	California Environmental Quality Act
CIP	Capital Improvement Program
CM	Construction Management
CO	Change Order
COVID-19	Coronavirus Disease of 2019
DB	Design, Build
DWR	Department of Water Resource
EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
FC	Final Completion
FTE	Full-Time Equivalent
FY	Fiscal Year
HH	Hetch Hetchy
HTWTP	Harry Tracy Water Treatment Plant
IVP	Irvington Portal
JOC	Job Order Contract
LOS	Levels of Service
MW	Megawatt
N/A	Not Applicable
NIT	New Irvington Tunnel
NTP	Notice to Proceed
PCCP	Pre-stressed Concrete Cylinder Pipe
PG&E	Pacific Gas and Electric Company
RGSR	Regional Groundwater Storage and Recovery
ROW	Right-of-Way
SABPL	San Antonio Backup Pipeline
SAPL	San Antonio Pipeline
SAPS	San Antonio Pump Station
SCADA	Supervisory Control and Data Acquisition
SFPUC	San Francisco Public Utilities Commission
SJPL	San Joaquin Pipeline
SQS	Supplier Quality Surveillance
SSF	South San Francisco
SVWTP	Sunol Valley Water Treatment Plant
TBM	Tunnel Boring Machine
TWR	Treated Water Reservoir
UM	University Mound
UPS	Uninterruptible Power Supply
UV	Ultra Violet
VFD	Variable Frequency Drives
WSIP	Water System Improvement Program

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DATE: May 25, 2023

TO: Commissioner Newsha Ajami, President
 Commissioner Sophie Maxwell, Vice President
 Commissioner Tim Paulson
 Commissioner Anthony Rivera
 Commissioner Kate Stacy

FROM: Dennis J. Herrera, General Manager *Dennis J. Herrera*

SUBJECT: Water System Improvement Program
 Quarterly Report (3rd Quarter / FY 2022-2023)

Enclosed please find the Water System Improvement Program (WSIP) Quarterly Report for the 3rd Quarter (Q3) of Fiscal Year (FY) 2022-2023. The primary intent of the report is to provide the Commission, stakeholders, and the public with a status summary of the Water System Improvement Program based on data for the period of January 1, 2023 to March 31, 2023. This quarterly report provides a summary update on the Regional WSIP projects. The Local WSIP was completed in June 2020.

Attachment

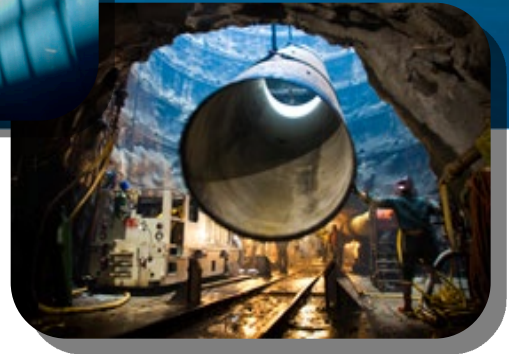
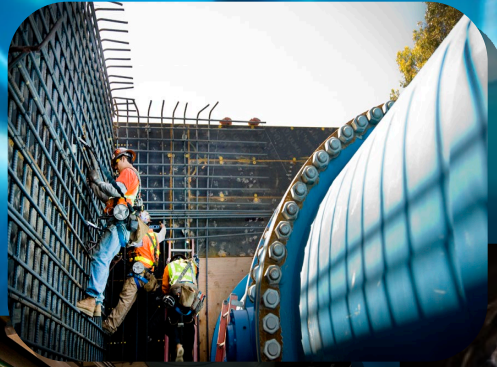
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WATER SYSTEM IMPROVEMENT PROGRAM



QUARTERLY REPORT

Regional Projects
Q3 FY 2022 | 2023
January 2023 — March 2023

Rebuilding Today for a Better Tomorrow

Published: May 25, 2023

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EXECUTIVE SUMMARY

This quarterly report provides a summary update on the regional projects in the Water System Improvement Program (WSIP) for the 3rd Quarter (Q3) of Fiscal Year (FY) 2022-2023. The primary intent of the report is to provide the San Francisco Public Utilities Commission (“Commission”), stakeholders, and the public with a status summary of the program’s regional projects for the period of January 1, 2023 through March 31, 2023.

This quarterly report incorporates program and project changes from the March 2022 Proposed Revised WSIP that was approved by the Commission on April 26, 2022 by Resolution No. 22-0080.

Program Current Status:

Figure A and Table A show the number of WSIP Regional projects and the total approved value of these projects that are active in various project phases.

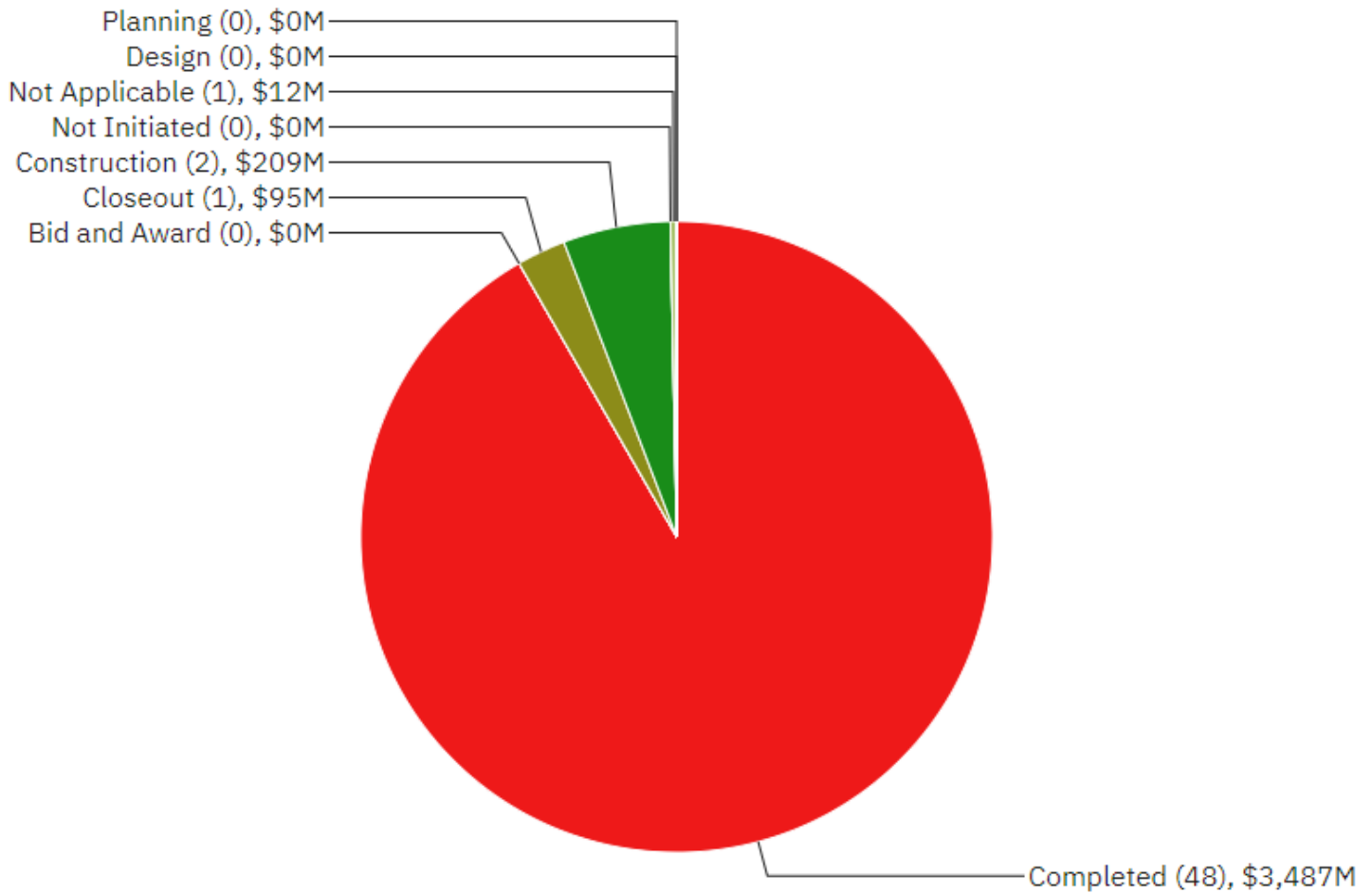


Figure A. Total Current Approved Budget for Regional Projects Active in Each Phase

Table A. Status of WSIP Regional Projects (as of March 31, 2023)

Project Phase	No. of Projects	Percent by No. of Projects	Total Project Value (\$M)	Percent by Project Value
Planning	0	0%	\$0	0%
Design	0	0%	\$0	0%
Bid & Award	0	0%	\$0	0%
Construction	2	4%	\$209	5%
Close-Out	1	2%	\$95	3%
Completed	48	92%	\$3,487	92%
Not Applicable ¹	1	2%	\$12	0%
Total	52	100%	\$3,803	100%

Note: (1) “Not Applicable” category is for the project that does not include construction: Long-Term Mitigation Endowment.

As of the end of the reporting period, two (2) regional projects with a total value of \$209M are in construction and forty-nine (49) projects with a total value of \$3,582M are in close-out or have been completed. Forty-one (41) out of forty-three (43) Regional WSIP projects with specific Level of Service (LOS) goals have achieved their LOS goals to date.

Tables B and C provide an overall program-level cost and schedule summary of the WSIP Regional Program. The total Current Approved WSIP Budget (including Regional and Local Programs, Local Water Supply Projects, and Financing Costs) and the Current Forecasted Cost at completion are each \$4,787.8 million. The Current Approved WSIP Budget and Forecasted Cost at completion for only the Regional Program (including construction contingency) are each \$3,803.1 million.

Table B. Program Cost Summary

Cost Categories	Expenditures To Date (\$ Million) (A)	2005 Baseline Budget (\$ Million) (B)	2022 Approved Budget (\$ Million) (C)	Current Approved Budget ⁽⁷⁾ (\$ Million) (D)	Q3/FY22-23 Forecasted Costs (\$ Million) (E)	Cost Variance (\$ Million) (F = D - E)
REGIONAL PROGRAM	\$3,722.1	\$3,407.3	\$3,803.1	\$3,803.1	\$3,803.1	-
Local Improvement Projects	\$331.9	\$383.2	\$331.9	\$331.9	\$331.9	-
Local Water Supply Projects	\$226.0	-	\$280.9	\$280.9	\$280.9	-
Finance	\$372.0	\$552.0	\$372.0	\$372.0	\$372.0	-
PROGRAM TOTAL	\$4,652.0	\$4,342.5	\$4,787.8	\$4,787.8	\$4,787.8	-

The Current Approved and Forecasted Schedule completion for the Regional WSIP (Local WSIP was completed in June 2020) are both February 2027.

Table C. 2022 Approved vs. Q3/FY22-23 Forecasted Schedule Dates

Category	2005 Baseline Start	2022 Approved Start	Current Approved Start*	Actual Start***	2005 Baseline Finish	2022 Approved Finish	Current Approved Finish*	Q3/FY22-23 Forecasted Finish***	Schedule Variance (Months)
Regional Program	03/01/03	03/31/03	03/31/03	03/01/03 A	06/30/14	05/05/23	02/01/27	02/01/27	-
Local** Program	03/01/03	03/31/03	03/31/03	03/01/03 A	06/28/13	7/31/18	06/03/20	06/03/20 A	Completed (-)
Overall WSIP	03/01/03	03/01/03	03/01/03	03/01/03 A	06/30/14	05/05/23	02/01/27	02/01/27	-

* The budget and schedule approved as part of the March 2022 WSIP, plus any additional budget and schedule changes approved by the Commission as part of additional contingencies on construction contracts.

** Excluding Local Water Supply projects.

*** "A" represents the actual date.

As of the end of the reporting period, the forecasted total program cost (regional and local projects) is \$4,787.8M, which is the same as the current Commission Approved Budget. As of the end of the reporting period, \$0.7M was transferred to the Construction Contingency from the program’s Director’s Reserve budget. All approved change orders (COs) in contracts total \$21.5M, and the forecasted remaining contingency is \$15.0M. Also, as of the end of the reporting period, all pending and potential COs, and trends total \$8.5M. Therefore, assuming all pending and proposed COs and trends become approved COs, the current forecasted remaining construction contingency is \$6.6M.

UPDATE ON PROJECTS IN CONSTRUCTION

As of the end of March 2023, WSIP regional construction contracts (including active, completed, and future contracts) are 99.1% complete overall.

As of the end of March 2023, monitored exposure hours on WSIP regional projects totaled 9.9 million construction person-hours. Since the implementation of the WSIP Safety Approach in April 2009, the total lost time incidence rate is 0.51, compared to the U.S. Bureau of Labor Statistics (BLS) industry average rate (2021) of 1.3.

The following is a summary of the progress made, issues encountered, and/or milestones achieved on the remaining WSIP Regional projects currently active in construction.

Regional Groundwater Storage and Recovery

For Phase 1 (Contract B), the Commission approved the agenda item for contract closeout on 1/10/2023, and as-built drawings are being converted to electronic. For Phase 2A (Contract C), the groundwater pumps have been pulled for inspection, and well rehabilitation has been completed at the nine (9) well stations. Well redevelopment at Southwood Drive Well Station has been completed. Potholing work of the existing groundwater line at the Colma BART and Millbrae well sites was completed in preparation for installation of the flowmeter. For Phase 2B (Contract D), an offer to

purchase an easement for the groundwater line crossing the Colma Creek channel was issued to San Mateo County Flood Control.

Alameda Creek Recapture Project

During the reporting period, negotiations continued with the contractor of the Alameda Creek Recapture Facility for potential change orders to 1) realign the water pipeline around the Pond F2 due to erosion conditions, and 2) relocate the tie-in point between the effluent pipeline and the existing 36-inch diameter Sunol Pipeline due to corrosion at the original tie-in location. The quarry operator presented a draft pond slope stability proposal to meet the requirements of their reclamation plan. Concerns with potential change orders and remaining construction risks, need to coordinate the quarry operator's slope stability repairs with facility construction, and staff concerns for operating and maintaining this complex and first of its kind facility in the SFPUC Regional Water System have led to a staff recommendation to terminate the construction contract. This would be followed by slope stability repairs, improvements to the facility design, and construction of the facility after the pond banks are stabilized. Approval for this recommendation will be sought from the Commission in the next quarter.

Quarterly Report - Q3 FY2022/2023

Water System Improvement Program - Regional Projects

TABLE OF CONTENTS

- 1. Program Description**
- 2. Program Status**
- 3. Program Cost Summary**
- 4. Program Schedule Summary**
- 5. Project Performance Summary**
- 6. Project Status Report**
- 7. On-Going Construction**
- 8. Projects in Closeout**
- 9. Completed Projects**

APPENDICES

- A. Project Descriptions**
- B. WSIP Approved Project-Level Schedule**
- C. List of Acronyms**



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1. PROGRAM DESCRIPTION

The Water System Improvement Program (WSIP) is a \$4.8 billion, multi-year capital program to upgrade the City of San Francisco's regional and local drinking water systems. The program will deliver improvements that enhance the City's ability to provide reliable, affordable, high quality drinking water to its 26 wholesale customers and regional retail customers in Alameda, Santa Clara, and San Mateo Counties, and to 800,000 retail customers in San Francisco, in an environmentally sustainable manner. The WSIP is structured to cost-effectively meet water quality requirements, improve seismic and delivery reliability, and achieve water supply goals.

Built in the early to mid-1900s, the water system has many components nearing the end of their working life, with crucial facilities crossing, or in close proximity to, three major earthquake faults. The San Francisco Public Utilities Commission (SFPUC) initiated the WSIP to repair, replace, and seismically upgrade the system's deteriorating pipelines, tunnels, dams, reservoirs, pump stations, storage tanks, and treatment facilities.

The program consists of 35 local projects located within San Francisco and 52 regional projects spread over seven different counties from the Sierra foothills to San Francisco. Local projects only benefit San Francisco residents whereas regional projects benefit both City residents and the 26 wholesale agencies that receive water from the SFPUC. The management of regional projects is divided into 6 regions – San Joaquin, Sunol Valley, Bay Division, Peninsula, San Francisco Regional, and Support Projects.

The WSIP is funded through the issuance of revenue bonds. Local Measures A and E, which were approved by San Francisco voters in November 2002, allowed for the financing of improvements to the City's water system using revenue bonds and/or other forms of revenue financing. Increases in the water rates of retail and wholesale customers are used to pay back the debt service on the bonds.

The program budget and schedule were originally adopted by the San Francisco Public Utilities Commission on March 1, 2003. The program at the time was referred to as the Capital Improvement Program (CIP). The scope of the CIP was changed significantly following the adoption of Level of Service (LOS) goals in early 2005. The program changes were so substantial that the program was renamed the WSIP and a new program budget and schedule were adopted on November 29, 2005. Since the scope of the 2005 Revised WSIP is in general representative of the program that is in the end stage of being implemented today, the 2005 budget and schedule are considered the "Baseline Budget and Schedule."

Subsequently, the WSIP Baseline Budget and Schedule were revised in 2007, 2009, 2011, 2013, 2014, 2015, 2016, 2017, 2018, 2020, and 2022, and these revisions were approved by the San Francisco Public Utilities Commission on February 26, 2008, July 28, 2009, July 12, 2011, April 23, 2013, April 22, 2014, December 8, 2015, April 26, 2016, February 14, 2017, April 10, 2018, April 14, 2020, and April 26, 2022, respectively. Refer to Appendix A for a scope description of all the regional projects included in the WSIP.

