Hetch Hetchy Capital Improvement Program

Quarterly Reports – Fiscal Year 2021-2022

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DATE: December 30, 2021

TO: Commissioner Anson Moran, President
Commissioner Newsha Ajami, Vice President
Commissioner Sophie Maxwell
Commissioner Tim Paulson
Commissioner Ed Harrington

FROM: Dennis Herrera, General Manager DJH

RE: Hetch Hetchy Capital Improvement Programs Quarterly Report
1st Quarter / Fiscal Year 2021-2022

Enclosed please find the Hetch Hetchy Capital Improvement Programs (HCIP) Quarterly Report for the 1st Quarter (Q1) of Fiscal Year (FY) 2021-2022. The primary intent of the report is to provide the Commission, stakeholders, and the public with a status summary of the Hetch Hetchy Capital Improvement Programs based on data for the period of July 1, 2021 to September 30, 2021.

Starting with this quarterly report, the Hetch Hetchy Renewal and Replacement (R&R) programs, including Water, Power, and Joint assets, will no longer be reported in this quarterly report. The progress of the Hetch Hetchy R&R programs was recently reported in the Annual Report on Water Enterprise-Managed Capital Improvement Projects, published September 30, 2021.

Approved Scope, Budget & Schedule

In the last quarterly report, the project performance was reported and compared for variance to the 2018 approved HCIP Baseline Budget and Schedule. Going forward and starting with this quarterly report, the project scopes, budgets and schedules in the Commission's approved 10-Year Capital Plan, as established every two years, specifically the 10-Year Hetch Hetchy Water Capital Improvement Program (CIP), will serve as the approved baseline for comparison to current program and project scope, schedule, and budget forecasts.

Accordingly, the "Approved" project budgets and schedules listed in this report to measure progress and report performance status have been updated since the Q4 FY20-21 Quarterly Report to conform with the 10-Year Hetch Hetchy Water CIP for FY21-30, approved by the PUC Commission on February 11, 2020.

The approved HCIP 10-Year CIP includes the following six (6) new projects:

- 10014110 – Moccasin Wastewater Treatment Plant
- 10014115 – Cherry Dam Spillway – Short Term Improvements
- 10035721 – Transmission Lines 7 & 8 Upgrades
- 10036809 – Moccasin Powerhouse Bypass Upgrades
- 10036810 – Kirkwood Powerhouse Bypass Upgrades
- 10037351 – Moccasin Dam Long Term Improvements

They are included in this report. A description of each new project is provided in Appendix A of this report.

Additionally, this Q1 FY21-22 report excludes the following eight (8) projects that have been completed as of September 2021:

- 10014066 – SJPL Rehabilitation
- 10014068 – Lower Cherry Aqueduct
- 10033156 – Moccasin Reservoir Perimeter Security Fence
- 10014085 – Kirkwood Penstock
- 10014091 – Early Intake Switchyard Slope Hazard Mitigation
- 10014107 – Moccasin Facilities New Construction
- 10014109 – Cherry Dam Outlet Works Rehabilitation
- 10014113 – Mountain Tunnel Inspection & Repairs

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 Q1 FY21-22 Quarterly Reports, staff incorporated the following revisions to the format of the CIP Quarterly Reports across all capital programs with the exception of the Water System Improvement Program Quarterly Reports, since that program is ninety-nine percent complete:

- This report now includes a new section titled as "Budget and Schedule Trend Summary," (Section 5 of this report). The intent of this section is to provide a comprehensive view of each project's budget and schedule status at milestones from initiation throughout implementation as projects are progressing toward completion. The new Budget and Schedule Trend Summary Table (Table 5) contains all approved HCIP projects that are active in any of planning, design, bid and award, or construction phases of the project.

- The Cost Summary Table 3 in Section 3 of this report contains a new column, titled "Cost Variance Over Reporting Period," intended to highlight forecasted budget changes during the reporting period and to provide new quarterly information "at a glance".
- The Project Performance Summary Table 6, in Section 6 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 7 of the report; the project order in this Section 7 is consistent with the order of projects listed in Tables 5 and 6 to facilitate consistent sequencing of projects throughout the report.

The highlights for this reporting period are as follows:

Under Contract HH-1000R, Mountain Tunnel Improvement Project, this quarter's progress included further excavation and retaining wall construction at Priest Reservoir for the Flow Control Facility (FCF) shaft and for the Priest Adit Portal area. Work also continued for the utilization and development of the spoil fill sites at Priest, which will be permanent after the project has completed. The FCF shaft excavation is expected to begin next quarter, in October. Safety improvement work continued on the adit access roads. Work progressed at the Early Intake Adit for the upcoming installation of a new bulkhead door. Planning and coordination are taking place for the project's first planned tunnel outage in January 2022. Forecast construction completion is at the end of 2026. Project completion is forecasted to be June 2027.

For Design Build Contract DB-121R2 Moccasin Powerhouse Generators Rehabilitation, the contract is in the Design Phase. Key design review packages were received for long lead items. Notice to Proceed for the Construction Phase is expected in June 2022.

For Contract HH-1003R, Moccasin Powerhouse Generator Step-Transformer Installation, the contractor disassembled the existing transformer and prepared the disassembled pieces for off haul. The design for the relay panel was approved, and fabrication has commenced. The first transformer has been fabricated and successfully factory tested. It is scheduled for delivery in October.

For Contract HH-1002R, O'Shaughnessy Dam Access and Drainage Improvements, Notice to Proceed was established on September 27, 2021. The contractor will be mobilizing to the work site next quarter.

For San Joaquin Pipeline (SJPL) Tesla Valve Replacement, a new 66-inch diameter butterfly valve and a new 24-inch diameter gate valve are being manufactured. These two valves are required to be installed during the upcoming Mountain Tunnel shutdown starting in January 2022. The valves are critical for the safety and reliability of the system. The project team is closely monitoring the delivery of the valves and proactively working with the vendor and contractor to avoid potential delays related to global supply chain issues.

For San Joaquin Pipeline Valve and Safe Entry, the project has achieved 95% design for Phase 1A and 65% design for Phase 1B. The construction contract HH-1005 for Phase 1A is on schedule to be advertised next quarter.

Attachment

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

QUARTERLY REPORT

Hetch Hetchy Capital Improvement Programs

July 2021 – September 2021

Published: December 30, 2021

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Quarterly Report
Hetch Hetchy
Capital Improvement Programs

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HETCH HETCHY WATER AND POWER (HHWP)–

WATER DIVISION CAPITAL IMPROVEMENT PROGRAMS

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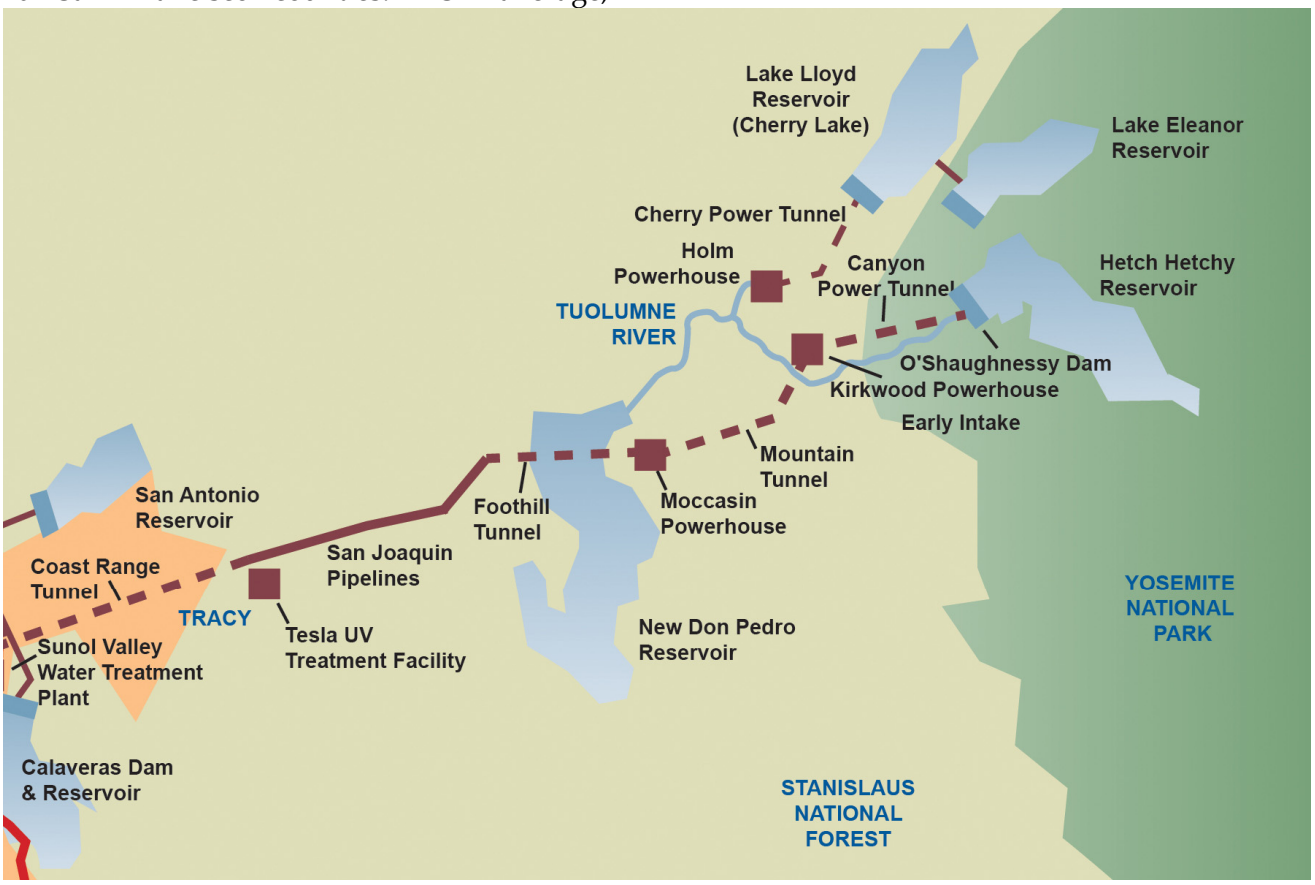
INTRODUCTION

The Hetch Hetchy Water and Power (HHWP) Water Division is the division responsible for operating, managing, and maintaining the HHWP system and facilities. This includes water facilities from Hetch Hetchy Reservoir, located in Yosemite National Park, to Alameda East Portal, located in Sunol Valley and power facilities located from Early Intake to Newark. The HHWP Water Division operates, manages, and maintains three impoundment reservoirs, three regulating reservoirs, four powerhouses, one switchyard, three substations, 170 miles of pipeline and tunnels, almost 50 miles of paved road, over 160 miles of transmission lines, watershed land, and right-of-way property. HHWP Water Division provides 85 percent of the San Francisco Public Utilities Commission (SFPUC) water supply for 2.7 million residential, commercial, and industrial customers in Alameda, Santa Clara, San Mateo, and San Francisco counties. On average, HHWP Water Division generates about 1,650 gigawatt hours (GWH) of clean hydro-generated power annually. A majority of HHWP staff is based in Moccasin, CA, which is 140 miles east of San Francisco.

The HHWP Water Division's capital improvement programs are divided into two programs: Hetchy Capital Improvement Projects (HCIP) and Renewal and Replacement (R&R). This report provides a quarterly status update on the HCIP, a group of capital improvement projects that are greater than $5M in value and have been approved by the Commission as part of the SFPUC's 10-Year Capital Improvement Program. The status of the Hetch Hetchy R&R projects is reported annually in the Annual Report on Water Enterprise-Managed Capital Improvement Projects.

The map below shows the location of the assets and facilities associated with HHWP.



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HETCHY CAPITAL IMPROVEMENT PROJECTS (HCIP)

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1. PROGRAM DESCRIPTION

The Hetchy Capital Improvement Projects (HCIP) are a multi-year group of capital projects to upgrade existing, aging infrastructure so that it will meet the challenges of today and the future. These projects will deliver improvements that enhance the SFPUC's ability to provide reliable, affordable, high quality water to its 2.7 million customers in an environmentally sustainable manner. The goals are to provide capital improvements needed to cost-effectively ensure that water quality, seismic reliability, delivery reliability, and water supply objectives that have been established for the regional water system facilities managed by HHWP are met, while optimizing the benefits of HHWP power facilities operations. Ongoing development of the HCIP will sustain the regional water system's status as an unfiltered water source and a gravity-driven system.

The scope of HCIP is divided into three major project types: Water, Power, and Joint. The Water sub-program includes only asset improvements benefiting the SFPUC's water customers. The Power sub-program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint sub-program includes projects for assets that are used for both water delivery and power generation. In addition, projects in each sub-program of the HCIP have been further organized by asset type consisting of the following:

- Buildings – projects to provide safe and code compliant work spaces.
- Dams & Reservoirs – projects to improve assets used for storage and delivery of water to SFPUC customers, as well as for water storage for power generation.
- Mountain Tunnel – projects to address deficiencies with the Mountain Tunnel, a critical, non-redundant link in the Hetch Hetchy water system that conveys water from Kirkwood Powerhouse to Priest Reservoir.
- Powerhouses – projects to improve facilities at the Holm, Kirkwood, and Moccasin powerhouses.
- Roads & Bridges – projects intended to replace bridges that are utilized to access HHWP assets.
- Switchyard & Substations – projects to meet operational objectives for power, including reliability, regulatory compliance, and sustainability.
- Tunnels – projects to repair tunnels along the HHWP system (other than Mountain Tunnel).
- Water Conveyance – projects to enhance the reliability of water delivery through pipelines and penstocks, allowing for both delivery of water to SFPUC customers and delivery of water to powerhouses for power generation.

2. PROGRAM STATUS

This first (1st) quarter report for FY2021-2022 presents the progress made on the HCIP between July 1, 2021 and September 30, 2021. In the last quarterly report, the project performance was reported and compared for variance to the 2018 approved HCIP Baseline Budget and Schedule. Going forward and starting with this quarterly report, the project scopes, budgets and schedules in the Commission's approved 10-Year Capital Plan, as established every two years, specifically the 10-Year Hetch Hetchy Water Capital Improvement Program (CIP), will serve as the approved baseline for comparison to current program and project scope, schedule, and budget forecasts. Accordingly, the "Approved" project budgets and schedules listed in this report to measure progress and report performance status have been updated since the Q4 FY20-21 Quarterly Report to conform with the 10-Year Hetch Hetchy Water CIP for FY21-30, approved by the PUC Commission on February 11, 2020.

The approved HCIP 10-Year CIP includes the following six (6) new projects:

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They are included in this report. A description of each new project is provided in Appendix A of this report. Additionally, this report excludes the following eight (8) projects that have been completed as of September 2021:

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- 10033156 – Moccasin Reservoir Perimeter Security Fence
- 10014085 – Kirkwood Penstock
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- 10014107 – Moccasin Facilities New Construction
- 10014109 – Cherry Dam Outlet Works Rehabilitation
- 10014113 – Mountain Tunnel Inspection & Repairs

There are now seventeen (17) projects in the HCIP together with (3) project development (PD) accounts for program-level expenditures for each of the Water, Power, and Joint Programs. These are included in the adopted 10-Year FY2021-2030 CIP. The accrued PD expenditures are included in the Cost Summary in Table 3 in order to give an accurate report of the overall HCIP cost performance.

Figure 2.1 shows the total Approved Budget for all seventeen (17) projects in each phase of the program as of September 30, 2021 (PD accounts do not have phases and are not included in Figure 2.1). The number of projects currently in each phase is shown in parentheses.

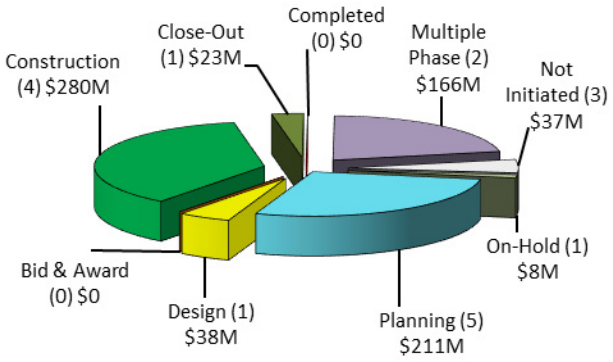


Figure 2.1 Approved Budget for Projects in Each Phase

Figure 2.2 shows the total number of projects in the following stages as of September 30, 2021: Pre-construction, Construction, and Post-construction.

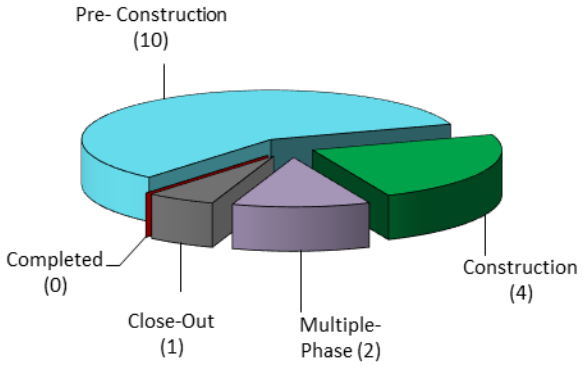


Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-Construction

Figure 2.3 summarizes the environmental review status of the HCIP projects as of September 30, 2021. Environmental review is performed for projects under California Environmental Quality Act (CEQA).

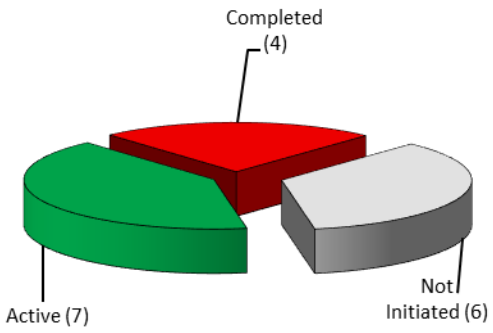


Figure 2.3 Program Environmental Review

3. PROGRAM COST SUMMARY

Table 3 provides an overall cost summary of the approved 17 HCIP projects and 3 HCIP PD accounts at the end of the quarter. It shows the Expenditures to Date, Current Approved Budget, Current Forecast Cost, the Cost Variance between the Approved and Forecast Costs, and the Cost Variance Over the Reporting Period. The Current Approved Budget for the FY21-30 CIP is $807.30 million and the Forecasted Cost is $45.51 million over the approved budget.

Table 3. Cost Summary

Subprograms	Expenditures To Date ($ Million) (A)	Current Approved Budget ($ Million) (B)	Q1/FY21-22 Forecasted Costs ($ Million) (C)	Cost Variance ($ Million) (D = B - C)	Cost Variance Over Reporting Period ($ Million) (E)
Water Infrastructure	**$7.72**	**$109.53**	**$153.27**	**($43.74)**	**($43.74)**
Water Conveyance (Water)	$3.93	$102.66	$146.40	($43.74)	($43.74)
Water Infrastructure Project Development	$3.79	$6.87	$6.87	-	-
Power Infrastructure	**$52.71**	**$204.24**	**$204.24**	**-**	**-**
Powerhouse	$26.32	$120.94	$120.94	-	-
Switchyard & Substations (Power)	$21.87	$34.25	$34.25	-	-
Transmission Lines	$2.22	$37.97	$37.97	-	-
Power Infrastructure Project Development	$2.29	$11.09	$11.09	-	-
Joint Infrastructure	**$60.96**	**$493.52**	**$495.29**	**($1.77)**	**($1.77)**
Dams & Reservoirs (Joint)	$7.35	$167.45	$184.13	($16.69)	($16.69)
Mountain Tunnel	$46.64	$238.22	$238.22	-	-
Roads & Bridges (Joint)	$0.97	$44.29	$29.37	$14.92	$14.92
Tunnels (Joint)	$0.57	$8.43	$8.43	-	-
Utilities (Joint)	$0.42	$8.79	$8.79	-	-
Joint Infrastructure Project Development	$5.02	$26.34	$26.34	-	-
Overall Program Total	**$121.39**	**$807.30**	**$852.81**	**($45.51)**	**($45.51)**

The overall program negative Cost Variance of $45.51M in Table 3 can be attributed to the following factors:

- $43.74M negative variance is due to the following Water Infrastructure project:
  - o The 10035575 SJPL Valve and Safe Entry Improvements forecasted costs increased by $43.74M.
- $1.77M negative variance is due to the combined positive and negative variances in the following Joint Infrastructure projects:
  - o The 10032903 OSD Outlet Works Phase I forecasted cost increased by $26.69M.
  - o The 10037351 Moccasin Dam Long-Term Improvements forecasted cost decreased by $10.00M.
  - o The 10035086 Bridge Replacement (4 Bridges) forecasted cost decreased by $14.92M.

4. PROGRAM SCHEDULE SUMMARY

Figure 4 and Table 4 compare the FY21 – 30 CIP Approved Schedule and the Current Forecast Schedule for the HCIP. As shown in Table 4, the overall HCIP is currently forecast to be completed in October 2035.

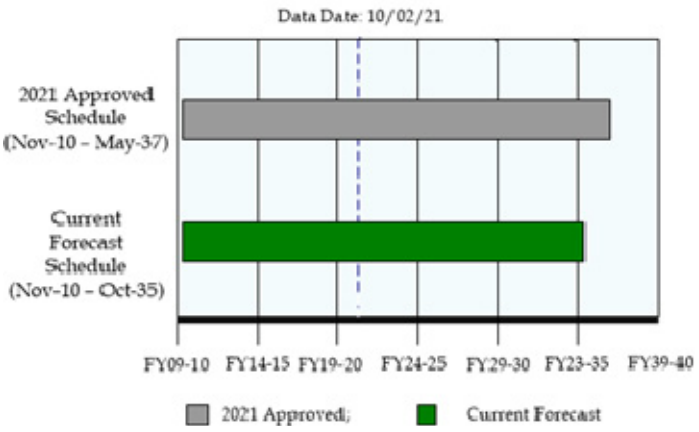


Figure 4. Program Schedule Summary

Table 4. FY21-30 CIP Approved vs. Current Forecast Schedule Dates

Sub-Program	2021 Approved Project Start	Actual Start	2021 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Water Infrastructure	11/08/10	11/08/10✓	06/30/31	06/28/30	12 Early
Power Infrastructure	05/29/12	05/29/12✓	06/30/31	10/30/35	52
Joint Infrastructure	10/03/11	10/03/11✓	05/25/37	06/28/30	82.9 Early
Overall HCIP Projects	**11/08/10**	**11/08/10✓**	**05/25/37**	**10/30/35**	**18.8 Early**

5. BUDGET AND SCHEDULE TREND SUMMARY

Starting with the Q1 FY21-22 Quarterly Report, a revised report format includes a new Table 5, titled Budget and Schedule Trend Summary. This Table 5 contains all approved HCIP projects that are active and in any of the planning, design, bid and award, or construction phases of the project. The table excludes all Project Development accounts, as well as any projects that are either Not-Initiated, On-Hold, in Close-Out or Completed.

During this Quarter (Q1 FY21-22), the following major milestones were achieved and the project cost and schedule forecasts were updated based on the updated milestone cost estimates accordingly for the following HCIP projects:

1. 95% Design for Phase 1 A of the SJPL Valve and Safe Entry Improvement project
2. 95% Design for the Transmission Lines 7/8 Upgrades project
3. CER for the O'Shaughnessy Dam Outlet Works Phase 1 project (Subproject A)
4. Awarded Construction Contract for the OSH Dam Access and Drainage Improvement project

Table 5. Budget and Schedule Trend Summary

All Costs are shown in million

Project Name	Most Recent CIP Approved Budget		Project Initiation		CER		35% Design		95% Design		Awarded Construction[1]		Current Status	
	Approved Budget	Approved Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion
	a	b	c	d	e	f	g	h	i	j	k	l	m	n
Water Infrastructure														
10035574 - SJPL Tesla Valves Replacement	FY21-30		05/01/19		11/27/20		07/28/20		11/17/20		04/06/21		Q1 - FY21-22	
	$3.7	12/30/22	$7.4	06/28/24	$7.4	06/28/24	$7.4	06/28/24	$7.4	06/28/24	$3.7	12/30/22	$3.7	12/30/22
10035575 - SJPL Valve and Safe Entry Improvement	FY21-30		7/1/2019		4/16/2021		03/03/21 (Phase 1A), 05/28/21 (Phase 1B), 03/25/22 (Phase 2) & 12/30/21 (Phase 3)		07/14/21 (Phase 1A), 10/29/21 (Phase 1B), 09/20/22 (Phase 2) & 05/06/22 (Phase 3)		04/15/22 (Phase 1A), 05/23/22 (Phase 1B), 06/19/23 (Phase 2) & 01/15/23 (Phase 3)		Q1 - FY21-22	
Phase 1A Phase 1B Phase 2 Phase 3	$98.9	03/13/28	$95.3	07/01/25	$95.3	07/01/25	$98.9	03/13/28	$142.7	03/13/28	TBD	TBD	$142.7	03/13/28
Power Infrastructure														
10036809 - Moccasin Powerhouse Bypass Upgrades	FY21-30		09/18/20		11/07/22		02/24/23		12/26/23		02/28/25		Q1 - FY21-22	
	$15.0	12/01/27	$15.0	12/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$15.0	12/01/27
10014086 - Moccasin Powerhouse and GSU Rehabilitation	FY21-30		01/04/16		05/14/21		07/29/19 (Phase 1), 10/01/19 (Phase 2) & 11/29/22 (Phase 3)		09/09/20 (Phase 1), 04/08/22 (Phase 2) & 01/29/24 (Phase 3)		06/07/21 (Phase 1), 06/08/22 (Phase 2) & 10/02/24 (Phase 3)		Q1 - FY21-22	
Phase 1 Phase 2 Phase 3	$66.7	04/13/27	$18.0	10/03/18	$66.7	04/13/27	$66.7	12/03/27	$66.7	12/03/27	$66.7	12/03/27	$66.7	12/03/27
10014087 - Warnerville Substation Rehabilitation	FY21-30		09/01/15 (Phase 1), 7/01/20 (Phase 2a) & 01/01/21 (Phase 2b)		02/29/16 (Phase 1), 01/18/21 (Phase 2a) & 01/03/23 (Phase 2b)		04/01/16 (Phase 1), 04/22/21 (Phase 2a) & 09/01/23 (Phase 2a)		12/24/16 (Phase 1), 08/16/21 (Phase2a) & 04/04/24 (Phase 2b)		11/26/18 (Phase 1), N/A (Phase 2a) & 02/03/25 (Phase 2b)		Q1 - FY21-22	
Phase 1 (DB-127R) Phase 2a Phase 2b	$34.2	11/25/26	$27.2	11/25/26	$34.2	11/25/26	$34.2	11/25/26	$34.2	11/25/26	$24.3	03/04/20	$34.2	11/25/26
10035721 - Transmission Lines 7/8 Upgrades	FY21-30		07/01/19		12/07/20[2]		03/19/21		09/24/21		10/03/22		Q1 - FY21-22	
	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	TBD	TBD	$38.0	01/31/25
Joint Infrastructure														
10014088 - Moccasin Penstock	FY21-30		12/11/18		04/21/23		10/16/23		06/10/24		04/16/25		Q1 - FY21-22	
	$47.3	02/28/28	$13.2	12/31/24	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$47.3	02/28/28
10030758 - OSH Dam Access and Drainage Improvements	FY21-30		03/01/17		06/28/19		09/01/19		08/21/20		09/27/21		Q1 - FY21-22	
	$4.0	02/28/23	$5.8	02/26/21	$5.8	02/26/21	$5.8	02/11/22	$5.8	12/16/22	$4.0	02/28/23	$4.0	02/28/23
10032903 - O'Shaughnessy Dam Outlet Works Phase I	FY21-30		02/01/18		9/30/2021 (Subproject A), Complete (Subproject B), 2/28/2022 (Subproject C), 8/30/2022 (Subproject D) & 8/30/2022 (Subproject E)		12/1/2021 (Subproject A), 11/30/2021 (Subproject B) & 5/31/2022 (Subproject C)		5/1/2022 (Subproject A), 2/01/2022 (Subproject B) & 1/30/2023 (Subproject C)		12/1/2022 (Subproject A), 12/1/2022 (Subproject B) & 9/30/2023 (Subproject C)		Q1 - FY21-22	
Subproject A Subproject B Subproject C Subproject D (Planning Only) Subproject E (Planning Only)	$21.2	09/16/25	$17.2	12/31/24	$47.9	09/16/25	TBD	TBD	TBD	TBD	TBD	TBD	$47.9	09/16/25

Table 5. Budget and Schedule Trend Summary

All Costs are shown in million

Project Name	Most Recent CIP Approved Budget		Project Initiation		CER		35% Design		95% Design		Awarded Construction[1]		Current Status	
	Approved Budget	Approved Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion
	a	b	c	d	e	f	g	h	i	j	k	l	m	n
10037351 - Moccasin Dam Long-Term Improvements	FY21-30		05/03/21		07/28/22		06/15/23		02/06/25		06/01/26		Q1 - FY21-22	
	$83.2	07/01/27	$83.2	07/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$73.2	06/30/28
10014115 - Cherry Dam Spillway - Short Term Improvements	FY21-30		03/01/21		07/15/22		12/02/22		09/08/23		08/20/24		Q1 - FY21-22	
	$11.9	07/01/27	$11.9	07/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$11.9	07/01/27
10014114 - Mountain Tunnel Improvement Project	FY21-30		10/03/11		12/29/17		05/15/18		07/31/19		10/13/20		Q1 - FY21-22	
	$238.2	06/03/27	$114.0	12/30/21	$246.1	12/31/26	$238.2	12/31/26	$238.2	12/31/26	$238.2	06/03/27	$238.2	06/03/27
10035086 - Bridge Replacement (4 - Bridges)	FY21-30		02/27/20		12/30/21 (Subproject 1) & 02/28/23 (Subproject 2)		05/23/22 (Subproject 1) & 05/05/23 (Subproject 2)		02/20/23 (Subproject 1) & 01/12/24 (Subproject 2)		02/01/24 (Subproject 1) & 02/03/25 (Subproject 2)		Q1 - FY21-22	
Subproject 1 Subproject 2	$44.3	05/25/37	$44.3	12/30/25	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$29.4	07/01/27

Footnotes:

1. This represents forecast project cost and project completion date at the time of award of construction contract (or award of CM/GC contracts/packages).
2. This represents the date the Design Criteria Report (DCR) was finalized for Transmission Lines 7/8 Upgrade project. CER was not required for the project.

6. PROJECT PERFORMANCE SUMMARY*

All costs are shown in $1,000s as of 10/02/21

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 Project Completion Date (h) (+)	Current Approved Completion (i) (++)	Current Forecast Completion (j)	Schedule Variance (Days) (k = i - j) (+++)
Water Infrastructure											
Water Conveyance (Water)											
10035574 - SJPL Tesla Valves Replacement	CN	$ 3,740	$ 3,740	$ 3,740	$ 1,054	-	0%	12/30/22	12/30/22	12/30/22	0
10035575 - SJPL Valve and Safe Entry Improvement	MP	$ 98,924	$ 98,924	$ 142,662	$ 2,878	($43,738)	-44%	03/13/28	03/13/28	03/13/28	0
Power Infrastructure											
Powerhouse											
10036809 - Moccasin Powerhouse Bypass Upgrades	PL	$ 15,007	$ 15,007	$ 15,007	$ 341	-	0%	12/01/27	12/01/27	12/01/27	0
10014086 - Moccasin Powerhouse and GSU Rehabilitation	MP	$ 66,714	$ 66,714	$ 66,714	$ 5,616	-	0%	04/13/27	04/13/27	12/03/27	(234)
Switchyard & Substations (Power)											
10014087 - Warnerville Substation Rehabilitation	CN	$ 34,248	$ 34,248	$ 34,248	$ 21,866	-	0%	11/25/26	11/25/26	11/25/26	0
Transmission Lines											
10035721 - Transmission Lines 7/8 Upgrades	DS	$ 37,969	$ 37,969	$ 37,969	$ 2,225	-	0%	01/31/25	01/31/25	01/31/25	0

* Exclude 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 MP Multiple-Phase

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 or/ and additional contingencies on construction contracts.

(+++) Negative number is reflecting cost overrun (Schedule delay) and positive number is reflecting cost underrun (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.

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 Project Completion Date (h) (+)	Current Approved Completion (i) (++)	Current Forecast Completion (j)	Schedule Variance (Days) (k = i - j) (+++)
Joint Infrastructure											
Dams & Reservoirs (Joint)											
10014088 - Moccasin Penstock	PL	$ 47,251	$ 47,251	$ 47,251	$ 5,131	-	0%	02/28/28	02/28/28	02/28/28	0
10030758 - OSH Dam Access and Drainage Improvements	CN	$ 3,952	$ 3,952	$ 3,952	$ 1,051	-	0%	02/28/23	02/28/23	02/28/23	0
10032903 - O'Shaughnessy Dam Outlet Works Phase I	PL	$ 21,206	$ 21,206	$ 47,894	$ 870	($26,688)	-126%	09/16/25	09/16/25	09/16/25	0
10037351 - Moccasin Dam Long-Term Improvements	PL	$ 83,176	$ 83,176	$ 73,176	$ 67	$ 10,000	12%	07/01/27	07/01/27	06/30/28	(365)
10014115 - Cherry Dam Spillway - Short Term Improvements	PL	$ 11,861	$ 11,861	$ 11,861	$ 228	-	0%	07/01/27	07/01/27	07/01/27	0
Mountain Tunnel											
10014114 - Mountain Tunnel Improvement Project	CN	$ 238,219	$ 238,219	$ 238,219	$ 46,639	-	0%	06/03/27	06/03/27	06/03/27	0
Roads & Bridges (Joint)											
10035086 - Bridge Replacement (4 - Bridges)	PL	$ 44,287	$ 44,287	$ 29,371	$ 970	$ 14,916	34%	05/25/37	05/25/37	07/01/27	3616

* Exclude 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 MP Multiple-Phase

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 or/ and additional contingencies on construction contracts.

(+++) Negative number is reflecting cost overrun (Schedule delay) and positive number is reflecting cost underrun (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.

7. PROJECT STATUS REPORT

10035574 - SJPL Tesla Valves Replacement

Project Description: The 2018 approved scope for this project is to replace four large diameter butterfly valves, namely TUV 101, 201, 301 and 401, inside the Tesla Valve Vault so that each of the four San Joaquin Pipelines (SJPL) can be safely isolated and shut down individually for inspection and repair work without shutting down the entire SJPL system. This project will also improve safety for entry into the pipelines for maintenance and inspection purposes. After the planning phase of the related project SJPL Valve and Safe Entry Improvement (Project 10035575) it was recommended that the scope of SJPL Tesla Valve Replacement be reduced, to focus on completing the replacement of TUV101 only. The remainder of the work (i.e. TUV 201, 301 and 401) has been added to the scope of SJPL Valve and Safe Entry Improvement (Project 10035575) to expedite improvements for TUV101 during the planned winter shutdown from January to February 2022 to facilitate necessary maintenance work for SJPL No. 1 during the remainder of 2022. The installation of TUV201, 301 and 401 will proceed together with the upgrade work proposed under SJPL Valve and Safe Entry Improvement, in 2023 and 2024.

Program: Water Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed

Project Cost:

Approved		$3.74 M
Forecast		$3.74 M
Actual		$1.05 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	May-19	Dec-22
Forecast	May-19	Dec-22

Project Percent Complete: 29.6%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	08/26/20✓	N/A	04/06/21✓	05/31/22

Progress and Status:

This project is divided into 2 sub-projects: A) the pre-purchase and installation of Tesla Valve TUV-101; B) the procurement and installation of Tesla Valves TUV-201, TUV-301 & TUV-401.

Subproject A: In this quarter, the City-purchased 66-inch diameter butterfly valve and actuator were being manufactured in South Korea and Germany, respectively. The JOC contractor continued to work on submittals focusing on long lead items including a new 24-inch diameter butterfly valve.

Subproject B: The procurement and installation of the remaining valves TUV 201, 301, and 401 will follow the traditional design-bid-build project delivery method. To optimize the construction and reduce impact on water delivery, the scope and budget for the improvements to TUV201, 301 and 401 will transfer out of this project and become a part of the SJPL Valve and Safe Entry Improvement project.

Components of 66-inch Butterfly Valve being assembled in factory

Issues and Challenges:

The global supply chain and port congestion issues may cause delay to the delivery of the materials and equipment for this project. This may jeopardize the project schedule to complete the work during the upcoming winter shutdown of the San Joaquin Pipeline from January to March 2022. The project team has been actively monitoring the situation and investigating possible risk mitigation measures.

10035575 - SJPL Valve and Safe Entry Improvement

Project Description: The San Joaquin Pipelines (SJPLs) consist of three parallel pipelines approximately 48 miles long (completed in 1932, 1953, and 1968, respectively) that cross the San Joaquin Valley from the Oakdale Portal of the Foothill Tunnel on the east end to the Tesla Portal of the Coast Range Tunnel (CRT) on the west. Portions of a fourth pipeline have also been constructed consisting of 6.4 miles of pipe downstream of Oakdale and 11 miles upstream of Tesla. The hydraulic gradient on the SJPLs was limited by surge stacks/towers at Oakdale portal (~825 ft) and Tesla portal (~500 ft). The pipelines were intended to be shut down at Oakdale.

As part of the SFPUC's Water System Improvement Program (WSIP), the Emery and Pelican crossover vaults were installed and the Roselle crossover vault was modified to allow for flows between SJPLs and isolation of SJPL segments for inspection and maintenance. In addition, the Tesla Valve House (TVH) and Tesla Treatment Facility (TTF) were added upstream of the Tesla surge tower. Like the SJPLs, the crossover vaults and Tesla facilities are rated for the maximum pressures that should occur under normal operating conditions. However, the pipelines and pipeline segments still need to be shut down from the upstream end. Closure of multiple in-line valves or all TTF UV reactor valves can over-pressurize the pipelines. As in the original design, complete shutdown of the SJPL system must be done at Oakdale.

The objective of this project is to allow safe entry into any and all sections of the SJPLs for inspection and maintenance while the remainder of the system stays in operation. The scope and budget of installing the TUV201, 301 and 401 butterfly valves has been transferred from project SJPL Tesla Valve Replacement project (10035574) and added to SJPL Valve and Safe Entry Improvement.

Program: Water Infrastructure	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:

Approved	$98.92 M
Forecast	$142.66 M
Actual	$2.88 M

Project Schedule:

Approved	Jul-19	Mar-28
Forecast	Jul-19	Mar-28

Project Percent Complete: 4.8%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 10/14/21 (B) 10/14/21 (C) 12/06/22 (D) 05/06/22	(A) 11/06/21 (B) 12/03/21 (C) 12/21/22 (D) 07/12/22	(A) 04/15/22 (B) 05/23/22 (C) 06/19/23 (D) 01/15/23	(A) 09/30/24 (B) 06/07/24 (C) 05/24/27 (D) 08/01/24

** (A) Phase 1A – Pipeline 2 Tesla & Oakdale Entry Improvements – HH-1005; (B) Phase 1B – Pipelines 3&4 Tesla & Oakdale Entry Improvements HH-1006; (C) Phase 2 -Pelican, Roselle, Emery and P4J Entry Improvements; and (D) Phase 3 - Tesla Surge Stack.*

Progress and Status:

This project is divided into four (4) sub-projects, as outlined in the above footnote:

For Phase 1A, the 95% design was completed in July. The project team continued to work towards the 100% design. For Phase 1B, the 65% design was also completed in July. The project team continued to work towards the 95% design. The design of the other two phases has not yet started

Issues and Challenges:

The forecasted cost is greater than the approved budget due to scope refinements to improve safe entry and resequencing of construction to better coordinate with system shutdowns in Fall/Winter to minimize the impact on water delivery.

Construction Photo of a Victaulic Cap and Coupling SJPL 1 @ Oakdale

10036809 - Moccasin Powerhouse Bypass Upgrades

Project Description: Hetch Hetchy water deliveries are conveyed from Priest Reservoir to Moccasin Powerhouse (MPH) through the Moccasin Penstocks. At MPH, water passes through two hydroelectric turbines where energy is converted from high-pressure water into electricity. When electricity is not being produced, the water deliveries are directed around the turbines by two bypass valves that dissipate up to 305 million gallons per day (mgd) at 560 pounds per square inch (psi) of water energy. In the past, short-term use of the bypass system has resulted in significant vibration and cavitation damage to the bypass valves. Long-term use (greater than two to five days) could lead to major mechanical damage or failure, leading in turn to the potential of interruption of water deliveries to San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the Moccasin Reservoir Bypass Pipeline, allowing for increased operating flexibility for HHWP to meet scheduled water deliveries even when MPH, Moccasin Switchyard, or power Transmission Lines #3 and #4 are curtailed.

Program: Power Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved		$15.01 M
Forecast		$15.01 M
Actual		$0.34 M

Project Schedule:

Approved	Sep-20 	Dec-27
Forecast	Sep-20 	Dec-27

Project Percent Complete: 4.1%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	08/26/24	08/27/24	02/28/25	06/01/27

Progress and Status:
The project is in planning. The consultant is working on the Needs Assessment Report (NAR) and will begin developing the Alternative Analysis Report (AAR) in the next quarter.

Issues and Challenges:
None at this time.

10014086 - Moccasin Powerhouse and GSU Rehabilitation

Project Description: The two Moccasin Powerhouse generators were completed in 1969 and generate a combined maximum output of 110 megawatts. Both generator units have exceeded their life expectancy and are in need of repair in order to continue operating reliably. The objective of this project is to replace stator cores and coils. The scope of work also includes rehabilitation of the rotor field poles with new pole cores and re-insulated field coils, replacement of the rotor pole/rim tail connection system with a new T-tail connection system, and supply of a new rotor rim for each generator following inspection and testing. The project will also include replacement of two generator step-up transformers (GSUs) with new oil containment barriers, and remaining plant work including: replacing 480V switchgear, 13.8kV switchgear, motor control centers, main control boards, protective relays, and cooling water piping.

Program: Power Infrastructure	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:		**Project Schedule:**	
Approved	$66.71 M	Approved Jan-16	Apr-27
Forecast	$66.71 M	Forecast Jan-16	Dec-27
Actual	$5.62 M	Project Percent Complete: 6.5%	

Approved; Actual Cost; Forecast

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 09/28/20✓ (B) 09/28/20✓ (C) 09/28/22	(A) 11/20/20✓ (B) 10/30/20✓ (C) 04/01/24	(A) 06/07/21✓ (B) 06/21/21✓ (C) 10/02/24	(A) 05/23/23 (B) 06/17/24 (C) 06/07/27

** (A) Moccasin Powerhouse Generator Step-Up (GSU's) Transformers HH-1003R was re-advertised on 1/14/21; (B) Moccasin Powerhouse Generators Rewind – DB-121R2; and (C) Moccasin Powerhouse Systems Upgrade.*

Progress and Status:

This project is divided into 3 sub-projects, as outlined in the above footnote. For Subproject A, HH-1003R MPH Generator Step-up (GSU) Transformer Installation, the contractor disassembled the spare transformer and moved it outside of the switchyard ready for removal. The GSU1 transformer will be delivered in October and the relay panels are scheduled for delivery in November. For Sub-project B, DB-121R2 MPH Generators Rehabilitation, sixty-five (65) percent design drawings were received for key long lead items. Notice to Proceed for Construction is scheduled for June 2022. For Sub-project C, MPH Systems Upgrades, the needs assessment report (NAR), including the prioritization of scope items, was submitted in September, and will be reviewed by the Technical Steering Committee (TSC) next quarter. The task order for consultant planning and design support is anticipated to receive NTP in December.

Delta Star GSU1 Transformer in Spare Slot

Issues and Challenges:

Subproject A: The GSU Relay panels are required to be on site by 11/29/21 prior to the Mountain Tunnel outage in January and February.

Subproject B: Several long leads items are coming from Brazil, Canada, and Europe. There are concerns with the timeliness of material delivery due to the recent backlog of container ships in the California ports.

10014087 - Warnerville Substation Rehabilitation

Project Description: This project is based on the need to extend the useful life of the Warnerville Substation and meet reliability requirements of NERC/WECC and PG&E Intertie Agreements. The upgrades include replacing three existing 3 phase transformer with two larger rated transformers. Other upgrades include new 115kV and 230kV disconnect switches and breakers; new Control Room, perimeter fence, relays and controls; improvement to the grading and grounding system.

Program: Power Infrastructure	**Project Status:** Construction	**Environmental Status:** Active

Project Cost:

Approved	$34.25 M
Forecast	$34.25 M
Actual	$21.87 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Sep-15	Nov-26
Forecast	Sep-15	Nov-26

Project Percent Complete: 66.7%

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 03/31/16✓	(A) 01/24/17✓ (B) 09/06/24	(A) 10/05/17✓ (B) 02/03/25	(A) 12/31/21 (B) 05/04/26

** (A) Warnerville Substation Phase 1 – DB-127R; (B) Warnerville Substation Phase 2.*

Progress and Status:

The project team, in coordination with the City Attorney's office, is working to close out the contract DB-127R, Warnerville Substation Rehabilitation. The team received 100% design for the breaker failure contingency plan, and this will be finalized next quarter.

Contract HH-1008 Warnerville Substation Rehabilitation Phase II, will be a design-bid-build contract. The team continued preliminary planning meetings with Hetch Hetchy Operations. A draft facility outage schedule has been developed to analyze potential outage windows during construction.

The Professional Service contract for electrical engineering support was awarded during the quarter. Notice to Proceed is anticipated to be issued in November. The Task Order scope for Planning, Engineering, and Services during Construction for this project has been developed and is under review.

