

Hetch Hetchy Capital Improvement Programs

Quarterly Report – Fiscal Year 2020-2021

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DATE: November 17, 2020

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

FROM: Harlan L. Kelly, Jr., General Manager 

RE: Hetch Hetchy Capital Improvement Programs Quarterly Report
 1st Quarter / Fiscal Year 2020-2021

Enclosed please find the Hetch Hetchy Capital Improvement Programs Quarterly Report for the 1st Quarter (Q1) of Fiscal Year (FY) 2020-2021. 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, 2020 to September 30, 2020.

This quarterly report incorporates the Hetch Hetchy Capital Improvement Programs 2018 Proposed Baseline that was approved by the San Francisco Public Utilities Commission (SFPUC) on December 11, 2018. The scopes, schedules, and budgets are included for individual projects over \$5M that are currently active or planned to be active within FY19/20 or FY20/21 and are part of the Hetchy Capital Improvement Projects (HCIP), a sub-set of projects within the adopted SFPUC Ten-Year Capital Plan for FY18/19 through FY27/28 for the Hetch Hetchy Water and Power (HHWP) Division of the Water Enterprise.

This report also includes a status summary of the Hetch Hetchy Renewal and Replacement (R&R) programs, including Water, Power, and Joint assets. The progress of these R&R programs is measured and reported upon based on the status of planned milestones at the end of the reporting quarter and forecast milestones for the subsequent quarter.

It should be noted that this report does not include all the expenditures accrued for the work completed from July 1 through September 30, 2020 due to challenges associated with the migration of the City financial system from FAMIS to PeopleSoft. We are working diligently with the Controller’s Office to address these challenges.

London N. Breed
 Mayor

Sophie Maxwell
 President

Anson Moran
 Vice President

Tim Paulson
 Commissioner

Ed Harrington
 Commissioner

Harlan L. Kelly, Jr.
 General Manager



As mentioned last quarter, on March 16, 2020, the Department of Public Health issued a shelter-in-place order, Order No. C19-07, effective March 17, 2020. In compliance with this order, nearly 1,200 SFPUC employees have been working remotely. Employees who have been deemed essential to continue operations by reporting to SFPUC facilities are doing so to deliver water, power and sewer services to the communities we serve.

Following the shelter-in-place order, on March 18, 2020, SFPUC issued a memo to the construction contractors stating that public works construction projects are considered an “essential activity” and work is expected to continue, but contractors are required to stop work temporarily and submit a revised Site-Specific Health and Safety Plan to address COVID-19 safety and protective work practices for SFPUC review by close of business on March 20, 2020.

On March 20, 2020, a letter was issued to contractors from the City Administrator. The letter noted that The City was prepared to partner with contractors to take steps to make projects as safe as possible for employees to help keep projects moving forward and determine if Social Distancing Requirements can be met.

On March 31, 2020, the Health Officer issued Health Order No. C19-07b, replacing the earlier March 16, 2020 order. The order requires the City Administrator, in consultation with the Health Officer, to specifically designate certain public works projects as an Essential Government Function if they are to continue during this shelter-in-place order.

Additionally, contractors were provided with the Construction Safety Guidelines, dated April 1, 2020, developed by City representatives and the San Francisco Building and Construction Trades Council, with input from construction industry contractors’ associations. This document provides industry guidelines for safe practices at construction work sites. Accordingly, Contractors were required to prepare and submit updated Site-Specific Health and Safety Plan to address COVID-19 issues at each site.

Furthermore, on April 15, 2020, the City Administrator’s Office issued Procedures for Implementation and Enforcement of COVID-19 Field Safety Guidelines for Public Works Projects.

And, on April 29, 2020, the Health Officer issued Health Order No. C19-07c, extending the shelter-in-place through the end of May. This new order went into effect on May 4, 2020 and all construction was allowed to resume as long as specific safety measures are in place. The Health Order C19-07c also provides Safety protocols for both small and large construction projects. Lastly, on May 5, 2020, the Health Officer issued a directive requiring that each contractor for a City public works project to comply with all aspects of these safety protocols.

During the months following, staff coordinated with the Enterprises to implement worksite health screenings and communication plans. The SFPUC’s construction management teams developed procedures and practices to fulfill the City’s role as mandated by the “Public Works Project Safety Protocol for COVID-19” through inspection of worksites to assure worker compliance with the contractors’ approved Health and Safety Plans.

Due to anticipated financial impacts from the pandemic, staff worked on revising the 10-year Capital Improvement Program (CIP) budget to ensure we can continue essential services to the public and maintain our financial sustainability. On July 14, 2020, a Revised CIP plan was submitted and approved by the Commission.

The highlights for this reporting period are as follows:

For Contract No. HH-989, Holm Powerhouse Rehabilitation and Kirkwood Powerhouse Oil Containment, the contractor met Substantial Completion and performed punch list and warranty work this quarter.

For the Moccasin Powerhouse and GSU Rehabilitation project, development of the bid package for the design-build contract to rewind the generators progressed, with anticipated advertisement during the next quarter. The procurement package for purchasing the generator step-up transformers was advertised in July; two bids were received and were being reviewed during the quarter.

For O'Shaughnessy Dam Access and Drainage Improvements, Contract No. HH-1002 was advertised for construction; bids are due next quarter.

For the Mountain Tunnel Improvement project, two bids were received and opened on August 27, 2020 for construction contract HH-1000R. Michels Tunneling was determined to be the lowest responsible and responsive bidder with a bid of \$138,973,189. The second bidder, Flatiron/Drill Tech, A Joint Venture, submitted a bid of \$167,490,996. The Engineer's Estimate was \$142,820,000. The award of contract to Michels Tunneling is scheduled for the SFPUC Commission meeting on October 13, 2020. If approved, the Notice to Proceed for this approximately five-year and 11-month long construction is anticipated to be issued by January 4, 2021.

For Contract No. HH-1001, Moccasin Reservoir Perimeter Security Fence, the contractor initiated work and was on track to meet the first milestone of completing installation of the vinyl coated chain-link fence along Highway 49, by October 31, 2020.

The funding amounts, awarded contract values, and expenditures to date for the 2018 March Storm Event Emergency Repairs and Interim Improvements for Operations, Water, Power, and Joint Assets are summarized in the table below.

Projects	Current Approved Budget (\$M)	Total Expenditures (\$M)	Construction Contracts		Professional Services Contracts		SFPUC Labor & Other Costs	
			Awarded Value ⁶ (\$M)	Expenditures (\$M)	Awarded Value ⁶ (\$M)	Expenditures (\$M)	Budget (\$M)	Expenditures (\$M)
Water ^{1,2}	\$23.3	\$22.6	\$14.1	\$14.1	\$6.8	\$6.1	\$2.4	\$2.4
Power ³	\$2.2	\$1.3	\$1.1	\$1.1	\$0.3	\$0.1	\$0.9	\$0.1
Joint ⁴	\$1.7	\$1.6	\$1.1	\$1.1	\$0.1	\$0.1	\$0.5	\$0.4
Operations ⁵	\$0.4	\$0.4	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	\$0.3
Total	\$27.6	\$25.8	\$16.3	\$16.3	\$7.2	\$6.3	\$4.1	\$3.2

Notes:

1. The Current Approved Budget was increased to cover the increases in the Moccasin Downstream Berm and the construction management costs. However, it should be noted that the approved budget for the HCIP portion remains at \$17.9M as reflected in the HCIP quarterly report.
2. Funding sources for Water Project: Existing funding was transferred from the following projects: 10014065 Hetchy Water - Water Only (\$7.0M that was originally slated for the SJPL Rehabilitation 100-01 project), 10014068 Lower Cherry Aqueduct (\$6.9M), 10014114 Mountain Tunnel (\$2.8M), and 10014071 Moccasin Gate #3 Shaft Replacement (\$0.9M). In addition, funding for the following projects originally scheduled to begin in FY18/19 has been deferred, and therefore funding was used to fund the Water Project: R&R SJPL Life Extension Program (\$1.0M), SJPL Valve and Safe Entry Improvements (\$2.4M), and SJPL Tesla Valves Replacement (\$1.0M). The balance of funding required to complete the Mt. Tunnel and deferred SJPL projects is being requested in the 10-Year CIP FY21-30. Finally, \$1.3M received through the California Governor's Office of Emergency Services (Cal OES) California Disaster Assistance Act (CDAA) grant has been used to supplement the Water Project budget.
3. Funding source for Power Project: 10014114 Mountain Tunnel (\$2.2M). The balance of funding required for the Mt Tunnel project is being requested under the joint program in the 10-Year CIP FY21-30.
4. Funding sources for Joint Project: 10014093 Hetchy Water - Joint Projects (\$1.2M), 10014097 Kirkwood Penstock (\$0.4M), and 10014100 Existing Hetchy Facilities (Outside Moccasin) (\$0.1M). Funding from these projects were from unused balances, and additional funding to supplement these projects will not be needed.
5. The amounts of Operations funded emergency work are now included in the budget and expenditures.
6. The total awarded value of emergency construction and professional services contracts is \$23.5M which is still within the Not-To-Exceed amount of \$25.0M based on General Manager Harlan Kelly's memo dated June 11, 2018 and the Board of Supervisor's concurrence in Motion No. M18-092 dated June 19, 2018.

The Water-related emergency repair and interim improvement projects conducted within the HCIP (\$21.51M of the \$22.6M in the table above) are presented in this quarterly report; other Water-related work was completed by HHWP personnel. Various contracts were utilized to perform emergency repairs and interim improvements to address the damage that occurred to HHWP facilities, including facilities associated with or in proximity to the Moccasin and Priest reservoirs, from the 2018 March Storm Event. Work associated with the last emergency contract HH-998E has been completed and was accepted by the Commission on August 25, 2020. Therefore, this will be the last quarter that progress is reported. A California Disaster Assistance Act (CDAA) grant with the California Governor's Office of Emergency Services (Cal OES) has been established and will reimburse part of the costs of damage repair. Staff continues to work with Cal OES representatives to determine applicable scope and costs that will be covered under the CDAA grant.



San Francisco
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QUARTERLY REPORT

Hetch Hetchy Capital Improvement Programs
July 2020 – September 2020

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Quarterly Report

Hetch Hetchy Capital Improvement Programs

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**I. 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.

The HHWP Water Division's capital improvement programs are divided into two programs: Hetchy Capital Improvement Projects (HCIP) and Renewal and Replacement (R&R).

A majority of HHWP staff is based in Moccasin, CA, which is 140 miles east of San Francisco. The map below shows the location of the assets and facilities associated with HHWP.



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I.A. 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 program includes only asset improvements benefiting the SFPUC's water customers. The Power program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint program includes projects for assets that are used for both water and power delivery. In addition, projects in each program have been further organized by asset type to align with the Hetch Hetchy 10-Year Capital Improvement Program (CIP) Plan for Fiscal Years (FY) 2019-2028. These sub-programs include the following:

- Buildings - projects to provide safe and code compliant work spaces for HHWP operations and maintenance crews.
- Dams & Reservoirs - projects to improve assets used for storage and delivery of water to SFPUC customers, as well as 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 FY2020-2021 presents the progress made on the HCIP between July 1, 2020 and September 30, 2020. The data reported herein as the "approved" project budget and schedule conforms to the annual update of the Hetch Hetchy 10-Year CIP for FY2019-2028, approved by the Water and Power Enterprise Managers and adopted by the Public Utilities Commission on February 13, 2018.

On December 11, 2018, SFPUC approved the Hetch Hetchy Capital Improvement Programs 2018 Proposed Baseline of \$682.93M, a subset of the Hetch Hetchy 10-Year CIP for FY2019-2028. The Approved Baseline included projects over \$5M that were then active or were intended to be active by FY2020. The status of these projects included in the 2018 Approved Baseline are discussed in this quarterly report and can be found in Section I.A.6 and I.A.10.

I.A Hetchy Capital Improvement Projects Quarterly Report

Work for the O’Shaughnessy Dam (OSD) Outlet Works has been prioritized into three projects: the OSD Access and Drainage Improvements, OSD Outlet Works Phase 1, and OSD Outlet Works Phase II. The 2018 Approved Baseline included the OSD Access and Drainage Improvements and the OSD Outlet Works Phase 1, which are included in this report, while the Phase II project will be addressed in the future. The Phase 1 project includes three sub-projects: 1) drum gate rehabilitation, 2) installation of a new bulkhead system, and 3) rehabilitation of slide gates and installation of a diversion pipe butterfly valve.

The CUH10215 – Canyon Tunnel Rehabilitation project, meanwhile, remains in “On-Hold” status.

Project Development (PD) accounts for program-level expenditures for each of the Water, Power, and Joint Programs were created in the 2018 Approved Baseline to capture overall programmatic costs. The accrued PD expenditures are included in Program Delivery Costs in Table 3.1 in order to give an accurate report of the overall HCIP cost performance.

In addition to the nineteen (19) projects presented in the 2018 Approved Baseline, this quarterly report includes the status of the 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets) project, for a total of twenty (20) projects.

On March 22, 2018, HHWP experienced excessive rainfall and subsequent flash flooding with a large volume of debris, consisting of silt, downed trees, and logs. This affected various assets associated with Priest Reservoir, Moccasin Reservoir, and adjacent areas. The project (\$17.92M) includes debris removal and emergency repairs at the water-related assets.

The budget baseline for the project is based on initial cost estimates and contract pricing, but has not been formally approved by the Commission. This project has been funded by deferring money from Water projects included in the Hetch Hetchy 10-Year CIP for FY2019-2028; it is anticipated that funding will be

reallocated back into project budgets during the FY21-30 10-Year CIP. Progress reporting for this project is included in Section I.A.6.

Figure 2.1 shows the total Approved Budget for all twenty (20) projects in each phase of the program as of September 30, 2020 (excluding PD accounts). The number of projects currently in each phase is shown in parentheses.

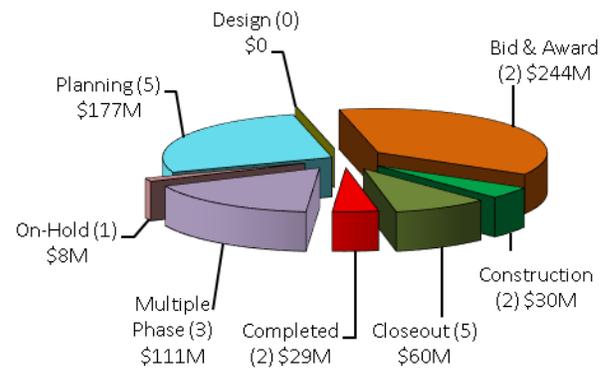


Figure 2.1 Approved Budget for Projects in Each Phase

Figure 2.2 shows the total number of projects in the following stages as of September 30, 2020: Pre-construction, Construction, and Post-construction.

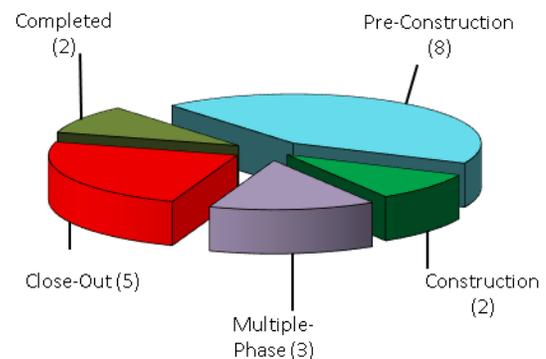


Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-Construction

Figure 2.3 summarizes the environmental review status of the HCIP projects as of September 30, 2020. Environmental review is performed for projects under California Environmental Quality Act (CEQA).

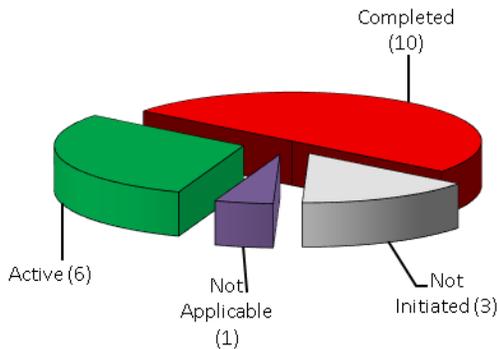


Figure 2.3 Program Environmental Review

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall cost summary of the 20 approved HCIP projects included in this report, as well as PD costs. It shows the Expenditures to Date, Current Approved Budget, Current Forecast Cost, and the Cost Variance between the Approved and Forecast Costs. The Current Approved Budget has been increased by \$17.92M over the 2018 Approved Baseline with the addition of the 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets) project.

The overall positive Cost Variance in Table 3.1 can be attributed to the following factors:

- Water Infrastructure - the overall positive Cost Variance is due to the following project reevaluations:
 - o The CUH10001 SJPL Rehabilitation project has been completed \$0.75M under budget.
 - o The CUH10003 Lower Cherry Aqueduct Forecasted Costs were reevaluated and reduced by \$6.00M.
- Power Infrastructure - the overall positive Cost Variance is due to the following project reevaluations:

- o The CUH10102 Holm and Other Powerhouse Projects' Forecasted Costs were reduced by \$3.67M.
- o The CUH10113 Kirkwood Penstock achieved Closeout \$0.06M over budget.
- o The CUH10115 Warnerville Substation Rehabilitation Forecasted Costs were increased by \$9.94M for additional design and construction to complete project work; this work has been funded as part of the approved 10-Year CIP for FY2021-30.
- o The CUH10116 Moccasin Penstock Rehabilitation Forecasted Costs were reduced by \$8.18M.
- o The CUH10119 Early Intake Switchyard Slope Hazard Mitigation Forecasted Costs were reduced by \$2.91M.
- Joint Infrastructure - the overall zero Cost Variance is due to the following project reevaluations:
 - o The CUH10214 Moccasin Facilities New Construction achieved Closeout \$1.19M under budget.
 - o The CUH10216 Cherry Dam Outlet Works Rehabilitation achieved Closeout \$0.65M under budget.
 - o The CUH10220 Mountain Tunnel Inspection & Repairs project was completed \$2.15M under budget.
 - o The 10032903 OSD Outlet Works Phase I Forecasted Costs were increased by \$4.00M to account for initial design and construction estimates being higher than expected.
- o 2018 March Storm Event - the negative Cost Variance of \$3.96M is due to increased construction cost for the flood control berm and associated construction management costs.

Table 3.1 Program Cost Summary

Cost Categories	Expenditures To Date (\$ Million) (A)	2018 Approved Budget (\$ Million) (B)	Current Approved Budget (\$ Million) (C)	Q1/FY20-21 Forecasted Costs (\$ Million) (D)	Cost Variance (\$ Million) (E = C - D)
Water Infrastructure	\$20.37	\$137.94	\$137.94	\$131.19	\$6.75
Construction Costs ⁽¹⁾	\$8.81	\$74.87	\$74.87	\$78.23	(\$3.36)
Program Delivery Costs ⁽²⁾	\$10.79	\$52.40	\$47.64	\$36.29	\$11.34
Other Costs ⁽³⁾	\$0.77	\$10.67	\$15.43	\$16.66	(\$1.23)
Power Infrastructure	\$51.27	\$151.19	\$151.19	\$146.43	\$4.76
Construction Costs ⁽¹⁾	\$26.16	\$80.79	\$80.79	\$79.05	\$1.74
Program Delivery Costs ⁽²⁾	\$23.42	\$57.73	\$57.73	\$60.29	(\$2.56)
Other Costs ⁽³⁾	\$1.69	\$12.68	\$12.68	\$7.09	\$5.58
Joint Infrastructure	\$80.73	\$393.81	\$393.81	\$393.81	-
Construction Costs ⁽¹⁾	\$31.18	\$215.69	\$215.69	\$224.89	(\$9.20)
Program Delivery Costs ⁽²⁾	\$48.31	\$156.05	\$156.05	\$144.28	\$11.77
Other Costs ⁽³⁾	\$1.24	\$22.07	\$22.07	\$24.64	(\$2.57)
2018 March Storm Event Emergency Repair and Interim Improvements (Water-Only Assets)	\$21.51	-	\$17.92	\$21.89	(\$3.96)
Overall Program Total	\$173.88	\$682.93	\$700.86	\$693.31	\$7.54

Notes:

- 1. Construction Costs** include the Construction Base Bid and owner-provided equipment/material for all projects. Those costs include any construction contingency.
- 2. Delivery Costs** include program management (i.e. Project Development), project management, planning, environmental (CEQA, permitting, construction compliance), design, construction management, and engineering support during construction.
- 3. Other Costs** include environmental mitigation, art enrichment, security improvements, real estate expenses, and director’s reserve.

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2018 Approved Schedule and the Current Forecast Schedule for the HCIP. As shown in Table 4.1, the overall HCIP is currently forecast to be completed in June 2028.

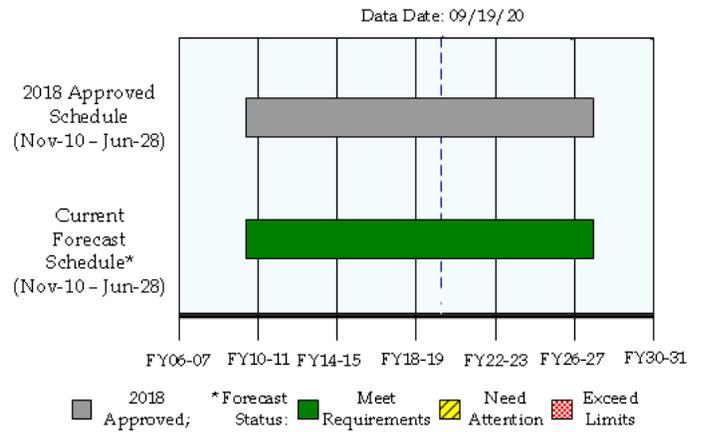


Figure 4.1 Program Schedule Summary

Table 4.1 2018 Approved vs. Current Forecast Schedule Dates

Sub-Program	2018 Approved Project Start	Actual Start	2018 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Water Infrastructure	11/08/10	11/08/10✓	06/30/28	06/30/28	-
Power Infrastructure	05/29/12	05/29/12✓	06/30/28	06/30/28	-
Joint Infrastructure	10/03/11	10/03/11✓	06/30/28	06/30/28	-
Overall HCIP Projects	11/08/10	11/08/10✓	06/30/28	06/30/28	-

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5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in \$1,000s as of 09/19/20

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Water Infrastructure											
Water Conveyance (Water)											
10035574 - SJPL Tesla Valves Replacement	PL	\$ 7,380	\$ 7,380	\$ 414	-	★	06/28/24	06/28/24	-	★	See Section 10
10035575 - SJPL Valve and Safe Entry Improvement	PL	\$ 95,284	\$ 95,284	\$ 555	-	★	07/01/25	07/01/25	-	★	See Section 10
Dams & Reservoirs											
10033156 - Moccasin Reservoir Perimeter Security Fence	CN	\$ 5,308	\$ 5,308	\$ 1,044	-	★	07/01/21	07/01/21	-	★	See Section 10
Power Infrastructure											
Water Conveyance (Power)											
CUH10116 - Moccasin Penstock	PL	\$ 13,158	\$ 4,987	\$ 3,199	\$ 8,171	★	12/31/24	08/31/21	40.0 mo. Early	★	See Section 10
Powerhouse											
CUH10102 - Holm and Other Powerhouse Projects	MP	\$ 26,733	\$ 23,061	\$ 18,925	\$ 3,672	★	03/30/20	12/07/21	20.3 mo. Late	●	See Section 6
CUH10114 - Moccasin Powerhouse and GSU Rehabilitation	MP	\$ 66,714	\$ 66,714	\$ 2,100	-	★	06/28/24	12/16/25	17.6 mo. Late	●	See Section 6

* 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		

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Power Infrastructure											
Switchyard & Substations (Power)											
CUH10115 - Warnerville Substation Rehabilitation	CN	\$ 24,305	\$ 34,248	\$ 20,712	(\$9,943)	●	03/04/20	03/31/25	60.9 mo. Late	●	See Section 6
Joint Infrastructure											
Dams & Reservoirs (Joint)											
10032903 - O'Shaughnessy Dam Outlet Works Phase I	PL	\$ 17,206	\$ 21,206	\$ 310	(\$4,000)	●	08/25/22	05/02/23	8.2 mo. Late	●	See Section 6
CUH10223 - OSH Dam Access and Drainage Improvements	BA	\$ 5,830	\$ 5,830	\$ 773	-	★	02/26/21	12/16/22	21.6 mo. Late	●	See Section 6
Mountain Tunnel											
CUH10221 - Mountain Tunnel Improvement Project	BA	\$ 238,219	\$ 238,219	\$ 25,005	-	★	12/31/26	06/03/27	5.1 mo. Late	⚠	See Section 6
Roads & Bridges (Joint)											
10035086 - Bridge Replacement (4 - Bridges)	PL	\$ 44,287	\$ 44,287	\$ 27	-	★	12/30/25	12/30/25	-	★	See Section 10
2018 Moccasin Storm Event											
10033233 - 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets)	MP	\$ 17,924	\$ 21,888	\$ 21,505	(\$3,964)	●	06/30/20	02/01/21	7.1 mo. Late	●	See Section 6

* 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		

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROJECTS NOT WITHIN BUDGET AND/OR SCHEDULE

CUH10102 - Holm and Other Powerhouse Projects

Project Description: This project will provide funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under \$1 million regarding power generation renewal and equipment replacement. The upgrade and rehabilitation of Holm Unit 2 includes 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 will be done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project includes upgrades to turbine and generators, and alternating current stations intended to extend the life of the unit by 20 years. Lastly, the project will upgrade the existing oil containment system at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators will be replaced, and other modifications will be made to the powerhouse interiors and to the transformer decks to discourage contaminated discharges into the adjacent streams. A monitoring system will be installed to alert Hetch Hetchy Water & Power (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 & cleanup.

Program: Power Infrastructure	Project Status: Multiple Phase	Environmental Status: Completed		
Project Cost:		Project Schedule:		
Approved \$26.73 M	Approved Sep-13			Mar-20
Forecast \$23.06 M	Forecast Sep-13			Dec-21
Actual \$18.93 M	Project Percent Complete: 64.6%			
Approved; Actual Cost; Forecast Status: Meet Requirements Need Attention Exceed Limits				
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/17/17✓	04/21/17✓	01/29/18✓	11/29/20

Progress and Status:

The breakdown below shows the number of subprojects summarized according to current status and/or active phase during this reporting period. The eleven (11) subprojects are distributed as follows: Construction: 2 subprojects

J101-02.010 Cherry Valve House - Bypass Fill Valve for Cherry Power Tunnel: The field work is scheduled for early next year. HHWP is anticipating delivery of the valve in January. After delivery and as soon as weather conditions permit access, HHWP will install the valve and piping. Completion anticipated of March 2021.

J101-02.003 Holm Powerhouse Rehabilitation and Kirkwood Powerhouse Oil Containment Upgrade: The contractor for Contract HH-989 completed punchlist items and warranty work this quarter and reached Substantial Completion.

Completed: 9 subprojects



Workers using the overhead crane when accepting a delivery of equipment

Issues and Challenges:

The project has trended nine months behind the Approved Baseline Schedule due to initial delay in issuing NTP.

Additional delay due to COVID-19 required rescheduling work that can only be performed during a shutdown. Some work that will be performed by HHWP crews will be performed after the construction contract is complete.

CUH10114 - 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. This is a design-build project and was advertised twice in 2011 and 2013. Bids were unresponsive. The project will also involve 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.

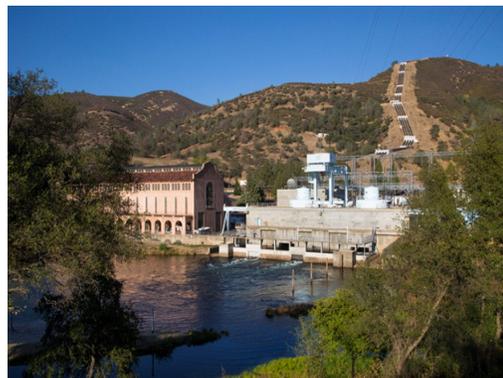
Program: Power Infrastructure	Project Status: Multiple Phase	Environmental Status: Active
Project Cost:		Project Schedule:
Approved  \$66.71 M	Approved Jan-16  Jun-24	
Forecast  \$66.71 M	Forecast Jan-16  Dec-25	
Actual  \$2.10 M	Project Percent Complete: 9.4%	
		

Key Milestones:	Environmental Approval	Bid Advertisement*	Construction NTP*	Construction* Final Completion
Current Forecast	09/28/20✓	(A) 11/10/20 (B) 10/30/20 (C) 11/22/22	(A) 05/08/21 (B) 05/01/21 (C) 11/02/23	(A) 06/22/23 (B) 06/03/24 (C) 06/02/25

* A) Moccasin Powerhouse Generator Step-Up (GSU's) Transformers Replacement; B) Moccasin Powerhouse Generators Rewind; and C) Moccasin Powerhouse Systems Upgrade.