Program Revision	Commission Approval	Budget (\$Million)	Schedule(*)
2003 (Original)	March 1, 2003	\$3,628	03/15/16
2005 (Baseline)	November 29, 2005	\$4,343	06/30/14
2007 (Revised)	February 26, 2008	\$4,392	12/18/14
2009 (Revised)	July 28, 2009	\$4,586	12/04/15
2011 (Revised)	July 12, 2011	\$4,586	07/29/16
2013 (Revised)	April 23, 2013	\$4,640	04/11/19
2014 (Revised)	April 22, 2014	\$4,765	05/24/19
2015 (Revised)	December 8, 2015	\$4,765	05/24/19
2016 (Revised)	April 26, 2016	\$4,845	12/20/19
2017 (Revised)	February 14, 2017	\$4,845	12/20/19
2018 (Revised)	April 10, 2018	\$4,788	12/30/21
2020 (Revised)	April 14, 2020	\$4,788	05/05/23
2022 (Revised)	April 26, 2022	\$4,788	02/01/27

* Final Program Completion Date

2. PROGRAM STATUS

This third (3rd) Quarterly Report for Fiscal Year (FY) 2022-2023 presents the progress made on the WSIP Regional Program between January 1, 2023 and March 31, 2023. The program’s schedule and budget were last approved by the San Francisco Public Utilities Commission (SFPUC or Commission) on April 26, 2022. The WSIP Local Program was completed on June 3, 2020.

Figure 2.1 shows the total Current Approved Budget for the regional projects remaining in each phase of the program as of March 31, 2023. The number of projects currently active in each phase is shown in parentheses.

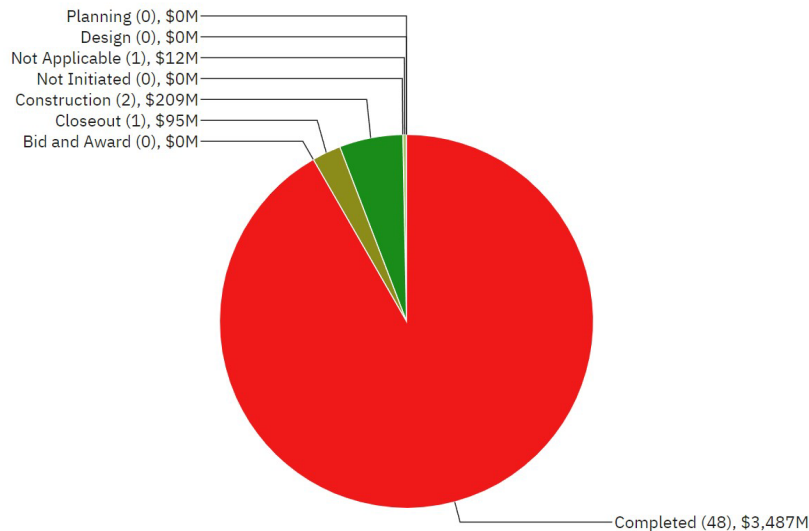


Figure 2.1 Total Current Approved Budget for Projects Active in Each Phase (\$Million)

Figure 2.2 shows the number of regional projects in the following phases as of March 31, 2023: Pre-construction, Construction, and Post-construction.

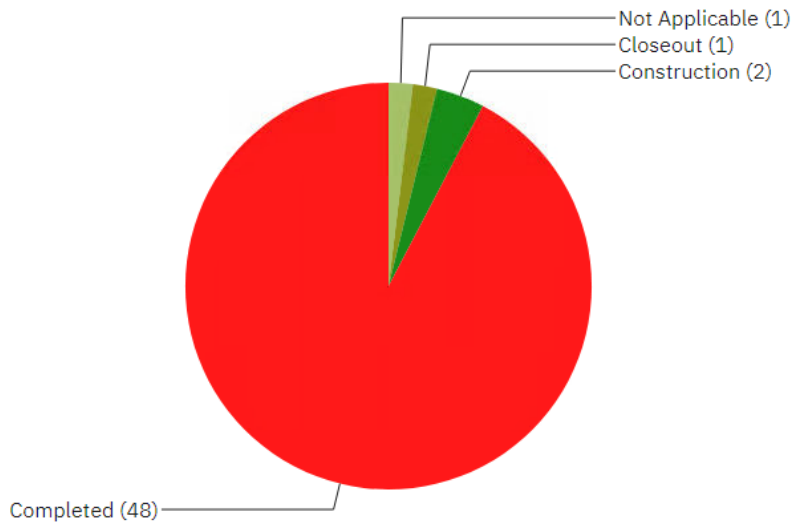


Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-construction

Figure 2.3 summarizes the environmental review and permitting status of the WSIP’s 52 regional projects as of March 31, 2023.

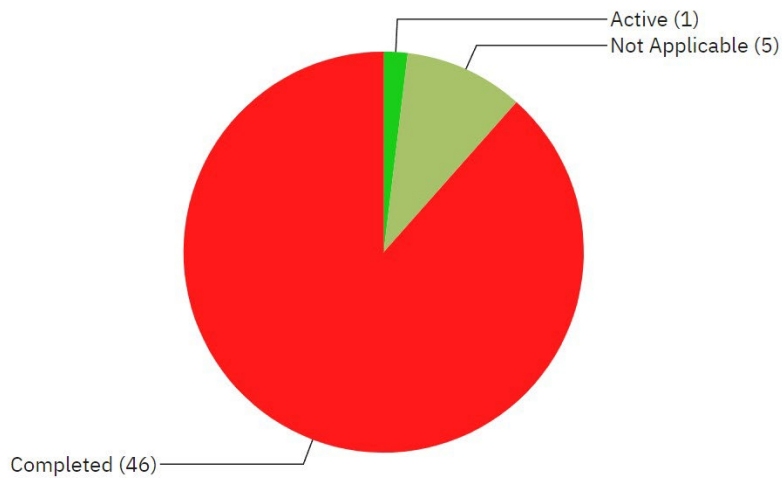


Figure 2.3 Program Environmental and Permitting Status

2.1 Progress Towards Meeting Level of Service (LOS) Goals

The scope of the WSIP is based on the following Level of Service (LOS) goals for the Regional Water System: Seismic Reliability, Delivery Reliability, Water Quality Reliability, and Water Supply Reliability. Each project that reaches construction substantial completion contributes to increasing the overall reliability of the system and achieving progress towards meeting the overall LOS goals for the system.

Table 2.1 lists the projects with their individual Primary (P) and Secondary (S) contributions towards LOS goals and indicates which projects have met their respective LOS goals. As can be seen in Table 2.1, the actual operational service start dates indicate that 41 of the 43 Regional WSIP projects with specific LOS goals have achieved their LOS goals to date. The other 9 Regional WSIP projects do not have specific LOS goals. The WSIP team remains committed to achieving the overall LOS goals established for the system.

Table 2.1 Progress Towards Meeting LOS Goals ⁽¹⁾

Project No.	Project Name / Construction Contract	Actual / Approved Substantial Completion Date	LOS Goals (P =Primary, S =Secondary)				Actual Operational Service Start	Construction Progress Toward LOS Goals
			Water Quality	Seismic Reliability	Delivery Reliability	Water Supply		
San Joaquin Projects								
CUW36401	Lawrence Livermore Water Quality Improvement <i>(Completed)</i>	08/31/10	P				08/31/10	100%
CUW37301	San Joaquin Pipeline System <i>(Completed)</i> (A) HH935A Crossovers (B) HH935B Western Segment (C) HH935C Eastern Segment	(A) 01/06/12 (B) 05/27/13 (C) 06/21/13			P		(A) 01/06/12 (B) 05/27/13 (C) 06/21/13	100%
CUW37302	Rehabilitation of Existing San Joaquin Pipelines (Roselle Crossover; <i>Completed</i>)	05/13/11			P		05/13/11	100%
CUW38401	Tesla Treatment Facility <i>(Completed)</i> (A) DB116 Tesla Treatment Facility Design-Build Contract (B) HH953 Tesla Portal Protection	(A) 06/24/11 (B) 08/05/13	P	S	S		(A) 06/24/11 (B) 08/05/13	100%
Sunol Valley Projects								
CUW35201	Alameda Creek Recapture	11/18/22				P		26%
CUW35501	Standby Power Facilities - Various Locations <i>(Completed)</i> (A) WD-2553 East Bay - Standby Power Facilities (B) WD-2511 Peninsula - Standby Power Facilities	(A) 09/11/08 (B) 04/15/10		P	S		(A) 09/11/08 (B) 04/15/10	100%
CUW35901	New Irvington Tunnel <i>(Completed)</i>	09/19/15		S	P		02/27/15	100%
CUW35902	Alameda Siphon #4 <i>(Completed)</i>	12/16/11		P	S		12/16/11	100%
CUW37001	Pipeline Repair & Readiness Improvements <i>(Completed)</i> (A) WD-2530 Phase A 8 Pipe Storage Sites (B) WD-2530 Phase B Pipe Rolling Machine Facility @ Sunol Yard	(A) 02/09/07 (B) 07/14/08		P	S		(A) 02/09/07 (B) 07/14/08	100%
CUW37401	Calaveras Dam Replacement <i>(Completed)</i> (A) WD-2551 Calaveras Dam Replacement (B) WD-2729 Alameda Creek Diversion Dam	(A) 04/12/19 (B) 02/15/19		S	P	S	(A) 04/12/19 (B) 02/15/19	(A) 100% (B) 100%
CUW37402	Calaveras Reservoir Upgrades <i>(Completed)</i>	10/06/05	P				10/06/05	100%
CUW37403	San Antonio Backup Pipeline <i>(Completed)</i>	12/31/14			P		12/31/14	100%
CUW38101	SVWTP Expansion & Treated Water Reservoir <i>(Completed)</i>	05/17/13	P		P		05/17/13	100%
CUW38601	San Antonio Pump Station Upgrade <i>(Completed)</i>	06/30/11			P		06/30/11	100%
Bay Division Projects								

Project No.	Project Name / Construction Contract	Actual / Approved Substantial Completion Date	LOS Goals (P =Primary, S =Secondary)				Actual Operational Service Start	Construction Progress Toward LOS Goals
			Water Quality	Seismic Reliability	Delivery Reliability	Water Supply		
CUW35301	BDPL Nos. 3 & 4 Crossover/Isolation Valves <i>(Completed)</i>	11/15/07		P			11/15/07	100%
CUW35302	Seismic Upgrade of BDPL Nos. 3 & 4 <i>(Completed)</i>	10/26/15		P			06/20/14	100%
CUW36301	SCADA System - Phase II <i>(Completed)</i>	11/29/10			P		11/29/10	100%
CUW36801	BDPL Reliability Upgrade – Tunnel <i>(Completed)</i>	05/20/15		P	S		10/15/14	100%
CUW36802	BDPL Reliability Upgrade – Pipeline <i>(Completed)</i> (A) WD-2541 East Bay (B) WD-2542 Peninsula (C) WD-2665 Cordilleras	(A) 12/09/11 (B) 06/13/12 (C) 03/05/13		P	S		(A) 12/09/11 (B) 06/13/12 (C) 03/05/13	100%
CUW36803	BDPL Reliability Upgrade - Relocation of BDPL Nos. 1 & 2 <i>(Completed)</i>	05/28/10			P		05/28/10	100%
CUW38001	BDPL Nos. 3 & 4 - Crossovers <i>(Completed)</i>	08/15/12		P	S		08/15/12	100%
CUW38901	SFPUC/EBMUD Intertie <i>(Completed)</i>	09/07/07			P		09/07/07	100%
CUW39301	BDPL No. 4 Condition Assessment PCCP Sections <i>(Completed)</i>	02/06/09		P	S		02/06/09	100%
Peninsula Projects								
CUW35401	Lower Crystal Springs Dam Improvements <i>(Completed)</i>	11/20/11			P	S	11/20/11	100%
CUW35601	New Crystal Springs Bypass Tunnel <i>(Completed)</i>	07/14/11		P	S		07/14/11	100%
CUW35701	Adit Leak Repair - Crystal Springs/Calaveras <i>(Completed)</i>	11/30/07			P		11/30/07	100%
CUW36101	Pulgas Balancing - Inlet/Outlet Work <i>(Completed)</i>	02/02/06	P		S		02/02/06	100%
CUW36102	Pulgas Balancing - Discharge Channel Modifications <i>(Completed)</i>	10/23/09			P		10/23/09	100%
CUW36103	Pulgas Balancing - Structural Rehabilitation & Roof Replacement <i>(Completed)</i>	07/26/11	P		S		07/26/11	100%
CUW36105	Pulgas Balancing - Modifications of the Existing Dechloramination Facility <i>(Completed)</i>	08/27/12	P		S		08/27/12	100%
CUW36501	Cross Connection Controls <i>(Completed)</i>	11/26/08	P				11/26/08	100%
CUW36601	HTWTP Short-Term Improvements - Demo Filters <i>(Completed)</i>	01/11/06		P	S		01/11/06	100%
CUW36603	HTWTP Short-Term Improvements - Coagulation & Flocculation/Remaining Filters <i>(Completed)</i>	12/21/09		P	S		12/21/09	100%
CUW36701	HTWTP Long -Term Improvements <i>(Completed)</i>	09/08/15		P	S		09/08/15	100%
CUW36702	Peninsula Pipelines Seismic Upgrade <i>(Completed)</i>	10/30/15		P			10/30/15	100%
CUW36901	Capuchino Valve Lot Improvements <i>(Completed)</i>	02/14/08			P		02/14/08	100%
CUW37101	Crystal Springs/San Andreas Transmission Upgrade <i>(Completed)</i>	06/30/14		P	S		09/02/14	100%
CUW37801	Crystal Springs Pipeline No. 2 Replacement <i>(Completed)</i>	01/31/13		P	S		01/31/13	100%
CUW37901	San Andreas Pipeline No. 3 Installation <i>(Completed)</i>	03/29/11		P	S		03/29/11	100%
CUW39101	Baden & San Pedro Valve Lots Improvements <i>(Completed)</i>	03/31/11		P	S		03/31/11	100%
San Francisco Regional Projects								

Project No.	Project Name / Construction Contract	Actual / Approved Substantial Completion Date	LOS Goals (P =Primary, S =Secondary)				Actual Operational Service Start	Construction Progress Toward LOS Goals
			Water Quality	Seismic Reliability	Delivery Reliability	Water Supply		
CUW30103	Regional Groundwater Storage and Recovery (A) WD-2600 Test Well Drilling (B) WD-2668 Regional Groundwater Storage and Recovery (Phase 1) (C) Regional Groundwater Storage and Recovery (Phase 2A) (D) Regional Groundwater Storage and Recovery (Phase 2B)	(A) 07/23/12 (B) 12/31/17 (C) 08/31/23 (D) 10/31/25				P	(A) 07/23/12 (B) 07/27/22	(A) 100% (B) 100% (C) 32% (D) 0%
CUW35801	Sunset Reservoir - North Basin <i>(Completed)</i>	09/19/08		P	S		09/19/08	100%
CUW37201	University Mound Reservoir - North Basin <i>(Completed)</i>	05/25/11		P	S		05/25/11	100%

Notes:

- 1 Support projects and WSIP Closeout projects are not listed in the table above since these projects do not have specific Level of Service (LOS) goals.

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall program-level cost summary of the WSIP Regional Program. It shows the Expenditures to Date; the 2005 Baseline, 2022 Approved, Current Approved and Q3/FY22-23 Forecasted Budgets; and the Cost Variance between the Current Approved and Forecasted Budgets.

The total Current Approved WSIP Budget (including Regional and Local Programs, Local Water Supply Projects, and Financing Costs) and the Current Forecasted Cost at completion are both \$4,787.8 million. The Current Approved WSIP Budget and Forecasted Cost at Completion for only the Regional Program (including construction contingency) are both \$3,803.1 million. The Current Approved Budget and final expenditures for the Local Improvement Projects are both \$331.9 million.