Typical 230KV SF6 Breaker to be Installed as Part of Phase II

Issues and Challenges:

None at this time.

10035721 - Transmission Lines 7/8 Upgrades

Project Description: This project develops the scope of work, design, and contract documents necessary to bid, award, and manage the reconductoring contract. Reconductoring will include replacement of the existing 115kV conductors on Lines 7/8 from Warnerville to Standiford substations, resulting in improved transmission tower stability, and resolved clearance detections.
The project will be partially funded by independent power generators interconnecting on the California Independent System Operator (CAISO).

Program: Power Infrastructure	**Project Status:** Design	**Environmental Status:** Active

Project Cost:

Approved	$37.97 M
Forecast	$37.97 M
Actual	$2.22 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Dec-19	Jan-25
Forecast	Dec-19	Jan-25

Project Percent Complete: 3.5%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	12/30/21	01/03/22	10/03/22	06/28/24

Progress and Status:
Significant progress was achieved in the environmental phase with the completion of the Final Historical Resources Evaluation Report, the Final Archaeological Resources Evaluation Report, and the Final Biological Resources Evaluation Report. All three of these reports support the Addendum to the existing Final Mitigated Negative Declaration for the Rehabilitation of the Existing San Joaquin Pipelines, file number 2007.1129E. This Addendum will be the guiding environmental permit for the project. In addition to this significant Environmental progress, after having previously completed the 65% design submission ahead of schedule, the design engineering consultant submitted the 95% design on schedule this quarter.

Transmission Line 7/8 Tower 508S Looking North

Issues and Challenges:
None at this time.

10014088 - Moccasin Penstock

Project Description: Moccasin Penstock was built in the early 1920's and conveys Hetch Hetchy water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. Moccasin penstock serves as the sole link in conveying water from Priest Reservoir to Moccasin Reservoir, from which water is routed to the San Francisco Public Utilities Commission (SFPUC) customers. The lower 1,084-foot section of welded steel pipe replaced the original penstocks when the new Moccasin Powerhouse was completed in the 1960s. The upper 4,000 feet of penstock dates to 1924 and has been in service for more than 97 years. Previous condition assessments have identified deficiencies including corrosion, coating damage, lining degradation, leakage, aggregate expansion, cracks in the concrete anchor blocks and saddles, vulnerability of the hammer forged steel pipe sections. The objective of this project is to enhance the reliability of water delivery and extend the life of the penstock system for another 50 to 100 years.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:

Approved		$47.25 M
Forecast		$47.25 M
Actual		$5.13 M

Approved; Actual Cost; Forecast

Project Schedule:

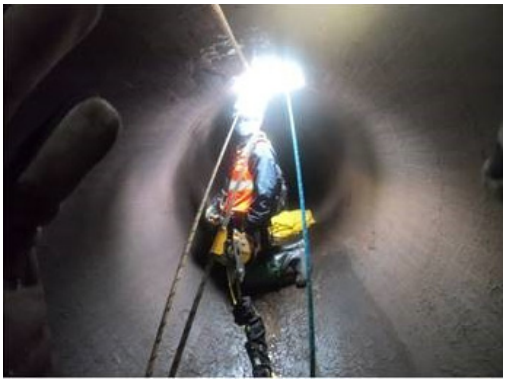
Approved	Feb-16	Feb-28
Forecast	Feb-16	Feb-28

Project Percent Complete: 10.5%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	10/08/24	10/08/24	04/16/25	08/24/27

Progress and Status:
In this quarter, the consultant continued to address the comments on condition assessment and the structural evaluation. In addition, the project team agreed on the project scope for the needs assessment phase and the alternatives analysis.

Issues and Challenges:
None at this time.



Interior inspection rope access

10030758 - OSH Dam Access and Drainage Improvements

Project Description: The O'Shaughnessy Dam is located 140 miles east of San Francisco, CA in Yosemite National Park, Tuolumne County. The dam, a concrete curved gravity structure, is located on the Tuolumne River across the steep□walled Hetch Hetchy Valley. The interior workings of the dam contain valves and appurtenances that must be accessed for operations and maintenance.
This project includes improvements for safe access, as well as mitigation of excess interior water leakage through drainage improvements, for the Ladder Wells, Galleries, Inclined Stairways, Control Room, and Diversion Tunnel.
The project was reduced in scope of work in 2020 to meet the existing approved budget. The new project will be advertised as O'Shaughnessy Dam-Fall Protection Improvements and Spillway Access to complete the reduced scope of work.
Improvements that were not included in this revised project, such as drainage improvements, will be included in the OSH Dam Outlet Works Phase 1 project.

Program: Joint Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed (CatEx)

Project Cost:

Approved		$3.95 M
Forecast		$3.95 M
Actual		$1.05 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Mar-17	Feb-23
Forecast	Mar-17	Feb-23

Project Percent Complete: 26.7%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	07/16/20✓	03/18/21✓	09/27/21✓	08/21/22

Progress and Status:
Notice to Proceed was established on September 27, 2021 for Contract HH-1002R. The contractor will be mobilizing to the work site next quarter.

Issues and Challenges:
None at this time.

Inclined Stairway OSH Dam

10032903 - O'Shaughnessy Dam Outlet Works Phase I

Project Description: O'Shaughnessy Dam (OSH) was completed in 1923 and raised in 1938. The original outlet works including gates and valves have been in services for more than 98 years. Inspections, condition assessments, and studies concluded that improvements and refurbishments of the outlet works system are needed to ensure safety and reliability. The work will be implemented in two phases. This project is to cover the Phase 1 work. The O'Shaughnessy Dam Outlet Works Phase 1 Project addresses the identified deficiencies of the existing outlet works system at OSH. Phase 1 will include four projects: (1) supply and installation of nine new bulkheads; (2) refurbishment of twelve existing slide gates; (3) rehabilitation of existing drum gates to replace the seals, replace the hinges and rivets, recoating the gates, and repair the spillway concrete; and (4) installation of a new diversion pipe isolation butterfly valve. The existing control gates and valves are essential features for dam safety and reservoir operation. The project is needed to maintain safe and reliable operation of these aging assets. Failure or malfunction of these gates and valves will affect dam safety and result in reduction of storage and reduction of water deliveries to SFPUC customers.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:

Approved	$21.21 M
Forecast	$47.89 M
Actual	$0.87 M

Project Schedule:

Approved	Feb-18	Sep-25
Forecast	Feb-18	Sep-25

Project Percent Complete: 12.9%

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 09/29/22 (B) 09/29/22 (C) 08/25/23	(A) 05/05/22 (B) 05/05/22 (C) 04/14/23	(A) 12/06/22 (B) 12/06/22 (C) 09/15/23	(A) 03/14/25 (B) 03/14/25 (C) 11/29/24

** (A) Bulkhead; (B) Access and Drainage; (C) Instream Flow Release*

Progress and Status:

During this quarter, the Conceptual Engineering Report for the Bulkhead Project was completed. The planning phase for the IFR Valve Replacement Project has begun. Based on priorities and available funding, the scopes of work for multiple projects at the O'Shaughnessy Dam were re-evaluated and scope changes are forecasted for this project. Replacement of the damaged existing instream flow release (IFR) valves was deemed critical and moved from the later Phase 2 project to this Phase 1 scope. Also, some of the improvements for safe access by personnel and for drainage reduction in the dam gallery were removed from the O'Shaughnessy Dam Access and Drainage scope and will be added to this Phase 1 scope. The current approved Phase 1 scope for refurbishment of the existing slide gates, rehabilitation of the drum gates, and installation of a new diversion pipe isolation valve are being considered for deferment to Phase 2 due to limitation in available funding for Phase 1. The current project forecasted budget and schedule include scope for installation of new bulkheads (original scope), replacement of the IFR valves, installation of safe access and drainage improvements, and funding for the planning phase for the drum gates and slide gates refurbishment.

Issues and Challenges:

The current planning-level design and construction cost estimates are higher than the approved budget due to the additional forecasted scope from the IFR Valves Replacement and the dam gallery access and drainage improvements, and the higher level of detail included in the most recent construction cost estimate for installation of the new bulkhead system. The schedule forecast for installation of the new bulkhead system has been likewise extended to allow time for additional inspections, underwater modification of the existing slots and corroded inlet surfaces, and installation of the bulkheads using divers. Based on the changes to Phase 1 scope discussed above, the project team has forecast that the Phase 1 construction will now be completed under multiple contracts, and the final subproject of Phase 1 will be completed in late 2025.

10037351 - Moccasin Dam Long-Term Improvements

Project Description: The flow capacity of the existing spillway is inadequate to protect the Moccasin Dam against overtopping and erosion from severe flood events. The dam almost overtopped during the March 2018 storm event when flows were released from the auxiliary spillway and caused significant damage to the auxiliary spillway. The surrounding areas and the upstream diversion dam also sustained damage from the flood. This project is needed for dam safety. The objective of this project is to increase the spillway flow capacity to allow safe passage of flood flows without overtopping the dam and to protect the associated facilities within the Moccasin reservoir boundary against flood damages. The estimated project cost is $83.2 million and is within the current 10-year CIP FY 21-30. Construction is scheduled for 2025-2027.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved	$83.18 M
Forecast	$73.18 M
Actual	$0.07 M

Project Schedule:

Approved	May-21	Jul-27
Forecast	May-21	Jun-28

Project Percent Complete: 1.4%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/29/26	01/26/26	07/27/26	12/30/27

Progress and Status:
The engineering consultant continues work to supplement and finalize the alternatives analysis report for this project. The alternative analysis is currently scheduled to be completed by the end of the next quarter.

Issues and Challenges:
None at this time.

Moccasin Dam Upstream Entrance to Existing Auxiliary Spillway (looking upstream)

10014115 - Cherry Dam Spillway - Short Term Improvements

Project Description: A spillway release from Cherry Dam in 2010 caused a landslide, blockage of the spill channel, and extensive erosion in the close proximity of the dam's right abutment. In addition, it caused flooding of the Cherry Power Tunnel Adit, and flooding of a campground further downstream. Engineering studies determined that significant long-term improvements to increase the spillway flow capacity are needed to maintain dam safety. The objective of this project is to re-establish containment for the breached spill channel section and to protect the downstream slope of the existing embankment dam from uncontrolled releases and erosion in the interim until the long-term improvements are implemented. Construction is scheduled for 2025-2026. The estimated project cost of $11.9 million is within the current 10-year CIP FY 21-30.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved	$11.86 M
Forecast	$11.86 M
Actual	$0.23 M

Project Schedule:

Approved	Mar-21	Jul-27
Forecast	Mar-21	Jul-27

Project Percent Complete: 6.0%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	08/15/24	03/29/24	10/31/24	12/31/26

Progress and Status:
The engineering consultant continued work on the alternative analysis study for the Cherry Dam Spillway short-term improvements in Q4. The alternative analysis is scheduled to complete in March 2022.

Issues and Challenges:
None at this time.

Cherry Valley Dam Spillway

10014114 - Mountain Tunnel Improvement Project

Project Description: Mountain Tunnel conveys the SFPUC water supply from Kirkwood Powerhouse to Priest Reservoir. Mountain Tunnel has been in service since 1925. Due to its age, deferred maintenance, and construction deficiencies in the early 1900s, sections of the tunnel lining have deteriorated, some extensively. This project provides design and construction of major tunnel repair and rehabilitation work, adit and tunnel entry improvements, access road improvements, and installation of a new flow control facility at Priest Reservoir to ensure that the tunnel can reliably provide drinking water to customers for the next 100 years.
The flow control structure and isolation valves will also be used to isolate the tunnel from Priest Reservoir during tunnel shutdowns. This will allow the reservoir to remain full and not backwater for over 8 miles into the dewatered tunnel. The full reservoir provides more supply water for safely extending the tunnel shutdowns to longer durations of 100 days for construction inside the tunnel. These longer outages will reduce the need for more typical 60-day outages and shorten the overall duration of the construction schedule.

Program: Joint Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed

Project Cost:

Approved	$238.22 M
Forecast	$238.22 M
Actual	$46.64 M

Project Schedule:

Approved	Oct-11	Jun-27
Forecast	Oct-11	Jun-27

Project Percent Complete: 32.1%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/14/20✓	11/13/19✓	01/29/21✓	12/03/26

Progress and Status:

This quarter's progress included further excavation and retaining wall construction at Priest Reservoir for the Flow Control Facility (FCF) shaft and for the Priest Adit Portal area. Work also continued for the utilization and development of the spoil fill sites at Priest, which will be permanent after the project has completed. The FCF shaft excavation is expected to begin in October 2021 with the Priest Adit work expected in January 2022. Safety improvement work continued on the adit access roads. Work progressed at the Early Intake Adit for the upcoming installation of a new bulkhead door. Planning and coordination continued for the project's first planned tunnel outage in January 2022.

Priest Spoils Disposal Site Development underway

Issues and Challenges:

None at this time.

10035086 - Bridge Replacement (4 - Bridges)

Project Description: HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessments in 2013 and 2016 determined that, four of these bridges require substantial rehabilitation or replacement: Lake Eleanor Dam Bridge, O'Shaughnessy Adit Access Bridge, Cherry Lake Road Bridge (public access), and Early Intake Bridge (public access). The project will be funded in 2 phases. The first phase will include planning, design and construction of Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge. The planning, design and construction of the Early Intake Bridge and Cherry Lake Road Bridge will be under Phase 2.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved	$44.29 M
Forecast	$29.37 M
Actual	$0.97 M

Project Schedule:

Approved	Feb-20	May-37
Forecast	Feb-20	Jul-27

Project Percent Complete: 43.4%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 06/30/23 (B) 07/31/24	(A) 08/01/23 (B) 08/01/24	(A) 02/01/24 (B) 02/03/25	(A) 12/31/25 (B) 01/29/27

** (A) Lake Eleanor Dam Bridge; and (B) O'Shaughnessy Adit Access Bridge.*

Progress and Status:

For the O'Shaughnessy Adit Access Bridge, two geotechnical drill holes were completed during the quarter. The consultant worked on the geotechnical evaluation and geotechnical data report. For Lake Eleanor Dam Bridge, the engineering consultant began work on the alternative analysis for rehabilitation of the existing bridge.

O'Shaughnessy Adit Bridge and Geotechnical Exploration

Issues and Challenges:

The variances between the approved budget and schedule and the forecasted budget and schedule are due to division of the project into two phases, with the planning, design and construction of the Lake Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge within the first phase and funded in the FY21-30 10-Year CIP; the funding for the planning, design and construction of the other two of the four bridges has been deferred until after 2030.

8. On-Going Construction*

The following table reflects active construction contract(s) with an original contract amount greater than $1M.

Construction Contract	Schedule			Budget		Variance (Original - Forecast)		Actual % Complete
	NTP Date	Approved Construction Final Completion	Current Forecast Construction Final Completion*	Approved Contract Cost	Current Forecast Cost*	Schedule (Cal. Days)	Current Forecast Cost	
Power Infrastructure								
10014086 - Moccasin Powerhouse Transformers Installation - HH-1003R	06/07/21	05/23/23	05/23/23	$ 3,653,575	$ 3,653,575	-	-	6.8%
10014086 - Moccasin Powerhouse Generator Rehab - DB-121R2	06/21/21	06/17/24	06/17/24	$ 28,898,986	$ 28,898,986	-	-	2.7%
10014087 - Warnerville Switchyard - DB-127R **	10/05/17	07/09/19	12/31/21	$ 14,591,450	$ 14,591,450	(906)	-	90.0%
Joint Infrastructure								
10030758 - OSH Dam Access & Drainage Improvement - HH-1002R	09/27/21	08/21/22	08/21/22	$ 1,648,556	$ 1,648,556	-	-	0.0%
10014114 - Mountain Tunnel Improvement - HH-1000R	01/29/21	12/03/26	12/03/26	$ 152,870,508	$ 152,870,508	-	-	10.3%

Program Total for On-Going Construction	Approved Contract Cost	Current Forecast Cost*	Variance	
			Cost	Percent
	$ 201,663,075	$ 201,663,075	$-	- %

Note:

* The Current Forecast Cost and Current Forecast Construction Final Completion include all approved, pending, and potential change orders.

** The contract is funded with both CIP and non-CIP funds, but only the CIP funded amount is reflected.

9. PROJECTS IN CLOSE-OUT

Project Title	Current Approved Construction Phase Completion	Actual Construction Phase Completion	Current Approved Construction Phase Budget	Construction Phase Expenditures To Date*
Power Infrastructure				
Powerhouse				
10014075 - Holm and Other Powerhouse Projects	05/14/21	05/14/21	$ 15,327,522	$ 12,872,280
TOTAL			$ 15,327,522	$ 12,872,280

10. COMPLETED PROJECTS

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Water Infrastructure				
Water Conveyance (Water)				
10014066-HCIP - SJPL Rehabilitation	12/31/18	02/28/19	$ 5,370,000	$ 4,622,228
10014068 - Lower Cherry Aqueduct	04/30/21	04/30/21	$ 12,484,293	$ 12,486,246
Dams & Reservoirs				
10033156 - Moccasin Reservoir Perimeter Security Fence	07/01/21	08/20/21	$ 5,308,000	$ 3,405,124
Power Infrastructure				
Switchyard & Substations (Power)				
10014091 - Early Intake Switchyard Slope Hazard Mitigation	09/30/20	09/30/20	$ 2,620,172	$ 2,175,083
Water Conveyance (Power)				
10014085 - Kirkwood Penstock	04/30/21	01/31/22	$ 2,826,822	$ 2,826,822
Joint Infrastructure				
Buildings (Joint)				
10014107 - Moccasin Facilities New Construction	04/30/21	04/30/21	$ 19,504,642	$ 19,504,642
Dams & Reservoirs (Joint)				
10014109 - Cherry Dam Outlet Works Rehabilitation	06/30/20	06/30/20	$ 9,728,018	$ 9,533,435
Mountain Tunnel				
10014113 - Mountain Tunnel Inspection & Repairs (completed)	12/02/19	12/02/19	$ 21,426,739	$ 21,494,786
TOTAL			$ 79,268,686	$ 76,048,366

APPENDICES

A PROJECT DESCRIPTIONS

B APPROVED PROJECT LEVEL SCHEDULES / BUDGETS

C LIST OF ACRONYMS

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APPENDIX A. PROJECT DESCRIPTIONS

The project titles and descriptions are updated according to the approved 10-year CIP for FY21-30.

HETCHY CAPITAL IMPROVEMENT PROJECTS (HCIP)

WATER INFRASTRUCTURE

10035574 - SJPL Tesla Valves Replacement

The 2018 approved scope for this project is to replace four large diameter butterfly valves, namely TUV 101, 201, 301 and 401, inside the Tesla Valve Vault so that each of the four San Joaquin Pipelines (SJPL) can be safely isolated and shut down individually for inspection and repair work without shutting down the entire SJPL system. This project will also improve safety for entry into the pipelines for maintenance and inspection purposes. After the planning phase of the related project SJPL Valve and Safe Entry Improvement (Project 10035575) it was recommended that the scope of SJPL Tesla Valve Replacement be reduced, to focus on completing the replacement of TUV101 only. The remainder of the work (i.e. TUV 201, 301 and 401) has been added to the scope of SJPL Valve and Safe Entry Improvement (Project 10035575) to expedite improvements for TUV101 during the planned winter shutdown from January to February 2022 to facilitate necessary maintenance work for SJPL No. 1 during the remainder of 2022. The installation of TUV201, 301 and 401 will proceed together with the upgrade work proposed under SJPL Valve and Safe Entry Improvement, in 2023 and 2024.

10035575 - SJPL Valve and Safe Entry Improvement

The San Joaquin Pipelines (SJPLs) consist of three parallel pipelines approximately 48 miles long (completed in 1932, 1953, and 1968, respectively) that cross the San Joaquin Valley from the Oakdale Portal of the Foothill Tunnel on the east end to the Tesla Portal of the Coast Range Tunnel (CRT) on the west. Portions of a fourth pipeline have also been constructed consisting of 6.4 miles of pipe downstream of Oakdale and 11 miles upstream of Tesla. The hydraulic gradient on the SJPLs was limited by surge stacks/towers at Oakdale portal (~825 ft) and Tesla portal (~500 ft). The pipelines were intended to be shut down at Oakdale.

As part of the SFPUC's Water System Improvement Program (WSIP), the Emery and Pelican crossover vaults were installed and the Roselle crossover vault was modified to allow for flows between SJPLs and isolation of SJPL segments for inspection and maintenance. The intent was to increase operational flexibility and the overall reliability of the SJPL System. In addition, the Tesla Valve House (TVH) and Tesla Treatment Facility (TTF) were added upstream of the Tesla surge tower. Like the SJPLs, the crossover vaults and Tesla facilities are rated for the maximum pressures that should occur under normal operating conditions. However, the pipelines and pipeline segments still need to be shut down from the upstream end. Closure of multiple in-line valves or all TTF UV reactor valves can over-pressurize the pipelines. As in the original design, complete shutdown of the SJPL system must be done at Oakdale.

The objective of this project is to allow safe entry into any and all sections of the SJPLs for inspection and maintenance while the remainder of the system stays in operation. The project objective is not to upgrade the entire SJPL system to the maximum possible static or transient pressures, nor to upgrade all components in vaults to prevent possible flooding of the vaults. However, the proposed surge tower will protect the entire SJPL system from high static and transient pressure caused by operation of valves at Tesla Treatment Facility. The scope and budget of installing the TUV201, 301 and 401 butterfly valves has been transferred from project SJPL Tesla Valve Replacement project (10035574) and added to

SJPL Valve and Safe Entry Improvement.

10014072 – WATER ONLY/PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

POWER INFRASTRUCTURE

10036809 - Moccasin Powerhouse Bypass Upgrades

Hetch Hetchy water deliveries are conveyed from Priest Reservoir to Moccasin Powerhouse (MPH) through the Moccasin Penstocks. At MPH, water passes through two hydroelectric turbines where energy is converted from high-pressure water into electricity. When electricity is not being produced, the water deliveries are directed around the turbines by two bypass valves that dissipate up to 305 million gallons per day (mgd) at 560 pounds per square inch (psi) of water energy. In the past, short-term use of the bypass system has resulted in significant vibration and cavitation damage to the bypass valves. Long-term use (greater than two to five days) could lead to major mechanical damage or failure, leading in turn to the potential of interruption of water deliveries to San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the Moccasin Reservoir Bypass Pipeline, allowing for increased operating flexibility for HHWP to meet scheduled water deliveries even when MPH, Moccasin Switchyard, or power Transmission Lines #3 and #4 are curtailed.

10036810 - Kirkwood Powerhouse Bypass Upgrades

Hetch Hetchy water deliveries are conveyed through the Canyon Tunnel to the Canyon Portal Valvehouse. Water then enters the Kirkwood Penstock and drops 1,245 feet in elevation to the Kirkwood Powerhouse (KPH). At KPH, water passes through three hydroelectric turbines where energy is converted from high-pressure water into electricity, producing a maximum output of 124 megawatts at a maximum flow of 1,408 cubic feet per second. When electricity is not being produced, the water deliveries are directed around the turbines through a separate bypass system consisting of a spherical guard valve and a 90-degree needle valve for flow control. Based on a condition assessment of KPH performed in 2010, existing control problems limit operation of the bypass needle valve to no more than 70% open. An inspection of the bypass valve and dissipation structure in 2016 indicated that the stainless steel dissipator had failed, causing damage at the base of a steel shaft column leading to the bypass tunnel. Repairs to the dissipator, bypass draft tube, and bypass chamber were completed in 2017, but the steel lining protecting the bypass chamber's concrete walls and floor subsequently failed after bypass usage. Additional repairs were made to the steel lining of the bypass in 2019 under the HH-991 2018 Mountain Tunnel Interim Repairs construction contract. Long-term use (greater than two to five days) could lead to major mechanical damage or failure, leading to potential interruption of water deliveries to

San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the KPH Bypass Chamber and Mountain Tunnel, allowing for increased operating flexibility for Hetch Hetchy Water & Power (HHWP) to meet scheduled water deliveries when KPH is not generating electricity.

10014075 - Holm and Other Powerhouse Projects

This project provided funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under $1 million involving power generation renewal and equipment replacement. The upgrade and rehabilitation of HPH Unit 2 included 13.8 kV equipment upgrades, addition and integration of a generator breaker, replacement of two 13.8kV feed breakers, replacement of Unit 2 Main Control Board, and any necessary tasks to match Unit 2 to Unit 1. System integration work was done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into the existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project included upgrades to turbine and generators and to alternating current stations, intended to extend the life of the unit by 20 years. Lastly, the project upgraded the existing oil containment systems at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators were replaced, and other modifications were made to the powerhouse interiors and to the transformer decks, to discourage contaminated discharges into the adjacent streams. A monitoring system was installed to alert HHWP of excessive leakage and the need to manually pump oil containment vessels. Failure of the oil containment systems at the powerhouses would likely result in environmental contamination, fines, additional regulatory exposure, and the need for rehabilitation and cleanup.

10014086 - Moccasin Powerhouse and GSU Rehabilitation

The two Moccasin Powerhouse generators were completed in 1969 and generate a combined maximum output of 110 megawatts. Both generator units have exceeded their life expectancy and are in need of repair in order to continue operating reliably. The objective of this project is to replace stator cores and coils. The scope of work also includes rehabilitation of the rotor field poles with new pole cores and re-insulated field coils, replacement of the rotor pole/rim tail connection system with a new T-tail connection system, and supply of a new rotor rim for each generator following inspection and testing. The project will also include replacement of two generator step-up transformers (GSUs) with new oil containment barriers, and remaining plant work including: replacing 480V switchgear, 13.8kV switchgear, motor control centers, main control boards, protective relays, and cooling water piping.

10014087 - Warnerville Substation Rehabilitation

This project is needed to extend the useful life of the Warnerville Substation and meet reliability requirements of NERC/WECC and PG&E Intertie Agreements. The upgrades include replacing three existing 3 phase transformer with two larger rated transformers. Other upgrades include new 115kV and 230kV disconnect switches and breakers; new Control Room, perimeter fence, relays and controls; improvement to the grading and grounding system.

10035721 - Transmission Lines 7/8 Upgrades

The SFPUC electric transmission lines 7/8 conveys power from Warnerville Substation to Modesto Irrigation District's (MID) Standiford Substation. The SFPUC must accommodate additional power flowing across its

transmission system due to grid interconnection requests from independent power generators interconnecting on the California Independent System Operator (CAISO). This is a requirement for SFPUC and HHWP obligations as a neighboring provider of electric transmission service.

Studies performed by the SFPUC indicate the principal impact to its system is an overload of 115kV Lines 7&8 between HHWP Warnerville Substation and MID Standiford Substation under contingency conditions if interconnections are made without modification to the system's capacity. Without modifications, the SFPUC and HHWP transmission system could face reliability issues. Reconductoring also resolves multiple locations where the clearance between the existing conductors and the ground or structures does not meet current safe clearance regulations.

This project develops the scope of work, design, and contract documents necessary to bid, award, and manage the reconductoring contract. Reconductoring will include replacement of the existing 115kV conductors on Lines 7/8 from Warnerville to Standiford substations, resulting in improved transmission tower stability, and resolved clearance detections.

The project will be partially funded by independent power generators interconnecting on the California Independent System Operator (CAISO).

10014092 - POWER ONLY/PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

JOINT INFRASTRUCTURE

10014088 - Moccasin Penstock

Moccasin Penstock was built in the early 1920's and conveys Hetch Hetchy water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. Moccasin penstock serves as the sole link in conveying water from Priest Reservoir to Moccasin Reservoir, from which water is routed to the San Francisco Public Utilities Commission (SFPUC) customers. The lower 1,084-foot section of welded steel pipe replaced the original penstocks when the new Moccasin Powerhouse was completed in the 1960s. The upper 4,000 feet of penstock dates to 1924 and has been in service for more than 97 years. Previous condition assessments have identified deficiencies including corrosion, coating damage, lining degradation, leakage, aggregate expansion, cracks in the concrete anchor blocks and saddles, vulnerability of the hammer forged steel pipe sections. The objective of this project is to enhance the reliability of water delivery and extend the life of the penstock system for another 50 to 100 years.

10030758 – OSH Dam Access and Drainage Improvements

The O'Shaughnessy Dam is located 140 miles east of San Francisco, CA in Yosemite National Park, Tuolumne County. The dam, a concrete curved gravity structure, is located on the Tuolumne River across the steep walled Hetch Hetchy Valley. The interior workings of the

dam contain valves and appurtenances that must be accessed for operations and maintenance. This project includes improvements for safe access, as well as mitigation of excess interior water leakage through drainage improvements, for the Ladder Wells, Galleries, Inclined Stairways, Control Room, and Diversion Tunnel. The project was reduced in scope of work in 2020 to meet the existing approved budget. The new project will be advertised as O'Shaughnessy Dam-Fall Protection Improvements and Spillway Access to complete the reduced scope of work. Improvements that were not included in this revised project, such as drainage improvements, will be included in the OSH Dam Outlet Works Phase 1 project.

10032903 – O'Shaughnessy Dam Outlet Works Phase 1

O'Shaughnessy Dam (OSH) was completed in 1923 and raised in 1938. The original outlet works including gates and valves have been in services for more than 98 years. Inspections, condition assessments, and studies concluded that improvements and refurbishments of the outlet works system are needed to ensure safety and reliability. The work will be implemented in two phases. This project is to cover the Phase 1 work. The O'Shaughnessy Dam Outlet Works Phase 1 Project addresses the identified deficiencies of the existing outlet works system at OSH. Phase 1 will include four projects: (1) supply and installation of nine new bulkheads; (2) refurbishment of twelve existing slide gates; (3) rehabilitation of existing drum gates to replace the seals, replace the hinges and rivets, recoating the gates, and repair the spillway concrete; and (4) installation of a new diversion pipe isolation butterfly valve. The existing control gates and valves are essential features for dam safety and reservoir operation. The project is needed to maintain safe and reliable operation of these aging assets. Failure or malfunction of these gates and valves will affect dam safety and result in reduction of storage and reduction of water deliveries to SFPUC customers.

10037351 – Moccasin Dam Long-Term Improvements

The flow capacity of the existing spillway is inadequate to protect the Moccasin Dam against overtopping and erosion from severe flood events. The dam almost overtopped during the March 2018 storm event when flows were released from the auxiliary spillway and caused significant damage to the auxiliary spillway. The surrounding areas and the upstream diversion dam also sustained damage from the flood. This project is needed for dam safety. The objective of this project is to increase the spillway flow capacity to allow safe passage of flood flows without overtopping the dam and to protect the associated facilities within the Moccasin reservoir boundary against flood damages. The estimated project cost is $83.2 million and is within the current 10-year CIP FY 21-30. Construction is scheduled for 2025-2027.

10014115 – Cherry Dam Spillway - Short Term Improvements

A spillway release from Cherry Dam in 2010 caused a landslide, blockage of the spill channel, and extensive erosion in the close proximity of the dam's right abutment. In addition, it caused flooding of the Cherry Power Tunnel Adit, and flooding of a campground further downstream. Engineering studies determined that significant long-term improvements to increase the spillway flow capacity are needed to maintain dam safety. The objective of this project is to re-establish containment for the breached spill channel section and to protect the downstream slope of the existing embankment dam from uncontrolled releases and erosion in the interim until the long-term improvements are implemented. Construction is scheduled for 2025-2026. The estimated project cost of $11.9 million is within the current 10-year CIP FY

21-30.

10014114 – Mountain Tunnel Improvement Project

Mountain Tunnel conveys the SFPUC water supply from Kirkwood Powerhouse to Priest Reservoir. Mountain Tunnel has been in service since 1925. Due to its age, deferred maintenance, and construction deficiencies in the early 1900s, sections of the tunnel lining have deteriorated, some extensively. This project provides design and construction of major tunnel repair and rehabilitation work, adit and tunnel entry improvements, access road improvements, and installation of a new flow control facility at Priest Reservoir to ensure that the tunnel can reliably provide drinking water to customers for the next 100 years. The flow control structure and isolation valves will also be used to isolate the tunnel from Priest Reservoir during tunnel shutdowns. This will allow the reservoir to remain full and not backwater for over 8 miles into the dewatered tunnel. The full reservoir provides more supply water for safely extending the tunnel shutdowns to longer durations of 100 days for construction inside the tunnel. These longer outages will reduce the need for more typical 60-day outages and shorten the overall duration of the construction schedule.

10035086 – Bridge Replacement (4 Bridges)

HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessments in 2013 and 2016 determined that, four of these bridges require substantial rehabilitation or replacement: Lake Eleanor Dam Bridge, O'Shaughnessy Adit Access Bridge, Cherry Lake Road Bridge (public access), and Early Intake Bridge (public access). The project will be funded in 2 phases. The first phase will include planning, design and construction of Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge. The planning, design and construction of the Early Intake Bridge and Cherry Lake Road Bridge will be under Phase 2.

10014108 – Canyon Tunnel Rehabilitation

Canyon Tunnel was built over 45 years ago. A condition assessment was performed on the tunnel in 2009 and the tunnel is in generally good condition, with the exception of the Hetchy Adit, a tunnel access point. Temporary repairs have been made to the plug at this adit twice (once in 1989 and once in 2009), but permanent repairs are needed to reduce leakage and increase reliability of the system. The project scope includes installation of a new reinforced concrete plug downstream of the existing plug.

10014110 – Moccasin Wastewater Treatment Plant

The Moccasin Wastewater Treatment Plant (WWTP) project proposes to replace the community's aging treatment plant. Moccasin's treatment plant was installed in the 1970s and has been in continuous service since that time. Wastewater generated by the Moccasin community, powerhouse, and related facilities flows to this treatment plant. The treatment facility currently serving Moccasin was a "package plant" that was manufactured off-site, transported to Moccasin, and installed in 1977. At more than 44-years old, the Moccasin treatment plant has reached the end of its useful service life, and is becoming increasingly maintenance intensive. Additionally, Moccasin has no backup treatment; accordingly, failure of the plant would have significant consequences.

This project will replace the existing wastewater treatment facilities with a Sequence Batch Reactor (SBR) plant. The proposed SBR "package plant" is to be a two-train facility. Each train would have a capacity of 12,000 gallons per day to accommodate average daily dry-weather flow.

The new plant would continue to treat wastewater to secondary standards. The new plant will be provided with upgraded screening, flow monitoring, flow equalization, SCADA instrumentation, and automation features. The package plant would be manufactured off-site, trucked to Moccasin, and then installed beside the current plant. The existing plant must serve the Moccasin community while the new plant is being installed and would remain in operation during construction. The proposed project is limited to the treatment plant only and does not include improvements either upstream or downstream of the plant.

10014116 – JOINT - PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

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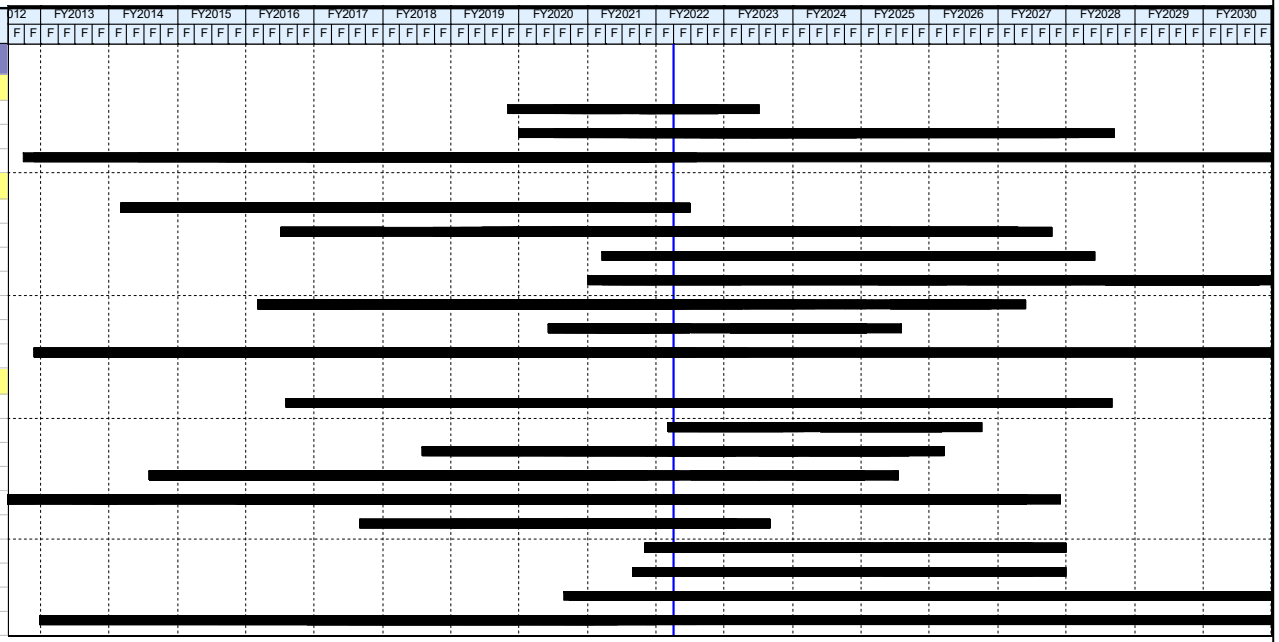
APPENDIX B. Hetch Hetchy Improvement Projects Approved Project Level Schedules/Budgets

Project Name	Approved Budget	Start	Finish
Hetchy Capital Improvement Projects	$807,296,327.49	03-Oct-11	25-May-37
Water Infrastructure	$109,533,203.01	26-Mar-12	30-Jun-31
10035574 SJPL Tesla Valves Replacement	$3,740,000.00	01-May-19	30-Dec-22
10035575 SJPL Valve and Safe Entry Improvement	$98,924,000.00	01-Jul-19	13-Mar-28
10014072 WATER ONLY/PROJ DEV	$6,869,203.00	26-Mar-12	30-Jun-31
Power Infrastructure	$204,242,684.48	29-May-12	30-Jun-31
10014075 Holm and Other Powerhouse Projects	$23,061,080.48	03-Sep-13	30-Dec-21
10014086 Moccasin Powerhouse and GSU Rehabilitation	$66,713,635.00	04-Jan-16	13-Apr-27
10036809 Moccasin Powerhouse Bypass Upgrades	$15,007,000.00	18-Sep-20	01-Dec-27
10036810 Kirkwood Powerhouse Bypass Upgrades	$16,157,000.00	01-Jul-20	23-Oct-30
10014087 Warnerville Substation Rehabilitation	$34,248,428.00	01-Sep-15	25-Nov-26
10035721 Transmission Lines 7/8 Upgrades	$37,969,000.00	02-Dec-19	31-Jan-25
10014092 POWER ONLY/PROJ DEVELP	$11,086,541.00	29-May-12	30-Jun-31
Joint Infrastructure	$493,520,440.00	03-Oct-11	25-May-37
10014088 Moccasin Penstock	$47,251,363.00	01-Feb-16	28-Feb-28
10014110 Moccasin Wastewater Treatment Plant	$8,794,549.00	01-Sep-21	07-Apr-26
10032903 O'Shaughnessy Dam Outlet Works Phase I	$21,206,000.00	01-Feb-18	16-Sep-25
10014108 Canyon Tunnel Rehabilitation	$8,428,813.00	03-Feb-14	13-Jan-25
10014114 Mountain Tunnel Improvement Project	$238,218,951.00	03-Oct-11	03-Jun-27
10030758 OSH Dam Access and Drainage Improvements	$3,952,211.00	01-Mar-17	28-Feb-23
10037351 Moccasin Dam Long-Term Improvements	$83,175,822.00	03-May-21	01-Jul-27
10014115 Cherry Dam Spillway - Short Term Improvements	$11,860,965.00	01-Mar-21	01-Jul-27
10035086 Bridge Replacement (4 - Bridges)	$44,287,000.00	27-Feb-20	25-May-37
10014116 JOINT - PROJECT DEVELOPMENT	$26,344,766.00	25-Jun-12	30-Jun-31



APPENDIX C. LIST OF ACRONYMS

AAR	Alternative Analysis Report
CAISO	California Independent System Operator
CATEX	Categorical Exemption
CEQA	California Environmental Quality Act
CER	Conceptual Engineering Report
CIP	Capital Improvement Program
COVID-19	Coronavirus Disease of 2019
CRT	Coast Range Tunnel
DB	Design, Build
DCR	Design Criteria Report
FCF	Flow Control Facility
FY	Fiscal Year
GSU	Generator Step-Up
GWH	Gigawatt Hours
HCIP	Hetchy Capital Improvement Projects
HH	Hetch Hetchy
HHWP	Hetch Hetchy Water and Power
HPH	Holm Powerhouse
IFR	Instream Flow Release
JOC	Job Order Contract
KPH	Kirkwood Powerhouse
MGD	Million Gallons per Day
MID	Modesto Irrigation District
MPH	Moccasin Powerhouse
NAR	Needs Assessment Report
NERC	North American Electric Reliability Corporation
NTP	Notice to Proceed
OSH	O'Shaughnessy Dam
PD	Project Development
PG&E	Pacific Gas and Electric Company
PLC	Programmable Logic Controllers
PSI	Per Square Inch
R&R	Renewal and Replacement
SBR	Sequence Batch Reactor
SCADA	Supervisory Control and Data Acquisition
SFPUC	San Francisco Public Utilities Commission
SJPL	San Joaquin Pipeline
TSC	Technical Steering Committee
TTF	Tesla Treatment Facility
TUV	Tesla Ultra Violet
TVH	Tesla Valve House
WSIP	Water System Improvement Program
WWTP	Wastewater Treatment Plant

San Francisco
Water Power Sewer
Operator of the Hetch Hetchy Regional Water System

525 Golden Gate Avenue, 13th Floor
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DATE: March 15, 2022

TO: Commissioner Anson Moran, President
Commissioner Newsha Ajami, Vice President
Commissioner Sophie Maxwell
Commissioner Tim Paulson

FROM: Dennis Herrera, General Manager

RE: Hetch Hetchy Capital Improvement Program Quarterly Report
2nd Quarter / Fiscal Year 2021-2022

Enclosed please find the Hetch Hetchy Capital Improvement Program (HCIP) Quarterly Report for the 2nd Quarter (Q2) of Fiscal Year (FY) 2021-2022. The primary intent of the report is to provide the Commission, stakeholders, and the public with a status summary of the HCIP based on data for the period of October 1, 2021 to December 31, 2021.

Quarterly Report Format Changes

In response to the Commission's request for providing a summary of program status as well as notable changes and accomplishments, this report includes an Executive Summary, which provides the requested high-level summary of the program current status as well as key project updates that may be newsworthy or noticeable to the Commission, stakeholders, or public.

Attachment

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San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

QUARTERLY REPORT

Hetch Hetchy Capital Improvement Program

October 2021 – December 2021

Published: March 15, 2022

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EXECUTIVE SUMMARY

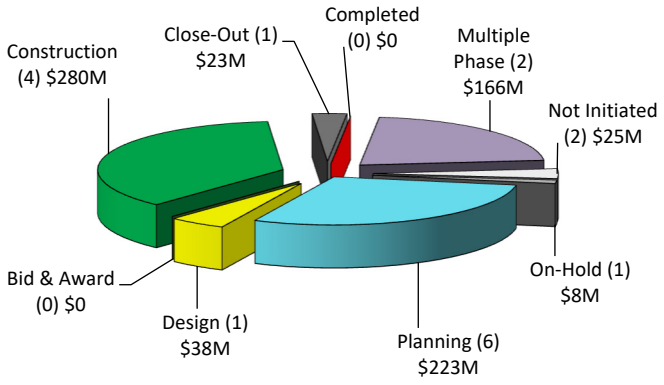
This quarterly report provides a summary update on the Hetch Hetchy Capital Improvement Program (HCIP) that is part of the larger Hetch Hetchy Water Capital Improvement Program. The primary intent of the report is to provide the Commission, stakeholders, and the public with a status summary of the HCIP based on data for the period of October 1, 2021 to December 31, 2021.

Starting with the HCIP Q1FY22, the last quarterly report, the projects of the HCIP and each of their scopes, budgets, and schedules, match the Commission's approved FY21-30 10-Year Capital Plan, specifically the FY21-30 10-Year Hetch Hetchy Water Capital Improvement Program (CIP), and serve as the FY22 baseline for the HCIP.

In this Q2 report, the forecasts for the HCIP projects' scopes, costs, and schedules match the FY23-32 10-Year CIP that is being presented to the Commission on February 8, 2022. Going forward, proposed changes to the approved projects and their baseline scopes, schedules, and budgets will continue to be presented for review and approval as part of the 10-year CIP that is updated every two years and approved by the SFPUC Commission. The proposed revisions to the program will become the new baseline for project scopes, schedules, and budgets in the beginning of the new fiscal year, July 1 of each bi-annual year, following approval by both SFPUC Commission and the Board of Supervisors (BOS).

Program Current Status:

Overall steady progress continued on the program. As of the end of the reporting period, the HCIP includes 17 projects (excluding the PD accounts) as follows: two (2) projects not initiated, one (1) project on-hold, seven (7) projects in planning or design, four (4) projects in construction, two (2) projects that are multiple phases, and one (1) project in close-out.



Approved Budget for Projects in Each Phase

The following Tables provide a high-level summary of the cost and schedule status for this program (including the 3 PD accounts). The forecasted overruns in projects' cost and schedule presented here,

as noted above, match the 10 – Year CIP for FY23-32 which will be presented to the Commission for review and approval next quarter.