Progress and Status:

This project is divided into 3 sub-projects: A) the purchasing and installation of the Moccasin Powerhouse Generator Step-Up Transformers (GSU's); B) the rewind of the Moccasin generators; and C) the overall plant rehabilitation. Sub-project A: The project team concluded work with the Office of Contract Administration (OCA), City Attorney, and SFPUC's Contract Administration Bureau and finalized the procurement package for the City-furnished GSUs. The procurement package was advertised in July. OCA received two bids. The project team reviewed the bids. The GSU installation contract (HH-1003) is forecast to advertise in November. Sub-project B: DB-121R2 Moccasin Powerhouse Generators, the project team continued to prepare the Request for Bids. Advertisement for this design-build contract is now forecast to occur in October. Sub-project C: Continued to conduct bi-weekly planning meetings with HHWP. A Request for Proposal (RFP) is being developed for a professional service contract to provide planning, design, and engineering support. The RFP was still under review and is forecast to be advertised next quarter.



Moccasin Powerhouse

Issues and Challenges:

Sub-project A: The vendors took exceptions to the terms and conditions in the bid documents of GSU. Further discussion with OCA is required to resolve the issues. Sub-project B: The contract administrative requirements for design-build are being updated; the new anticipated contract advertising date is on 10/30/2020.

CUH10115 - Warnerville Substation Rehabilitation

Project Description: Warnerville Substation facilities and equipment have reached the end of their life expectancy. The facility needs to be upgraded to meet regulatory and safety requirements. This project will address major renewal and replacement of the substation components including grounding, fence, circuit breaker, control room upgrade, electrical equipment, and disconnect switch. This project will also improve grading in the substation.

Program: Power Infrastructure		Project Status: Construction		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$24.31 M	Approved Sep-15		Mar-20
Forecast		\$34.25 M	Forecast Sep-15		Mar-25
Actual		\$20.71 M	Project Percent Complete: 84.9%		
					
Key Milestones:	Environmental Approval	Bid Advertisement*	Construction NTP*	Construction* Final Completion	
Current Forecast	03/31/16✓	(A) 01/24/17✓ (B) 04/29/22	(A) 10/05/17✓ (B) 11/29/22	(A) 07/05/21 (B) 07/28/23	

(A) Warnerville Substation Phase 1; (B) Warnerville Substation Phase 2.

Progress and Status:

Phase 2: Biweekly planning meetings continued this quarter. Professional Service Contract PRO.0182 continues to be developed and has not been advertised. The contract is anticipated to advertise next quarter. This contract will provide planning, design, and engineering support during construction for this project. An as-needed engineering consultant was selected this quarter to provide engineering support for short-term contingency planning until the Phase 2 project is completed.



Warnerville New Direct Current Battery Bank

Issues and Challenges:

Oil Circuit Breaker 450 failed this quarter, and was repaired by HHWP crews. This was one of the four older breakers that are scheduled to be installed under Phase II.

The planned future task order will provide contingency planning for interim failures until the larger project can be completed. As discussed previously, the project budget and duration are extended to cover the Phase 2 work. The new budget and schedule will be incorporated in the re-baseline.

10032903 - O'Shaughnessy Dam Outlet Works Phase I

Project Description: O'Shaughnessy Dam (OSD) was completed in 1923 and raised in 1938. Condition assessment of the dam outlet works revealed deficiencies. This rehabilitation project addresses deficiencies of the existing outlet works system at OSD, including the drum gates and release system through OSD to Canyon Tunnel and the Tuolumne River. Seven projects were identified and have been prioritized. Phase 1 will include three of these projects: drum gate rehabilitation (upgrading the hinges and rivets, recoating the gate and existing seals, and repairing the spillway concrete), installation of a new bulkhead system, and rehabilitation of slide gates & installation of a diversion pipe butterfly valve.

Program: Joint Infrastructure	Project Status: Planning	Environmental Status: Active
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Project Cost:		Project Schedule:	
Approved	█ \$17.21 M	Approved Feb-18	█ Aug-22
Forecast	▨ \$21.21 M	Forecast Feb-18	▨ May-23
Actual	▮ \$0.31 M	Project Percent Complete: 3.5%	
█ Approved; ▮ Actual Cost; Forecast Status: █ Meet Requirements ▨ Need Attention ▨ Exceed Limits			

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	TBD	09/14/21	02/01/22	11/02/22

Progress and Status:

Bulkhead Systems: Additional comments were received during the quarter, after the final alternative analysis report was circulated for signatures. Accordingly, the report was reopened to address the comments and will be finalized next quarter. The draft conceptual engineering report was submitted this quarter and is under review. It will not be finalized until the diving inspection is completed early next year, which will provide more detailed information on the condition of the intake to the slide gates. The project team will initiate a task order under a Job Order Contract for the bulkhead slot inspection by divers next quarter. **Slide Gates, Drum Gate Rehabilitation, Isolation Butterfly Valve:** Conducted meetings this quarter to review these remaining subprojects. The team will maximize opportunities to sequence work in order to meet the project schedules.



Bulkhead Slots Gates D & E – O' Shaughnessy Dam

Issues and Challenges:

The current planning-level design and construction estimates are higher than budgeted due to the addition of diver inspections and the higher level of detail included in the most recent construction cost estimate. The schedule forecast includes time for additional inspections using divers.

CUH10223 - OSH Dam Access and Drainage Improvements

Project Description: The key objective of this project is to provide safe access for Hetch Hetchy Water and Power operators inside the O'Shaughnessy Dam by improving fall protection, access, and drainage. The key elements include:

- Replace Access Structures in Ladder Wells. The existing access structures in the four (4) vertical ladder wells (shafts) include vertical ladders and horizontal grating platforms that are spaced throughout the ladder wells.
- Install Fall Protection Systems. Install new Occupational Safety and Health Administration (OSHA) - compliant ladders and landings with safety cage and/or install fall restraint systems.
- Seal or Mitigate Existing Leakage. Address flowing water by sealing leaks or otherwise diverting, collecting and disposing of flows.
- Drainage Improvements. Clear the drains in the dam so that water can drain as designed and/or install sump pumps, if appropriate.
- Replace Watertight Door between Ladder Wells 3 & 4. This scope item includes replacing the existing watertight door between Ladder Wells 3 & 4.

Program: Joint Infrastructure	Project Status: Bid and Award	Environmental Status: Active (CatEx)
Project Cost:		Project Schedule:
Approved  \$5.83 M	Approved Mar-17  Feb-21	
Forecast  \$5.83 M	Forecast Mar-17  Dec-22	
Actual  \$0.77 M	Project Percent Complete: 23.4%	
 Approved;  Actual Cost; Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	07/16/20✓	09/22/20✓	03/18/21	06/17/22

Progress and Status:

The construction contract HH-1002 was advertised, and bids are due next quarter. Because of the COVID-19 pandemic, the preconstruction conference was held in two phases, a virtual meeting and then a site visit a few days later. The Notice to Proceed is anticipated to issue in Spring 2021.

Issues and Challenges:

The variance between the approved and forecast completion dates is due to: challenges with specifying the drain cleaning requirements due to lack of as-built information; difficulty selecting appropriate submersible light systems; and the need for additional evaluation of fall protection systems.



Diversion Pipe at O' Shaughnessy Dam

CUH10221 - 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 for design and construction of an engineering alternative that will keep this vital component of the Hetch Hetchy Water and Power System in reliable service for years to come.

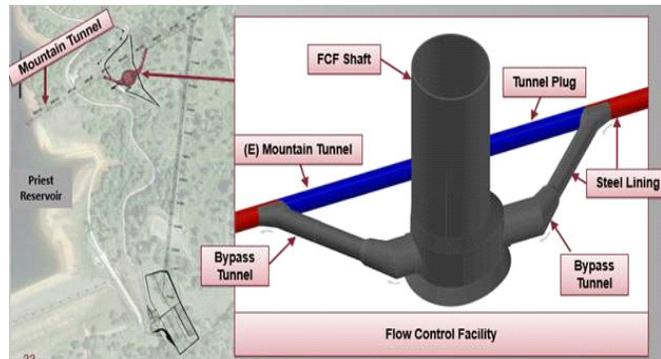
Up until 2016, the scope consisted of just the Planning Phase for the project. The primary focus was on the development of viable alternatives for the project including rehabilitation or relining the existing tunnel or construction of a new tunnel.

In 2017, the City adopted the rehabilitation alternative as the preferred project for design and construction. The rehabilitation option met almost all of the project performance standards with the least cost. The project consists of tunnel lining repairs, contact grouting, downstream flow control valving, a new tunnel adit at Priest Reservoir, a South Fork Siphon extension tunnel, access road widening and tunnel access improvements, and environmental mitigations, and site restoration.

Program: Joint Infrastructure		Project Status: Bid and Award		Environmental Status: Completed	
Project Cost:			Project Schedule:		
Approved		\$238.22 M	Approved Oct-11		Dec-26
Forecast		\$238.22 M	Forecast Oct-11		Jun-27
Actual		\$25.00 M	Project Percent Complete: 17.3%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	01/14/20✓	11/13/19✓	01/04/21	12/03/26	

Progress and Status:

Two bids were opened during the quarter, on August 27, for construction contract HH-1000R Mountain Tunnel Improvements. Michels Tunneling was determined to be the lowest responsible bidder, with a bid of \$138,973,189. The second bidder, Flatiron/Drill Tech, a Joint Venture, submitted a bid of \$167,490,996. The Engineer’s Estimate was \$142,820,000. The award of contract to Michel’s Tunneling is scheduled for the SFPUC Commission meeting on October 13, 2020. If approved, the Notice to Proceed for this approximately 5 year and 11 month long construction is anticipated to be issued by January 4, 2021. The State Water Resources Control Board is reviewing the City's application for \$238.2M in funding from the State Revolving Fund for this project. The funding decision is still anticipated by the end of 2020.



The new Flow Control Facility will improve hydraulic control in the tunnel.

Issues and Challenges:

The Schedule Variance between the Current Forecast and Approved schedule is due to delay associated with re-bidding the project and COVID-19 challenges. The reported delay reflects mitigation efforts, including resequencing of the tunnel shutdowns to minimize the

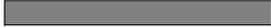
schedule impact. The team continues to evaluate the schedule for additional adjustments to mitigate the delay.

10033233 - 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets)

Project Description: On March 22, 2018, a storm event caused widespread damage to Tuolumne County. Hetch Hetchy Water and Power (HHWP) sustained considerable damage to assets associated with water supply, drainage, and power generation, including Moccasin Lower Dam and auxiliary spillway, Moccasin Upper Diversion Dam, Moccasin Reservoir, Priest Reservoir, Moccasin Powerhouse, and Moccasin Lowhead Powerhouse. On March 29, 2018, the Mayor of San Francisco, Mark E Farrell, officially declared the storm damage a Local Emergency Event.

This project addresses the emergency repairs and interim improvements to the water-related assets located in Moccasin. Various contracts will be utilized to complete construction activities associated with: debris removal from the Moccasin Upper Diversion Dam and Moccasin Reservoir; repairs to the Moccasin Upper Diversion Dam; repairs to the Moccasin Lower Dam; replacement of the Leithold Line water distribution line; replacement of drainage systems (culverts and piping); access improvements to the Gate 3 structure located in the Moccasin Reservoir; installation of debris barriers upstream of the Moccasin Upper Diversion Dam and within the Moccasin Reservoir; and installation of a flood control berm downstream of the Moccasin Lower Dam.

Program: 2018 Moccasin Storm Event	Project Status: Multiple Phase	Environmental Status: Completed
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Project Cost:		Project Schedule:	
Approved	 \$17.92 M	Approved Mar-18	 Jun-20
Forecast	 \$21.89 M	Forecast Mar-18	 Feb-21
Actual	 \$21.51 M	Project Percent Complete: 99.5%	
			

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	N/A	N/A	N/A	N/A

Progress and Status:

As-built drawings have been completed. Completion of the last emergency contract, HH-998, has been achieved, and closeout was approved by the Commission during the quarter, on August 25. This is the final quarter that project status will be reported.

Issues and Challenges:

The forecasted cost at completion is \$21.89 million, which is approximately \$0.28 million more than reported in the last quarter. The increase was mainly due to the reconciliation of labor costs and professional services support charges which were not captured in the last quarter.



Construction of the flood control berm

7. 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								
10033156 - Moccasin Reservoir Perimeter Security Fence - HH-1001	06/22/20	03/01/21	03/06/21	\$ 1,364,290	\$ 1,364,290	(5)	-	30.0%
Power Infrastructure								
J101-02.0030 Holm Powerhouse Rehabilitation - HH-989	01/29/18	09/03/19	11/29/20	\$ 9,948,000	\$ 11,821,407	(453)	(\$1,873,407)	90.0%
CUH101-15.001 Warnerville Switchyard - DB-127R **	10/05/17	07/09/19	07/05/21	\$ 14,591,450	\$ 14,591,450	(727)	-	90.0%

Program Total for On-Going Construction	Approved Contract Cost	Current Forecast Cost*	Variance	
			Cost	Percent
	\$ 25,903,740	\$ 27,777,147	(\$1,873,407)	(7.2%)

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.

8. 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*
Water Infrastructure				
Water Conveyance (Water)				
CUH10003 - Lower Cherry Aqueduct	01/31/20	11/26/19	\$ 11,526,985	\$ 6,425,961
Power Infrastructure				
Switchyard & Substations (Power)				
CUH10119 - Early Intake Switchyard Slope Hazard Mitigation	12/20/19	02/05/20	\$ 4,135,347	\$ 1,041,960
Water Conveyance (Power)				
CUH10113 - Kirkwood Penstock	12/31/18	02/05/19	\$ 1,893,834	\$ 1,164,263
Joint Infrastructure				
Buildings (Joint)				
CUH10214 - Moccasin Facilities New Construction	06/11/18	06/11/18	\$ 4,775,795	\$ 10,053,964
Dams & Reservoirs (Joint)				
CUH10216 - Cherry Dam Outlet Works Rehabilitation	10/24/18	07/18/18	\$ 8,577,232	\$ 7,000,196
TOTAL			\$ 30,909,193	\$ 25,686,344

* It should be noted that this report does not include all phase-level expenditures that have been accrued for work completed due to challenges associated with the migration of the City financial system from FAMIS to PeopleSoft.

9. COMPLETED PROJECTS

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Water Infrastructure				
Water Conveyance (Water)				
CUH10001-HCIP - SJPL Rehabilitation	12/31/18	02/28/19	\$ 5,370,000	\$ 4,621,613
Joint Infrastructure				
Mountain Tunnel				
CUH10220 - Mountain Tunnel Inspection & Repairs (completed)	12/31/19	12/02/19	\$ 23,500,000	\$ 21,348,590
TOTAL			\$ 28,870,000	\$ 25,970,203

10. PROJECTS WITHIN BUDGET AND SCHEDULE

10035574 - SJPL Tesla Valves Replacement

Project Description: This project intends to replace all the under rated inline valves, Tesla Ultra Violet (TUV) 101 to 401, with properly rated valves to improve safety and entry into all four (4) San Joaquin Pipelines (SJPL). In addition, all cross- over valves and bypass valves may need to be replaced or made safe. Modification to the pipes, flanges, spool pieces, actuators, and valve controls are needed. The valve vault will need modification to accommodate the new valves. New facilities may need to be constructed if additional new valves are not designed for direct burial.

Program: Water Infrastructure	Project Status: Planning	Environmental Status: Active
Project Cost:		Project Schedule:
Approved  \$7.38 M	Approved Jan-20  Jun-24	
Forecast  \$7.38 M	Forecast Jan-20  Jun-24	
Actual  \$0.41 M	Project Percent Complete: 8.0%	
 Approved;  Actual Cost; Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

Key Milestones:	Environmental Approval	Bid Advertisement*	Construction NTP*	Construction* Final Completion
Current Forecast	08/26/20✓	(A) N/A (B) 12/01/21	(A) 04/07/21 (B) 05/04/22	(A) 04/05/22 (B) 12/31/23

* A) Pre-purchase and installation of Tesla Valve TUV-101; and B) Procurement and installation of Tesla Valves TUV-201, TUV-301 & TUV-401

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 Tesla Valves TUV-201, TUV-301 & TUV-401.

Subproject A: In this quarter, the project team worked with the Office of Contract Administration (OCA) regarding the pre-purchase of the 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. The entire project is forecast to complete on schedule by mid-2024.



SJPL#1-4 with isolation valves within Tesla Valvehouse

Issues and Challenges:

To minimize the impact to water delivery, the installation of the new valves will only take place during the system shutdowns in the Fall/Winter. Timely delivery of the new valves and well-coordinated preparation work prior to the shutdowns are the keys to a successful project.

10035575 - SJPL Valve and Safe Entry Improvement

Project Description: The San Joaquin Pipeline (SJPL) Entry Assessment and Valve Improvement Project involves the three parallel transmission pipelines that stretch approximately 48-miles across the San Joaquin Valley from Oakdale Portal to Tesla Portal, with a partial fourth pipeline consisting of a 6.4-mile Eastern Segment and an 11-mile Western Segment. The four pipelines were built between 1932 and 2012, respectively, and range from 56- to 79.5-inches in diameter. As part of the Water System Improvement Program (WSIP), valve vaults were constructed along the SJPL System at various locations to increase operational flexibility and the overall reliability of the SJPL System. Since the commissioning of the valve vaults, Hetch Hetchy Water & Power (HHWP) has expressed concern that 1) valves may not be sufficiently rated and may fail due to a pressure transient surge event using certain operational assumptions 2) there is an inability to establish double isolation and bleed configurations along the SJPL System, resulting in insufficient protection for maintenance personnel, and 3) multiple isolation valves are not adequately rated for hydrostatic head. In order to achieve the safety and access goals, the scope is to: install a surge shaft upstream of Tesla Treatment Facility (TTF) to reduce maximum pressure from unplanned reactor valve closure and upgrade line valves to resist transient pressure from unplanned line valve closure; install new double isolation and bleed valves at all locations where major upgrades and construction are required; and retain single isolation where no upgrades are needed. There are four primary locations where major upgrades and construction are required: Emery, Roselle, Pelican, and Tesla.

Program: Water Infrastructure	Project Status: Planning	Environmental Status: Not Initiated
Project Cost:		Project Schedule:
Approved 	\$95.28 M	Approved Jul-19  Jul-25
Forecast 	\$95.28 M	Forecast Jul-19  Jul-25
Actual	\$0.55 M	Project Percent Complete: 7.0%
		

Key Milestones:	Environmental Approval	Bid Advertisement*	Construction NTP*	Construction* Final Completion
Current Forecast	05/03/21	(A) 10/01/21 (B) 06/01/23 (C) 11/01/22	(A) 04/01/22 (B) 12/01/23 (C) 05/02/23	(A) 12/31/24 (B) 12/31/24 (C) 12/31/24

* A) Phase 1 - Tesla and Oakdale Entry Improvements; B) Phase 2 - Pelican, Roselle, Emery and P4J Entry Improvements; and C) Phase 3 - Tesla Surge Stack.

Progress and Status:

This project is divided into 3 sub-projects: A) Phase 1 - Tesla and Oakdale Entry Improvements; B) Phase 2 - Pelican, Roselle, Emery and P4J Entry Improvements; and C) Phase 3 - Tesla Surge Stack.

Planning continued, with geotechnical investigation, surveying and potholing along the pipelines being performed during the quarter. A draft conceptual engineering report (CER) was under preparation and is expected to be available next quarter.

Issues and Challenges:

Construction must be coordinated with system shutdowns in Fall/Winter to minimize the impact on water delivery.



SJPL#1 – installation of a removable spool piece at Oakdale Portal

10033156 - Moccasin Reservoir Perimeter Security Fence

Project Description: Hetch Hetchy Water & Power (HHWP) will install an approximately 6,500 feet long perimeter security fence system around Moccasin Reservoir to discourage trespassers. Moccasin Reservoir covers approximately 32 acres. Fence monitoring alarms, signs, lighting, and security cameras will be considered as part of the design.

Program: Water Infrastructure	Project Status: Construction	Environmental Status: Active
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Project Cost:		Project Schedule:	
Approved	 \$5.31 M	Approved Feb-17	 Jul-21
Forecast	 \$5.31 M	Forecast Feb-17	 Jul-21
Actual	 \$1.04 M	Project Percent Complete: 75.6%	

 Approved;  Actual Cost; Forecast Status:  Meet Requirements  Need Attention  Exceed Limits

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	12/31/20	01/30/20✓	06/22/20✓	03/06/21

Progress and Status:

The Commission approved an increase of construction contract cost and duration contingencies for additional costs to meet Planning Department requirements and additional safety requirements for COVID-19. The contractor mobilized to the site during the quarter and started construction along Hwy 49. The construction progress is on schedule.

Issues and Challenges:

None at this time.



Construction has started along Hwy 49 for the Moccasin Security Perimeter Fence Project; road traffic control is in place.

CUH10116 - Moccasin Penstock

Project Description: The Moccasin Penstock conveys San Francisco Public Utilities Commission (SFPUC) water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. 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 back to 1924 and has been in service for more than 90 years. Condition assessments based on external inspection and imaging have identified a number of deficiencies along the original pipe. The 104-inch diameter (narrowing to 98-inch) riveted steel penstocks extend 1,554 feet from the downstream Moccasin Tunnel portal then bifurcate to four 66-inch diameter hammer-forged welded steel conduits extending about 2,384 feet to the lower welded steel pipe. Additionally, in September of 2018 the penstock experienced significant leakage in two separate areas, necessitating emergency repairs. This rehabilitation project is intended to enhance the reliability of the penstock system and will include: repair or replacement of some sections of corroded pipe; repair or replacement of four badly cracked concrete anchors and damaged penstock saddles; installation of new manways and a rollout pipe section to provide better access for inspection and maintenance; and recoating the outside pipe, where needed, to reduce future corrosion. The project scope was expanded to include: 1) The installation of additional penstock pipe between the valve house and the first downstream anchor; 2) The replacement of the butterfly valve pneumatic actuator with an electronic actuator, which will include new controls with SCADA connectivity; and 3) A new backup generator.

Program: Power Infrastructure	Project Status: Planning	Environmental Status: Not Applicable
Project Cost:		Project Schedule:
Approved 	\$13.16 M	Approved Feb-16  Dec-24
Forecast 	\$4.99 M	Forecast Feb-16  Aug-21
Actual 	\$3.20 M	Project Percent Complete: 93.1%
		

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	N/A	N/A	N/A	N/A

Progress and Status:

Notice to proceed (NTP) was issued during the quarter for the professional services task order for inspection and structural analysis of Moccasin Penstock. This task order will cover two phases of inspection, external and internal. A JOC task order is being developed to provide field support for the inspection and a condition assessment. The external inspection is anticipated to be conducted in October 2020.



Moccasin Penstock

Issues and Challenges:

This project will continue during the planning phase utilizing the remaining power funds. Once the power funds are expended, a new joint funded project will be initiated for the Moccasin Penstock in the future.

10035086 - Bridge Replacement (4 - Bridges)

Project Description: HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessment has identified the need for rehabilitation and/or replacement (both due to age and to meet current seismic design criteria). Four of the fourteen bridges require substantial modification or replacement and have been combined into this project. This project includes rehabilitation and/or replacement of Cherry Lake Road Bridge (public access), Early Intake Bridge (public access), and O'Shaughnessy Adit Access Bridge.

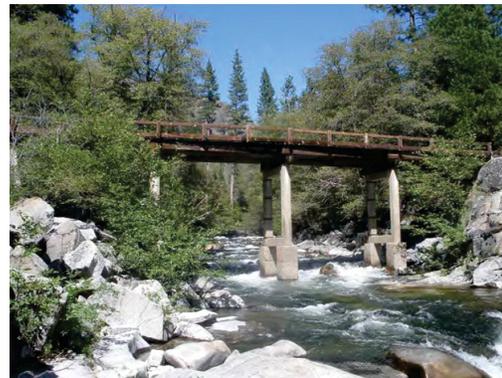
Program: Joint Infrastructure	Project Status: Planning	Environmental Status: Not Initiated
--	---	--

Project Cost:		Project Schedule:	
Approved 	\$44.29 M	Approved Jul-19 	Dec-25
Forecast 	\$44.29 M	Forecast Feb-20 	Dec-25
Actual	\$0.03 M	Project Percent Complete: 1.0%	
			

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

Progress and Status:

This project is in the beginning of the planning phase and was only initiated last quarter. For the O'Shaughnessy Adit Access Bridge, the Department of Public Works (DPW) is developing a work plan for the planning and design of the bridge improvements. At the same time, a professional services task order is being set up to support the surveying, geotechnical investigation, and hydraulic analysis. For Lake Eleanor Dam Bridge, a professional services task order is being processed to bring a dam specialist consultant on board to perform the planning and design of the bridge rehabilitation, since the bridge actually forms an integral part of the dam structure.



O'Shaughnessy Adit Access Bridge

Issues and Challenges:

The O'Shaughnessy Adit Access Bridge is located in the proximity of O'Shaughnessy Dam within Yosemite National Park. The geotechnical investigation and construction will require close coordination and an approval from National Park Service. The work associated with Eleanor Dam Bridge will require coordination with the United States Forest Service. Both bridges are located within remote and environmentally sensitive areas. Environmental permitting and site access are both anticipated to be challenging.

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I.B. HETCHY RENEWAL AND REPLACEMENT PROGRAM (R&R)



1. PROGRAM DESCRIPTION

The Hetchy Renewal and Replacement (R&R) Program is an ongoing annual program that addresses deficiencies in three areas: Water Infrastructure, Power Infrastructure, and Joint Infrastructure. The Water program includes only asset improvements benefiting the SFPUC's water customers. The Power program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint program includes projects for assets that are used for both water and power delivery. The objective of the R&R Program is to meet level of service goals and objectives, to ensure regulatory permit compliance, to obtain system reliability and functionality, and to continue sustainable operation of the system.

The R&R Program consists of a series of projects specifically developed to address the needs of an aging infrastructure associated with the Hetch Hetchy Water and Power System. The projects are designed to better the system through inspections, assessments, protective and corrective measures, and routine equipment replacement. Due to the nature of these ongoing projects that are funded on an annual basis, progress is measured by achievement of short-term goals. These goals are discussed in further detail in Section I.B.10, and are referred to as Planned Milestones for the Reporting Quarter (goals that are expected to be achieved during the quarter), Status of Planned Milestones for the Reporting Quarter (progress made in achieving these goals), and Planned Milestones for the Subsequent Quarter (goals for the upcoming quarter).

2. PROGRAM STATUS

This Quarterly Report presents the progress made on the R&R projects between July 1, 2020 and September 30, 2020. The data reported herein as the "approved" project budget and schedule conforms to the most recent annual update of the Hetch Hetchy 10-Year CIP for FY2019-2028, which was approved by the Water

and Power Enterprise Managers and adopted by the Public Utilities Commission on February 13, 2018. The 10-Year CIP for FY2019-2028 re-prioritizes the R&R program by defunding several projects that were determined to be lower priority, and re-allocating a portion of the funding to projects determined to be higher priority. Overall, this constituted an increase of \$85.75M in the program budget, from \$227.05M in FY2017-2026 to \$312.08M. The project budget and schedule were developed and approved based on the project team's best assessment HHWP's infrastructure needs at the time. It should be noted that the project team continues the process of re-validating these earlier assessments.

Figures 2.1 to 2.3 show the total number of subprojects remaining in each phase of the R&R Water, Power, and Joint Infrastructure programs as of September 30, 2020. As reported in previous quarters, the following CUH10001 - SJPL Rehabilitation subprojects were removed from the R&R program and included in the Hetch Hetchy Capital Improvement Programs 2018 Proposed Baseline with a budget of \$5.37M (it should be noted that these subprojects have been subsequently completed under the HCIP Program:

- CUH10001 - SJPL Rehabilitation
 - CUH10001.011 - SJPL No. 1 Replacement at Cashman Creek
 - CUH10001.018 - SJPL No. 1 Replacement at SJVH
 - CUH10001.022 - Tesla Valves Replacement

The remaining subprojects under project CUH10001 will continue to be reported under the R&R Program. The CUH10001 approved budget, expenditures to date, and current forecast cost have been reduced to reflect the transfer of the three subprojects to the HCIP program.