Table 3.1 Program Cost Summary

Cost Categories	Expenditures To Date (\$ Million) (A)	2005 Baseline Budget (\$ Million) (B)	2022 Approved Budget (\$ Million) (C)	Current Approved Budget ⁽⁷⁾ (\$ Million) (D)	Q3/FY22-23 Forecasted Costs (\$ Million) (E)	Cost Variance (\$ Million) (F = D - E)
Regional Improvement Projects	\$3,463.4	\$3,181.3	\$3,513.8	\$3,513.8	\$3,507.8	\$6.0
Construction Costs ⁽¹⁾	\$2,459.3	\$2,322.3	\$2,495.1	\$2,495.1	\$2,491.5	\$3.6
Program Delivery Costs ⁽²⁾	\$974.6	\$758.0	\$984.2	\$984.2	\$983.8	\$0.4
Other Costs ⁽³⁾	\$29.5	\$101.0	\$34.5	\$34.5	\$32.5	\$2.0
Support Projects ⁽⁴⁾	\$239.6	\$32.8	\$262.0	\$262.0	\$258.8	\$3.3
Construction Contingency for Regional & Support Projects ⁽⁵⁾	\$19.2	\$193.2	\$27.3	\$27.3	\$36.5	(\$9.3)
REGIONAL PROGRAM WITH CONTINGENCY	\$3,722.2	\$3,407.3	\$3,803.1	\$3,803.1	\$3,803.1	-
Local Improvement Projects	\$331.9	\$383.2	\$331.9	\$331.9	\$331.9	-
Local Water Supply Projects ⁽⁶⁾⁽⁸⁾	\$226.0	-	\$280.9	\$280.9	\$280.9	-
Finance ^(9,10,11)	\$372.0	\$552.0	\$372.0	\$372.0	\$372.0	-
PROGRAM TOTAL	\$4,652.0	\$4,342.5	\$4,787.8	\$4,787.8	\$4,787.8	-

Notes:

- Construction Costs** include the Construction Base Bid and owner-provided equipment/material for all regional and support projects. Those costs do not include any construction contingency. That contingency is reflected as a separate cost category.
- Delivery Costs** include project management, planning, environmental (CEQA, permitting, construction compliance), design, construction management, and engineering support during construction.
- Other Costs** include environmental mitigation, art enrichment, security improvements, and real estate expenses.
- Support Projects** include (1) System Security Upgrades, (2) Programmatic EIR, (3) Bioregional Habitat Restoration, (4) Vegetation Restoration of WSIP Construction Sites, (5) Long Term Mitigation Endowment, (6) Program Management, and (7) Watershed and Environmental Improvement Program. Please note that the cost reflected above for support projects only includes "Delivery" and "Other" costs, and "Construction" cost for these projects is included in "Construction Costs" under the Regional Improvement Projects.
- Expenditures to Date for Construction Contingency for Regional and Support projects correspond to the Total Approved Change Orders on those projects. For projects with ongoing or completed construction, the 2022 Approved Budget for construction contingency includes all change orders and trends as identified at the time of the March 2022 Revised WSIP, or projects in pre-construction, the 2022 Approved Budget for construction contingency includes 10% of the estimated construction base bid
- Local Water Supply Projects managed as part of the Water Enterprise Capital Improvement Program (CIP) are (1) Lake Merced Water Level Restoration, (2) San Francisco Groundwater Supply, (3) San Francisco Westside Recycled Water, (4) Harding Park Recycled Water, and (5) San Francisco Eastside Recycled Water.
- The budget approved as part of the March 2022 Revised WSIP, plus any additional budget changes approved by the Commission as part of additional contingencies on construction contracts.
- The WSIP Local Water Supply projects underwent a September 2013 re-baseline. Only the original WSIP portion of the re-baselined costs is reported here. The remaining budget is funded under the Water Enterprise CIP and is managed outside the purview of the WSIP.
- The original \$522M estimate of financing cost was based on a memorandum to the Commission dated November 23, 2005.

10. The financing cost budget of \$372M that was included in the March 2022 Revised WSIP includes all financing costs appropriated to date.
11. The actual financing cost is assumed to match the budgeted financing cost. Final reconciliation of all associated financing costs will occur upon WSIP completion.

Table 3.2 provides the current remaining construction contingency. For each region, it shows the Forecasted Construction Contingency as of Q2/FY22-23; the Total Approved Change Orders prior to the reporting quarter; Change Orders Approved during the reporting quarter; Total Approved Change Orders through the reporting quarter; Project Savings Moved to Contingency/ Funds Moved out of Contingency during the Reporting Quarter; the Q3/FY22-23 Forecasted Construction Contingency; and the Forecasted Remaining Contingency as of the end of the reporting quarter. As of March 31, 2023, the Forecasted Construction Contingency is \$36.5 million, and the Forecasted Remaining Contingency is \$15.0 million.

The total costs of Change Orders approved in Q3/FY22-23 are shown in Table 3.2.

Table 3.2 Current Remaining Construction Contingency

Region	Q2/FY22-23 Forecasted Construction Contingency ⁽¹⁾ (\$ Million) (A)	Total Approved Change Orders as of Q2/FY22-23 ^(2,3) (\$ Million) (B)	Change Orders Approved in Q3/FY22-23 ⁽²⁾ (\$ Million) (C)	Total Approved Change Orders as of Q3/FY22-23 (\$ Million) (D = B+C)	Project Savings or Director's Reserves (+) Moved to Contingency/ Funds (-) Moved out of Contingency during Q3/FY22-23 ⁽⁴⁾ (\$ Million) (E)	Q3/FY22-23 Forecasted Construction Contingency (\$ Million) (F = A + E)	Q3/FY22-23 Forecasted Remaining Contingency (\$ Million) (G = F - D)
San Joaquin Region	-	-	-	-	-	-	-
Sunol Valley Region	\$10.6	\$2.0	\$0.6	\$2.6	\$0.7	\$11.3	\$8.7
Bay Division Region	-	-	-	-	-	-	-
Peninsula Region	-	-	-	-	-	-	-
San Francisco Regional Region	\$25.2	\$20.9	(\$2.0)	\$18.9	-	\$25.2	\$6.3
Support Projects	-	-	-	-	-	-	-
Regional Total	\$35.8	\$22.9	(\$1.4)	\$21.5	\$0.7	\$36.5	\$15.0

Notes:

1. Construction Contingency approved as part of the March 2022 Revised WSIP, plus any regional projects' savings moved to contingency.
2. Approved Change Orders are changes that have received all required approvals, including that of the City Controller.
3. This table only reports change orders for the active construction contracts as of this reporting cycle.
4. Values only reflect savings realized after the Commission adopted the March 2022 Revised WSIP.

Table 3.3 provides a breakdown of forecast change orders and trends comprising the forecasted remaining construction contingency. For each region as of Q3/FY22-23, it shows the Remaining Construction Contingency, Pending Change Orders, Potential Change Orders, Trends, and Forecasted Remaining Construction Contingency. As of March 31, 2023, the Total Forecasted Remaining Construction Contingency for the Regional WSIP is \$6.6 million. This amount does not include funds that are currently held in Director's Reserve.

Table 3.3 Forecasted Remaining Construction Contingency

Region	Q3/FY22-23 Remaining Construction Contingency ⁽¹⁾ (\$ Million) (A)	Pending Change Orders as of Q3/FY22-23 ⁽²⁾ (\$ Million) (B)	Potential Change Orders as of Q3/FY22-23 ⁽³⁾ (\$ Million) (C)	Trends as of Q3/FY22-23 ⁽⁴⁾ (\$ Million) D	Q3/FY22-23 Forecasted Remaining Construction Contingency (\$ Million) (E =A-B-C-D)
San Joaquin Region	-	-	-	-	-
Sunol Valley Region	\$8.7	-	\$7.2	\$1.5	-
Bay Division Region	-	-	-	-	-
Peninsula Region	-	-	-	-	-
San Francisco Regional Region	\$6.3	-	(\$0.6)	\$0.3	\$6.6
Support Projects	-	-	-	-	-
Regional Total	\$15.0	-	\$6.6	\$1.9	\$6.6

Notes:

1. Same as Column G in Table 3.2.
2. Pending Change Orders are changes that have been negotiated and approved by the SFPUC but have to be approved by the City Controller.
3. Potential Change Orders are changes that have been requested and entered into the construction contract management database but are still being negotiated.
4. Trends are any expected impact that the CM team believes may become a change order but are yet to be entered into the construction contract management database as a Potential Change Order.

The Program Management project includes programmatic activities that span multiple regions and benefit several WSIP projects (Table 3.4). The project provides funding for the following functions and resources: SFPUC staff assigned to the management of the overall program; consultants supporting SFPUC staff at the program level (program, project and pre-construction management consultant, program construction management consultant, program control consultant); labor relations, including management of the project labor agreement; communication and public outreach; programmatic legal support; real estate acquisitions; program controls, including the tracking and reporting of all WSIP efforts; and program-level construction management activities associated with quality assurance, risk management, the Supplier Quality Surveillance (SQS) Program, operations assistance, safety, and training.

The activities under the Program Management project are organized into five categories that are tracked and monitored on a monthly basis. These categories are Management Support, Project Labor Agreement, Planning and Project Development, Program Controls, and Program Construction Management. The remaining balance in the Director’s Reserve is \$2.1M.

Table 3.4 Status of Program Management Project Cost Breakdown

Category	Expenditures To Date (\$ Million) (A)	2022 Approved Budget (\$ Million) (B)	Current Approved Budget (\$ Million) (C)	Q3/FY22-23 Forecasted Cost (\$ Million) (D)	Cost Variance (\$ Million) (E = C-D)
Management Support	\$37.9	\$46.5	\$46.5	\$42.0	\$4.4
Project Labor Agreement	\$3.7	\$3.8	\$3.8	\$3.8	-
Planning and Project Development	\$18.0	\$18.3	\$18.3	\$18.3	-
Program Controls	\$20.8	\$20.9	\$20.9	\$20.9	-
Program Construction Management	\$27.8	\$27.8	\$27.8	\$27.8	-
Program Management Total	\$108.3	\$117.3	\$117.3	\$112.9	\$4.4

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2005 Baseline, 2022 Approved, Current Approved, and Q3/FY22-23 Forecasted Schedules for the WSIP Regional Program. The Current Approved Finish and the Forecasted Finish for the Regional WSIP (Local WSIP was completed in June 2020) are each February 2027. Consult Appendix B for a graphical presentation of the WSIP Approved Project-Level Schedule.

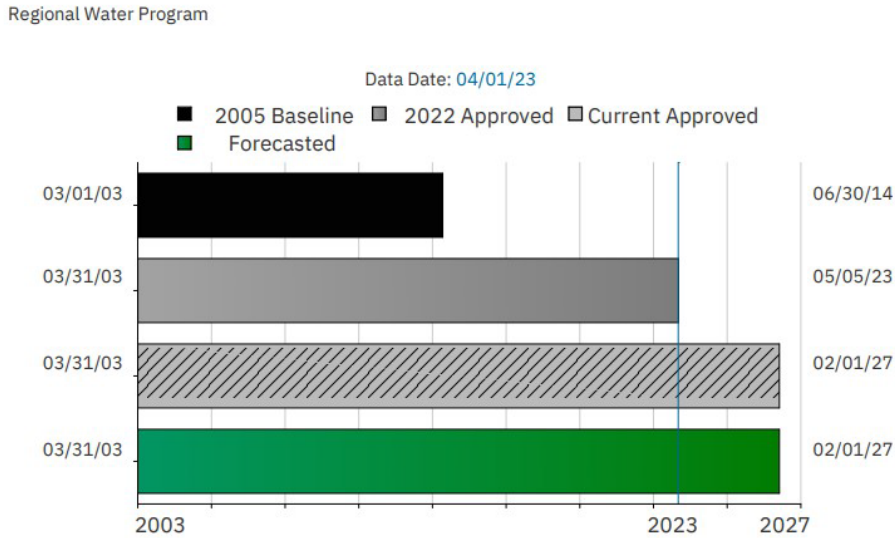


Figure 4.1 Program Schedule Summary

Table 4.1 2022 Approved vs. Q3/FY22-23 Forecasted Schedule Dates

Category	2005 Baseline Start	2022 Approved Start	Current* Approved Start	Actual*** Start	2005 Baseline Finish	2022 Approved Finish	Current* Approved Finish	Q3/FY22-23 Forecasted Finish	Schedule Variance (Months)
Regional Program	03/01/03	03/31/03	03/31/03	03/01/03 A	06/30/14	05/05/23	02/01/27	02/01/27	-
Local** Program	03/01/03	03/31/03	03/31/03	03/01/03 A	06/28/13	7/31/18	06/03/20	06/03/20A	Completed
Overall WSIP	03/01/03	03/01/03	03/01/03	03/01/03 A	06/30/14	05/05/23	02/01/27	02/01/27	-

* The budget and schedule approved as part of the March 2022 WSIP, plus any additional budget and schedule changes approved by the Commission as part of additional contingencies on construction contracts.

** Excluding Local Water Supply Projects

*** "A" represents the actual date.

5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in \$1,000s

Project Name	Active Phase (**)	2005 Baseline Budget (a)	2022 Approved Budget (b)	Current Approved Budget (c)	Current Forecast Cost (d)	Expenditures to Date (e)	Cost Variance (f=c-d) (+++)	% Cost Changes (g=f/c) (+++)	2005 Completion Date (h)	2022 Completion Date (i)	Approved Completion Date (j) (++)	Forecast Completion Date (k)	Schedule Variance (Days) (l=j-k) (+++)
Sunol Valley Region													
10015281 Alameda Creek Recapture Project	CN	\$18,809	\$43,967	\$43,967	\$54,189	\$26,213	(\$10,221)	(23%)	05/25/12	06/18/24	06/18/24	06/18/24	0
San Francisco Regional Region													
10015241 Regional Groundwater Storage and Recovery	CN	\$39,233	\$158,350	\$158,350	\$158,350	\$125,868	\$0	0%	02/27/14	02/01/27	02/01/27	02/01/27	0
Support Projects													
10015337 Long Term Mitigation Endowment	N/A		\$12,000	\$12,000	\$12,000	\$0	\$0	0%		10/01/24	10/01/24	10/01/24	0

* Does not include projects in closeout, completed, not initiated, on hold, deleted projects, and projects combined with other projects.

** Phase Status Legend			
PL	Planning	DS	Design
BA	Bid & Award	CN	Construction

Footnotes:

- (+) **2022 Approved Budget and Project Completion Date:** The budget and schedule approved by the San Francisco Public Utilities Commission (SFPUC or Commission) on April 26, 2022.
- (++) **Current Approved Budget and Schedule:** The budget and schedule approved as part of "2022 Approved", plus any additional budget and schedule changes approved by the Commission as part of construction contract award.
- (+++)
(+) Negative number reflects cost overrun (or schedule delay) and positive number reflects cost underrun (or ahead of schedule). Projects with a forecasted cost overrun greater than 10%, or forecasted delay of greater than 6 months or 10%, will be highlighted in grey.

6. PROJECT STATUS REPORT

10015281 - Alameda Creek Recapture Project

Project Description: The planned facilities include the following components: four (4) identical vertical turbine pumps mounted on floating barges located in existing Pond F2; four (4) flexible discharge pipelines extending from each pump to a new pipe manifold located on shore; a pipeline connection between the new pipe manifold and the existing Sunol Pipeline to discharge the recaptured water to the SFPUC system; throttling valves and a flow meter; electrical control building; power lines from the existing Hetch Hetchy Water & Power Calaveras Electrical Substation installed on new power poles; and general site improvements.

Program: Sunol Valley Region	Project Status: Construction	Environmental Status: Completed (Various)
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Project Cost:		Project Schedule:	
Approved	\$ 43.97 M	Approved 09/30/03	06/18/24
Forecast	\$ 54.19 M	Forecast 09/30/03	06/18/24
Actual	\$ 26.21 M	Project Percent Complete: 56.1%	

Key Milestones	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	04/28/20 A	12/18/20 A	06/21/21 A	02/29/24

Progress and Status:

During the reporting period, negotiations continued regarding the contractor’s price quotes for potential change orders for 1) the water pipeline realignment around the Pond F2 due to erosion conditions, and 2) relocation of the tie-in point between Sunol Pipeline due to corrosion at the original tie-in location. Additionally, the quarry operator proposed a slope stabilization design for meeting the requirements of their reclamation plan. During the quarter, staff considered the following risks leading to a recommendation to terminate the current construction contract: 1) concern with the increasing number of change orders and the remaining construction risks, 2) coordination of the quarry operator’s slope stability repairs with facility construction, and 3) concerns from staff about the complexities of operating and maintaining this first of its kind facility in the SFPUC Regional Water System. A memorandum recommending termination of the contract was submitted to the General Manager for consideration. The recommendation to terminate the contract will be presented to the Commission for approval during the next reporting period.



Erosion Along Access Road

Issues and Challenges:

The cost and schedule impacts to the project related to the contract termination are being evaluated and will be reported next quarter. The project team will reevaluate the objectives and design taking into consideration long-term slope stability issues as well as operations and maintenance feasibility and revise the design accordingly. A new construction contract for the revised design will be issued only after the pond banks have been stabilized. While this step back will delay the planned operation of the facility, the decision to terminate and engage in redesign is intended to reduce overall costs and result in a more reliable and maintainable asset.

10015241 - Regional Groundwater Storage and Recovery

Project Description: The current scope was planned to be constructed in two (2) phases. Phase 1 included construction of 13 wells to produce 6.2 mgd of dry year supply over 7.5 years. Operating the wells during drought will provide data and insights into how much water can be reasonably expected to be produced, and if additional well stations are needed to reach the desired drought period pumping capacity. Phase 2 included construction of two (2) installed test wells, completion of the South San Francisco (SSF) Main well, pipeline, and other work. The test wells which would not be converted to production wells at this time will allow for determination as to whether the identified sites could be viable production wells, and will provide information to water quality and pumping capacities that can be used for future planning. Phase 2 has been separated into two contracts due to the long lead-time required for easements and permits for work at the SSF Main Well site. Phase 2A includes installation of cathodic protection, well rehabilitation, and other mechanical work. Phase 2B consists of work at the SSF Main Well and pipeline installation to connect the well to Cal Water's treatment facility.