Table A. Program Cost Summary

Program	Expenditures To Date ($ Million) (A)	Current Approved Budget ($ Million) (B)	Q2/FY21-22 Forecasted Costs ($ Million) (C)	Cost Variance ($ Million) (D = B - C)	Cost Variance Over Reporting Period * ($ Million) (E)
Program Total	**$134.29**	**$807.30**	**$852.81**	**($45.51)**	**-**

* Negative number reflects cost increases since last quarter, and positive number reflects cost reduction since last quarter.

Table B. Current Approved vs. Current Forecast Schedule Dates

Program	Current Approved Project Start	Actual Start	Current Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Overall HCIP Program	**11/08/10**	**11/08/10✓**	**05/25/37**	**10/30/35**	**18.8 Early**

Program Key Update:

The key update for the HCIP includes:

- The overall forecasted cost and schedule at completion for the HCIP have been updated to match the budget and schedule that will be presented to the Commission as part of the FY23-32 10-Year CIP. The overall forecasted budget for the HCIP is $45.51M higher than the current Approved budget.
- For the SJPL Tesla Valve Replacement project, the 66-inch diameter butterfly valve and actuator and the new 24-inch diameter butterfly valve all arrived on site in time for installation during next quarter's system shutdown.
- The SJPL Valve and Safe Entry Improvements Phase 1A construction contract (HH-1005) was advertised during the quarter. For Phase 1B, the 95% design was completed in October, and it is anticipated that the construction contract (HH-1006) will be advertised next quarter. Project scope refinements during design including re-sequencing of construction to minimize risks during shutdowns, resulted in a forecasted cost increase of $43.7M.

- For the Moccasin Powerhouse Bypass Upgrades project, the consultant submitted the final Needs Assessment Report (NAR) during the quarter.
- For Moccasin Powerhouse (MPH) and Generator Step-Up (GSU) Rehabilitation, Subproject A, MPH GSU Transformer Installation, the contractor received delivery of the new GSU1 transformer in October. For subproject B, DB-121R2 MPH Generators Rehabilitation, the Notice to Proceed for Construction is scheduled for June 2022. For subproject C, MPH Systems Upgrades, the Needs Assessment Report (NAR), including its prioritization of scope items, was reviewed and approved by the Technical Steering Committee (TSC) in November.
- For Transmission Lines 7/8 Upgrades project, significant progress was achieved in the environmental phase with the completion of a required addendum to include this work in the existing Final Mitigated Negative Declaration for the Rehabilitation of the Existing San Joaquin Pipelines. The design engineering consultant is on track to submit the 100% design next quarter.
- For the Moccasin Penstock Rehabilitation project, the condition assessment and the structural evaluation reports have been finalized.
- For the O'Shaughnessy Dam Access and Drainage Improvements project, Notice to Proceed was issued on September 27, 2021 for Contract HH-1002R. The contractor mobilized in November and installed fall protection in the inclined stairways and on the drum gate ladders during the quarter.
- For the O'Shaughnessy Dam Outlet Works Phase 1 project, major scope changes are forecasted based on new prioritization of three projects now included in Phase 1: replacement of the damaged existing instream flow release (IFR) valves; drainage improvements within the dam gallery; and installation of new bulkheads (original scope). The revised scope and scope refinements have resulted in a forecasted cost increase of $26.7 million.
- For the Moccasin Dam Long-Term Improvements project, the Alternative Analysis Report (AAR) was completed in December. The AAR confirmed that the preferred alternative to increase spillway capacity is to construct an auxiliary spillway. The engineering consultant will begin the conceptual engineering phase in the next quarter.
- For the Mountain Tunnel Improvement project during the quarter, the retaining wall and the mass surface excavation for the Flow Control Facility (FCF) shaft were completed; the FCF shaft concrete collar was constructed; and the shaft was excavated to a depth of thirty-five feet. In addition, the Priest Adit retaining wall was substantially completed, and construction of the adit commenced. Also, the temporary water treatment plant below Priest Reservoir to treat construction water was substantially completed along with the temporary water treatment plant to provide drinking water to Moccasin during the five Mountain Tunnel shutdowns planned for this project. Significant preparation took place for the first of the planned Mountain Tunnel shutdowns that starts in January.
- For the Bridge Replacement O'Shaughnessy Adit Access Bridge subproject, the Geotechnical Data Report (GDR) has been finalized.

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Quarterly Report
Hetch Hetchy
Capital Improvement Program

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HETCH HETCHY WATER AND POWER (HHWP)–

WATER DIVISION CAPITAL IMPROVEMENT PROGRAMS

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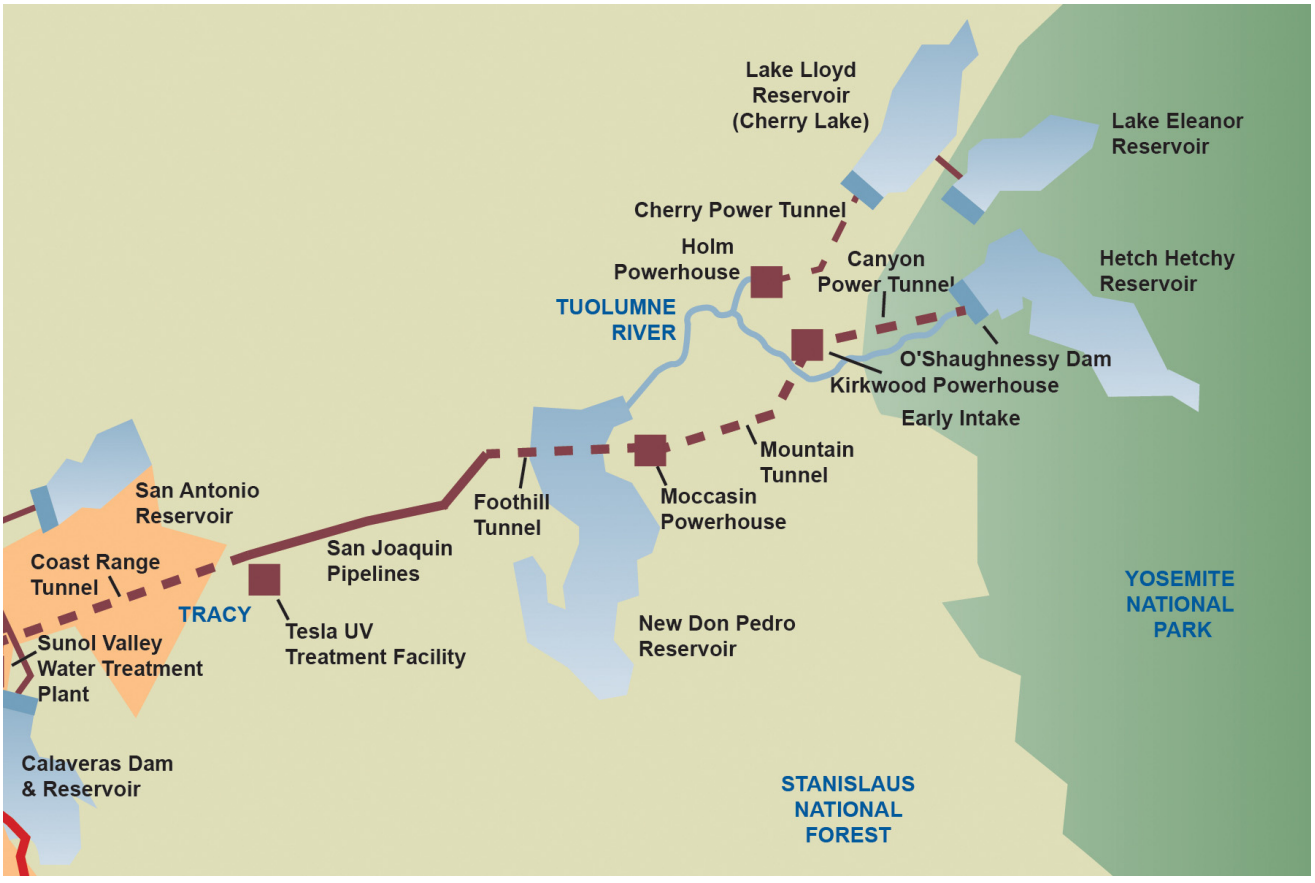
INTRODUCTION

The Hetch Hetchy Water and Power (HHWP) Water Division is the division responsible for operating, managing, and maintaining the HHWP system and facilities. This includes water facilities that are part of the Regional Water System from Hetch Hetchy Reservoir, located in Yosemite National Park, to Alameda East Portal, located in Sunol Valley and power facilities located from Early Intake to Newark. The HHWP Water Division operates, manages, and maintains three impoundment reservoirs, three regulating reservoirs, four powerhouses, one switchyard, three substations, 170 miles of pipeline and tunnels, almost 50 miles of paved road, over 160 miles of transmission lines, watershed land, and right-of-way property. HHWP Water Division provides 85 percent of the San Francisco Public Utilities Commission (SFPUC) water supply for 2.7 million residential, commercial, and industrial customers in Alameda, Santa Clara, San Mateo, and San Francisco counties. On average, HHWP Water Division generates about 1,650 gigawatt hours (GWH) of clean hydro-generated power annually. A majority of HHWP staff is based in Moccasin, CA, which is 140 miles east of San Francisco.

The HHWP Water Division's capital improvement programs are divided into two programs: Hetch Hetchy Capital Improvement Program (HCIP) and Renewal and Replacement (R&R). This report provides a quarterly status update on the HCIP, a group of capital improvement projects that are greater than $5M in value and have been approved by the Commission as part of the SFPUC's 10-Year Capital Improvement Program. The status of the Hetch Hetchy R&R projects is reported annually in the Annual Report on Water Enterprise-Managed Capital Improvement Projects.

The map below shows the location of the assets and facilities associated with HHWP.



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HETCH HETCHY CAPITAL IMPROVEMENT PROGRAM (HCIP)

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1. PROGRAM DESCRIPTION

The Hetch Hetchy Capital Improvement Program (HCIP) is a multi-year group of capital projects to upgrade existing, aging infrastructure so that it will meet the challenges of today and the future. These projects will deliver improvements that enhance the SFPUC's ability to provide reliable, affordable, high quality water to its 2.7 million customers in an environmentally sustainable manner. The goals are to 1) provide capital improvements needed to cost-effectively ensure that water quality, seismic reliability, delivery reliability, and water supply objectives established for the Regional Water System facilities managed by HHWP are met, while 2) optimizing the benefits of HHWP power facilities operations. Ongoing development of the HCIP will sustain the Regional Water System's status as an unfiltered water source and a gravity-driven system.

The scope of HCIP is divided into three major project types: Water, Power, and Joint. The Water sub-program includes only asset improvements benefiting the SFPUC's water customers. The Power sub-program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint sub-program includes projects for assets that are used for both water delivery and power generation. In addition, projects in each sub-program of the HCIP have been further organized by asset type consisting of the following:

- Buildings – projects to provide safe and code compliant work spaces.
- Dams & Reservoirs – projects to improve assets used for storage and delivery of water to SFPUC customers, as well as for water storage for power generation.
- Mountain Tunnel – projects to address deficiencies with the Mountain Tunnel, a critical, non-redundant link in the Hetch Hetchy and Regional Water System that conveys water from Kirkwood Powerhouse to Priest Reservoir.
- Powerhouses – projects to improve facilities at the Holm, Kirkwood, and Moccasin powerhouses.
- Roads & Bridges – projects intended to replace bridges that are utilized to access HHWP assets.
- Switchyard & Substations – projects to meet operational objectives for power, including reliability, regulatory compliance, and sustainability.
- Tunnels – projects to repair tunnels along the HHWP system (other than Mountain Tunnel).
- Water Conveyance – projects to enhance the reliability of water delivery through pipelines and penstocks, allowing for both delivery of water to SFPUC customers and delivery of water to powerhouses for power generation.

2. PROGRAM STATUS

This second (2nd) quarter report for FY2021-2022 presents the progress made on the HCIP between October 1, 2021 and December 31, 2021. As announced in the first (1st) Quarter report for FY2021-2022, project scopes, budgets and schedules in the Commission's approved 10-Year Capital Plan for FY21-30, approved by PUC Commission on February 11, 2020, serve as the approved baseline herein for comparison to current program and project scope, schedule, and budget forecasts. This baseline for comparison will remain the same until adoption of a new 10-Year CIP and the start of the fiscal year following adoption.

There are seventeen (17) projects in the HCIP together with (3) project development (PD) accounts for program-level expenditures for each of the Water, Power, and Joint Programs. A description of each project and of each project development account is provided in the Appendix A of this Report.

The accrued PD expenditures are included in the Cost Summary in Table 3 in order to give an accurate report of the overall HCIP cost performance.

Figure 2.1 shows the total Approved Budget for all seventeen (17) projects in each phase of the program as of December 31, 2021 (PD accounts do not have phases and are not included in Figure 2.1). The number of projects currently in each phase is shown in parentheses.

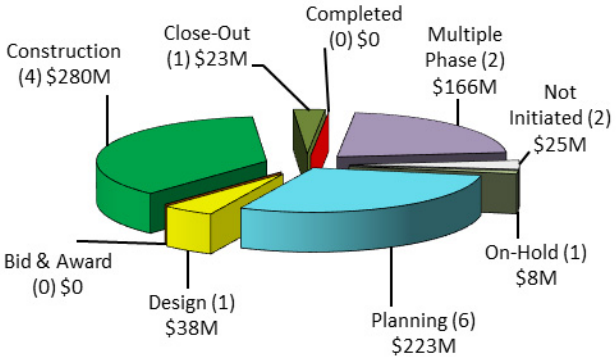

Figure 2.1 Approved Budget for Projects in Each Phase

Figure 2.2 shows the total number of projects in the following stages as of December 31, 2021: Pre-construction, Construction, and Post-construction.

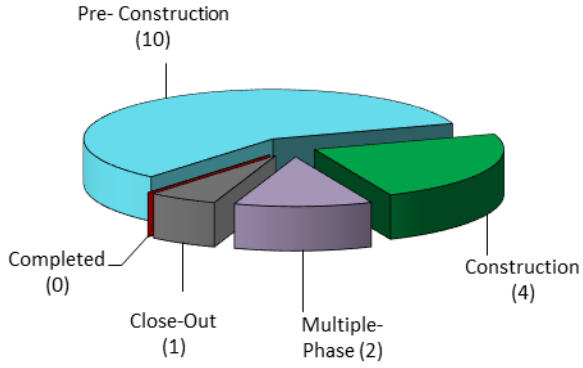

Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-Construction

Figure 2.3 summarizes the environmental review status of the HCIP projects as of December 31, 2021. Environmental review is performed for projects under California Environmental Quality Act (CEQA).

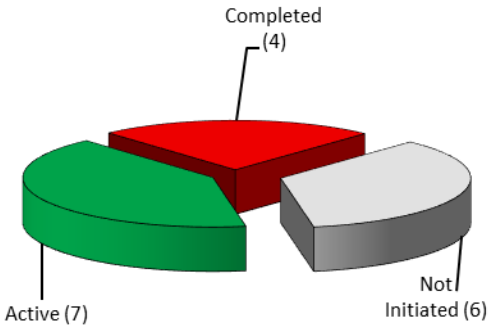

Figure 2.3 Program Environmental Review

3. PROGRAM COST SUMMARY

Table 3 provides an overall cost summary of the approved 17 HCIP projects and 3 HCIP PD accounts at the end of the quarter. It shows the Expenditures to Date, Current Approved Budget, Current Forecast Cost, the Cost Variance between the Approved and Forecast Costs, and the Cost Variance Over the Reporting Period. The Current Approved Budget for the HCIP under the FY21-30 CIP is $807.30 million, while the HCIP Q2FY21-22 Forecasted Cost is $852.81 million, which is $45.51 million over the Approved Budget. This is the same program Cost Variance as last quarter.

Table 3. Cost Summary

Subprograms	Expenditures To Date ($ Million) (A)	Current Approved Budget ($ Million) (B)	Q2/FY21-22 Forecasted Costs ($ Million) (C)	Cost Variance ($ Million) (D = B - C)	Cost Variance Over Reporting Period ($ Million) (E)
Water Infrastructure	**$8.70**	**$109.53**	**$153.27**	**($43.74)**	**-**
Water Conveyance (Water)	$4.86	$102.66	$146.40	($43.74)	-
Water Infrastructure Project Development	$3.85	$6.87	$6.87	-	-
Power Infrastructure	**$55.62**	**$204.24**	**$204.24**	**-**	**-**
Powerhouse	$28.58	$120.94	$120.94	-	-
Switchyard & Substations (Power)	$21.88	$34.25	$34.25	-	-
Transmission Lines	$2.71	$37.97	$37.97	-	-
Power Infrastructure Project Development	$2.46	$11.09	$11.09	-	-
Joint Infrastructure	**$69.98**	**$493.52**	**$495.29**	**($1.77)**	**-**
Dams & Reservoirs (Joint)	$7.93	$167.45	$184.13	($16.69)	-
Mountain Tunnel	$54.60	$238.22	$238.22	-	-
Roads & Bridges (Joint)	$1.22	$44.29	$29.37	$14.92	-
Tunnels (Joint)	$0.59	$8.43	$8.43	-	-
Utilities (Joint)	$0.42	$8.79	$8.79	-	-
Joint Infrastructure Project Development	$5.22	$26.34	$26.34	-	-
Overall Program Total	**$134.30**	**$807.30**	**$852.81**	**($45.51)**	**-**

** Negative number reflects cost increases since last quarter, and positive number reflects cost reduction since last quarter.*

The overall program negative Cost Variance of $45.51M in Table 3 can be attributed to the following factors:

- $43.74M negative variance is due to the following Water Infrastructure project:
  - o The 10035575 SJPL Valve and Safe Entry Improvements forecasted costs increased by $43.74M.
- $1.77M negative variance is due to the combined positive and negative variances in the following Joint Infrastructure projects:
  - o The 10032903 OSD Outlet Works Phase I forecasted cost increased by $26.69M.
  - o The 10037351 Moccasin Dam Long-Term Improvements forecasted cost decreased by $10.00M.
  - o The 10035086 Bridge Replacement (4 Bridges) forecasted cost decreased by $14.92M.

4. PROGRAM SCHEDULE SUMMARY

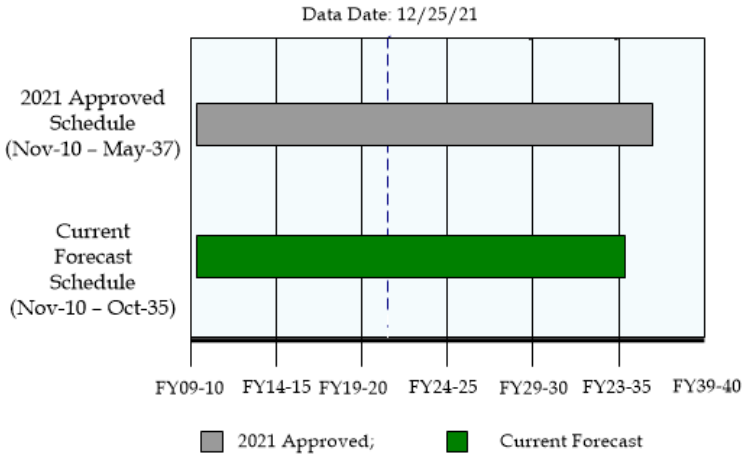

Figure 4. Program Schedule Summary

Figure 4 and Table 4 compare the FY21 – 30 CIP Approved Schedule and the Current Forecast Schedule for the HCIP. As shown in Table 4, the overall HCIP is currently forecast to be completed in October 2035, which is 18.8 Months before the Approved Completion of May 2037.

Table 4. FY21-30 CIP Approved vs. Current Forecast Schedule Dates

Sub-Program	2021 Approved Project Start	Actual Start	2021 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Water Infrastructure	11/08/10	11/08/10✓	06/30/31	06/28/30	12 Early
Power Infrastructure	05/29/12	05/29/12✓	06/30/31	10/30/35	52
Joint Infrastructure	10/03/11	10/03/11✓	05/25/37	06/29/35	22.9 Early
Overall HCIP Program	**11/08/10**	**11/08/10✓**	**05/25/37**	**10/30/35**	**18.8 Early**

5. BUDGET AND SCHEDULE TREND SUMMARY

Starting with the Q1 FY21-22 Quarterly Report, a revised report format includes a new Table 5, titled Budget and Schedule Trend Summary. This Table 5 contains all approved HCIP projects that are active and in any of the planning, design, bid and award, or construction phases of the project. The table excludes all Project Development accounts, as well as any projects that are either Not-Initiated, On-Hold, in Close-Out or Completed.

During this Quarter (Q2 FY21-22), the following major milestone was achieved and the project cost and schedule forecasts were updated based on the updated milestone cost estimate accordingly for the following HCIP project:

1. 95% Design for Phase 1B of the SJPL Valve and Safe Entry Improvement project

Table 5. Budget and Schedule Trend Summary

All Costs are shown in million

Project Name	Most Recent CIP Approved Budget		Project Initiation		CER		35% Design		95% Design		Awarded Construction[1]		Current Status	
	Approved Budget	Approved Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion
	a	b	c	d	e	f	g	h	i	j	k	l	m	n
Water Infrastructure														
10035574 - SJPL Tesla Valves Replacement	FY21-30		05/01/19		11/27/20		07/28/20		11/17/20		04/06/21		Q2 - FY21-22	
	$3.7	12/30/22	$7.4	06/28/24	$7.4	06/28/24	$7.4	06/28/24	$7.4	06/28/24	$3.7	12/30/22	$3.7	12/30/22
10035575 - SJPL Valve and Safe Entry Improvement	FY21-30		7/1/2019		4/16/2021		03/03/21 (Phase 1A), 05/28/21 (Phase 1B), 05/13/22 (Phase 2) & 12/30/21 (Phase 3)		07/14/21 (Phase 1A), 10/29/21 (Phase 1B), 10/27/22 (Phase 2) & 05/06/22 (Phase 3)		05/05/22 (Phase 1A), 09/02/22 (Phase 1B), 07/15/23 (Phase 2) & 01/15/23 (Phase 3)		Q2 - FY21-22	
Phase 1A Phase 1B Phase 2 Phase 3	$98.9	03/13/28	$95.3	07/01/25	$95.3	07/01/25	$98.9	03/13/28	$142.7	03/13/28	TBD	TBD	$142.7	03/13/28
Power Infrastructure														
10036809 - Moccasin Powerhouse Bypass Upgrades	FY21-30		09/18/20		11/07/22		02/24/23		12/26/23		02/28/25		Q2 - FY21-22	
	$15.0	12/01/27	$15.0	12/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$15.0	12/01/27
10014086 - Moccasin Powerhouse and GSU Rehabilitation	FY21-30		01/04/16		05/14/21		07/29/19 (Phase 1), 10/01/19 (Phase 2) & 9/28/22 (Phase 3)		09/09/20 (Phase 1), 05/12/22 (Phase 2) & 03/29/24 (Phase 3)		06/07/21 (Phase 1), 06/08/22 (Phase 2) & 10/02/24 (Phase 3)		Q2 - FY21-22	
Phase 1 Phase 2 Phase 3	$66.7	04/13/27	$18.0	10/03/18	$66.7	04/13/27	$66.7	12/03/27	$66.7	12/03/27	$66.7	12/03/27	$66.7	12/03/27
10014087 - Warnerville Substation Rehabilitation	FY21-30		09/01/15 (Phase 1), 7/01/20 (Phase 2a) & 01/01/21 (Phase 2b)		02/29/16 (Phase 1), 01/18/21 (Phase 2a) & 01/03/23 (Phase 2b)		04/01/16 (Phase 1), 04/22/21 (Phase 2a) & 09/01/23 (Phase 2a)		12/24/16 (Phase 1), 08/16/21 (Phase2a) & 04/04/24 (Phase 2b)		11/26/18 (Phase 1), N/A (Phase 2a) & 02/03/25 (Phase 2b)		Q2 - FY21-22	
Phase 1 (DB-127R) Phase 2a Phase 2b	$34.2	11/25/26	$27.2	11/25/26	$34.2	11/25/26	$34.2	11/25/26	$34.2	11/25/26	$24.3	03/04/20	$34.2	11/25/26
10035721 - Transmission Lines 7/8 Upgrades	FY21-30		07/01/19		12/07/20[2]		03/19/21		09/24/21		10/03/22		Q2 - FY21-22	
	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	TBD	TBD	$38.0	01/31/25
Joint Infrastructure														
10014088 - Moccasin Penstock	FY21-30		12/11/18		04/21/23		10/16/23		06/10/24		04/15/25		Q2 - FY21-22	
	$47.3	02/28/28	$13.2	12/31/24	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$47.3	02/28/28
10030758 - OSH Dam Access and Drainage Improvements	FY21-30		03/01/17		06/28/19		09/01/19		08/21/20		09/27/21		Q2 - FY21-22	
	$4.0	02/28/23	$5.8	02/26/21	$5.8	02/26/21	$5.8	02/11/22	$5.8	12/16/22	$4.0	02/28/23	$4.0	02/28/23
10032903 - O'Shaughnessy Dam Outlet Works Phase I[3]	FY21-30		02/01/18		9/30/2021 (Subproject A), Complete (Subproject B), 2/28/2022 (Subproject C), 8/30/2022 (Subproject D) & 8/30/2022 (Subproject E)		12/1/2021 (Subproject A), 11/30/2021 (Subproject B) & 5/31/2022 (Subproject C)		5/1/2022 (Subproject A), 2/01/2022 (Subproject B) & 1/30/2023 (Subproject C)		12/1/2022 (Subproject A), 12/1/2022 (Subproject B) & 9/30/2023 (Subproject C)		Q2 - FY21-22	
Subproject A Subproject B Subproject C Subproject D (Planning Only) Subproject E (Planning Only)	$21.2	09/16/25	$17.2	12/31/24	$47.9	09/16/25	TBD	TBD	TBD	TBD	TBD	TBD	$47.9	09/16/25

Table 5. Budget and Schedule Trend Summary

All Costs are shown in million

Project Name	Most Recent CIP Approved Budget		Project Initiation		CER		35% Design		95% Design		Awarded Construction[1]		Current Status	
	Approved Budget	Approved Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion
	a	b	c	d	e	f	g	h	i	j	k	l	m	n
10037351 - Moccasin Dam Long-Term Improvements[3]	FY21-30		05/03/21		07/28/22		06/15/23		02/06/25		06/01/26		Q2 - FY21-22	
	$83.2	07/01/27	$83.2	07/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$73.2	06/30/28
10014115 - Cherry Dam Spillway - Short Term Improvements	FY21-30		03/01/21		07/15/22		12/02/22		09/08/23		08/20/24		Q2 - FY21-22	
	$11.9	07/01/27	$11.9	07/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$11.9	07/01/27
10014114 - Mountain Tunnel Improvement Project	FY21-30		10/03/11		12/29/17		05/15/18		07/31/19		10/13/20		Q2 - FY21-22	
	$238.2	06/03/27	$114.0	12/30/21	$246.1	12/31/26	$238.2	12/31/26	$238.2	12/31/26	$238.2	06/03/27	$238.2	06/03/27
10035086 - Bridge Replacement (4 - Bridges)	FY21-30		02/27/20		7/15/22 (Subproject 1) & 02/28/23 (Subproject 2)		05/23/22 (Subproject 1) & 05/05/23 (Subproject 2)		02/20/23 (Subproject 1) & 01/12/24 (Subproject 2)		02/01/24 (Subproject 1) & 02/03/25 (Subproject 2)		Q2 - FY21-22	
Subproject 1	$44.3	05/25/37	$44.3	12/30/25	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$29.4	07/01/27
Subproject 2														

Footnotes:

1. This represents forecast project cost and project completion date at the time of award of construction contract (or award of CM/GC contracts/packages).
2. This represents the date the Design Criteria Report (DCR) was finalized for Transmission Lines 7/8 Upgrade project. CER was not required for the project.
3. This represents that the 95% Design is actually 100% for Subproject A & B.

6. PROJECT PERFORMANCE SUMMARY*

All costs are shown in $1,000s as of 12/25/21

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 Project Completion Date (h) (+)	Current Approved Completion (i) (++)	Current Forecast Completion (j)	Schedule Variance (Days) (k = i - j) (+++)
Water Infrastructure											
Water Conveyance (Water)											
10035574 - SJPL Tesla Valves Replacement	CN	$ 3,740	$ 3,740	$ 3,740	$ 1,560	-	0%	12/30/22	12/30/22	12/30/22	0
10035575 - SJPL Valve and Safe Entry Improvement	MP	$ 98,924	$ 98,924	$ 142,662	$ 3,298	($43,738)	-44%	03/13/28	03/13/28	03/13/28	0
Power Infrastructure											
Powerhouse											
10036809 - Moccasin Powerhouse Bypass Upgrades	PL	$ 15,007	$ 15,007	$ 15,007	$ 390	-	0%	12/01/27	12/01/27	12/01/27	0
10014086 - Moccasin Powerhouse and GSU Rehabilitation	MP	$ 66,714	$ 66,714	$ 66,714	$ 7,784	-	0%	04/13/27	04/13/27	12/03/27	(234)
Switchyard & Substations (Power)											
10014087 - Warnerville Substation Rehabilitation	CN	$ 34,248	$ 34,248	$ 34,248	$ 21,879	-	0%	11/25/26	11/25/26	11/25/26	0
Transmission Lines											
10035721 - Transmission Lines 7/8 Upgrades	DS	$ 37,969	$ 37,969	$ 37,969	$ 2,705	-	0%	01/31/25	01/31/25	01/31/25	0

* Exclude 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 MP Multiple-Phase

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 or/ and additional contingencies on construction contracts.

(+++) Negative number is reflecting cost overrun (Schedule delay) and positive number is reflecting cost underrun (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.

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 Project Completion Date (h) (+)	Current Approved Completion (i) (++)	Current Forecast Completion (j)	Schedule Variance (Days) (k = i - j) (+++)
Joint Infrastructure											
Dams & Reservoirs (Joint)											
10014088 - Moccasin Penstock	PL	$ 47,251	$ 47,251	$ 47,251	$ 5,231	-	0%	02/28/28	02/28/28	02/28/28	0
10030758 - OSH Dam Access and Drainage Improvements	CN	$ 3,952	$ 3,952	$ 3,952	$ 1,172	-	0%	02/28/23	02/28/23	02/28/23	0
10032903 - O'Shaughnessy Dam Outlet Works Phase I	PL	$ 21,206	$ 21,206	$ 47,894	$ 1,061	($26,688)	-126%	09/16/25	09/16/25	09/16/25	0
10037351 - Moccasin Dam Long-Term Improvements	PL	$ 83,176	$ 83,176	$ 73,176	$ 175	$ 10,000	12%	07/01/27	07/01/27	06/30/28	(365)
10014115 - Cherry Dam Spillway - Short Term Improvements	PL	$ 11,861	$ 11,861	$ 11,861	$ 294	-	0%	07/01/27	07/01/27	07/01/27	0
Mountain Tunnel											
10014114 - Mountain Tunnel Improvement Project	CN	$ 238,219	$ 238,219	$ 238,219	$ 54,598	-	0%	06/03/27	06/03/27	06/03/27	0
Roads & Bridges (Joint)											
10035086 - Bridge Replacement (4 - Bridges)	PL	$ 44,287	$ 44,287	$ 29,371	$ 1,219	$ 14,916	34%	05/25/37	05/25/37	07/01/27	3616

* Exclude 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 MP Multiple-Phase

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 or/ and additional contingencies on construction contracts.

(+++) Negative number is reflecting cost overrun (Schedule delay) and positive number is reflecting cost underrun (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.

7. PROJECT STATUS REPORT

10035574 - SJPL Tesla Valves Replacement

Project Description: The 2018 approved scope for this project is to replace four large diameter butterfly valves, namely TUV 101, 201, 301 and 401, inside the Tesla Valve Vault so that each of the four San Joaquin Pipelines (SJPL) can be safely isolated and shut down individually for inspection and repair work without shutting down the entire SJPL system. This project will also improve safety for entry into the pipelines for maintenance and inspection purposes. After the planning phase of the related project SJPL Valve and Safe Entry Improvement (Project 10035575) it was recommended that the scope of SJPL Tesla Valve Replacement be reduced, to focus on completing the replacement of TUV101 only. The remainder of the work (i.e. TUV 201, 301 and 401) has been added to the scope of SJPL Valve and Safe Entry Improvement (Project 10035575) to expedite improvements for TUV101 during the planned winter shutdown from January to February 2022 to facilitate necessary maintenance work for SJPL No. 1 during the remainder of 2022. The installation of TUV201, 301 and 401 will proceed together with the upgrade work proposed under SJPL Valve and Safe Entry Improvement, in 2023 and 2024.

Program: Water Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed

Project Cost:

Approved		$3.74 M
Forecast		$3.74 M
Actual		$1.56 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	May-19	Dec-22
Forecast	May-19	Dec-22

Project Percent Complete: 53.1%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	08/26/20✓	N/A	04/06/21✓	05/31/22

Progress and Status:

In this quarter, the project team expedited delivery of the City-purchased 66-inch diameter butterfly valve by authorizing air-freight delivery to the country. The actuator was also delivered during the quarter, and both valve and actuator were inspected and accepted by SFPUC staff. The JOC contractor received timely delivery of the new 24-inch diameter butterfly valve. The on-time delivery of these long lead time components was critical in order to meet the construction window for installation during the Mountain Tunnel system shutdown scheduled for next quarter.

Delivery of 66-Inch Butterfly Valve to the Tesla Facility

Issues and Challenges:

None at this time.

10035575 - SJPL Valve and Safe Entry Improvement

Project Description: The San Joaquin Pipelines (SJPLs) consist of three parallel pipelines approximately 48 miles long (completed in 1932, 1953, and 1968, respectively) that cross the San Joaquin Valley from the Oakdale Portal of the Foothill Tunnel on the east end to the Tesla Portal of the Coast Range Tunnel (CRT) on the west. Portions of a fourth pipeline have also been constructed consisting of 6.4 miles of pipe downstream of Oakdale and 11 miles upstream of Tesla. The hydraulic gradient on the SJPLs was limited by surge stacks/towers at Oakdale portal (~825 ft) and Tesla portal (~500 ft). The pipelines were intended to be shut down at Oakdale.
As part of the SFPUC's Water System Improvement Program (WSIP), the Emery and Pelican crossover vaults were installed and the Roselle crossover vault was modified to allow for flows between SJPLs and isolation of SJPL segments for inspection and maintenance. In addition, the Tesla Valve House (TVH) and Tesla Treatment Facility (TTF) were added upstream of the Tesla surge tower. Like the SJPLs, the crossover vaults and Tesla facilities are rated for the maximum pressures that should occur under normal operating conditions. However, the pipelines and pipeline segments still need to be shut down from the upstream end. Closure of multiple in-line valves or all TTF UV reactor valves can over-pressurize the pipelines. As in the original design, complete shutdown of the SJPL system must be done at Oakdale.
The objective of this project is to allow safe entry into any and all sections of the SJPLs for inspection and maintenance while the remainder of the system stays in operation. The scope and budget of installing the TUV201, 301 and 401 butterfly valves has been transferred from project SJPL Tesla Valve Replacement project (10035574) and added to SJPL Valve and Safe Entry Improvement.

Program: Water Infrastructure	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:

Approved	$98.92 M
Forecast	$142.66 M
Actual	$3.30 M

Project Schedule:

Approved	Jul-19	Mar-28
Forecast	Jul-19	Mar-28

Project Percent Complete: 6.2%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 05/04/22 (B) 05/04/22 (C) 05/04/22 (D) 12/06/22	(A) 12/08/21✓ (B) 03/18/22 (C) 01/08/23 (D) 07/12/22	(A) 05/05/22 (B) 09/02/22 (C) 07/15/23 (D) 01/15/23	(A) 09/30/24 (B) 06/07/24 (C) 05/24/27 (D) 08/01/24

** (A) Phase 1A – Pipeline 2 Tesla & Oakdale Entry Improvements – HH-1005; (B) Phase 1B – Pipelines 3&4 Tesla & Oakdale Entry Improvements HH-1006; (C) Phase 2 -Pelican, Roselle, Emery and P4J Entry Improvements; and (D) Phase 3 - Tesla Surge Stack - HH-1009.*

Progress and Status:
This project is divided into four (4) sub-projects, as specified in the above footnote. For Phase 1A, the 100% design was completed in October and the project team continued to work on the contract bid documents. The construction contract (HH-1005) was advertised in December, and bids are anticipated to be opened in January. For Phase 1B, the 95% design was completed in October and the project team is working on the 100% design submission. It is anticipated that the construction contract (HH-1006) will be advertised next quarter. Phase 2 and Phase 3 of the project are still in Planning.

Issues and Challenges:
The forecasted cost is greater than the approved budget due to scope refinements to further improve safe entry and due to resequencing of construction to better coordinate with system shutdowns in Fall/Winter so as to minimize the impact on water delivery.

10036809 - Moccasin Powerhouse Bypass Upgrades

Project Description: Hetch Hetchy water deliveries are conveyed from Priest Reservoir to Moccasin Powerhouse (MPH) through the Moccasin Penstocks. At MPH, water passes through two hydroelectric turbines where energy is converted from high-pressure water into electricity. When electricity is not being produced, the water deliveries are directed around the turbines by two bypass valves that dissipate up to 305 million gallons per day (mgd) at 560 pounds per square inch (psi) of water energy. In the past, short-term use of the bypass system has resulted in significant vibration and cavitation damage to the bypass valves. Long-term use (greater than two to five days) could lead to major mechanical damage or failure, leading in turn to the potential of interruption of water deliveries to San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the Moccasin Reservoir Bypass Pipeline, allowing for increased operating flexibility for HHWP to meet scheduled water deliveries even when MPH, Moccasin Switchyard, or power Transmission Lines #3 and #4 are curtailed.

Program: Power Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved		$15.01 M
Forecast		$15.01 M
Actual		$0.39 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Sep-20	Dec-27
Forecast	Sep-20	Dec-27

Project Percent Complete: 5.4%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	08/26/24	08/27/24	02/28/25	06/02/27

Progress and Status:

The consultant submitted the final Needs Assessment Report (NAR) during this quarter and is working on the Alternative Analysis Report (AAR). Alternatives that are being considered include replacing the old bypass valves with new valves inside the powerhouse as well as moving the bypass system to a location outside of the powerhouse.

Issues and Challenges:

None at this time.

Turbine bypass valve

10014086 - Moccasin Powerhouse and GSU Rehabilitation

Project Description: The two Moccasin Powerhouse generators were completed in 1969 and generate a combined maximum output of 110 megawatts. Both generator units have exceeded their life expectancy and are in need of repair in order to continue operating reliably. The objective of this project is to replace stator cores and coils. The scope of work also includes rehabilitation of the rotor field poles with new pole cores and re-insulated field coils, replacement of the rotor pole/rim tail connection system with a new T-tail connection system, and supply of a new rotor rim for each generator following inspection and testing. The project will also include replacement of two generator step-up transformers (GSUs) with new oil containment barriers, and remaining plant work including: replacing 480V switchgear, 13.8kV switchgear, motor control centers, main control boards, protective relays, and cooling water piping.

Program: Power Infrastructure	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:

Approved	$66.71 M
Forecast	$66.71 M
Actual	$7.78 M

Project Schedule:

Approved	Jan-16	Apr-27
Forecast	Jan-16	Dec-27

Project Percent Complete: 10.6%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 09/28/20✓ (B) 09/28/20✓ (C) 09/28/22	(A) 11/20/20✓ (B) 10/30/20✓ (C) 04/01/24	(A) 06/07/21✓ (B) 06/08/22 (C) 10/02/24	(A) 05/23/23 (B) 06/17/24 (C) 06/07/27

** (A) Moccasin Powerhouse Generator Step-Up (GSU's) Transformers HH-1003R was re-advertised on 1/14/21; (B) Moccasin Powerhouse Generators Rewind – DB-121R2; and (C) Moccasin Powerhouse Systems Upgrade.*

Progress and Status:

This project is divided into 3 subprojects, as specified in the above footnote. For subproject A, HH-1003R Moccasin Powerhouse (MPH) Generator Step-up (GSU) Transformer Installation, the new Delta Star GSU1 transformer was delivered in October and was temporarily installed in the spare slot outside the Powerhouse. The contractor moved the older GSU1 to a temporary location outside the yard. The disassembled former spare transformer is still outside of the switchyard awaiting removal. The new GSU1 and GSU2 relay panels were delivered in November, were installed in the Powerhouse and are ready to be wired and tested next quarter. For subproject B, DB-121R2 MPH Generators Rehabilitation, the 100% design drawings were received for key long-lead items; construction is scheduled for June 2022. For subproject C, MPH Systems Upgrades, the Needs Assessment Report (NAR), including the prioritization of scope items, was reviewed and approved by the Technical Steering Committee (TSC) in November 2021. The task order for consultant planning and design support is anticipated to start next quarter

Delta Star GSU1 Transformer in Spare Slot

Issues and Challenges:

Subproject A: The foundation design for GSU1 was found to be in conflict with the centerline of the rails and underground utilities. This conflict resulted in the redesign of the foundation and additional excavation and shoring that impacted schedule during December. The impact to the start-up schedule will be evaluated next quarter. Subproject B: The potential risk of delayed materials delivery due to the recent backlog of container ships in the California ports will be evaluated during the next few quarters.

10014087 - Warnerville Substation Rehabilitation

Project Description: This project is based on the need to extend the useful life of the Warnerville Substation and meet reliability requirements of NERC/WECC and PG&E Intertie Agreements. The upgrades include replacing three existing 3 phase transformer with two larger rated transformers. Other upgrades include new 115kV and 230kV disconnect switches and breakers; new Control Room, perimeter fence, relays and controls; improvement to the grading and grounding system.

Program: Power Infrastructure	**Project Status:** Construction	**Environmental Status:** Active

Project Cost:		**Project Schedule:**	
Approved	$34.25 M	Approved Sep-15	Nov-26
Forecast	$34.25 M	Forecast Sep-15	Nov-26
Actual	$21.88 M	Project Percent Complete: 67.3%	

Approved; Actual Cost; Forecast

Key Milestones:	**Environmental* Approval**	**Bid* Advertisement**	**Construction* NTP**	**Construction* Final Completion**
Current Forecast	(A) 03/31/16✓	(A) 01/24/17✓ (B) 09/06/24	(A) 10/05/17✓ (B) 02/03/25	(A) 03/31/22 (B) 05/04/26

** (A) Warnerville Substation Phase 1 – DB-127R; (B) Warnerville Substation Phase 2.*

Progress and Status:

The project team, in coordination with the City Attorney's office, is working to close out the contract DB-127R, Warnerville Substation Rehabilitation. The project team is completing the breaker failure contingency plan for Contract documents to be finalized next quarter. Contract HH-1008 Warnerville Substation Rehabilitation Phase 2 will be a design-bid-build contract. A task order for engineering services during planning, design and construction is being negotiated.

Typical 230KV SF6 Breaker to be Installed as Part of Phase 2

Issues and Challenges:

None at this time.

10035721 - Transmission Lines 7/8 Upgrades

Project Description: This project develops the scope of work, design, and contract documents necessary to bid, award, and manage the reconductoring contract. Reconductoring will include replacement of the existing 115kV conductors on Lines 7/8 from Warnerville to Standiford substations, resulting in improved transmission tower stability, and resolved clearance detections.
The project will be partially funded by independent power generators interconnecting on the California Independent System Operator (CAISO).

Program: Power Infrastructure	**Project Status:** Design	**Environmental Status:** Active

Project Cost:

Approved	$37.97 M
Forecast	$37.97 M
Actual	$2.71 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Dec-19	Jan-25
Forecast	Dec-19	Jan-25

Project Percent Complete: 10.7%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	11/04/21✓	02/17/22	10/03/22	06/28/24

Progress and Status:
Significant progress was achieved in the environmental phase with the completion of an addendum to include this project work within the existing Final Mitigated Negative Declaration for the Rehabilitation of the Existing San Joaquin Pipelines, which contains the final historical, archeological, and biological evaluations completed last quarter. In addition, the design engineering consultant is on track to submit the 100% design for next quarter. The specifications development started this quarter for the construction contract and will be final next quarter with the anticipated advertisement of this contract for public bid.

Transmission Line 7/8 Tower 508S Looking North

Issues and Challenges:
None at this time.

10014088 - Moccasin Penstock

Project Description: Moccasin Penstock was built in the early 1920's and conveys Hetch Hetchy water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. Moccasin penstock serves as the sole link in conveying water from Priest Reservoir to Moccasin Reservoir, from which water is routed to the San Francisco Public Utilities Commission (SFPUC) customers. The lower 1,084-foot section of welded steel pipe replaced the original penstocks when the new Moccasin Powerhouse was completed in the 1960s. The upper 4,000 feet of penstock dates to 1924 and has been in service for more than 97 years. Previous condition assessments have identified deficiencies including corrosion, coating damage, lining degradation, leakage, aggregate expansion, cracks in the concrete anchor blocks and saddles, vulnerability of the hammer forged steel pipe sections. The objective of this project is to enhance the reliability of water delivery and extend the life of the penstock system for another 50 to 100 years.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:

Approved	$47.25 M
Forecast	$47.25 M
Actual	$5.23 M

Project Schedule:

Approved	Feb-16	Feb-28
Forecast	Feb-16	Feb-28

Project Percent Complete: 11.1%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	10/07/24	10/07/24	04/15/25	08/24/27

Progress and Status:

In this quarter, the condition assessment and the structural evaluation reports were finalized. A workshop with Hetch Hetchy Operations was held to present findings during the Condition Assessment phase. In addition, NTP was issued for the Needs Assessment phase of the project. The Task Order Kickoff meeting was held on December 14, 2021. The field visit scheduled for December was postponed to January due to adverse weather conditions.