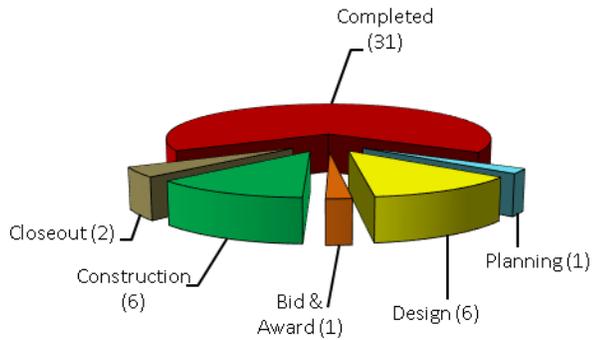


Figure 2.1 Total Number of Water Infrastructure Sub-Projects in R&R Program

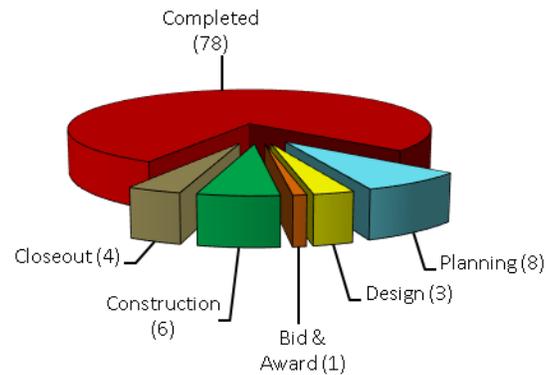


Figure 2.3 Total Number of Joint Infrastructure Sub-Projects in R&R Program

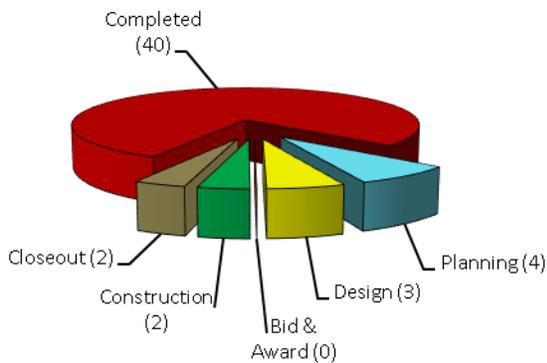


Figure 2.2 Total Number of Power Infrastructure Sub-Projects in R&R Program

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall current program level cost summary of the R&R Program included in this report. It shows the Expenditures to Date, Approved Budget, Current Forecast Cost, and Cost Variance between Approved Budget and Current Forecast Cost. There were no adjustments to the Approved Budget or Current Forecast Cost during the quarter.

Table 3.1 Program Cost Summary

	Expenditures to Date (\$ Million) (A)	Approved Budget** (\$ Million) (B)	Current Forecast Cost (\$ Million) (C)	Cost Variance (\$ Million) (D = B - C)
Water Infrastructure	\$19.38	\$115.70	\$115.70	-
Power Infrastructure	\$39.59	\$89.51	\$89.51	-
Joint Infrastructure	\$45.04	\$106.88	\$106.88	-
Hetchy R&R Program Total*	\$104.00	\$312.08	\$312.08	-

*The program total values include completed, not-initiated, and on-hold projects.

**The approved budget includes the 10-Year CIP Plan, as well as the previous fiscal year's appropriated budget

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 compares the 2018 Approved Schedule and Current Forecast Schedule for the R&R program. Refer to the “Cost and Schedule Status” notes in Section 5 for the criteria associated with the three color-coded Forecast Status levels in Figure 4.1 – Meet Requirements, Need Attention, and Exceed Limits.

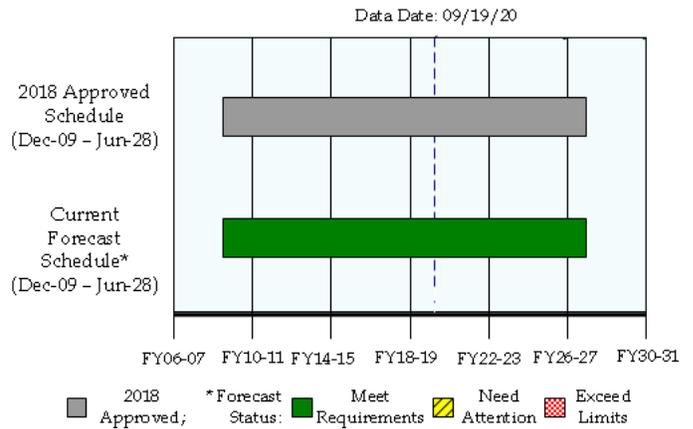


Figure 4.1 R&R Program Schedule Summary

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5. PROGRAM PERFORMANCE SUMMARY

All costs are shown in \$1,000s as of 09/19/20

Program Name	Active Phase (**)	Approved Budget (A)	Current Forecast Cost (B)	Expenditures To Date (C)	Cost Variance (D= A - B)	Cost Status (+)	Approved Completion (E)	Current Forecast Completion (F)	Schedule Variance (G = E - F)	Schedule Status (+)	Program Data Sheet
Water Infrastructure											
CUH100 - Water Infrastructure	MP	\$ 115,698	\$ 115,698	\$ 19,380	-	★	06/30/28	06/30/28	-	★	See Section 10
Power Infrastructure											
CUH101 - Power Infrastructure	MP	\$ 89,509	\$ 89,509	\$ 39,585	-	★	06/30/28	06/30/28	-	★	See Section 10
Joint Infrastructure											
CUH102 - Joint Infrastructure	MP	\$ 106,875	\$ 106,875	\$ 45,039	-	★	06/30/28	06/30/28	-	★	See Section 10

** Phase Status Legend

PL Planning DS Design
BA Bid & Award CN Construction MP Multiple-Phase

+ Cost and Schedule Status

- ★ Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
- ⚠ Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
- Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROGRAMS NOT WITHIN BUDGET AND/OR SCHEDULE

All programs are within the current approved budget and schedule.

7. ON-GOING CONSTRUCTION

There are no active construction projects with a construction contract amount greater than \$1 million.

8. PROGRAMS IN CLOSE-OUT

No program is currently in close-out.

9. COMPLETED PROJECTS

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Water Infrastructure				
CUH10005 - Priest Pipe Recoating	06/30/18	06/30/18	\$ 39,407	\$ 38,368
CUH10006 - Moccasin Gate No. 3 Shaft Replacement and Automation	12/31/18	12/31/18	\$ 1,049,557	\$ 133,278
Power Infrastructure				
CUH10103 - Powerhouse Control Upgrade	07/31/15	07/31/15	\$ 1,724,231	\$ 1,724,231
CUH10108 - Step-Up Transformers	04/04/17	04/04/17	\$ 221,995	\$ 182,525
CUH10109 - Moccasin Low Head Rehabilitation Project	05/31/18	05/31/18	\$ 619,140	\$ 568,367
CUH10111 - Moccasin GSU Transformers & Oil Containment	02/27/15	02/27/15	\$ 84,343	\$ 82,369
CUH10112 - Kirkwood Powerhouse Refurbishment & TSOV	06/30/17	06/30/17	\$ 62,177	\$ 47,473
CUH10118 - Kirkwood PH Valve Dissipation	06/30/17	06/30/17	\$ 810,613	\$ 718,117
Joint Infrastructure				
CUH10205 - Small Water Systems Upgrades	06/30/14	06/30/14	\$ 1,922,482	\$ 1,922,482
CUH10207 - Existing Hetchy Facilities (Outside Moccasin)	11/02/18	11/02/18	\$ 1,588,814	\$ 1,231,168
CUH10208 - Remote Terminal Unit Replacement	09/28/18	09/28/18	\$ 1,648,985	\$ 1,134,513
CUH10210 - Hetchy Fiber Projects	05/29/15	05/29/15	\$ 167,531	\$ 115,621
TOTAL			\$ 9,939,275	\$ 7,898,512

10. PROGRAMS WITHIN BUDGET AND SCHEDULE

CUH100 - Water Infrastructure

Program Description: The purpose of the Hetchy R&R Water Infrastructure Program is to extend the useful life of the water conveyance facility assets including tunnels and pipelines. The R&R projects are prioritized based upon regulatory compliance, condition assessment, operation staff recommendations, and level of service goals.

Program: Water Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost:		Program Schedule:
Approved  \$115.70 M	Approved Nov-10  Jun-28	
Forecast  \$115.70 M	Forecast Nov-10  Jun-28	
Actual  \$19.38 M	Program Percent Complete: 28.1%	
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

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

Progress and Status:

The CUH100 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 47 subprojects.

Planning: 1 subproject

- 10034364.007 SJPL No 1 Alternatives Analysis Report (December 02, 2019)

Design: 6 subprojects

- J100-01.019 San Joaquin Pipeline System Wide Testing (April 01, 2015)
- J100-01.038 SJPL Improvement at Claratina Crossing (February 01, 2018)
- J100-01.021 SJPL Isolation Assessment and Valve Replacement (April 01, 2015)
- J100-05.001 Priest Outlet 24 (inch) Pipe Recoating (February 03, 2014)
- 10034364.002 Foothill Tunnel Lining Repair at Oakdale Portal (October 02, 2019)
- 10034364.006 Oakdale Portal Standpipe and Anchors System Repairs (December 02, 2019)

Bid and Award:1 subproject

- 10034364.005 SJPL No 4 Oakdale Portal Flowmeter Replacement (September 03, 2019)

Construction: 6 subprojects

- J100-01.031 San Joaquin Pipeline No 1 East of River Road Damage Assessment (December 01, 2016)
- J100-01.033 SJPL No 1 Oakdale Portal to Emery Inspection and Repair (September 01, 2017)

- 10034364.001 SJPL No 1 Oakdale Portal and Tesla Roll Out Installation (December 14, 2018)

- 10034364.003 SJPL No 1 Pipe Replacement 2020 Outage (September 03, 2019)

- 10034364.004 SJPL No 1 Air Guard and Blow-off Valve Replacement (October 01, 2019)

- 10034364.008 San Joaquin Pipeline No.1 Pipe Replacement - Mile Post 91 (May 12, 2020)

Closeout: 2 subprojects

- J100-01.010 Rankin Property Acquisition (April 01, 2013)

- 10034520.001 Moccasin Dam and Outlet Works (September 02, 2019)

Completed: 31 subprojects

Planned Milestones for Reporting Quarter:

Complete Closeout: Two subprojects 100-01.035 and 100-01.036 closed this quarter.

Status of Planned Milestones for Reporting Quarter:

One subproject moved from Planning to Design, One subproject moved from Design to Bid and Award, and one subproject moved from Planning to Construction and two subprojects moved from Bid and Award to Construction. One subproject moved from Planning to Closeout.

Planned Milestones for Subsequent Quarter:

Complete Closeout: 1 subproject

Start Planning: 1 subproject

Issues and Challenges:

No new issues or challenges at this time.

CUH101 - Power Infrastructure

Program Description: The purpose of the Hetchy R&R Power Infrastructure Program is to extend the useful life of the power generation facility assets including powerhouse, switchyards, power distribution towers, and electrical distribution lines. The R&R projects are prioritized based upon regulatory compliance, condition assessments, Operations staff recommendations, and level of service goals.

Program: Power Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost:		Program Schedule:
Approved 	\$89.51 M	Approved Dec-09  Jun-28
Forecast 	\$89.51 M	Forecast Dec-09  Jun-28
Actual 	\$39.59 M	Program Percent Complete: 48.7%
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

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

Progress and Status:

The CUH101 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 51 subprojects.

Planning: 4 subprojects

- 101-18.002 Kirkwood PH Bypass Interim Repairs (November 01, 2019)
- 10036104.001 Modicon Quantum Programmable Logic Controller Upgrade to M580 (March 02, 2020)
- 10036104.002 Moccasin Low Head Powerhouse Exterior and Interior Repairs (March 02, 2020)
- 10036265.001 Riverbank Transmission Line Service Extension (February 10, 2020)

Design: 3 subprojects

- 101-18.004 Critical Spare Procurement for Kirkwood Powerhouse Energy Dissipation Cone (August 31, 2020)
- 10036104.003 Moccasin Powerhouse Gates and Valves Automation (April 02, 2020)
- 10036265.002 Warnerville and Early Intake Switchyard Control Room Roof Replacements (April 13, 2020)

Construction: 2 subprojects

- 101-01.021 Moccasin Switchyard Isolation Transformer Protection (September 01, 2016)
- 101-17.003 Transmission Line Clearance Mitigation Project (July 03, 2017)

Closeout: 2 subprojects

- 10034521.001 Moccasin Powerhouse Gantry Crane Upgrade (October 01, 2019)
- 101-01.013 HPH/KPH Ridge Line Transformer Protection (October 04, 2012)

Completed : 40 subprojects



Generator Shaft at Moccasin Powerhouse

Planned Milestones for Reporting Quarter:

Complete closeout: No subprojects closed this quarter.

Status of Planned Milestones for Reporting Quarter:

One new subproject started this quarter and is already in design, 101-18.004. One subprojects moved from planning to design. One subproject moved from planning to closeout this quarter. One subproject moved from design to construction.

Planned Milestones for Subsequent Quarter:

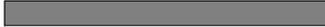
Complete closeout: 1 subproject.

Issues and Challenges:

No new issues or challenges at this time.

CUH102 - Joint Infrastructure

Program Description: The purpose of the Hetchy R&R Joint Infrastructure Program is to extend the useful life of the joint-facilities assets including dams, roads, communication systems, wastewater treatment facilities, cottages, and operational yard facilities. The R&R projects are prioritized based upon regulatory compliance, condition assessments, and Operations staff recommendations.

Program: Joint Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost:		Program Schedule:
Approved  \$106.88 M	Approved Nov-10  Jun-28	
Forecast  \$106.88 M	Forecast Nov-10  Jun-28	
Actual  \$45.04 M	Program Percent Complete: 35.9%	
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

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

Progress and Status:

The CUH102 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 100 subprojects.

Planning: 8 subprojects

- 102-03.011 Early Intake Dam Stability and Spillway Repairs (June 20, 2013)
- 102-08.001 KPH Unit 3 Remote Terminal Unit (RTU) Replacement and PLC Stop Logic Implementation (June 20, 2013)
- 102-09.016 Yosemite Park Hetch Hetchy Road Guard Rail Improvements (January 01, 2015)
- 102-09.018 Hetch Hetchy Roads FY 2019-2020 (August 01, 2019)
- 102-11.007 Rock River and Microwave Sites Physical Security Upgrade (September 23, 2019)
- 10034501.002 Distribution PRC 4292 Equipment Replacement (November 01, 2019)
- 10034501.004 Overhead Electrical Distribution Line (March 16, 2020)
- 102-13.005 Moccasin Peak Communication Building Air Conditioner Replacement (May 04, 2020)

Design: 3 subprojects

- 102-02.006 Moccasin Sewer Pond Upgrade (November 01, 2012)
- 102-03.010 O’Shaughnessy Dam Spillway Condition Assessment (September 01, 2017)
- 10034501.001 Cherry Ridgeline Transformer Rehabilitation (April 01, 2019)

Bid and Award: 1 subproject

- 10034501.003 Cherry Camp Power System Upgrade (December 15, 2019)

Construction: 6 subprojects

- 102-01.005 Upcountry Microwave Improvement (March 09, 2017)
 - 102-02.025 Moccasin Village and Shops Transformers (April 03, 2017)
 - 102-09.010 Small Bridge Improvement Project (January 15, 2016)
 - 102-09.012 Kearny Lateral Crossing (August 08, 2016)
 - 102-11.005 Security Upgrade for Mixed Facilities (March 27, 2017)
 - 102-02.028 Early Cottage No 1, 2, 3, & 4 Roof Replacement (November 01, 2019)
- Closeout: 4 subprojects
- 102-02.019 Moccasin Control and Server Building Boiler Work (March 01, 2016)
 - 102-03.005 Cherry Dam Condition Assessment (February 03, 2014)
 - 102-09.008 Road and Bridge Improvement (July 06, 2015)
 - 102-09.014 Cherry Lake Road Guardrail C-3 and 4 (May 01, 2017)
- Completed : 78 subprojects

Planned Milestones for Reporting Quarter:

Complete Closeout: 1 subproject 102-13.004 Duckwall Communication Site Power System Repair, completed closeout this quarter.

Status of Planned Milestones for Reporting Quarter:

One new subproject moved from Planning to Design. One subproject moved from Design to Bid and Award. One subproject moved from Bid and Award to Construction, and one subproject moved from Design to Construction. One subproject completed this quarter.

Planned Milestones for Subsequent Quarter:

Complete Closeout: 1 subproject

Issues and Challenges:

No new issues or challenges at this time.

**II. SAN FRANCISCO POWER ENTERPRISE
CAPITAL IMPROVEMENT PROGRAMS (POWER)**



INTRODUCTION

The San Francisco Power Enterprise (Power) is responsible for the marketing and sale of the clean hydro-generated power produced by the Hetch Hetchy system, and balances that supply with purchases or sales to meet customer demand. Power transmits, distributes, meters, and prepares the electric bills for its customers, comprised of all City and County of San Francisco offices, facilities, and their tenants, ranging from neighborhood Police Stations and Fire Houses, the Ferry Building, and City Hall, to the Airport, General Hospital, Wastewater pumping and treatment facilities, the Regional Water Treatment Facilities, and the Municipal Railway (MUNI). Power is also the full-service electricity provider to Treasure and Yerba Buena Islands, and the newly developing Hunters Point Shipyard. Power operates and maintains four substations and switchgear, and many miles of distribution wires, to provide reliable electric service to its customers.

Power also owns, operates, manages, and maintains approximately 25,000 street lights and related circuitry throughout San Francisco.

Power provides the full complement of electricity services to its vital City service customers, which includes identifying and implementing energy efficiency improvements and on-site renewable power generation. Power has developed and owns 2 Megawatts (MW) of rooftop solar projects, developed and owns the output of the 5 MW Sunset Solar Generating project, and developed 2 MW of methane gas-fired co-generation facilities at the Southeast Wastewater Treatment Plant.



1. PROGRAM DESCRIPTION

The SFPUC Power Enterprise’s capital improvement projects are divided into six groups: Generation, Energy Efficiency, Retail Services, Street Lights, Transmission/Distribution System, and Redevelopment-Treasure Island Projects.

2. PROGRAM STATUS

This Quarterly Report presents the progress made between July 1, 2020 and September 30, 2020. The data reported herein as the “approved” project budget and schedule conforms to the Power Capital Improvement Program’s 10-Year Plan, which was approved by the Water and Power Enterprise Managers and became effective on February 9, 2016.

Figure 2.1 shows the Approved Budget for the projects in each phase of the program as of September 30, 2020. The number of projects currently in each phase is shown in parentheses. Multiple Phase projects are currently active in several phases as indicated by their respective project status sheets (Sections 6 and 10 of this report).

There are three (3) projects whose status is “on-hold”, CUHCAP02, CUH98001, and CUH985, and are consequently not being reported in this quarterly report. However, funding status related to these on-hold projects is included in Table 3.1, in order to give an accurate report of the overall program’s cost performance. Progress reporting for these projects will be included in subsequent editions of this report upon their initiation or resumption.

Figure 2.2 summarizes the environmental review status of the Hetch Hetchy projects as of September 30, 2020.

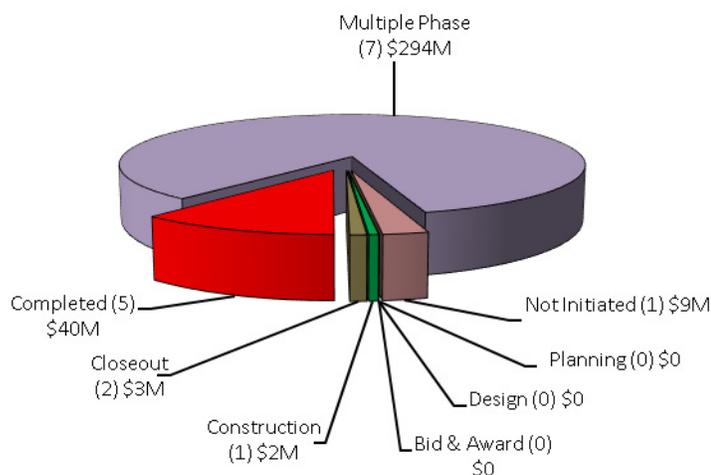
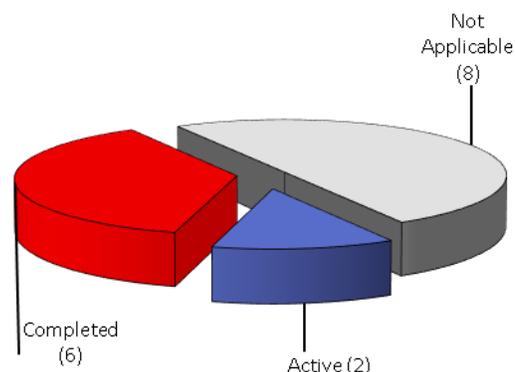


Figure 2.1 Approved Budget for Projects in Each Phase



* Environmental review does not apply to the projects not under CEQA requirements or with no environmental phase.

Figure 2.2 Program Environmental Status

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall current program-level funding status of the Power projects included in this report. It shows the Approved Budget as of 2018 Hetch Hetchy 10-Year CIP Plan, Appropriated Budget to Date, Not Appropriated Budget to Date, Total Expenditures to Date, and Remaining Appropriated Budget.

Table 3.2 reflects the total number of projects by their status. Table 3.3 provides an overall current program-level cost summary of the active projects included in this report. It shows the Expenditures to Date, Current Approved

Budget and Current Forecast Cost, and the Cost Variance between the Current Approved Budget and the Current Forecast Cost. The total Current Approved Budget for active projects included in this report is \$260.03M, and the current Forecast Cost is \$153.26M over budget.

The staffing and development of schedules for new and inactive projects are underway. Progress reporting for these projects will be included in subsequent editions of this report upon their initiation or resumption.

Table 3.1 - Status of Funding Appropriated to Date

	Approved Budget as of Hetch Hetchy 10-Year CIP Plan (\$ Million) (A)	Appropriated Budget to Date (\$ Million) (B)	Not Appropriated Budget to Date (\$ Million) (C=A-B)	Total Expenditures to Date (\$ Million) (D)	Remaining Appropriated Budget (\$ Million) (E=B-D)
Generation	\$55.57	\$44.71	\$10.85	\$38.42	\$6.30
Efficiency	\$49.01	\$36.76	\$12.25	\$33.38	\$3.39
Street Lights	\$109.34	\$84.57	\$24.76	\$61.78	\$22.79
Retail Services	\$41.70	\$118.81	(\$77.12)	\$45.09	\$73.73
Transmission/ Distribution System**	\$117.47	\$37.31	\$80.16	\$16.99	\$20.32
Redevelopment - Treasure Island	\$43.75	\$43.79	(\$0.04)	\$8.01	\$35.78
Power Enterprise Total*	\$416.83	\$365.96	\$50.87	\$203.65	\$162.32

*The Total Values include Project Development related costs, On-Hold, Completed, and Not Initiated projects.

**A new project, Intervening Facilities, with budget cost of \$99.5M was added in March 2019.

Table 3.2 - Number of Projects by Status

	# of Active Projects (A)	# of Completed Projects (B)	# of Not Initiated Projects (C)
Generation	3	2	0
Efficiency	2	1	0
Street Lights	1	1	0
Retail Services	2	1	0
Transmission/ Distribution System	2	0	0
Redevelopment - Treasure Island	0	0	1
Power Enterprise Total	10	5	1

Table 3.3 Active Projects Cost Summary

	Expenditures to Date (\$ Million) (A)	Current Approved Budget (\$ Million) (B)	Current Forecast Cost (\$ Million) (C)	Cost Variance (\$ Million) (D= B-C)
Generation	\$35.47	\$38.14	\$38.40	(\$0.26)
Efficiency	\$5.28	\$7.85	\$7.85	-
Street Lights	\$60.55	\$108.10	\$108.10	-
Retail Services	\$39.29	\$1.70	\$154.70	(\$153.00)
Transmission/ Distribution System	\$4.41	\$104.25	\$104.25	-
Redevelopment - Treasure Island	-	-	-	-
Power Enterprise Total*	\$145.00	\$260.03	\$413.29	(\$153.26)

*The Total Values do not include Project Development related costs, On-Hold, Completed, and Not Initiated projects.

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2016 Approved Schedule and Current Forecast Schedule for the Power program. As shown in Table 4.1 the Overall Power Enterprise Program is currently forecast to be completed in June 2028.

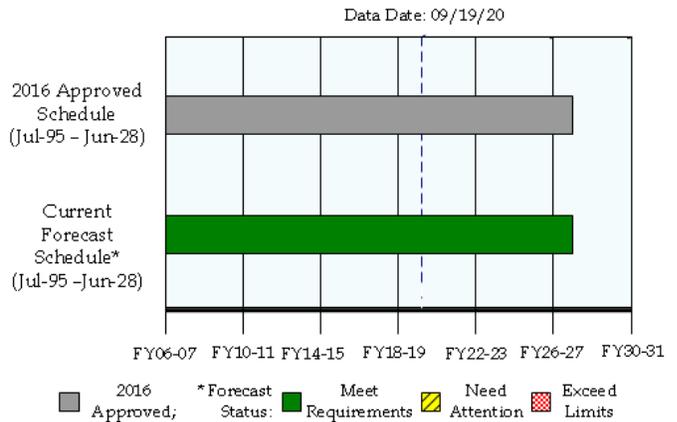


Figure 4.1 Program Schedule Summary

Table 4.1 2016 Approved vs. Current Forecast Schedule Dates

Sub-Program	2016 Approved Project Start	Actual Start	2016 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Generation	07/01/08	07/01/08✓	02/01/19	06/28/24	64.9
Efficiency	01/01/08	01/01/08✓	12/30/21	12/30/21	-
Street Lights	09/08/08	09/08/08✓	05/12/25	06/30/27	25.6
Retail Services	07/01/95	07/01/95✓	03/01/22	06/30/22	4.0
Transmission/ Distribution System	07/01/05	07/01/05✓	06/30/28	06/30/28	-
Redevelopment - Treasure Island	-	-	-	-	-
Overall Power Enterprise*	07/01/95	07/01/95✓	06/30/28	06/30/28	-

*The Overall Schedule does not include On-Hold and Not Initiated projects.

5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in \$1,000s as of 09/19/20

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Generation											
CUH94763 - Go Solar SF Program	MP	\$ 34,120	\$ 34,120	\$ 32,261	-	★	06/29/18	06/28/24	72.0 mo. Late	●	See Section 6
CUH99309 - Marina Middle School Solar	CN	\$ 1,920	\$ 1,920	\$ 854	-	★	01/31/19	09/18/20✓	19.6 mo. Late	●	See Section 6
Efficiency											
CUH983 - Civic Center Sustainable District Program	MP	\$ 6,650	\$ 6,650	\$ 4,167	-	★	12/30/21	12/30/21	-	★	See Section 10
Street Lights											
CUH896 - Streetlight Replacement	MP	\$ 108,096	\$ 108,096	\$ 60,550	-	★	05/12/25	06/30/27	25.6 mo. Late	●	See Section 6
Retail Services											
CUH870 - Distribution Services Retail Customers	MP	\$ 40,000	\$ 168,452	\$ 43,431	(\$128,452)	●	07/02/20	06/30/22	23.9 mo. Late	●	See Section 6
CUH891 - Metering and Load Monitoring	MP	\$ 699	\$ 699	\$ 337	-	★	03/01/22	06/30/22	4.0 mo. Late	⚠	See Section 6

* 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		

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Transmission / Distribution											
10033821 - Intervening Facilities	MP	\$ 99,500	\$ 99,500	\$ 2,477	-	★	06/30/28	06/30/28	-	★	See Section 10
CUH972 - Load Meter Program	MP	\$ 4,750	\$ 4,750	\$ 1,936	-	★	03/01/22	06/30/22	4.0 mo. Late	⚠	See Section 6

* 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	

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROJECTS NOT WITHIN BUDGET AND/OR SCHEDULE

CUH94763 - Go Solar SF Program

Project Description: GoSolarSF is an incentive program to encourage San Francisco residents to install solar power systems by offering one-time incentive payments to reduce the costs to the homeowners. The program launched in 2008 and provides between \$2 and \$5 Million per year in incentives to residents of San Francisco.