Program: San Francisco Regional Region	Project Status: Construction	Environmental Status: Active (Various)
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Project Cost:		Project Schedule:	
Approved	\$ 158.35 M	Approved 06/01/03	02/01/27
Forecast	\$ 158.35 M	Forecast 06/01/03	02/01/27
Actual	\$ 125.87 M	Project Percent Complete: 85.4%	

Key Milestones	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	A	09/07/09 A	09/07/11 A	01/30/12 A	09/05/12 A
	B	08/07/14 A	09/22/14 A	04/06/15 A	09/02/22 A
	C	11/10/20 A	09/27/21 A	06/23/22 A	02/20/24
	D	06/30/23	08/01/23	02/01/24	01/31/26

Progress and Status:

Project includes multiple construction contracts: (A) WD-2600 Test well drilling (completed); (B) Phase 1 WD-2668 Well station (13 wells) ; (C) Phase 2A WD-2878A; (D) Phase 2B. For Phase 1 (Contract B) WD-2668, the Commission approved the agenda item for contract closeout on 1/10/2023. The contractor's red-line markups needed to create final as-built drawings have been completed, and conversion to computer-aided design (CAD) has started. Preparation of remaining operation and maintenance manuals (those related to controls systems) continued during the quarter. For Phase 2A (Contract C) WD-2878A, the groundwater pumps have been pulled for inspection, and well rehabilitation has been completed at the nine (9) well stations. Well redevelopment at Southwood Drive Well Station has been completed. Potholing work for the existing groundwater line at the Colma BART and Millbrae well sites was completed in preparation for installation of the flow meter. For Phase 2B (Contract D), coordination with Cal Water continued regarding the requirements for site security and the use of their property for construction staging. A parallel discussion with the City of South San Francisco (SSF) was initiated to request the use of its vacant lot adjacent to Cal Water's property as an alternative staging area. An offer to purchase an easement for the groundwater line crossing the Colma Creek channel was made to San Mateo County Flood Control during the quarter.



Well brushing at Colma BART Well Facility as part of Phase 2A (Contract C) WD-2878A

Issues and Challenges:

For Phase 2A (Contract C) WD-2878A, the delivery of variable frequency drives (VFD) for the pump motors has been delayed for about a year due to supply chain issues. An alternative VFD submittal is currently in review. The schedule will be reviewed to assess the impact to the overall construction completion, and the revised schedule forecast will be reflected in the future update.

7. On-Going Construction

Construction Contract	Schedule			Budget		Variance (Approved - Forecast)		Actual % Complete
	NTP Date	Approved Construction Final Completion*	Q3/FY22-23 Forecast Construction Final Completion**	Approved Contract Cost +	Q3/FY22-23 Forecast Cost++	Schedule (Cal. Days)	Cost	
Sunol Valley Region								
10015281 - Alameda Creek Recapture Project (WD-2825R)	06/21/21	12/19/22	02/29/24	\$22,098,143	\$29,258,624.79	(437)	(\$7,160,482)	26.0%
San Francisco Regional Region								
10015241 - Regional GW Storage and Recovery (Contract C, WD-2878A)	06/23/22	02/20/24	02/20/24	\$6,561,394	\$ 6,010,626	0	\$568,768	32.0%

Program Total for On-Going Construction	Approved Contract Cost	Q3/FY22-23 Forecast	Variance	
			Cost	Percent
	\$28,659,537	\$35,269,251	(\$6,609,714)	(23.1%)

Note:

* Approved Construction Final Completion Date includes approved change orders.

** The Forecasted Construction Final Completion Date includes all approved, pending, and potential change orders and trends.

+ Approved Contract Cost includes awarded contract amount and approved change orders.

++ The Forecasted Cost includes awarded contract amount and all approved, pending, and potential change orders.

8. PROJECTS IN CLOSEOUT

Project Title	2005 Baseline Construction Phase Completion	2022 Approved Construction Phase Completion	Current Approved Construction Phase Completion	Actual Construction Phase Completion	2005 Approved Project Completion	2022 Approved Project Completion	Current Approved Project Completion	Forecast Project Completion	2005 Construction Budget	2022 Approved Construction Phase Budget	Current Approved Construction Phase Budget	Construction Phase Expenditures To Dates
Support Projects												
10015335 - Bioregional Habitat Restoration		05/31/18	05/31/18	05/31/18		10/01/24	10/01/24	10/01/24		\$51,367,076	\$51,367,076	\$51,287,090

9. COMPLETED PROJECTS

Project Title	2005 Baseline Project Completion	2022 Approved Project Completion	Current Approved Project Completion	Actual Project Completion	2005 Baseline Project Budget	2022 Approved Project Budget	Current Approved Project Budget	Project Expenditures To Date
San Joaquin Region								
10015301 - Lawrence Livermore Water Quality Improvement	11/07/11	07/31/13	07/31/13	07/31/13	\$4,235,258	\$4,198,247	\$4,198,247	\$4,198,247
10015315 - San Joaquin Pipeline System	03/25/14	03/31/16	03/31/16	03/31/16	\$352,732,000	\$203,178,015	\$203,178,015	\$203,178,014
10015316 - Rehabilitation of Existing San Joaquin Pipelines	06/30/14	10/31/14	10/31/14	10/31/14	\$80,000,000	\$21,153,622	\$21,153,622	\$21,153,622
10015330 - Tesla Treatment Facility	07/01/11	01/30/15	01/30/15	01/30/15	\$101,643,001	\$113,211,607	\$113,211,607	\$113,211,607
10015487 - WSIP Closeout - San Joaquin		03/31/21	03/31/21	03/31/21	\$0	\$3,376,376	\$3,376,376	\$2,011,448
Sunol Valley Region								
10015286 - Standby Power Facilities - Various Locations	12/06/10	12/22/10	12/22/10	12/22/10	\$9,949,735	\$12,950,566	\$12,950,566	\$12,950,566
10015290 - New Irvington Tunnel	09/17/13	03/31/18	03/31/18	03/31/18	\$214,650,004	\$340,406,358	\$340,406,358	\$339,901,806
10015291 - Alameda Siphon #4	04/14/11	06/28/13	06/28/13	06/28/13	\$78,577,000	\$64,950,507	\$64,950,507	\$64,950,507
10015312 - Pipeline Repair & Readiness Improvements	03/30/07	04/16/09	04/16/09	04/16/09	\$5,591,770	\$5,195,381	\$5,195,381	\$5,195,381
10015317 - Calaveras Dam Replacement	05/25/12	03/31/22	03/31/22	03/31/22	\$256,511,407	\$794,066,323	\$794,066,323	\$793,272,308
10015318 - Calaveras Reservoir Upgrades	02/17/06	07/28/06	07/28/06	07/28/06	\$1,740,055	\$1,690,552	\$1,690,552	\$1,690,552
10015319 - San Antonio Backup Pipeline	06/29/12	06/30/16	06/30/16	06/30/16	\$7,677,000	\$53,594,683	\$53,594,683	\$53,594,683
10015325 - SVWTP Expansion & Treated Water Reservoir	07/09/13	10/31/14	10/31/14	10/31/14	\$133,108,002	\$129,593,674	\$129,593,674	\$129,593,674
10015332 - San Antonio Pump Station Upgrade	12/12/11	06/29/12	06/29/12	06/29/12	\$41,854,000	\$12,894,592	\$12,894,592	\$12,894,592
10015492 - WSIP Closeout - Sunol Valley		06/30/22	06/30/22	12/31/22	\$0	\$5,989,845	\$5,989,845	\$5,194,277
Bay Division Region								
10015282 - BDPL Nos. 3 & 4 Crossover/Isolation Valves	09/30/08	07/31/09	07/31/09	07/31/09	\$27,600,158	\$27,039,149	\$27,039,149	\$27,037,926
10015283 - Seismic Upgrade of BDPL Nos. 3 & 4	10/15/12	07/30/18	07/30/18	07/30/18	\$66,792,849	\$72,194,219	\$72,194,219	\$70,530,532
10015299 - SCADA System - Phase II	02/24/12	05/28/13	05/28/13	05/28/13	\$36,098,999	\$9,470,922	\$9,470,922	\$9,470,923
10015308 - BDPL Reliability Upgrade / Tunnel	01/31/14	08/30/16	08/30/16	08/30/16	\$572,022,634	\$272,364,089	\$272,364,089	\$271,823,525
10015309 - BDPL Reliability Upgrade - Pipeline		03/31/16	03/31/16	03/31/16	\$0	\$216,722,172	\$216,722,172	\$216,722,172
10015310 - BDPL Reliability Upgrade - Relocation of BDPL Nos. 1 & 2		05/28/10	05/28/10	05/28/10	\$0	\$3,046,981	\$3,046,981	\$3,046,981
10015324 - BDPL Nos. 3 & 4 Crossovers	04/24/13	06/30/14	06/30/14	06/30/14	\$36,616,911	\$29,910,449	\$29,910,449	\$29,910,449
10015338 - SFPUC/EBMUD Intertie	02/07/07	03/20/14	03/20/14	03/20/14	\$8,598,851	\$9,167,306	\$9,167,306	\$9,167,306
10015484 - WSIP Closeout - Bay Division		03/31/21	03/31/21	03/31/21	\$0	\$3,597,500	\$3,597,500	\$3,322,156
10015341 - BDPL No. 4 Condition Assessment PCCP Sections	05/01/08	02/06/09	02/06/09	02/06/09	\$2,000,000	\$1,937,599	\$1,937,599	\$1,937,599
Peninsula Region								
10015285 - Lower Crystal Springs Dam Improvements	08/16/11	12/28/12	12/28/12	12/28/12	\$27,752,222	\$34,859,040	\$34,859,040	\$34,859,040
10015287 - New Crystal Springs Bypass Tunnel	10/28/10	08/17/12	08/17/12	08/17/12	\$83,222,790	\$81,466,732	\$81,466,732	\$81,466,732

Project Title	2005 Baseline Project Completion	2022 Approved Project Completion	Current Approved Project Completion	Actual Project Completion	2005 Baseline Project Budget	2022 Approved Project Budget	Current Approved Project Budget	Project Expenditures To Date
10015288 - Adit Leak Repair - Crystal Springs/Calaveras	07/03/08	07/31/08	07/31/08	07/31/08	\$3,748,452	\$2,787,322	\$2,787,322	\$2,787,322
10015293 - Pulgas Balancing - Inlet/Outlet Work	05/11/06	05/11/06	05/11/06	05/11/06	\$1,667,532	\$1,765,938	\$1,765,938	\$1,765,938
10015294 - Pulgas Balancing - Discharge Channel Modifications	08/05/13	07/30/10	07/30/10	07/30/10	\$8,111,422	\$2,910,007	\$2,910,007	\$2,910,007
10015295 - Pulgas Balancing - Structural Rehabilitation and Roof Replacement	01/29/13	12/28/12	12/28/12	12/28/12	\$36,712,846	\$20,238,716	\$20,238,716	\$20,238,716
10015297 - Pulgas Balancing - Modifications of the Existing Dechloramination Facility		03/20/13	03/20/13	03/20/13	\$0	\$5,390,031	\$5,390,031	\$5,390,031
10015302 - Cross Connection Controls	05/15/09	04/30/09	04/30/09	04/30/09	\$6,111,779	\$3,948,944	\$3,948,944	\$3,948,944
10015303 - HTWTP Short-Term Improvements (Demo Filters)	07/03/06	11/14/06	11/14/06	11/14/06	\$4,381,375	\$3,067,903	\$3,067,903	\$3,067,903
10015305 - HTWTP Short-Term Improvements - Coagulation & Flocculation/ Remaining Filters	09/08/10	07/28/10	07/28/10	07/28/10	\$9,741,617	\$18,604,937	\$18,604,937	\$18,604,937
10015306 - HTWTP Long-Term Improvements	04/08/14	12/30/16	12/30/16	12/30/16	\$167,570,000	\$274,081,969	\$274,081,969	\$273,833,162
10015307 - Peninsula Pipelines Seismic Upgrade		07/06/16	07/06/16	07/06/16	\$0	\$38,825,346	\$38,825,346	\$38,773,912
10015311 - Capuchino Valve Lot Improvements	07/24/09	08/19/08	08/19/08	08/19/08	\$3,573,782	\$2,803,153	\$2,803,153	\$2,803,153
10015313 - Crystal Springs/San Andreas Transmission Upgrade	04/01/14	06/30/15	06/30/15	06/30/15	\$148,582,655	\$190,309,453	\$190,309,453	\$189,816,066
10015322 - Crystal Springs Pipeline No. 2 Replacement	04/27/12	12/31/14	12/31/14	12/31/14	\$93,926,000	\$56,070,509	\$56,070,509	\$56,070,509
10015323 - San Andreas Pipeline No. 3 Installation	06/09/11	08/30/12	08/30/12	08/30/12	\$42,029,941	\$27,495,558	\$27,495,558	\$27,495,558
10015339 - Baden and San Pedro Valve Lots Improvements	10/12/11	03/29/13	03/29/13	03/29/13	\$47,319,999	\$24,990,803	\$24,990,803	\$24,990,803
10015486 - WSIP Closeout - Peninsula		12/30/21	12/30/21	12/30/21	\$0	\$13,579,680	\$13,579,680	\$13,470,613
San Francisco Regional Region								
10015289 - Sunset Reservoir - North Basin	05/06/09	09/10/10	09/10/10	09/10/10	\$61,975,999	\$64,270,725	\$64,270,725	\$64,270,725
10015314 - University Mound Reservoir - North Basin	03/10/11	03/29/13	03/29/13	03/29/13	\$102,882,610	\$43,266,552	\$43,266,552	\$43,266,552
Support Projects								
10015300 - System Security Upgrades		04/19/19	04/19/19	04/19/19	\$0	\$14,700,669	\$14,700,669	\$14,431,849
10015334 - Programmatic EIR	06/20/07	06/30/09	06/30/09	06/30/09	\$9,271,001	\$10,730,684	\$10,730,684	\$10,730,684
10015336 - Vegetation Restoration of WSIP Construction Sites		06/30/16	06/30/16	06/30/16	\$0	\$2,111,546	\$2,111,546	\$2,099,755
10015342 - Watershed and Environmental Improvement Program	06/28/13	06/30/22	06/30/22	06/30/22	\$20,000,000	\$20,000,000	\$20,000,000	\$20,068,597
TOTAL					\$2,916,581,656	\$3,370,176,951	\$3,370,176,951	\$3,363,122,364

APPENDICES

- A. PROJECT DESCRIPTIONS**
 - B. WSIP APPROVED PROJECT-LEVEL SCHEDULE**
 - C. LIST OF ACRONYMS**
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APPENDIX A. PROJECT DESCRIPTIONS**SAN JOAQUIN REGION****10015301 - Lawrence Livermore Water Quality Improvement (Completed)**

The project consists of:

- Ultraviolet (UV) disinfection, including two (2) 150-gallon-per-minute, parallel UV units and ancillary facilities. The units will be installed in the existing Thomas Shaft building.
- Two (2) pumps that will pump water from the Coast Range Tunnel to the new disinfection system.

10015315 - San Joaquin Pipeline System (Completed)

This project consists of:

- Pipeline crossover facilities at Emery Road (including 10 valves) and Pelican Road (including 12 valves).
- Installation of a portion of new pipeline, the Western Segment, from the San Joaquin River to the Tesla Portal. The pipeline will be 78-inches in diameter, approximately 10.3 miles in length and will include tunneled crossings of several highways, railroads, and irrigation canals. The pipeline will cross over the top of the California Aqueduct.
- Installation of a portion of new pipeline, the Eastern Segment, from the Oakdale Portal to a new connection point approximately 6.7 miles downstream on SJPL No. 3. This segment will also be 78-inches in diameter.
- Installation of valve facilities on SJPL Nos. 3 and 4 along the Eastern Segment to provide for operational needs to divide and isolate segments of these lines for maintenance and to regulate flow and control pressure in the system.
- Security-related site improvements at Oakdale Portal.

10015316 - Rehabilitation of Existing San Joaquin Pipelines (Completed)

The project scope is to assure that existing San Joaquin Pipelines will meet Delivery Reliability LOS goals by establishing a program of routine maintenance, repair and replacement activities for long-term implementation and by addressing the highest priority rehabilitation measures identified during the timeframe of the WSIP:

- Rehabilitation of and security-related site improvements at the existing Roselle Crossover.
- Establishment of a program of pipelines conditions assessment, including upgrading and renewal as required, of pipe coating and lining systems.
- Upgrade of the existing SJPL cathodic protection system.
- Upgrade of the existing SJPL Supervisory Control and Data Acquisition (SCADA) system.

10015330 - Tesla Treatment Facility (Completed)

The project consists of:

- Isolation valves and piping to divert SJPL flow to the new treatment facility, large-diameter piping and valves located within the treatment facilities, and a single discharge pipeline to tie back into the existing SJPLs.
- A disinfection building housing 12 UV reactors, cleaning equipment, and ancillary equipment.
- A chemical storage and feed building for sodium hypochlorite, hydrofluosilicic acid (i.e., fluoride), and carbon dioxide.
- Office, laboratory, and control facilities, emergency engine generators, and security-related site and access road improvements.