Moccasin Penstock along steep section

Issues and Challenges:

None at this time.

10030758 - OSH Dam Access and Drainage Improvements

Project Description: The O'Shaughnessy Dam is located 140 miles east of San Francisco, CA in Yosemite National Park, Tuolumne County. The dam, a concrete curved gravity structure, is located on the Tuolumne River across the steep-walled Hetch Hetchy Valley. The interior workings of the dam contain valves and appurtenances that must be accessed for operations and maintenance.
This project includes improvements for safe access, as well as mitigation of excess interior water leakage through drainage improvements, for the Ladder Wells, Galleries, Inclined Stairways, Control Room, and Diversion Tunnel.
The project was reduced in scope of work in 2020 to meet the existing approved budget. The new project will be advertised as O'Shaughnessy Dam-Fall Protection Improvements and Spillway Access to complete the reduced scope of work.
Improvements that were not included in this revised project, such as drainage improvements, will be included in the OSH Dam Outlet Works Phase 1 project.

Program: Joint Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed (CatEx)

Project Cost:

Approved	$3.95 M
Forecast	$3.95 M
Actual	$1.17 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Mar-17	Feb-23
Forecast	Mar-17	Feb-23

Project Percent Complete: 36.4%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	07/16/20✓	03/18/21✓	09/27/21✓	08/21/22

Progress and Status:
Notice to Proceed was established on September 27, 2021 for Contract HH-1002R. The contractor mobilized to the worksite in November. Fall protection was installed in the inclined stairways and on the drum gate ladders. The exterior ladder to the spillway invert installation was in progress during the quarter but not yet completed.

Issues and Challenges:
None at this time.

Spillway Access Ladder with Fall Protection

10032903 - O'Shaughnessy Dam Outlet Works Phase I

Project Description: O'Shaughnessy Dam (OSH) was completed in 1923 and raised in 1938. The original outlet works including gates and valves have been in services for more than 98 years. Inspections, condition assessments, and studies concluded that improvements and refurbishments of the outlet works system are needed to ensure safety and reliability. The work will be implemented in two phases. This project is to cover the Phase 1 work. The O'Shaughnessy Dam Outlet Works Phase 1 Project addresses the identified deficiencies of the existing outlet works system at OSH. Phase 1 will include four projects: (1) supply and installation of nine new bulkheads; (2) refurbishment of twelve existing slide gates; (3) rehabilitation of existing drum gates to replace the seals, replace the hinges and rivets, recoating the gates, and repair the spillway concrete; and (4) installation of a new diversion pipe isolation butterfly valve.

The existing control gates and valves are essential features for dam safety and reservoir operation. The project is needed to maintain safe and reliable operation of these aging assets. Failure or malfunction of these gates and valves will affect dam safety and result in reduction of storage and reduction of water deliveries to SFPUC customers.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:

Approved	$21.21 M
Forecast	$47.89 M
Actual	$1.06 M

Project Schedule:

Approved	Feb-18	Sep-25
Forecast	Feb-18	Sep-25

Project Percent Complete: 15.1%

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 09/29/22 (B) 09/29/22 (C) 12/28/23	(A) 05/31/22 (B) 05/31/22 (C) 04/14/23	(A) 12/06/22 (B) 12/06/22 (C) 09/15/23	(A) 03/14/25 (B) 03/14/25 (C) 11/29/24

** (A) Bulkhead; (B) Access and Drainage; (C) Instream Flow Release*

Progress and Status:

Subproject A: During this quarter, work began on a peer review of the bulkhead design concept. The team also scoped a JOC task order for divers to perform 1) an underwater inspection of the bulkheads and 2) a trial surface cleaning method to remove the rust on sealing surfaces of the bulkhead at one of the existing outlets. Subproject B: Work began on contracting for a CCTV inspection of the drain system in the O'Shaughnessy Dam for the Access and Drainage Project. Subproject C: Preparation of the NAR/AAR and of the planning phase environmental assessment for the Instream Flow Release (IFR) Valve Replacement Project continues. The current project forecasted budget and schedule include scope for installation of new bulkheads (original scope), replacement of the IFR valves, installation of safe access and drainage improvements, and the planning phase for the drum gates and slide gates refurbishment.

Issues and Challenges:

As noted last quarter, the current planning phase design and construction cost and duration estimates are higher than the approved budget and schedule due to the following: 1) added scope of IFR valves replacement and dam gallery access and drainage improvements; 2) scope refinement and greater detail in the most recent construction cost estimate for the new bulkhead system. The scope now specifies additional inspections, underwater modification of the existing slots and corroded inlet surfaces, and installation of the bulkheads using divers. Completion of the IFR valves replacement NAR/AAR is delayed to next quarter, but the delay can be recovered during the remaining planning and design schedule without impacts to the overall project completion date.

10037351 - Moccasin Dam Long-Term Improvements

Project Description: The flow capacity of the existing spillway is inadequate to protect the Moccasin Dam against overtopping and erosion from severe flood events. The dam almost overtopped during the March 2018 storm event when flows were released from the auxiliary spillway and caused significant damage to the auxiliary spillway. The surrounding areas and the upstream diversion dam also sustained damage from the flood. This project is needed for dam safety. The objective of this project is to increase the spillway flow capacity to allow safe passage of flood flows without overtopping the dam and to protect the associated facilities within the Moccasin reservoir boundary against flood damages. The estimated project cost is $83.2 million and is within the current 10-year CIP FY 21-30. Construction is scheduled for 2025-2027.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved		$83.18 M
Forecast		$73.18 M
Actual		$0.17 M

Project Schedule:

Approved	May-21	Jul-27
Forecast	May-21	Jun-28

Project Percent Complete: 1.7%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/29/26	01/26/26	07/27/26	12/30/27

Progress and Status:
The alternatives analysis (AAR) was complete in December 2021. The AAR confirmed that an auxiliary spillway is the preferred alternative for increasing the spillway capacity. Additional detail was provided for ancillary facilities. The engineering consultant will begin the conceptual engineering phase in the next quarter.

Issues and Challenges:
None at this time.

Existing Moccasin Dam Spillway

10014115 - Cherry Dam Spillway - Short Term Improvements

Project Description: A spillway release from Cherry Dam in 2010 caused a landslide, blockage of the spill channel, and extensive erosion in the close proximity of the dam's right abutment. In addition, it caused flooding of the Cherry Power Tunnel Adit, and flooding of a campground further downstream. Engineering studies determined that significant long-term improvements to increase the spillway flow capacity are needed to maintain dam safety. The objective of this project is to re-establish containment for the breached spill channel section and to protect the downstream slope of the existing embankment dam from uncontrolled releases and erosion in the interim until the long-term improvements are implemented. Construction is scheduled for 2025-2026. The estimated project cost of $11.9 million is within the current 10-year CIP FY 21-30.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:		**Project Schedule:**		
Approved	$11.86 M	Approved	Mar-21	Jul-27
Forecast	$11.86 M	Forecast	Mar-21	Jul-27
Actual	$0.29 M	Project Percent Complete: 6.9%		

Approved; Actual Cost; Forecast

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	08/15/24	03/29/24	10/31/24	12/31/26

Progress and Status:
The engineering consultant continued work on the alternative analysis for the Cherry Dam Spillway Short-Term Improvements. The alternatives will include grading and erosion protection to contain the spillway discharge. The alternatives analysis is scheduled to complete in March 2022.

Issues and Challenges:
None at this time.

The Spillway Overflow Weir and Upstream Channel

10014114 - Mountain Tunnel Improvement Project

Project Description: Mountain Tunnel conveys the SFPUC water supply from Kirkwood Powerhouse to Priest Reservoir. Mountain Tunnel has been in service since 1925. Due to its age, deferred maintenance, and construction deficiencies in the early 1900s, sections of the tunnel lining have deteriorated, some extensively. This project provides design and construction of major tunnel repair and rehabilitation work, adit and tunnel entry improvements, access road improvements, and installation of a new flow control facility at Priest Reservoir to ensure that the tunnel can reliably provide drinking water to customers for the next 100 years.
The flow control structure and isolation valves will also be used to isolate the tunnel from Priest Reservoir during tunnel shutdowns. This will allow the reservoir to remain full and not backwater for over 8 miles into the dewatered tunnel. The full reservoir provides more supply water for safely extending the tunnel shutdowns to longer durations of 100 days for construction inside the tunnel. These longer outages will reduce the need for more typical 60-day outages and shorten the overall duration of the construction schedule.

Program: Joint Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed

Project Cost:

Approved	$238.22 M
Forecast	$238.22 M
Actual	$54.60 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Oct-11	Jun-27
Forecast	Oct-11	Jun-27

Project Percent Complete: 32.1%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/14/20✓	11/13/19✓	01/29/21✓	12/03/26

Progress and Status:

This quarter's progress included completing the retaining wall and surface mass excavation to allow construction of the Flow Control Facility (FCF) shaft. The FCF shaft concrete collar was constructed, and the shaft was excavated to a depth of thirty-five feet. The Priest Adit portal wall construction was substantially completed, and the adit construction has started. The temporary water treatment plant below Priest Reservoir to treat construction water was substantially completed along with the temporary water treatment plant to provide drinking water to Moccasin during the five Mountain Tunnel shutdowns planned for this project. Safety improvement work continued on the adit access roads. Work continues on the bulkhead door at Early Intake. Significant planning and preparation took place for the first of the planned Mountain Tunnel shutdowns that starts in January 2022.

FCF Shaft Collar Construction

Issues and Challenges:

None at this time.

10035086 - Bridge Replacement (4 - Bridges)

Project Description: HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessments in 2013 and 2016 determined that, four of these bridges require substantial rehabilitation or replacement: Lake Eleanor Dam Bridge, O'Shaughnessy Adit Access Bridge, Cherry Lake Road Bridge (public access), and Early Intake Bridge (public access). The project will be funded in 2 phases. The first phase will include planning, design and construction of Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge. The planning, design and construction of the Early Intake Bridge and Cherry Lake Road Bridge will be under Phase 2.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:		**Project Schedule:**		
Approved	$44.29 M	Approved	Feb-20	May-37
Forecast	$29.37 M	Forecast	Feb-20	Jul-27
Actual	$1.22 M	Project Percent Complete: 44.8%		

Approved; Actual Cost; Forecast

Key Milestones:	**Environmental* Approval**	**Bid* Advertisement**	**Construction* NTP**	**Construction* Final Completion**
Current Forecast	(A) 06/30/23 (B) 07/31/24	(A) 08/01/23 (B) 08/01/24	(A) 02/01/24 (B) 02/03/25	(A) 12/31/25 (B) 01/29/27

** (A) Lake Eleanor Dam Bridge; and (B) O'Shaughnessy Adit Access Bridge.*

Progress and Status:

For the O'Shaughnessy Adit Access Bridge, a geotechnical data report has been finalized and the draft Alternatives Technical Memorandum is being developed. For Lake Eleanor Dam Bridge, the engineering consultant started working on a constructability review in conjunction with preliminary alternatives for rehabilitation of the existing bridge.

O'Shaughnessy Adit Bridge and Geotechnical Exploration

Issues and Challenges:

The variances between the approved budget and schedule and the forecasted budget and schedule are due to division of the project into two phases, with the planning, design and construction of the Lake Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge within the first phase and funded in the FY21-30 10-Year CIP; the funding for the planning, design and construction of the other two of the four bridges has been deferred until after 2030. The forecasted completion for the two bridges is decreased from the approved completion date of May 2037 to a revised completion date of January 2027.

8. On-Going Construction*

The following table reflects active construction contract(s) with an original contract amount greater than $1M.

Construction Contract	Schedule			Budget		Variance (Original - Forecast)		Actual % Complete
	NTP Date	Approved Construction Final Completion	Current Forecast Construction Final Completion*	Approved Contract Cost	Current Forecast Cost*	Schedule (Cal. Days)	Current Forecast Cost	
Power Infrastructure								
10014086 - Moccasin Powerhouse Transformers Installation - HH-1003R	06/07/21	05/23/23	05/23/23	$ 3,653,575	$ 3,653,575	-	-	16.9%
10014086 - Moccasin Powerhouse Generator Rehab - DB-121R2	06/21/21	06/17/24	06/17/24	$ 28,898,986	$ 28,898,986	-	-	3.2%
10014087 - Warnerville Switchyard - DB-127R **	10/05/17	07/09/19	03/31/22	$ 14,591,450	$ 14,591,450	(996)	-	90.0%
Joint Infrastructure								
10030758 - OSH Dam Access & Drainage Improvement - HH-1002R	09/27/21	08/21/22	08/21/22	$ 1,648,556	$ 1,648,556	-	-	13.6%
10014114 - Mountain Tunnel Improvement - HH-1000R	01/29/21	12/03/26	12/03/26	$ 152,870,508	$ 152,870,508	-	-	10.3%

Program Total for On-Going Construction	Approved Contract Cost	Current Forecast Cost*	Variance	
			Cost	Percent
	$ 201,663,075	**$ 201,663,075**	**$-**	**- %**

Note:

* The Current Forecast Cost and Current Forecast Construction Final Completion include all approved, pending, and potential change orders.

** The contract is funded with both CIP and non-CIP funds, but only the CIP funded amount is reflected.

9. PROJECTS IN CLOSE-OUT

Project Title	Current Approved Construction Phase Completion	Actual Construction Phase Completion	Current Approved Construction Phase Budget	Construction Phase Expenditures To Date*
Power Infrastructure				
Powerhouse				
10014075 - Holm and Other Powerhouse Projects	05/14/21	05/14/21	$ 15,327,522	$ 12,869,291
TOTAL			$ 15,327,522	$ 12,869,291

10. COMPLETED PROJECTS

There are no completed projects

APPENDICES

A PROJECT DESCRIPTIONS

B APPROVED PROJECT LEVEL SCHEDULES / BUDGETS

C LIST OF ACRONYMS

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APPENDIX A. PROJECT DESCRIPTIONS

The project titles and descriptions are updated according to the approved 10-year CIP for FY21-30.

HETCH HETCHY CAPITAL IMPROVEMENT PROGRAM (HCIP)

WATER INFRASTRUCTURE

10035574 - SJPL Tesla Valves Replacement

The 2018 approved scope for this project is to replace four large diameter butterfly valves, namely TUV 101, 201, 301 and 401, inside the Tesla Valve Vault so that each of the four San Joaquin Pipelines (SJPL) can be safely isolated and shut down individually for inspection and repair work without shutting down the entire SJPL system. This project will also improve safety for entry into the pipelines for maintenance and inspection purposes. After the planning phase of the related project SJPL Valve and Safe Entry Improvement (Project 10035575) it was recommended that the scope of SJPL Tesla Valve Replacement be reduced, to focus on completing the replacement of TUV101 only. The remainder of the work (i.e. TUV 201, 301 and 401) has been added to the scope of SJPL Valve and Safe Entry Improvement (Project 10035575) to expedite improvements for TUV101 during the planned winter shutdown from January to February 2022 to facilitate necessary maintenance work for SJPL No. 1 during the remainder of 2022. The installation of TUV201, 301 and 401 will proceed together with the upgrade work proposed under SJPL Valve and Safe Entry Improvement, in 2023 and 2024.

10035575 - SJPL Valve and Safe Entry Improvement

The San Joaquin Pipelines (SJPLs) consist of three parallel pipelines approximately 48 miles long (completed in 1932, 1953, and 1968, respectively) that cross the San Joaquin Valley from the Oakdale Portal of the Foothill Tunnel on the east end to the Tesla Portal of the Coast Range Tunnel (CRT) on the west. Portions of a fourth pipeline have also been constructed consisting of 6.4 miles of pipe downstream of Oakdale and 11 miles upstream of Tesla. The hydraulic gradient on the SJPLs was limited by surge stacks/towers at Oakdale portal (~825 ft) and Tesla portal (~500 ft). The pipelines were intended to be shut down at Oakdale.

As part of the SFPUC's Water System Improvement Program (WSIP), the Emery and Pelican crossover vaults were installed and the Roselle crossover vault was modified to allow for flows between SJPLs and isolation of SJPL segments for inspection and maintenance. The intent was to increase operational flexibility and the overall reliability of the SJPL System. In addition, the Tesla Valve House (TVH) and Tesla Treatment Facility (TTF) were added upstream of the Tesla surge tower. Like the SJPLs, the crossover vaults and Tesla facilities are rated for the maximum pressures that should occur under normal operating conditions. However, the pipelines and pipeline segments still need to be shut down from the upstream end. Closure of multiple in-line valves or all TTF UV reactor valves can over-pressurize the pipelines. As in the original design, complete shutdown of the SJPL system must be done at Oakdale.

The objective of this project is to allow safe entry into any and all sections of the SJPLs for inspection and maintenance while the remainder of the system stays in operation. The project objective is not to upgrade the entire SJPL system to the maximum possible static or transient pressures, nor to upgrade all components in vaults to prevent possible flooding of the vaults. However, the proposed surge tower will protect the entire SJPL system from high static and transient pressure caused by operation of valves at Tesla Treatment Facility. The scope and budget of installing the TUV201, 301 and 401 butterfly valves has been transferred from project SJPL Tesla Valve

Replacement project (10035574) and added to SJPL Valve and Safe Entry Improvement.

10014072 – WATER ONLY/PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

POWER INFRASTRUCTURE

10036809 - Moccasin Powerhouse Bypass Upgrades

Hetch Hetchy water deliveries are conveyed from Priest Reservoir to Moccasin Powerhouse (MPH) through the Moccasin Penstocks. At MPH, water passes through two hydroelectric turbines where energy is converted from high-pressure water into electricity. When electricity is not being produced, the water deliveries are directed around the turbines by two bypass valves that dissipate up to 305 million gallons per day (mgd) at 560 pounds per square inch (psi) of water energy. In the past, short-term use of the bypass system has resulted in significant vibration and cavitation damage to the bypass valves. Long-term use (greater than two to five days) could lead to major mechanical damage or failure, leading in turn to the potential of interruption of water deliveries to San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the Moccasin Reservoir Bypass Pipeline, allowing for increased operating flexibility for HHWP to meet scheduled water deliveries even when MPH, Moccasin Switchyard, or power Transmission Lines #3 and #4 are curtailed.

10036810 - Kirkwood Powerhouse Bypass Upgrades

Hetch Hetchy water deliveries are conveyed through the Canyon Tunnel to the Canyon Portal Valvehouse. Water then enters the Kirkwood Penstock and drops 1,245 feet in elevation to the Kirkwood Powerhouse (KPH). At KPH, water passes through three hydroelectric turbines where energy is converted from high-pressure water into electricity, producing a maximum output of 124 megawatts at a maximum flow of 1,408 cubic feet per second. When electricity is not being produced, the water deliveries are directed around the turbines through a separate bypass system consisting of a spherical guard valve and a 90-degree needle valve for flow control. Based on a condition assessment of KPH performed in 2010, existing control problems limit operation of the bypass needle valve to no more than 70% open. An inspection of the bypass valve and dissipation structure in 2016 indicated that the stainless steel dissipator had failed, causing damage at the base of a steel shaft column leading to the bypass tunnel. Repairs to the dissipator, bypass draft tube, and bypass chamber were completed in 2017, but the steel lining protecting the bypass chamber's concrete walls and floor subsequently failed after bypass usage. Additional repairs were made to the steel lining of the bypass in 2019 under the HH-991 2018 Mountain Tunnel Interim Repairs construction contract. Long-term use (greater than two to five days) could lead to major mechanical damage or

failure, leading to potential interruption of water deliveries to San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the KPH Bypass Chamber and Mountain Tunnel, allowing for increased operating flexibility for Hetch Hetchy Water & Power (HHWP) to meet scheduled water deliveries when KPH is not generating electricity.

10014075 - Holm and Other Powerhouse Projects

This project provided funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under $1 million involving power generation renewal and equipment replacement. The upgrade and rehabilitation of HPH Unit 2 included 13.8 Kv equipment upgrades, addition and integration of a generator breaker, replacement of two 13.8kV feed breakers, replacement of Unit 2 Main Control Board, and any necessary tasks to match Unit 2 to Unit 1. System integration work was done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into the existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project included upgrades to turbine and generators and to alternating current stations, intended to extend the life of the unit by 20 years. Lastly, the project upgraded the existing oil containment systems at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators were replaced, and other modifications were made to the powerhouse interiors and to the transformer decks, to discourage contaminated discharges into the adjacent streams. A monitoring system was installed to alert HHWP of excessive leakage and the need to manually pump oil containment vessels. Failure of the oil containment systems at the powerhouses would likely result in environmental contamination, fines, additional regulatory exposure, and the need for rehabilitation and cleanup.

10014086 - Moccasin Powerhouse and GSU Rehabilitation

The two Moccasin Powerhouse generators were completed in 1969 and generate a combined maximum output of 110 megawatts. Both generator units have exceeded their life expectancy and are in need of repair in order to continue operating reliably. The objective of this project is to replace stator cores and coils. The scope of work also includes rehabilitation of the rotor field poles with new pole cores and re-insulated field coils, replacement of the rotor pole/rim tail connection system with a new T-tail connection system, and supply of a new rotor rim for each generator following inspection and testing. The project will also include replacement of two generator step-up transformers (GSUs) with new oil containment barriers, and remaining plant work including: replacing 480V switchgear, 13.8kV switchgear, motor control centers, main control boards, protective relays, and cooling water piping.

10014087 - Warnerville Substation Rehabilitation

This project is needed to extend the useful life of the Warnerville Substation and meet reliability requirements of NERC/WECC and PG&E Intertie Agreements. The upgrades include replacing three existing 3 phase transformer with two larger rated transformers. Other upgrades include new 115kV and 230kV disconnect switches and breakers; new Control Room, perimeter fence, relays and controls; improvement to the grading and grounding system.

10035721 - Transmission Lines 7/8 Upgrades

The SFPUC electric transmission lines 7/8 conveys power from Warnerville Substation to Modesto Irrigation District's (MID) Standiford Substation. The SFPUC must accommodate

additional power flowing across its transmission system due to grid interconnection requests from independent power generators interconnecting on the California Independent System Operator (CAISO). This is a requirement for SFPUC and HHWP obligations as a neighboring provider of electric transmission service.

Studies performed by the SFPUC indicate the principal impact to its system is an overload of 115kV Lines 7&8 between HHWP Warnerville Substation and MID Standiford Substation under contingency conditions if interconnections are made without modification to the system's capacity. Without modifications, the SFPUC and HHWP transmission system could face reliability issues. Reconductoring also resolves multiple locations where the clearance between the existing conductors and the ground or structures does not meet current safe clearance regulations.

This project develops the scope of work, design, and contract documents necessary to bid, award, and manage the reconductoring contract. Reconductoring will include replacement of the existing 115kV conductors on Lines 7/8 from Warnerville to Standiford substations, resulting in improved transmission tower stability, and resolved clearance detections.

The project will be partially funded by independent power generators interconnecting on the California Independent System Operator (CAISO).

10014092 - POWER ONLY/PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

JOINT INFRASTRUCTURE

10014088 - Moccasin Penstock

Moccasin Penstock was built in the early 1920's and conveys Hetch Hetchy water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. Moccasin penstock serves as the sole link in conveying water from Priest Reservoir to Moccasin Reservoir, from which water is routed to the San Francisco Public Utilities Commission (SFPUC) customers. The lower 1,084-foot section of welded steel pipe replaced the original penstocks when the new Moccasin Powerhouse was completed in the 1960s. The upper 4,000 feet of penstock dates to 1924 and has been in service for more than 97 years. Previous condition assessments have identified deficiencies including corrosion, coating damage, lining degradation, leakage, aggregate expansion, cracks in the concrete anchor blocks and saddles, vulnerability of the hammer forged steel pipe sections. The objective of this project is to enhance the reliability of water delivery and extend the life of the penstock system for another 50 to 100 years.

10030758 – OSH Dam Access and Drainage Improvements

The O'Shaughnessy Dam is located 140 miles east of San Francisco, CA in Yosemite National Park, Tuolumne County. The dam, a concrete curved gravity structure, is located on the

Tuolumne River across the steep walled Hetch Hetchy Valley. The interior workings of the dam contain valves and appurtenances that must be accessed for operations and maintenance. This project includes improvements for safe access, as well as mitigation of excess interior water leakage through drainage improvements, for the Ladder Wells, Galleries, Inclined Stairways, Control Room, and Diversion Tunnel. The project was reduced in scope of work in 2020 to meet the existing approved budget. The new project will be advertised as O'Shaughnessy Dam-Fall Protection Improvements and Spillway Access to complete the reduced scope of work. Improvements that were not included in this revised project, such as drainage improvements, will be included in the OSH Dam Outlet Works Phase 1 project.

10032903 – O'Shaughnessy Dam Outlet Works Phase 1

O'Shaughnessy Dam (OSH) was completed in 1923 and raised in 1938. The original outlet works including gates and valves have been in services for more than 98 years. Inspections, condition assessments, and studies concluded that improvements and refurbishments of the outlet works system are needed to ensure safety and reliability. The work will be implemented in two phases. This project is to cover the Phase 1 work. The O'Shaughnessy Dam Outlet Works Phase 1 Project addresses the identified deficiencies of the existing outlet works system at OSH. Phase 1 will include four projects: (1) supply and installation of nine new bulkheads; (2) refurbishment of twelve existing slide gates; (3) rehabilitation of existing drum gates to replace the seals, replace the hinges and rivets, recoating the gates, and repair the spillway concrete; and (4) installation of a new diversion pipe isolation butterfly valve. The existing control gates and valves are essential features for dam safety and reservoir operation. The project is needed to maintain safe and reliable operation of these aging assets. Failure or malfunction of these gates and valves will affect dam safety and result in reduction of storage and reduction of water deliveries to SFPUC customers.

10037351 – Moccasin Dam Long-Term Improvements

The flow capacity of the existing spillway is inadequate to protect the Moccasin Dam against overtopping and erosion from severe flood events. The dam almost overtopped during the March 2018 storm event when flows were released from the auxiliary spillway and caused significant damage to the auxiliary spillway. The surrounding areas and the upstream diversion dam also sustained damage from the flood. This project is needed for dam safety. The objective of this project is to increase the spillway flow capacity to allow safe passage of flood flows without overtopping the dam and to protect the associated facilities within the Moccasin reservoir boundary against flood damages. The estimated project cost is $83.2 million and is within the current 10-year CIP FY 21-30. Construction is scheduled for 2025-2027.

10014115 – Cherry Dam Spillway - Short Term Improvements

A spillway release from Cherry Dam in 2010 caused a landslide, blockage of the spill channel, and extensive erosion in the close proximity of the dam's right abutment. In addition, it caused flooding of the Cherry Power Tunnel Adit, and flooding of a campground further downstream. Engineering studies determined that significant long-term improvements to increase the spillway flow capacity are needed to maintain dam safety. The objective of this project is to re-establish containment for the breached spill channel section and to protect the downstream slope of the existing embankment dam from uncontrolled releases

and erosion in the interim until the long-term improvements are implemented. Construction is scheduled for 2025-2026. The estimated project cost of $11.9 million is within the current 10-year CIP FY 21-30.

10014114 – Mountain Tunnel Improvement Project

Mountain Tunnel conveys the SFPUC water supply from Kirkwood Powerhouse to Priest Reservoir. Mountain Tunnel has been in service since 1925. Due to its age, deferred maintenance, and construction deficiencies in the early 1900s, sections of the tunnel lining have deteriorated, some extensively. This project provides design and construction of major tunnel repair and rehabilitation work, adit and tunnel entry improvements, access road improvements, and installation of a new flow control facility at Priest Reservoir to ensure that the tunnel can reliably provide drinking water to customers for the next 100 years. The flow control structure and isolation valves will also be used to isolate the tunnel from Priest Reservoir during tunnel shutdowns. This will allow the reservoir to remain full and not backwater for over 8 miles into the dewatered tunnel. The full reservoir provides more supply water for safely extending the tunnel shutdowns to longer durations of 100 days for construction inside the tunnel. These longer outages will reduce the need for more typical 60-day outages and shorten the overall duration of the construction schedule.

10035086 – Bridge Replacement (4 Bridges)

HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessments in 2013 and 2016 determined that, four of these bridges require substantial rehabilitation or replacement: Lake Eleanor Dam Bridge, O'Shaughnessy Adit Access Bridge, Cherry Lake Road Bridge (public access), and Early Intake Bridge (public access). The project will be funded in 2 phases. The first phase will include planning, design and construction of Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge as well as the planning and design of the other two bridges. The construction of the Early Intake Bridge and Cherry Lake Road Bridge will be under Phase 2.

10014108 – Canyon Tunnel Rehabilitation

Canyon Tunnel was built over 45 years ago. A condition assessment was performed on the tunnel in 2009 and the tunnel is in generally good condition, with the exception of the Hetchy Adit, a tunnel access point. Temporary repairs have been made to the plug at this adit twice (once in 1989 and once in 2009), but permanent repairs are needed to reduce leakage and increase reliability of the system. The project scope includes installation of a new reinforced concrete plug downstream of the existing plug.

10014110 – Moccasin Wastewater Treatment Plant

The Moccasin Wastewater Treatment Plant (WWTP) project proposes to replace the community's aging treatment plant. Moccasin's treatment plant was installed in the 1970s and has been in continuous service since that time. Wastewater generated by the Moccasin community, powerhouse, and related facilities flows to this treatment plant. The treatment facility currently serving Moccasin was a "package plant" that was manufactured off-site, transported to Moccasin, and installed in 1977. At more than 44-years old, the Moccasin treatment plant has reached the end of its useful service life, and is becoming increasingly maintenance intensive. Additionally, Moccasin has no backup treatment; accordingly, failure of the plant would have significant consequences.

This project will replace the existing wastewater treatment facilities with a Sequence Batch Reactor (SBR) plant. The

proposed SBR "package plant" is to be a two-train facility. Each train would have a capacity of 12,000 gallons per day to accommodate average daily dry-weather flow. The new plant would continue to treat wastewater to secondary standards. The new plant will be provided with upgraded screening, flow monitoring, flow equalization, SCADA instrumentation, and automation features. The package plant would be manufactured off-site, trucked to Moccasin, and then installed beside the current plant. The existing plant must serve the Moccasin community while the new plant is being installed and would remain in operation during construction. The proposed project is limited to the treatment plant only and does not include improvements either upstream or downstream of the plant.

10014116 – JOINT - PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

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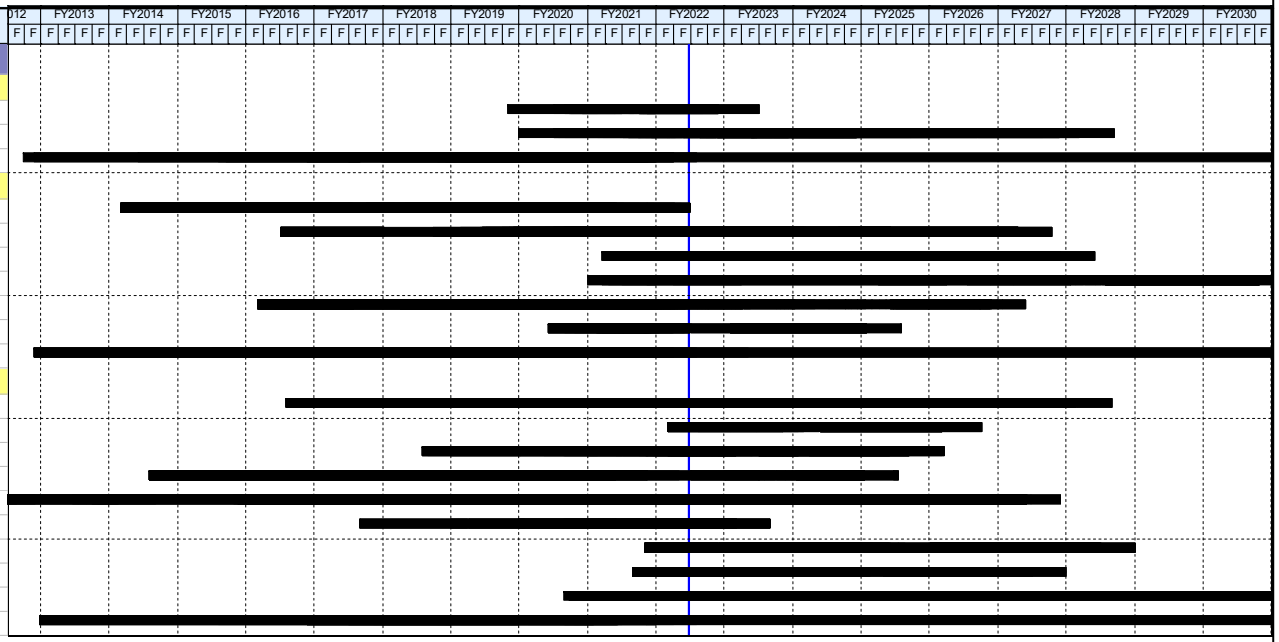
APPENDIX B. Hetch Hetchy Improvement Projects Approved Project Level Schedules/Budgets

Project Name	Approved Budget	Start	Finish
Hetchy Capital Improvement Projects	$807,296,327.49	03-Oct-11	25-May-37
Water Infrastructure	$109,533,203.01	26-Mar-12	30-Jun-31
10035574 SJPL Tesla Valves Replacement	$3,740,000.00	01-May-19	30-Dec-22
10035575 SJPL Valve and Safe Entry Improvement	$98,924,000.00	01-Jul-19	13-Mar-28
10014072 WATER ONLY/PROJ DEV	$6,869,203.00	26-Mar-12	30-Jun-31
Power Infrastructure	$204,242,684.48	29-May-12	30-Jun-31
10014075 Holm and Other Powerhouse Projects	$23,061,080.48	03-Sep-13	30-Dec-21
10014086 Moccasin Powerhouse and GSU Rehabilitation	$66,713,635.00	04-Jan-16	13-Apr-27
10036809 Moccasin Powerhouse Bypass Upgrades	$15,007,000.00	18-Sep-20	01-Dec-27
10036810 Kirkwood Powerhouse Bypass Upgrades	$16,157,000.00	01-Jul-20	23-Oct-30
10014087 Warnerville Substation Rehabilitation	$34,248,428.00	01-Sep-15	25-Nov-26
10035721 Transmission Lines 7/8 Upgrades	$37,969,000.00	02-Dec-19	31-Jan-25
10014092 POWER ONLY/PROJ DEVELP	$11,086,541.00	29-May-12	30-Jun-31
Joint Infrastructure	$493,520,440.00	03-Oct-11	25-May-37
10014088 Moccasin Penstock	$47,251,363.00	01-Feb-16	28-Feb-28
10014110 Moccasin Wastewater Treatment Plant	$8,794,549.00	01-Sep-21	07-Apr-26
10032903 O'Shaughnessy Dam Outlet Works Phase I	$21,206,000.00	01-Feb-18	16-Sep-25
10014108 Canyon Tunnel Rehabilitation	$8,428,813.00	03-Feb-14	13-Jan-25
10014114 Mountain Tunnel Improvement Project	$238,218,951.00	03-Oct-11	03-Jun-27
10030758 OSH Dam Access and Drainage Improvements	$3,952,211.00	01-Mar-17	28-Feb-23
10037351 Moccasin Dam Long-Term Improvements	$83,175,822.00	03-May-21	30-Jun-28
10014115 Cherry Dam Spillway - Short Term Improvements	$11,860,965.00	01-Mar-21	01-Jul-27
10035086 Bridge Replacement (4 - Bridges)	$44,287,000.00	27-Feb-20	25-May-37
10014116 JOINT - PROJECT DEVELOPMENT	$26,344,766.00	25-Jun-12	30-Jun-31



APPENDIX C. LIST OF ACRONYMS

AAR	Alternative Analysis Report
BOS	Board of Supervisors
CAISO	California Independent System Operator
CATEX	Categorical Exemption
CEQA	California Environmental Quality Act
CER	Conceptual Engineering Report
CIP	Capital Improvement Program
COVID-19	Coronavirus Disease of 2019
CRT	Coast Range Tunnel
DB	Design, Build
DCR	Design Criteria Report
FCF	Flow Control Facility
FY	Fiscal Year
GDR	Geotechnical Data Report
GSU	Generator Step-Up
GWH	Gigawatt Hours
HCIP	Hetch Hetchy Capital Improvement Program
HH	Hetch Hetchy
HHWP	Hetch Hetchy Water and Power
HPH	Holm Powerhouse
IFR	Instream Flow Release
JOC	Job Order Contract
KPH	Kirkwood Powerhouse
MGD	Million Gallons per Day
MID	Modesto Irrigation District
MPH	Moccasin Powerhouse
NAR	Needs Assessment Report
NERC	North American Electric Reliability Corporation
NTP	Notice to Proceed
OSH	O'Shaughnessy Dam
PD	Project Development
PG&E	Pacific Gas and Electric Company
PLC	Programmable Logic Controllers
PSI	Per Square Inch
R&R	Renewal and Replacement
SBR	Sequence Batch Reactor
SCADA	Supervisory Control and Data Acquisition
SFPUC	San Francisco Public Utilities Commission
SJPL	San Joaquin Pipeline
TSC	Technical Steering Committee
TTF	Tesla Treatment Facility
TUV	Tesla Ultra Violet
TVH	Tesla Valve House
WSIP	Water System Improvement Program
WWTP	Wastewater Treatment Plant

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

525 Golden Gate Avenue, 13th Floor
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DATE: June 6, 2022

TO: Commissioner Anson Moran, President
Commissioner Newsha Ajami, Vice President
Commissioner Sophie Maxwell
Commissioner Tim Paulson

FROM: Dennis J. Herrera, General Manager

RE: Hetch Hetchy Capital Improvement Program Quarterly Report
3rd Quarter / Fiscal Year 2021-2022

Enclosed please find the Hetch Hetchy Capital Improvement Program (HCIP) Quarterly Report for the 3rd Quarter (Q3) of Fiscal Year (FY) 2021-2022. The primary intent of the report is to provide the Commission, stakeholders, and the public with a status summary of the HCIP based on data for the period of January 1, 2022 to March 31, 2022.

Attachment

OUR MISSION: To provide our customers with high-quality, efficient and reliable water, power and sewer services in a manner that values environmental and community interests and sustains the resources entrusted to our care.

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San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

QUARTERLY REPORT

Hetch Hetchy Capital Improvement Program

January 2022 – March 2022

Published: June 06, 2022

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EXECUTIVE SUMMARY

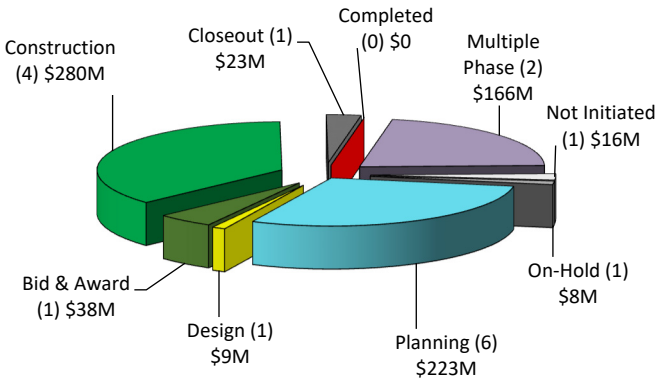
This quarterly report provides a summary update on the Hetch Hetchy Capital Improvement Program (HCIP) that is part of the larger Hetch Hetchy Water Capital Improvement Program. The primary intent of the report is to provide the Commission, stakeholders, and the public with a status summary of the HCIP based on data for the period of January 1, 2022 to March 31, 2022.

Starting with the HCIP in the first quarter (Q1) of fiscal year 2022 (FY22), the projects of the HCIP and each of their scopes, budgets, and schedules, match the Commission's approved FY21-30 10-Year Capital Plan, specifically the FY21-30 10-Year Hetch Hetchy Water Capital Improvement Program (10-Year CIP), and serve as the FY22 baseline for the HCIP.

In this Q3 report, the forecasts for the HCIP projects' scopes, costs, and schedules match the FY23-32 10-Year CIP that was presented to the Commission on February 8, 2022. Going forward, proposed changes to the approved projects and their baseline scopes, schedules, and budgets will continue to be presented for review and approval as part of the 10-Year CIP that is updated every two years and approved by the SFPUC Commission. The proposed revisions to the program will become the new baseline for project scopes, schedules, and budgets in the beginning of the new fiscal year, July 1 of each bi-annual year, following approval by both SFPUC Commission and the Board of Supervisors (BOS).

Program Current Status:

Overall steady progress continued on the program. As of the end of the reporting period, the status of the 17 HCIP projects (excluding the Project Development (PD) accounts) is as follows: one (1) project not initiated, one (1) project on-hold, eight (8) projects in planning, design or bid & award, four (4) projects in construction, two (2) projects that are multiple phases, and one (1) project in closeout.



Approved Budget for Projects in Each Phase

The following Tables provide a high-level summary of the cost and schedule status for this program (including the 3 PD accounts). The forecasted overruns in projects' cost and schedule presented here,

as noted above, match the 10 – Year CIP for FY23-32 which was presented to the Commission and approved during the quarter, on February 8, 2022. All project variances occurred in the first quarter of fiscal year 2021-2022, and there have been no new project cost or schedule variances forecasted during either this or last quarter.

Table A. Program Cost Summary

Program	Expenditures To Date ($ Million) (A)	Current Approved Budget ($ Million) (B)	Q3/FY21-22 Forecasted Costs ($ Million) (C)	Cost Variance ($ Million) (D = B - C)	Cost Variance Over Reporting Period * ($ Million) (E)
Program Total	**$151.53**	**$807.30**	**$852.81**	**($45.51)**	**-**

* Negative number reflects cost increases since last quarter, and positive number reflects cost reduction since last quarter.

Table B. Current Approved vs. Current Forecast Schedule Dates

Program	Current Approved Project Start	Actual Start	Current Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Overall HCIP Program	**11/08/10**	**11/08/10 ✓**	**05/25/37**	**10/30/35**	**18.8 Early**

Program Key Updates:

The key updates for the HCIP include:

- For the SJPL Tesla Valve Replacement project, during this quarter, the new 66-inch diameter butterfly valve and the new 24-inch diameter butterfly valve were successfully installed during the 60-day Mountain Tunnel system shutdown and are currently in service.
- For the SJPL Valve and Safe Entry Improvements project, Phase 1A, the construction contract, HH-1005, was awarded on March 8, 2022. For Phase 1B, the 100% design was completed in February and the project team is working on the contract bid documents for advertisement next quarter.
- For the Moccasin Powerhouse Bypass Upgrades project, the alternatives analysis report (AAR) was approved by the Technical Steering Committee in February 2022. The preferred alternative is to move the bypass system to a location outside of the powerhouse and north of the Moccasin penstocks.

- For Moccasin Powerhouse (MPH) and Generator Step-Up (GSU) Rehabilitation, subproject A, HH-1003R, Moccasin Powerhouse (MPH) Generator Step-up (GSU) Transformer Installation, the new Delta Star GSU1 transformer was installed on the new oil containment foundation in March 2022 during the systemwide shutdown at the powerhouse. The new GSU1 relay panels were also tested and commissioned in March 2022. For subproject B, DB-121R2, MPH Generators Rehabilitation, 100% design drawings for Generator Rewind scope and 65% design drawings for the Relay Protection and Control Panels were submitted during the quarter. For subproject C, MPH Systems Upgrades, a task order for planning, design, and engineering support during construction was approved.
- For Transmission Lines 7/8 Upgrades project, the 100% design was completed during the quarter. The construction contract was advertised for bid on February 11; three bids were opened March 24. The contract is anticipated to be awarded next quarter.
- For the O'Shaughnessy Dam Outlet Works Phase 1 project, Subproject A (Bulkhead): During this quarter, an underwater inspection and cleaning of the corroded cast iron sealing surface were completed at one of the upper outlets. Work began on preparation of the specification and bid package for the design and construction of the bulkhead under a progressive-design-build approach.
- For the Mountain Tunnel Improvement project, Shutdown No. 1 was implemented between January and March, and the Mountain Tunnel was successfully shut down, dewatered, and brought back to service within the planned 60-day timeframe. This quarter's progress included excavation to a depth of 100 feet and placement of initial lining in the Flow Control Facility (FCF) Shaft. The Priest Adit tunnel was excavated to a length of 200 feet, also with initial lining installed in the excavated section. Shutdown work inside the tunnel included a survey of the entire tunnel and of the siphon at South Fork, geological evaluation of the South Fork siphon, and installation of rock dowels at tie-in locations within the bypass tunnels and Priest Adit tunnel. The construction water treatment plant at Priest was commissioned and successfully used to treat construction water during the shutdown. A temporary water filtration plant was also successfully installed at Moccasin and was used to treat drinking water for Moccasin during the shutdown. Safety and road improvement work continued on Adit 8/9 road, Adit 5/6 road, South Fork road, and Rickson road.