Program: Generation	Project Status: Multiple Phase	Environmental Status: Not Applicable		
Project Cost:		Project Schedule:		
Approved 	\$34.12 M	Approved Jul-08 	Jun-18	
Forecast 	\$34.12 M	Forecast Jul-08 	Jun-24	
Actual 	\$32.26 M	Project Percent Complete: 94.0%		
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits				
Key Milestones:	Environmental Approval+	Bid+ Advertisement	Construction+ NTP	Construction+ Final Completion
Current Forecast	See Note	N/A	N/A	N/A

+ This is one of the programmatic projects; it does not result in construction projects that the City bids out, manages, or owns.

Progress and Status:

GoSolarSF recently ended the programs third quarter for calendar year 2020, providing incentives to 60 applicants. As of September 31, 2020, \$126,357.00 in incentives were paid in the reporting quarter.

Issues and Challenges:

New applications slowed due to COVID-19 shelter in place impacts, but activity is again picking back up. GoSolarSF is also providing relief to applicants that are not able to meet stipulated deadlines when impacted by COVID-19. Schedule variance was due to a decision to extend the GoSolarSF program, and continue offering solar incentives.

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CUH99309 - Marina Middle School Solar

Project Description: The project scope consists of the design and the installation of a rooftop solar electric system with energy storage at Marina Middle School. The design phase includes DC/AC electrical and structural design for a photovoltaic (PV) rack mounted array and related electrical equipment. The system's energy storage (batteries) will provide flexibility with regard to how much power is drawn from the grid and will provide resiliency in the case of a disaster event. The Construction Phase will include the installation of a grid connected PV system and energy storage. Once completed, the PV system will be interconnected to the PG&E electrical distribution system.

Program: <i>Generation</i>		Project Status: <i>Construction</i>		Environmental Status: <i>Completed</i>	
Project Cost:			Project Schedule:		
Approved		\$1.92 M	Approved Mar-16		Jan-19
Forecast		\$1.92 M	Forecast Mar-16		Sep-20
Actual		\$0.85 M	Project Percent Complete: 100.0%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	11/27/19✓	N/A	11/01/19✓	09/18/20✓	

Progress and Status:

This project was previously funded by a CREBS bond. During this time the funding fell under CUH99309. This bond expired earlier this year at which time all funding under the authority was closed out. The construction of the project will be performed by Power Enterprise's internal construction crews and funded (~\$200k) through Power's Cap and Trade Authority.

Issues and Challenges:

Marina Middle School PV installation was delayed by work related to the SFUSD bond modernization construction activities on site. This is the last report for this project.



Marina Middle School Solar Project

CUH896 - Streetlight Replacement

Project Description: The SFPUC maintains approximately 25,500 street lights in the City of San Francisco. This Program funds various street lighting projects, street light engineering and capital support services, electric vehicle charger installations, community benefits capital projects, small and large street lighting capital projects, and street lighting Repair and Replacement (R&R) projects. The overall program provides funding for multiple projects over multiple years with varying start and end dates.

Program: Street Lights		Project Status: Multiple Phase		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$108.10 M	Approved Sep-08		May-25
Forecast		\$108.10 M	Forecast Sep-08		Jun-27
Actual		\$60.55 M	Project Percent Complete: 56.1%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	Various	Various	Various	Various	

Progress and Status:

- CUH896.01 is an ongoing capital project for the streetlights of San Francisco. 52 sub-level projects are each composed of several mini-streetlight projects at various milestone stages.
- CUH 896.48 - 3rd Street Rehabilitation. This project is complete and fully operational.
- CUH 896.32 - Van Ness Bus Rapid Transit. This is a cost share project with MTA. SFPUC is only providing funds for the ongoing project. Installation of new street and sidewalk light pole foundations are in progress.
- CUH 896.49 - Holiday and Festival Lighting. This is an ongoing project with annual work during the holiday season. SFPUC crews install holiday lighting on Market St. and Third St.
- CUH896.50 Pedestrian Lighting. This project is still awaiting sub-projects to be engineered. This will be an ongoing project which will add pedestrian lighting based on community requests.
- CUH 896.51 - Street Light and Pedestrian Pole Assessment. Project is ongoing and currently in Phase II. Phase I is completed and has assessed 23,219 street light poles to date. Phase II is underway and has assessed 1,275 poles to date.
- CUH 896.52 - San Bruno Street Light Improvement. This project is complete and fully operational.
- CUH896.52 Streetlight Pole Rehabilitation. We have completed the replacement of 626 deteriorated poles to date. The poles are identified by pole inspections.

- CUH 896.40 Series Loop Conversions. We have completed 6 conversions to date and have 2 remaining to complete the project. We are estimating completion in June 2022.
- CUH896.27 LED Street Light Conversion Project. We have completed 21,100 LED conversions to date. The cobra head portion of this project is completed. Maintenance and the decorative portion of this project is ongoing.
- CUH896.47 Tenderloin Street Light Improvements. Phase 1 has been completed and Phase 2 is in design.
- CUH896.30 Street Light Repair and Replacement. This is an ongoing project for replacement of street light facilities requested through 311 or by the Board of Supervisors.
- CUH896.31 Street Light Area Improvements. This is an ongoing project for addition of street light facilities requested through 311 or by the Board of Supervisors.
- CUH896.DA- Distributed Antenna System. This is an ongoing project to install wireless 4G and 5G equipment on City-owned streetlights. The existing 12-year license agreements with wireless telecommunications providers will expire in 2027 but may be extended indefinitely. To date, there are 776 DAS sites on City-owned poles. Installation is on-going as carriers continue to submit requests to add poles to their agreements.

Issues and Challenges:

Schedule variance was due to CUH896.DA which the existing agreement would expire in 2027.

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CUH870 - Distribution Services Retail Customers

Project Description: A program to develop SFPUC-owned transmission and electrical distribution facilities along the Bayside of San Francisco has been initiated. The objective is to receive transmission level voltage from PG&E Potrero substation at 230kV, transform this high voltage to 34.5 kV, and then distribute this lower voltage to SFPUC Power Enterprise electrical customers. The scope of Phase One of the program encompasses ductbanks, conduits, cables, electrical equipment and vaults underground from 23rd Street along Illinois to 16th St, and then Terry Francois Boulevard to South Street. The Phase One work is planned to be completed by end of December 2018. The balance of the Bay Corridor Transmission Distribution (BCTD) project will be built in subsequent stages, with the SFPUC substation to be built in parallel with the Phase One distribution work.

Program: Retail Services		Project Status: Multiple Phase		Environmental Status: Completed (CatEx)	
Project Cost:			Project Schedule:		
Approved		\$40.00 M	Approved Dec-15		Jul-20
Forecast		\$168.45 M	Forecast Dec-15		Jun-22
Actual		\$43.43 M	Project Percent Complete: 26.4%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	Various	Various	Various	Various	

Progress and Status:

CUH870 has 5 subprojects:

- CUH870.01 Distribution Services Retail Customers: This subproject holds unallocated budget for use by other subprojects.
- CUH870.02 Bay Corridor Transmission Distribution (BCTD): This subproject contains multiple contracts. Forecasted cost at completion is \$154M.
- CUH870.03 Distribution Interface - New Customers: This subproject will be ongoing for the foreseeable future.
- CUH870.04 Electrical Service Improvements: This subproject will be ongoing for the foreseeable future.
- CUH870.05 HHP-EE Programs for New Retail Customers: This subproject will be ongoing for the foreseeable future.

CUH870.02 is the only active subproject in CUH870.

- Contract DB-128R2: Final Completion (FC) date is being negotiated.
- Contract DB-129.1: Design work occurring. Construction completion in 2021.
- Contract DB-129.2: Design work occurring. Construction completion in 2021.
- Contract DB-130: Design work occurring. Construction completion in 2021.

Issues and Challenges:

None at this time. Cost variance was due to new forecast from 10014227 / CUH870.02 BCTD. Field work delayed by virus restrictions.

CUH891 - Metering and Load Monitoring

Project Description: The purpose of this project is to upgrade existing metering to revenue quality meters, and to upgrade any associated equipment as needed. Metering and communication equipment will be installed and replaced according to the meter data acquisition strategy developed by CUH972 Load Meter Project.

Program: Retail Services		Project Status: Multiple Phase		Environmental Status: Completed	
Project Cost:			Project Schedule:		
Approved		\$0.70 M	Approved Jul-95		Mar-22
Forecast		\$0.70 M	Forecast Jul-95		Jun-22
Actual		\$0.34 M	Project Percent Complete: 48.2%		
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	09/26/16✓	N/A	03/01/19✓	06/30/22	

Progress and Status:

The Load Meter Project created a strategy to identify, procure, and install an Advanced Metering Infrastructure (AMI) system for Power Enterprise electric meters. After the strategy development is complete, funds remaining in CUH972 and all funds in CUH891 will be used for the purchase and installation of metering and communication equipment. Power Enterprise evaluated CUH972 Load Meter Program in conjunction with this project to refine and delineate the scope of these 2 projects.

The project schedule includes issuing a Request for Proposals (RFP) for procurement of the AMI system. An RFP was issued in April 2017, but no qualified responses were received. A sole-source contract was signed with Aclara in October 2018. A pilot study was initiated in March 2019; and testing of the pilot phase has been completed.

Deployment and testing of the system, along with replacement of the existing 1,250 meters with AMI meters, is expected to be completed in 2020; but that completion will be delayed until 2021 if network communication gaps are found during or after system deployment. Installation of the second phase of Data Collection Unit (DCU) began in August 2020 and will continue through December 2020.

Because the operations budget cannot pay for future meters at redevelopment or Housing Authority sites, the project will pay for future AMI meters.

Issues and Challenges:

The project is merged with CUH972.

II POWER Quarterly Report

CUH972 - Load Meter Program

Project Description: The purpose of this project is to identify and then implement the most cost effective method to collect reliable meter data from existing and future SFPUC Power customers in geographically dispersed areas. The project will evaluate the feasibility of implementing an Advanced Metering Infrastructure (AMI) System. The project will also consider the feasibility of replacing all or a portion of the 2000 PG&E meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, or, in the alternative, the Power Enterprise purchasing these meters from PG&E.

Program: Transmission / Distribution		Project Status: Multiple Phase		Environmental Status: Completed	
Project Cost:			Project Schedule:		
Approved		\$4.75 M	Approved Jul-05		Mar-22
Forecast		\$4.75 M	Forecast Jul-05		Jun-22
Actual		\$1.94 M	Project Percent Complete: 40.5%		
					
Key Milestones:	Environmental Approval	Bid+ Advertisement	Construction+ NTP	Construction+ Final Completion	
Current Forecast	09/26/16✓	N/A (B) 11/30/16✓	(A) 07/01/05✓ (B) 03/01/19✓	(A) 03/31/09✓ (B) 06/30/22	

+ The project includes multi-phase construction: (A) Phase 1; (B) Phase 2

Progress and Status:

The purpose of this project is to identify and then implement the most cost-effective method to collect reliable meter data from existing and future SFPUC Power customers in geographically dispersed areas. The project will evaluate the feasibility of implementing an Advanced Metering Infrastructure (AMI) System. The project will also consider the feasibility of replacing all or a portion of the 2000 PG&E meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, or, in the alternative, the Power Enterprise purchasing these meters from PG&E.

Issues and Challenges:

No qualified responses to the April 2017 RFP were received, causing delays in the contracting process. The procurement was delayed to Fall 2018 to allow enough time to select and procure a vendor. A sole-source contract was signed with Aclara in October 2018.

7. 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	
Generation								
CUH99308 - SF Academy Solar Carport	01/04/18	07/31/18	07/31/20	\$ 1,820,000	\$ 1,820,000	(731)	-	94.0%

Program Total for On-Going Construction	Original Contract Cost	Current Forecast Cost*	Variance	
			Cost	Percent
	\$ 1,820,000	\$ 1,820,000	\$-	- %

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

8. 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
Generation				
CUH99308 - SF Academy Solar Carport	07/31/18	07/31/20	\$ 1,819,632	\$ 1,819,632
Efficiency				
CUH995 - Enterprise Fund Dept - Energy Efficiency	06/29/18	03/31/20	\$ 1,195,720	\$ 1,111,089
TOTAL			\$ 3,015,352	\$ 2,930,721

9. COMPLETED PROJECTS*

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Generation				
CUH99302 - Alvarado Elementary School -- Solar Electric (completed)	01/04/13	01/04/13	\$ 582,170	\$ 580,224
CUH99307 - North Beach Library Solar -- Renewable/Generation - Small Renewables (completed)	09/26/14	09/26/14	\$ 212,160	\$ 127,077
Efficiency				
CUH986 - Energy Efficiency General Fund Program	06/30/21	09/25/20	\$ 36,877,376	\$ 26,690,006
Retail Services				
CUH973 - Distribution System Assessment (completed)	11/28/16	06/13/18	\$ 1,000,000	\$ 1,319,755
Street Lights				
CUH91503 - San Bruno Street Light Improvement Project (completed)	03/25/17	03/25/17	\$ 1,240,000	\$ 1,226,894
TOTAL			\$ 39,911,706	\$ 29,943,956

* This table only includes projects listed in the 10-Year CIP Plan for FY2017-2026.

10. PROJECTS WITHIN BUDGET AND SCHEDULE

CUH983 - Civic Center Sustainable District Program

Project Description: This project funds planning, design, and construction of projects in the green district of the Civic Center in accordance with the partnership Memorandum of Understanding (MOU) with the Clinton Climate Initiative. This effort will employ new technologies in energy efficiency for whole-building retrofits and will pursue Leadership in Energy and Environmental Design (LEED) certification from the US Green Building Council (USGBC). The program and its related projects will demonstrate the City's leadership by transforming the historic Civic Center into a green and sustainable resource district by maximizing energy efficiency and showcasing sustainable concepts and technologies.

Program: Efficiency		Project Status: Multiple Phase		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$6.65 M	Approved Jan-08		Dec-21
Forecast		\$6.65 M	Forecast Jan-08		Dec-21
Actual		\$4.17 M	Project Percent Complete: 62.0%		
					
Key Milestones:	Environmental Approval	Bid+ Advertisement	Construction+ NTP	Construction+ Final Completion	
Current Forecast	TBD	Multiple Small JOCs	Various	Various	

+ This is one of the programmatic projects, which include multiple construction contracts.

Progress and Status:

The Civic Center Sustainable District Program for this quarter continued to focus on energy efficiency services, retro-commissioning, and LEED certification for the City's building portfolio in the Civic Center including: City Hall, Asian Art Museum, Main Library, Department of Public Health, Civic Center Garage, Brooks Hall, UN Plaza, and the San Francisco War Memorial: Davies Symphony Hall, Veterans Building, and Opera House.

- City Hall Heat Pumps Replacement Project performance specification is in development with professional services contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 7.
- City Hall Cooling Towers Replacement Project performance specification is in development with professional services contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 10.
- City Hall Fuel Switching Feasibility Study is in development with professional services contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 11.
- City Hall LED Interior Dome Lighting Design was revised to comply with concerns with the Historic Preservation Commission. Environmental Review is in process with SFPUC Bureau of Environmental

Management and the San Francisco Planning Department. Construction services have been assigned to Rubicon Builders through JOC 64-11, pending environmental review approval.

- Installation of condensate meters at the Bill Graham Civic Auditorium was completed. These meters will be used to measure energy usage for future energy reporting requirements.
- Additional projects related to HVAC and lighting retrofits are being identified and evaluated for funding requirements.

Issues and Challenges:

None at this time.

10033821 - Intervening Facilities

Project Description: Under the Wholesale Distribution Tariff (WDT), electric service requires intervening facilities between PG&E's service points and SFPUC end-use customers. The installations of intervening facilities are needed for the upgrade of new electric service, conversion of service from secondary to primary service level, and aggregation of electric service to common points of service interconnection where feasible. The electric service improvements cover the installation of service cables, medium voltage switchgears, transformers, switches, service equipment and distribution infrastructures to be owned and maintained by the SFPUC Power Enterprise.

Program: Transmission / Distribution		Project Status: Multiple Phase		Environmental Status: Not Applicable	
Project Cost:			Project Schedule:		
Approved		\$99.50 M	Approved Dec-18		Jun-28
Forecast		\$99.50 M	Forecast Dec-18		Jun-28
Actual		\$2.48 M	Project Percent Complete: 1.7%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	N/A	N/A	N/A	N/A	

Progress and Status:

No updates on schedule or progress.

Issues and Challenges:

Intervening facilities may be required at various new construction and development projects where PG&E requires primary electric service. Each project is scheduled based on when the customer needs electric service.

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APPENDICES

A PROJECT DESCRIPTIONS

B APPROVED PROJECT-LEVEL SCHEDULE

C LIST OF ACRONYMS

APPENDIX A. PROJECT DESCRIPTIONS

A1-A HETCHY CAPITAL IMPROVEMENT PROJECTS (HCIP)

WATER INFRASTRUCTURE

CUH10001-HCIP - San Joaquin Pipeline Rehabilitation (Completed)

The purpose of the San Joaquin Pipeline Rehabilitation (SJPL) is to extend the useful life of these water conveyance facility assets, including tunnels and pipelines. Baseline dates and budgets for the subprojects below were presented to and approved by the Commission on 09/08/15. Since they are now considered to be active HCIP subprojects, they have been moved from CUH100 R&R.

CUH10003 - Lower Cherry Aqueduct

The Lower Cherry Aqueduct (LCA) delivers water from Cherry Creek to supplement the primary Hetch Hetchy reservoir supply during a drought year. Due to current drought conditions, as described in the Declaration of Emergency issued on February 21, 2014, there is a need for this reliable backup water supply to be re-established in the LCA. However, due to damage during the Rim Fire Emergency and age, the LCA is in need of restoration before it can become a reliable asset. This project consists of improvements such as emergency debris removal and tunnel cleaning, temporary structures installation, monitoring and instrumentation, and forebay and diversion dam repairs.

10035574 - SJPL Tesla Valves Replacement

This project intends to replace all the under rated inline valves, Tesla Ultra Violet (TUV) 101 to 401, with properly rated valves to improve safety and entry into all 4 San Joaquin Pipelines (SJPL). In addition, all cross-over valves and bypass valves may need to be replaced or made safe. Modification to the pipes, flanges, spool pieces, actuators, and

valve controls are needed. The valve vault will need modification to accommodate the new valves. New facilities may need to be constructed if additional new valves are not designed for direct burial.

10035575 - SJPL Valve and Safe Entry Improvement

The San Joaquin Pipeline (SJPL) Entry Assessment and Valve Improvement Project involves the three parallel transmission pipelines that stretch approximately 48-miles across the San Joaquin Valley from Oakdale Portal to Tesla Portal, with a partial fourth pipeline consisting of a 6.4-mile Eastern Segment and an 11-mile Western Segment. The four pipelines were built between 1932 and 2012, respectively, and range from 56- to 79.5-inches in diameter. As part of the Water System Improvement Program (WSIP), valve vaults were constructed along the SJPL System at various locations to increase operational flexibility and the overall reliability of the SJPL System. Since the commissioning of the valve vaults, Hetch Hetchy Water & Power (HHWP) has expressed concern that 1) valves may not be sufficiently rated and may fail due to a pressure transient surge event using certain operational assumptions 2) there is an inability to establish double isolation and bleed configurations along the SJPL System, resulting in insufficient protection for maintenance personnel, and 3) multiple isolation valves are not adequately rated for hydrostatic head. In order to achieve the safety and access goals, the scope is to: install a surge shaft upstream of Tesla Treatment Facility (TTF) to reduce maximum pressure from unplanned reactor valve closure and upgrade line valves to resist transient pressure from unplanned line valve closure; install new double isolation and bleed valves at all locations where major upgrades and construction are required; and retain single isolation where no upgrades are needed. There are four primary locations where major

upgrades and construction are required: Emery, Roselle, Pelican, and Tesla.

10033156 - Moccasin Reservoir Perimeter Security Fence

Hetch Hetchy Water & Power (HHWP) will install an approximately 6,500 feet long perimeter security fence system around Moccasin Reservoir to discourage trespassers. Moccasin Reservoir covers approximately 32 acres. Fence monitoring alarms, signs, lighting, and security camera will be considered as part of the design.

CUH100PD - 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

CUH10102 - Holm and Other Powerhouse Projects

This project will provide funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under \$1 million regarding power generation renewal and equipment replacement. The upgrade and rehabilitation of Holm Unit 2 includes 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 will be done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project includes upgrades to turbine and generators, and alternating current stations intended to extend the life of the unit by 20 years. Lastly, the project will upgrade the existing oil containment system at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators will be replaced, and other modifications will be made to the powerhouse interiors and to the transformer decks to discourage contaminated discharges into the adjacent streams. A monitoring system will be installed to alert Hetch Hetchy Water & Power (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 & cleanup.

CUH10113 - Kirkwood Penstock

Kirkwood Penstock was built in 1964 and conveys the SFPUC water supply from Canyon Tunnel to KPH. Kirkwood Penstock has experienced significant foundation movement without impact to the service utility. In February 2007, however, there was significant movement on the penstock, and the penstock partially detached from one fixed saddle directly below anchor block 2. The scope of this project includes an internal and external inspection; development of an Emergency Action Plan and a Penstock Monitoring Plan; repairs to the damaged saddle; installation of a

monitoring system; and procurement of emergency spare equipment.

CUH10114 - 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. This is a design-build project and was advertised twice in 2011 and 2013. Bids were unresponsive. The project will also involve 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.

CUH10115 - Warnerville Substation Rehabilitation

Warnerville Substation facilities and equipment have reached the end of their life expectancy. The facility needs to be upgraded to meet regulatory and safety requirements. This project will address major renewal and replacement of the substation components, including grounding, fence, circuit breaker, control room, electrical equipment, and disconnect switch. This project will also improve grading in the substation.

CUH10116 - Moccasin Penstock

The Moccasin Penstock conveys San Francisco Public Utilities Commission (SFPUC) water nearly one mile from Moccasin Tunnel to the

Moccasin Powerhouse. 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 back to 1924 and has been in service for more than 90 years. Condition assessments based on external inspection and imaging have identified a number of deficiencies along the original pipe. The 104-inch diameter (narrowing to 98-inch) riveted steel penstocks extend 1,554 feet from the downstream Moccasin Tunnel portal then bifurcate to four 66-inch diameter hammer-forged welded steel conduits extending about 2,384 feet to the lower welded steel pipe. Additionally, in September of 2018 the penstock experienced significant leakage in two separate areas, necessitating emergency repairs. This rehabilitation project is intended to enhance the reliability of the penstock system and will include: repair or replacement of some sections of corroded pipe; repair or replacement of four badly cracked concrete anchors and damaged penstock saddles; installation of new manways and a rollout pipe section to provide better access for inspection and maintenance; and recoating the outside pipe, where needed, to reduce future corrosion. The project scope was expanded to include: 1) The installation of additional penstock pipe between the valve house and the first downstream anchor; 2) The replacement of the butterfly valve pneumatic actuator with an electronic actuator, which will include new controls with SCADA connectivity; and 3) A new backup generator.

CUH10119 - Early Intake Switchyard Slope Hazard Mitigation

The Hetch Hetchy Water and Power (HHWP) Early Intake Switchyard (ISY) is a 230 kV switchyard located alongside the Tuolumne River, downstream of HHWP's Kirkwood Powerhouse (KPH). The switchyard is a critical HHWP asset that provides the transmission of electrical power generated at Kirkwood and

Holm powerhouses to Moccasin, as well as the local distribution of power to HHWP's upcountry facilities. The slope requiring hazard mitigation, located next to ISY, was severely burned in the Rim Fire. The purpose of the project is to reduce the risk of slope failure which may cause damage to the switchyard and loss of power transmission capability.

CUH101PD - 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

10032903 - O'Shaughnessy Dam Outlet Works Phase 1

O'Shaughnessy Dam (OSD) was completed in 1923 and raised in 1938. Condition assessment of the dam outlet works revealed deficiencies. This rehabilitation project addresses deficiencies of the existing outlet works system at OSD, including the drum gates and release system through OSD to Canyon Tunnel and the Tuolumne River. A recent condition assessment identified deficiencies in the OSD release system. Seven projects were identified

and have been prioritized. Phase 1 will include three of these projects: drum gate rehabilitation (upgrading the hinges and rivets, recoating the gate and existing seals, and repairing the spillway concrete), installation of a new bulkhead system, and rehabilitation of slide gates & installation of a diversion pipe butterfly valve.

CUH10214 - Moccasin Facilities New Construction

The existing HHWP shops and buildings are original and vary in age from between 45 to 80 years old. Some maintenance crews are currently working in buildings that were not originally intended to be used as shops. Many of these facilities do not meet current codes, require extensive repairs, and are not efficient work environments. The primary objective of this project is to build a 10,000-square-foot, combined-function building consisting of a plumbing shop, vegetation management shop, right-of-way shop, electric technician chop, lockers, shower facilities, break room, and new materials bins.

CUH10215 - 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.

CUH10216 - Cherry Dam Outlet Works Rehabilitation

The outlet facilities for Cherry Dam have reached the end of their service life at nearly 60 years old. The stream release assets must work sufficiently well to meet U.S. Department of

Interior's stream flow requirements, and these requirements cannot currently be met at low lake elevations. The 66" valves will be replaced in order to safely operate the dam during storm conditions with heavy inflows to Cherry Lake. The valves are critical for maintaining maximum carryover storage and meeting the SFPUC's water supply objectives. The scope of work includes replacement of the stream release valves and associated piping as well as the Low Level Outlet (LLO) 66" hollow jet valves. The project also replaced both butterfly valves that serve as isolation valves upstream of the hollow jet valves as change orders during construction.

CUH10220 - Mountain Tunnel Inspection & Repairs (Completed)

The objective of this project is to assess the current condition of the Mountain Tunnel and complete any urgent interim repairs to reduce the risk of tunnel lining failure until the completion of the long-term Mountain Tunnel Improvements project in 2026. The project consists of:

- A tunnel inspection in 2017 to update the Condition Assessment conducted in 2008; and
- Short term repairs in 2017 and 2018-19 to reduce the risk of failures in the concrete lining.

CUH10221 - 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:

- Initial evaluation of alternatives for the Mountain Tunnel facility, and
- Eventual design and construction of the preferred engineering alternative that will keep this vital component of the Hetch Hetchy

Water and Power System in reliable service for years to come.

The 2016 scope consisted of just the Planning Phase for the project. The primary focus was on the development of viable alternatives for the project including:

- Rehabilitation of the existing tunnel,
- Relining the existing tunnel,
- Construction of a new bypass tunnel within the tunnel right-of-way, and
- Construction of a new bypass tunnel outside the tunnel right-of-way.

In 2017, the existing tunnel was shut down for 60 days and a detail inspection was performed. The inspection and subsequent condition assessment found many defects in the tunnel lining. However, all the defects were repairable, and the tunnel was still structurally sound. This substantiated the viability of the rehabilitation alternative with downstream valve control, and the City adopted this as the preferred project for design and construction in July 2017. The rehabilitation option met almost all of the project performance standards with the least cost. The project consists of:

- Repairs of all significant concrete lining defect with wire mesh reinforcement and shotcrete,
- Contact grouting of the entire lining to further reinforce and seal the lining to the surround rock,
- A new downstream flow control facility at Priest Reservoir with valving to meter flows and keep the tunnel running full during all operations and mitigate future erosion of the lining,
- A new tunnel adit at Priest Reservoir to allow maintenance access to Mountain Tunnel without having to drain the reservoir in order to expose the current access portal,
- An extension of the South Fork Siphon crossing under the Tuolumne River to bypass a problematic section of the tunnel that infiltrates excessive groundwater into the tunnel, and causes adverse water quality issues,

Appendices

- An enlarged concrete portal at Early Intake to accommodate maintenance equipment access at the upstream section of the tunnel,
- Access road widening and improvements to accommodate safer maintenance access to Adit 5/6 and Adit 8/9, and
- Temporary construction staging areas, environmental mitigations, and site restoration improvements.