10015487- WSIP Closeout - San Joaquin (Completed)

• **Supplemental Solar Panel Installations** – The 10015315 San Joaquin Pipeline System, including the western segment, eastern segment and facilities, and crossover pipeline projects achieved final completion in 2013, 2014 and 2015, respectively. During the initial course of operations, it was noted

the solar panel arrays designed to provide power for the facility equipment were not sufficient to meet all modes of operational demands. This sub-project will provide additional solar panels to cover power shortfalls and allow the facility to better meet its water delivery reliability LOS goal. This sub-project consists of three (3) job order contracts at three (3) sites: Oakdale, Knight Ferry Throttling Station, and San Joaquin Junction No. 4. The scope of work as noted in the March 2016 Notice of Change includes:

- o Minor site preparation and grading work
- o Furnishing and installing new supplemental solar arrays mounted on concrete pads within security fence enclosures
- o Connections and integration of the new solar panels into the existing power system and controls
- o Installation of batteries for solar power storage on-site
- o Minor site preparation and grading work

• **Tesla Portal Facility Interior Floor Slab** – The Tesla Portal Facility, a sub-project of the 10015330 Tesla Treatment Facility, was completed in January 2015. During construction, the concrete interior floor slab was deleted from the project construction documents to allow easier access to repair corrosion of the existing pipelines discovered during construction beneath the new Tesla Portal Facility. Due to drainage issues at the site, the Operations staff at the facility has now requested the interior slab be incorporated into the structure with a small access opening for future maintenance and corrosion repairs of the existing buried pipelines. As noted in the March 2016 Notice of Change, this sub-project will be constructed through use of a job order contract including:

- o A new interior concrete slab slope to drain to a new catch basin
- o A new catch basin with grating and sump
- o A small sump pump and drain through the slab or existing concrete wall to a discharge point

SUNOL VALLEY REGION

10015281 - Alameda Creek Recapture Project

The planned facilities for this project are based on Alternative 4-1 from the Updated Alternatives Analysis Report (AAR) dated January 30, 2009, with some refinements described below. The planned facilities include the following components: four (4) identical vertical turbine pumps mounted on floating barges located in existing Pond F2 (including a mooring system); four (4) flexible discharge pipelines extending from each pump to a new pipe manifold located on shore; approximately 100-feet of 36-inch pipeline connection between the new pipe manifold and the existing Sunol Pipeline to discharge the recaptured water to the SFPUC system; throttling valves and a flow meter; electrical control building; 1,600 feet of power lines from the existing Hetch Hetchy Water & Power Calaveras Electrical Substation installed on 10 new power poles; and general site improvements. In addition, the scope includes conveyance of the water to various existing storage sites within the Sunol Valley or the Sunol Valley Water Treatment Plant, as necessary.

10015286 - Standby Power Facilities - Various Locations (Completed)

Standby power requirements are provided at six (6) sites in the East Bay and on the Peninsula. Each site is either provided with an emergency generator or the electrical receptacles to accommodate a portable emergency generator.

The facilities at the six (6) sites include:

- Alameda West Portal: standby power improvements include installing a permanent 20- kilowatt (kW) emergency generator in a sound-attenuated masonry wall enclosure.
- San Antonio Reservoir and Dam: standby power improvements include providing electrical receptacles for a portable 37-kW emergency generator at two (2) locations.
- Harry Tracy Water Treatment Plant (HTWTP): standby power improvements include removing the four (4) existing, smaller emergency generators and providing two (2) permanently installed 2-megawatt (MW) emergency generators.
- Millbrae Yard: standby power improvements include replacing the existing emergency generator with a permanently installed 300-kW unit to enable this facility to function as an emergency operations

center.

- San Pedro Valve Lot: standby power improvements include installing a permanent 20-kW emergency generator in a sound-attenuated masonry wall enclosure.
- Capuchino Valve Lot: standby power improvements include providing an electrical receptacle for a portable 30-kW engine generator.
- The project will also provide the trailer mounted engine generator that will be stored at the Millbrae Yard.

10015290 - New Irvington Tunnel (Completed)

The NIT alignment will be located just to the south of the existing tunnel. It will be 18,660 feet long and have a horseshoe shape with excavated dimensions of approximately 13 feet by 14 feet. The final tunnel lining will be mortar-lined, welded steel pipe, resulting in a finished diameter of 8.5 feet. Extra thick steel liner segments will also be used at low cover areas near the portals and beneath Interstate 680, and where it intersects inactive fault zones or in locations of poor ground conditions.

The NIT project is currently in construction and approximately 99% complete. Major project elements are listed below.

- Conventional mining methods were used for excavation in a westward direction from the Alameda West Portal, in both an eastward and westward direction from an intermediate shaft located near Vargas Road, just off Interstate 680, and in an eastward direction from Irvington Portal. Tunneling was completed by multiple road header tunneling machines, and limited, controlled detonation in areas of hard rock. Spoils disposal was taken to fill sites just north of the San Antonio Pump Station (SAPS) near the intersection of Calaveras Road and Interstate 680. The completed spoils fills will create a visual barrier to new quarry operation located near Calaveras Road. Potentially contaminated spoils were screened, separated, and if found to contain contaminants, hauled to a permitted landfill.
- At the Irvington Portal, tunnel connections were made to Bay Division Pipeline (BDPL) Nos. 1, 2, and 5 and to BDPL Nos. 3 and 4. Control valves were directly buried with instrumentation and electrical gear in a small control building. At the Alameda West Portal, the tunnel was connected to the discharge of the new mixing manifold to be constructed as part of the Alameda Siphons # 4 Project and to the existing overflow shaft. The project includes a new isolation valve between the mixing manifold and the portal.
- A new access bridge was constructed across Alameda Creek to accommodate temporary construction traffic and on-going SFPUC Alameda West Portal operations.
- A Groundwater Management Program was developed that includes two (2) years of pre- construction monitoring of wells, springs, creeks, ponds, and wetlands; environmental habitat construction mitigation measures; and two (2) years of monitoring after construction to minimize the impact to the local groundwater.
- At both the existing Irvington and Alameda West Portal facilities, other security-related site improvements were constructed, including undergrounding of portal structures and new card access controlled gates and security fences.
- In the March 2014 Notice of Change, simplifications were made to the design of the new security structure for the existing Alameda West Portal. The design changes included a more secure structure with a smaller footprint and removal of pipe manifolds that will no longer be in service.

10015291 - Alameda Siphon #4 (Completed)

The Alameda Siphon #4 Project extends approximately 3,000 feet from the Alameda East Portal across both the Calaveras Fault and Alameda Creek to the Alameda West Portal.

The project primarily consists of:

- A 66-inch-diameter welded steel pipeline with 310 feet of special trench design and thicker-walled pipe in the fault rupture zone, and a tunneled crossing of Alameda Creek.
- A 96-inch-diameter “blending structure” consisting of a pipe and valve manifold near the Alameda West Portal that will blend SVWTP and Hetch Hetchy water so that the existing and new Irvington Tunnels will receive a uniform quality of water.

- New isolation/throttling valves on Alameda Siphons No. 3 and 4 and new isolation valves on Alameda Siphons No. 1 and 2. The valves will be installed upstream of the blending structure.
- Ventilation improvements at Alameda East Portal for the Coast Range Tunnel required for construction access.
- New chemical injection facilities on Alameda Siphon No. 4.
- Relocation and extension of the existing overflow pipe from the Alameda East Portal about 500 feet to an existing quarry, and site fencing at Alameda East Portal. The overflow to the existing quarry includes a grouted rock riprap channel down the side of the quarry for erosion protection.
- Road improvements at the intersection with Calaveras Road for construction access.

10015312 - Pipeline Repair & Readiness Improvements (Completed)

This project is 100% complete and has been closed out. The project was separated into the three (3) following implementation phases:

- Phase A: Procurement of varied lengths and sizes of welded steel pipe and fittings for stockpiling at new storage facilities at seven (7) locations along the transmission system, west of the Coast Range Tunnel.
- Phase B: Procurement and installation of a pipe rolling machine at the Sunol Yard. The rolling machine, which has the capability to roll pipe sections up to 9 feet in diameter, will be housed in a new building with an emergency power supply.
- Phase C: Development of a pipeline repair prioritization plan, on-call emergency repair procedures and contracts, and mutual assistance agreements.

10015317 - Calaveras Dam Replacement (Completed)

Project elements primarily include:

- Constructing a new 210-foot-high earth and rock fill dam designed to accommodate a maximum credible earthquake on the Calaveras Fault. The dam will be constructed immediately downstream of the existing dam and will have a crest length of 1,210 feet, a base thickness of 1,180 feet, and a crest thickness of 80 feet. The total volume of the dam will be approximately 2.8 million cubic yards.
- The materials for construction will primarily originate from onsite sources, while surplus excavated material will be placed at disposal sites around the rim of the Calaveras Reservoir, including two (2) in-water disposal sites and several upland disposal sites.
- The existing spillway will be removed, and a new spillway and stilling basin will be constructed. The overflow weir of the new spillway will be 307 feet long. The spillway will vary from 60 to 80 feet wide and will be 1,100 feet long. The stilling basin below the spillway will be 80 feet wide and 155 feet long.
- A new intake tower and shaft will be constructed. The drain line and three (3) adits from the existing facility will be connected to the new shaft. The existing outlet conduit from the tower will be extended 1,250 feet downstream (beneath the replacement dam) and will be equipped with a high capacity fixed-cone discharge valve (relocated from the existing facility) to accommodate water releases from the reservoir. Fish screens will be added to the existing adits of the intake tower.
- The existing dam will largely remain in place. The downstream face will, however, be partially removed and re-graded and a channel will be excavated through the dam to form the approach to the new spillway.
- A new 525-foot long fish ladder and flow bifurcation systems at ACDD will be used in conjunction with new low-flow capacity valves to be added at the base of the replacement Calaveras Dam to provide flows downstream of these facilities to support native aquatic resources and future populations of steelhead trout that are being restored to the Alameda Creek Watershed.
- The fish ladder and a total of four (4) new fish protection screens will be added on the right abutment (looking downstream) of the ACDD. In addition, conveyance pipes will be installed to allow water from Alameda Creek to be delivered to the Calaveras Reservoir via the ACDT.
- Landslide A removal beneath the northern half of the left abutment slope located on the left side of the valley (when looking downstream) as well as other associated changes as previously noted in the March 2013 Notice of Change.

- Landslide B removal within the lower left abutment slope as well as other associated changes as previously noted in the March 2014 Notice of Change.
- Additional slope reinforcement in Borrow Area B and import of offsite rockfill as noted in the March 2016 Notice of Change.
- Repairs to the landslide portion of Calaveras Road and restoration of the West Haul Road as noted in the scope refinements listed below for this March 2018 Notice of Change.
- For the ACDD fish ladder, to address the potential landslide hazard and further protect the fish passage structure, as noted in the scope refinements listed below for this March 2018 Notice of Change, an extension to the contract landslide stabilization wall and an additional reinforced concrete panel wall with tie-backs to reinforce a section of the soil nail wall.

10015318 - Calaveras Reservoir Upgrades (Completed)

The project consists of installing a hypolimnetic oxygenation system and associated cryogenic (oxygen generation) equipment near the dam. The addition of oxygen into the reservoir will limit the negative effects of algal blooms and may promote a healthier fish habitat. The system will continue to be usable following completion of the replacement Calaveras Dam. The project primarily consists of the new cryogenic equipment, two (2) diffuser systems in the reservoir, and miscellaneous site work.

10015319 - San Antonio Backup Pipeline (Completed)

The SABPL consists of 6,600 feet of 66-inch-diameter steel pipe and extends from the Alameda Siphons at the SAPS to Sunol quarry, SMP-24, near the intersection of Calaveras Road and San Antonio Creek. There are three (3) tie-in facilities with air gap provisions from the SABPL: one connecting to Alameda Siphon No. 3, a second to the SAPL near SAPS, and a third to the SAPL on the west side of Calaveras Road before the SAPL alignment turns and heads west to quarry SMP-24. The alignment of the SABPL parallels that of the existing SAPL, terminating with a control valve and concrete energy dissipation structure to quarry SMP-24. The project includes new chemical storage, feed and water quality monitoring facilities for de-chlorination and pH adjustment of any discharges through the SABPL, the existing SAPL, and the Alameda East Portal overflow pipe. Water discharged into the SMP-24 quarry pond will be recovered with two submersible pumps and a short section of 24-inch diameter steel pipe which will connect to the existing SAPL to convey water to San Antonio Reservoir. Power to the water recovery pumps will be supplied from the nearby Calaveras Substation, which is owned and operated by Hetch Hetchy Water & Power. Construction of a slurry wall is included around the quarry pond to minimize groundwater intrusion and to ensure slope stability.

10015325 - SVWTP Expansion & Treated Water Reservoir (Completed)

The project primarily consists of:

- The expansion improvements, which increase the sustainable capacity to 160 mgd, include the addition of a new flocculation/sedimentation basin and the retrofit of six (6) of the twelve (12) existing filters. Design of improvements to the remaining six (6) filters was performed under the project, and was included as an optional bid item in the construction contract. As a result, upgrades to all 12 filters were able to be performed under the construction contract, providing an additional factor of safety for reliable and sustainable production of 160 mgd required to meet the LOS goals established for the system.
- A single 17.5-million-gallon (mg) circular TWR which was constructed along with a new 3.5-MG rectangular chlorine contact tank on the northern portion of the existing plant site. Roughly 400,000 cubic yards of excavated material was hauled to a disposal site immediately east of the plant for disposal.
- New chemical storage and feed facilities for disinfection are constructed including sodium hypochlorite and ammonia. New fluoride facilities were also added.
- Construction of approximately 2,700 feet of 78-inch-diameter pipe that connects the new TWR to the existing plant discharge pipeline. This included a tunneled crossing of Alameda Creek.
- Nine (9) existing chemical tanks and associated electrical and instrumentation components were

replaced under the construction contract. The existing chemical tanks and the associated electrical and instrumentation had reached the end of their useful life and were in jeopardy of failure.

- Miscellaneous plant improvements include a new emergency generator and improvements to the plant electrical system, substation, electrical panels, and motor control centers; an upgrade of the instrumentation and controls; a new filter washwater recovery basin; improvements to the flow distribution structure and associated facilities; replacement of the plant's existing boiler; improvements to the influent chemical mixing system; and repaving of the existing plant access road.

10015332 - San Antonio Pump Station Upgrade (Completed)

The project consists of:

- Replacement of the three (3) 1,000-horsepower electrical pumps.
- Addition of two (2) 1.5-megawatt emergency generators. The generators are sized to power the three (3) electric pumps.
- Seismic retrofit of the pump station, including reinforcement of the walls, foundation improvements, and connection of the roof to the walls.

10015492- WSIP Closeout - Sunol Valley

- **Alameda Siphon No. 4 Carrier Water System Modifications** – The 10015291 Alameda Siphon No. 4 Project was completed in 2013. Since that time, new facilities that have been brought on-line as well as other changes have occurred in water operations, have resulted in an apparent drop in water pressures and volumes at the Sunol Valley Chloramination Facility. This has reduced the available water needed for the current carrier water system to pump the necessary water treatment chemicals into the system. This new sub-project is designed to resolve the deficiency and allow the facility to better meet its water delivery reliability LOS goal. This sub-project will be constructed by a job order contract including:

- o Modifications of the current chemical injection system of overcome lack of water system pressure and volume

- o New supplemental water facilities, including possible new storage tanks, and monitoring and regulating equipment as needed

- o Plumbing and control connections between the new facilities and the current system

- **Erosion Repair at Pond F3 East** – The completed 10015319 San Antonio Backup Pipeline Project included drainage improvements on the east side bank of Quarry Pond F3 East. After completion of construction, it was noted that the rock riprap below a 12- inch drainage pipe had eroded away and undermined the downstream section of the pipe. This sub-project will repair the erosion and restore the drainage pipe through a job order contract including:

- o New rockfill on the east back of the quarry pond from the current drainpipe to the toe of the bank

- o Excavation and grading to remove loose bank debris and prepare the subgrade slope to receive new rockfill

- o Extension of the existing drainpipe downslope to the water line of the pond

- o Temporary access improvements at the side bank of the pond for a crane and other equipment to deliver to, and place new rockfill and other materials into, the repair area

- **Sunol Valley Water Treatment Plant Basin Polymer Feed Facility.** The Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir Project was completed in 2014 and included addition of a new fifth flocculation sedimentation basin (Basin 5) to the existing four (4) basins at the plant. During operations after completion, it was noted that Basin 5 was not able to achieve the optimal water production goal of 40 million gallons per day consistently. This sub-project is to build a polymer feed facility that will serve not only Basin 5, but also the four (4) older basins (Basins 1 to 4), to optimize plant water production, and allow this facility to better meet its water quality and delivery reliability LOS goals. The portion of the facility cost attributed to Basin 5 will be funded under the WSIP; the portion of the facility cost attributed to Basins 1 to 4 will be funded under the Water 10- Year Capital Improvement Program. This sub-project will be constructed by a bid contract including:

- o Addition of new flocculant aid polymer to Basin 5

- o Water testing to develop a range of polymer doses for the range of different water quality expected at the plant
- o Construction of new structures and facilities to store, monitor and control the application of the new polymer
- o Possible extension of the new polymer to optimize water production from the four (4) older basins
- **Miscellaneous Work at Alameda West Portal, Irvington Portal and San Antonio Back-Up Pipeline** – The CUW 35901 New Irvington Tunnel (NIT) was completed in 2017, and the CUW 37403 San Antonio Backup Pipeline (SABPL) was completed in 2016. This subproject will include the following work:
 - o Installation of new security doors at Alameda West Portal (AWP) and Irvington Portal (IVP)
 - o Installation of new couplings between the valve stem and actuator for the cathodic protection at AWP and IVP
 - o Refurbishment of uninterruptible power supply (UPS) and installation of new enclosures for the UPS at AWP and IVP
 - o Installation of discharge pipe lateral supports, safety railings, ladder stiffening supports, and sunshades for electrical equipment on SABPL
- **New Irvington Tunnel Water Quality Equipment Relocation** – The 10015290 New Irvington Tunnel (NIT) project installed new water quality monitoring equipment in an underground vault to monitor water quality on Irvington Portal 2 (IP2). After the equipment was installed, problems were noted that related to safe access and water drainage. This sub-project is to relocate the water quality monitoring equipment to Building B10 for Irvington Portal 1 (IP1), and install a new pump to pump water from Irvington Tunnel 2 (IT2) to Irvington Tunnel 1 (IT1) to provide IT2 water for the water quality monitoring.
- **San Antonio Backup Pipeline Carrier Water System Modifications** – The 10015319 San Antonio Back Pipeline was completed in 2016. Since that time, changes in operations have resulted in an apparent drop in water pressure in the carrier water system for two (2) chemicals including Calcium Thiosulfate for dechlorination and Hydrofluorosilicic acid for pH adjustment. The purpose of this sub-project is to modify the carrier water and chemical injection system to ensure the chemicals will be injected properly. Fish Passage facilities at the Alameda Creek Diversion Dam is to modify the VSAT power supply system, replace the main photovoltaic battery bank and realign several valves and actuator drive stems.
- **Alameda Creek Diversion Dam Power and Communication Facilities** (new sub-project addition in 2022) – The 10015317 Alameda Creek Diversion Dam Fish Passage Facilities (WD-2729 contract) is a sub-project to the Calaveras Dam Replacement Project, which will close out on 3/31/2022. After operating the fish passage facility for over one year, a few deficiencies were discovered in the power system for the communication facilities, the main power system, and a few of the valves and gates. Job Order Contracts (small contracts less than one million dollars in value) will be used to address these issues under this new sub-project. This subproject is to modify the VSAT power supply system, replace the main photovoltaic battery bank and realign several valves and actuator drive stems.