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Quarterly Report
Hetch Hetchy
Capital Improvement Program

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HETCH HETCHY WATER AND POWER (HHWP)–

WATER DIVISION CAPITAL IMPROVEMENT PROGRAMS

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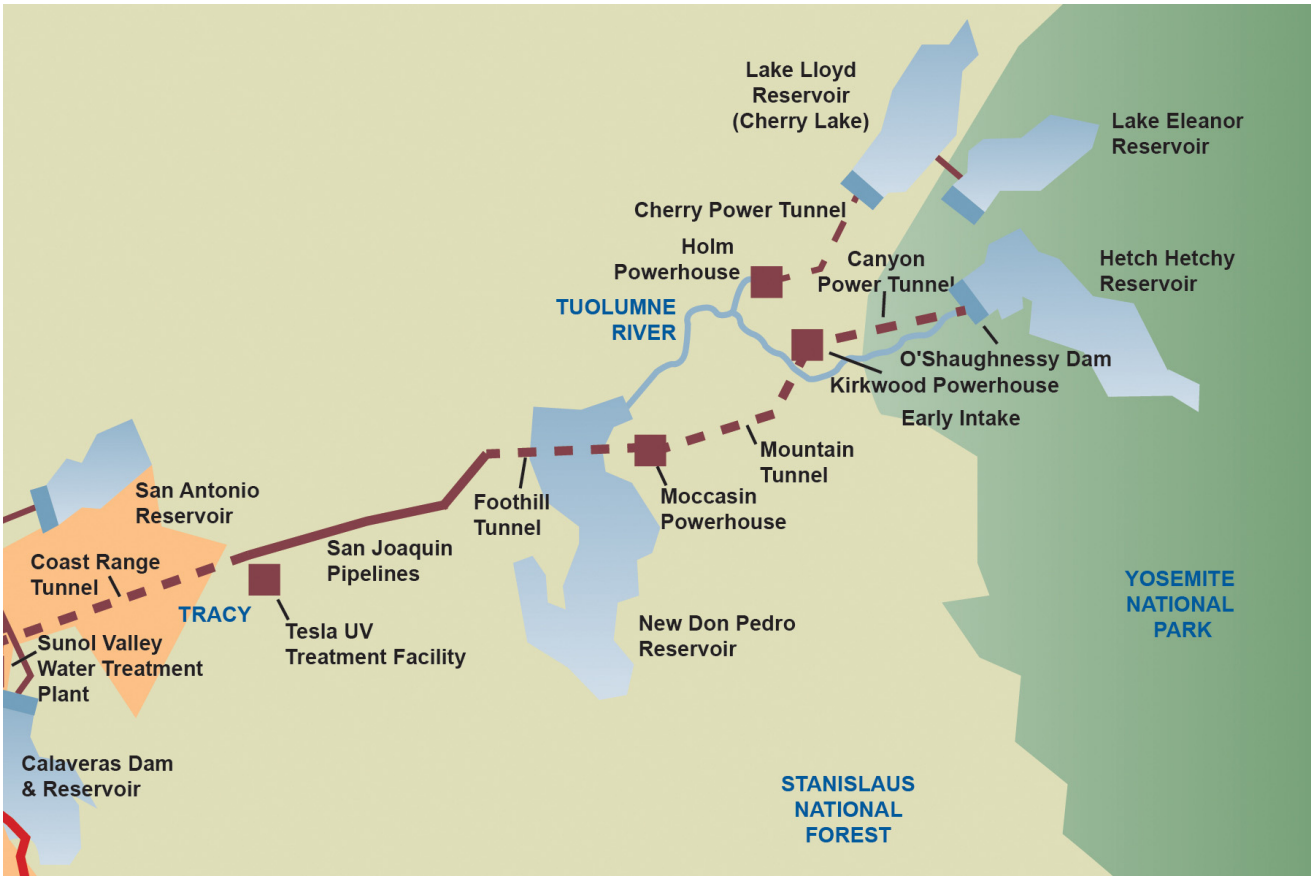
INTRODUCTION

The Hetch Hetchy Water and Power (HHWP) Water Division is the division responsible for operating, managing, and maintaining the HHWP system and facilities. This includes water facilities that are part of the Regional Water System from Hetch Hetchy Reservoir, located in Yosemite National Park, to Alameda East Portal, located in Sunol Valley and power facilities located from Early Intake to Newark. The HHWP Water Division operates, manages, and maintains three impoundment reservoirs, three regulating reservoirs, four powerhouses, one switchyard, three substations, 170 miles of pipeline and tunnels, almost 50 miles of paved road, over 160 miles of transmission lines, watershed land, and right-of-way property. HHWP Water Division provides 85 percent of the San Francisco Public Utilities Commission (SFPUC) water supply for 2.7 million residential, commercial, and industrial customers in Alameda, Santa Clara, San Mateo, and San Francisco counties. On average, HHWP Water Division generates about 1,650 gigawatt hours (GWH) of clean hydro-generated power annually. A majority of HHWP staff is based in Moccasin, CA, which is 140 miles east of San Francisco.

The HHWP Water Division's capital improvement programs are divided into two programs: Hetch Hetchy Capital Improvement Program (HCIP) and Renewal and Replacement (R&R). This report provides a quarterly status update on the HCIP, a group of capital improvement projects that are greater than $5M in value and have been approved by the Commission as part of the SFPUC's 10-Year Capital Improvement Program. The status of the Hetch Hetchy R&R projects is reported annually in the Annual Report on Water Enterprise-Managed Capital Improvement Projects.

The map below shows the location of the assets and facilities associated with HHWP.



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HETCH HETCHY CAPITAL IMPROVEMENT PROGRAM (HCIP)

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1. PROGRAM DESCRIPTION

The Hetch Hetchy Capital Improvement Program (HCIP) is a multi-year group of capital projects to upgrade existing, aging infrastructure so that it will meet the challenges of today and the future. These projects will deliver improvements that enhance the SFPUC's ability to provide reliable, affordable, high quality water to its 2.7 million customers in an environmentally sustainable manner. The goals are to 1) provide capital improvements needed to cost-effectively ensure that water quality, seismic reliability, delivery reliability, and water supply objectives established for the Regional Water System facilities managed by HHWP are met, while 2) optimizing the benefits of HHWP power facilities operations. Ongoing development of the HCIP will sustain the Regional Water System's status as an unfiltered water source and a gravity-driven system.

The scope of HCIP is divided into three major project types: Water, Power, and Joint. The Water sub-program includes only asset improvements benefiting the SFPUC's water customers. The Power sub-program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint sub-program includes projects for assets that are used for both water delivery and power generation. In addition, projects in each sub-program of the HCIP have been further organized by asset type consisting of the following:

- Buildings – projects to provide safe and code compliant work spaces.
- Dams & Reservoirs – projects to improve assets used for storage and delivery of water to SFPUC customers, as well as for water storage for power generation.
- Mountain Tunnel – projects to address deficiencies with the Mountain Tunnel, a critical, non-redundant link in the Hetch Hetchy and Regional Water System that conveys water from Kirkwood Powerhouse to Priest Reservoir.
- Powerhouses – projects to improve facilities at the Holm, Kirkwood, and Moccasin powerhouses.
- Roads & Bridges – projects intended to replace bridges that are utilized to access HHWP assets.
- Switchyard & Substations – projects to meet operational objectives for power, including reliability, regulatory compliance, and sustainability.
- Tunnels – projects to repair tunnels along the HHWP system (other than Mountain Tunnel).
- Water Conveyance – projects to enhance the reliability of water delivery through pipelines and penstocks, allowing for both delivery of water to SFPUC customers and delivery of water to powerhouses for power generation.

2. PROGRAM STATUS

This third (3rd) quarter report for FY2021-2022 presents the progress made on the HCIP between January 1, 2022 and March 31, 2022. As announced in the first (1st) quarter report for FY2021-2022, project scopes, budgets and schedules in the Commission's approved 10-Year Capital Plan for FY21-30, approved by the SFPUC Commission on February 11, 2020, serve as the approved baseline herein for comparison to current program and project scope, schedule, and budget forecasts. This baseline for comparison will remain the same until adoption of a new 10-Year CIP; the baseline will be updated with the changes in the adopted CIP at the start of the fiscal year following adoption.

There are seventeen (17) projects in the HCIP together with (3) project development (PD) accounts for program-level expenditures for each of the Water, Power, and Joint Programs. A description of each project and of each project development account is provided in the Appendix A of this Report.

The accrued PD expenditures are included in the Cost Summary in Table 3 in order to give an accurate report of the overall HCIP cost performance.

Figure 2.1 shows the total Approved Budget for all seventeen (17) projects in each phase of the program as of March 31, 2022 (PD accounts do not have phases and are not included in Figure 2.1). The number of projects currently in each phase is shown in parentheses.

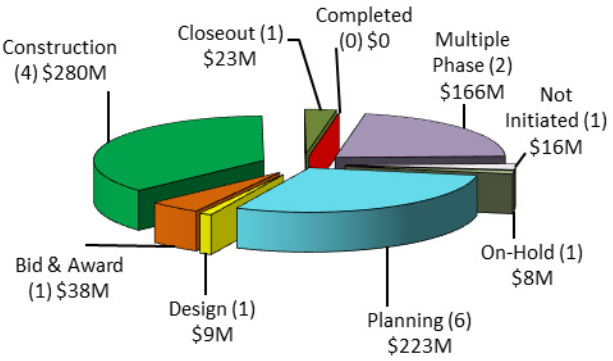

Figure 2.1 Approved Budget for Projects in Each Phase

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

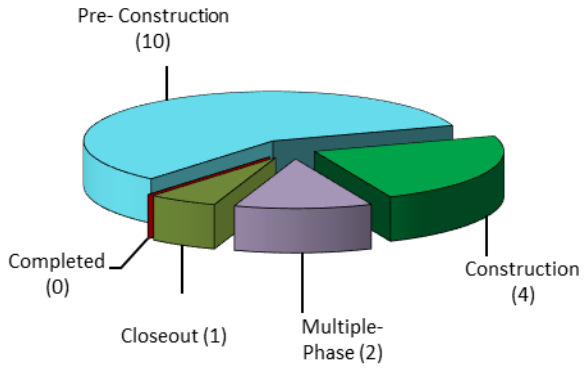

Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-Construction

Figure 2.3 summarizes the environmental review status of the HCIP projects as of March 31, 2022. Environmental review is performed for projects under California Environmental Quality Act (CEQA).

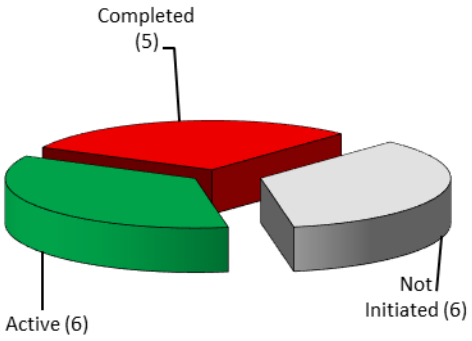

Figure 2.3 Program Environmental Review

3. PROGRAM COST SUMMARY

Table 3 provides an overall cost summary of the approved 17 HCIP projects and 3 HCIP PD accounts at the end of the quarter. It shows the Expenditures to Date, Current Approved Budget, Current Forecast Cost, the Cost Variance between the Approved and Forecast Costs, and the Cost Variance Over the Reporting Period. The Current Approved Budget for the HCIP under the FY21-30 CIP is $807.30 million, while the HCIP Q3FY21-22 Forecasted Cost is $852.81 million, which is $45.51 million over the Approved Budget. This is the same program Cost Variance as last quarter.

Table 3. Cost Summary

Subprograms	Expenditures To Date ($ Million) (A)	Current Approved Budget ($ Million) (B)	Q3/FY21-22 Forecasted Costs ($ Million) (C)	Cost Variance ($ Million) (D = B - C)	Cost Variance Over Reporting Period * ($ Million) (E)
Water Infrastructure	**$9.87**	**$109.53**	**$153.27**	**($43.74)**	**-**
Water Conveyance (Water)	$5.93	$102.66	$146.40	($43.74)	-
Water Infrastructure Project Development	$3.94	$6.87	$6.87	-	-
Power Infrastructure	**$59.48**	**$204.24**	**$204.24**	**-**	**-**
Powerhouse	$31.88	$120.94	$120.94	-	-
Switchyard & Substations (Power)	$21.94	$34.25	$34.25	-	-
Transmission Lines	$3.00	$37.97	$37.97	-	-
Power Infrastructure Project Development	$2.65	$11.09	$11.09	-	-
Joint Infrastructure	**$82.18**	**$493.52**	**$495.29**	**($1.77)**	**-**
Dams & Reservoirs (Joint)	$9.88	$167.45	$184.13	($16.69)	-
Mountain Tunnel	$64.40	$238.22	$238.22	-	-
Roads & Bridges (Joint)	$1.37	$44.29	$29.37	$14.92	-
Tunnels (Joint)	$0.64	$8.43	$8.43	-	-
Utilities (Joint)	$0.44	$8.79	$8.79	-	-
Joint Infrastructure Project Development	$5.45	$26.34	$26.34	-	-
Overall Program Total	**$151.53**	**$807.30**	**$852.81**	**($45.51)**	**-**

** Negative number reflects cost increases since last quarter, and positive number reflects cost reduction since last quarter.*

The overall program negative Cost Variance of $45.51M in Table 3 can be attributed to the following factors, all of which were reported in the first quarterly report for fiscal year 2021-2022; there have been no new variances this or last quarter:

- $43.74M negative variance is due to the following Water Infrastructure project:
  - o The 10035575 SJPL Valve and Safe Entry Improvements forecasted costs increased by $43.74M.
- $1.77M negative variance is due to the combined positive and negative variances in the following Joint Infrastructure projects:
  - o The 10032903 OSD Outlet Works Phase I forecasted cost increased by $26.69M.
  - o The 10037351 Moccasin Dam Long-Term Improvements forecasted cost decreased by $10.00M.
  - o The 10035086 Bridge Replacement (4 Bridges) forecasted cost decreased by $14.92M.

4. PROGRAM SCHEDULE SUMMARY

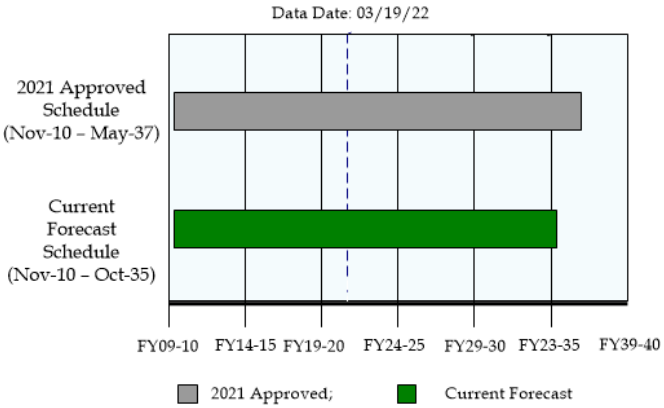

Figure 4. Program Schedule Summary

Figure 4 and Table 4 compare the FY21 – 30 CIP Approved Schedule and the Current Forecast Schedule for the HCIP. As shown in Table 4, the overall HCIP is currently forecast to be completed in October 2035, which is 18.8 Months before the Approved Completion date of May 2037.

Table 4. FY21-30 CIP Approved vs. Current Forecast Schedule Dates

Sub-Program	2021 Approved Project Start	Actual Start	2021 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Water Infrastructure	11/08/10	11/08/10✓	06/30/31	06/28/30	12 Early
Power Infrastructure	05/29/12	05/29/12✓	06/30/31	10/30/35	52
Joint Infrastructure	10/03/11	10/03/11✓	05/25/37	06/29/35	22.9 Early
Overall HCIP Projects	**11/08/10**	**11/08/10✓**	**05/25/37**	**10/30/35**	**18.8 Early**

5. BUDGET AND SCHEDULE TREND SUMMARY

Starting with the Q1 FY21-22 Quarterly Report, a revised report format includes a new Table 5, titled Budget and Schedule Trend Summary. This Table 5 contains all approved HCIP projects that are active and in any of the planning, design, bid and award, or construction phases of the project. The table excludes all Project Development accounts, as well as any projects that are either Not-Initiated, On-Hold, in Closeout or Completed.

During this Quarter (Q3 FY21-22), no major milestones were reached.

Table 5. Budget and Schedule Trend Summary

All Costs are shown in million

Project Name	Most Recent CIP Approved Budget		Project Initiation		CER		35% Design		95% Design		Awarded Construction[1]		Current Status	
	Approved Budget	Approved Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion
	a	b	c	d	e	f	g	h	i	j	k	l	m	n
Water Infrastructure														
10035574 - SJPL Tesla Valves Replacement	FY21-30		05/01/19		11/27/20		07/28/20		11/17/20		04/06/21		Q3 - FY21-22	
	$3.7	12/30/22	$7.4	06/28/24	$7.4	06/28/24	$7.4	06/28/24	$7.4	06/28/24	$3.7	12/30/22	$3.7	12/30/22
10035575 - SJPL Valve and Safe Entry Improvement	FY21-30		7/1/2019		04/16/21		03/03/21 (Phase 1A), 05/28/21 (Phase 1B), 08/15/22 (Phase 2) & 12/30/21 (Phase 3)		07/14/21 (Phase 1A), 10/29/21 (Phase 1B), 02/15/23 (Phase 2) & 05/13/22 (Phase 3)		05/05/22 (Phase 1A), 09/25/22 (Phase 1B), 11/16/23 (Phase 2) & 01/15/23 (Phase 3)		Q3 - FY21-22	
Phase 1A Phase 1B Phase 2 Phase 3	$98.9	03/13/28	$95.3	07/01/25	$95.3	07/01/25	$98.9	03/13/28	$142.7	03/13/28	TBD	TBD	$142.7	03/13/28
Power Infrastructure														
10036809 - Moccasin Powerhouse Bypass Upgrades	FY21-30		09/18/20		11/07/22		02/24/23		12/26/23		02/28/25		Q3 - FY21-22	
	$15.0	12/01/27	$15.0	12/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$15.0	12/01/27
10014086 - Moccasin Powerhouse and GSU Rehabilitation	FY21-30		01/04/16		05/14/21		07/29/19 (Phase 1), 10/01/19 (Phase 2) & 9/28/22 (Phase 3)		09/09/20 (Phase 1), 05/12/22 (Phase 2) & 03/29/24 (Phase 3)		06/07/21 (Phase 1), 06/08/22 (Phase 2) & 10/02/24 (Phase 3)		Q3 - FY21-22	
Phase 1 Phase 2 Phase 3	$66.7	04/13/27	$18.0	10/03/18	$66.7	04/13/27	$66.7	12/03/27	$66.7	12/03/27	$66.7	12/03/27	$66.7	12/03/27
10014087 - Warnerville Substation Rehabilitation	FY21-30		09/01/15 (Phase 1), 7/01/20 (Phase 2a) & 01/01/21 (Phase 2b)		02/29/16 (Phase 1), 01/18/21 (Phase 2a) & 01/03/23 (Phase 2b)		04/01/16 (Phase 1), 04/22/21 (Phase 2a) & 09/01/23 (Phase 2a)		12/24/16 (Phase 1), 08/16/21 (Phase2a) & 04/04/24 (Phase 2b)		11/26/18 (Phase 1), N/A (Phase 2a) & 02/03/25 (Phase 2b)		Q3 - FY21-22	
Phase 1 (DB-127R) Phase 2a Phase 2b	$34.2	11/25/26	$27.2	11/25/26	$34.2	11/25/26	$34.2	11/25/26	$34.2	11/25/26	$24.3	03/04/20	$34.2	11/25/26
10035721 - Transmission Lines 7/8 Upgrades	FY21-30		07/01/19		12/07/20[2]		03/19/21		09/24/21		10/03/22		Q3 - FY21-22	
	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	TBD	TBD	$38.0	01/31/25
Joint Infrastructure														
10014088 - Moccasin Penstock	FY21-30		12/11/18		04/21/23		10/16/23		06/10/24		04/15/25		Q3 - FY21-22	
	$47.3	02/28/28	$13.2	12/31/24	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$47.3	02/28/28
10030758 - OSH Dam Access and Drainage Improvements	FY21-30		03/01/17		06/28/19		09/01/19		08/21/20		09/27/21		Q3 - FY21-22	
	$4.0	02/28/23	$5.8	02/26/21	$5.8	02/26/21	$5.8	02/11/22	$5.8	12/16/22	$4.0	02/28/23	$4.0	02/28/23
10032903 - O'Shaughnessy Dam Outlet Works Phase I[3]	FY21-30		02/01/18		09/30/21 (Subproject A), Complete (Subproject B), 06/30/22 (Subproject C), 05/30/22 (Subproject D) & 05/30/22 (Subproject E)		05/31/22 (Subproject A), 05/31/22 (Subproject B) & 08/05/22 (Subproject C)		12/22/22 (Subproject A), 01/09/23 (Subproject B) & 11/01/22 (Subproject C)		07/18/23 (Subproject A), 08/17/23 (Subproject B) & 04/14/23 (Subproject C)		Q3 - FY21-22	
Subproject A Subproject B Subproject C Subproject D (Planning Only) Subproject E (Planning Only)	$21.2	09/16/25	$17.2	12/31/24	$47.9	09/16/25	TBD	TBD	TBD	TBD	TBD	TBD	$47.9	09/16/25
10037351 - Moccasin Dam Long-Term Improvements[3]	FY21-30		05/03/21		07/28/22		06/15/23		02/06/25		06/01/26		Q3 - FY21-22	
	$83.2	07/01/27	$83.2	07/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$73.2	06/30/28
10014115 - Cherry Dam Spillway - Short Term Improvements	FY21-30		03/01/21		09/30/22		02/01/23		09/27/23		08/20/24		Q3 - FY21-22	
	$11.9	07/01/27	$11.9	07/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$11.9	07/01/27

All Costs are shown in million

Project Name	Most Recent CIP Approved Budget		Project Initiation		CER		35% Design		95% Design		Awarded Construction[1]		Current Status	
	Approved Budget	Approved Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion
	a	b	c	d	e	f	g	h	i	j	k	l	m	n
10014114 - Mountain Tunnel Improvement Project	FY21-30		10/03/11		12/29/17		05/15/18		07/31/19		10/13/20		Q3 - FY21-22	
	$238.2	06/03/27	$114.0	12/30/21	$246.1	12/31/26	$238.2	12/31/26	$238.2	12/31/26	$238.2	06/03/27	$238.2	06/03/27
10035086 - Bridge Replacement (4 - Bridges)	FY21-30		02/27/20		10/31/22 (Subproject 1) & 02/28/23 (Subproject 2)		02/28/23 (Subproject 1) & 05/05/23 (Subproject 2)		09/29/23 (Subproject 1) & 01/12/24 (Subproject 2)		08/01/24 (Subproject 1) & 02/03/25 (Subproject 2)		Q3 - FY21-22	
Subproject 1	$44.3	05/25/37	$44.3	12/30/25	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$29.4	07/01/27
Subproject 2														
10014110 - Moccasin Wastewater Treatment Plant[4]	FY21-30		01/03/22		-		04/29/22		12/30/22		11/27/23		Q3 - FY21-22	
	$8.8	04/07/26	$8.8	04/07/26	-	-	TBD	TBD	TBD	TBD	TBD	TBD	$8.8	04/07/26

Footnotes:

1. This represents forecast project cost and project completion date at the time of award of construction contract (or award of CM/GC contracts/packages).
2. This represents the date the Design Criteria Report (DCR) was finalized for Transmission Lines 7/8 Upgrade project. CER was not required for the project.
3. This represents that the 95% Design is actually 100% for Subproject A & B.
4. This represents that the project started during the Design Phase.

6. PROJECT PERFORMANCE SUMMARY*

All costs are shown in $1,000s as of 03/19/22

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 Project Completion Date (h) (+)	Current Approved Completion (i) (++)	Current Forecast Completion (j)	Schedule Variance (Days) (k = i - j) (+++)
Water Infrastructure											
Water Conveyance (Water)											
10035574 - SJPL Tesla Valves Replacement	CN	$ 3,740	$ 3,740	$ 3,740	$ 2,051	-	0%	12/30/22	12/30/22	12/30/22	0
10035575 - SJPL Valve and Safe Entry Improvement	MP	$ 98,924	$ 98,924	$ 142,662	$ 3,879	($43,738)	-44%	03/13/28	03/13/28	03/13/28	0
Power Infrastructure											
Powerhouse											
10036809 - Moccasin Powerhouse Bypass Upgrades	PL	$ 15,007	$ 15,007	$ 15,007	$ 486	-	0%	12/01/27	12/01/27	12/01/27	0
10014086 - Moccasin Powerhouse and GSU Rehabilitation	MP	$ 66,714	$ 66,714	$ 66,714	$ 10,943	-	0%	04/13/27	04/13/27	12/03/27	(234)
Switchyard & Substations (Power)											
10014087 - Warnerville Substation Rehabilitation	CN	$ 34,248	$ 34,248	$ 34,248	$ 21,945	-	0%	11/25/26	11/25/26	11/25/26	0
Transmission Lines											
10035721 - Transmission Lines 7/8 Upgrades	BA	$ 37,969	$ 37,969	$ 37,969	$ 3,002	-	0%	01/31/25	01/31/25	01/31/25	0

* Exclude 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 MP Multiple-Phase

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 or/ and additional contingencies on construction contracts.

(+++) Negative number is reflecting cost overrun (Schedule Delay) and positive number is reflecting cost underrun (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.

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 Project Completion Date (h) (+)	Current Approved Completion (i) (++)	Current Forecast Completion (j)	Schedule Variance (Days) (k = i - j) (+++)
Joint Infrastructure											
Dams & Reservoirs (Joint)											
10014088 - Moccasin Penstock	PL	$ 47,251	$ 47,251	$ 47,251	$ 5,357	-	0%	02/28/28	02/28/28	02/28/28	0
10030758 - OSH Dam Access and Drainage Improvements	CN	$ 3,952	$ 3,952	$ 3,952	$ 2,331	-	0%	02/28/23	02/28/23	02/28/23	0
10032903 - O'Shaughnessy Dam Outlet Works Phase I	PL	$ 21,206	$ 21,206	$ 47,894	$ 1,469	($26,688)	-126%	09/16/25	09/16/25	09/16/25	0
10037351 - Moccasin Dam Long-Term Improvements	PL	$ 83,176	$ 83,176	$ 73,176	$ 297	$ 10,000	12%	06/30/28	06/30/28	06/30/28	0
10014115 - Cherry Dam Spillway - Short Term Improvements	PL	$ 11,861	$ 11,861	$ 11,861	$ 425	-	0%	07/01/27	07/01/27	07/01/27	0
Mountain Tunnel											
10014114 - Mountain Tunnel Improvement Project	CN	$ 238,219	$ 238,219	$ 238,219	$ 64,403	-	0%	06/03/27	06/03/27	06/03/27	0
Roads & Bridges (Joint)											
10035086 - Bridge Replacement (4 - Bridges)	PL	$ 44,287	$ 44,287	$ 29,371	$ 1,373	$ 14,916	34%	05/25/37	05/25/37	07/01/27	3616

* Exclude 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 MP Multiple-Phase

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 or/ and additional contingencies on construction contracts.

(+++) Negative number is reflecting cost overrun (Schedule Delay) and positive number is reflecting cost underrun (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.

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 Project Completion Date (h) (+)	Current Approved Completion (i) (++)	Current Forecast Completion (j)	Schedule Variance (Days) (k = i - j) (+++)
Joint Infrastructure											
Utilities (Joint)											
10014110 - Moccasin Wastewater Treatment Plant	DS	$ 8,795	$ 8,795	$ 8,795	$ 442	-	0%	04/07/26	04/07/26	04/07/26	0

∗ Exclude 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 MP Multiple-Phase

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 or/ and additional contingencies on construction contracts.

(+++) Negative number is reflecting cost overrun (Schedule Delay) and positive number is reflecting cost underrun (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.

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7. PROJECT STATUS REPORT

10035574 - SJPL Tesla Valves Replacement

Project Description: The 2018 approved scope for this project is to replace four large diameter butterfly valves, namely TUV 101, 201, 301 and 401, inside the Tesla Valve Vault so that each of the four San Joaquin Pipelines (SJPL) can be safely isolated and shut down individually for inspection and repair work without shutting down the entire SJPL system. This project will also improve safety for entry into the pipelines for maintenance and inspection purposes. After the planning phase of the related project SJPL Valve and Safe Entry Improvement (Project 10035575) it was recommended that the scope of SJPL Tesla Valve Replacement be reduced, to focus on completing the replacement of TUV101 only. The remainder of the work (i.e. TUV 201, 301 and 401) has been added to the scope of SJPL Valve and Safe Entry Improvement (Project 10035575) to expedite improvements for TUV101 during the planned winter shutdown from January to February 2022 to facilitate necessary maintenance work for SJPL No. 1 during the remainder of 2022. The installation of TUV201, 301 and 401 will proceed together with the upgrade work proposed under SJPL Valve and Safe Entry Improvement, in 2023 and 2024.

Program: Water Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed

Project Cost:

Approved		$3.74 M
Forecast		$3.74 M
Actual		$2.05 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	May-19	Dec-22
Forecast	May-19	Dec-22

Project Percent Complete: 67.8%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	08/26/20✓	N/A	04/06/21✓	05/31/22

Progress and Status:

In this quarter, the new 66-inch diameter butterfly valve and the new 24-inch diameter butterfly valve were successfully installed during the 60-day Mountain Tunnel system shutdown; the valves were subsequently put into service. The contractor is addressing punch-list items, including the exterior coating of the 24-inch butterfly valve. It is expected that the contractor will achieve final completion next quarter.

New 66-Inch Butterfly Valve

Issues and Challenges:

None at this time.

10035575 - SJPL Valve and Safe Entry Improvement

Project Description: The San Joaquin Pipelines (SJPLs) consist of three parallel pipelines approximately 48 miles long (completed in 1932, 1953, and 1968, respectively) that cross the San Joaquin Valley from the Oakdale Portal of the Foothill Tunnel on the east end to the Tesla Portal of the Coast Range Tunnel (CRT) on the west. Portions of a fourth pipeline have also been constructed consisting of 6.4 miles of pipe downstream of Oakdale and 11 miles upstream of Tesla. The hydraulic gradient on the SJPLs was limited by surge stacks/towers at Oakdale portal (~825 ft) and Tesla portal (~500 ft). The pipelines were intended to be shut down at Oakdale.

As part of the SFPUC's Water System Improvement Program (WSIP), the Emery and Pelican crossover vaults were installed and the Roselle crossover vault was modified to allow for flows between SJPLs and isolation of SJPL segments for inspection and maintenance. In addition, the Tesla Valve House (TVH) and Tesla Treatment Facility (TTF) were added upstream of the Tesla surge tower. Like the SJPLs, the crossover vaults and Tesla facilities are rated for the maximum pressures that should occur under normal operating conditions. However, the pipelines and pipeline segments still need to be shut down from the upstream end. Closure of multiple in-line valves or all TTF UV reactor valves can over-pressurize the pipelines. As in the original design, complete shutdown of the SJPL system must be done at Oakdale.

The objective of this project is to allow safe entry into any and all sections of the SJPLs for inspection and maintenance while the remainder of the system stays in operation. The scope and budget of installing the TUV201, 301 and 401 butterfly valves has been transferred from project SJPL Tesla Valve Replacement project (10035574) and added to SJPL Valve and Safe Entry Improvement.

Program: Water Infrastructure	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:

Approved	$98.92 M
Forecast	$142.66 M
Actual	$3.88 M

Project Schedule:

Approved	Jul-19	Mar-28
Forecast	Jul-19	Mar-28

Project Percent Complete: 7.9%

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 01/27/22✓ (B) 01/27/22✓ (C) 01/27/22✓ (D) 12/06/22	(A) 12/25/21✓ (B) 04/25/22 (C) 06/01/23 (D) 07/12/22	(A) 05/05/22 (B) 09/25/22 (C) 11/16/23 (D) 01/15/23	(A) 09/30/24 (B) 06/30/24 (C) 05/24/27 (D) 08/01/24

** (A) Phase 1A – Pipeline 2 Tesla & Oakdale Entry Improvements – HH-1005; (B) Phase 1B – Pipelines 3&4 Tesla & Oakdale Entry Improvements HH-1006; (C) Phase 2 -Pelican, Roselle, Emery and P4J Entry Improvements; and (D) Phase 3 - Tesla Surge Stack.*

Progress and Status:

This project is divided into four (4) sub-projects, as specified in the above footnote. For Phase 1A, on March 8, the Commission approved award of construction contract HH-1005. Notice to Proceed (NTP) is anticipated next quarter. For Phase 1B, the 100% design was completed in February; the project team continued to work on the contract bid documents. It is anticipated that the construction contract (HH-1006) will be advertised next quarter, approximately one month behind schedule; the delay is not anticipated to impact coordination of planned work with future system shutdowns. For Phase 2, design is expected to start next quarter. For Phase 3, the 65% design milestone was achieved this quarter.

Issues and Challenges:

As previously reported, the forecasted cost is greater than the approved budget due to scope refinements to further improve safe entry and due to resequencing of construction so as to minimize the impact on water delivery. No new variances rose during the quarter.

10036809 - Moccasin Powerhouse Bypass Upgrades

Project Description: Hetch Hetchy water deliveries are conveyed from Priest Reservoir to Moccasin Powerhouse (MPH) through the Moccasin Penstocks. At MPH, water passes through two hydroelectric turbines where energy is converted from high-pressure water into electricity. When electricity is not being produced, the water deliveries are directed around the turbines by two bypass valves that dissipate up to 305 million gallons per day (mgd) at 560 pounds per square inch (psi) of water energy. In the past, short-term use of the bypass system has resulted in significant vibration and cavitation damage to the bypass valves. Long-term use (greater than two to five days) could lead to major mechanical damage or failure, leading in turn to the potential of interruption of water deliveries to San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the Moccasin Reservoir Bypass Pipeline, allowing for increased operating flexibility for HHWP to meet scheduled water deliveries even when MPH, Moccasin Switchyard, or power Transmission Lines #3 and #4 are curtailed.

Program: Power Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved		$15.01 M
Forecast		$15.01 M
Actual		$0.49 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Sep-20	Dec-27
Forecast	Sep-20	Dec-27

Project Percent Complete: 6.6%

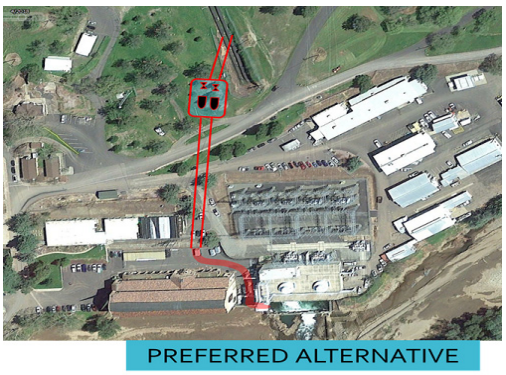
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	08/26/24	08/27/24	02/28/25	06/02/27

Progress and Status:

The consultant submitted the draft Alternative Analysis Report (AAR) in January 2022. The AAR was approved by the Technical Steering Committee on February 17, 2022. The project team is proceeding to the Conceptual Engineering Report. The preferred alternative is to move the bypass system to a location outside of the powerhouse and north of the Moccasin penstocks.

Issues and Challenges:

The construction cost estimate for the preferred alternative is $16.6M to $21.6M, approximately 100% to 145% higher than the original construction estimate of $8.8M. The project team will evaluate the effect of this increase on the total project budget and will update forecasts next quarter.



Moccasin Powerhouse Bypass preferred alternative location

10014086 - Moccasin Powerhouse and GSU Rehabilitation

Project Description: The two Moccasin Powerhouse generators were completed in 1969 and generate a combined maximum output of 110 megawatts. Both generator units have exceeded their life expectancy and are in need of repair in order to continue operating reliably. The objective of this project is to replace stator cores and coils. The scope of work also includes rehabilitation of the rotor field poles with new pole cores and re-insulated field coils, replacement of the rotor pole/rim tail connection system with a new T-tail connection system, and supply of a new rotor rim for each generator following inspection and testing. The project will also include replacement of two generator step-up transformers (GSUs) with new oil containment barriers, and remaining plant work including: replacing 480V switchgear, 13.8kV switchgear, motor control centers, main control boards, protective relays, and cooling water piping.

Program: Power Infrastructure	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:		**Project Schedule:**	
Approved	$66.71 M	Approved Jan-16	Apr-27
Forecast	$66.71 M	Forecast Jan-16	Dec-27
Actual	$10.94 M	Project Percent Complete: 16.8%	

Approved; Actual Cost; Forecast

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 09/28/20✓ (B) 09/28/20✓ (C) 09/28/22	(A) 11/20/20✓ (B) 10/30/20✓ (C) 04/01/24	(A) 06/07/21✓ (B) 06/08/22 (C) 10/02/24	(A) 05/23/23 (B) 06/17/24 (C) 06/07/27

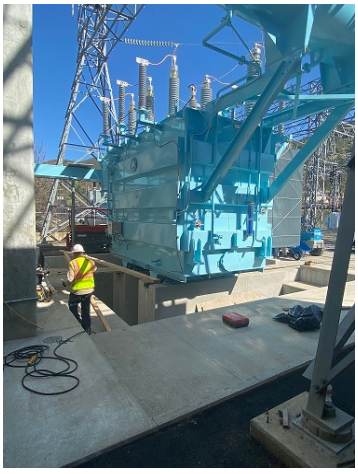
** (A) Moccasin Powerhouse Generator Step-Up (GSU's) Transformers HH-1003R was re-advertised on 1/14/21; (B) Moccasin Powerhouse Generators Rewind – DB-121R2; and (C) Moccasin Powerhouse Systems Upgrade.*

Progress and Status:

This project is divided into 3 subprojects, as specified in the above footnote. For subproject A, HH-1003R, Moccasin Powerhouse (MPH) Generator Step-up (GSU) Transformer Installation, the new Delta Star GSU1 transformer was moved from the spare slot outside the Powerhouse and installed on the new oil containment foundation inside the Powerhouse in March. Partial utilization is expected early next quarter. For subproject B, DB-121R2, MPH Generators Rehabilitation, both the 100% design drawings for miscellaneous generator rewind items and the 65% design drawings for the Relay Protection and Control Panels were received during the quarter. Construction Notice to Proceed (NTP) is scheduled for late next quarter. For subproject C, MPH Systems Upgrades, the task order for consultant planning, design, and engineering support during construction was approved. The Planning Phase kickoff meeting is scheduled for early next quarter.

Issues and Challenges:

Subproject B: The potential risk of delayed materials delivery due to the recent backlog of container ships in the California ports will be evaluated during the next few quarters. No new variances in schedule were forecast in the quarter.



Installation of MPH GSU1 Transformer

10014087 - Warnerville Substation Rehabilitation

Project Description: This project is based on the need to extend the useful life of the Warnerville Substation and meet reliability requirements of NERC/WECC and PG&E Intertie Agreements. The upgrades include replacing three existing 3 phase transformer with two larger rated transformers. Other upgrades include new 115kV and 230kV disconnect switches and breakers; new Control Room, perimeter fence, relays and controls; improvement to the grading and grounding system.

Program: Power Infrastructure	**Project Status:** Construction	**Environmental Status:** Active

Project Cost:

Approved		$34.25 M
Forecast		$34.25 M
Actual		$21.94 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Sep-15	Nov-26
Forecast	Sep-15	Nov-26

Project Percent Complete: 77.8%

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 03/31/16✓ (B) 07/07/23	(A) 01/24/17✓ (B) 09/06/24	(A) 10/05/17✓ (B) 02/03/25	(A) 03/31/24 (B) 05/04/26

** (A) Warnerville Substation Phase 1 – DB-127R; (B) Warnerville Substation Phase 2.*

Progress and Status:

The project team, in coordination with the City Attorney's office, is working to close out the contract DB-127R, Warnerville Substation Rehabilitation. The design was completed last quarter for the "breaker failure contingency plan" that supports emergency replacement of any breakers that fail until they can be replaced; however, the contracting strategy for this work that would only be needed if a failure occurs is still being determined.

Contract HH-1008 Warnerville Substation Rehabilitation Phase 2 will be a design-bid-build contract. The task order scope of work for engineering services during planning, design, and construction was negotiated during the quarter.

Typical 230KV SF6 Breaker to be Installed as Part of Phase 2

Issues and Challenges:

None at this time.

10035721 - Transmission Lines 7/8 Upgrades

Project Description: This project develops the scope of work, design, and contract documents necessary to bid, award, and manage the reconductoring contract. Reconductoring will include replacement of the existing 115kV conductors on Lines 7/8 from Warnerville to Standiford substations, resulting in improved transmission tower stability, and resolved clearance detections.
The project will be partially funded by independent power generators interconnecting on the California Independent System Operator (CAISO).

Program: Power Infrastructure	**Project Status:** Bid and Award	**Environmental Status:** Completed

Project Cost:

Approved	$37.97 M
Forecast	$37.97 M
Actual	$3.00 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Dec-19	Jan-25
Forecast	Dec-19	Jan-25

Project Percent Complete: 15.7%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	11/04/21✓	02/11/22✓	10/03/22	06/28/24

Progress and Status:
Significant progress was achieved in the Design and Bid / Award phases with the completion of the 100% Plans and Specification and bid documents. The Project was advertised on February 11, and the three bids received were opened March 24. The Engineers Estimate was stated at $28M. The project is anticipated to be awarded in the next quarter.

Issues and Challenges:
None at this time.

Transmission Line 7/8 Tower 508S Looking North

10014088 - Moccasin Penstock

Project Description: Moccasin Penstock was built in the early 1920's and conveys Hetch Hetchy water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. Moccasin penstock serves as the sole link in conveying water from Priest Reservoir to Moccasin Reservoir, from which water is routed to the San Francisco Public Utilities Commission (SFPUC) customers. The lower 1,084-foot section of welded steel pipe replaced the original penstocks when the new Moccasin Powerhouse was completed in the 1960s. The upper 4,000 feet of penstock dates to 1924 and has been in service for more than 97 years. Previous condition assessments have identified deficiencies including corrosion, coating damage, lining degradation, leakage, aggregate expansion, cracks in the concrete anchor blocks and saddles, vulnerability of the hammer forged steel pipe sections. The objective of this project is to enhance the reliability of water delivery and extend the life of the penstock system for another 50 to 100 years.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:

Approved		$47.25 M
Forecast		$47.25 M
Actual		$5.36 M

Project Schedule:

Approved	Feb-16	Feb-28
Forecast	Feb-16	Feb-28

Project Percent Complete: 12.1%

Approved; Actual Cost; Forecast

Key Milestones:	**Environmental Approval**	**Bid Advertisement**	**Construction NTP**	**Construction Final Completion**
Current Forecast	10/07/24	10/08/24	04/16/25	08/24/27

Progress and Status:
A field visit to kick off the Needs Assessment phase was held during the quarter, on January 19. A workshop, to present the identified needs to Hetch Hetchy Water & Power, was held on February 10. A study was initiated to evaluate the condition of the penstock manway opening and to assess the need for any security measures for the facility.

Issues and Challenges:
None at this time.

Site visit inside West Portal Valve House

10030758 - OSH Dam Access and Drainage Improvements

Project Description: The O'Shaughnessy Dam is located 140 miles east of San Francisco, CA in Yosemite National Park, Tuolumne County. The dam, a concrete curved gravity structure, is located on the Tuolumne River across the steep-walled Hetch Hetchy Valley. The interior workings of the dam contain valves and appurtenances that must be accessed for operations and maintenance. This project includes improvements for safe access, as well as mitigation of excess interior water leakage through drainage improvements, for the Ladder Wells, Galleries, Inclined Stairways, Control Room, and Diversion Tunnel.
The project was reduced in scope of work in 2020 to meet the existing approved budget. The new project will be advertised as O'Shaughnessy Dam-Fall Protection Improvements and Spillway Access to complete the reduced scope of work.
Improvements that were not included in this revised project, such as drainage improvements, will be included in the OSH Dam Outlet Works Phase 1 project.

Program: Joint Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed (CatEx)

Project Cost:

Approved		$3.95 M
Forecast		$3.95 M
Actual		$2.33 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Mar-17 	Feb-23
Forecast	Mar-17 	Feb-23

Project Percent Complete: 64.7%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	07/16/20✓	03/18/21✓	09/27/21✓	08/21/22

Progress and Status:
The exterior ladder to the spillway invert, including fall protection, was completed during this quarter. The inclined stairway steel and anchorage remediation is 95% complete. Work in the Control Room was completed during this quarter, including construction of new gaskets for manhole covers and the secure sealing of electrical boxes. Substantial completion for the construction contract is anticipated next quarter.

Issues and Challenges:
None at this time.

Exterior Ladder and Fall Protection to Spillway Invert

10032903 - O'Shaughnessy Dam Outlet Works Phase I

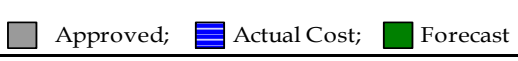
Project Description: O'Shaughnessy Dam (OSH) was completed in 1923 and raised in 1938. The original outlet works including gates and valves have been in services for more than 98 years. Inspections, condition assessments, and studies concluded that improvements and refurbishments of the outlet works system are needed to ensure safety and reliability. The work will be implemented in two phases. This project is to cover the Phase 1 work. The O'Shaughnessy Dam Outlet Works Phase 1 Project addresses the identified deficiencies of the existing outlet works system at OSH. Phase 1 will include four projects: (1) supply and installation of nine new bulkheads; (2) refurbishment of twelve existing slide gates; (3) rehabilitation of existing drum gates to replace the seals, replace the hinges and rivets, recoating the gates, and repair the spillway concrete; and (4) installation of a new diversion pipe isolation butterfly valve.