CUH10223 - OSH Dam Access and Drainage Improvements

The key objective of this project is to provide safe access for Hetch Hetchy Water and Power operators inside the O'Shaughnessy Dam by improving fall protection, access, and drainage. The key elements include:

- Replace Access Structures in Ladder Wells. The existing access structures in the four (4) vertical ladder wells (shafts) include vertical ladders and horizontal grating platforms that are spaced throughout the ladder wells.
- Install Fall Protection Systems. Install new Occupational Safety and Health Administration (OSHA) compliant ladders and landings with safety cage and/or install fall restraint systems.
- Seal or Mitigate Existing Leakage. Address flowing water by sealing leaks or otherwise diverting, collecting and disposing of flows.
- Drainage Improvements. Clear the drains in the dam so that water can drain as designed and/or install sump pumps, if appropriate.
- Replace Watertight Door between Ladder Wells 3 & 4. This scope item includes replacing the existing watertight door between Ladder Wells 3 & 4.

10035086 - Bridge Replacement (4 Bridges)

HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessment has identified the need for rehabilitation and/or replacement (both due to age and to meet current seismic design criteria). Four of the fourteen bridges require substantial

modification or replacement and have been combined into this project. This project includes rehabilitation and/or replacement of Cherry Lake Road Bridge (public access), Early Intake Bridge (public access), and O'Shaughnessy Adit Access Bridge.

CUH102PD - 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.

2018 MOCCASIN STORM EVENT**10033233 - 2018 March Storm Event
Emergency Repairs and Interim
Improvements**

On March 22, 2018, a storm event caused widespread damage to Tuolumne County. Hetch Hetchy Water and Power (HHWP) sustained considerable damage to assets associated with water supply, drainage, and power generation, including Moccasin Lower Dam and auxiliary spillway, Moccasin Upper Diversion Dam, Moccasin Reservoir, Priest Reservoir, Moccasin Powerhouse, and Moccasin Lowhead Powerhouse. On March 29, 2018, the Mayor of SF, Mark E Farrell officially declared the storm damage a Local Emergency Event. This project addresses the emergency repairs and interim improvements to the water-related assets located in Moccasin. Various contracts will be utilized to complete construction activities associated with: debris removal from the Moccasin Upper Diversion Dam and Moccasin Reservoir; repairs to the Moccasin Upper Diversion Dam; repairs to the Moccasin Lower Dam; replacement of the Leithold Line water distribution line; replacement of drainage systems (culverts and piping); access improvements to the Gate 3 structure located in the Moccasin Reservoir; installation of debris barriers upstream of the Moccasin Upper Diversion Dam and within the Moccasin Reservoir; and installation of a flood control berm downstream of the Moccasin Lower Dam.

A1-B HETCHY RENEWAL AND REPLACEMENT PROGRAM

WATER INFRASTRUCTURE

CUH10001 - SJPL Rehabilitation

The San Joaquin Pipelines (SJPLs) convey water from Foothill Tunnel to Coast Range Tunnel. The asset varies in age from 5 to almost 80 years old. Hetch Hetchy Water and Power (HHWP) have developed an annual program to inspect, monitor and manage the SJPLs and extend the life of the asset prior to replacement.

CUH10005 - Priest Pipe Recoating (Completed)

The coating on a 24" pipe located in a tunnel at Priest Reservoir has failed. The project scope will be to recoat the pipe.

POWER INFRASTRUCTURE

CUH10103 - Powerhouse Control Upgrade (Completed)

This project will upgrade the powerhouse protection, control, indication, and monitoring system. The electromechanical relays will be replaced with multifunction digital relays to improve reliability and functionality of the electrical protection system. The scope of work includes de-terminating the wiring, removing relays from the main control board, and installing new relays and internal wiring. Digital relays have diagnostics that will notify or alarm the operator if there is relay trouble, thus preventing potential consequential failures, damage, and electrical safety hazards. The existing electromechanical type relays do not have diagnostic capability and present a higher overall risk of failure. If an electromechanical relay does fail, there is a loss of protection on the electric system that could prevent generation. Furthermore, the digital type requires less maintenance at once every five years instead of annually as required for

the electromechanical type under regulatory requirement PRC-005.

CUH10108 - Step-Up Transformers (Completed)

These projects include replacing step-up transformers at Kirkwood and Cherry Ridge Line.

CUH10109 - Moccasin Low Head Rehabilitation Project (Completed)

This project is for the rehabilitation of the Moccasin Low Head Powerhouse, which includes the following components: Replace Roof - Repair or replacement of the aging powerhouse roof. Oil Spill Containment / Prevention - Provision on an oil separation system or other modification should be installed inside the powerhouse to prevent contamination. Upgrade Excitation System - Replacing the existing excitation system with a modern digital excitation system to improve unit availability. A reliable, functioning excitation system is required for unit generation. Upgrade Electrical Protective System - Replace the single function, solid state relays with multifunctional digital relays to improve reliability and functionality of the electrical protection system. The scope includes de-terminating the wiring, removing relays from the main control board, and installing new relays and internal wiring. Upgrade Unit Control System - this project upgrades the unit control system and re-locates the control panel to improve safety conditions for operations personnel. Governor Upgrades - this project provides for the upgrade of the mechanical governor to digital governor. This project is required so we can backfeed from the low head for the Moccasin Compound while upgrades are performed at Moccasin Switchyard.

CUH10110 - Early Intake Switchyard (Completed)

This project is for the rehabilitation of the Early

Intake Switchyard, which includes the following work: replace existing oil circuit breakers (OCBs) with new gas powered circuit breakers on Kirkwood and Holm section of 230kv bus; install gas powered circuit breakers and related components including bus conductors, structural steel, control cables, and galvanized rigid steel conduits. Install City furnished capacitive voltage transformer (CVTs) and surge arresters. Replace main bus-side and line-side disconnects bay 1 through 7, replace Aux bus disconnects bays 1 through 7, replace main bus-side breaker and aux bus disconnect within bay 0. Replace cap and pin insulator stacks with equivalent replacement post insulators within the main and aux buses, including underhung T-drop bus supports. Replace insulators associated with main bus sectionalizing switch. Removal of wave trap remnants, install new support structures. Remove and dispose of existing above grade oil transfer piping system. Connect into new programmable logic controllers (PLC) system. Install a Shoe-fly-bypass using a job order contract (JOC) contractor.

CUH10111 - Moccasin GSU Transformers & Oil Containment (Completed)

This project will provide replacement for two Generator Step Up transformers. The project scope also includes the concurrent design of oil containment of the specified transformers. The assessment will provide a cost estimate to develop the scope and specification criteria to be provided to a consultant engineer to develop construction drawings and specifications.

CUH10112 - Kirkwood Powerhouse Refurbishment & TSOV (Completed)

This project will provide funding for the rehabilitation of Kirkwood Powerhouse to increase life expectancy of the asset as well as improve safety by replacement of the two turbine shutoff valves (TSOVs). The scope of

work for the proposed project includes the following:

- Remove and replace TSOVs for Unit 1 and Unit 2 at Kirkwood Powerhouse.
- Replace the 480V breakers, complete switchgear lineup, Motor Control Centers (MCCs) and panel board with provision for an additional.
- Refurbish / replace various auxiliary systems including: cooling generators, exciters, turbines, transformers, building mechanical equipment, and building structure.
- Add Partial Discharge Analysis Instrumentation to Generator Unit 3 which includes monitoring the Unit 3 generator stator winding insulation and generator with a partial discharge analysis (PDA) instrument.
- Upgrade Vibrator Monitor System including removing the existing system, installing three independent systems with associated sensors and cabling, and incorporating systems into unit controls.

CUH10117 - Transmission Clearance

Moccasin Powerhouse Generators No. 1 and No. 2 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 the Generator No.1 and/or No. 2 stator cores and coils to uprate from 57.5 (MVA) to new rating of 61 MVA. The scope of work also include 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 to supply a new rotor rim for each generator following inspection and testing.

CUH10121 - MPH Bypass Valves

Following the 2013 Rim-Fire, the City was invited to apply for a FEMA Hazard Mitigation Grant. A grant application was prepared and submitted in 2014 to provide

mitigation measures for the potential hazards posed by the steep mountainside situated southeast of the Early Intake Switchyard (ISY). In the past there have been damage and shutdowns of the switchyard due to mudflows, rock falls, and landslides. The Rim Fire burned vegetation from much of the slope, thereby increasing the likelihood of future damage.

JOINT INFRASTRUCTURE

CUH10203 - Reservoirs and Dams

This project includes a condition assessment on all reservoirs and dams as well as more immediate projects to address safety or environmental concerns. The project includes a condition assessment of all storage and regulating reservoirs (six total) to identify work to be performed. Work is being prioritized and included in the Hetch Hetchy 10-Yr CIP Plan.

CUH10205 - Small Water Systems Upgrades (Completed)

Upgrade small water systems at Moccasin Compound, O'Shaughnessy and Early Intake in order to meet state regulatory compliance requirements. HHWP must upgrade their small water systems with ultraviolet (UV) treatment equipment.

CUH10207 - Existing Hetchy Facilities (Outside Moccasin) (Completed)

This project will fund the rehabilitation of all HHWP facilities outside of Moccasin (approximately 80 facilities). Within the work included are: Maintenance - Painting, Roof Replacement, Gutters, Dry Rot, Foundations and Drainage upgrades. Hazardous Material Abatement - Lead and asbestos removal. Building and Electrical Code Violations, Water Distribution System, Waste Water and or Septic Tanks and Energy Efficient Projects. The scope of work on the Industrial Buildings will consist of repairs to the Arc Flash deficiencies

and provide Emergency Power for the Support Facilities.

CUH10208 - Remote Terminal Unit Replacement (Completed)

The project includes removing the unit annunciator remote terminal unit and installing a Modicom I/O rack, wiring signals to new I/O, and migrating signals through the new programmable logic controllers for access by the new supervisory control and data acquisition system. This project is an upgrade to the existing system and will improve reporting and operations. This project is part of an ongoing HHWP program to upgrade the SCADA and unit controls for both the water and power systems.

CUH10209 - Road Improvements

This project includes maintaining almost 50 miles of paved roads and rehabilitation of eleven bridges. Preliminary findings in the condition assessment indicate that some of the bridges will require replacement and/or retrofit. Also, signage, reflectors, guardrails, slope stabilization, and selective road widening will be required to enhance the safety of road users.

CUH10210 - Hetchy Fiber Projects (Completed)

This project will install fiber between Modesto and Moccasin Peak on lines 5/6 and lines 7/8, as well as replace the fiber system within the Moccasin compound. Fiber will become the primary means of communication, with our existing licensed microwave functioning as the redundant system. Communication channels will include the business network, control network, security network, protection network, and voice over internet protocol (VoIP) network. The upgraded system will not only meet regulatory requirements but provide a more secure, reliable communication and power protection system. By 2022, the fiber electronic hardware will have reached the end

of its technical life expectancy and will require upgrades.

CUH10211 - Facilities Security Project

HHWP is updating security fences and installing card access at remote locations. HHWP is also evaluating new security requirements that are now required to meet North American Electric Reliability Corporation (NERC) regulatory requirements. HHWP only has door alarms at many remote sites. Increased security is required including fencing, card access and camera monitoring to minimize the risk of intrusion at these facilities. In addition, HHWP has to address regulatory security requirements.

CUH10212 - Moccasin Penstock

Moccasin Penstock was built in the early 1920s and conveys the SFPUC water supply from Moccasin Tunnel to Moccasin Powerhouse. HHWP is currently in the process of performing a penstock condition assessment. The penstock includes about four miles of hammer-forged welded steel penstock and may be subject to failure. In addition, issues have been identified regarding the anchor/saddle system. The short-term program includes completing the condition assessment, performing repairs at locations with significant corrosion, and addressing concerns with the anchor/saddle system. In 2015, coating and lining issues will be addressed on the non-hammer-forged welded sections. The long-term project is to replace the hammer-forged welded section if this is the most cost-effective alternative identified during the condition assessment.

CUH10213 - Communication System Upgrade

The project will provide funding for replacement and expansion of the HHWP two-way radio system resulting in better coverage in the up-country river canyons as well as inter-divisional communication with other water enterprise operating divisions in

the Bay Area. In addition, the project will extend 6GHz microwave communication to remote locations such as O'Shaughnessy and Cherry Valley Dams and Cherry Pump Station, allowing for remote monitoring and control of assets, enhanced security capabilities as well as business network connectivity at those sites. Lastly, this project will complete redundant paths of communication for control network systems between critical facilities such as HPH, KPH, and ISY using both microwave and fiber technology for those short hops.

A2 SAN FRANCISCO POWER ENTERPRISE GENERATION

CUH94763 - Go Solar SF Program

GoSolarSF is an incentive program to encourage San Francisco residents to install solar power systems by offering one-time incentive payments to reduce the costs to the homeowners. The program launched in 2008 and provides between \$2 and \$5 Million per year in incentives. This program does not result in construction or capital projects that the City owns and operates. The City simply pays incentives to residents for projects that the resident contracts for and may own or lease from a solar contractor.

CUH99302 - Alvarado Elementary School -- Solar Electric (Completed)

The project scope consists of the design and the installation of a 50kW solar electric system on top of the Alvarado Elementary School. The Design Phase includes DC/AC electrical and structural design for the photovoltaic (PV) stationary rack mounted array and equipment pad area. The Construction Phase includes installation of approximately 250 solar modules and installation of inverters and supporting electrical equipment with interconnection onto the PG&E distribution system. There are no advertisement dates or bid/award dates (not applicable) since this project will be designed by the SFPUC and constructed by DPW.

CUH99307 - North Beach Library Solar - Renewable/Generation - Small Renewables (Completed)

The project scope consists of the design and the installation of a 10.0kW solar electric system on top of the newly constructed North Beach Library. The Design Phase includes DC/AC electrical and structural design for a photovoltaic (PV) stationary rack mounted array and equipment area. The Construction

Phase includes installation of approximately 35 solar modules and installation of an inverter and supporting electrical equipment with interconnection onto the PG&E distribution system.

CUH99308 - SF Academy Solar Carport

The project consists of the design and installation of carports mounted with a solar electric system in the existing carpark located at the San Francisco Police Academy, 350 Amber Drive, in the Diamond Heights Neighborhood. The design phase includes electrical and structural design for the carport structure and integrated photovoltaic (PV) array. The Construction Phase will include the installation of the carports and mounting of a grid-connected PV system of approximately 220kW in size. Once completed, the PV system will be interconnected to the PG&E electrical distribution system and supply the building load.

CUH99309 - Marina Middle School Solar

The project scope consists of the design and the installation of a rooftop solar electric system at Marina Middle School. The design phase includes DC/AC electrical and structural design for a photovoltaic (PV) rack mounted array and related electrical equipment. The Construction Phase will include the installation of a grid connected PV system. Once completed, the PV system will be interconnected to the PG&E electrical distribution system.

EFFICIENCY

CUH983 - Civic Center Sustainable District Program

The Civic Center Sustainable District Program involves retrofitting City buildings and facilities in the Civic Center to create a substantial reduction in building carbon footprint, electricity, natural gas, and operating costs, while improving operations and

occupant comfort. Buildings and facilities included in this program are: City Hall, Asian Art Museum, Main Library, Department of Public Health, Civic Center Garage, Brooks Hall, UN Plaza, San Francisco War Memorial: Davies Symphony Hall, Veterans Building, and Opera House.

CUH986 - Energy Efficiency - General Fund Program

This project funds the planning, design and construction of Energy Efficiency (EE) projects at General Fund facilities. Energy retrofits include lighting, heating and ventilation, energy management systems, and demand response projects. These EE projects provide reductions in greenhouse gas emissions, upgrades to these public facilities, and result in long-term utility cost savings for the General Fund. The FY15 funds the staff and consultants to implement projects from previous fiscal years, along with limited other project technical and implementation expenses for new EE projects. FY16 and later fiscal year budgets will primarily fund staff expenses and will focus on project planning and development (for non-PUC funding sources), support for departments which have project funds available, and lower-cost EE projects and services (e.g. building retro-commissioning). Budgets also support staff and consultants related to the Benchmarking and Auditing Ordinance.

CUH995 - Energy Efficiency - Enterprise Fund Program

This project funds planning and operating energy efficiency services for new residential and other customers (e.g., at Hunter's Point Shipyard and Treasure Island), Enterprise Departments, and direct-paying customers of the Power Enterprise. Municipal customers served by this capital fund include the Port and Port Tenants, San Francisco Airport, SFPUC, MUNI, Convention Facilities, City College and, San Francisco Unified School

District (SFUSD). There are multiple sub-projects under this program. Milestones for individual sub-projects are not shown.

STREET LIGHTS

CUH896 - Streetlight Replacement

The SFPUC maintains approximately 25,500 street lights in the City of San Francisco. This Program funds various street lighting programs; street light engineering and capital support services; electric vehicle charger installations; community benefits capital projects; small and large street lighting capital projects; and street lighting Repair and Replacement (R&R) projects. The overall program provides funding for multiple projects over multiple years with varying start and ending dates.

CUH91503 - San Bruno Street Light Improvement Project (Completed)

San Bruno Street Light (SL) Improvement Project will upgrade the streetlights at San Bruno Ave. between Silver Ave. and Wilde Ave. Approximately 51 Light-emitting diode (LED) fixtures, 68-Lumec Optima Post-top light poles with High Pressure Sodium Vapor (HPSV) luminaires, will be replaced with LED luminaires. The proposed new poles will match the existing 16 foot poles with post top fixtures. The majority of the scope of work includes LED swapping of HPS luminaires, sidewalk removal, trenching, foundation and electrical conduit work, installation of light poles and fixtures, and more than 37 Pacific Gas and Electric Company (PG&E) power connections. Several Department of Public Works (DPW) banner poles would be utilized as streetlights.

RETAIL SERVICES

CUH870 - Distribution Services Retail Customers

A program to develop SFPUC-owned electrical

transmission and distribution facilities along the Bayside of San Francisco has been initiated. The long term geographical area of interest stretches from City of Brisbane boundary in the South, to China Basin in the North. System planning studies are currently being conducted by PG&E. The objective is to have a transmission agreement with PG&E to receive transmission level voltage from PG&E Potrero substation at 115kV or 230kV, transform this high voltage to 34.5 kV, and then distribute this lower voltage to SFPUC Power Enterprise electrical customers. A pool of 4 qualified contractors has been selected for distribution work. A Request for Bids (RFB) (DB-128R) will be issued to these qualified bidders February 2017, with a planned contract award date at end of March 2017. The scope of Phase One of the program (DB-128R plus other supplementary contracts) encompasses ductbanks, conduits, cables, electrical equipment and vaults underground from 23rd Street along Illinois to 16th St, and then Terry Francois Boulevard to South Street. The Phase One work is planned to be completed by end of December 2018. Contract arrangements, and design and construction of the SFPUC substation will proceed in parallel with the Phase One distribution project. The balance of the Bay Corridor Transmission Distribution project will be built in subsequent stages.

CUH891 - Metering and Load Monitoring

The purpose of this project is to install metering and communication infrastructure to cost effectively collect reliable meter data from existing and future PUC customers in geographically dispersed areas. Replacement of outdated EMON meters at Moscone Center, Pier 80 and other locations are within the scope of this project. Based upon the evaluation performed by CUH972, the following procurements may be pursued by the Power Enterprise: (1) procurement of an AMI system for meter data communication as part of CUH891, (2) replacement of all or a portion of

the 2000-Pacific Gas & Electric Company (PG&E) meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, or (3) purchase of PG&E owned meters from PG&E.

CUH973 - Distribution System Assessment (Completed)

This project will fund a feasibility study to assess the general condition of Pacific Gas and Electric Company's (PG&E) electric distribution system within the boundaries of the City and County of San Francisco. In particular, this will include an assessment of the general condition (age, condition, and technology) of the facilities (including overhead/underground wires, poles, substations, transformers, and meters) and an assessment of the connection of the distribution system to the existing grid. This feasibility study is the first phase toward evaluating the costs and benefits of either purchasing PG&E's distribution system or constructing a City-owned distribution system. The specific focus of this study will be to assess the feasibility of installing intervening facilities and distribution in order to aggregate current load served under the PG&E Interconnection Agreement (IA), additional load on City-owned property (such as the Port), and redevelopment load (such as the Transbay Terminal) under new Wholesale Distribution Tariff Agreements after the IA expires. Total Estimated Cost: \$1,000,000. This project is a study with no physical construction envisioned.

TRANSMISSION - DISTRIBUTION SYSTEM

CUH972 - Load Meter Project

The purpose of this project is to identify and then implement the most cost effective method to collect reliable meter data from existing and future SFPUC Power customers in geographically dispersed areas. The project

will evaluate the feasibility of implementing an Advanced Metering Infrastructure (AMI) System with the intent to identify a meter data acquisition strategy that is technically and financially in the best interest of the PUC. Based upon this evaluation, the Power Enterprise may opt to procure an AMI system. The feasibility study will entail a needs assessment to determine the SFPUC operational requirements, followed by an evaluation of contractual and regulatory factors, meter and wireless communication systems capabilities, equipment and software cost, and the feasibility of using PG&E's existing AMI infrastructure to gather municipal meter data. In tandem, a meter inventory will be performed. Alternatives will be developed, including among others (1) replacing all or a portion of the 2000-Pacific Gas & Electric Company (PG&E) meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, and (2) the Power Enterprise purchasing these meters from PG&E. A cost benefit analysis will be performed on each alternative to determine the preferred strategy. The remote meter data acquisition strategy that provides the greatest value for SFPUC customers will be identified, followed by system procurement and implementation.

CUH985 - Transbay Transit Center

The City and County of San Francisco ("the City"), through its Public Utilities Commission (SFPUC), will provide construction and permanent electric services to the new Transbay Transit Center, including adjacent bus ramps, and the new bus storage facility at Stillman Street, in San Francisco, California. The SFPUC, in agreement with the Transbay Joint Powers Authority (TJPA), will provide electric service to the Transit Center by installing two 12-kilovolt (kV) electric circuits, 12-kV switchgears, transformers, and other electrical equipment.

10033821 - Intervening Facilities

Under the Wholesale Distribution Tariff (WDT), electric service requires intervening facilities between PG&E's service points and SFPUC end-use customers. The installations of intervening facilities are needed for the upgrade of new electric service, conversion of service from secondary to primary service level, and aggregation of electric service to common points of service interconnection where feasible. The electric service improvements cover the installation of service cables, medium voltage switchgears, transformers, switches, service equipment and distribution infrastructures to be owned and maintained by the SFPUC Power Enterprise.

APPENDIX B. Hetch Hetchy Enterprise Approved Project Level Schedules

Project Name	Start	Finish	FY2013				FY2014				FY2015				FY2016				FY2017				FY2018				FY2019				FY2020				FY2021				FY2022				FY2023			
			Q1	Q2	Q3	Q4																																								
Hetchy Renewal and Replacement Program (R&R)	22-Dec-09	30-Jun-28																																												
Water Infrastructure	04-Nov-10	30-Jun-28																																												
Power Infrastructure	22-Dec-09	30-Jun-28																																												
Joint Infrastructure	02-May-11	30-Jun-28																																												

APPENDIX C. LIST OF ACRONYMS

AC	Alternating Current	NERC	North American Electric Reliability Corporation
AMI	Advanced Metering Infrastructure	NHPA	National Historic Preservation Act
BCTD	Bay Corridor Transmission Distribution	NPS	National Park Service
CATEX	Categorical Exemption	NTP	Notice to Proceed
CCSF	City and County of San Francisco	O&M	Operations and Maintenance
CEQA	California Environmental Quality Act	OCA	Office of Contract Administration
CER	Conceptual Engineering Report	OCB	Oil Circuit Breakers
CIP	Capital Improvement Program	OSD	O'Shaughnessy Dam
CM	Construction Management	OSHA	Occupational Safety and Health Administration
COVID-19	Coronavirus Disease of 2019	PD	Project Development
CVT	Capacitor Voltage Transformers	PG&E	Pacific Gas and Electric Company
DB	Design, Build	PLC	Programmable Logic Controllers
DC	Direct Current	PUC	Public Utilities Commission
DC/AC	Direct Current/Alternating Current	PV	Photovoltaic
DCU	Data Collection Unit	R&R	Renewal and Replacement
DPH	Department of Public Health	RFP	Request for Proposal
DPW	Department of Public Works	ROW	Right-of-Way
EE	Energy Efficiency	RTU	Remote Terminal Unit
FEMA	Federal Emergency Management Agency	SCADA	Supervisory Control and Data Acquisition
FY	Fiscal Year	SF	San Francisco
Ghz	Gigahertz	SFO	San Francisco Airport
GSU	Generator Step-Up	SFPUC	San Francisco Public Utilities Commission
GWH	Gigawatt Hours	SFUSD	San Francisco Unified School District
HCIP	Hetchy Capital Improvement Projects	SJPL	San Joaquin Pipeline
HH	Hetch Hetchy	SJVH	San Joaquin Valvehouse
HHWP	Hetch Hetchy Water and Power	TBD	To be determined
HMGP	Hazard Mitigation Grant Program	TI/YBI	Treasure Island/Yerba Buena Island
HPH	Holm Powerhouse	TJPA	Transbay Joint Powers Authority
HVAC	Heating, Ventilation, and Air Conditioning	TTC	Transbay Transit Center
IA	Interconnection Agreement	TTF	Tesla Treatment Facility
ISY	Intake Swithyard	TUV	Tesla Ultra Violet
JOC	Job Order Contract	USFS	United States Forest Service
KPH	Kirkwood Powerhouse	USGBC	United States Green Building Council
kV	kiloVolt	VoIP	Voice Over Internet Protocol
kW	kilowatt	WDT	Wholesale Distribution Tariff
LCA	Lower Cherry Aqueduct	WSIP	Water System Improvement Program
LED	Light Emitting Diodes		
LEED	Leadership in Energy and Environmental Design		
LLO	Low Level Outlet		
MOU	Memorandum of Understanding		
MPH	Moccasin Powerhouse		
MUNI	Municipal Railway		
MW	Megawatt		

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DATE: February 16, 2021

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

FROM: Michael Carlin, Acting General Manager 

RE: Hetch Hetchy Capital Improvement Programs Quarterly Report
2nd Quarter / Fiscal Year 2020-2021

Enclosed please find the Hetch Hetchy Capital Improvement Programs Quarterly Report for the 2nd Quarter (Q2) of Fiscal Year (FY) 2020-2021. 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 October 1, 2020 to December 31, 2020.

This quarterly report incorporates the Hetch Hetchy Capital Improvement Programs 2018 Baseline that was approved by the San Francisco Public Utilities Commission (SFPUC) on December 11, 2018. The scopes, schedules, and budgets are included for individual projects over \$5M that are currently active or planned to be active within FY19/20 or FY20/21 and are part of the Hetchy Capital Improvement Projects (HCIP), a sub-set of projects within the adopted SFPUC Ten-Year Capital Plan for FY18/19 through FY27/28 for the Hetch Hetchy Water and Power (HHWP) Division of the Water Enterprise.

This report also includes a status summary of the Hetch Hetchy Renewal and Replacement (R&R) programs, including Water, Power, and Joint assets. The progress of these R&R programs is measured and reported upon based on the status of planned milestones at the end of the reporting quarter and forecast milestones for the subsequent quarter.

London N. Breed
Mayor

Sophie Maxwell
President

Anson Moran
Vice President

Tim Paulson
Commissioner

Ed Harrington
Commissioner

Newsha Ajami
Commissioner

Michael Carlin
Acting
General Manager



On March 16, 2020, the Department of Public Health issued a shelter-in-place order, Order No. C19-07, effective March 17, 2020. In compliance with this order, nearly 1,200 SFPUC employees have been working remotely. Employees who have been deemed essential to continue operations by reporting to SFPUC facilities are doing so to deliver water, power and sewer services to the communities we serve.

Following the shelter-in-place order, on March 18, 2020, SFPUC issued a memo to the construction contractors stating that public works construction projects are considered an “essential activity” and work is expected to continue, but contractors are required to stop work temporarily and submit a revised Site-Specific Health and Safety Plan to address COVID-19 safety and protective work practices for SFPUC review by close of business on March 20, 2020.

On March 20, 2020, a letter was issued to contractors from the City Administrator. The letter noted that The City was prepared to partner with contractors to take steps to make projects as safe as possible for employees to help keep projects moving forward and determine if Social Distancing Requirements can be met.

On March 31, 2020, the Health Officer issued Health Order No. C19-07b, replacing the earlier March 16, 2020 order. The order requires the City Administrator, in consultation with the Health Officer, to specifically designate certain public works projects as an Essential Government Function if they are to continue during this shelter-in-place order.

Additionally, contractors were provided with the Construction Safety Guidelines, dated April 1, 2020, developed by City representatives and the San Francisco Building and Construction Trades Council, with input from construction industry contractors’ associations. This document provides industry guidelines for safe practices at construction work sites. Accordingly, Contractors were required to prepare and submit updated Site-Specific Health and Safety Plan to address COVID-19 issues at each site.