BAY DIVISION REGION

10015282 - BDPL Nos. 3 & 4 Crossover/ Isolation Valves (Completed)

The project consists of:

- Two (2) large vaults that are primarily below-ground installations with only the top 30 inches of the structure exposed. Above-ground facilities include security fencing and satellite communication dishes. The vaults are approximately 2,400 feet apart along the BDPL Nos. 3 and 4.
- Each vault includes four (4) mainline isolation valves and a crossover valve. The isolation valves are hydraulically operated, while the crossover valves are electrically operated.
- The existing BDPL No. 3 is a 78-inch-diameter reinforced concrete pipe, and BDPL No. 4 is a 96-inch-diameter PCCP. At each vault, approximately 170 feet of each pipeline will be replaced with welded steel pipe.

- Each facility will be equipped with connections for portable electric generators, and a battery system will provide immediate emergency power to operate the hydraulic system.
- Valve actuators will have remote monitoring and operating capability through the SFPUC SCADA system.

10015283 - Seismic Upgrade of BDPL Nos. 3 & 4 (Completed)

The existing pipeline fault crossing between the two (2) crossover/isolation valve vaults constructed under the BDPL Nos. 3 & 4 Crossover/Isolation Valves Project is about 2,400 feet in length, and consists of BDPL No. 3, a 78-inch-diameter reinforced concrete cylinder pipe, and BDPL No. 4, a 96-inch-diameter PCCP. These vaults are located east and west of I-680 near the intersection of Mission Boulevard. The current project scope includes replacement of about 2,300 feet of BDPL No. 3. Ongoing investigations have determined that improvements to BDPL No. 4 are also required to facilitate the failure of BDPL No. 4 in a controlled manner that does not cause the failure of BDPL No. 3. It is planned that about 400 feet of the new BDPL No. 3 will cross Trace A under I-680 in an existing oversized corrugated metal pipe; about 300 feet that crosses Trace B under Mission Blvd. will be in a newly constructed concrete vault ("box culvert"); and the remaining new pipeline will be buried. All new construction will be in the SFPUC's existing right-of-way (ROW).

The project primarily consists of:

BDPL No. 3:

- A new 300-foot-long concrete vault will be constructed under Mission Boulevard near the I- 680 Interchange where Fault Trace B is located. A new 300-foot segment of 72-inch welded steel BDPL No. 3 will be installed inside the vault. Within the vault and on either end of the fault trace zone, 72-inch-diameter ball joints and slip joints will be installed that will accommodate pipeline displacement during a seismic event.
- For the crossing under I-680 at Trace A, about 400 feet of 78-inch-diameter welded steel pipe will be installed in an existing, unused corrugated metal pipe. About 1,450 feet of additional new 78-inch diameter welded steel pipe will connect the existing and new segments between the two (2) vaults, and will be buried.

BDPL No. 4:

- About 400 feet of new 80-inch steel liner will be installed inside BDPL No. 4 at Hayward Fault Trace C.
- BDPL No. 4 will be encased with concrete outside the existing slip joint vault at Hayward Fault Trace B.
- Modifications to the existing slip joint vault will be made including enlarging BDPL No. 4 pipe penetrations in the vault, new drainage systems, new roof panels and adjustments to the existing slip joint.
- Modifications to the existing BDPL No. 3 (to be abandoned in place) to collect and divert water from the area and prevent the undermining of the new BDPL No. 3.
- About 400 feet of new 90-inch diameter welded steel pipe will be installed at Trace A of the Hayward Fault.
- Relocation of the following utilities: two (2) Alameda County Water District water pipelines, one (1) Union Sanitary District sewer pipeline, one (1) conduit of AT&T phone lines, and one (1) six-inch diameter PG&E gas pipeline.

10015299 - SCADA System - Phase II (Completed)

The project primarily consists of:

- Establish a common software platform and migrate all elements to this platform.
- Connect existing flow meters and new pressure transmitters, and provide communication to SCADA master station at five (5) major Bay Area Water Supply and Conservation Agency (BAWSCA) customer sites.
- Install pressure transmitters, perform piping modifications, and provide communication to SCADA

master station at seven (7) existing regulating valves in the City of San Francisco distribution system.

- Install new flow and pressure monitoring devices at 23 key locations in the City distribution system.

10015308 - BDPL Reliability Upgrade – Tunnel (Completed)

The tunnel extends 5 miles under San Francisco Bay and is adjacent to the marshlands between the vicinity of the Ravenswood Valve Lot and the Newark Valve Lot. The tunnel will be constructed with a Tunnel Boring Machine (TBM). The final tunnel lining will consist of a 9-foot- diameter welded steel pipeline. The tunnel will terminate on each end with vertical shafts and a connection to the BDPL Nos. 1, 2, and 5 piping manifolds. The two (2) piping manifolds are provided under the BDPL Reliability Upgrade - Pipeline Project. The tunnel spoils are anticipated to be used as part of the conversion of adjacent salt ponds to marshland. The portion of the existing BDPL Nos. 1 and 2 that are replaced by the tunnel will be capped on each end and will be abandoned in place.

Two (2) facilities were added to the original scope of work as part of the March 2014 Revised WSIP and are necessary to ensure the project will meet LOS goals:

- SCADA Communications system at Newark Valve Lot - This added scope provides for the installation of a SCADA communications system and integrating such system into the existing water quality monitoring equipment located in the Newark Valve Lot Control Building. The work consists of installing communications equipment, telephone line, wires, conduits, and electrical cabinets.
- 42-inch diameter Bay Division Pipeline No. 2 (BDPL2) Bypass - The supply from the Newark Valve Lot to the City of Hayward is currently being fed from both Bay Division Pipelines (BDPL) No. 1 and No. 2. Upon the completion of the Bay Tunnel Project, Hayward supply will be fed only by BDPL2. BDPL2, built in the mid-1930s, is a mixture of reinforced concrete cylinder pipe and wrought steel pipe. Thus, with the original scope of the Bay Tunnel project, the reliability of the Hayward service line could be reduced when the project is completed. The scope of work for this change provides for the installation 640 lineal feet of new 42-inch diameter welded steel pipe, replacing a portion of BDPL2, thereby increasing the reliability of the Hayward service.

10015309 - BDPL Reliability Upgrade – Pipeline (Completed)

The project primarily consists of:

- In the East Bay, 7 miles of 72-inch-diameter pipe will be constructed between the Irvington Portal and the Newark Portal of the new Bay Tunnel. On the Peninsula, 9 miles of 60-inch- diameter pipe will be constructed between the Ravenswood Portal of the new Bay Tunnel and the portal of the Pulgas Tunnel.
- A seismically resistant crossing of the Hayward Fault will be constructed. The crossing will include a new crossover valve vault on each side of the fault. The valves will be hydraulically actuated and will include emergency batteries. The pipe between the vaults will be higher strength and will be installed on a special foundation or trench section.
- Isolation valves and an interconnecting pipe manifold will be constructed at each portal of the new Bay Tunnel. The facilities will include new or rehabilitated control buildings with new emergency generators.
- New crossover valves between BDPL Nos. 2 and 5 will be installed at a location in Redwood City. The crossover facility will include a new or rehabilitated control building and connections for a portable emergency generator.
- A new throttling valve will also be added on BDPL No. 5 at the Pulgas Valve Lot. The throttling valve will include a new or rehabilitated control building.
- The project originally included underground concrete vaults for crossover facilities at Newark, Ravenswood, and Redwood City Valve Lots. The current project eliminates the concrete vaults and directly buries the valves with full access to valve actuators at these facilities.

10015310 - BDPL Reliability Upgrade - Relocation of BDPL Nos. 1 & 2 (Completed)

The project includes relocation of approximately 600 feet of each pipeline (BDPL Nos. 1 and 2) at the BART/railroad crossings. The pipe segments to be relocated will be installed inside new casings that

will be placed by the construction contractor doing the other development work in the area. The encased pipes are being installed in accordance with a utility agreement between the City of Fremont and the SFPUC.

10015324 - BDPL Nos. 3 & 4 Crossovers (Completed)

The three (3) proposed crossover facilities are located near the Guadalupe River in Santa Clara, near Barron Creek in Palo Alto, and near Bear Gulch in Atherton. The facilities include vaults that are largely below-ground, with only the top 30 inches exposed. They are very similar to one another, consisting of four (4) mainline valves and a crossover valve. Emergency engine generators will be included as an optional bid item.

10015338 - SFPUC/EBMUD Intertie (Completed)

The project primarily consists of:

- Providing new 36-inch-diameter piping and valving at the Newark Turnout to provide an additional connection between BDPL Nos. 1 and 2 to the existing City of Hayward system.
- Using the existing City of Hayward system for conveyance and providing six (6) new valves for isolation.
- Providing 1.3 miles of new 36-inch-diameter pipe to connect the City of Hayward system to the EBMUD system and providing a new pump station along this alignment.

10015341 - BDPL No. 4 Condition Assessment PCCP Sections (Completed)

This project is 100% complete and has been closed out. This project includes a detailed condition assessment of the two PCCP segments along BDPL No. 4. The first reach of concern (Reach 1) is 8.6 miles long and 96-inches in diameter. The second reach of concern (Reach 4) is 8.0 miles long and 84-inches in diameter. The condition assessment consists of an electromagnetic survey, seismic risk analysis, corrosion survey, visual inspection, and field investigations.

The assessment identified six (6) reaches of pipe (144 feet total out of 16 miles) that are potentially distressed. During initial investigations, the condition of one (1) distressed pipe segment (Pipe 1558) was determined visually to be particularly deteriorated, and immediate emergency repair was recommended. The project funded and completed emergency repair, using post-tension exterior tendon repair, for this segment. For the other five (5) potentially distressed pipe segments that were identified using electromagnetic survey, and determined to be of lower priority, recommendations were made for future excavation to confirm pipe condition in these areas, and repair if needed. A number of future follow-up investigations were recommended, including monitoring of groundwater acidity for a period of one (1) year in the area of Edgewood Road, and additional excavations of lower priority pipe pieces. Any additional required repairs will be scheduled based on urgency and funded through the Water Enterprise's Repair and Replacement (R&R) Program.

10015484- WSIP Closeout - Bay Division (Completed)

- **Site Drainage and Pipe Coating Repairs** - This sub-project will focus on providing a drainage system solely within SFPUC's Right-of-Way to address an erosion issue that developed after the construction of the 10015283 Seismic Upgrades of BDPL Nos. 3 & 4. In addition, this sub-project will include repairs to coatings on the pipe and pipe supports of the Bay Division Pipeline (BDPL) No. 3 to address issues that developed inside the articulated vault after construction was completed. The sub-project includes design, construction, and management of the drainage system work.
- **Bay Tunnel Warranty Inspection and BDPL 1 & 2 EIR Mitigation** – This sub-project advances the planning for a decommissioning study of the existing BDPL Nos. 1 and 2 until such time that the funding for a new Water 10-Year Capital Improvement Project (CIP) to further study mitigation alternatives and pursue removal of the BDPL Nos. 1 and 2 within the Don Edwards San Francisco Bay National Wildlife Refuge becomes available in FY2020-21.
- **Hydro-seeding at Bay Tunnel Project** - Due to the drought conditions and timing of hydro-seeding performed for the Bay Tunnel Project outside of the typical seasonal window, it may not be possible to

file the Notice of Termination (NOT) to close out the storm water permit prior to the Bay Tunnel Project closeout date, as the 70% growth take requirement, with less than 10% noxious weeds, may not be achieved by that time. Accordingly, the scope of this sub-project provides for monitoring of the hydro-seeded areas, removal of noxious weeds and potentially re-seeding some of the areas at the tunnel portals in Menlo Park and Newark if the storm water performance objectives are not met.

- **Newark Valve Lot Additional Gravel Placement** - The Bay Tunnel Project design plans call for a portion of the Newark Valve Lot to be landscaped and hydro-seeded. However, based on recent discussions, Operations staff are requesting that gravel be placed in this area since it will be a high traffic area during shutdowns and other maintenance work. Accordingly, this sub-project provides for the purchase and placement of the gravel.

- **Corrosion Protection for Valve E50U** – The E50U Valve was installed in 2011 as part of the 10015309 BDPL Reliability Upgrade – Pipeline Project. Immediately prior to the Bay Tunnel Project in-service/commissioning date in early Fall 2015, the Bay Tunnel Contractor completed the flanged connection of the manifold to the existing E50U Valve. However, during the installation and testing of the new flanged connection, the Bay Tunnel Contractor discovered an inconsistency in the corrosion protection isolation system of the existing valve E50U (high corrosion potential). It was decided to not authorize a Change Order to fix the corrosion problem of the E50U Valve at that time due to the risk of potential delays to the Bay Tunnel Project, at high cost, if leaks were to occur after the solution was implemented. Accordingly, this sub-project includes excavating and shoring the area around the valve, and removal of one bolt at a time for testing and replacing of the bolts (if necessary). A gasket will be purchased and may be installed if there are leaks that develop after the bolts are removed, cleaned and replaced. The proposed work on the valve will be done during the shutdown of the Bay Tunnel for warranty inspection in Winter 2016/2017.

- **Ventilation and Sump Pump Systems Installation (new sub-project in 2018)** - This sub-project provides improvements for inspection, monitoring and maintenance associated with the construction of the 10015283 Seismic Upgrades of BDPL Nos. 3 and 4. The BDPL No. 3 pipe, slip joint, ball joints and pipe supports and seismic monitoring equipment inside the articulated vault require on-going inspection, monitoring and maintenance. The type and frequency of inspection and maintenance were not well defined during the design phase; it is now clear that a fixed ventilation system is required for the BDPL No. 3 vault. Furthermore, the BDPL No. 4 expansion joint vault also requires access for inspection and monitoring; installation of a sump pump is required to remove water from the vault prior to inspections. Accordingly, the scope of this sub- project is to install a fixed ventilation system and a sump pump system to eliminate the need for removing access hatches and installing temporary fans and sump pump prior to accessing the vaults for frequent inspection and maintenance needs.

PENINSULA REGION

10015285 - Lower Crystal Springs Dam Improvements (Completed)

The project consists of:

- Spillway modifications that include widening the spillway, constructing two (2) bridge piers within the spillway to accommodate rebuilding of a San Mateo County Bridge, removing the existing timber stop-log system, constructing a new weir system within the spillway, installing access cat-walks for operation and maintenance, and eliminating water ponding on top of the dam.
- Parapet wall modifications that include raising the wall that is located on top of the upstream face of the dam and raising the approach walls to the spillway.
- Stilling basin modifications at the base of the spillway that include removing the existing basin, constructing a new larger basin, and adding downstream riprap protection at the toe of the basin.

10015287 - New Crystal Springs Bypass Tunnel (Completed)

The project consists of:

- A 4,200-foot-long tunnel with an 8-foot-diameter welded steel liner.
- Vertical shafts on each end of the tunnel to accommodate the TBM and future maintenance.

- The southern shaft will include a connection to the existing CSBPL near the north end of the existing Crystal Springs Bypass Tunnel; the existing pipeline has been determined to be seismically reliable in this area.
- The northern shaft of the new tunnel will tie into the southern ends of both the Crystal Springs Pipeline (CSPL) No. 2 and the Sunset Supply Pipeline (SSPL). The connecting segment and tie-in to the SSPL will be provided by this project. However, the connecting segment and a blind flange for CSPL No. 2 will be provided by the Crystal Springs Pipeline No. 2 Replacement Project, and this project will tie into the blind flange. This contractual arrangement is used to prevent two (2) shutdowns of the CSPL No. 2.
- New isolation valves and valve vaults.
- Standby power near valve vault G40.
- The existing pipeline will remain in service to provide redundancy for inspection of the tunnel.