The existing control gates and valves are essential features for dam safety and reservoir operation. The project is needed to maintain safe and reliable operation of these aging assets. Failure or malfunction of these gates and valves will affect dam safety and result in reduction of storage and reduction of water deliveries to SFPUC customers.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:

Approved	$21.21 M
Forecast	$47.89 M
Actual	$1.47 M



Project Schedule:

Approved	Feb-18	Sep-25
Forecast	Feb-18	Sep-25

Project Percent Complete: 15.6%

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 01/03/23 (B) 12/30/22 (C) 05/31/23	(A) 03/01/23 (B) 04/03/23 (C) 12/01/22	(A) 09/01/23 (B) 10/02/23 (C) 06/01/23	(A) 03/14/25 (B) 06/28/24 (C) 03/27/25

** (A) Bulkhead; (B) Access and Drainage; (C) Instream Flow Release*

Progress and Status:

Subproject A (Bulkhead): During this quarter, peer review for the bulkhead design concept was completed. The proposed bulkhead concept was found to be acceptable. An underwater inspection, and development of methods for cleaning the corroded cast iron sealing surface, were completed at one of the upper outlets during the quarter. Work began on preparation of the specification and bid package for the design and construction of the bulkhead under a progressive-design-build approach. Subproject B (Access & Drainage): A Job Order Contract for a closed-circuit television (CCTV) inspection of the existing dam drain system is being finalized. Subproject C (Instream Flow Release Valve Replacement): Preparation of both the Needs Assessment Report/Alternatives Analysis Report (NAR/AAR) and of the planning phase environmental assessment for the Instream Flow Release (IFR) Valve Replacement Project continued during the quarter.

Issues and Challenges:

As noted the past two quarters, the current planning phase design and construction cost estimate is higher than in the approved budget due to the following: 1) added scope of IFR valves replacement and dam gallery access and drainage improvements; 2) scope refinement and greater detail in the most recent construction cost estimate for the new bulkhead system. The scope now specifies additional inspections, underwater modification of the existing slots and corroded inlet surfaces, and installation of the bulkheads using divers. No part of the cost variance is new this quarter.

10037351 - Moccasin Dam Long-Term Improvements

Project Description: The flow capacity of the existing spillway is inadequate to protect the Moccasin Dam against overtopping and erosion from severe flood events. The dam almost overtopped during the March 2018 storm event when flows were released from the auxiliary spillway and caused significant damage to the auxiliary spillway. The surrounding areas and the upstream diversion dam also sustained damage from the flood. This project is needed for dam safety. The objective of this project is to increase the spillway flow capacity to allow safe passage of flood flows without overtopping the dam and to protect the associated facilities within the Moccasin reservoir boundary against flood damages. The estimated project cost is $83.2 million and is within the current 10-year CIP FY 21-30. Construction is scheduled for 2025-2027.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved	$83.18 M
Forecast	$73.18 M
Actual	$0.30 M

Project Schedule:

Approved	May-21	Jun-28
Forecast	May-21	Jun-28

Project Percent Complete: 1.7%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/29/26	01/26/26	07/27/26	12/30/27

Progress and Status:
The engineering consultant began work on the conceptual engineering for a new concrete lined auxiliary spillway and control structures.

Issues and Challenges:
None at this time.

Moccasin Dam Existing Auxiliary Spillway

10014115 - Cherry Dam Spillway - Short Term Improvements

Project Description: A spillway release from Cherry Dam in 2010 caused a landslide, blockage of the spill channel, and extensive erosion in the close proximity of the dam's right abutment. In addition, it caused flooding of the Cherry Power Tunnel Adit, and flooding of a campground further downstream. Engineering studies determined that significant long-term improvements to increase the spillway flow capacity are needed to maintain dam safety. The objective of this project is to re-establish containment for the breached spill channel section and to protect the downstream slope of the existing embankment dam from uncontrolled releases and erosion in the interim until the long-term improvements are implemented. Construction is scheduled for 2025-2026. The estimated project cost of $11.9 million is within the current 10-year CIP FY 21-30.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved	$11.86 M
Forecast	$11.86 M
Actual	$0.42 M

Project Schedule:

Approved	Mar-21	Jul-27
Forecast	Mar-21	Jul-27

Project Percent Complete: 7.3%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	08/15/24	03/29/24	10/31/24	12/31/26

Progress and Status:
The engineering consultant continued work on the alternative analysis for the Cherry Dam Spillway Short-Term Improvements. The alternatives will include grading and erosion protection for dam safety and downstream public safety. The alternatives analysis was delayed to further consider project performance criteria, and is scheduled to complete in June 2022.

Issues and Challenges:
None at this time.

Cherry Valley Dam and Spillway

10014114 - Mountain Tunnel Improvement Project

Project Description: Mountain Tunnel conveys the SFPUC water supply from Kirkwood Powerhouse to Priest Reservoir. Mountain Tunnel has been in service since 1925. Due to its age, deferred maintenance, and construction deficiencies in the early 1900s, sections of the tunnel lining have deteriorated, some extensively. This project provides design and construction of major tunnel repair and rehabilitation work, adit and tunnel entry improvements, access road improvements, and installation of a new flow control facility at Priest Reservoir to ensure that the tunnel can reliably provide drinking water to customers for the next 100 years.
The flow control structure and isolation valves will also be used to isolate the tunnel from Priest Reservoir during tunnel shutdowns. This will allow the reservoir to remain full and not backwater for over 8 miles into the dewatered tunnel. The full reservoir provides more supply water for safely extending the tunnel shutdowns to longer durations of 100 days for construction inside the tunnel. These longer outages will reduce the need for more typical 60-day outages and shorten the overall duration of the construction schedule. .

Program: Joint Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed

Project Cost:

Approved	$238.22 M
Forecast	$238.22 M
Actual	$64.40 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Oct-11	Jun-27
Forecast	Oct-11	Jun-27

Project Percent Complete: 32.6%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/14/20✓	11/13/19✓	01/29/21✓	12/03/26

Progress and Status:
Shutdown No. 1 was implemented between January and March, and the Mountain Tunnel was successfully shut down, dewatered, and brought back to service, within the planned 60-day timeframe. This quarter's progress included excavation to a depth of 100 feet and placement of initial lining in the Flow Control Facility (FCF) Shaft. The Priest Adit tunnel was excavated to a length of 200 feet, also with initial lining installed in the excavated section. Shutdown work inside the tunnel included survey of the entire tunnel and of the siphon at South Fork, geological evaluation of the South Fork siphon, and installation of rock dowels at tie-in locations within the bypass tunnels and Priest Adit tunnel. The construction water treatment plant at Priest was commissioned and successfully used to treat construction water during the shutdown. A temporary water filtration plant was also successfully installed at Moccasin and was used to treat drinking water for Moccasin during the shutdown. Safety and road improvement work continued on Adit 8/9 road, Adit 5/6 road, South Fork road, and Rickson road. Partnering meetings were held; additionally, a meeting with the Dispute Resolution Board (DRB) was held to familiarize the DRB with the project. An SFGOV TV crew filmed various project worksites during the shutdown and are now finalizing a "virtual tour" of project highlights. Planning for Shutdown No. 2 is taking place on a continuous basis.

Installing Rock Dowels inside the Tunnel at the New Priest Adit Tie-in Location during Shutdown No. 1

Issues and Challenges:
None at this time.

10035086 - Bridge Replacement (4 - Bridges)

Project Description: HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessments in 2013 and 2016 determined that, four of these bridges require substantial rehabilitation or replacement: Lake Eleanor Dam Bridge, O'Shaughnessy Adit Access Bridge, Cherry Lake Road Bridge (public access), and Early Intake Bridge (public access). The project will be funded in 2 phases. The first phase will include planning, design and construction of Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge. The planning, design and construction of the Early Intake Bridge and Cherry Lake Road Bridge will be under Phase 2.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved	$44.29 M
Forecast	$29.37 M
Actual	$1.37 M

Project Schedule:

Approved	Feb-20	May-37
Forecast	Feb-20	Jul-27

Project Percent Complete: 45.7%

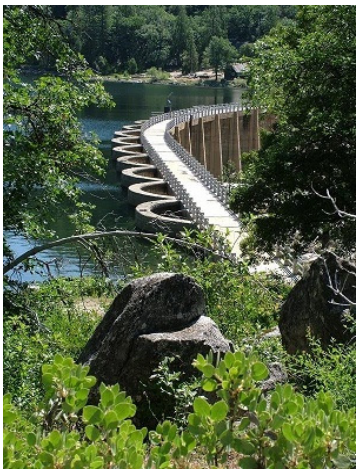
Approved; Actual Cost; Forecast

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 12/29/23 (B) 07/31/24	(A) 10/31/23 (B) 08/01/24	(A) 08/01/24 (B) 02/03/25	(A) 12/31/25 (B) 01/29/27

** (A) Lake Eleanor Dam Bridge; and (B) O'Shaughnessy Adit Access Bridge.*

Progress and Status:

For Lake Eleanor Dam Bridge, the engineering consultant continued work during the quarter on the alternatives study for rehabilitation of the existing bridge. For the O'Shaughnessy Adit Access Bridge, two workshops were held with Hetch Hetchy Water & Power during the quarter, in February and March 2022, for the project team to present the developed alternatives. The project team is using the Geotechnical Interpretative Report completed last quarter to inform the alternatives analysis.



Lake Eleanor Dam Bridge

Issues and Challenges:

As noted last quarter, the variances between the approved budget and schedule and the forecasted budget and schedule are due to division of the project into two phases, with the planning, design and construction of the Lake Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge within the first phase and funded in the FY21-30 10-Year CIP; the funding for the planning, design and construction of the other two of the four bridges has been deferred until after 2030. The forecasted completion for the two bridges is decreased from the approved completion date of May 2037 to a revised completion date of January 2027. No new variances arose during the quarter.

10014110 - Moccasin Wastewater Treatment Plant

Project Description: The Moccasin Wastewater Treatment Plant (WWTP) project proposes to replace the community's aging treatment plant. Moccasin's treatment plant was installed in the 1970s and has been in continuous service since that time. Wastewater generated by the Moccasin community, powerhouse, and related facilities flows to this treatment plant. The treatment facility currently serving Moccasin was a "package plant" that was manufactured off-site, transported to Moccasin, and installed in 1977. At more than 44-years old, the Moccasin treatment plant has reached the end of its useful service life, and is becoming increasingly maintenance intensive. Additionally, Moccasin has no backup treatment; accordingly, failure of the plant would have significant consequences.

This project will replace the existing wastewater treatment facilities with a Sequence Batch Reactor (SBR) plant. The proposed SBR "package plant" is to be a two-train facility. Each train would have a capacity of 12,000 gallons per day to accommodate average daily dry-weather flow. The new plant would continue to treat wastewater to secondary standards. The new plant will be provided with upgraded screening, flow monitoring, flow equalization, SCADA instrumentation, and automation features. The package plant would be manufactured off-site, trucked to Moccasin, and then installed beside the current plant. The existing plant must serve the Moccasin community while the new plant is being installed and would remain in operation during construction. The proposed project is limited to the treatment plant only and does not include improvements either upstream or downstream of the plant.

Program: Joint Infrastructure	**Project Status:** Design	**Environmental Status:** Not Initiated

Project Cost:

Approved	$8.79 M
Forecast	$8.79 M
Actual	$0.44 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Sep-21	Apr-26
Forecast	Jan-22	Apr-26

Project Percent Complete: 6.6%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	11/14/23	05/09/23	11/28/23	09/09/25

Progress and Status:

The project commenced design phase during the quarter with a consultant under contract to the SFPUC submitting an approved proposal to support the project during design and construction phases. Notice To Proceed to the contractor is expected to issue in April.

Issues and Challenges:

None at this time.

8. On-Going Construction*

The following table reflects active construction contract(s) with an original contract amount greater than $1M.

Construction Contract	Schedule			Budget		Variance (Original - Forecast)		Actual % Complete
	NTP Date	Approved Construction Final Completion	Current Forecast Construction Final Completion*	Approved Contract Cost	Current Forecast Cost*	Schedule (Cal. Days)	Current Forecast Cost	
Power Infrastructure								
10014086 - Moccasin Powerhouse Transformers Installation - HH-1003R	06/07/21	05/23/23	05/23/23	$ 3,653,575	$ 3,653,575	-	-	42.9%
10014086 - Moccasin Powerhouse Generator Rehab - DB-121R2	06/21/21	06/17/24	06/17/24	$ 28,898,986	$ 28,898,986	-	-	5.0%
10014087 - Warnerville Switchyard - DB-127R **	10/05/17	07/09/19	03/31/24	$ 14,591,450	$ 14,591,450	(1,727)	-	90.0%
Joint Infrastructure								
10030758 - OSH Dam Access & Drainage Improvement - HH-1002R	09/27/21	08/21/22	08/21/22	$ 1,648,556	$ 1,648,556	-	-	60.6%
10014114 - Mountain Tunnel Improvement - HH-1000R	01/29/21	12/03/26	12/03/26	$ 152,870,508	$ 152,870,508	-	-	17.0%

Program Total for On-Going Construction	Approved Contract Cost	Current Forecast Cost*	Variance	
			Cost	Percent
	$ 201,663,075	**$ 201,663,075**	**-**	**-**

Note:

* The Current Forecast Cost and Current Forecast Construction Final Completion include all approved, pending, and potential change orders.

** The contract is funded with both CIP and non-CIP funds, but only the CIP funded amount is reflected.

9. PROJECTS IN CLOSEOUT

Project Title	Current Approved Construction Phase Completion	Actual Construction Phase Completion	Current Approved Construction Phase Budget	Construction Phase Expenditures To Date*
Power Infrastructure				
Powerhouse				
10014075 - Holm and Other Powerhouse Projects	05/14/21	05/14/21	$ 15,327,522	$ 12,869,573
TOTAL			$ 15,327,522	$ 12,869,573

10. COMPLETED PROJECTS

There are no completed projects

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APPENDICES

A PROJECT DESCRIPTIONS

B APPROVED PROJECT LEVEL SCHEDULES / BUDGETS

C LIST OF ACRONYMS

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APPENDIX A. PROJECT DESCRIPTIONS

The project titles and descriptions are updated according to the approved 10-year CIP for FY21-30.

HETCH HETCHY CAPITAL IMPROVEMENT PROGRAM (HCIP)

WATER INFRASTRUCTURE

10035574 - SJPL Tesla Valves Replacement

The 2018 approved scope for this project is to replace four large diameter butterfly valves, namely TUV 101, 201, 301 and 401, inside the Tesla Valve Vault so that each of the four San Joaquin Pipelines (SJPL) can be safely isolated and shut down individually for inspection and repair work without shutting down the entire SJPL system. This project will also improve safety for entry into the pipelines for maintenance and inspection purposes. After the planning phase of the related project SJPL Valve and Safe Entry Improvement (Project 10035575) it was recommended that the scope of SJPL Tesla Valve Replacement be reduced, to focus on completing the replacement of TUV101 only. The remainder of the work (i.e. TUV 201, 301 and 401) has been added to the scope of SJPL Valve and Safe Entry Improvement (Project 10035575) to expedite improvements for TUV101 during the planned winter shutdown from January to February 2022 to facilitate necessary maintenance work for SJPL No. 1 during the remainder of 2022. The installation of TUV201, 301 and 401 will proceed together with the upgrade work proposed under SJPL Valve and Safe Entry Improvement, in 2023 and 2024.

10035575 - SJPL Valve and Safe Entry Improvement

The San Joaquin Pipelines (SJPLs) consist of three parallel pipelines approximately 48 miles long (completed in 1932, 1953, and 1968, respectively) that cross the San Joaquin Valley from the Oakdale Portal of the Foothill Tunnel on the east end to the Tesla Portal of the Coast Range Tunnel (CRT) on the west. Portions of a fourth pipeline have also been constructed consisting of 6.4 miles of pipe downstream of Oakdale and 11 miles upstream of Tesla. The hydraulic gradient on the SJPLs was limited by surge stacks/towers at Oakdale portal (~825 ft) and Tesla portal (~500 ft). The pipelines were intended to be shut down at Oakdale.

As part of the SFPUC's Water System Improvement Program (WSIP), the Emery and Pelican crossover vaults were installed and the Roselle crossover vault was modified to allow for flows between SJPLs and isolation of SJPL segments for inspection and maintenance. The intent was to increase operational flexibility and the overall reliability of the SJPL System. In addition, the Tesla Valve House (TVH) and Tesla Treatment Facility (TTF) were added upstream of the Tesla surge tower. Like the SJPLs, the crossover vaults and Tesla facilities are rated for the maximum pressures that should occur under normal operating conditions. However, the pipelines and pipeline segments still need to be shut down from the upstream end. Closure of multiple in-line valves or all TTF UV reactor valves can over-pressurize the pipelines. As in the original design, complete shutdown of the SJPL system must be done at Oakdale.

The objective of this project is to allow safe entry into any and all sections of the SJPLs for inspection and maintenance while the remainder of the system stays in operation. The project objective is not to upgrade the entire SJPL system to the maximum possible static or transient pressures, nor to upgrade all components in vaults to prevent possible flooding of the vaults. However, the proposed surge tower will protect the entire SJPL system from high static and transient pressure caused by operation of valves at Tesla Treatment Facility. The scope and budget of installing the TUV201, 301 and 401 butterfly valves has been transferred from project SJPL Tesla Valve Replacement project (10035574) and added to

SJPL Valve and Safe Entry Improvement.

10014072 – WATER ONLY/PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

POWER INFRASTRUCTURE

10036809 - Moccasin Powerhouse Bypass Upgrades

Hetch Hetchy water deliveries are conveyed from Priest Reservoir to Moccasin Powerhouse (MPH) through the Moccasin Penstocks. At MPH, water passes through two hydroelectric turbines where energy is converted from high-pressure water into electricity. When electricity is not being produced, the water deliveries are directed around the turbines by two bypass valves that dissipate up to 305 million gallons per day (mgd) at 560 pounds per square inch (psi) of water energy. In the past, short-term use of the bypass system has resulted in significant vibration and cavitation damage to the bypass valves. Long-term use (greater than two to five days) could lead to major mechanical damage or failure, leading in turn to the potential of interruption of water deliveries to San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the Moccasin Reservoir Bypass Pipeline, allowing for increased operating flexibility for HHWP to meet scheduled water deliveries even when MPH, Moccasin Switchyard, or power Transmission Lines #3 and #4 are curtailed.

10036810 - Kirkwood Powerhouse Bypass Upgrades

Hetch Hetchy water deliveries are conveyed through the Canyon Tunnel to the Canyon Portal Valvehouse. Water then enters the Kirkwood Penstock and drops 1,245 feet in elevation to the Kirkwood Powerhouse (KPH). At KPH, water passes through three hydroelectric turbines where energy is converted from high-pressure water into electricity, producing a maximum output of 124 megawatts at a maximum flow of 1,408 cubic feet per second. When electricity is not being produced, the water deliveries are directed around the turbines through a separate bypass system consisting of a spherical guard valve and a 90-degree needle valve for flow control. Based on a condition assessment of KPH performed in 2010, existing control problems limit operation of the bypass needle valve to no more than 70% open. An inspection of the bypass valve and dissipation structure in 2016 indicated that the stainless steel dissipator had failed, causing damage at the base of a steel shaft column leading to the bypass tunnel. Repairs to the dissipator, bypass draft tube, and bypass chamber were completed in 2017, but the steel lining protecting the bypass chamber's concrete walls and floor subsequently failed after bypass usage. Additional repairs were made to the steel lining of the bypass in 2019 under the HH-991 2018 Mountain Tunnel Interim Repairs construction contract. Long-term use (greater than two to five days) could lead to major mechanical damage or failure, leading to potential interruption of water deliveries to

San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the KPH Bypass Chamber and Mountain Tunnel, allowing for increased operating flexibility for Hetch Hetchy Water & Power (HHWP) to meet scheduled water deliveries when KPH is not generating electricity.

10014075 - Holm and Other Powerhouse Projects

This project provided funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under $1 million involving power generation renewal and equipment replacement. The upgrade and rehabilitation of HPH Unit 2 included 13.8 Kv equipment upgrades, addition and integration of a generator breaker, replacement of two 13.8kV feed breakers, replacement of Unit 2 Main Control Board, and any necessary tasks to match Unit 2 to Unit 1. System integration work was done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into the existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project included upgrades to turbine and generators and to alternating current stations, intended to extend the life of the unit by 20 years. Lastly, the project upgraded the existing oil containment systems at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators were replaced, and other modifications were made to the powerhouse interiors and to the transformer decks, to discourage contaminated discharges into the adjacent streams. A monitoring system was installed to alert HHWP of excessive leakage and the need to manually pump oil containment vessels. Failure of the oil containment systems at the powerhouses would likely result in environmental contamination, fines, additional regulatory exposure, and the need for rehabilitation and cleanup.

10014086 - Moccasin Powerhouse and GSU Rehabilitation

The two Moccasin Powerhouse generators were completed in 1969 and generate a combined maximum output of 110 megawatts. Both generator units have exceeded their life expectancy and are in need of repair in order to continue operating reliably. The objective of this project is to replace stator cores and coils. The scope of work also includes rehabilitation of the rotor field poles with new pole cores and re-insulated field coils, replacement of the rotor pole/rim tail connection system with a new T-tail connection system, and supply of a new rotor rim for each generator following inspection and testing. The project will also include replacement of two generator step-up transformers (GSUs) with new oil containment barriers, and remaining plant work including: replacing 480V switchgear, 13.8kV switchgear, motor control centers, main control boards, protective relays, and cooling water piping.

10014087 - Warnerville Substation Rehabilitation

This project is needed to extend the useful life of the Warnerville Substation and meet reliability requirements of NERC/WECC and PG&E Intertie Agreements. The upgrades include replacing three existing 3 phase transformer with two larger rated transformers. Other upgrades include new 115kV and 230kV disconnect switches and breakers; new Control Room, perimeter fence, relays and controls; improvement to the grading and grounding system.

10035721 - Transmission Lines 7/8 Upgrades

The SFPUC electric transmission lines 7/8 conveys power from Warnerville Substation to Modesto Irrigation District's (MID) Standiford Substation. The SFPUC must accommodate additional power flowing across its

transmission system due to grid interconnection requests from independent power generators interconnecting on the California Independent System Operator (CAISO). This is a requirement for SFPUC and HHWP obligations as a neighboring provider of electric transmission service.

Studies performed by the SFPUC indicate the principal impact to its system is an overload of 115kV Lines 7&8 between HHWP Warnerville Substation and MID Standiford Substation under contingency conditions if interconnections are made without modification to the system's capacity. Without modifications, the SFPUC and HHWP transmission system could face reliability issues. Reconductoring also resolves multiple locations where the clearance between the existing conductors and the ground or structures does not meet current safe clearance regulations.

This project develops the scope of work, design, and contract documents necessary to bid, award, and manage the reconductoring contract. Reconductoring will include replacement of the existing 115kV conductors on Lines 7/8 from Warnerville to Standiford substations, resulting in improved transmission tower stability, and resolved clearance detections.

The project will be partially funded by independent power generators interconnecting on the California Independent System Operator (CAISO).

10014092 - POWER ONLY/PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

JOINT INFRASTRUCTURE

10014088 - Moccasin Penstock

Moccasin Penstock was built in the early 1920's and conveys Hetch Hetchy water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. Moccasin penstock serves as the sole link in conveying water from Priest Reservoir to Moccasin Reservoir, from which water is routed to the San Francisco Public Utilities Commission (SFPUC) customers. The lower 1,084-foot section of welded steel pipe replaced the original penstocks when the new Moccasin Powerhouse was completed in the 1960s. The upper 4,000 feet of penstock dates to 1924 and has been in service for more than 97 years. Previous condition assessments have identified deficiencies including corrosion, coating damage, lining degradation, leakage, aggregate expansion, cracks in the concrete anchor blocks and saddles, vulnerability of the hammer forged steel pipe sections. The objective of this project is to enhance the reliability of water delivery and extend the life of the penstock system for another 50 to 100 years.

10030758 – OSH Dam Access and Drainage Improvements

The O'Shaughnessy Dam is located 140 miles east of San Francisco, CA in Yosemite National Park, Tuolumne County. The dam, a concrete curved gravity structure, is located on the Tuolumne River across the steep walled Hetch Hetchy Valley. The interior workings of the

dam contain valves and appurtenances that must be accessed for operations and maintenance. This project includes improvements for safe access, as well as mitigation of excess interior water leakage through drainage improvements, for the Ladder Wells, Galleries, Inclined Stairways, Control Room, and Diversion Tunnel. The project was reduced in scope of work in 2020 to meet the existing approved budget. The new project will be advertised as O'Shaughnessy Dam-Fall Protection Improvements and Spillway Access to complete the reduced scope of work. Improvements that were not included in this revised project, such as drainage improvements, will be included in the OSH Dam Outlet Works Phase 1 project.

10032903 – O'Shaughnessy Dam Outlet Works Phase 1

O'Shaughnessy Dam (OSH) was completed in 1923 and raised in 1938. The original outlet works including gates and valves have been in services for more than 98 years. Inspections, condition assessments, and studies concluded that improvements and refurbishments of the outlet works system are needed to ensure safety and reliability. The work will be implemented in two phases. This project is to cover the Phase 1 work. The O'Shaughnessy Dam Outlet Works Phase 1 Project addresses the identified deficiencies of the existing outlet works system at OSH. Phase 1 will include four projects: (1) supply and installation of nine new bulkheads; (2) refurbishment of twelve existing slide gates; (3) rehabilitation of existing drum gates to replace the seals, replace the hinges and rivets, recoating the gates, and repair the spillway concrete; and (4) installation of a new diversion pipe isolation butterfly valve. The existing control gates and valves are essential features for dam safety and reservoir operation. The project is needed to maintain safe and reliable operation of these aging assets. Failure or malfunction of these gates and valves will affect dam safety and result in reduction of storage and reduction of water deliveries to SFPUC customers.

10037351 – Moccasin Dam Long-Term Improvements

The flow capacity of the existing spillway is inadequate to protect the Moccasin Dam against overtopping and erosion from severe flood events. The dam almost overtopped during the March 2018 storm event when flows were released from the auxiliary spillway and caused significant damage to the auxiliary spillway. The surrounding areas and the upstream diversion dam also sustained damage from the flood. This project is needed for dam safety. The objective of this project is to increase the spillway flow capacity to allow safe passage of flood flows without overtopping the dam and to protect the associated facilities within the Moccasin reservoir boundary against flood damages. The estimated project cost is $83.2 million and is within the current 10-year CIP FY 21-30. Construction is scheduled for 2025-2027.

10014115 – Cherry Dam Spillway - Short Term Improvements

A spillway release from Cherry Dam in 2010 caused a landslide, blockage of the spill channel, and extensive erosion in the close proximity of the dam's right abutment. In addition, it caused flooding of the Cherry Power Tunnel Adit, and flooding of a campground further downstream. Engineering studies determined that significant long-term improvements to increase the spillway flow capacity are needed to maintain dam safety. The objective of this project is to re-establish containment for the breached spill channel section and to protect the downstream slope of the existing embankment dam from uncontrolled releases and erosion in the interim until the long-term improvements are implemented. Construction is scheduled for 2025-2026. The estimated project cost of $11.9 million is within the current 10-year CIP FY

21-30.

10014114 – Mountain Tunnel Improvement Project

Mountain Tunnel conveys the SFPUC water supply from Kirkwood Powerhouse to Priest Reservoir. Mountain Tunnel has been in service since 1925. Due to its age, deferred maintenance, and construction deficiencies in the early 1900s, sections of the tunnel lining have deteriorated, some extensively. This project provides design and construction of major tunnel repair and rehabilitation work, adit and tunnel entry improvements, access road improvements, and installation of a new flow control facility at Priest Reservoir to ensure that the tunnel can reliably provide drinking water to customers for the next 100 years. The flow control structure and isolation valves will also be used to isolate the tunnel from Priest Reservoir during tunnel shutdowns. This will allow the reservoir to remain full and not backwater for over 8 miles into the dewatered tunnel. The full reservoir provides more supply water for safely extending the tunnel shutdowns to longer durations of 100 days for construction inside the tunnel. These longer outages will reduce the need for more typical 60-day outages and shorten the overall duration of the construction schedule.

10035086 – Bridge Replacement (4 Bridges)

HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessments in 2013 and 2016 determined that, four of these bridges require substantial rehabilitation or replacement: Lake Eleanor Dam Bridge, O'Shaughnessy Adit Access Bridge, Cherry Lake Road Bridge (public access), and Early Intake Bridge (public access). The project will be funded in 2 phases. The first phase will include planning, design and construction of Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge as well as the planning and design of the other two bridges. The construction of the Early Intake Bridge and Cherry Lake Road Bridge will be under Phase 2.

10014108 – Canyon Tunnel Rehabilitation

Canyon Tunnel was built over 45 years ago. A condition assessment was performed on the tunnel in 2009 and the tunnel is in generally good condition, with the exception of the Hetchy Adit, a tunnel access point. Temporary repairs have been made to the plug at this adit twice (once in 1989 and once in 2009), but permanent repairs are needed to reduce leakage and increase reliability of the system. The project scope includes installation of a new reinforced concrete plug downstream of the existing plug.

10014110 – Moccasin Wastewater Treatment Plant

The Moccasin Wastewater Treatment Plant (WWTP) project proposes to replace the community's aging treatment plant. Moccasin's treatment plant was installed in the 1970s and has been in continuous service since that time. Wastewater generated by the Moccasin community, powerhouse, and related facilities flows to this treatment plant. The treatment facility currently serving Moccasin was a "package plant" that was manufactured off-site, transported to Moccasin, and installed in 1977. At more than 44-years old, the Moccasin treatment plant has reached the end of its useful service life, and is becoming increasingly maintenance intensive. Additionally, Moccasin has no backup treatment; accordingly, failure of the plant would have significant consequences.

This project will replace the existing wastewater treatment facilities with a Sequence Batch Reactor (SBR) plant. The proposed SBR "package plant" is to be a two-train facility. Each train would have a capacity of 12,000 gallons per day to accommodate average daily dry-weather flow.

The new plant would continue to treat wastewater to secondary standards. The new plant will be provided with upgraded screening, flow monitoring, flow equalization, SCADA instrumentation, and automation features. The package plant would be manufactured off-site, trucked to Moccasin, and then installed beside the current plant. The existing plant must serve the Moccasin community while the new plant is being installed and would remain in operation during construction. The proposed project is limited to the treatment plant only and does not include improvements either upstream or downstream of the plant.

10014116 – JOINT - PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

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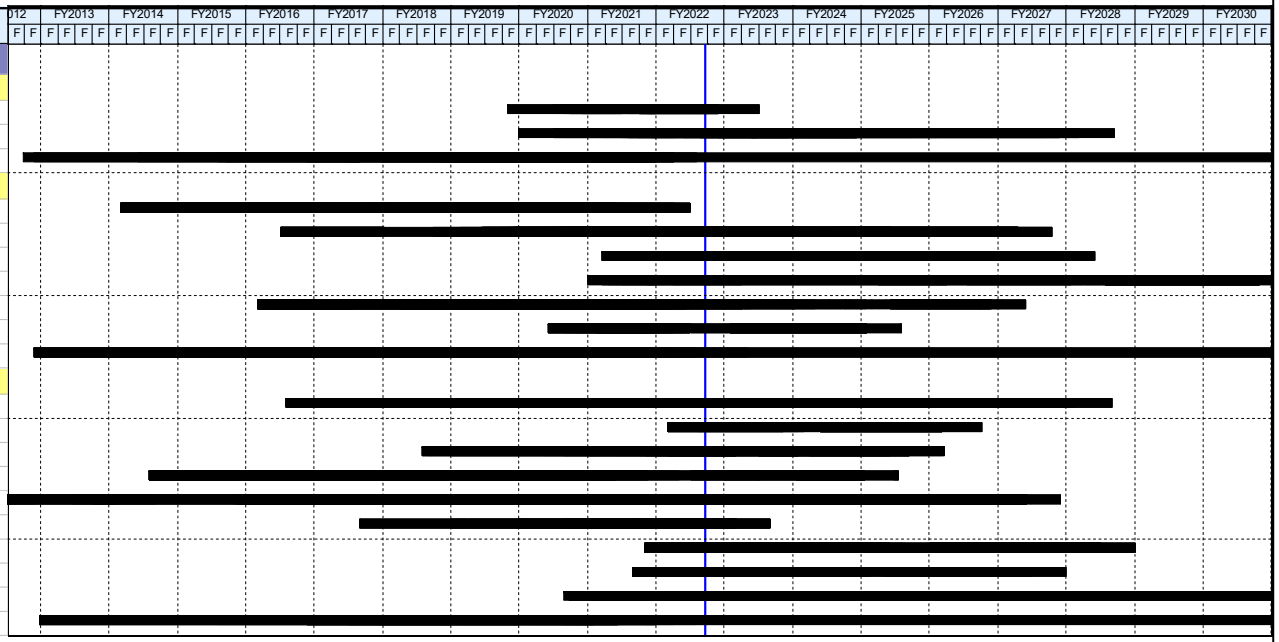
APPENDIX B. Hetch Hetchy Improvement Projects Approved Project Level Schedules/Budgets

Project Name	Approved Budget	Start	Finish
Hetchy Capital Improvement Projects	$807,296,327.49	03-Oct-11	25-May-37
Water Infrastructure	$109,533,203.01	26-Mar-12	30-Jun-31
10035574 SJPL Tesla Valves Replacement	$3,740,000.00	01-May-19	30-Dec-22
10035575 SJPL Valve and Safe Entry Improvement	$98,924,000.00	01-Jul-19	13-Mar-28
10014072 WATER ONLY/PROJ DEV	$6,869,203.00	26-Mar-12	30-Jun-31
Power Infrastructure	$204,242,684.48	29-May-12	30-Jun-31
10014075 Holm and Other Powerhouse Projects	$23,061,080.48	03-Sep-13	30-Dec-21
10014086 Moccasin Powerhouse and GSU Rehabilitation	$66,713,635.00	04-Jan-16	13-Apr-27
10036809 Moccasin Powerhouse Bypass Upgrades	$15,007,000.00	18-Sep-20	01-Dec-27
10036810 Kirkwood Powerhouse Bypass Upgrades	$16,157,000.00	01-Jul-20	23-Oct-30
10014087 Warnerville Substation Rehabilitation	$34,248,428.00	01-Sep-15	25-Nov-26
10035721 Transmission Lines 7/8 Upgrades	$37,969,000.00	02-Dec-19	31-Jan-25
10014092 POWER ONLY/PROJ DEVELP	$11,086,541.00	29-May-12	30-Jun-31
Joint Infrastructure	$493,520,440.00	03-Oct-11	25-May-37
10014088 Moccasin Penstock	$47,251,363.00	01-Feb-16	28-Feb-28
10014110 Moccasin Wastewater Treatment Plant	$8,794,549.00	01-Sep-21	07-Apr-26
10032903 O'Shaughnessy Dam Outlet Works Phase I	$21,206,000.00	01-Feb-18	16-Sep-25
10014108 Canyon Tunnel Rehabilitation	$8,428,813.00	03-Feb-14	13-Jan-25
10014114 Mountain Tunnel Improvement Project	$238,218,951.00	03-Oct-11	03-Jun-27
10030758 OSH Dam Access and Drainage Improvements	$3,952,211.00	01-Mar-17	28-Feb-23
10037351 Moccasin Dam Long-Term Improvements	$83,175,822.00	03-May-21	30-Jun-28
10014115 Cherry Dam Spillway - Short Term Improvements	$11,860,965.00	01-Mar-21	01-Jul-27
10035086 Bridge Replacement (4 - Bridges)	$44,287,000.00	27-Feb-20	25-May-37
10014116 JOINT - PROJECT DEVELOPMENT	$26,344,766.00	25-Jun-12	30-Jun-31



APPENDIX C. LIST OF ACRONYMS

AAR	Alternative Analysis Report
CAISO	California Independent System Operator
CATEX	Categorical Exemption
CEQA	California Environmental Quality Act
CER	Conceptual Engineering Report
CIP	Capital Improvement Program
CRT	Coast Range Tunnel
DB	Design, Build
DCR	Design Criteria Report
FCF	Flow Control Facility
FY	Fiscal Year
GSU	Generator Step-Up
GWH	Gigawatt Hours
HCIP	Hetch Hetchy Capital Improvement Program
HH	Hetch Hetchy
HHWP	Hetch Hetchy Water and Power
HPH	Holm Powerhouse
IFR	Instream Flow Release
JOC	Job Order Contract
KPH	Kirkwood Powerhouse
MGD	Million Gallons per Day
MID	Modesto Irrigation District
MPH	Moccasin Powerhouse
NAR	Needs Assessment Report
NERC	North American Electric Reliability Corporation
NTP	Notice to Proceed
OSH	O'Shaughnessy Dam
PD	Project Development
PG&E	Pacific Gas and Electric Company
PLC	Programmable Logic Controllers
PSI	Per Square Inch
R&R	Renewal and Replacement
SBR	Sequence Batch Reactor
SCADA	Supervisory Control and Data Acquisition
SFPUC	San Francisco Public Utilities Commission
SJPL	San Joaquin Pipeline
TTF	Tesla Treatment Facility
TUV	Tesla Ultra Violet
TVH	Tesla Valve House
WSIP	Water System Improvement Program
WWTP	Wastewater Treatment Plant

San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

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DATE: September 6, 2022

TO: Commissioner Anson Moran, President
Commissioner Newsha Ajami, Vice President
Commissioner Sophie Maxwell
Commissioner Tim Paulson

FROM: Dennis J. Herrera, General Manager DJH

RE: Hetch Hetchy Capital Improvement Program Quarterly Report
4th Quarter / Fiscal Year 2021-2022

Enclosed please find the Hetch Hetchy Capital Improvement Program (HCIP) Quarterly Report for the 4th Quarter (Q4) of Fiscal Year (FY) 2021-2022. The primary intent of the report is to provide the Commission, stakeholders, and the public with a status summary of the HCIP based on data for the period of April 1, 2022 to June 30, 2022.

Attachment

OUR MISSION: To provide our customers with high-quality, efficient and reliable water, power and sewer services in a manner that values environmental and community interests and sustains the resources entrusted to our care.

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San Francisco
Water Power Sewer
Services of the San Francisco Public Utilities Commission

QUARTERLY REPORT

Hetch Hetchy Capital Improvement Program

April 2022 – June 2022

Published: September 6, 2022

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EXECUTIVE SUMMARY

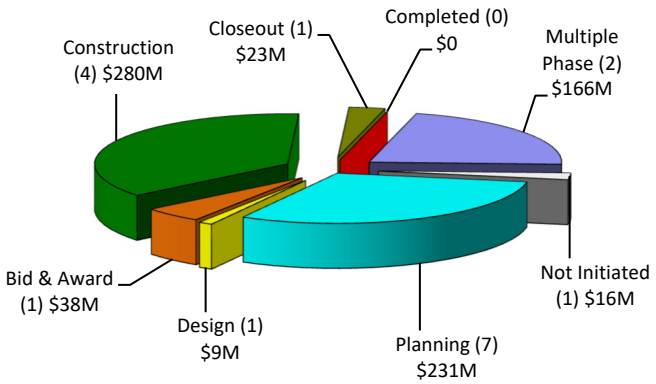
This quarterly report provides a summary update on the Hetch Hetchy Capital Improvement Program (HCIP) that is part of the larger Hetch Hetchy Water Capital Improvement Program. The primary intent of the report is to provide the Commission, stakeholders, and the public with a status summary of the HCIP based on data for the period of April 1, 2022 to June 30, 2022.

Starting with the HCIP in the first quarter (Q1) of fiscal year 2022 (FY22), the projects of the HCIP and each of their scopes, budgets, and schedules, match the Commission's approved FY21-30 10-Year Capital Plan, specifically the FY21-30 10-Year Hetch Hetchy Water Capital Improvement Program (10-Year CIP), and serve as the FY22 baseline for the HCIP.

In this Q4 report, the forecasts for the HCIP projects' scopes, costs, and schedules match the FY23-32 10-Year CIP that was presented to the Commission on February 8, 2022. Going forward, proposed changes to the approved projects and their baseline scopes, schedules, and budgets will continue to be presented for review and approval as part of the 10-Year CIP that is updated every two years and approved by the SFPUC Commission. The proposed revisions to the program will become the new baseline for project scopes, schedules, and budgets in the beginning of the new fiscal year, July 1 of each bi-annual year, following approval by both SFPUC Commission and the Board of Supervisors (BOS).

Program Current Status:

Overall steady progress continued on the program with very few changes to forecasted scopes schedules and budgets. As of the end of the reporting period, the status of the 17 HCIP projects (excluding the Project Development (PD) accounts) is as follows: one (1) project not initiated, nine (9) projects in planning, design, or bid & award, four (4) projects in construction, two (2) projects that are multiple phases, and one (1) project in closeout.



Approved Budget for Projects in Each Phase

The following Tables provide a high-level summary of the cost and schedule status for this program (including the 3 PD accounts). The forecasted overruns in projects' cost and schedule presented here, as noted above, match the 10 – Year CIP for FY23-32 which was presented to the Commission and approved during the quarter, on February 8, 2022. All project variances occurred in the first quarter (Q1) of fiscal year 2021-2022, and there have been no new project cost or schedule variances forecasted during either this or last quarter.

Table A. Program Cost Summary

Program	Expenditures To Date ($ Million) (A)	Current Approved Budget ($ Million) (B)	Q4/FY21-22 Forecasted Costs ($ Million) (C)	Cost Variance ($ Million) (D = B - C)	Cost Variance Over Reporting Period * ($ Million) (E)
Program Total	**$174.51**	**$807.30**	**$852.81**	**($45.51)**	**-**

* Negative number reflects cost increases since last quarter, and positive number reflects cost reduction since last quarter.

Table B. Current Approved vs. Current Forecast Schedule Dates

Program	Current Approved Project Start	Actual Start	Current Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Overall HCIP Program	**10/03/11**	**10/03/11 ✓**	**05/25/37**	**10/30/35**	**18.8 Early**

Program Key Updates:

The key updates for the HCIP include:

- For the SJPL Tesla Valve Replacement project, the new 66-inch diameter butterfly valve and the new 24-inch diameter butterfly valve have been in service without issues since last quarter. In this quarter, the contractor completed punch-list items, including the repair of the exterior coating of the 24-inch butterfly valve, and all remaining field work. The contractor is anticipated to submit as-built drawings and achieve final completion in July 2022.
- For the SJPL Valve and Safe Entry Improvements project, for Phase 1A, the Notice to Proceed (NTP) of Construction Contract HH-1005 was issued on May 6. For Phase 1B, Construction Contract HH-1006 was advertised on April 21; the Engineer's Estimate was $14M. The bids will

be opened on July 7. For Phase 2, the design has started. For Phase 3, the 95% design milestone was achieved this quarter.

- For the Moccasin Powerhouse Bypass Upgrades project, the project team issued NTP for Planning Phase Conceptual Engineering Report (CER) in May 2022. The preferred alternative is to move the bypass system to a location outside of the powerhouse and north of the Moccasin penstocks. The Topographical and Utility Survey has been scheduled for August 2022. The team is evaluating potentially higher construction cost for the preferred alternative.
- For Moccasin Powerhouse (MPH) and Generator Step-Up (GSU) Rehabilitation project, subproject A (HH-1003R, MPH GSU Transformer Installation), partial utilization of the new Delta Star GSU1 transformer was achieved in April 2022. For subproject B (DB-121R2, MPH Generators Rehabilitation), the 100% design drawings for miscellaneous generator rewind items and the Relay Protection and Control Panels were received. Construction Notice to Proceed (NTP) is scheduled for August 2022. For subproject C (MPH Systems Upgrades), the Planning Phase kickoff meeting was held in May 2022 and the Site Walk was completed in June 2022.
- For Transmission Lines 7/8 Upgrades project, progress was achieved in the Bid and Award phase with the formal award of the project by San Francisco Public Utilities Commissioners at the June 28th, 2022 meeting. The Engineers Estimate was stated at $28M and the lowest responsive bidder, Wilson Utilities Construction Company, was awarded the project at $23,980,141. The project is anticipated to issue Notice to Proceed for construction no later than October 1, 2022.
- For the O'Shaughnessy Dam Access & Drainage Improvements project, Substantial Completion was established on May 20. The Contractor is developing final as-builts, and the project team is completing the construction contract closeout.
- For the O'Shaughnessy Dam Outlet Works Phase 1 project, work continues on preparation of a progressive-design-build specification and bid package for the design and construction of the bulkhead. Subproject B (Access & Drainage): The plan and Job Order Contract for a closed-circuit television (CCTV) inspection of the existing dam drain system was finalized; the inspection will be performed in early July. Subproject C (Instream Flow Release Valve Replacement): The Needs Assessment Report/Alternatives Analysis Report (NAR/AAR) was completed and approved by the Technical Steering Committee (TSC) on June 2, 2022. Work began on the Conceptual Engineering Report (CER). The environmental assessment for the proposed project continues.
- For the Mountain Tunnel Improvement project, progress included completing the excavation and initial lining of the Flow Control Facility (FCF) Shaft and 90% completion of the excavation and initial lining of the Upstream and Downstream Bypass Tunnels. The 1,000-foot Priest Adit tunnel excavation and initial lining achieved a completion rate of 90%. Key material items needed for Outage No. 2 are being fabricated and include large diameter steel pipes for the Bypass Tunnels and four double-disc knife-gate valves required for the bottom of the FCF shaft, along with the steel bulkhead door required for the Priest Adit tunnel. Road improvement work along Rickson Road at the Priest Reservoir site is approximately 80%

complete. Safety and road improvement work continues at Adit 8/9, Adit 5/6 and South Fork Roads. Planning and risk management for Outage No. 2 is taking place on a continuous basis.