Furthermore, on April 15, 2020, the City Administrator’s Office issued Procedures for Implementation and Enforcement of COVID-19 Field Safety Guidelines for Public Works Projects.

And, on April 29, 2020, the Health Officer issued Health Order No. C19-07c, extending the shelter-in-place through the end of May. This new order went into effect on May 4, 2020 and all construction was allowed to resume as long as specific safety measures were in place. The Health Order C19-07c also provides Safety protocols for both small and large construction projects. Lastly on May 5, 2020, the Health Officer issued a directive requiring that each contractor for a City public works project to comply with all aspects of these safety protocols.

During the months following, staff coordinated with the Enterprises to implement worksite health screenings and communication plans. The SFPUC’s construction management teams developed procedures and practices to fulfill the City’s role as mandated by the “Public Works

Project Safety Protocol for COVID-19” through inspection of worksites to assure worker compliance with the contractors’ approved Health and Safety Plans.

Due to anticipated financial impacts from the pandemic, staff worked on revising the 10-year Capital Improvement Program (CIP) budget to ensure we can continue essential services to the public and maintain our financial sustainability. As a result of this effort, a Revised CIP plan was submitted to the Commission on July 14, 2020.

The highlights for this reporting period are as follows:

For the Mountain Tunnel Improvement project, Contract HH-1000R was awarded to Michels Tunneling by the Commission on October 13, 2020. The Notice to Proceed is anticipated to be issued in January 2021. Forecast construction completion is at the end of 2026.

An external inspection was completed of the Moccasin Penstock in November. An internal inspection is scheduled for February, followed by an overall condition assessment.

For Holm and Other Powerhouse Projects, the Holm Powerhouse Rehabilitation and Kirkwood Powerhouse Oil Containment Upgrade contract reached Final Completion during the quarter.

For Design-Build Contract DB-121R2, Moccasin Powerhouse Generator Rehabilitation, a Request for Bids was issued on October 30, 2020. The bid due date is forecast to occur in February 2021.

For Contract HH-1003, Moccasin Powerhouse Generator Step-up Transformers Installation, only one bid was received; the bid price was over the Engineer’s Estimate and the bid was rejected. More outreach will be performed, and the contract will be re-advertised in Q3.

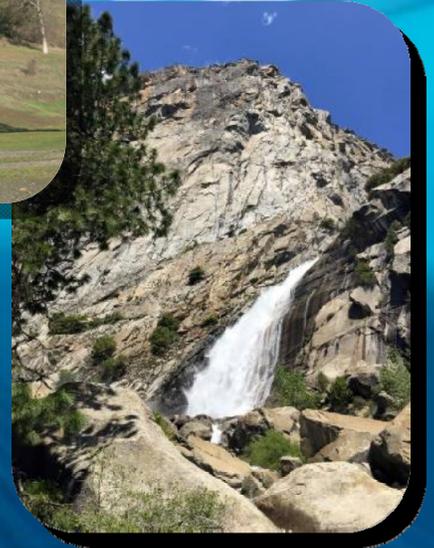
For Contract HH-1002, O’Shaughnessy Dam Access and Drainage Improvements, only one bid was received; the bid price was over the Engineer’s Estimate and the bid was rejected. The Project Team is working with Hetch Hetchy Water and Power to prioritize work scope, move some scope to the O’Shaughnessy Dam Outlet Works Phase 1 projects, and re-advertise the revised contract in Q4.

For Contract No. HH-1001, Moccasin Reservoir Perimeter Security Fence, the contractor is on schedule to meet the final construction completion date of March 6, 2021.

Attachment



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



QUARTERLY REPORT

Hetch Hetchy Capital Improvement Programs
October 2020 – December 2020

Published: February 16, 2021

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Quarterly Report

Hetch Hetchy Capital Improvement Programs

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**I. 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.

The HHWP Water Division's capital improvement programs are divided into two programs: Hetchy Capital Improvement Projects (HCIP) and Renewal and Replacement (R&R).

A majority of HHWP staff is based in Moccasin, CA, which is 140 miles east of San Francisco. The map below shows the location of the assets and facilities associated with HHWP.



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I.A. 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 program includes only asset improvements benefiting the SFPUC's water customers. The Power program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint program includes projects for assets that are used for both water and power delivery. In addition, projects in each program have been further organized by asset type to align with the Hetch Hetchy 10-Year Capital Improvement Program (CIP) Plan for Fiscal Years (FY) 2019-2028. These sub-programs include the following:

- Buildings - projects to provide safe and code compliant work spaces for HHWP operations and maintenance crews.
- Dams & Reservoirs - projects to improve assets used for storage and delivery of water to SFPUC customers, as well as 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 second (2nd) quarter report for FY2020-2021 presents the progress made on the HCIP between October 1, 2020 and December 31, 2020. The data reported herein as the "approved" project budget and schedule conforms to the annual update of the Hetch Hetchy 10-Year CIP for FY2019-2028, approved by the Water and Power Enterprise Managers and adopted by the Public Utilities Commission on February 13, 2018.

On December 11, 2018, SFPUC approved the Hetch Hetchy Capital Improvement Programs 2018 Proposed Baseline of \$682.93M, a subset of the Hetch Hetchy 10-Year CIP for FY2019-2028. The Approved Baseline included projects over \$5M that were then active or were intended to be active by FY2020. The status of these projects included in the 2018 Approved Baseline are discussed in this quarterly report and can be found in sections I.A.6 and I.A.10.

I.A Hetchy Capital Improvement Projects Quarterly Report

Work for the O’Shaughnessy Dam (OSD) Outlet Works has been prioritized into three projects: the OSD Access and Drainage Improvements, OSD Outlet Works Phase 1, and OSD Outlet Works Phase II. The 2018 Approved Baseline included the OSD Access and Drainage Improvements and the OSD Outlet Works Phase 1, which are included in this report, while the Phase II project will be addressed in the future. The Phase 1 project includes three sub-projects: 1) drum gate rehabilitation, 2) installation of a new bulkhead system, and 3) rehabilitation of slide gates and installation of a diversion pipe butterfly valve.

The CUH10215 – Canyon Tunnel Rehabilitation project, meanwhile, remains in “On-Hold” status.

Project Development (PD) accounts for program-level expenditures for each of the Water, Power, and Joint Programs were created in the 2018 Approved Baseline to capture overall programmatic costs. The accrued PD expenditures are included in Program Delivery Costs in Table 3.1 in order to give an accurate report of the overall HCIP cost performance.

In addition to the nineteen (19) projects presented in the 2018 Approved Baseline, this quarterly report includes the status of the 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets) project, which is in the closeout phase and is reported in Section 8 of the report.

On March 22, 2018, HHWP experienced excessive rainfall and subsequent flash flooding with a large volume of debris, consisting of silt, downed trees, and logs. This affected various assets associated with Priest Reservoir, Moccasin Reservoir, and adjacent areas. The project (\$17.92M) includes debris removal and emergency repairs at the water-related assets.

The budget baseline for the project is based on initial cost estimates and contract pricing, but has not been formally approved by the Commission. This project has been funded by deferring money from Water projects included in the Hetch Hetchy 10-Year CIP for FY2019-

2028. Progress reporting for this project is included in Section I.A.6.

Figure 2.1 shows the total Approved Budget for all twenty (20) projects in each phase of the program as of December 31, 2020 (excluding PD accounts). The number of projects currently in each phase is shown in parentheses.

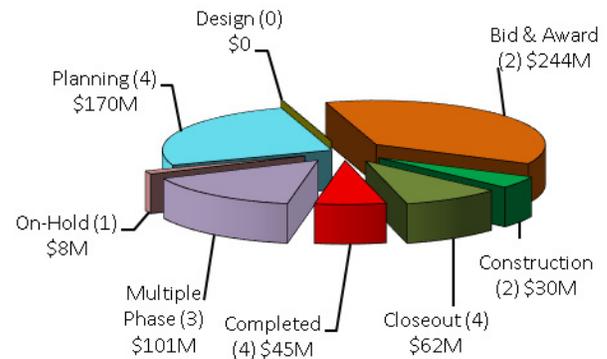


Figure 2.1 Approved Budget for Projects in Each Phase

Figure 2.2 shows the total number of projects in the following stages as of December 31, 2020: Pre-construction, Construction, and Post-construction.

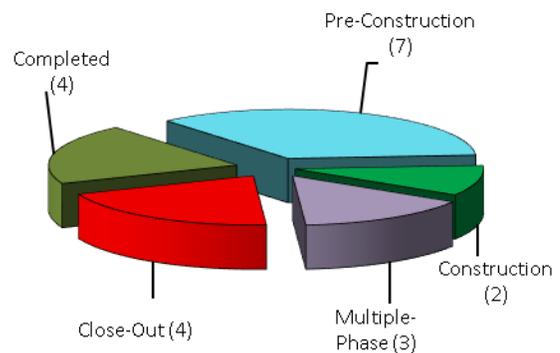


Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-Construction

Figure 2.3 summarizes the environmental review status of the HCIP projects as of December 31, 2020. Environmental review is performed for projects under California Environmental Quality Act (CEQA).

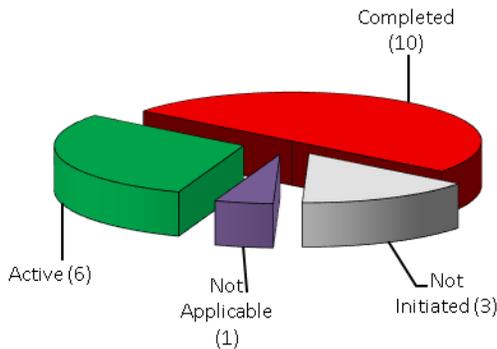


Figure 2.3 Program Environmental Review

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall cost summary of the 20 approved HCIP projects included in this report, as well as PD costs. It shows the Expenditures to Date, Current Approved Budget, Current Forecast Cost, and the Cost Variance between the Approved and Forecast Costs. The Current Approved Budget has been increased by \$17.92M over the 2018 Approved Baseline with the addition of the 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets) project.

The overall program positive Cost Variance of \$9.31M (under budget) in Table 3.1 can be attributed to the following factors:

- Water Infrastructure - the overall positive Cost Variance of \$6.75M is due to the following project reevaluations:
 - o The CUH10001 SJPL Rehabilitation project has been completed \$0.75M under budget.
 - o The CUH10003 Lower Cherry Aqueduct Forecasted Costs were reevaluated and reduced by \$6.00M.
- Power Infrastructure - the overall positive Cost Variance of \$6.63M is due to the following project reevaluations:

- o The CUH10102 Holm and Other Powerhouse Projects' Forecasted Costs were reduced by \$3.67M.
- o The CUH10113 Kirkwood Penstock achieved Closeout \$1.82M under budget.
- o The CUH10115 Warnerville Substation Rehabilitation Forecasted Costs were increased by \$9.94M for additional design and construction to complete project work; this work has been funded as part of the approved 10-Year CIP for FY2021-30.
- o The CUH10116 Moccasin Penstock Rehabilitation Forecasted Costs were reduced by \$8.17M.
- o The CUH10119 Early Intake Switchyard Slope Hazard Mitigation Forecasted Costs were reduced by \$2.91M.
- Joint Infrastructure - the overall negative Cost Variance of \$0.03M is due to the following project reevaluations:
 - o The CUH10214 Moccasin Facilities New Construction achieved Closeout \$1.19M under budget.
 - o The CUH10216 Cherry Dam Outlet Works Rehabilitation achieved Closeout \$0.65M under budget.
 - o The CUH10220 Mountain Tunnel Inspection & Repairs project was completed \$2.12M under budget.
 - o The 10032903 OSD Outlet Works Phase I Forecasted Costs were increased by \$4.00M to account for initial design and construction estimates being higher than expected.
 - o 2018 March Storm Event - the negative Cost Variance of \$4.04M is due to increased construction cost for the flood control berm and associated construction management costs.

Table 3.1 Program Cost Summary

Cost Categories	Expenditures To Date (\$ Million) (A)	2018 Approved Budget (\$ Million) (B)	Current Approved Budget (\$ Million) (C)	Q2/FY20-21 Forecasted Costs (\$ Million) (D)	Cost Variance (\$ Million) (E = C - D)
Water Infrastructure	\$22.28	\$137.94	\$137.94	\$131.19	\$6.75
Construction Costs ⁽¹⁾	\$9.72	\$74.87	\$74.87	\$78.19	(\$3.32)
Program Delivery Costs ⁽²⁾	\$11.91	\$52.40	\$47.64	\$36.51	\$11.13
Other Costs ⁽³⁾	\$0.64	\$10.67	\$15.43	\$16.49	(\$1.05)
Power Infrastructure	\$52.51	\$151.19	\$151.19	\$144.56	\$6.63
Construction Costs ⁽¹⁾	\$26.16	\$80.79	\$80.79	\$82.34	(\$1.55)
Program Delivery Costs ⁽²⁾	\$24.66	\$57.73	\$57.76	\$56.76	\$1.00
Other Costs ⁽³⁾	\$1.69	\$12.68	\$12.65	\$5.46	\$7.19
Joint Infrastructure	\$81.63	\$393.81	\$393.81	\$393.84	(\$0.03)
Construction Costs ⁽¹⁾	\$31.52	\$215.69	\$212.69	\$225.68	(\$12.99)
Program Delivery Costs ⁽²⁾	\$49.88	\$156.05	\$159.05	\$148.85	\$10.20
Other Costs ⁽³⁾	\$0.22	\$22.07	\$22.07	\$19.31	\$2.76
2018 March Storm Event Emergency Repair and Interim Improvements (Water-Only Assets)	\$21.65	-	\$17.92	\$21.97	(\$4.04)
Overall Program Total	\$178.06	\$682.93	\$700.86	\$691.55	\$9.31

Notes:

- 1. Construction Costs** include the Construction Base Bid and owner-provided equipment/material for all projects. Those costs include any construction contingency.
- 2. Delivery Costs** include program management (i.e. Project Development), project management, planning, environmental (CEQA, permitting, construction compliance), design, construction management, and engineering support during construction.
- 3. Other Costs** include environmental mitigation, art enrichment, security improvements, real estate expenses, and director’s reserve.

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2018 Approved Schedule and the Current Forecast Schedule for the HCIP. As shown in Table 4.1, the overall HCIP is currently forecast to be completed in June 2028.

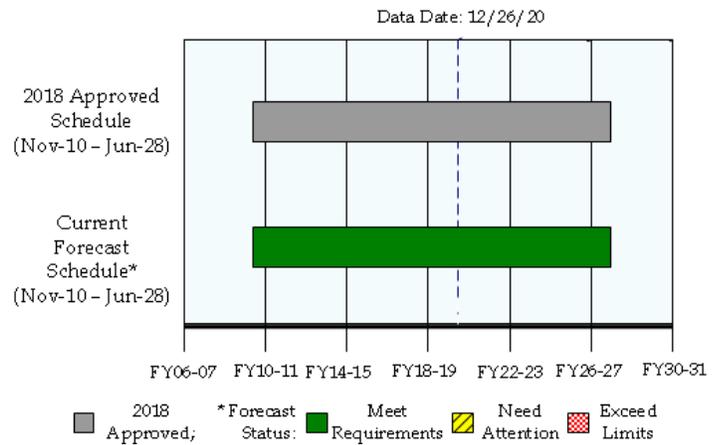


Figure 4.1 Program Schedule Summary

Table 4.1 2018 Approved vs. Current Forecast Schedule Dates

Sub-Program	2018 Approved Project Start	Actual Start	2018 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Water Infrastructure	11/08/10	11/08/10✓	06/30/28	06/30/28	-
Power Infrastructure	05/29/12	05/29/12✓	06/30/28	06/30/28	-
Joint Infrastructure	10/03/11	10/03/11✓	06/30/28	06/30/28	-
Overall HCIP Projects	11/08/10	11/08/10✓	06/30/28	06/30/28	-

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5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in \$1,000s as of 12/26/20

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Water Conveyance (Water)											
Water Conveyance (Water)											
10035574 - SJPL Tesla Valves Replacement	MP	\$ 7,380	\$ 7,380	\$ 701	-	★	06/28/24	06/28/24	-	★	See Section 10
10035575 - SJPL Valve and Safe Entry Improvement	PL	\$ 95,284	\$ 95,284	\$ 943	-	★	07/01/25	07/01/25	-	★	See Section 10
Dams & Reservoirs											
10033156 - Moccasin Reservoir Perimeter Security Fence	CN	\$ 5,308	\$ 5,308	\$ 2,127	-	★	07/01/21	07/01/21	-	★	See Section 10
Power Infrastructure											
Water Conveyance (Power)											
CUH10116 - Moccasin Penstock	PL	\$ 13,158	\$ 4,987	\$ 3,708	\$ 8,171	★	12/31/24	08/31/21	40.0 mo. Early	★	See Section 10
Powerhouse											
CUH10102 - Holm and Other Powerhouse Projects	MP	\$ 26,733	\$ 23,061	\$ 19,028	\$ 3,672	★	03/30/20	09/29/21	18.0 mo. Late	●	See Section 6
CUH10114 - Moccasin Powerhouse and GSU Rehabilitation	MP	\$ 66,714	\$ 66,714	\$ 2,233	-	★	06/28/24	12/16/25	17.6 mo. Late	●	See Section 6

* 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		

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Power Infrastructure											
Switchyard & Substations (Power)											
CUH10115 - Warnerville Substation Rehabilitation	CN	\$ 24,305	\$ 34,248	\$ 20,994	(\$9,943)	●	03/04/20	03/31/25	60.9 mo. Late	●	See Section 6
Joint Infrastructure											
Dams & Reservoirs (Joint)											
10032903 - O'Shaughnessy Dam Outlet Works Phase I	PL	\$ 17,206	\$ 21,206	\$ 340	(\$4,000)	●	08/25/22	12/31/27	64.2 mo. Late	●	See Section 6
CUH10223 - OSH Dam Access and Drainage Improvements	BA	\$ 5,830	\$ 5,830	\$ 792	-	★	02/26/21	07/21/23	28.8 mo. Late	●	See Section 6
Mountain Tunnel											
CUH10221 - Mountain Tunnel Improvement Project	BA	\$ 238,219	\$ 238,219	\$ 25,507	-	★	12/31/26	06/03/27	5.1 mo. Late	⚠	See Section 6
Roads & Bridges (Joint)											
10035086 - Bridge Replacement (4 - Bridges)	PL	\$ 44,287	\$ 44,287	\$ 87	-	★	12/30/25	12/30/25	-	★	See Section 10

* 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		

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROJECTS NOT WITHIN BUDGET AND/OR SCHEDULE

CUH10102 - Holm and Other Powerhouse Projects

Project Description: This project will provide funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under \$1 million regarding power generation renewal and equipment replacement. The upgrade and rehabilitation of Holm Unit 2 includes 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 will be done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project includes upgrades to turbine and generators, and alternating current stations intended to extend the life of the unit by 20 years. Lastly, the project will upgrade the existing oil containment system at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators will be replaced, and other modifications will be made to the powerhouse interiors and to the transformer decks to discourage contaminated discharges into the adjacent streams. A monitoring system will be installed to alert Hetch Hetchy Water & Power (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 & cleanup.

Program: Power Infrastructure	Project Status: Multiple Phase	Environmental Status: Completed		
Project Cost:		Project Schedule:		
Approved	 \$26.73 M	Approved Sep-13		Mar-20
Forecast	 \$23.06 M	Forecast Sep-13		Sep-21
Actual	 \$19.03 M	Project Percent Complete: 98.8%		
				
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/17/17✓	04/21/17✓	01/29/18✓	11/29/20✓

Progress and Status:

The breakdown below shows the number of subprojects summarized according to current status and/or active phase during this reporting period. The eleven (11) subprojects are distributed as follows: Construction: 2 subprojects

J101-02.010 Cherry Valve House - Bypass Fill Valve for Cherry Power Tunnel: The field work is scheduled for early next year. HHWP is anticipating delivery of the valve in January. After delivery and as soon as weather conditions permit access, HHWP will install the valve and piping. Completion anticipated March 2021.

J101-02.003 Holm Powerhouse Rehabilitation and Kirkwood Powerhouse Oil Containment Upgrade: The Final Completion was reached during this reporting quarter. The Project Team is working on closeout documents. Final closeout is expected to be submitted to the Commission in Q3.

Completed: 9 subprojects

Issues and Challenges:

The variance between the forecasted schedule over the



New Motor Control Board at Holm Powerhouse

approved schedule is due to the initial delay in issuing NTP, additional delay from COVID-19 work stoppage required rescheduling work that could only be performed during a shutdown, and scope that will be performed by HHWP crews after the construction contract is complete.

CUH10114 - 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. This is a design-build project and was advertised twice in 2011 and 2013. Bids were unresponsive. The project will also involve 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  Jun-24	
Forecast  \$66.71 M	Forecast Jan-16  Dec-25	
Actual  \$2.23 M	Project Percent Complete: 20.3%	
 Approved;  Actual Cost; Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

Key Milestones:	Environmental Approval	Bid* Advertisement	Construction NTP*	Construction* Final Completion
Current Forecast	09/28/20✓	(A) 11/20/20✓ (B) 10/30/20✓ (C) 09/06/23	(A) 05/27/21 (B) 06/04/21 (C) 03/05/24	(A) 05/26/23 (B) 06/03/24 (C) 06/02/25

* A) Moccasin Powerhouse Generator Step-Up (GSU's) Transformers Replacement; B) Moccasin Powerhouse Generators Rewind; and C) Moccasin Powerhouse Systems Upgrade.

Progress and Status:

This project is divided into 3 sub-projects: A) the purchasing and installation of the Moccasin Powerhouse Generator Step-Up Transformers (GSU's); B) the rewind of the Moccasin generators; and C) the overall plant rehabilitation.

Sub-project A: The apparent low bidder for the procurement of the GSU's worked with the Office of Contract Administration (OCA) and Contract Monitoring Division (CMD) to obtain compliance with 12b provisions; the Notice to Proceed for the Purchase Order (PO) is anticipated to be issued next quarter. The GSU installation contract (HH-1003) was advertised on November 20. One bid was received and was over the Engineer's Estimate. Extensive additional outreach will be performed, and the contract will be rebid next quarter.

Sub-project B: Contract DB-121R2 Moccasin Powerhouse Generators, Rehabilitation was advertised on October 30. The bid due date was extended to February 4, 2021 by bidder request. Questions from potential bidders about the bid documents are being addressed by the project team.

Sub-project C: The project team scheduled several System Workshops to review the condition of the powerhouse equipment with HHWP staff to inform the planning process. The Request for Proposal (RFP) for a professional services contract to provide planning, design, and engineering support is forecast to be advertised next quarter.

Issues and Challenges:

Sub-project A: Delays to the procurement process may affect the equipment delivery schedule; the project team will work with the GSU vendor after the PO is issued next quarter to determine if the GSU can still be delivered by October/November 2021; this timing is critical to the HH-1003 GSU installation contract and the fixed Mountain Tunnel outage in December 2021. Sub-project C: The variance in the forecasted completion date from the approved completion date is due to the extended time to procure a professional services contract for planning and design.

CUH10115 - Warnerville Substation Rehabilitation

Project Description: Warnerville Substation facilities and equipment have reached the end of their life expectancy. The facility needs to be upgraded to meet regulatory and safety requirements. This project will address major renewal and replacement of the substation components including grounding, fence, circuit breaker, control room upgrade, electrical equipment, and disconnect switch. This project will also improve grading in the substation.

Program: Power Infrastructure		Project Status: Construction		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$24.31 M	Approved Sep-15		Mar-20
Forecast		\$34.25 M	Forecast Sep-15		Mar-25
Actual		\$20.99 M	Project Percent Complete: 84.9%		
 Approved;  Actual Cost; Forecast Status:  Meet Requirements  Need Attention  Exceed Limits					
Key Milestones:	Environmental Approval	Bid* Advertisement	Construction NTP*	Construction* Final Completion	
Current Forecast	03/31/16✓	(A) 01/24/17✓ (B) 04/29/22	(A) 10/05/17✓ (B) 11/29/22	(A) 07/05/21 (B) 07/28/23	

(A) Warnerville Substation Phase 1; (B) Warnerville Substation Phase 2.

Progress and Status:

Phase 2: A professional services task order was drafted to develop a Warnerville Substation Oil Circuit Breaker Replacement Contingency Plan to perform emergency repairs if any one of the four circuit breakers fails; the task order will be awarded next quarter. The contract for planning, design, and engineering support during construction for Phase 2 is still being developed and is anticipated to be advertised next quarter.

Issues and Challenges:

The variances between the forecasted cost over the approved budget and the forecasted schedule over the approved schedule are due to the termination of the original design-build construction contract, rescoping including completion of a design package, and bidding of a new construction contract to complete the work.



Oil Circuit Breakers

10032903 - O'Shaughnessy Dam Outlet Works Phase I

Project Description: O'Shaughnessy Dam (OSD) was completed in 1923 and raised in 1938. Condition assessment of the dam outlet works revealed deficiencies. This rehabilitation project addresses deficiencies of the existing outlet works system at OSD, including the drum gates and release system through OSD to Canyon Tunnel and the Tuolumne River. Seven projects were identified and have been prioritized. Phase 1 will include three of these projects: drum gate rehabilitation (upgrading the hinges and rivets, recoating the gate and existing seals, and repairing the spillway concrete), installation of a new bulkhead system, and rehabilitation of slide gates & installation of a diversion pipe butterfly valve.

Program: Joint Infrastructure		Project Status: Planning		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$17.21 M	Approved Feb-18		Aug-22
Forecast		\$21.21 M	Forecast Feb-18		Dec-27
Actual		\$0.34 M	Project Percent Complete: 3.5%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	11/30/23	02/01/23	09/01/23	06/30/27	

Progress and Status:

In this quarter, the project team reviewed a draft Conceptual Engineering Report on the bulkhead system. The project team is reviewing sequencing and costs of subprojects including the drum gates, slides gates and isolation valve at the diversion tunnel, and is evaluating completing construction under three contracts, considering seasonal constraints. This sequencing and the overall project schedule are being closely analyzed and will be reported on and updated in the next quarter



Slide Gate A

Issues and Challenges:

The current planning-level design and construction estimates are higher than budgeted due to the addition of diver inspections and the higher level of detail included in the most recent construction cost estimate. The schedule forecast has been extended to allow time for additional inspections, underwater modification of the existing slots and corroded inlet surfaces, and installation of the bulkheads using divers. In addition, the project team re-evaluated the overall project schedule and sequencing and considered the best

combination of sub-projects and contracts. Based on this analysis, it is forecasted that the construction will be completed under three contracts, and the final subproject will not be completed until November 2024 or later. This sequencing and the overall project schedule are being closely analyzed and will be reported on and updated in Q3 and in the program rebaseline in June 2021.

CUH10223 - OSH Dam Access and Drainage Improvements

Project Description: The key objective of this project is to provide safe access for Hetch Hetchy Water and Power operators inside the O'Shaughnessy Dam by improving fall protection, access, and drainage. The key elements include:

- Replace Access Structures in Ladder Wells. The existing access structures in the four (4) vertical ladder wells (shafts) include vertical ladders and horizontal grating platforms that are spaced throughout the ladder wells.
- Install Fall Protection Systems. Install new Occupational Safety and Health Administration (OSHA) - compliant ladders and landings with safety cage and/or install fall restraint systems.
- Seal or Mitigate Existing Leakage. Address flowing water by sealing leaks or otherwise diverting, collecting and disposing of flows.
- Drainage Improvements. Clear the drains in the dam so that water can drain as designed and/or install sump pumps, if appropriate.
- Replace Watertight Door between Ladder Wells 3 & 4. This scope item includes replacing the existing watertight door between Ladder Wells 3 & 4.

Program: Joint Infrastructure	Project Status: Bid and Award	Environmental Status: Completed (CatEx)
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Project Cost:		Project Schedule:	
Approved	 \$5.83 M	Approved Mar-17	 Feb-21
Forecast	 \$5.83 M	Forecast Mar-17	 Jul-23
Actual	 \$0.79 M	Project Percent Complete: 25.4%	
			

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	07/16/20✓	04/19/21	10/18/21	01/17/23

Progress and Status:

The construction contract HH-1002 received one bid that was higher than the engineer's estimate and it was rejected. The contract scope of work is being revised to meet available funding along with transferring some items of work to the OSH Outlet Works Phase 1 project. The contract will be repackaged and re-advertised in April 2021. The variance between the approved and forecast completion dates is due to the need to rebid the contract due to higher than anticipated costs; challenges with specifying the drain cleaning requirements due to lack of as-built information; difficulty selecting appropriate submersible light systems; and the need for additional evaluation of fall protection systems.