10015288 - Adit Leak Repair - Crystal Springs/Calaveras (Completed)

The project consists of:

- Crystal Springs Outlet Tower No. 1: repairing leaks inside the tower, blasting and recoating piping and valves, replacing the roof, structurally retrofitting the access footbridge, and installing a marine hatch at the tower drain.
- Crystal Springs Outlet Tower No. 2: installing a marine hatch at the tower drain.
- Calaveras Outlet Tower: installing a dewatering pump, replacing a deteriorated valve actuator, and providing ladder fall protection.
- San Antonio Outlet Tower: installing a dewatering pump and repairing leaks inside the tower.

10015293 - Pulgas Balancing - Inlet/Outlet Work (Completed)

The project includes new inlet and outlet piping designed to direct the path of the water in such a manner as to promote better mixing. The shutdowns associated with construction of these improvements also provided an opportunity to perform a condition assessment of the reservoir interior that has been used to help identify work associated with the Pulgas Balancing - Structural Rehabilitation & Roof Replacement Project.

10015294 - Pulgas Balancing - Discharge Channel Modifications (Completed)

The discharge channel modifications to be built under this project will accommodate the anticipated maximum flow of 250 mgd. Project components include raising the channel walls, repairing concrete cracks and exposed reinforcing steel, strengthening and interconnecting the channel floor sections, and strengthening the tall tapered wall near the Pulgas Tunnel.

10015295 - Pulgas Balancing - Structural Rehabilitation and Roof Replacement (Completed)

The project includes structural rehabilitation of the reservoir, which consists of seismic retrofit of the walls, installation of a new steel frame roof, and repairs of concrete cracks and exposed reinforcing steel. The general rehabilitation also includes the installation of a new ventilation system and sampling ports, the replacement of utility piping, and the upgrade of the electrical system.

10015297 - Pulgas Balancing - Modifications of the Existing Dechloramination Facility (Completed)

Improvements to the dechloramination and pH control facilities are necessary to address immediate compliance issues. The modifications are anticipated to primarily be made to the flow measurement and control system, and to the various process control and chemical feed systems. Emphasis will be placed on chlorine removal and pH adjustment first to comply with existing regulations, with consideration towards the interdependent secondary goal of maximizing ammonia removal for nutrient control in the reservoirs. The scope of this project will be refined further as design efforts continue to move forward.

10015302 - Cross Connection Controls (Completed)

The project consists of providing improvements at the 304 sites identified to address potential cross connections. The work varies from site to site due to specific site conditions. The major work elements typically include:

- Install air gaps at blow-off locations and at air valves
- Install backflow protection devices
- Reconstruct or raise existing vaults
- Install new vault covers
- Replace existing air valves
- Modify, relocate, or remove existing blow-off facilities

10015303/ 10015304/ 10015305, Harry Tracy Water Treatment Plant Short-Term Improvements (Completed)

The projects consist of:

- 10015303 (HTWTP Short-Term Improvements - Demo Filters): Retrofit of two (2) filters and full-scale performance demonstration testing (project has been completed).
- 10015304 (HTWTP Short-Term Improvements - Remaining Filters): Scope of that project combined with Project 10015304.
- 10015305 (HTWTP Short-Term Improvements – Coagulation & Flocculation/Remaining Filters):
 - o Coagulation improvements that include restoring and improving operation of the pumped-jet flash-mix system, increasing capacity of the flash-mix pumps, providing the pumps with variable speed controls to improve efficiency, providing an automated dilution water system, and reconfiguring the chemical injectors to improve performance.
 - o Flocculation improvements that include reconfiguring the baffling system to reduce headloss by widening the channels, adding new mechanical mixers with variable speed controls to improve performance and efficiency, and seismically retrofitting the walkways and basin walls.
 - o Filtration modifications to eight (8) of the ten (10) existing filters (two (2) were replaced in Project 10015303), replacing effluent control valves and backwash supply valves, providing a filter to waste system, installing new underdrains and media, and seismically retrofitting the basin walls. The project consists of retrofitting two filters and performing full-scale performance demonstration testing of the retrofitted filters. The project was successfully completed in November 2006.

10015306 - HTWTP Long-Term Improvements (Completed)

The project consists of:

- Hydraulic improvements in the various treatment units to reduce headloss and increase capacity.
- Improvements to the disinfection process by upgrading the ozone generation system and backup oxygen supply.
- Expansion of the filtration process capacity by adding five (5) new filters.
- Improvements to the sludge handling system, including the addition of improved thickening and dewatering systems.
- Improvements to the washwater system, including the addition of a second washwater tank, associated equipment and piping.
- Seismic upgrade to all critical process units.
- Electrical upgrade, including a new substation, switchgear, and motor control center. New emergency generators are being provided as part of the Standby Power Facilities - Various Locations Project.
- Interim seismic response improvements, such as automated valves, to minimize seismic hazards until the long-term improvements are complete.
- New 11.0 mg TWR and subsequent abandonment of the existing 6.5 mg and 8.0 mg TWRs.
- New seismically reliable pipelines just east of the existing TWRs.
- Miscellaneous improvements to chemical feed systems, site piping, drainage, and roads.
- Addition of a third 2-megawatt generator set to satisfy emergency power needs of new facilities added as part of the project;

- Replacement of parallel switchgear and motor control center to accommodate addition of third generator set and to provide additional operational flexibility;
- Improvements to plant's recloser to increase reliability of PG&E power to the plant;
- Additional seismic anchorage of existing equipment; and
- Hydraulic modifications to coagulation and flocculation basins.

10015307 - Peninsula Pipelines Seismic Upgrade (Completed)

The scope of this project includes geotechnical investigations to characterize the Serra Fault in the vicinity of the pipelines and to confirm assumptions about sub-surface conditions along the length of the pipelines (SAPL2 and SAPL3 from HTWTP to San Pedro Valve Lot, SSBPL from HTWTP to Capuchino Valve Lot, and Sunset Supply Pipeline (SSPL) from Capuchino Valve Lot to San Pedro Valve Lot). In addition, hydraulic modeling has been performed to review system/facility requirements to meet system goals. The objectives of the investigations were: 1) to determine the potential fault offset at the Serra Fault crossings and the potential response from the three (3) pipelines to these offsets, and 2) to determine potential for pipeline rupture due to displacement from liquefaction, landslides, and other seismically-triggered hazards along the pipeline alignments.

The extensive geotechnical and modeling analyses performed to date have been carefully reviewed to identify specific project recommendations. The refined project scope currently includes the following components: The refined project scope (Phase 1) currently includes the following components at five (5) locations on the San Francisco Peninsula to address Serra Fault Crossing locations and liquefaction hazard potential in the Colma Creek area:

- Colma Site – Replacement of an approximately 700-ft segment of SAPL2
- South San Francisco Site – Replacement of an approximately 720-ft segment of SAPL2
- San Bruno North Site – Stabilization of SAPL2 where it extends through a tunnel
- San Bruno South Site – Replacement of an approximately 1,170-ft segment of SAPL2 and an approximately 1,050-ft segment of SAPL3; and
- Millbrae Site – Replacement of an approximately 900-ft segment of SSBPL A common staging area is planned to be located at SFPUC Baden Valve Lot in South San Francisco on El Camino Real. Phase 2 of the project will include installation of two (2) new isolation valves near the Baden Valve Lot on SAPL No. 2 and No. 3 in the City of South San Francisco.

The WSIP construction contract will include both Phases 1 and 2.

Phase 3 has been identified as a non-WSIP project, and includes condition assessment and improvements to SAPL2, installation of new isolation valves, and the potential addition of flexible connections along the alignment within the City of San Francisco.

10015311 - Capuchino Valve Lot Improvements (Completed)

This project is 100% complete and has been closed out. The project primarily consists of replacing two (2) existing isolation valves; providing new electric actuators for valve operation; performing concrete crack repair to prevent water leakage into the vault; providing new instrumentation and control systems for valve operation and pressure monitoring; and relocating the existing electrical and instrumentation systems outside the vault.

10015313 - Crystal Springs/San Andreas Transmission Upgrade (Completed)

Improvements will be made to the Upper Crystal Springs Dam discharge culverts, the Lower Crystal Springs outlet structures, the Crystal Springs Pump Station (CSPS), the CSSA Pipeline, and the San Andreas outlet structures.

The project primarily consists of:

- The Upper Crystal Springs Dam includes two (2) discharge culverts. During geotechnical investigations, it was confirmed that the lower culvert crosses the 1906 San Andreas Fault. Improvements will be made to the lower culvert to ensure its operation following a San Andreas Event. This will involve lining the culvert to provide operational and seismic protection and providing a second discharge riser on the east side of the San Andreas Fault.

- The Lower Crystal Springs Outlet Structures Nos. 1 and 2 improvements include removal of all equipment from the outlet towers and installation of new submerged adit valves; removal of the free-standing portion of the towers and bridge to address seismic concerns; installation of reliable adit selection system; and installation of fish screens. Additionally, the tunnels and pipe systems leading from the outlet structures to the CSPS will be improved.
- A new CSPS, together with site piping and valving, will be constructed with increased capacity to meet LOS goals and other functionalities, similar to those provided by the existing pump station. Additionally, a new electrical substation; emergency backup electrical generators for emergency demands, yard valves and small auxiliary pump (but not for large pumps); and security-related site improvements will be provided.
- The emergency chlorination system at the existing CSPS will be replaced with a portable chlorination system to provide more reliable response during an emergency.
- The CSSA Pipeline improvements include improvements to the first 800 feet of pipeline (upstream end of pipeline) to provide reliable operation at a higher operating pressure; replacement of the last 1,400 feet of the pipeline (downstream end of pipeline) to address seismic hazards; replacement and refurbishment of all appurtenances and lining to provide a 50-year life and protect against surge and seismic hazards; improvements, installation, and repair to 31 drainages that cross the pipeline alignment; and road improvements to provide access for maintenance and emergency response.
- The San Andreas Reservoir Outlet Structure Nos. 2 and 3 improvements include seismic retrofit to the structures; construction of an approach channel; modifications to the adits; replacement of all equipment in the towers; and installation of emergency isolation valves, reliable adit selection systems, and fish screens.
- The pipe in the tunnel leading from the San Andreas Outlet Structure No. 2 to the raw water pump station at the HTWTP will be replaced with a tunnel liner system.
- The tunnel portal of San Andreas Outlet Structure No. 3 will be retrofitted to protect the pipeline from the Serra Fault crossing.
- The isolation valves at Upper Crystal Springs Dam were removed from the contract per direction from DSOD. The concern was that the installation of these valves would bring the Upper Crystal Springs Dam (Hwy 92) under DSOD's jurisdiction.
- Part of one segment of pipeline from the Crystal Springs Pipeline No. 2 project was added to this contract. This segment runs along the access road to the pump station and was added to avoid conflict between different Contractors.

10015322 - Crystal Springs Pipeline No. 2 Replacement (Completed)

The major project elements consist of:

- Seismic reliability improvements, which include replacing or relocating a total of 1.7 miles of pipe at 12 different locations, sliplining 3.5 miles of pipe, retrofitting pipe bridge pier supports at two (2) creek crossings, providing a new connection at the CSPS, and providing a connecting segment with a blind flange for later connection to the NCSBT. The tie-in to the NCSBT will be performed under the NCSBT Project, eliminating the need for a second shutdown of the CSPL No. 2.
- Installing a new isolation valve near the CSPS area.
- Performing site improvements, including the installing fences and enclosures for exposed facilities, concealing exposed portions of pipe, and painting exposed portions of pipe.
- Upgrading the cathodic protection system along the length of the pipeline.

10015323 - San Andreas Pipeline No. 3 Installation (Completed)

This project is 100% complete and has been closed out. The major project elements include:

- Installation of 4.4 miles of 36-inch-diameter pipe with three (3) bore-and-jack street crossings along 19th Avenue and John Daly Boulevard.
- Installation of five (5) service connections.
- Installation of one (1) altitude valve at Merced Manor Reservoir, six (6) isolation valves, and a flow meter.

- Installation of a new cathodic protection system.
- Installation of three (3) connections to the San Andreas Pipeline No. 2 (SAPL2).

10015339 - Baden and San Pedro Valve Lots Improvements (Completed)

The project includes a general mechanical and seismic upgrade of existing facilities and the addition of a pressure-reducing station. Miscellaneous work will also be performed at the Pulgas Pump Station and the Pulgas Tunnel Air Shaft to facilitate moving flow southward through the system at higher pressures than normal.

The major work elements at the various sites primarily include:

- The Baden Valve Lot improvements include installation of a new pressure-reducing valve to allow water to flow from the HTWTP high-pressure zone to the low-pressure supply zone, installation of five (5) new isolation valves, replacement of three (3) existing valves, seismic retrofit of eight (8) existing vaults, replacement of onsite piping segments, replacement of the existing electrical switchgear and transformer, replacement of three (3) pumps, installation of variable frequency drives, and other miscellaneous improvements
- The San Pedro Valve Lot improvements include seismic retrofit of two (2) valve vaults, modification of the electric valve operators, installation of a new air valve, and miscellaneous site drainage improvements
- The Pulgas Pump Station improvements include replacement of one (1) isolation valve
- The Pulgas Tunnel Air Shaft improvements include site work to stabilize slopes

10015486- WSIP Closeout – Peninsula (Completed)

• **LCSD Stilling Basin Modifications & Dissipation Structure Riprap** – This sub-project is provided in response to concerns that fish may be “trapped” in the Lower Crystal Springs Dam (LCSD) stilling basin during low flow summer periods, and that high flow discharges from the new LCSD dissipation structure and potential high water levels in Pool 2 may cause erosion of the bank adjacent to the dissipation structure. The dissipation structure includes 60-inch diameter pipes with a maximum flow of 600 cubic feet per second (cfs) each and two (2) 8-inch diameter pipes with maximum flow of 7 cfs each. During flow testing of the dissipation structure, released water could be observed flowing over the dissipation structure, potentially eroding the bank adjacent to the structure. It was also observed that during summer periods, due to low flow in the channel downstream of the stilling basin, fish trapped in the basin were dying due to warm water temperatures. The purposes of this sub-project are to hydraulically connect the stilling basin with Pool 2 in order to allow fish to escape the basin in summer, and to add rip-rap behind the dissipation structure to prevent erosion. Specifically, this sub-project consists of:

- o A new deeper channel between the dissipation structure and the Pool 2, which would prevent fish from being trapped in the stilling basin
- o Installation of a new SCADA controls to the existing 8-in discharge pipeline and re-routing one (1) line to the stilling basin
- o Installation of additional rip-rap around the dissipation structure
- o Installation of a new 24-inch HDPE pipeline through an existing abandoned 60- inch pipe directed to the stilling basin
- o Coordination and facilitation of access for a piezometer drilling contractor during periods of concurrent work in the stilling basin
- o Addition of tree, shrub, and grass plantings along the creek bank in accordance with the approved re-vegetation plan

• **LCSD Valve H53 / Pipeline Investigation & Fisheries Release Valve** – As stipulated by the US Army Corps of Engineers 404 permit and the associated biological opinion by NOAA’s National Marine Fisheries Service (NMFS) covering the SFPUC activities at the Crystal Springs Pump Station (CSPS), the SFPUC is to take measures to protect the threatened Central California Coast (CCC) steelhead present in San Mateo Creek at CSPS site. One measure requires the release of fresh water at a rate of

3 to 17 cubic feet per second (cfs) depending on the season in recorded dry and wet years. This sub-project will utilize modification of an existing pipeline to release the required flows to the LCSD stilling basin feeding San Mateo Creek. Specifically, this sub-project consists of:

- o Condition assessment of the existing 60-in diameter pipeline from Valve H-53 to the stilling basin. In addition, valve H-53 will be exposed and visually inspected to determine its condition, requiring excavation and shoring of a pit approximately 20 feet long by 20 feet wide by 20 feet deep.
- o Depending on the verified condition, viable alternatives, including abandonment of the option to use H-53 pipeline, will be evaluated.
- o The approved option will include a SCADA controlled 12-inch valve installed at the discharge end of the pipeline. Depending on the condition of the pipeline, the approved option may also include repairs to the pipeline lining. Options may also include slip-lining the existing line with a smaller diameter pipeline such as 12 to 24-in diameter flexible polypropylene pipe.
- o Use of a temporary pipeline “line stop” and associated shoring upstream of Valve H-53 to allow for potential installation of a permanent blind flange.
- o Replacement of leaking plug valves that discharge from an existing concrete vault to the stilling basin with new knife gate valves.
- o Installation of new flow control valves, isolation valves and appurtenances for Pool 2.
- o Connections to the existing 72-inch pipeline using hot taps.
- o Construction of a new concrete walkway from the access road to the existing stairs at the flow dissipation structure adjacent to the stilling basin.