- For the Bridge Replacement project, on the Lake Eleanor Dam Bridge subproject, the engineering consultant performed additional analyses to address findings from DSOD's structural analysis for the capacity of the existing structure and the proposed alternatives. For the O'Shaughnessy Adit Access Bridge subproject, the draft Alternatives Analysis Report was submitted on May 16th and presented to SFPUC management on June 17th. The project team is scheduled to present the selected alternatives to the Technical Steering Committee for approval on July 7th.
- The Canyon Tunnel Rehabilitation project restarted during this quarter after being placed on hold in 2016 due to need for boundary correction from the Bureau of Land Management (BLM). A cost reimbursement agreement between the SFPUC and BLM was signed and the Right of Way application was submitted to BLM for review during the quarter. Notice to Proceed was issued on April 21st for the professional service consultant to support the project during planning, design, and construction phases. A site visit to evaluate dry side of the plug and observe exposed rock within the Hetch Hetchy Adit was held on May 4th, followed by a workshop to discuss needs and schedule with HHWP on June 1st.

Quarterly Report
Hetch Hetchy
Capital Improvement Program

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HETCH HETCHY WATER AND POWER (HHWP)–

WATER DIVISION CAPITAL IMPROVEMENT PROGRAMS

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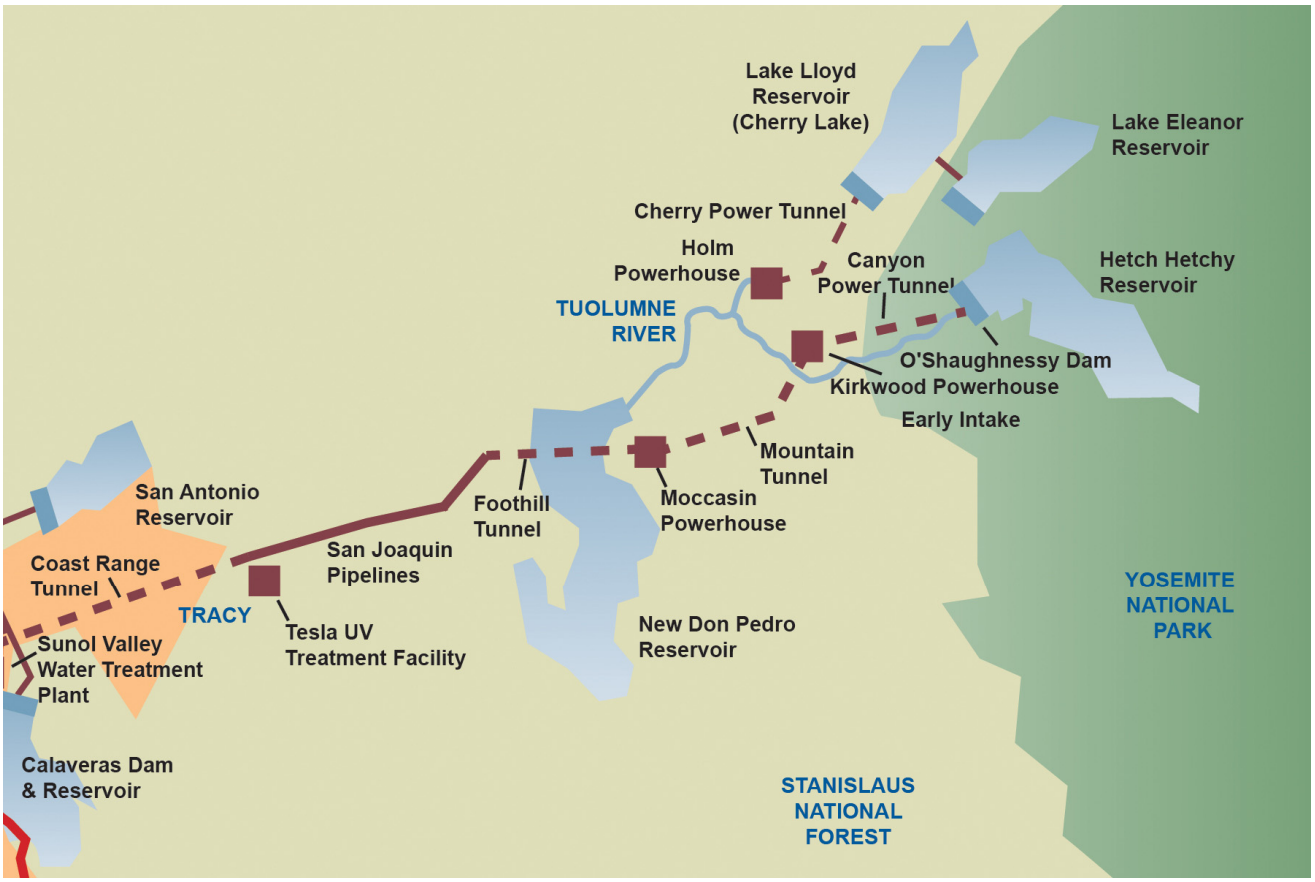
INTRODUCTION

The Hetch Hetchy Water and Power (HHWP) Water Division is the division responsible for operating, managing, and maintaining the upcountry HHWP system and facilities. This includes water facilities that are part of the Regional Water System from Hetch Hetchy Reservoir, located in Yosemite National Park, to Alameda East Portal, located in Sunol Valley, and power facilities located from Cherry Power Tunnel to City of Newark. The HHWP Water Division operates, manages, and maintains three impoundment reservoirs, three regulating reservoirs, four powerhouses, one switchyard, three substations, 170 miles of pipeline and tunnels, almost 50 miles of paved road, and over 160 miles of transmission lines, watershed land, and right-of-way property. The Hetch Hetchy water supply that the HHWP Water Division manages provides 85 percent of the San Francisco Public Utilities Commission (SFPUC) water supply for 2.7 million residential, commercial, and industrial customers in Alameda, Santa Clara, San Mateo, and San Francisco counties. On average, HHWP Water Division generates about 1,650 gigawatt hours (GWH) of clean hydro-generated power annually. A majority of HHWP staff is based in Moccasin, CA, which is 140 miles east of San Francisco.

The HHWP Water Division's capital improvement programs are divided into two programs: Hetch Hetchy Capital Improvement Program (HCIP) and Renewal and Replacement Program (R&R). This report provides a quarterly status update on the HCIP, a group of capital improvement projects that are greater than $5M in value and have been approved by the Commission as part of the SFPUC's 10-Year Capital Improvement Program (CIP). The status of the Hetch Hetchy R&R Program is reported annually in the Annual Report on Water Enterprise-Managed Capital Improvement Projects.

The map below shows the location of the assets and facilities associated with HHWP.



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HETCH HETCHY CAPITAL IMPROVEMENT PROGRAM (HCIP)

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1. PROGRAM DESCRIPTION

The HCIP is a multi-year group of capital projects that upgrades existing and provides new infrastructure to meet the challenges of today and the future. These projects deliver improvements that enhance the SFPUC's ability to provide reliable, affordable, high quality water to its 2.7 million customers in an environmentally sustainable manner. The goals are to 1) provide capital improvements needed to cost-effectively ensure that water quality, seismic reliability, delivery reliability, and water supply objectives established for the Regional Water System facilities managed by HHWP are met, while 2) optimizing the benefits of HHWP power facilities operations. Ongoing development of the HCIP will sustain the Regional Water System's status as an unfiltered water source and a gravity-driven system.

The scope of HCIP is divided into three major project types: Water, Power, and Joint. The Water sub-program includes only asset improvements benefiting the SFPUC's water customers. The Power sub-program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint sub-program includes projects for assets that are used for both water delivery and power generation. In addition, projects in each sub-program of the HCIP have been further organized by asset type consisting of the following:

- Buildings – projects to provide safe, updated, and code compliant work spaces.
- Dams & Reservoirs – projects to improve assets used for storage and delivery of water to SFPUC customers, as well as for water storage for power generation.
- Mountain Tunnel – projects to address deficiencies with the Mountain Tunnel, a critical, non-redundant link in the Hetch Hetchy and Regional Water System that conveys water from Kirkwood Powerhouse to Priest Reservoir.
- Powerhouses – projects to improve facilities at the Holm, Kirkwood, and Moccasin powerhouses.
- Roads & Bridges – projects intended to replace bridges that are utilized to access HHWP assets.
- Switchyard & Substations – projects to meet operational objectives for power, including reliability, regulatory compliance, and sustainability.
- Tunnels – projects to repair tunnels along the HHWP system (other than Mountain Tunnel).
- Water Conveyance – projects to enhance the reliability of water delivery through pipelines and penstocks, allowing for both delivery of water to SFPUC customers and delivery of water to powerhouses for power generation.

2. PROGRAM STATUS

This fourth (4th) quarter (Q4) report for Fiscal Year 2021-2022 (FY21-22) presents the progress made on the HCIP between April 1, 2022 and June 30, 2022. As announced in the first (1st) quarter report for FY21-22, project scopes, budgets and schedules in the Commission's approved 10-Year Capital Plan for FY21-30, approved by the SFPUC Commission on February 11, 2020, serve as the approved baseline herein for comparison to current program and project scope, schedule, and budget forecasts. This baseline for comparison will remain the same until adoption of a new 10-Year CIP; the baseline will be updated with the changes in the adopted CIP at the start of the fiscal year following adoption.

There are seventeen (17) projects in the HCIP together with (3) project development (PD) accounts for program-level expenditures for each of the Water, Power, and Joint Programs. A description of each project and of each project development account is provided in the Appendix A of this Report.

The accrued PD expenditures are included in the Cost Summary in Table 3 in order to give an accurate report of the overall HCIP cost performance.

Figure 2.1 shows the total Approved Budget for all seventeen (17) projects in each phase of the program as of June 30, 2022 (PD accounts do not have phases and are not included in Figure 2.1). The number of projects currently in each phase is shown in parentheses.

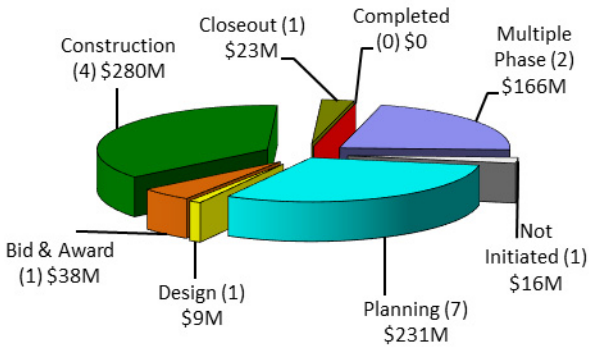


Figure 2.1 Approved Budget for Projects in Each Phase

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

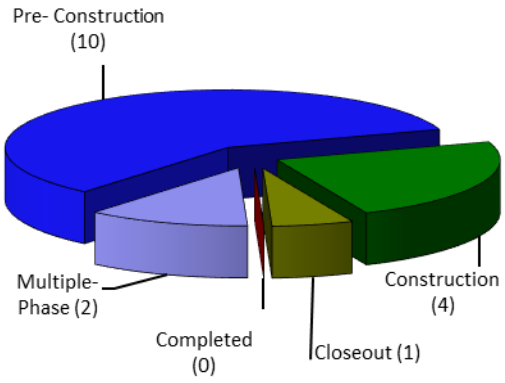


Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-Construction

Figure 2.3 summarizes the environmental review status of the HCIP projects as of June 30, 2022. Environmental review is performed for projects under California Environmental Quality Act (CEQA).

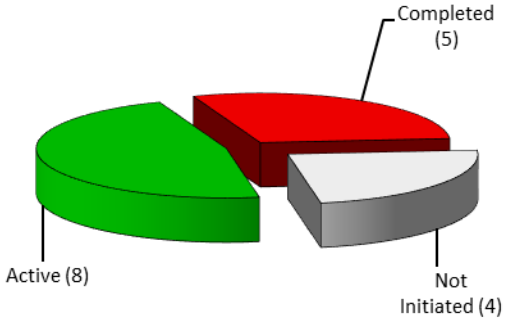


Figure 2.3 Program Environmental Review

3. PROGRAM COST SUMMARY

Table 3 provides an overall cost summary of the approved 17 HCIP projects and 3 HCIP PD accounts at the end of the quarter. It shows the Expenditures to Date, Current Approved Budget, Current Forecast Cost, the Cost Variance between the Approved and Forecast Costs, and the Cost Variance Over the Reporting Period. The Current Approved Budget for the HCIP under the FY21-30 CIP is $807.30 million, while the HCIP Q4FY21-22 Forecasted Cost is $852.81 million, which is $45.51 million over the Approved Budget. This is the same program Cost Variance since the first quarter FY2021/2022.

Table 3. Cost Summary

Subprograms	Expenditures To Date ($ Million) (A)	Current Approved Budget ($ Million) (B)	Q4/FY21-22 Forecasted Costs ($ Million) (C)	Cost Variance ($ Million) (D = B - C)	Cost Variance Over Reporting Period * ($ Million) (E)
Water Infrastructure	**$11.10**	**$109.53**	**$153.27**	**($43.74)**	**-**
Water Conveyance (Water)	$7.04	$102.66	$146.40	($43.74)	-
Water Infrastructure Project Development	$4.06	$6.87	$6.87	-	-
Power Infrastructure	**$64.40**	**$204.24**	**$204.24**	**-**	**-**
Powerhouse	$36.18	$120.94	$120.94	-	-
Switchyard & Substations (Power)	$22.04	$34.25	$34.25	-	-
Transmission Lines	$3.28	$37.97	$37.97	-	-
Power Infrastructure Project Development	$2.90	$11.09	$11.09	-	-
Joint Infrastructure	**$99.01**	**$493.52**	**$495.29**	**($1.77)**	**-**
Water Conveyance (Joint)	$5.63	$47.25	$47.25	-	-
Dams & Reservoirs (Joint)	$5.59	$120.19	$136.88	($16.69)	-
Mountain Tunnel	$78.87	$238.22	$238.22	-	-
Roads & Bridges (Joint)	$1.88	$44.29	$29.37	$14.92	-
Tunnels (Joint)	$0.70	$8.43	$8.43	-	-
Utilities (Joint)	$0.50	$8.79	$8.79	-	-
Joint Infrastructure Project Development	$5.83	$26.34	$26.34	-	-
Overall Program Total	**$174.51**	**$807.30**	**$852.81**	**($45.51)**	**-**

** Negative number reflects cost increases since last quarter, and positive number reflects cost reduction since last quarter.*

The overall program negative Cost Variance of $45.51M in Table 3 can be attributed to the following factors, all of which were reported in the first quarterly report for fiscal year 2021-2022; there have been no new variances since Q1 and none in this quarter:

- $43.74M negative variance is due to the following Water Infrastructure project:
  - o The 10035575 San Joaquin Pipeline (SJPL) Valve and Safe Entry Improvements forecasted costs increased by $43.74M.
- $1.77M negative variance is due to the combined positive and negative variances in the following Joint Infrastructure projects:
  - o The 10032903 O'Shaughnessy Dam (OSD) Outlet Works Phase I forecasted cost increased by $26.69M.
  - o The 10037351 Moccasin Dam Long-Term Improvements forecasted cost decreased by $10.00M.
  - o The 10035086 Bridge Replacement (4 Bridges) forecasted cost decreased by $14.92M.

4. PROGRAM SCHEDULE SUMMARY

Figure 4 and Table 4 compare the FY21 – 30 CIP Approved Schedule and the Current Forecast Schedule for the HCIP. As shown in Table 4, the overall HCIP is currently forecast to be completed in October 2035, which is 18.8 Months before the Approved Completion date of May 2037.

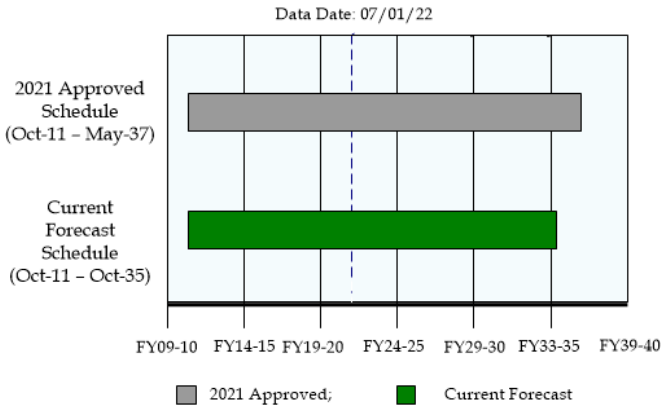


Figure 4. Program Schedule Summary

Table 4. FY21-30 CIP Approved vs. Current Forecast Schedule Dates

Sub-Program	2021 Approved Project Start	Actual Start	2021 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Water Infrastructure	03/26/12	03/26/12✓	06/30/31	06/28/30	12 Early
Power Infrastructure	05/29/12	05/29/12✓	06/30/31	10/30/35	52
Joint Infrastructure	10/03/11	10/03/11✓	05/25/37	06/28/30	82.9 Early
Overall HCIP Projects	**10/03/11**	**10/03/11✓**	**05/25/37**	**10/30/35**	**18.8 Early**

5. BUDGET AND SCHEDULE TREND SUMMARY

Starting with the Q1 FY21-22 Quarterly Report, a revised report format includes a new Table 5, titled Budget and Schedule Trend Summary. This Table 5 contains all approved HCIP projects that are active and in any of the planning, design, bid and award, or construction phases of the project. The table excludes all Project Development accounts, as well as any projects that are either Not-Initiated, On-Hold, in Closeout or Completed.

During this Quarter (Q4 FY21-22), the following major milestones were reached

- Bid Award and Notice to Proceed (NTP) for SJPL Valve and Safe Entry Improvement Phase 1A (HH-1005)
- 95% Design for Phase 2 (under DB-121R2) of Moccasin Powerhouse and Generator Step-Up Unit (GSU) Rehabilitation
- 35% Design for Moccasin Wastewater Treatment Plant

Table 5. Budget and Schedule Trend Summary

All Costs are shown in million

Project Name	Most Recent CIP Approved Budget		Project Initiation		CER		35% Design		95% Design		Awarded Construction[1]		Current Status	
	Approved Budget	Approved Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion
	a	b	c	d	e	f	g	h	i	j	k	l	m	n
Water Infrastructure														
10035574 - SJPL Tesla Valves Replacement	FY21-30		05/01/19		11/27/20		07/28/20		11/17/20		04/06/21		Q4 - FY21-22	
	$3.7	12/30/22	$7.4	06/28/24	$7.4	06/28/24	$7.4	06/28/24	$7.4	06/28/24	$3.7	12/30/22	$3.7	12/30/22
10035575 - SJPL Valve and Safe Entry Improvement	FY21-30		7/1/2019		04/16/21		03/03/21 (Phase 1A), 05/28/21 (Phase 1B), 08/15/22 (Phase 2) & 12/30/21 (Phase 3)		07/14/21 (Phase 1A), 10/29/21 (Phase 1B), 02/15/23 (Phase 2) & 07/29/22 (Phase 3)		05/16/22 (Phase 1A), 10/28/22 (Phase 1B), 11/16/23 (Phase 2) & 04/09/23 (Phase 3)		Q4 - FY21-22	
Phase 1A Phase 1B Phase 2 Phase 3	$98.9	03/13/28	$95.3	07/01/25	$95.3	07/01/25	$98.9	03/13/28	$142.7	03/13/28	$142.7	03/13/28	$142.7	03/13/28
Power Infrastructure														
10036809 - Moccasin Powerhouse Bypass Upgrades	FY21-30		09/18/20		11/07/22		02/24/23		12/26/23		02/28/25		Q4 - FY21-22	
	$15.0	12/01/27	$15.0	12/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$15.0	12/01/27
10014086 - Moccasin Powerhouse and GSU Rehabilitation	FY21-30		01/04/16		05/14/21		07/29/19 (Phase 1), 10/01/19 (Phase 2) & 9/28/22 (Phase 3)		09/09/20 (Phase 1), 05/12/22 (Phase 2) & 03/29/24 (Phase 3)		06/07/21 (Phase 1), 08/08/22 (Phase 2) & 10/02/24 (Phase 3)		Q4 - FY21-22	
Phase 1 Phase 2 Phase 3	$66.7	04/13/27	$18.0	10/03/18	$66.7	04/13/27	$66.7	12/03/27	$66.7	12/03/27	$66.7	12/03/27	$66.7	12/03/27
10014087 - Warnerville Substation Rehabilitation	FY21-30		09/01/15 (Phase 1), 7/01/20 (Phase 2a) & 01/01/21 (Phase 2b)		02/29/16 (Phase 1), 01/18/21 (Phase 2a) & 01/03/23 (Phase 2b)		04/01/16 (Phase 1), 04/22/21 (Phase 2a) & 09/01/23 (Phase 2a)		12/24/16 (Phase 1), 08/16/21 (Phase2a) & 04/04/24 (Phase 2b)		11/26/18 (Phase 1), N/A (Phase 2a) & 02/03/25 (Phase 2b)		Q4 - FY21-22	
Phase 1 (DB-127R) Phase 2a Phase 2b	$34.2	11/25/26	$27.2	11/25/26	$34.2	11/25/26	$34.2	11/25/26	$34.2	11/25/26	$24.3	03/04/20	$34.2	11/25/26
10035721 - Transmission Lines 7/8 Upgrades	FY21-30		07/01/19		12/07/20[2]		03/19/21		09/24/21		10/03/22		Q4 - FY21-22	
	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	$38.0	01/31/25	TBD	TBD	$38.0	01/31/25
Joint Infrastructure														
10014088 - Moccasin Penstock	FY21-30		12/11/18		04/21/23		10/16/23		06/10/24		04/15/25		Q4 - FY21-22	
	$47.3	02/28/28	$13.2	12/31/24	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$47.3	02/28/28
10030758 - OSH Dam Access and Drainage Improvements	FY21-30		03/01/17		06/28/19		09/01/19		08/21/20		09/27/21		Q4 - FY21-22	
	$4.0	02/28/23	$5.8	02/26/21	$5.8	02/26/21	$5.8	02/11/22	$5.8	12/16/22	$4.0	02/28/23	$4.0	02/28/23
10032903 - O'Shaughnessy Dam Outlet Works Phase I[3]	FY21-30		02/01/18		09/30/21 (Subproject A), Complete (Subproject B), 09/30/22 (Subproject C), N/A (Subproject D) & N/A (Subproject E)		N/A (Subproject A), N/A (Subproject B) & 11/07/22 (Subproject C)		N/A (Subproject A), N/A (Subproject B) & 02/07/23 (Subproject C)		05/22/23 (Subproject A), 09/19/23 (Subproject B) & 07/17/23 (Subproject C)		Q4 - FY21-22	
Subproject A Subproject B Subproject C Subproject D (Planning Only) Subproject E (Planning Only)	$21.2	09/16/25	$17.2	12/31/24	$47.9	09/16/25	TBD	TBD	TBD	TBD	TBD	TBD	$47.9	09/16/25
10037351 - Moccasin Dam Long-Term Improvements[3]	FY21-30		05/03/21		12/30/22		07/21/23		12/31/24		05/08/26		Q4 - FY21-22	
	$83.2	07/01/27	$83.2	07/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$73.2	06/30/28
10014115 - Cherry Dam Spillway - Short Term Improvements	FY21-30		03/01/21		02/10/23		07/05/23		04/10/24		08/20/24		Q4 - FY21-22	
	$11.9	07/01/27	$11.9	07/01/27	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$11.9	06/30/27

All Costs are shown in million

Project Name	Most Recent CIP Approved Budget		Project Initiation		CER		35% Design		95% Design		Awarded Construction[1]		Current Status	
	Approved Budget	Approved Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion	Forecasted Cost	Forecasted Completion
	a	b	c	d	e	f	g	h	i	j	k	l	m	n
10014114 - Mountain Tunnel Improvement Project	FY21-30		10/03/11		12/29/17		05/15/18		07/31/19		10/13/20		Q4 - FY21-22	
	$238.2	06/03/27	$114.0	12/30/21	$246.1	12/31/26	$238.2	12/31/26	$238.2	12/31/26	$238.2	06/03/27	$238.2	06/03/27
10035086 - Bridge Replacement (4 - Bridges)	FY21-30		02/27/20		7/18/23 (Subproject 1) & 03/17/23 (Subproject 2)		11/03/23 (Subproject 1) & 05/05/23 (Subproject 2)		6/03/24 (Subproject 1) & 01/12/24 (Subproject 2)		04/18/25 (Subproject 1) & 02/03/25 (Subproject 2)		Q4 - FY21-22	
Subproject 1	$44.3	05/25/37	$44.3	12/30/25	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	$29.4	07/01/27
Subproject 2														
10014108 - Canyon Tunnel Rehabilitation	FY21-30		02/03/14		03/06/23		03/30/16		12/14/23		12/17/24		Q4 - FY21-22	
	$8.4	01/13/25	$0.5	06/30/16	TBD	TBD	$8.0	06/30/18	TBD	TBD	TBD	TBD	$8.4	09/01/26
10014110 - Moccasin Wastewater Treatment Plant[4]	FY21-30		01/03/22		-		04/29/22		12/30/22		11/27/23		Q4 - FY21-22	
	$8.8	04/07/26	$8.8	04/07/26	-	-	$8.8	04/07/26	TBD	TBD	TBD	TBD	$8.8	04/07/26

Footnotes:

1. This represents forecast project cost and project completion date at the time of award of construction contract (or award of CM/GC contracts/packages).
2. This represents the date the Design Criteria Report (DCR) was finalized for Transmission Lines 7/8 Upgrade project. CER was not required for the project.
3. This represents that Contract A will be doing Progressive Design Build during Construction. Contract B is in the process of finalizing the design. Contract D & E will not be doing CER.
4. This represents that the project started during the Design Phase.

6. PROJECT PERFORMANCE SUMMARY*

All costs are shown in $1,000s as of 07/01/22

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 Project Completion Date (h) (+)	Current Approved Completion (i) (++)	Current Forecast Completion (j)	Schedule Variance (Days) (k = i - j) (+++)
Water Infrastructure											
Water Conveyance (Water)											
10035574 - SJPL Tesla Valves Replacement	CN	$ 3,740	$ 3,740	$ 3,740	$ 2,317	-	0%	12/30/22	12/30/22	12/30/22	0
10035575 - SJPL Valve and Safe Entry Improvement	MP	$ 98,924	$ 98,924	$ 142,662	$ 4,721	($43,738)	-44%	03/13/28	03/13/28	03/13/28	0
Power Infrastructure											
Powerhouse											
10036809 - Moccasin Powerhouse Bypass Upgrades	PL	$ 15,007	$ 15,007	$ 15,007	$ 542	-	0%	12/01/27	12/01/27	12/01/27	0
10014086 - Moccasin Powerhouse and GSU Rehabilitation	MP	$ 66,714	$ 66,714	$ 66,714	$ 15,115	-	0%	04/13/27	04/13/27	12/03/27	(234)
Switchyard & Substations (Power)											
10014087 - Warnerville Substation Rehabilitation	CN	$ 34,248	$ 34,248	$ 34,248	$ 22,044	-	0%	11/25/26	11/25/26	11/25/26	0
Transmission Lines											
10035721 - Transmission Lines 7/8 Upgrades	BA	$ 37,969	$ 37,969	$ 37,969	$ 3,276	-	0%	01/31/25	01/31/25	01/31/25	0

* Exclude 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 MP Multiple-Phase

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 or/ and additional contingencies on construction contracts.

(+++) Negative number is reflecting cost overrun (Schedule Delay) and positive number is reflecting cost underrun (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.

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 Project Completion Date (h) (+)	Current Approved Completion (i) (++)	Current Forecast Completion (j)	Schedule Variance (Days) (k = i - j) (+++)
Joint Infrastructure											
Water Conveyance (Joint)											
10014088 - Moccasin Penstock	PL	$ 47,251	$ 47,251	$ 47,251	$ 5,633	-	0%	02/28/28	02/28/28	02/28/28	0
Dams & Reservoirs (Joint)											
10030758 - OSH Dam Access and Drainage Improvements	CN	$ 3,952	$ 3,952	$ 3,952	$ 2,600	-	0%	02/28/23	02/28/23	02/28/23	0
10032903 - O'Shaughnessy Dam Outlet Works Phase I	PL	$ 21,206	$ 21,206	$ 47,894	$ 1,952	($26,688)	-126%	09/16/25	09/16/25	09/16/25	0
10037351 - Moccasin Dam Long-Term Improvements	PL	$ 83,176	$ 83,176	$ 73,176	$ 457	$ 10,000	12%	07/01/27	07/01/27	06/30/28	(365)
10014115 - Cherry Dam Spillway - Short Term Improvements	PL	$ 11,861	$ 11,861	$ 11,861	$ 584	-	0%	07/01/27	07/01/27	06/30/27	1
Mountain Tunnel											
10014114 - Mountain Tunnel Improvement Project	CN	$ 238,219	$ 238,219	$ 238,219	$ 78,874	-	0%	06/03/27	06/03/27	06/03/27	0
Roads & Bridges (Joint)											
10035086 - Bridge Replacement (4 - Bridges)	PL	$ 44,287	$ 44,287	$ 29,371	$ 1,876	$ 14,916	34%	05/25/37	05/25/37	07/01/27	3616

* Exclude 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 MP Multiple-Phase

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 or/ and additional contingencies on construction contracts.

(+++) Negative number is reflecting cost overrun (Schedule Delay) and positive number is reflecting cost underrun (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.

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 Project Completion Date (h) (+)	Current Approved Completion (i) (++)	Current Forecast Completion (j)	Schedule Variance (Days) (k = i - j) (+++)
Joint Infrastructure											
Tunnels (Joint)											
10014108 - Canyon Tunnel Rehabilitation	PL	$ 8,429	$ 8,429	$ 8,429	$ 704	-	0%	01/13/25	01/13/25	09/01/26	(596)
Utilities (Joint)											
10014110 - Moccasin Wastewater Treatment Plant	DS	$ 8,795	$ 8,795	$ 8,795	$ 503	-	0%	04/07/26	04/07/26	04/07/26	0

∗ Exclude 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 MP Multiple-Phase

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 or/ and additional contingencies on construction contracts.

(+++) Negative number is reflecting cost overrun (Schedule Delay) and positive number is reflecting cost underrun (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.

7. PROJECT STATUS REPORT

10035574 - SJPL Tesla Valves Replacement

Project Description: The 2018 approved scope for this project is to replace four large diameter butterfly valves, namely TUV 101, 201, 301 and 401, inside the Tesla Valve Vault so that each of the four San Joaquin Pipelines (SJPL) can be safely isolated and shut down individually for inspection and repair work without shutting down the entire SJPL system. This project will also improve safety for entry into the pipelines for maintenance and inspection purposes. After the planning phase of the related project SJPL Valve and Safe Entry Improvement (Project 10035575) it was recommended that the scope of SJPL Tesla Valve Replacement be reduced, to focus on completing the replacement of TUV101 only. The remainder of the work (i.e. TUV 201, 301 and 401) has been added to the scope of SJPL Valve and Safe Entry Improvement (Project 10035575) to expedite improvements for TUV101 during the planned winter shutdown from January to February 2022 to facilitate necessary maintenance work for SJPL No. 1 during the remainder of 2022. The installation of TUV201, 301 and 401 will proceed together with the upgrade work proposed under SJPL Valve and Safe Entry Improvement, in 2023 and 2024.

Program: Water Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed

Project Cost:

Approved		$3.74 M
Forecast		$3.74 M
Actual		$2.32 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	May-19	Dec-22
Forecast	May-19	Dec-22

Project Percent Complete: 76.7%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	08/26/20✓	N/A	04/06/21✓	07/29/22

Progress and Status:
The new 66-inch diameter butterfly valve and the new 24-inch diameter butterfly valve have been in service without issues since installed last quarter. In this quarter, the contractor completed punch-list items, including repair of the exterior coating of the 24-inch butterfly valve. All the field work has been completed as of the end of this quarter. The contractor is anticipated to finalize the as-built drawings and achieve final completion in July 2022.

Worker performing coating repair for the 24-inch butterfly valve

Issues and Challenges:
None at this time.

10035575 - SJPL Valve and Safe Entry Improvement

Project Description: The San Joaquin Pipelines (SJPLs) consist of three parallel pipelines approximately 48 miles long (completed in 1932, 1953, and 1968, respectively) that cross the San Joaquin Valley from the Oakdale Portal of the Foothill Tunnel on the east end to the Tesla Portal of the Coast Range Tunnel (CRT) on the west. Portions of a fourth pipeline have also been constructed consisting of 6.4 miles of pipe downstream of Oakdale and 11 miles upstream of Tesla. The hydraulic gradient on the SJPLs was limited by surge stacks/towers at Oakdale portal (~825 ft) and Tesla portal (~500 ft). The pipelines were intended to be shut down at Oakdale.

As part of the SFPUC's Water System Improvement Program (WSIP), the Emery and Pelican crossover vaults were installed and the Roselle crossover vault was modified to allow for flows between SJPLs and isolation of SJPL segments for inspection and maintenance. In addition, the Tesla Valve House (TVH) and Tesla Treatment Facility (TTF) were added upstream of the Tesla surge tower. Like the SJPLs, the crossover vaults and Tesla facilities are rated for the maximum pressures that should occur under normal operating conditions. However, the pipelines and pipeline segments still need to be shut down from the upstream end. Closure of multiple in-line valves or all TTF UV reactor valves can over-pressurize the pipelines. As in the original design, complete shutdown of the SJPL system must be done at Oakdale.

The objective of this project is to allow safe entry into any and all sections of the SJPLs for inspection and maintenance while the remainder of the system stays in operation. The scope and budget of installing the TUV201, 301 and 401 butterfly valves has been transferred from project SJPL Tesla Valve Replacement project (10035574) and added to SJPL Valve and Safe Entry Improvement.

Program: Water Infrastructure	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:

Approved	$98.92 M
Forecast	$142.66 M
Actual	$4.72 M

Project Schedule:

Approved	Jul-19	Mar-28
Forecast	Jul-19	Mar-28

Project Percent Complete: 9.6%

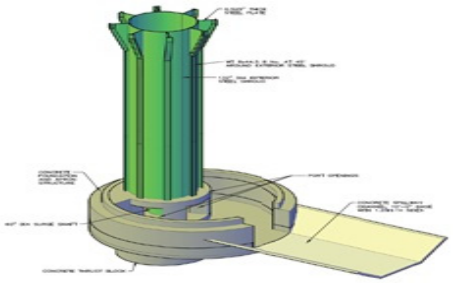
Approved; Actual Cost; Forecast

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 01/27/22✓ (B) 01/27/22✓ (C) 01/27/22✓ (D) 12/06/22	(A) 12/25/21✓ (B) 04/21/22✓ (C) 06/01/23 (D) 10/01/22	(A) 05/16/22✓ (B) 10/28/22 (C) 11/16/23 (D) 04/09/23	(A) 09/13/24 (B) 09/02/24 (C) 05/24/27 (D) 10/24/24

** (A) Phase 1A – Pipeline 2 Tesla & Oakdale Entry Improvements – HH-1005; (B) Phase 1B – Pipelines 3&4 Tesla & Oakdale Entry Improvements HH-1006; (C) Phase 2 -Pelican, Roselle, Emery and P4J Entry Improvements; and (D) Phase 3 - Tesla Surge Tower.*

Progress and Status:

This project is divided into four (4) sub-projects, as specified in the above footnote. For Phase 1A, the Notice to Proceed (NTP) for Construction Contract HH-1005 was issued on May 6. For Phase 1B, Construction Contract HH-1006 was advertised during the quarter on April 21. The Engineer's Estimate was $14M. The bids will be opened next quarter on July 7. For Phase 2, the design phase started this quarter. For Phase 3, the 95% design milestone was achieved this quarter.



Proposed Tesla Surge Tower (Phase 3)

Issues and Challenges:

Surge tower operations are being reviewed to better understand scenarios when the surge tower might overflow. At this time, there is no change in forecast for the overall project budget and schedule.

10036809 - Moccasin Powerhouse Bypass Upgrades

Project Description: Hetch Hetchy water deliveries are conveyed from Priest Reservoir to Moccasin Powerhouse (MPH) through the Moccasin Penstocks. At MPH, water passes through two hydroelectric turbines where energy is converted from high-pressure water into electricity. When electricity is not being produced, the water deliveries are directed around the turbines by two bypass valves that dissipate up to 305 million gallons per day (mgd) at 560 pounds per square inch (psi) of water energy. In the past, short-term use of the bypass system has resulted in significant vibration and cavitation damage to the bypass valves. Long-term use (greater than two to five days) could lead to major mechanical damage or failure, leading in turn to the potential of interruption of water deliveries to San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the Moccasin Reservoir Bypass Pipeline, allowing for increased operating flexibility for HHWP to meet scheduled water deliveries even when MPH, Moccasin Switchyard, or power Transmission Lines #3 and #4 are curtailed.

Program: Power Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved		$15.01 M
Forecast		$15.01 M
Actual		$0.54 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Sep-20	Dec-27
Forecast	Sep-20	Dec-27

Project Percent Complete: 7.3%

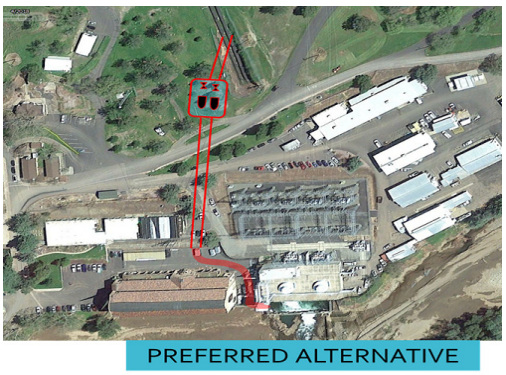
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	08/26/24	08/27/24	02/28/25	06/02/27

Progress and Status:

The project team issued NTP to the consultant for the planning phase conceptual engineering report (CER) in May 2022. The preferred alternative is to move the bypass system to a location outside of the powerhouse and north of the Moccasin penstocks. A topographical and utility survey has been scheduled for August 2022.

Issues and Challenges:

The preliminary planning phase construction cost estimate for the preferred alternative is $16.6M to $21.6M, approximately 100% to 145% higher than the original estimate of $8.8M. The project team will evaluate the effect of this increase on the total project budget and will update forecasts next quarter.



Moccasin Powerhouse Bypass preferred alternative location

10014086 - Moccasin Powerhouse and GSU Rehabilitation

Project Description: The two Moccasin Powerhouse generators were completed in 1969 and generate a combined maximum output of 110 megawatts. Both generator units have exceeded their life expectancy and are in need of repair in order to continue operating reliably. The objective of this project is to replace stator cores and coils. The scope of work also includes rehabilitation of the rotor field poles with new pole cores and re-insulated field coils, replacement of the rotor pole/rim tail connection system with a new T-tail connection system, and supply of a new rotor rim for each generator following inspection and testing. The project will also include replacement of two generator step-up transformers (GSUs) with new oil containment barriers, and remaining plant work including: replacing 480V switchgear, 13.8kV switchgear, motor control centers, main control boards, protective relays, and cooling water piping.

Program: Power Infrastructure	**Project Status:** Multiple Phase	**Environmental Status:** Active

Project Cost:		**Project Schedule:**	
Approved	$66.71 M	Approved Jan-16	Apr-27
Forecast	$66.71 M	Forecast Jan-16	Dec-27
Actual	$15.12 M	Project Percent Complete: 23.2%	

Approved; Actual Cost; Forecast

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 09/28/20✓ (B) 09/28/20✓ (C) 09/28/22	(A) 11/20/20✓ (B) 10/30/20✓ (C) 04/01/24	(A) 06/07/21✓ (B) 08/08/22 (C) 10/02/24	(A) 05/23/23 (B) 06/17/24 (C) 06/07/27

** (A) Moccasin Powerhouse Generator Step-Up (GSU's) Transformers HH-1003R was re-advertised on 1/14/21; (B) Moccasin Powerhouse Generators Rewind – DB-121R2; and (C) Moccasin Powerhouse Systems Upgrade.*

Progress and Status:

This project is divided into 3 subprojects, as specified in the above footnote. For subproject A, HH-1003R, Moccasin Powerhouse (MPH) Generator Step-up (GSU) Transformer Installation, the new Delta Star GSU1 transformer was moved from the spare slot outside the Powerhouse and installed on the new oil containment foundation inside the Powerhouse last quarter, in March. Partial utilization was achieved this quarter, in April. For subproject B, DB-121R2, MPH Generators Rehabilitation, both the 100% design drawings for miscellaneous generator rewind items and the 100% design drawings for the Relay Protection and Control Panels were received from the design-builder. Construction Notice to Proceed (NTP) is scheduled for August 2022, it is anticipated that the two month delay to issuing the construction NTP should not have an impact to construction final completion in June 2024. For subproject C, MPH Systems Upgrades, the Planning Phase kickoff meeting was held in May 2022 and the Site Walk was completed in June 2022.

Generator Winding Bars being formed in factory

Issues and Challenges:

None at this time.

10014087 - Warnerville Substation Rehabilitation

Project Description: This project is based on the need to extend the useful life of the Warnerville Substation and meet reliability requirements of NERC/WECC and PG&E Intertie Agreements. The upgrades include replacing three existing 3 phase transformer with two larger rated transformers. Other upgrades include new 115kV and 230kV disconnect switches and breakers; new Control Room, perimeter fence, relays and controls; improvement to the grading and grounding system.

Program: Power Infrastructure	**Project Status:** Construction	**Environmental Status:** Active

Project Cost:

Approved		$34.25 M
Forecast		$34.25 M
Actual		$22.04 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Sep-15	Nov-26
Forecast	Sep-15	Nov-26

Project Percent Complete: 77.8%

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 03/31/16✓ (B) 07/07/23	(A) 01/24/17✓ (B) 09/06/24	(A) 10/05/17✓ (B) 02/03/25	(A) 03/31/24 (B) 05/04/26

** (A) Warnerville Substation Phase 1 – DB-127R; (B) Warnerville Substation Phase 2.*

Progress and Status:

The project team, in coordination with the City Attorney's office, is working to close out the contract DB-127R, Warnerville Substation Rehabilitation. The design was completed last quarter for the "breaker failure contingency plan" that provides for emergency temporary replacement of any breakers that fail until they can be permanently replaced. The strategy to contract for this work, that would only be required in the event of breaker failure but not otherwise, is still being determined.

Contract HH-1008 Warnerville Substation Rehabilitation Phase 2 will be a design-bid-build contract. Notice To Proceed (NTP) on a task order for engineering services during planning, design and construction was issued in May 2022. The site visit is scheduled for July 2022.

Typical 230KV SF6 Breaker to be Installed as Part of Phase 2

Issues and Challenges:

None at this time.

10035721 - Transmission Lines 7/8 Upgrades

Project Description: This project develops the scope of work, design, and contract documents necessary to bid, award, and manage the reconductoring contract. Reconductoring will include replacement of the existing 115kV conductors on Lines 7/8 from Warnerville to Standiford substations, resulting in improved transmission tower stability, and resolved clearance detections.
The project will be partially funded by independent power generators interconnecting on the California Independent System Operator (CAISO).

Program: Power Infrastructure	**Project Status:** Bid and Award	**Environmental Status:** Completed

Project Cost:

Approved	$37.97 M
Forecast	$37.97 M
Actual	$3.28 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Dec-19	Jan-25
Forecast	Dec-19	Jan-25

Project Percent Complete: 17.2%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	11/04/21✓	02/11/22✓	10/03/22	06/28/24

Progress and Status:
Significant progress was achieved in the Bid/Award phase with the formal award of the project by the San Francisco Public Utilities Commission during the quarter at the June 28 Commission meeting. The Engineers Estimate was $28M and the lowest responsive bidder, Wilson Utilities Construction Company, was awarded the project at $23,980,141. The project is anticipated to issue Notice to Proceed for construction no later than October 1, 2022.

Issues and Challenges:
None at this time.

Transmission Line 7/8 Tower 508S Looking North

10014088 - Moccasin Penstock

Project Description: Moccasin Penstock was built in the early 1920's and conveys Hetch Hetchy water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. Moccasin penstock serves as the sole link in conveying water from Priest Reservoir to Moccasin Reservoir, from which water is routed to the San Francisco Public Utilities Commission (SFPUC) customers. The lower 1,084-foot section of welded steel pipe replaced the original penstocks when the new Moccasin Powerhouse was completed in the 1960s. The upper 4,000 feet of penstock dates to 1924 and has been in service for more than 97 years. Previous condition assessments have identified deficiencies including corrosion, coating damage, lining degradation, leakage, aggregate expansion, cracks in the concrete anchor blocks and saddles, vulnerability of the hammer forged steel pipe sections. The objective of this project is to enhance the reliability of water delivery and extend the life of the penstock system for another 50 to 100 years.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:

Approved	$47.25 M
Forecast	$47.25 M
Actual	$5.63 M

Project Schedule:

Approved	Feb-16	Feb-28
Forecast	Feb-16	Feb-28

Project Percent Complete: 12.7%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	10/07/24	10/07/24	04/15/25	08/24/27

Progress and Status:

A second workshop was held during the quarter, on April 14 to present the needs assessment report (NAR) to Hetch Hetchy Water & Power (HHWP). The NAR was finalized on April 25. A notice of task order change was issued on April 28 to perform condition assessment testing of the penstocks, using destructive testing on samples of the hammer-forged welded steel joints, and non-destructive testing of the pipes. A site visit to evaluate the condition of the Moccasin penstock manway opening and to assess the need for any security measures for the facility was held during the quarter, on May 10. The alternatives analysis (AAR) project phase kick-off meeting with HHWP was held during the quarter, on June 13, to discuss strategy, schedule, and risk for the project.

Site visit to evaluate the Moccasin penstock manway openings

Issues and Challenges:

None at this time.