Diversion Pipe at O' Shaughnessy Dam

Issues and Challenges:

A reduced scope of work to meet available funding requires coordination and approval of the Hetch Hetchy Maintenance and Operations, and revisions to the plans and specifications.

CUH10221 - 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 for design and construction of an engineering alternative that will keep this vital component of the Hetch Hetchy Water and Power System in reliable service for years to come.

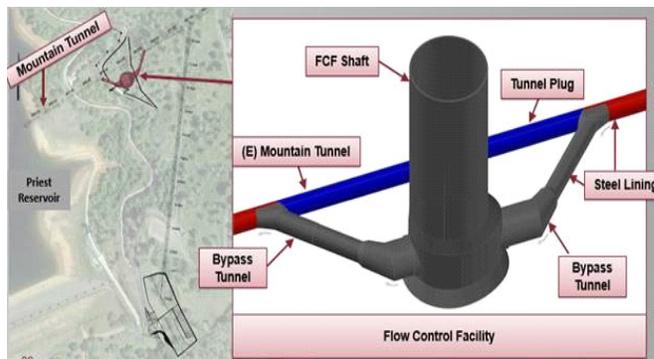
Up until 2016, the scope consisted of just the Planning Phase for the project. The primary focus was on the development of viable alternatives for the project including rehabilitation or relining the existing tunnel or construction of a new tunnel.

In 2017, the City adopted the rehabilitation alternative as the preferred project for design and construction. The rehabilitation option met almost all of the project performance standards with the least cost. The project consists of tunnel lining repairs, contact grouting, downstream flow control valving, a new tunnel adit at Priest Reservoir, a South Fork Siphon extension tunnel, access road widening and tunnel access improvements, and environmental mitigations, and site restoration.

Program: Joint Infrastructure		Project Status: Bid and Award		Environmental Status: Completed	
Project Cost:			Project Schedule:		
Approved		\$238.22 M	Approved Oct-11		Dec-26
Forecast		\$238.22 M	Forecast Oct-11		Jun-27
Actual		\$25.51 M	Project Percent Complete: 17.3%		
					
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:

During the quarter, on October 13, the Commission awarded the HH-1000R contract for the Mountain Tunnel Improvements construction to Michels Tunneling. The Notice to Proceed is anticipated to be issued in January 2021. In the meantime, the SFPUC staff has been in informal discussions with the contractor and scheduling jobsite visits for them to prepare for contract submittals and to mobilize for construction as quickly as possible. The State Water Resources Control Board is in final review of the City's application for \$238.2M in funding from the State Revolving Fund for this project. The funding decision is anticipated by mid-2021.



The new Flow Control Facility will improve hydraulic control in the tunnel.

Issues and Challenges:

The Schedule Variance between the Current Forecast and Approved schedule is due to delay associated with re-bidding the project and COVID-19 challenges. The reported delay reflects mitigation efforts, including resequencing of the tunnel shutdowns to minimize the schedule impact. The team will evaluate the contractor's schedule for potential adjustments to mitigate the delay.

7. 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								
10033156 - Moccasin Reservoir Perimeter Security Fence - HH-1001	06/22/20	03/01/21	03/06/21	\$ 1,364,290	\$ 1,364,290	(5)	-	30.0%
Power Infrastructure								
J101-02.0030 Holm Powerhouse Rehabilitation - HH-989	01/29/18	09/03/19	11/29/20	\$ 9,948,000	\$ 11,821,407	(453)	(\$1,873,407)	90.0%
CUH101-15.001 Warnerville Switchyard - DB-127R **	10/05/17	07/09/19	07/05/21	\$ 14,591,450	\$ 14,591,450	(727)	-	90.0%

Program Total for On-Going Construction	Approved Contract Cost	Current Forecast Cost*	Variance	
			Cost	Percent
	\$ 25,903,740	\$ 27,777,147	(\$1,873,407)	(7.2%)

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.

8. 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*
Water Infrastructure				
Water Conveyance (Water)				
CUH10003 - Lower Cherry Aqueduct	01/31/20	11/26/19	\$ 11,526,914	\$ 6,425,961
Power Infrastructure				
Water Conveyance (Power)				
CUH10113 - Kirkwood Penstock	12/31/18	02/05/19	\$ 1,893,834	\$ 1,164,263
Joint Infrastructure				
Buildings (Joint)				
CUH10214 - Moccasin Facilities New Construction	06/11/18	06/11/18	\$ 4,775,795	\$ 10,053,964
2018 Moccasin Storm Event				
2018 Moccasin Storm Event				
10033233 - 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets)	11/27/19	04/20/20	\$ 10,907,365	\$ 13,316,542
TOTAL			\$ 29,103,908	\$ 30,960,730

* It should be noted that this report does not include all phase-level expenditures that have been accrued for work completed due to challenges associated with the migration of the City financial system from FAMIS to PeopleSoft.

9. COMPLETED PROJECTS

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Water Infrastructure				
Water Conveyance (Water)				
CUH10001-HCIP - SJPL Rehabilitation	12/31/18	02/28/19	\$ 5,370,000	\$ 4,621,613
Power Infrastructure				
Switchyard & Substations (Power)				
CUH10119 - Early Intake Switchyard Slope Hazard Mitigation	09/30/20	09/30/20	\$ 5,533,855	\$ 2,151,957
Joint Infrastructure				
Dams & Reservoirs (Joint)				
CUH10216 - Cherry Dam Outlet Works Rehabilitation	06/28/19	06/30/20	\$ 10,382,439	\$ 9,512,645
Mountain Tunnel				
CUH10220 - Mountain Tunnel Inspection & Repairs (completed)	12/31/19	12/02/19	\$ 23,500,000	\$ 21,379,448
TOTAL			\$ 44,786,294	\$ 37,665,663

10. PROJECTS WITHIN BUDGET AND SCHEDULE

10035574 - SJPL Tesla Valves Replacement

Project Description: This project intends to replace all the inline valves that are under-rated for pressure, Tesla Ultra Violet (TUV) 101 to 401, with properly rated valves to improve safety and entry into all four (4) San Joaquin Pipelines (SJPL). In addition, all cross-over valves and bypass valves may need to be replaced or made safe. Modification to the pipes, flanges, spool pieces, actuators, and valve controls are needed. The valve vault will need modification to accommodate the new valves. New facilities may need to be constructed if additional new valves are not designed for direct burial.

Program: Water Conveyance (Water)		Project Status: Multiple Phase		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$7.38 M	Approved Jan-20		Jun-24
Forecast		\$7.38 M	Forecast Jan-20		Jun-24
Actual		\$0.70 M	Project Percent Complete: 9.1%		
Key Milestones:	Environmental Approval	Bid* Advertisement	Construction NTP*	Construction* Final Completion	
Current Forecast	12/01/21	N/A (B) 12/01/21	(A) 04/07/21 (B) 05/04/22	(A) 04/05/22 (B) 12/29/23	

* A) Pre-purchase and installation of Tesla Valve TUV-101; and B) Procurement and installation of Tesla Valves TUV-201, TUV-301 & TUV-401

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 Tesla Valves TUV-201, TUV-301 & TUV-401.

Subproject A: In this quarter, the project team continued to work with the Office of Contract Administration (OCA) regarding the pre-purchase of the valve. The project team also completed the design and initiated a task order under a Job Order Contract (JOC) to install the valve. The contractor is preparing a cost proposal that expected to be available by next quarter.

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. The entire project is forecast to complete on schedule by mid-2024. The project team completed the planning phase in this quarter. The design will start in the next quarter.



SJPL#1-4 with isolation valves within Tesla Valvehouse

Issues and Challenges:

To minimize the impact to water delivery, the installation of the new valves will only take place during the system shutdowns in the Fall/Winter. Timely delivery of the new valves and well-coordinated preparation work prior to the shutdowns are the keys to a successful project.

10035575 - SJPL Valve and Safe Entry Improvement

Project Description: The San Joaquin Pipeline (SJPL) Entry Assessment and Valve Improvement Project involves the three parallel transmission pipelines that stretch approximately 48-miles across the San Joaquin Valley from Oakdale Portal to Tesla Portal, with a partial fourth pipeline consisting of a 6.4-mile Eastern Segment and an 11-mile Western Segment. The four pipelines were built between 1932 and 2012, respectively, and range from 56- to 79.5-inches in diameter. As part of the Water System Improvement Program (WSIP), valve vaults were constructed along the SJPL System at various locations to increase operational flexibility and the overall reliability of the SJPL System. Since the commissioning of the valve vaults, Hetch Hetchy Water & Power (HHWP) has expressed concern that 1) valves may not be sufficiently rated and may fail due to a pressure transient surge event using certain operational assumptions 2) there is an inability to establish double isolation and bleed configurations along the SJPL System, resulting in insufficient protection for maintenance personnel, and 3) multiple isolation valves are not adequately rated for hydrostatic head. In order to achieve the safety and access goals, the scope is to: install a surge shaft upstream of Tesla Treatment Facility (TTF) to reduce maximum pressure from unplanned reactor valve closure and upgrade line valves to resist transient pressure from unplanned line valve closure; install new double isolation and bleed valves at all locations where major upgrades and construction are required; and retain single isolation where no upgrades are needed. There are four primary locations where major upgrades and construction are required: Emery, Roselle, Pelican, and Tesla.

Program: Water Conveyance (Water)	Project Status: Planning	Environmental Status: Active
Project Cost:		Project Schedule:
Approved  \$95.28 M	Approved Jul-19  Jul-25	
Forecast  \$95.28 M	Forecast Jul-19  Jul-25	
Actual  \$0.94 M	Project Percent Complete: 7.0%	
		

Key Milestones:	Environmental Approval	Bid* Advertisement	Construction NTP*	Construction* Final Completion
Current Forecast	05/03/21	(A) 10/01/21 (B) 06/01/23 (C) 11/01/22	(A) 04/01/22 (B) 12/01/23 (C) 05/02/23	(A) 12/31/24 (B) 12/31/24 (C) 12/31/24

* A) Phase 1 - Tesla and Oakdale Entry Improvements; B) Phase 2 - Pelican, Roselle, Emery and P4J Entry Improvements; and C) Phase 3 - Tesla Surge Stack.

Progress and Status:

This project is divided into 3 sub-projects: A) Phase 1 - Tesla and Oakdale Entry Improvements; B) Phase 2 - Pelican, Roselle, Emery and P4J Entry Improvements; and C) Phase 3 - Tesla Surge Stack.

Planning continued, with geotechnical investigation, surveying and potholing along the pipelines completed during the quarter. A draft conceptual engineering report (CER) was issued and is being reviewed by the project team.

Issues and Challenges:

Construction must be coordinated with system shutdowns in Fall/Winter to minimize the impact on water delivery. The construction sequences are being considered to minimize the time of return to service in case of emergency.



SJPL#1 – installation of a removable spool piece at Oakdale Portal

10033156 - Moccasin Reservoir Perimeter Security Fence

Project Description: Hetch Hetchy Water & Power (HHWP) will install an approximately 6,500 feet long perimeter security fence system around Moccasin Reservoir to discourage trespassers. Moccasin Reservoir covers approximately 32 acres. Fence monitoring alarms, signs, lighting, and security cameras will be considered as part of the design.

Program: Water Infrastructure	Project Status: Construction	Environmental Status: Active
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Project Cost:		Project Schedule:	
Approved 	\$5.31 M	Approved Feb-17 	Jul-21
Forecast 	\$5.31 M	Forecast Feb-17 	Jul-21
Actual 	\$2.13 M	Project Percent Complete: 76.8%	
			

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	12/31/20	01/30/20✓	06/22/20✓	03/06/21

Progress and Status:

The construction progress is on schedule with final completion date of March 06, 2021. Chain link fences and gates along Highway 49 and Moccasin Switchback roads were installed and completed. Installation of agricultural fences and gates along the Moccasin Switchback Road were finished.

Issues and Challenges:

None at this time.



Installation of Chain link fences and gates along Highway 49 are in progress

CUH10116 - Moccasin Penstock

Project Description: The Moccasin Penstock conveys San Francisco Public Utilities Commission (SFPUC) water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. 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 back to 1924 and has been in service for more than 90 years. Condition assessments based on external inspection and imaging have identified a number of deficiencies along the original pipe. The 104-inch diameter (narrowing to 98-inch) riveted steel penstocks extend 1,554 feet from the downstream Moccasin Tunnel portal then bifurcate to four 66-inch diameter hammer-forged welded steel conduits extending about 2,384 feet to the lower welded steel pipe. Additionally, in September of 2018 the penstock experienced significant leakage in two separate areas, necessitating emergency repairs. This rehabilitation project is intended to enhance the reliability of the penstock system and will include: repair or replacement of some sections of corroded pipe; repair or replacement of four badly cracked concrete anchors and damaged penstock saddles; installation of new manways and a rollout pipe section to provide better access for inspection and maintenance; and recoating the outside pipe, where needed, to reduce future corrosion. The project scope was expanded to include: 1) The installation of additional penstock pipe between the valve house and the first downstream anchor; 2) The replacement of the butterfly valve pneumatic actuator with an electronic actuator, which will include new controls with SCADA connectivity; and 3) A new backup generator.

Program: Power Infrastructure	Project Status: Planning	Environmental Status: Completed
Project Cost:		Project Schedule:
Approved 	\$13.16 M	Approved Feb-16  Dec-24
Forecast 	\$4.99 M	Forecast Feb-16  Aug-21
Actual 	\$3.71 M	Project Percent Complete: 93.1%
		

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	N/A	N/A	N/A	N/A

Progress and Status:

Notice to proceed (NTP) was issued last quarter for a professional services task order for inspection and structural analysis of Moccasin Penstock. The professional services task order covers two phases of inspection, external and internal. The external inspection was completed in November 2020. A JOC task order is being developed to provide field support for the internal inspection and a condition assessment, which is anticipated in February 2021.



Moccasin Penstock

Issues and Challenges:

This project will continue during the planning phase utilizing the remaining power funds. Once the power funds are expended, a new joint funded project will be initiated for the Moccasin Penstock in the future.

10035086 - Bridge Replacement (4 - Bridges)

Project Description: HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessment has identified the need for rehabilitation and/or replacement (both due to age and to meet current seismic design criteria). Four of the fourteen bridges require substantial modification or replacement and have been combined into this project. This project includes rehabilitation and/or replacement of Cherry Lake Road Bridge (public access), Early Intake Bridge (public access), O'Shaughnessy Adit Access Bridge, and Lake Eleanor Dam Bridge.

Program: Roads & Bridges (Joint)	Project Status: Planning	Environmental Status: Not Initiated
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Project Cost:		Project Schedule:	
Approved  \$44.29 M	Approved Jul-19  Dec-25	Forecast  \$44.29 M	Forecast Feb-20  Dec-25
Actual \$0.09 M	Project Percent Complete: 10.5%		
 Approved;  Actual Cost; Forecast Status:  Meet Requirements  Need Attention  Exceed Limits			

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

Progress and Status:

This project is in the planning phase. For the O'Shaughnessy Adit Access Bridge, the Department of Public Works (DPW) submitted a work plan for the planning and design of the bridge improvements. The work plan was reviewed while the SFPUC negotiated a Memorandum Of Understanding (MOU) with DPW to set up a project account to capture DPW's labor costs. A Notice To Proceed (NTP) was issued for a professional services task order to perform surveying, geotechnical investigation, and hydraulic analysis. For Lake Eleanor Dam Bridge, a professional services task order was set up to perform the planning and design of the bridge rehabilitation.



O'Shaughnessy Adit Access Bridge

Issues and Challenges:

The O'Shaughnessy Adit Access Bridge is located in the proximity of O'Shaughnessy Dam within the Yosemite National Park. The geotechnical investigation and construction will require close coordination with the National Park Service. The work associated with Eleanor Dam Bridge will require coordination with the United States Forest Service. Both bridges are located within remote and environmentally sensitive areas. Environmental permitting and site access are both anticipated to be challenging.

I.B. HETCHY RENEWAL AND REPLACEMENT PROGRAM (R&R)



1. PROGRAM DESCRIPTION

The Hetchy Renewal and Replacement (R&R) Program is an ongoing annual program that addresses deficiencies in three areas: Water Infrastructure, Power Infrastructure, and Joint Infrastructure. The Water program includes only asset improvements benefiting the SFPUC's water customers. The Power program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint program includes projects for assets that are used for both water and power delivery. The objective of the R&R Program is to meet level of service goals and objectives, to ensure regulatory permit compliance, to obtain system reliability and functionality, and to continue sustainable operation of the system.

The R&R Program consists of a series of projects specifically developed to address the needs of an aging infrastructure associated with the Hetch Hetchy Water and Power System. The projects are designed to better the system through inspections, assessments, protective and corrective measures, and routine equipment replacement. Due to the nature of these ongoing projects that are funded on an annual basis, progress is measured by achievement of short-term goals. These goals are discussed in further detail in Section I.B.10, and are referred to as Planned Milestones for the Reporting Quarter (goals that are expected to be achieved during the quarter), Status of Planned Milestones for the Reporting Quarter (progress made in achieving these goals), and Planned Milestones for the Subsequent Quarter (goals for the upcoming quarter).

2. PROGRAM STATUS

This Quarterly Report presents the progress made on the R&R projects between October 1, 2020 and December 31, 2020. The data reported herein as the "approved" project budget and schedule conforms to the most recent annual update of the Hetch Hetchy 10-Year CIP for FY2019-2028, which was approved by the Water

and Power Enterprise Managers and adopted by the Public Utilities Commission on February 13, 2018. The 10-Year CIP for FY2019-2028 re-prioritizes the R&R program by defunding several projects that were determined to be lower priority, and re-allocating a portion of the funding to projects determined to be higher priority. Overall, this constituted an increase of \$85.75M in the program budget, from \$227.05M in FY2017-2026 to \$312.08M. The project budget and schedule were developed and approved based on the project team's best assessment HHWP's infrastructure needs at the time. It should be noted that the project team continues the process of re-validating these earlier assessments.

Figures 2.1 to 2.3 show the total number of subprojects remaining in each phase of the R&R Water, Power, and Joint Infrastructure programs as of December 31, 2020. As reported in previous quarters, the following CUH10001 - SJPL Rehabilitation subprojects were removed from the R&R program and included in the Hetch Hetchy Capital Improvement Programs 2018 Proposed Baseline with a budget of \$5.37M (it should be noted that these subprojects have been subsequently completed under the HCIP Program:

- CUH10001 - SJPL Rehabilitation
 - CUH10001.011 - SJPL No. 1 Replacement at Cashman Creek
 - CUH10001.018 - SJPL No. 1 Replacement at SJVH
 - CUH10001.022 - Tesla Valves Replacement

The remaining subprojects under project CUH10001 will continue to be reported under the R&R Program. The CUH10001 approved budget, expenditures to date, and current forecast cost have been reduced to reflect the transfer of the three subprojects to the HCIP program.

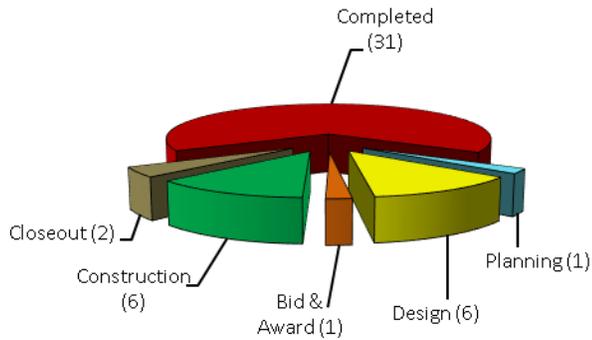


Figure 2.1 Total Number of Water Infrastructure Sub-Projects in R&R Program

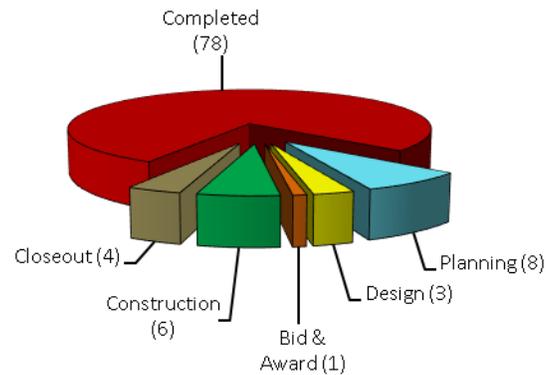


Figure 2.3 Total Number of Joint Infrastructure Sub-Projects in R&R Program

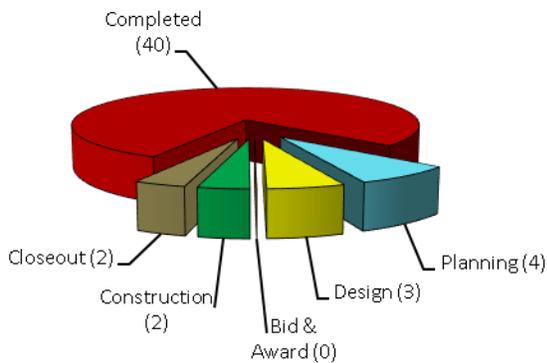


Figure 2.2 Total Number of Power Infrastructure Sub-Projects in R&R Program

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall current program level cost summary of the R&R Program included in this report. It shows the Expenditures to Date, Approved Budget, Current Forecast Cost, and Cost Variance between Approved Budget and Current Forecast Cost. There were no adjustments to the Approved Budget or Current Forecast Cost during the quarter.

Table 3.1 Program Cost Summary

	Expenditures to Date (\$ Million) (A)	Approved Budget** (\$ Million) (B)	Current Forecast Cost (\$ Million) (C)	Cost Variance (\$ Million) (D = B - C)
Water Infrastructure	\$19.38	\$115.70	\$115.70	-
Power Infrastructure	\$39.59	\$89.51	\$89.51	-
Joint Infrastructure	\$45.04	\$106.88	\$106.88	-
Hetchy R&R Program Total*	\$104.00	\$312.08	\$312.08	-

*The program total values include completed, not-initiated, and on-hold projects.

**The approved budget includes the 10-Year CIP Plan, as well as the previous fiscal year's appropriated budget

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 compares the 2018 Approved Schedule and Current Forecast Schedule for the R&R program. Refer to the “Cost and Schedule Status” notes in Section 5 for the criteria associated with the three color-coded Forecast Status levels in Figure 4.1 – Meet Requirements, Need Attention, and Exceed Limits.

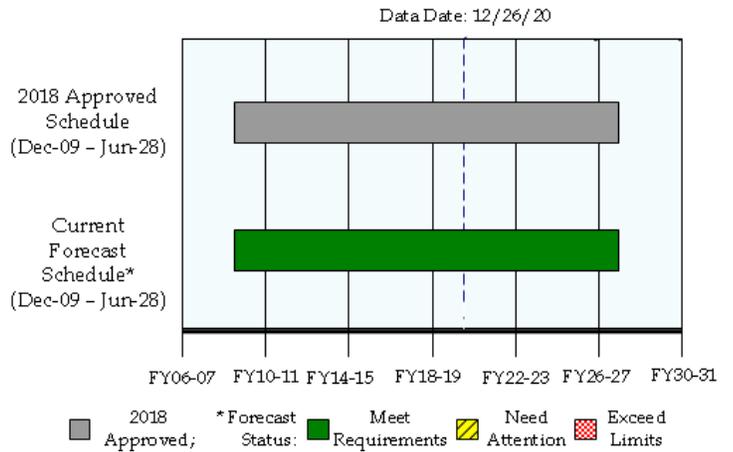


Figure 4.1 R&R Program Schedule Summary

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5. PROGRAM PERFORMANCE SUMMARY

All costs are shown in \$1,000s as of 12/26/20

Program Name	Active Phase (**)	Approved Budget (A)	Current Forecast Cost (B)	Expenditures To Date (C)	Cost Variance (D= A - B)	Cost Status (+)	Approved Completion (E)	Current Forecast Completion (F)	Schedule Variance (G = E - F)	Schedule Status (+)	Program Data Sheet
Water Infrastructure											
CUH100 - Water Infrastructure	MP	\$ 115,698	\$ 115,698	\$ 19,380	-	★	06/30/28	06/30/28	-	★	See Section 10
Power Infrastructure											
CUH101 - Power Infrastructure	MP	\$ 89,509	\$ 89,509	\$ 39,585	-	★	06/30/28	06/30/28	-	★	See Section 10
Joint Infrastructure											
CUH102 - Joint Infrastructure	MP	\$ 106,875	\$ 106,875	\$ 45,039	-	★	06/30/28	06/30/28	-	★	See Section 10

**** Phase Status Legend**

- PL Planning DS Design
- BA Bid & Award CN Construction MP Multiple-Phase

+ Cost and Schedule Status

- ★ Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
- ⚠ Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
- Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROGRAMS NOT WITHIN BUDGET AND/OR SCHEDULE

All programs are within the current approved budget and schedule.

7. ON-GOING CONSTRUCTION

There are no active construction projects with a construction contract amount greater than \$1 million.

8. PROGRAMS IN CLOSE-OUT

No program is currently in close-out.

9. COMPLETED PROJECTS

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Water Infrastructure				
CUH10005 - Priest Pipe Recoating	06/30/18	06/30/18	\$ 39,407	\$ 38,368
CUH10006 - Moccasin Gate No. 3 Shaft Replacement and Automation	12/31/18	12/31/18	\$ 1,049,557	\$ 133,278
Power Infrastructure				
CUH10103 - Powerhouse Control Upgrade	07/31/15	07/31/15	\$ 1,724,231	\$ 1,724,231
CUH10108 - Step-Up Transformers	04/04/17	04/04/17	\$ 221,995	\$ 182,525
CUH10109 - Moccasin Low Head Rehabilitation Project	05/31/18	05/31/18	\$ 619,140	\$ 568,367
CUH10111 - Moccasin GSU Transformers & Oil Containment	02/27/15	02/27/15	\$ 84,343	\$ 82,369
CUH10112 - Kirkwood Powerhouse Refurbishment & TSOV	06/30/17	06/30/17	\$ 62,177	\$ 47,473
CUH10118 - Kirkwood PH Valve Dissipation	06/30/17	06/30/17	\$ 810,613	\$ 718,117
Joint Infrastructure				
CUH10205 - Small Water Systems Upgrades	06/30/14	06/30/14	\$ 1,922,482	\$ 1,922,482
CUH10207 - Existing Hetchy Facilities (Outside Moccasin)	11/02/18	11/02/18	\$ 1,588,814	\$ 1,231,168
CUH10208 - Remote Terminal Unit Replacement	09/28/18	09/28/18	\$ 1,648,985	\$ 1,134,513
CUH10210 - Hetchy Fiber Projects	05/29/15	05/29/15	\$ 167,531	\$ 115,621
TOTAL			\$ 9,939,275	\$ 7,898,512

10. PROGRAMS WITHIN BUDGET AND SCHEDULE

CUH100 - Water Infrastructure

Program Description: The purpose of the Hetchy R&R Water Infrastructure Program is to extend the useful life of the water conveyance facility assets including tunnels and pipelines. The R&R projects are prioritized based upon regulatory compliance, condition assessment, operation staff recommendations, and level of service goals.

Program: Water Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost: Approved  \$115.68 M Forecast  \$115.68 M Actual  \$19.36 M		Program Schedule: Approved Nov-10  Jun-28 Forecast Nov-10  Jun-28 Program Percent Complete: 30.2%
 Approved;  Actual Cost; Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

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

Progress and Status:

The CUH100 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 47 subprojects.