• **New Crystal Springs Bypass Tunnel Electrical Modifications** – The New Crystal Springs Bypass Tunnel (CUW35601) was commissioned in July 2011 and the project administratively closed in August 2012. Various inspections of the above ground facilities discovered excessive groundwater intrusion and resultant corrosion of equipment and electrical components. Preliminary inspections identified the following in the South Shaft: groundwater seepage into the venturi meter and valve G32 vaults through pipe/conduit wall penetrations, resulting in coating failure and localized corrosion. In the North Shaft, preliminary investigations identified surface runoff is entering electrical boxes. In addition, groundwater was seeping through wall penetrations into G36 and G38 vaults. Due to the high moisture, some electrical switches and two (2) actuators failed and required replacement. This sub-project developed a thorough documentation of the above ground facilities at the north and south shafts and designed and implemented repairs as warranted. Repairs included replacement of damaged equipment and electrical components, water proofing of the affected vaults, and rechanneling of surface runoff as necessary. This subproject is 100% complete and has been closed out.

• **Closeout of DSOD Permit Applications for LCSDI and CSSA Projects** – California Department of Water Resources, Division of Safety of Dams (DSOD) issued Alteration Permits allowing the start of construction of CUW35401, Lower Crystal Springs Dam Improvements (LCSDI) Project (Application No. 10-6) and the construction of 10015313, Crystal Springs / San Andreas Transmission Upgrade (CSSA) Project (Application No.10-10). In June 2015, DSOD issued an approval of the completed work and requested the SFPUC to submit the final documentation of each project. Under this sub-project, the following information and documents will be extracted from the project files and submitted in a format acceptable to DSOD: affidavit of actual costs of construction and design; full size as-built drawings stamped and signed by a California registered Civil Engineer; and final concrete testing summary reports.

• **Coordination with San Mateo County Bridge Construction over LCS** - The implementation of the CUW35401 Lower Crystal Springs Dam Improvement (LCSDI) Project required the demolition of an existing San Mateo County (SMC) Bridge that spanned over the LCSD crest. With the completion of the LCSDI Project, SMC awarded the construction contract for the new bridge and gave notice-to-proceed to the construction contractor in January 2016. To support this, SMC and the SFPUC executed a Memorandum of Understanding outlining the roles and responsibilities and expectations of both organizations. Accordingly, this sub-project will support the coordination between the SFPUC and SMC Bridge Project team. Typical activities may include response to relevant Requests for Information (RFI) such as existing site conditions, existing dam design, coordination with SFPUC Operations and

Watershed groups; field inspection of placement of the bridge piers over the dam and the construction of the SFPUC funded catwalk; and attendance of construction meetings and participating in other activities concerning the water quality in Lower Crystal Springs Reservoir, security measures, and other aspects affecting SFPUC assets.

• **Harry Tracy Water Treatment Plant (HTWTP) Improvements (new sub-project in 2018)** - The Harry Tracy Long-Term Improvements Project (10015306) was completed in 2014. Since 2014, the following needs were identified to address construction issues and improve operations at the plant to fully meet the LOS goals and objectives:

- o Automate the 12-inch gate valve at the High Rate Clarifiers' filter to waste manhole to eliminate the need for Operations to manually operate the valve on a frequent basis
- o Modify Sludge Tank No. 1 piping to eliminate cavitation in the washwater pumps
- o Upgrade the filters of three (3) emergency generators from passive filters to active filters to increase the effectiveness of the exhaust filtration and to reduce the need for Operations to constantly clean the filters
- o Repair leaks in the filter gallery channels where stainless steel angle plates were added to support several concrete walls
- o Automate flushing of the sludge transfer pumps and piping to eliminate the need for Operations to manually flush on a frequent basis
- o Replace and relocate failed variable frequency drives (VFDs) for the wash water and sludge transfer pumps to address an over-heating issue
- o Install double containment for the diesel fuel supply lines for the exterior generator to protect against leaks into the environment
- o Provide training and programming modifications to the Raw Water Pump Station switchgear equipment to enable remote SCADA control
- o Install vibration control monitoring system on the electrical panels at the Raw Water Pump Station to replace the existing obsolete system
- o Evaluate/Assess condition of failed mixers in the equalization basin

• **Crystal Springs/San Andreas Pipeline (CSSA) Erosion Repairs (new sub-project in 2018)** - The heavy winter storms of 2017 exacerbated erosion at two (2) watershed culvert locations, OW-13 and OW-18, along the CSSA Pipeline. Erosion has caused the CSSA Pipeline to be exposed and potentially undermined. The scope of this sub-project is to repair the erosion with systems consistent with the requirements of permitting agencies such as the State Water Resources Control Board.

SAN FRANCISCO REGIONAL REGION

10015241 - Regional Groundwater Storage and Recovery

The original scope of the Regional Groundwater Storage and Recovery (RGWSR) project was planned to be constructed in two (2) phases. The original scope of Phase 1 included construction of 13 new deep groundwater wells, and the original scope of Phase 2 included construction of 2 to 3 additional wells, depending upon well yield. Based on the modelling data inputs and results, it is projected that the 13 new wells constructed in Phase 1 would produce approximately 6.2 mgd of dry year supply over 7.5 years. Operating the RGSR Project during times of drought will provide data and insights into how much water can be reasonably expected to be produced by the project and if additional well stations are needed to reach the desired drought period pumping capacity. In addition to the need for collecting operational data to determine the pumping capacity of the 13 new wells, the Daly City Recycled Water Expansion Project proposes to serve recycled water to existing irrigated properties (gold courses and cemeteries) in the Colma area for irrigation use. Replacing groundwater with recycled water for irrigation use will decrease or eliminate the cemeteries' use of the aquifer, creating more in lieu storage in the aquifer for water supply use. The SFPUC will identify potential benefits to the aquifer resulting from the Daly City Recycled Water Expansion Project during project planning and design, as well as monitor operation of the project. Given the considerations noted above, the SFPUC modified the scope of Phase 2 in 2018 to install up to three (3) test wells (Ludeman North, Ludeman South, and Centennial

Trail), complete the South San Francisco Main well and pipeline, and complete other Phase 1 scope items, including chemical system monitoring, sampling, and storage at various sites. The test wells will allow for determination as to whether the identified sites could be viable production wells, and will provide valuable information related to water quality and potential pumping capacities that can be used for future planning and decision making. The test wells would not be converted to production wells at this time. Proceeding with these changes to Phase 2 will allow all 13 new Phase 1 RGWSR wells to be operated to gain experience and insight into the pumping capacities of each individual well in addition to how the wells work in combination with each other and existing municipal and irrigation wells. Staff will gain valuable experience regarding the relationship of RGWSR drought year pumping to the management of the groundwater basin. Operational experience will allow refinement of the modelled dry year water supply yield of the RGWSR project. The changes to RGWSR Phase 2 also allows for the collection of test well data at up to 3 locations for use in future planning if the operational experience with the 13 wells shows the need for more pumping capacity. This option also allows for the basin effects of the Daly City Recycled Water Expansion Project to be identified and may provide greater flexibility in the future to utilize the basin for water supply.

The approved scope for the RGWSR remains the same as approved in April 2018. However, since 2018 several scope refinements and some additions have been required for successful implementation of the project. Two out of three of the proposed test wells, Ludeman North and Centennial Trail, were installed. The third well, Ludeman South, was not built due to siting and constructability issues. The initial test results from the two test wells indicated that the combined yield of the two wells might be up to 0.6MGD. Based on the relatively low yield from both locations and additional costs required to upsize the Millbrae treatment facility in order to accept and treat these additional flows, it was decided that the test wells would not be converted to production wells at this time. However, these wells will provide valuable information related to water quality and potential pumping capacities that can be used for future planning and decision making.

Below are the Phase 1 modifications and additional work that increased the contract cost for the Phase 1 construction contract:

- Several modifications resulted during the installation of the sodium hydroxide treatment systems (for pH control):
 1. Potential water quality issues were anticipated in blending groundwater with distribution system water at two of the well stations that were planned to connect to Daly City's and Cal Water's systems; these two well stations were subsequently returned to the SFPUC and were connected to the SFPUC's water system. Sodium hydroxide systems needed to be added for these two wells in order to raise the pH to be consistent with SFPUC's water quality.
 2. At five of the well stations, to prevent potential scaling and plugging of the groundwater pipeline after sodium hydroxide addition, modifications to the chemical injection systems were made to improve mixing by moving the injection point closer to the transmission line.
 3. Miscellaneous modifications were implemented including addition of chemical piping double-containment systems; retrofits to the chemical rooms to accommodate the revised sodium hydroxide injection systems; restoration of landscape and hardscape; and installation of new fencing at several well stations.
- During construction, the decision was made to change the ammonia chemical (used to create chloramine for disinfection) from aqueous ammonia to liquid ammonium sulfate, which has been found to be much safer for worker handling. This change required revisions to engineering, operational, and maintenance requirements and documents; revisions to the application for the conditional Division of Drinking Water permit; and modifications to the chemical metering pumps, chemical piping and feed systems, and programming and controls systems.
- Seven (7) remote water quality analyzer stations were installed to replace manual water sample stations in order to collect real time data needed for water quality compliance at key monitoring point locations.
- Poor pump performance at three locations was investigated and found to be due to internal corrosion and/or presence of a foreign object. The modifications to correct performance issues included

investigations and forensic testing, installation of cathodic protection systems, replacement of damaged well column pipes and shafts, and well rehabilitation.

- Modification to the existing access road through Bay Area Rapid Transit's (BART's) right of way into one of the well stations was required to accommodate the turning radius of chemical delivery trucks and Fire Department emergency vehicles. The acquisition of the access permit from BART was significantly delayed while easement negotiations were ongoing. Additionally, Town of Colma required changes to the access design for traffic control requirements.

10015289 - Sunset Reservoir - North Basin (Completed)

This project is 100% complete and has been closed out. The project primarily consists of:

- Seismic rehabilitation, which includes stabilization of the soil dam embankment; a retrofit of the walls and roof using seismic joints, shear walls, diagonal bracing, and struts; and foundation improvements.
- General rehabilitation, which includes repairs of deteriorated concrete, replacement of part of the reservoir lining material, replacement of the inlet piping, installation of security fencing, landscaping upgrades, and other miscellaneous site improvements.

10015314 - University Mound Reservoir - North Basin (Completed)

The project primarily consists of:

- Seismic rehabilitation of the reservoir walls and roof using seismic joints, shear walls, diagonal bracing, and struts and foundation improvements. A geotechnical investigation was conducted that verified that the reservoir embankments are not subject to seismically induced failure.
- General rehabilitation, which includes repairs of deteriorated concrete; replacement of the reservoir lining material; replacement of the inlet/outlet, drain, and overflow piping; replacement of outlet and drain valves; landscaping upgrades and other miscellaneous site improvements.

SUPPORT PROJECTS

10015300 - System Security Upgrades (Completed)

The purpose of this project is to develop and integrate security components at critical water system facilities including those identified in previous vulnerability assessments and to ensure that security functions such as deterrence, detection, assessment, delay, and response will be effective. As part of this project, SFPUC Security has evaluated all WSIP projects. The project includes the identification of all necessary security components including security fencing, intrusion detection, and vehicle barriers for applicable WSIP projects. The project provides for the necessary planning and design of these facilities, while the individual WSIP projects will fund the installation and construction of civil security work such as conduit lay out, fencing, gate installation. This project will however fund the furnishing and installing Access Control and Alarm Monitoring System (ACAMS) and Digital Video Surveillance System (DVSS) equipment, and necessary security systems.

10015334 - Programmatic EIR (Completed)

This project includes the preparation of a Programmatic Environmental Impact Report (PEIR) in compliance with the California Environmental Quality Act (CEQA). The WSIP establishes LOS goals and system performance objectives and includes a number of projects that will improve the Regional Water System in respect to water quality, seismic reliability, delivery reliability, and water supply to meet delivery needs through the year 2030. The PEIR will (1) identify and analyze, at a programmatic level, the potential environmental impacts of proposed system improvements, (2) describe and evaluate feasible alternatives to the proposed program, and (3) propose mitigation measures.

The PEIR was certified by the San Francisco Planning Commission on October 30, 2008. On that same day the SFPUC approved the WSIP Goals and Objectives and adopted the CEQA Findings, including a statement of overriding consideration and the Mitigation Monitoring and Reporting Program (MMRP).

10015335 - Bioregional Habitat Restoration

The Bioregional Habitat Restoration project was created to provide a coordinated and consolidated approach to compensate for habitat impacts that may result from implementation of the WSIP projects in the San Joaquin, Sunol Valley, Bay Division, and Peninsula Regions of the SFPUC Regional Water System. The previously approved scope of the Bioregional Habitat Restoration project included projects to preserve, enhance, restore, or create approximately 2,350 acres of tidal marsh, vernal pools, white alder riparian forest, sycamore alluvial woodland, arroyo willow riparian habitat, oak woodland and savannah, sage scrub habitat, serpentine grasslands, coastal live oak woodland, annual grasslands, and oak riparian forest.

The project description includes development of compensation sites to preserve, enhance, restore, or create approximately 2,350 acres of tidal marsh, vernal pools, sycamore and oak riparian woodland, oak woodland and savannah, and serpentine and annual grasslands. The project includes design, environmental permitting, construction, construction management, maintenance and performance monitoring during a 3-year plant establishment period.

The wide variety of the types of impacts from WSIP projects resulted in the need for development of 18 compensation sites on SFPUC property and contracting with 7 property owners to secure compensation on property outside the Alameda and Peninsula watersheds. There are 7 compensation sites on SFPUC property in the Alameda watershed with an average size of 250 acres, demonstrating a significant commitment to the continued protection of species habitat. Although the average size of the 11 Peninsula compensation sites is 15 acres, the projects have been strategically placed to best benefit the San Francisco garter snake and the fountain thistle. The increase in habitat compensation addresses the addition of mitigation for the fountain thistle and changes in the Calaveras Dam Replacement Project.

10015336 - Vegetation Restoration of WSIP Construction Sites (Completed)

The purpose of this project is to provide maintenance, monitoring and reporting of onsite habitat restoration installed at the various WSIP construction sites after project construction work is completed.

10015337 - Long Term Mitigation Endowment

The scope of work and budget for this Long Term Mitigation Endowment was previously included and reported within the WSIP Regional project 10015335 Bioregional Habitat Restoration; however, the office of the City Controller has established a separate project, specific for this endowment fund in project 10015337 Long Term Mitigation Endowment.

This perpetual endowment fund was requested by the United States Army Corps of Engineers and California Department of Fish and Wildlife to provide a secure source of funds for the perpetual monitoring and maintenance of the Bioregional Habitat Restoration sites constructed in the SFPUC watershed.

10015342 - Watershed and Environmental Improvement Program (Completed)

The Watershed and Environmental Improvement Program (WEIP) includes the comprehensive identification and protection of critical watershed lands and ecosystem restoration needs within the hydrologic boundaries of the Alameda Creek, Peninsula (San Mateo and Pilarcitos Creeks) and Tuolumne River watersheds, and prioritizes the protection and/or restoration of these lands. Projects under this program will protect source water quality, native species and their habitat; and identify critical watershed lands for protection by purchasing fee title and/or perpetual conservation easements. The program also supports projects that enhance public awareness and provide education opportunities related to water quality, water supply, conservation, and environmental stewardship issues. These projects include construction of the proposed Alameda Creek Watershed Center and improved public access (e.g., trail connections) compatible with watershed management plans and policies.

Initially, specific projects were identified, including the Repair or Replacement of Niles Gage and Watershed Road Management Plan and Improvements – both in the Alameda Creek watershed. After

further research and planning, the program's focus has shifted towards permanently protecting Alameda Creek watershed lands through conservation easements and/or fee title purchase of property from willing landowners and providing education opportunities that will further the goals of the Water Enterprise Environmental Stewardship Policy. Opportunities that are consistent with the WEIP description and purpose in the Peninsula and Tuolumne watersheds will be considered as well.

APPENDIX C. LIST OF ACRONYMS

AAR	Alternatives Analysis Report
AWP	Alameda West Portal
BAWSCA	Bay Area Water Supply and Conservation Agency
BDPL	Bay Division Pipeline
BHR	Bioregional Habitat Restoration
BLS	Bureau of Labor Statistics
CDRP	Calaveras Dam Replacement Project
CEQA	California Environmental Quality Act
CIP	Capital Improvement Program
CM	Construction Management
CO	Change Order
COVID-19	Coronavirus Disease of 2019
DB	Design, Build
DWR	Department of Water Resource
EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
FC	Final Completion
FTE	Full-Time Equivalent
FY	Fiscal Year
HH	Hetch Hetchy
HTWTP	Harry Tracy Water Treatment Plant
IVP	Irvington Portal
JOC	Job Order Contract
LOS	Levels of Service
MW	Megawatt
N/A	Not Applicable
NIT	New Irvington Tunnel
NTP	Notice to Proceed
PCCP	Pre-stressed Concrete Cylinder Pipe
PG&E	Pacific Gas and Electric Company
RGSR	Regional Groundwater Storage and Recovery
ROW	Right-of-Way
SABPL	San Antonio Backup Pipeline
SAPL	San Antonio Pipeline
SAPS	San Antonio Pump Station
SCADA	Supervisory Control and Data Acquisition
SFPUC	San Francisco Public Utilities Commission
SJPL	San Joaquin Pipeline
SQS	Supplier Quality Surveillance
SSF	South San Francisco
SVWTP	Sunol Valley Water Treatment Plant
TBM	Tunnel Boring Machine
TWR	Treated Water Reservoir
UM	University Mound
UPS	Uninterruptible Power Supply
UV	Ultra Violet
VFD	Variable Frequency Drives
WSIP	Water System Improvement Program

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