10030758 - OSH Dam Access and Drainage Improvements

Project Description: The O'Shaughnessy Dam is located 140 miles east of San Francisco, CA in Yosemite National Park, Tuolumne County. The dam, a concrete curved gravity structure, is located on the Tuolumne River across the steep-walled Hetch Hetchy Valley. The interior workings of the dam contain valves and appurtenances that must be accessed for operations and maintenance.
This project includes improvements for safe access, as well as mitigation of excess interior water leakage through drainage improvements, for the Ladder Wells, Galleries, Inclined Stairways, Control Room, and Diversion Tunnel.
The project was reduced in scope of work in 2020 to meet the existing approved budget. The new project will be advertised as O'Shaughnessy Dam-Fall Protection Improvements and Spillway Access to complete the reduced scope of work.
Improvements that were not included in this revised project, such as drainage improvements, will be included in the OSH Dam Outlet Works Phase 1 project.

Program: Joint Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed (CatEx)

Project Cost:

Approved	$3.95 M
Forecast	$3.95 M
Actual	$2.60 M

Approved; Actual Cost; Forecast

Project Schedule:

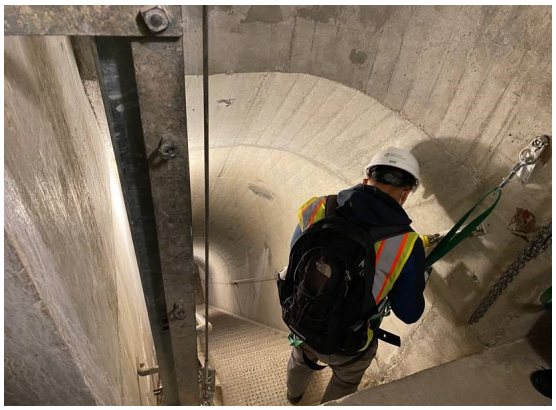
Approved	Mar-17	Feb-23
Forecast	Mar-17	Feb-23

Project Percent Complete: 72.2%

Key Milestones:	**Environmental Approval**	**Bid Advertisement**	**Construction NTP**	**Construction Final Completion**
Current Forecast	07/16/20✓	03/18/21✓	09/27/21✓	08/21/22

Progress and Status:
Substantial Completion was established during the quarter, on May 20. The Contractor is developing final as-builts. The project team is working on the construction contract closeout.

Issues and Challenges:
None at this time.



New Fall Protection – Inclined Stairs

10032903 - O'Shaughnessy Dam Outlet Works Phase I

Project Description: O'Shaughnessy Dam (OSH) was completed in 1923 and raised in 1938. The original outlet works including gates and valves have been in services for more than 98 years. Inspections, condition assessments, and studies concluded that improvements and refurbishments of the outlet works system are needed to ensure safety and reliability. The work will be implemented in two phases. This project is to cover the Phase 1 work. The O'Shaughnessy Dam Outlet Works Phase 1 Project addresses the identified deficiencies of the existing outlet works system at OSH. Phase 1 will include four projects: (1) supply and installation of nine new bulkheads; (2) refurbishment of twelve existing slide gates; (3) rehabilitation of existing drum gates to replace the seals, replace the hinges and rivets, recoating the gates, and repair the spillway concrete; and (4) installation of a new diversion pipe isolation butterfly valve.

The existing control gates and valves are essential features for dam safety and reservoir operation. The project is needed to maintain safe and reliable operation of these aging assets. Failure or malfunction of these gates and valves will affect dam safety and result in reduction of storage and reduction of water deliveries to SFPUC customers.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:

Approved	$21.21 M
Forecast	$47.89 M
Actual	$1.95 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Feb-18	Sep-25
Forecast	Feb-18	Sep-25

Project Percent Complete: 20.7%

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 01/03/23 (B) 12/30/22 (C) 08/30/23	(A) 01/03/23 (B) 04/03/23 (C) 03/07/23	(A) 09/01/23 (B) 11/06/23 (C) 08/31/23	(A) 03/14/25 (B) 06/28/24 (C) 03/27/25

** (A) Bulkhead; (B) Access and Drainage; (C) Instream Flow Release*

Progress and Status:

Subproject A (Bulkhead): During this quarter, work continued on preparation of a progressive-design-build specification and bid package for the design and construction of the bulkhead. Subproject B (Access & Drainage): The plan and a job order contract (JOC) for a closed-circuit television (CCTV) inspection of the existing dam drain system were both finalized this quarter. The drain inspection JOC will be performed next quarter, in early July. Subproject C (Instream Flow Release Valve Replacement): The Needs Assessment Report/Alternatives Analysis Report (NAR/AAR) was completed and approved by the Technical Steering Committee (TSC) on June 2, 2022. Work also began on the Conceptual Engineering Report (CER). The environmental assessment for the proposed project continues. A historic resource evaluation determined that the existing instream flow release valves and the access building do not display sufficient historical significance to be categorized and treated as a historic resource.

O'Shaughnessy Dam Instream Flow Release Valves

Issues and Challenges:

The project schedule is predicated on receiving the Bureau of Land Management (BLM) approval for the Raker Act boundary correction in August. Delay in obtaining the needed boundary correction may impact the project schedule.

10037351 - Moccasin Dam Long-Term Improvements

Project Description: The flow capacity of the existing spillway is inadequate to protect the Moccasin Dam against overtopping and erosion from severe flood events. The dam almost overtopped during the March 2018 storm event when flows were released from the auxiliary spillway and caused significant damage to the auxiliary spillway. The surrounding areas and the upstream diversion dam also sustained damage from the flood. This project is needed for dam safety. The objective of this project is to increase the spillway flow capacity to allow safe passage of flood flows without overtopping the dam and to protect the associated facilities within the Moccasin reservoir boundary against flood damages. The estimated project cost is $83.2 million and is within the current 10-year CIP FY 21-30. Construction is scheduled for 2025-2027.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved	$83.18 M
Forecast	$73.18 M
Actual	$0.46 M

Project Schedule:

Approved	May-21	Jul-27
Forecast	May-21	Jun-28

Project Percent Complete: 2.6%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	06/30/26	01/02/26	09/03/26	12/30/27

Progress and Status:
The engineering consultant continued work on the conceptual engineering phase during the quarter. Geotechnical field exploratory drilling was completed in June. Hydraulic evaluation and conceptual design for the new Moccasin Dam auxiliary spillway and to provide flood protection improvement for the Moccasin powerhouse are in progress.

Issues and Challenges:
None at this time.

Moccasin Geotechnical Drilling

10014115 - Cherry Dam Spillway - Short Term Improvements

Project Description: A spillway release from Cherry Dam in 2010 caused a landslide, blockage of the spill channel, and extensive erosion in the close proximity of the dam's right abutment. In addition, it caused flooding of the Cherry Power Tunnel Adit, and flooding of a campground further downstream. Engineering studies determined that significant long-term improvements to increase the spillway flow capacity are needed to maintain dam safety. The objective of this project is to re-establish containment for the breached spill channel section and to protect the downstream slope of the existing embankment dam from uncontrolled releases and erosion in the interim until the long-term improvements are implemented. Construction is scheduled for 2025-2026. The estimated project cost of $11.9 million is within the current 10-year CIP FY 21-30.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:		**Project Schedule:**	
Approved	$11.86 M	Approved Mar-21	Jul-27
Forecast	$11.86 M	Forecast Mar-21	Jun-27
Actual	$0.58 M	Project Percent Complete: 10.1%	

Approved; Actual Cost; Forecast

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	06/18/24	08/29/24	04/30/25	12/31/26

Progress and Status:

The engineering consultant continued work on the alternative analysis for the Cherry Dam Spillway Short-Term Improvements. Additional hydraulic analysis and alternative study for the lower spillway section are being performed to evaluate the different scopes and costs for alternative improvements that will provide several different levels of flood protection and performance criteria.

Issues and Challenges:

The additional hydraulic analysis and alternative study for the lower spillway will delay completion of the planning phase. The overall project schedule will be re-evaluated when the planning phase is completed.

Cherry Valley Dam Spillway Downstream Channel (looking downstream)

10014114 - Mountain Tunnel Improvement Project

Project Description: Mountain Tunnel conveys the SFPUC water supply from Kirkwood Powerhouse to Priest Reservoir. Mountain Tunnel has been in service since 1925. Due to its age, deferred maintenance, and construction deficiencies in the early 1900s, sections of the tunnel lining have deteriorated, some extensively. This project provides design and construction of major tunnel repair and rehabilitation work, adit and tunnel entry improvements, access road improvements, and installation of a new flow control facility at Priest Reservoir to ensure that the tunnel can reliably provide drinking water to customers for the next 100 years.
The flow control structure and isolation valves will also be used to isolate the tunnel from Priest Reservoir during tunnel shutdowns. This will allow the reservoir to remain full and not backwater for over 8 miles into the dewatered tunnel. The full reservoir provides more supply water for safely extending the tunnel shutdowns to longer durations of 100 days for construction inside the tunnel. These longer outages will reduce the need for more typical 60-day outages and shorten the overall duration of the construction schedule.

Program: Joint Infrastructure	**Project Status:** Construction	**Environmental Status:** Completed

Project Cost:

Approved	$238.22 M
Forecast	$238.22 M
Actual	$78.87 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Oct-11	Jun-27
Forecast	Oct-11	Jun-27

Project Percent Complete: 39.5%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/14/20✓	11/13/19✓	01/29/21✓	08/30/24

Progress and Status:

This quarter's progress included completing 100% of the excavation and initial lining of the Flow Control Facility (FCF) shaft and 90% of the excavation and initial lining of both the Upstream Bypass Tunnel and the Downstream Bypass Tunnel. The 1,000-foot Priest Adit tunnel excavation and initial lining also achieved 90% completion during the quarter. Key material items needed for Outage No. 2 (January 3 through March 8, 2023) are being fabricated at this time and include large diameter steel pipes for the Bypass Tunnels, four double-disc knife-gate valves required for the bottom of the FCF shaft and a steel bulkhead door required for the Priest Adit tunnel. Road improvement work along Rickson Road at the Priest Reservoir site is approximately 80% complete. Safety and road improvement work also continues at Adit 8/9, Adit 5/6 and South Fork Roads. Planning and risk management for Outage No. 2 is taking place on a continuous basis.

Flow Control Facility Shaft and Bypass Tunnels (View from top of shaft looking down)

Issues and Challenges:

None at this time.

10035086 - Bridge Replacement (4 - Bridges)

Project Description: HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessments in 2013 and 2016 determined that, four of these bridges require substantial rehabilitation or replacement: Lake Eleanor Dam Bridge, O'Shaughnessy Adit Access Bridge, Cherry Lake Road Bridge (public access), and Early Intake Bridge (public access). The project will be funded in 2 phases. The first phase will include planning, design and construction of Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge. The planning, design and construction of the Early Intake Bridge and Cherry Lake Road Bridge will be under Phase 2.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Not Initiated

Project Cost:

Approved	$44.29 M
Forecast	$29.37 M
Actual	$1.88 M

Project Schedule:

Approved	Feb-20	May-37
Forecast	Feb-20	Jul-27

Project Percent Complete: 46.9%

Approved; Actual Cost; Forecast

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 09/04/24 (B) 07/31/24	(A) 07/17/24 (B) 08/01/24	(A) 04/18/25 (B) 02/03/25	(A) 09/17/26 (B) 04/13/27

** (A) Lake Eleanor Dam Bridge; and (B) O'Shaughnessy Adit Access Bridge.*

Progress and Status:

This project is divided into 2 subprojects, as specified in the above footnote. For the Lake Eleanor Dam Bridge, the engineering consultant continued work during the quarter on additional analyses to address findings from Department of Safety of Dams (DSOD)s structural analysis. Work continued to further develop the capacity of the existing structure and the proposed alternatives. For the O'Shaughnessy Adit Access Bridge, a follow up meeting to the two previously held workshops was conducted by the consultant with HHWP during the quarter on April 4, and the draft alternatives analysis report (AAR) was submitted on May 16. An alternatives scoring panel workshop was held on May 20, and the draft AAR was presented to Engineering Management Bureau section managers and HHWP on June 17. The project team is scheduled to present the selected alternatives to Technical Steering Committee (TSC) members for approval next quarter, on July 7.

Aerial View of the Lake Eleanor Dam Bridge

Issues and Challenges:

As noted since Q1, the variances between the approved budget and schedule and the forecasted budget and schedule are due to division of the project into two phases, with the planning, design and construction of the Lake Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge within the first phase and funded in the FY21-30 10-Year CIP. The funding for the planning, design and construction of the other two of the four bridges has been deferred until after 2030. The forecasted completion for the two bridges is decreased from the approved completion date of May 2037 to a revised completion date of January 2027. The forecast date of final construction completion for the Lake Eleanor Dam Bridge subproject has increased nine months from the date reported last quarter due to project planning status this quarter incorporating the preliminary alternative study for the Eleanor Bridge to reflect more extensive constructability planning and structural evaluation required.

10014108 - Canyon Tunnel Rehabilitation

Project Description: Canyon Tunnel was built over 45 years ago. A condition assessment was performed on the tunnel in 2009. The tunnel is in generally good condition, with the exception of the Hetch Hetchy Adit, a tunnel access point. Temporary repairs have been made to the plug at this adit twice (once in 1989 and once in 2009), but permanent repairs are needed to reduce leakage and increase reliability of the system. The project scope includes installation of a new, reinforced concrete plug downstream of the existing plug.

Program: Joint Infrastructure	**Project Status:** Planning	**Environmental Status:** Active

Project Cost:

Approved	$8.43 M
Forecast	$8.43 M
Actual	$0.70 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved	Feb-14	Jan-25
Forecast	Feb-14	Sep-26

Project Percent Complete: 9.9%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	07/31/24	08/01/24	02/01/25	02/27/26

Progress and Status:

The project restarted in this quarter after it was placed on hold in 2016 due to right of way issues. Cost Reimbursement agreement with Bureau of Land Management (BLM) has been signed and the Right of Way application has been submitted to Bureau of Land Management for review. Notice to Proceed was issued on April 21st for the professional service consultant to support the project during planning, design and construction phases. A site visit was held on May 4th with HHWP and the consultant to evaluate the dry side of the existing plug and observe exposed rock within the Hetch Hetchy Adit. A workshop was held to present the identified needs and discuss the construction schedule with HHWP on June 1st.

Site visit to evaluate the existing plug at Hetch Hetchy Adit within the Canyon Tunnel.

Issues and Challenges:

The forecasted completion date is 20 months later than the approved completion date due to the time required to obtain the Right of Way boundary correction from BLM.

10014110 - Moccasin Wastewater Treatment Plant

Project Description: The Moccasin Wastewater Treatment Plant (WWTP) project proposes to replace the community's aging treatment plant. Moccasin's treatment plant was installed in the 1970s and has been in continuous service since that time. Wastewater generated by the Moccasin community, powerhouse, and related facilities flows to this treatment plant. The treatment facility currently serving Moccasin was a "package plant" that was manufactured off-site, transported to Moccasin, and installed in 1977. At more than 44-years old, the Moccasin treatment plant has reached the end of its useful service life, and is becoming increasingly maintenance intensive. Additionally, Moccasin has no backup treatment; accordingly, failure of the plant would have significant consequences.

This project will replace the existing wastewater treatment facilities with a Sequence Batch Reactor (SBR) plant. The proposed SBR "package plant" is to be a two-train facility. Each train would have a capacity of 12,000 gallons per day to accommodate average daily dry-weather flow. The new plant would continue to treat wastewater to secondary standards. The new plant will be provided with upgraded screening, flow monitoring, flow equalization, SCADA instrumentation, and automation features. The package plant would be manufactured off-site, trucked to Moccasin, and then installed beside the current plant. The existing plant must serve the Moccasin community while the new plant is being installed and would remain in operation during construction. The proposed project is limited to the treatment plant only and does not include improvements either upstream or downstream of the plant.

Program: Joint Infrastructure	**Project Status:** Design	**Environmental Status:** Active

Project Cost:

Approved		$8.79 M
Forecast		$8.79 M
Actual		$0.50 M

Approved; Actual Cost; Forecast

Project Schedule:

Approved Sep-21		Apr-26
Forecast Jan-22		Apr-26

Project Percent Complete: 7.5%

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	11/14/23	05/09/23	11/28/23	09/09/25

Progress and Status:

Notice to Proceed was issued during the quarter, on April 14, for the professional service consultant to support the project during planning, design and construction phases. A site visit with the consultant, Engineering Management Bureau staff and Hetch Hetchy Water and Power staff to evaluate the existing condition , proposed staging areas, and proposed site layout of the Moccasin Wastewater Treatment plant, was held during the quarter, on May 11. A design criteria report workshop is scheduled to be held next quarter, in early August.

Site visit with HHWP, Consultant, and EMB

Issues and Challenges:

None at this time.

8. On-Going Construction*

The following table reflects active construction contract(s) with an original contract amount greater than $1M.

Construction Contract	Schedule			Budget		Variance (Original - Forecast)		Actual % Complete
	NTP Date	Approved Construction Final Completion	Current Forecast Construction Final Completion*	Approved Contract Cost	Current Forecast Cost*	Schedule (Cal. Days)	Current Forecast Cost	
Water Infrastructure								
10035575 - SJPL Valve & Safe Entry Improvement - Phase 1A - HH-1005	05/16/22	09/13/24	09/13/24	$ 11,879,454	$ 11,879,454	-	-	0.0%
Power Infrastructure								
10014086 - Moccasin Powerhouse Transformers Installation - HH-1003R	06/07/21	05/23/23	05/23/23	$ 3,653,575	$ 3,653,575	-	-	66.4%
10014086 - Moccasin Powerhouse Generator Rehab - DB-121R2	06/21/21	06/17/24	06/17/24	$ 28,898,986	$ 28,898,986	-	-	14.6%
10014087 - Warnerville Switchyard - DB-127R **	10/05/17	07/09/19	03/31/24	$ 14,591,450	$ 14,591,450	(1,727)	-	90.0%
Joint Infrastructure								
10030758 - OSH Dam Access & Drainage Improvement - HH-1002R	09/27/21	08/21/22	08/21/22	$ 1,648,556	$ 1,648,556	-	-	80.4%
10014114 - Mountain Tunnel Improvement - HH-1000R	01/29/21	12/03/26	12/03/26	$ 152,870,508	$ 152,870,508	-	-	22.0%

Program Total for On-Going Construction	Approved Contract Cost	Current Forecast Cost*	Variance	
			Cost	Percent
	$ 213,542,529	**$ 213,542,529**	**$-**	**- %**

Note:

* The Current Forecast Cost and Current Forecast Construction Final Completion include all approved, pending, and potential change orders.

** The contract is funded with both CIP and non-CIP funds, but only the CIP funded amount is reflected.

9. PROJECTS IN CLOSEOUT

Project Title	Current Approved Construction Phase Completion	Actual Construction Phase Completion	Current Approved Construction Phase Budget	Construction Phase Expenditures To Date
Power Infrastructure				
Powerhouse				
10014075 - Holm and Other Powerhouse Projects	05/14/21	05/14/21	$ 15,327,522	$ 12,869,573
TOTAL			$ 15,327,522	$ 12,869,573

10. COMPLETED PROJECTS

There are no completed projects

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APPENDICES

A PROJECT DESCRIPTIONS

B APPROVED PROJECT LEVEL SCHEDULES / BUDGETS

C LIST OF ACRONYMS

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APPENDIX A. PROJECT DESCRIPTIONS

The project titles and descriptions are updated according to the approved 10-year CIP for FY21-30.

HETCH HETCHY CAPITAL IMPROVEMENT PROGRAM (HCIP)

WATER INFRASTRUCTURE

10035574 - SJPL Tesla Valves Replacement

The 2018 approved scope for this project is to replace four large diameter butterfly valves, namely TUV 101, 201, 301 and 401, inside the Tesla Valve Vault so that each of the four San Joaquin Pipelines (SJPL) can be safely isolated and shut down individually for inspection and repair work without shutting down the entire SJPL system. This project will also improve safety for entry into the pipelines for maintenance and inspection purposes. After the planning phase of the related project SJPL Valve and Safe Entry Improvement (Project 10035575) it was recommended that the scope of SJPL Tesla Valve Replacement be reduced, to focus on completing the replacement of TUV101 only. The remainder of the work (i.e. TUV 201, 301 and 401) has been added to the scope of SJPL Valve and Safe Entry Improvement (Project 10035575) to expedite improvements for TUV101 during the planned winter shutdown from January to February 2022 to facilitate necessary maintenance work for SJPL No. 1 during the remainder of 2022. The installation of TUV201, 301 and 401 will proceed together with the upgrade work proposed under SJPL Valve and Safe Entry Improvement, in 2023 and 2024.

10035575 - SJPL Valve and Safe Entry Improvement

The San Joaquin Pipelines (SJPLs) consist of three parallel pipelines approximately 48 miles long (completed in 1932, 1953, and 1968, respectively) that cross the San Joaquin Valley from the Oakdale Portal of the Foothill Tunnel on the east end to the Tesla Portal of the Coast Range Tunnel (CRT) on the west. Portions of a fourth pipeline have also been constructed consisting of 6.4 miles of pipe downstream of Oakdale and 11 miles upstream of Tesla. The hydraulic gradient on the SJPLs was limited by surge stacks/towers at Oakdale portal (~825 ft) and Tesla portal (~500 ft). The pipelines were intended to be shut down at Oakdale.

As part of the SFPUC's Water System Improvement Program (WSIP), the Emery and Pelican crossover vaults were installed and the Roselle crossover vault was modified to allow for flows between SJPLs and isolation of SJPL segments for inspection and maintenance. The intent was to increase operational flexibility and the overall reliability of the SJPL System. In addition, the Tesla Valve House (TVH) and Tesla Treatment Facility (TTF) were added upstream of the Tesla surge tower. Like the SJPLs, the crossover vaults and Tesla facilities are rated for the maximum pressures that should occur under normal operating conditions. However, the pipelines and pipeline segments still need to be shut down from the upstream end. Closure of multiple in-line valves or all TTF UV reactor valves can over-pressurize the pipelines. As in the original design, complete shutdown of the SJPL system must be done at Oakdale.

The objective of this project is to allow safe entry into any and all sections of the SJPLs for inspection and maintenance while the remainder of the system stays in operation. The project objective is not to upgrade the entire SJPL system to the maximum possible static or transient pressures, nor to upgrade all components in vaults to prevent possible flooding of the vaults. However, the proposed surge tower will protect the entire SJPL system from high static and transient pressure caused by operation of valves at Tesla Treatment Facility. The scope and budget of installing the TUV201, 301 and 401 butterfly valves has been transferred from project SJPL Tesla Valve Replacement project (10035574) and added to

SJPL Valve and Safe Entry Improvement.

10014072 – WATER ONLY/PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

POWER INFRASTRUCTURE

10036809 - Moccasin Powerhouse Bypass Upgrades

Hetch Hetchy water deliveries are conveyed from Priest Reservoir to Moccasin Powerhouse (MPH) through the Moccasin Penstocks. At MPH, water passes through two hydroelectric turbines where energy is converted from high-pressure water into electricity. When electricity is not being produced, the water deliveries are directed around the turbines by two bypass valves that dissipate up to 305 million gallons per day (mgd) at 560 pounds per square inch (psi) of water energy. In the past, short-term use of the bypass system has resulted in significant vibration and cavitation damage to the bypass valves. Long-term use (greater than two to five days) could lead to major mechanical damage or failure, leading in turn to the potential of interruption of water deliveries to San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the Moccasin Reservoir Bypass Pipeline, allowing for increased operating flexibility for HHWP to meet scheduled water deliveries even when MPH, Moccasin Switchyard, or power Transmission Lines #3 and #4 are curtailed.

10036810 - Kirkwood Powerhouse Bypass Upgrades

Hetch Hetchy water deliveries are conveyed through the Canyon Tunnel to the Canyon Portal Valvehouse. Water then enters the Kirkwood Penstock and drops 1,245 feet in elevation to the Kirkwood Powerhouse (KPH). At KPH, water passes through three hydroelectric turbines where energy is converted from high-pressure water into electricity, producing a maximum output of 124 megawatts at a maximum flow of 1,408 cubic feet per second. When electricity is not being produced, the water deliveries are directed around the turbines through a separate bypass system consisting of a spherical guard valve and a 90-degree needle valve for flow control. Based on a condition assessment of KPH performed in 2010, existing control problems limit operation of the bypass needle valve to no more than 70% open. An inspection of the bypass valve and dissipation structure in 2016 indicated that the stainless steel dissipator had failed, causing damage at the base of a steel shaft column leading to the bypass tunnel. Repairs to the dissipator, bypass draft tube, and bypass chamber were completed in 2017, but the steel lining protecting the bypass chamber's concrete walls and floor subsequently failed after bypass usage. Additional repairs were made to the steel lining of the bypass in 2019 under the HH-991 2018 Mountain Tunnel Interim Repairs construction contract. Long-term use (greater than two to five days) could lead to major mechanical damage or failure, leading to potential interruption of water deliveries to

San Francisco. This project will provide a reliable hydraulic bypass and energy dissipation system for conveying water around the turbines to the KPH Bypass Chamber and Mountain Tunnel, allowing for increased operating flexibility for Hetch Hetchy Water & Power (HHWP) to meet scheduled water deliveries when KPH is not generating electricity.

10014075 - Holm and Other Powerhouse Projects

This project provided funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under $1 million involving power generation renewal and equipment replacement. The upgrade and rehabilitation of HPH Unit 2 included 13.8 Kv equipment upgrades, addition and integration of a generator breaker, replacement of two 13.8kV feed breakers, replacement of Unit 2 Main Control Board, and any necessary tasks to match Unit 2 to Unit 1. System integration work was done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into the existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project included upgrades to turbine and generators and to alternating current stations, intended to extend the life of the unit by 20 years. Lastly, the project upgraded the existing oil containment systems at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators were replaced, and other modifications were made to the powerhouse interiors and to the transformer decks, to discourage contaminated discharges into the adjacent streams. A monitoring system was installed to alert HHWP of excessive leakage and the need to manually pump oil containment vessels. Failure of the oil containment systems at the powerhouses would likely result in environmental contamination, fines, additional regulatory exposure, and the need for rehabilitation and cleanup.

10014086 - Moccasin Powerhouse and GSU Rehabilitation

The two Moccasin Powerhouse generators were completed in 1969 and generate a combined maximum output of 110 megawatts. Both generator units have exceeded their life expectancy and are in need of repair in order to continue operating reliably. The objective of this project is to replace stator cores and coils. The scope of work also includes rehabilitation of the rotor field poles with new pole cores and re-insulated field coils, replacement of the rotor pole/rim tail connection system with a new T-tail connection system, and supply of a new rotor rim for each generator following inspection and testing. The project will also include replacement of two generator step-up transformers (GSUs) with new oil containment barriers, and remaining plant work including: replacing 480V switchgear, 13.8kV switchgear, motor control centers, main control boards, protective relays, and cooling water piping.

10014087 - Warnerville Substation Rehabilitation

This project is needed to extend the useful life of the Warnerville Substation and meet reliability requirements of NERC/WECC and PG&E Intertie Agreements. The upgrades include replacing three existing 3 phase transformer with two larger rated transformers. Other upgrades include new 115kV and 230kV disconnect switches and breakers; new Control Room, perimeter fence, relays and controls; improvement to the grading and grounding system.

10035721 - Transmission Lines 7/8 Upgrades

The SFPUC electric transmission lines 7/8 conveys power from Warnerville Substation to Modesto Irrigation District's (MID) Standiford Substation. The SFPUC must accommodate additional power flowing across its

transmission system due to grid interconnection requests from independent power generators interconnecting on the California Independent System Operator (CAISO). This is a requirement for SFPUC and HHWP obligations as a neighboring provider of electric transmission service.

Studies performed by the SFPUC indicate the principal impact to its system is an overload of 115kV Lines 7&8 between HHWP Warnerville Substation and MID Standiford Substation under contingency conditions if interconnections are made without modification to the system's capacity. Without modifications, the SFPUC and HHWP transmission system could face reliability issues. Reconductoring also resolves multiple locations where the clearance between the existing conductors and the ground or structures does not meet current safe clearance regulations.

This project develops the scope of work, design, and contract documents necessary to bid, award, and manage the reconductoring contract. Reconductoring will include replacement of the existing 115kV conductors on Lines 7/8 from Warnerville to Standiford substations, resulting in improved transmission tower stability, and resolved clearance detections.

The project will be partially funded by independent power generators interconnecting on the California Independent System Operator (CAISO).

10014092 - POWER ONLY/PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

JOINT INFRASTRUCTURE

10014088 - Moccasin Penstock

Moccasin Penstock was built in the early 1920's and conveys Hetch Hetchy water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. Moccasin penstock serves as the sole link in conveying water from Priest Reservoir to Moccasin Reservoir, from which water is routed to the San Francisco Public Utilities Commission (SFPUC) customers. The lower 1,084-foot section of welded steel pipe replaced the original penstocks when the new Moccasin Powerhouse was completed in the 1960s. The upper 4,000 feet of penstock dates to 1924 and has been in service for more than 97 years. Previous condition assessments have identified deficiencies including corrosion, coating damage, lining degradation, leakage, aggregate expansion, cracks in the concrete anchor blocks and saddles, vulnerability of the hammer forged steel pipe sections. The objective of this project is to enhance the reliability of water delivery and extend the life of the penstock system for another 50 to 100 years.

10030758 – OSH Dam Access and Drainage Improvements

The O'Shaughnessy Dam is located 140 miles east of San Francisco, CA in Yosemite National Park, Tuolumne County. The dam, a concrete curved gravity structure, is located on the Tuolumne River across the steep walled Hetch Hetchy Valley. The interior workings of the

dam contain valves and appurtenances that must be accessed for operations and maintenance. This project includes improvements for safe access, as well as mitigation of excess interior water leakage through drainage improvements, for the Ladder Wells, Galleries, Inclined Stairways, Control Room, and Diversion Tunnel. The project was reduced in scope of work in 2020 to meet the existing approved budget. The new project will be advertised as O'Shaughnessy Dam-Fall Protection Improvements and Spillway Access to complete the reduced scope of work. Improvements that were not included in this revised project, such as drainage improvements, will be included in the OSH Dam Outlet Works Phase 1 project.

10032903 – O'Shaughnessy Dam Outlet Works Phase 1

O'Shaughnessy Dam (OSH) was completed in 1923 and raised in 1938. The original outlet works including gates and valves have been in services for more than 98 years. Inspections, condition assessments, and studies concluded that improvements and refurbishments of the outlet works system are needed to ensure safety and reliability. The work will be implemented in two phases. This project is to cover the Phase 1 work. The O'Shaughnessy Dam Outlet Works Phase 1 Project addresses the identified deficiencies of the existing outlet works system at OSH. Phase 1 will include four projects: (1) supply and installation of nine new bulkheads; (2) refurbishment of twelve existing slide gates; (3) rehabilitation of existing drum gates to replace the seals, replace the hinges and rivets, recoating the gates, and repair the spillway concrete; and (4) installation of a new diversion pipe isolation butterfly valve. The existing control gates and valves are essential features for dam safety and reservoir operation. The project is needed to maintain safe and reliable operation of these aging assets. Failure or malfunction of these gates and valves will affect dam safety and result in reduction of storage and reduction of water deliveries to SFPUC customers.

10037351 – Moccasin Dam Long-Term Improvements

The flow capacity of the existing spillway is inadequate to protect the Moccasin Dam against overtopping and erosion from severe flood events. The dam almost overtopped during the March 2018 storm event when flows were released from the auxiliary spillway and caused significant damage to the auxiliary spillway. The surrounding areas and the upstream diversion dam also sustained damage from the flood. This project is needed for dam safety. The objective of this project is to increase the spillway flow capacity to allow safe passage of flood flows without overtopping the dam and to protect the associated facilities within the Moccasin reservoir boundary against flood damages. The estimated project cost is $83.2 million and is within the current 10-year CIP FY 21-30. Construction is scheduled for 2025-2027.

10014115 – Cherry Dam Spillway - Short Term Improvements

A spillway release from Cherry Dam in 2010 caused a landslide, blockage of the spill channel, and extensive erosion in the close proximity of the dam's right abutment. In addition, it caused flooding of the Cherry Power Tunnel Adit, and flooding of a campground further downstream. Engineering studies determined that significant long-term improvements to increase the spillway flow capacity are needed to maintain dam safety. The objective of this project is to re-establish containment for the breached spill channel section and to protect the downstream slope of the existing embankment dam from uncontrolled releases and erosion in the interim until the long-term improvements are implemented. Construction is scheduled for 2025-2026. The estimated project cost of $11.9 million is within the current 10-year CIP FY

21-30.

10014114 – Mountain Tunnel Improvement Project

Mountain Tunnel conveys the SFPUC water supply from Kirkwood Powerhouse to Priest Reservoir. Mountain Tunnel has been in service since 1925. Due to its age, deferred maintenance, and construction deficiencies in the early 1900s, sections of the tunnel lining have deteriorated, some extensively. This project provides design and construction of major tunnel repair and rehabilitation work, adit and tunnel entry improvements, access road improvements, and installation of a new flow control facility at Priest Reservoir to ensure that the tunnel can reliably provide drinking water to customers for the next 100 years. The flow control structure and isolation valves will also be used to isolate the tunnel from Priest Reservoir during tunnel shutdowns. This will allow the reservoir to remain full and not backwater for over 8 miles into the dewatered tunnel. The full reservoir provides more supply water for safely extending the tunnel shutdowns to longer durations of 100 days for construction inside the tunnel. These longer outages will reduce the need for more typical 60-day outages and shorten the overall duration of the construction schedule.

10035086 – Bridge Replacement (4 Bridges)

HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessments in 2013 and 2016 determined that, four of these bridges require substantial rehabilitation or replacement: Lake Eleanor Dam Bridge, O'Shaughnessy Adit Access Bridge, Cherry Lake Road Bridge (public access), and Early Intake Bridge (public access). The project will be funded in 2 phases. The first phase will include planning, design and construction of Eleanor Dam Bridge and O'Shaughnessy Adit Access Bridge as well as the planning and design of the other two bridges. The construction of the Early Intake Bridge and Cherry Lake Road Bridge will be under Phase 2.

10014108 – Canyon Tunnel Rehabilitation

Canyon Tunnel was built over 45 years ago. A condition assessment was performed on the tunnel in 2009 and the tunnel is in generally good condition, with the exception of the Hetchy Adit, a tunnel access point. Temporary repairs have been made to the plug at this adit twice (once in 1989 and once in 2009), but permanent repairs are needed to reduce leakage and increase reliability of the system. The project scope includes installation of a new reinforced concrete plug downstream of the existing plug.

10014110 – Moccasin Wastewater Treatment Plant

The Moccasin Wastewater Treatment Plant (WWTP) project proposes to replace the community's aging treatment plant. Moccasin's treatment plant was installed in the 1970s and has been in continuous service since that time. Wastewater generated by the Moccasin community, powerhouse, and related facilities flows to this treatment plant. The treatment facility currently serving Moccasin was a "package plant" that was manufactured off-site, transported to Moccasin, and installed in 1977. At more than 44-years old, the Moccasin treatment plant has reached the end of its useful service life, and is becoming increasingly maintenance intensive. Additionally, Moccasin has no backup treatment; accordingly, failure of the plant would have significant consequences.

This project will replace the existing wastewater treatment facilities with a Sequence Batch Reactor (SBR) plant. The proposed SBR "package plant" is to be a two-train facility. Each train would have a capacity of 12,000 gallons per day to accommodate average daily dry-weather flow.

The new plant would continue to treat wastewater to secondary standards. The new plant will be provided with upgraded screening, flow monitoring, flow equalization, SCADA instrumentation, and automation features. The package plant would be manufactured off-site, trucked to Moccasin, and then installed beside the current plant. The existing plant must serve the Moccasin community while the new plant is being installed and would remain in operation during construction. The proposed project is limited to the treatment plant only and does not include improvements either upstream or downstream of the plant.

10014116 – JOINT - PROJECT DEVELOPMENT

The Project Development (PD) Account captures Program level expenditures. There are four types of charges that will be allocated to the PD Account: 1) charges for task orders for overall program management and project prioritization tasks, where the costs should be distributed over all Capital Improvement Program (CIP) Projects; 2) charges for Infrastructure and Hetchy staff performing program level tasks including: capital plan development, budget management (including fund management, and cost reallocations), and quarterly report generation tasks, where the costs should be distributed over all CIP Projects; 3) charges for portal support for the existing SharePoint Portal (includes document management and project dashboard reporting); and 4) charges for work outreach programs.

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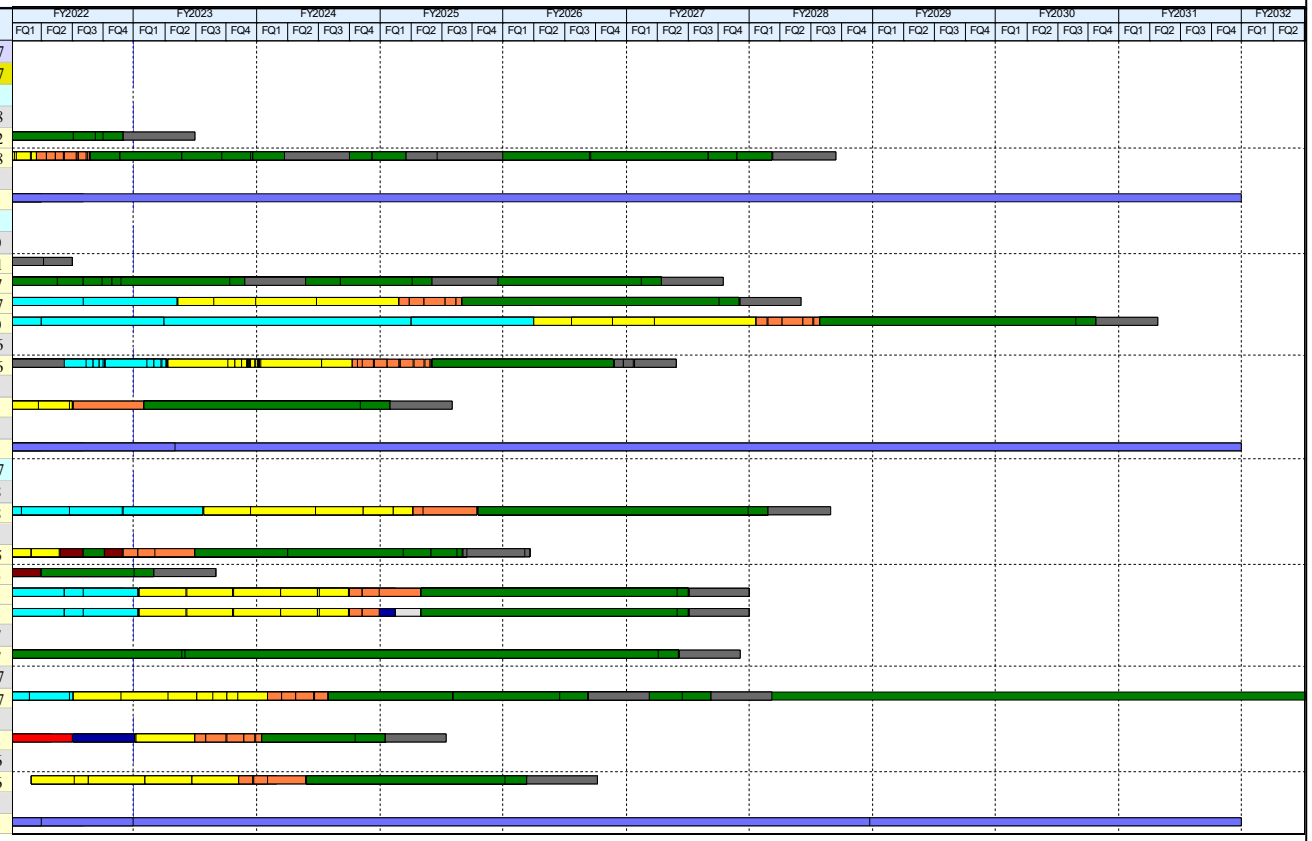
APPENDIX B. Hetch Hetchy Capital Improvement Program Approved Project Level Schedules/Budgets

Project Name	Approved Budget	Start	Finish
Hetchy Capital Improvement Program	$807,296,327.49	03-Oct-11	25-May-37
Hetch Hetchy Water Enterpise	$807,296,327.49	03-Oct-11	25-May-37
Water Infrastructure	$109,533,203.01	26-Mar-12	30-Jun-31
Water Conveyance (Water)	$102,664,000.01	01-May-19	13-Mar-28
10035574 SJPL Tesla Valves Replacement	$3,740,000.00	01-May-19	30-Dec-22
10035575 SJPL Valve and Safe Entry Improvement	$98,924,000.00	01-Jul-19	13-Mar-28
Water Infrastructure Project Development	$6,869,203.00	26-Mar-12	30-Jun-31
10014072 WATER ONLY/PROJ DEV	$6,869,203.00	26-Mar-12	30-Jun-31
Power Infrastructure	$204,242,684.48	29-May-12	30-Jun-31
Powerhouse	$120,938,715.48	03-Sep-13	23-Oct-30
10014075 Holm and Other Powerhouse Projects	$23,061,080.48	03-Sep-13	30-Dec-21
10014086 Moccasin Powerhouse and GSU Rehabilitation	$66,713,635.00	04-Jan-16	13-Apr-27
10036809 Moccasin Powerhouse Bypass Upgrades	$15,007,000.00	18-Sep-20	01-Dec-27
10036810 Kirkwood Powerhouse Bypass Upgrades	$16,157,000.00	01-Jul-20	23-Oct-30
Switchyard & Substations (Power)	$34,248,428.00	01-Sep-15	25-Nov-26
10014087 Warnerville Substation Rehabilitation	$34,248,428.00	01-Sep-15	25-Nov-26
Transmission Lines	$37,969,000.00	02-Dec-19	31-Jan-25
10035721 Transmission Lines 7/8 Upgrades	$37,969,000.00	02-Dec-19	31-Jan-25
Power Infrastructure Project Development	$11,086,541.00	29-May-12	30-Jun-31
10014092 POWER ONLY/PROJ DEVELP	$11,086,541.00	29-May-12	30-Jun-31
Joint Infrastructure	$493,520,440.00	03-Oct-11	25-May-37
Water Conveyance (Joint)	$47,251,363.00	01-Feb-16	28-Feb-28
10014088 Moccasin Penstock	$47,251,363.00	01-Feb-16	28-Feb-28
Dams & Reservoirs (Joint)	$120,194,998.00	01-Mar-17	01-Jul-27
10032903 O'Shaughnessy Dam Outlet Works Phase I	$21,206,000.00	01-Feb-18	16-Sep-25
10030758 OSH Dam Access and Drainage Improvements	$3,952,211.00	01-Mar-17	28-Feb-23
10037351 Moccasin Dam Long-Term Improvements	$83,175,822.00	03-May-21	01-Jul-27
10014115 Cherry Dam Spillway - Short Term Improvements	$11,860,965.00	01-Mar-21	01-Jul-27
Mountain Tunnel	$238,218,951.00	03-Oct-11	03-Jun-27
10014114 Mountain Tunnel Improvement Project	$238,218,951.00	03-Oct-11	03-Jun-27
Road and Bridges (Joint)	$44,287,000.00	27-Feb-20	25-May-37
10035086 Bridge Replacement (4 - Bridges)	$44,287,000.00	27-Feb-20	25-May-37
Tunnels (Joint)	$8,428,813.00	03-Feb-14	13-Jan-25
10014108 Canyon Tunnel Rehabilitation	$8,428,813.00	03-Feb-14	13-Jan-25
Utilities (Joint)	$8,794,549.00	01-Sep-21	07-Apr-26
10014110 Moccasin Wastewater Treatment Plant	$8,794,549.00	01-Sep-21	07-Apr-26
Joint Infrastructure Project Development	$26,344,766.00	25-Jun-12	30-Jun-31
10014116 JOINT - PROJECT DEVELOPMENT	$26,344,766.00	25-Jun-12	30-Jun-31



Project Management
Environmental
Right-of-Way
Construction Mgmt
Closeout
Planning
Design
Bid & Award
Construction
Program Mgmt

APPENDIX C. LIST OF ACRONYMS

AAR	Alternative Analysis Report
BLM	Bureau of Land Management
CAISO	California Independent System Operator
CATEX	Categorical Exemption
CCTV	Closed-Circuit Television
CEQA	California Environmental Quality Act
CER	Conceptual Engineering Report
CIP	Capital Improvement Program
CRT	Coast Range Tunnel
DB	Design, Build
DCR	Design Criteria Report
DSOD	Division of Safety of Dams
EMB	Engineering Management Bureau
FCF	Flow Control Facility
FY	Fiscal Year
GSU	Generator Step-Up
GWH	Gigawatt Hours
HCIP	Hetch Hetchy Capital Improvement Program
HH	Hetch Hetchy
HHWP	Hetch Hetchy Water and Power
HPH	Holm Powerhouse
IFR	Instream Flow Release
JOC	Job Order Contract
KPH	Kirkwood Powerhouse
MGD	Million Gallons per Day
MID	Modesto Irrigation District
MPH	Moccasin Powerhouse
NAR	Needs Assessment Report
NERC	North American Electric Reliability Corporation
NTP	Notice to Proceed
OSH	O'Shaughnessy Dam
PD	Project Development
PG&E	Pacific Gas and Electric Company
PLC	Programmable Logic Controllers
PSI	Per Square Inch
R&R	Renewal and Replacement
SBR	Sequence Batch Reactor
SCADA	Supervisory Control and Data Acquisition
SFPUC	San Francisco Public Utilities Commission
SJPL	San Joaquin Pipeline
TSC	Technical Steering Committee
TTF	Tesla Treatment Facility
TUV	Tesla Ultra Violet
TVH	Tesla Valve House
WSIP	Water System Improvement Program
WWTP	Wastewater Treatment Plant