Planning: 1 subproject

- 10034364.007 SJPL No 1 Alternatives Analysis Report (December 02, 2019)

Design: 6 subprojects

- J100-01.019 San Joaquin Pipeline System Wide Testing (April 01, 2015)
- J100-01.038 SJPL Improvement at Claratina Crossing (February 01, 2018)
- J100-01.021 SJPL Isolation Assessment and Valve Replacement (April 01, 2015)
- J100-05.001 Priest Outlet 24 (inch) Pipe Recoating (February 03, 2014)
- 10034364.002 Foothill Tunnel Lining Repair at Oakdale Portal (October 02, 2019)
- 10034364.006 Oakdale Portal Standpipe and Anchors System Repairs (December 02, 2019)

Bid and Award:1 subproject

- 10034364.005 SJPL No 4 Oakdale Portal Flowmeter Replacement (September 03, 2019)

Construction: 6 subprojects

- J100-01.031 San Joaquin Pipeline No 1 East of River Road Damage Assessment (December 01, 2016)
- J100-01.033 SJPL No 1 Oakdale Portal to Emery Inspection and Repair (September 01, 2017)

- 10034364.001 SJPL No 1 Oakdale Portal and Tesla Roll Out Installation (December 14, 2018)

- 10034364.003 SJPL No 1 Pipe Replacement 2020 Outage (September 03, 2019)

- 10034364.004 SJPL No 1 Air Guard and Blow-off Valve Replacement (October 01, 2019)

- 10034364.008 San Joaquin Pipeline No.1 Pipe Replacement - Mile Post 91 (May 12, 2020)

Closeout: 2 subprojects

- J100-01.010 Rankin Property Acquisition (April 01, 2013)

- 10034520.001 Moccasin Dam and Outlet Works (September 02, 2019)

Completed: 31 subprojects

Planned Milestones for Reporting Quarter:

Complete Closeout: Two subprojects 100-01.035 and 100-01.036 closed this quarter.

Status of Milestones for Reporting Quarter:

One subproject moved from Planning to Design, One subproject moved from Design to Bid and Award, and one subproject moved from Planning to Construction and two subprojects moved from Bid and Award to Construction. One subproject moved from Planning to Closeout.

Planned Milestones for Subsequent Quarter:

Complete Closeout: 1 subproject

Start Planning: 1 subproject

Issues and Challenges:

No new issues or challenges at this time.

CUH101 - Power Infrastructure

Program Description: The purpose of the Hetchy R&R Power Infrastructure Program is to extend the useful life of the power generation facility assets including powerhouse, switchyards, power distribution towers, and electrical distribution lines. The R&R projects are prioritized based upon regulatory compliance, condition assessments, Operations staff recommendations, and level of service goals.

Program: Power Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost:		Program Schedule:
Approved 	\$89.51 M	Approved Dec-09  Jun-28
Forecast 	\$89.51 M	Forecast Dec-09  Jun-28
Actual 	\$39.59 M	Program Percent Complete: 48.7%
		

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

Progress and Status:

The CUH101 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 51 subprojects.

Planning: 4 subprojects

- 101-18.002 Kirkwood PH Bypass Interim Repairs (November 01, 2019)
- 10036104.001 Modicon Quantum Programmable Logic Controller Upgrade to M580 (March 02, 2020)
- 10036104.002 Moccasin Low Head Powerhouse Exterior and Interior Repairs (March 02, 2020)
- 10036265.001 Riverbank Transmission Line Service Extension (February 10, 2020)

Design: 3 subprojects

- 101-18.004 Critical Spare Procurement for Kirkwood Powerhouse Energy Dissipation Cone (August 31, 2020)
- 10036104.003 Moccasin Powerhouse Gates and Valves Automation (April 02, 2020)
- 10036265.002 Warnerville and Early Intake Switchyard Control Room Roof Replacements (April 13, 2020)

Construction: 2 subprojects

- 101-01.021 Moccasin Switchyard Isolation Transformer Protection (September 01, 2016)
- 101-17.003 Transmission Line Clearance Mitigation Project (July 03, 2017)

Closeout: 2 subprojects

- 10034521.001 Moccasin Powerhouse Gantry Crane Upgrade (October 01, 2019)
- 101-01.013 HPH/KPH Ridge Line Transformer Protection (October 04, 2012)

Completed : 40 subprojects



Generator Shaft at Moccasin Powerhouse

Planned Milestones for Reporting Quarter:

Complete closeout of one (1) project.

Status of Milestones for Reporting Quarter:

One (1) new subproject started this quarter and is already in design, 101-18.004. One (1) subproject moved from planning to design. One (1) subproject moved from planning to closeout this quarter. One (1) subproject moved from design to construction.

Planned Milestones for Subsequent Quarter:

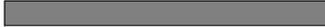
Complete closeout: 1 subproject.

Issues and Challenges:

No new issues or challenges at this time.

CUH102 - Joint Infrastructure

Program Description: The purpose of the Hetchy R&R Joint Infrastructure Program is to extend the useful life of the joint-facilities assets including dams, roads, communication systems, wastewater treatment facilities, cottages, and operational yard facilities. The R&R projects are prioritized based upon regulatory compliance, condition assessments, and Operations staff recommendations.

Program: Joint Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost:		Program Schedule:
Approved  \$106.87 M	Approved Nov-10  Jun-28	
Forecast  \$106.87 M	Forecast Nov-10  Jun-28	
Actual  \$45.03 M	Program Percent Complete: 36.4%	
 Approved;  Actual Cost; Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

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

Progress and Status:

The CUH102 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 100 subprojects.

Planning: 8 subprojects

- 102-03.011 Early Intake Dam Stability and Spillway Repairs (June 20, 2013)
- 102-08.001 KPH Unit 3 Remote Terminal Unit (RTU) Replacement and PLC Stop Logic Implementation (June 20, 2013)
- 102-09.016 Yosemite Park Hetch Hetchy Road Guard Rail Improvements (January 01, 2015)
- 102-09.018 Hetch Hetchy Roads FY 2019-2020 (August 01, 2019)
- 102-11.007 Rock River and Microwave Sites Physical Security Upgrade (September 23, 2019)
- 10034501.002 Distribution PRC 4292 Equipment Replacement (November 01, 2019)
- 10034501.004 Overhead Electrical Distribution Line (March 16, 2020)
- 102-13.005 Moccasin Peak Communication Building Air Conditioner Replacement (May 04, 2020)

Design: 3 subprojects

- 102-02.006 Moccasin Sewer Pond Upgrade (November 01, 2012)
- 102-03.010 O’Shaughnessy Dam Spillway Condition Assessment (September 01, 2017)
- 10034501.001 Cherry Ridgeline Transformer Rehabilitation (April 01, 2019)

Bid and Award: 1 subproject

- 10034501.003 Cherry Camp Power System Upgrade (December 15, 2019)

Construction: 6 subprojects

- 102-01.005 Upcountry Microwave Improvement (March 09, 2017)
 - 102-02.025 Moccasin Village and Shops Transformers (April 03, 2017)
 - 102-09.010 Small Bridge Improvement Project (January 15, 2016)
 - 102-09.012 Kearny Lateral Crossing (August 08, 2016)
 - 102-11.005 Security Upgrade for Mixed Facilities (March 27, 2017)
 - 102-02.028 Early Cottage No 1, 2, 3, & 4 Roof Replacement (November 01, 2019)
- Closeout: 4 subprojects
- 102-02.019 Moccasin Control and Server Building Boiler Work (March 01, 2016)
 - 102-03.005 Cherry Dam Condition Assessment (February 03, 2014)
 - 102-09.008 Road and Bridge Improvement (July 06, 2015)
 - 102-09.014 Cherry Lake Road Guardrail C-3 and 4 (May 01, 2017)

Completed : 78 subprojects

Planned Milestones for Reporting Quarter:

Complete Closeout of one (1) subproject.

Status of Milestones for Reporting Quarter:

One (1) subproject closed: 102-13.004 Duckwall Communication Site Power System Repair. One (1) new subproject moved from Planning to Design. One (1) subproject moved from Design to Bid and Award. One (1) subproject moved from Bid and Award to Construction. One (1) subproject moved from Design to Construction. One (1) subproject completed this quarter.

Planned Milestones for Subsequent Quarter:

Complete Closeout: 1 subproject

Issues and Challenges:

No new issues or challenges at this time.

**II. SAN FRANCISCO POWER ENTERPRISE
CAPITAL IMPROVEMENT PROGRAMS (POWER)**



INTRODUCTION

The San Francisco Power Enterprise (Power) is responsible for the marketing and sale of the clean hydro-generated power produced by the Hetch Hetchy system, and balances that supply with purchases or sales to meet customer demand. Power transmits, distributes, meters, and prepares the electric bills for its customers, comprised of all City and County of San Francisco offices, facilities, and their tenants, ranging from neighborhood Police Stations and Fire Houses, the Ferry Building, and City Hall, to the Airport, General Hospital, Wastewater pumping and treatment facilities, the Regional Water Treatment Facilities, and the Municipal Railway (MUNI). Power is also the full-service electricity provider to Treasure and Yerba Buena Islands, and the newly developing Hunters Point Shipyard. Power operates and maintains four substations and switchgear, and many miles of distribution wires, to provide reliable electric service to its customers.

Power also owns, operates, manages, and maintains approximately 25,000 street lights and related circuitry throughout San Francisco.

Power provides the full complement of electricity services to its vital City service customers, which includes identifying and implementing energy efficiency improvements and on-site renewable power generation. Power has developed and owns 2 Megawatts (MW) of rooftop solar projects, developed and owns the output of the 5 MW Sunset Solar Generating project, and developed 2 MW of methane gas-fired co-generation facilities at the Southeast Wastewater Treatment Plant.



1. PROGRAM DESCRIPTION

The SFPUC Power Enterprise’s capital improvement projects are divided into six groups: Generation, Energy Efficiency, Retail Services, Street Lights, Transmission/Distribution System, and Redevelopment-Treasure Island Projects.

2. PROGRAM STATUS

This Quarterly Report presents the progress made between October 1, 2020 and December 31, 2020. The data reported herein as the “approved” project budget and schedule conforms to the Power Capital Improvement Program’s 10-Year Plan, which was approved by the Water and Power Enterprise Managers and became effective on February 9, 2016.

Figure 2.1 shows the Approved Budget for the projects in each phase of the program as of December 31, 2020. The number of projects currently in each phase is shown in parentheses. Multiple Phase projects are currently active in several phases as indicated by their respective project status sheets (Sections 6 and 10 of this report).

There are three (3) projects whose status is “on-hold”, CUHCAP02, CUH98001, and CUH985, and are consequently not being reported in this quarterly report. However, funding status related to these on-hold projects is included in Table 3.1, in order to give an accurate report of the overall program’s cost performance. Progress reporting for these projects will be included in subsequent editions of this report upon their initiation or resumption.

Figure 2.2 summarizes the environmental review status of the Hetch Hetchy projects as of December 31, 2020.

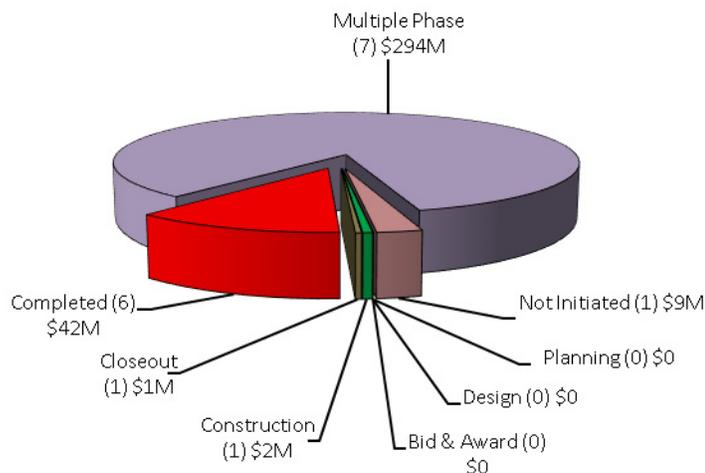
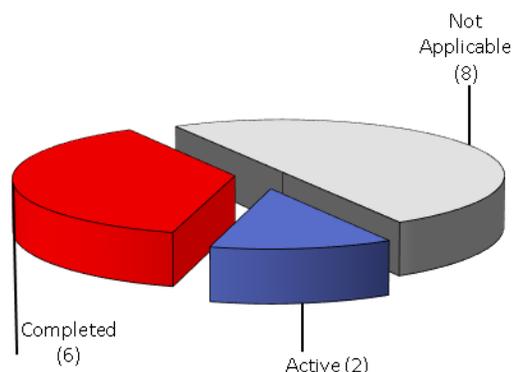


Figure 2.1 Approved Budget for Projects in Each Phase



* Environmental review does not apply to the projects not under CEQA requirements or with no environmental phase.

Figure 2.2 Program Environmental Status

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall current program-level funding status of the Power projects included in this report. It shows the Approved Budget as of 2018 Hetch Hetchy 10-Year CIP Plan, Appropriated Budget to Date, Not Appropriated Budget to Date, Total Expenditures to Date, and Remaining Appropriated Budget.

Table 3.2 reflects the total number of projects by their status. Table 3.3 provides an overall current program-level cost summary of the active projects included in this report. It shows the Expenditures to Date, Current Approved

Budget and Current Forecast Cost, and the Cost Variance between the Current Approved Budget and the Current Forecast Cost. The total Current Approved Budget for active projects included in this report is \$257.93M, and the current Forecast Cost is \$153.00M over budget.

The staffing and development of schedules for new and inactive projects are underway. Progress reporting for these projects will be included in subsequent editions of this report upon their initiation or resumption.

Table 3.1 - Status of Funding Appropriated to Date

	Approved Budget as of Hetch Hetchy 10-Year CIP Plan (\$ Million) (A)	Appropriated Budget to Date (\$ Million) (B)	Not Appropriated Budget to Date (\$ Million) (C=A-B)	Total Expenditures to Date (\$ Million) (D)	Remaining Appropriated Budget (\$ Million) (E=B-D)
Generation	\$55.57	\$45.77	\$9.80	\$38.95	\$6.82
Efficiency	\$49.01	\$36.73	\$12.29	\$33.50	\$3.23
Street Lights	\$109.34	\$84.57	\$24.76	\$63.88	\$20.69
Retail Services	\$41.70	\$154.88	(\$113.19)	\$50.10	\$104.78
Transmission/ Distribution System**	\$117.47	\$37.30	\$80.17	\$18.42	\$18.88
Redevelopment - Treasure Island	\$43.75	\$41.88	\$1.87	\$8.58	\$33.30
Power Enterprise Total*	\$416.83	\$401.13	\$15.71	\$213.42	\$187.70

*The Total Values include Project Development related costs, On-Hold, Completed, and Not Initiated projects.

**A new project, Intervening Facilities, with budget cost of \$99.5M was added in March 2019.

Table 3.2 - Number of Projects by Status

	# of Active Projects (A)	# of Completed Projects (B)	# of Not Initiated Projects (C)
Generation	2	3	0
Efficiency	2	1	0
Street Lights	1	1	0
Retail Services	2	1	0
Transmission/ Distribution System	2	0	0
Redevelopment - Treasure Island	0	0	1
Power Enterprise Total	9	6	1

Table 3.3 Active Projects Cost Summary

	Expenditures to Date (\$ Million) (A)	Current Approved Budget (\$ Million) (B)	Current Forecast Cost (\$ Million) (C)	Cost Variance (\$ Million) (D= B-C)
Generation	\$33.47	\$36.04	\$36.04	-
Efficiency	\$5.29	\$7.85	\$7.85	-
Street Lights	\$62.65	\$108.10	\$108.10	-
Retail Services	\$44.18	\$1.70	\$154.70	(\$153.00)
Transmission/ Distribution System	\$5.10	\$104.25	\$104.25	-
Redevelopment - Treasure Island	-	-	-	-
Power Enterprise Total*	\$150.69	\$257.93	\$410.93	(\$153.00)

*The Total Values do not include Project Development related costs, On-Hold, Completed, and Not Initiated projects.

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2016 Approved Schedule and Current Forecast Schedule for the Power program. As shown in Table 4.1 the Overall Power Enterprise Program is currently forecast to be completed in June 2028.

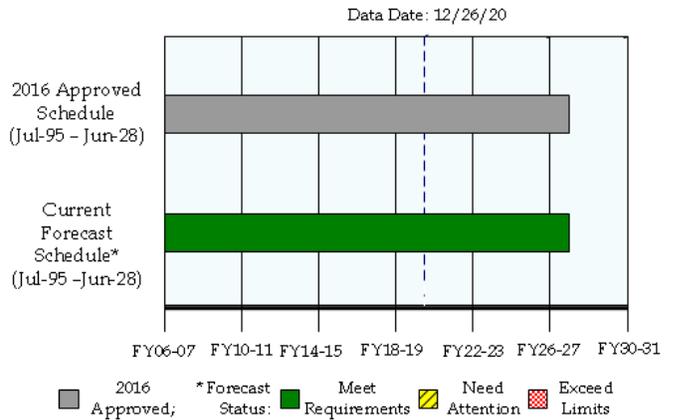


Figure 4.1 Program Schedule Summary

Table 4.1 2016 Approved vs. Current Forecast Schedule Dates

Sub-Program	2016 Approved Project Start	Actual Start	2016 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Generation	07/01/08	07/01/08✓	02/01/19	06/28/24	64.9
Efficiency	01/01/08	01/01/08✓	12/30/21	12/30/21	-
Street Lights	09/08/08	09/08/08✓	05/12/25	06/30/27	25.6
Retail Services	07/01/95	07/01/95✓	03/01/22	06/30/22	4.0
Transmission/ Distribution System	07/01/05	07/01/05✓	06/30/28	06/30/28	-
Redevelopment - Treasure Island	-	-	-	-	-
Overall Power Enterprise*	07/01/95	07/01/95✓	06/30/28	06/30/28	-

*The Overall Schedule does not include On-Hold and Not Initiated projects.

5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in \$1,000s as of 12/26/20

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Generation											
CUH94763 - Go Solar SF Program	MP	\$ 34,120	\$ 34,120	\$ 32,615	-	★	06/29/18	06/28/24	72.0 mo. Late	●	See Section 6
CUH99309 - Marina Middle School Solar	CN	\$ 1,920	\$ 1,920	\$ 854	-	★	01/31/19	09/18/20✓	19.6 mo. Late	●	See Section 6
Efficiency											
CUH983 - Civic Center Sustainable District Program	MP	\$ 6,650	\$ 6,650	\$ 4,179	-	★	12/30/21	12/30/21	-	★	See Section 10
Street Lights											
CUH896 - Streetlight Replacement	MP	\$ 108,096	\$ 108,096	\$ 62,651	-	★	05/12/25	06/30/27	25.6 mo. Late	●	See Section 6
Retail Services											
CUH870 - Distribution Services Retail Customers	MP	\$ 40,000	\$ 168,452	\$ 48,443	(\$128,452)	●	07/02/20	06/30/22	23.9 mo. Late	●	See Section 6
CUH891 - Metering and Load Monitoring	MP	\$ 699	\$ 699	\$ 337	-	★	03/01/22	06/30/22	4.0 mo. Late	⚠	See Section 6

* 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	

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Transmission / Distribution											
10033821 - Intervening Facilities	MP	\$ 99,500	\$ 99,500	\$ 2,972	-	★	06/30/28	06/30/28	-	★	See Section 10
CUH972 - Load Meter Program	MP	\$ 4,750	\$ 4,750	\$ 2,126	-	★	03/01/22	06/30/22	4.0 mo. Late	⚠	See Section 6

* 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	

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROJECTS NOT WITHIN BUDGET AND/OR SCHEDULE

CUH94763 - Go Solar SF Program

Project Description: GoSolarSF is an incentive program to encourage San Francisco residents to install solar power systems by offering one-time incentive payments to reduce the costs to the homeowners. The program launched in 2008 and provides between \$2 and \$5 Million per year in incentives to residents of San Francisco.

Program: Generation		Project Status: Multiple Phase		Environmental Status: Not Applicable	
Project Cost:			Project Schedule:		
Approved		\$34.12 M	Approved Jul-08		Jun-18
Forecast		\$34.12 M	Forecast Jul-08		Jun-24
Actual		\$32.62 M	Project Percent Complete: 96.0%		
 Approved;  Actual Cost; Forecast Status:  Meet Requirements  Need Attention  Exceed Limits					
Key Milestones:	Environmental Approval+	Bid+ Advertisement	Construction+ NTP	Construction+ Final Completion	
Current Forecast	See Note	N/A	N/A	N/A	

+ This is one of the programmatic projects; it does not result in construction projects that the City bids out, manages, or owns.

Progress and Status:

GoSolarSF recently ended the programs fourth quarter for calendar year 2020, providing incentives to 96 applicants. As of December 31, 2020, \$249,428.00 in incentives were paid in the reporting quarter. On Jan 1, 2021 according to the Solar ordinance the incentives rates that were reduced annually over the last 4-years reached \$0, concluding most of the programs offerings. Currently only a small amount of funding for Non-Profit and Low-Income incentives remain.

Issues and Challenges:

GoSolarSF is also providing relief to applicants that are not able to meet stipulated deadlines when impacted by Covid-19.

II POWER Quarterly Report

CUH99309 - Marina Middle School Solar

Project Description: The project scope consists of the design and the installation of a rooftop solar electric system with energy storage at Marina Middle School. The design phase includes DC/AC electrical and structural design for a photovoltaic (PV) rack mounted array and related electrical equipment. The system's energy storage (batteries) will provide flexibility with regard to how much power is drawn from the grid and will provide resiliency in the case of a disaster event. The Construction Phase will include the installation of a grid connected PV system and energy storage. Once completed, the PV system will be interconnected to the PG&E electrical distribution system.

Program: <i>Generation</i>		Project Status: <i>Construction</i>		Environmental Status: <i>Completed</i>	
Project Cost:			Project Schedule:		
Approved		\$1.92 M	Approved Mar-16		Jan-19
Forecast		\$1.92 M	Forecast Mar-16		Sep-20
Actual		\$0.85 M	Project Percent Complete: 100.0%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	11/27/19✓	N/A	11/01/19✓	09/18/20✓	

Progress and Status:

This project was previously funded by a CREBS bond. During this time the funding fell under CUH99309. This bond expired earlier this year at which time all funding under the authority was closed out. The construction of the project will be performed by Power Enterprise's internal construction crews and funded (~\$200k) through Power's Cap and Trade Authority.

Issues and Challenges:

Marina Middle School PV installation was delayed by work related to the SFUSD bond modernization construction activities on site. This is the last report for this project.



Marina Middle School Solar Project

CUH896 - Streetlight Replacement

Project Description: The SFPUC maintains approximately 25,500 street lights in the City of San Francisco. This Program funds various street lighting projects, street light engineering and capital support services, electric vehicle charger installations, community benefits capital projects, small and large street lighting capital projects, and street lighting Repair and Replacement (R&R) projects. The overall program provides funding for multiple projects over multiple years with varying start and end dates.

Program: Street Lights		Project Status: Multiple Phase		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$108.10 M	Approved Sep-08		May-25
Forecast		\$108.10 M	Forecast Sep-08		Jun-27
Actual		\$62.65 M	Project Percent Complete: 57.2%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	Various	Various	Various	Various	

Progress and Status:

- CUH896.01 is an ongoing capital project for the streetlights of San Francisco. 52 sub-level projects are each composed of several mini-streetlight projects at various milestone stages.
- CUH 896.48 - 3rd Street Rehabilitation. This project is complete and fully operational.
- CUH 896.32 - Van Ness Bus Rapid Transit. This is a cost share project with MTA. SFPUC is only providing funds for the ongoing project. Installation of new street and sidewalk light pole foundations are in progress.
- CUH 896.49 - Holiday and Festival Lighting. This is an ongoing project with annual work during the holiday season. SFPUC crews install holiday lighting on Market St. and Third St.
- CUH896.50 Pedestrian Lighting. This project is still awaiting sub-projects to be engineered. This will be an ongoing project which will add pedestrian lighting based on community requests.
- CUH 896.51 - Street Light and Pedestrian Pole Assessment. Project is ongoing and currently in Phase II. Phase I is completed and has assessed 23,219 street light poles to date. Phase II is underway and has assessed 1,275 poles to date.
- CUH 896.52 - San Bruno Street Light Improvement. This project is complete and fully operational.
- CUH896.52 Streetlight Pole Rehabilitation. We have completed the replacement of 626 deteriorated poles to date. The poles are identified by pole inspections.

- CUH 896.40 Series Loop Conversions. We have completed 6 conversions to date and have 2 remaining to complete the project. We are estimating completion in June 2022.
- CUH896.27 LED Street Light Conversion Project. We have completed 21,100 LED conversions to date. The cobra head portion of this project is completed. Maintenance and the decorative portion of this project is ongoing.
- CUH896.47 Tenderloin Street Light Improvements. Phase 1 has been completed and Phase 2 is in design.
- CUH896.30 Street Light Repair and Replacement. This is an ongoing project for replacement of street light facilities requested through 311 or by the Board of Supervisors.
- CUH896.31 Street Light Area Improvements. This is an ongoing project for addition of street light facilities requested through 311 or by the Board of Supervisors.
- CUH896.DA- Distributed Antenna System. This is an ongoing project to install wireless 4G and 5G equipment on City-owned streetlights. The existing 12-year license agreements with wireless telecommunications providers will expire in 2027 but may be extended indefinitely. To date, there are 811 DAS sites on City-owned poles. Installation is on-going as carriers continue to submit requests to add poles to their agreements.

Issues and Challenges:

Schedule variance was due to CUH896.DA which the existing agreement would expire in 2027.

II POWER Quarterly Report

CUH870 - Distribution Services Retail Customers

Project Description: A program to develop SFPUC-owned transmission and electrical distribution facilities along the Bayside of San Francisco has been initiated. The objective is to receive transmission level voltage from PG&E Potrero substation at 230kV, transform this high voltage to 34.5 kV, and then distribute this lower voltage to SFPUC Power Enterprise electrical customers. The scope of Phase One of the program encompasses ductbanks, conduits, cables, electrical equipment and vaults underground from 23rd Street along Illinois to 16th St, and then Terry Francois Boulevard to South Street. The Phase One work is planned to be completed by end of December 2018. The balance of the Bay Corridor Transmission Distribution (BCTD) project will be built in subsequent stages, with the SFPUC substation to be built in parallel with the Phase One distribution work.

Program: Retail Services		Project Status: Multiple Phase		Environmental Status: Completed (CatEx)	
Project Cost:			Project Schedule:		
Approved		\$40.00 M	Approved Dec-15		Jul-20
Forecast		\$168.45 M	Forecast Dec-15		Jun-22
Actual		\$48.44 M	Project Percent Complete: 27.0%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	Various	Various	Various	Various	

Progress and Status:

CUH870 has 5 subprojects:

- CUH870.01 Distribution Services Retail Customers: This subproject holds unallocated budget for use by other subprojects.
- CUH870.02 Bay Corridor Transmission Distribution (BCTD): This subproject contains multiple contracts. Forecasted cost at completion is \$154M.
- CUH870.03 Distribution Interface - New Customers: This subproject will be ongoing for the foreseeable future.
- CUH870.04 Electrical Service Improvements: This subproject will be ongoing for the foreseeable future.
- CUH870.05 HHP-EE Programs for New Retail Customers: This subproject will be ongoing for the foreseeable future.

CUH870.02 is the only active subproject in CUH870.

- Contract DB-128R2: Final Completion (FC) date is being negotiated.
- Contract DB-129.1: Design work occurring. Construction completion in 2021.
- Contract DB-129.2: Design work occurring. Construction completion in 2021.
- Contract DB-130: Design work occurring. Construction completion in 2021.

Issues and Challenges:

None at this time. Cost variance was due to new forecast from 10014227 / CUH870.02 BCTD. Field work was delayed due to COVID-19 restrictions.

CUH891 - Metering and Load Monitoring

Project Description: The purpose of this project is to upgrade existing metering to revenue quality meters, and to upgrade any associated equipment as needed. Metering and communication equipment will be installed and replaced according to the meter data acquisition strategy developed by CUH972 Load Meter Project.

Program: Retail Services		Project Status: Multiple Phase		Environmental Status: Completed	
Project Cost:			Project Schedule:		
Approved		\$0.70 M	Approved Jul-95		Mar-22
Forecast		\$0.70 M	Forecast Jul-95		Jun-22
Actual		\$0.34 M	Project Percent Complete: 96.2%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	09/26/16✓	N/A	03/01/19✓	06/30/22	

Progress and Status:

The Load Meter Project created a strategy to identify, procure, and install an Advanced Metering Infrastructure (AMI) system for Power Enterprise electric meters. After the strategy development is complete, funds remaining in CUH972 and all funds in CUH891 will be used for the purchase and installation of metering and communication equipment. Power Enterprise evaluated CUH972 Load Meter Program in conjunction with this project to refine and delineate the scope of these 2 projects.

The project schedule includes issuing a Request for Proposals (RFP) for procurement of the AMI system. An RFP was issued in April 2017, but no qualified responses were received. A sole-source contract was signed with Aclara in October 2018. A pilot study was initiated in March 2019; and testing of the pilot phase has been completed.

Deployment and testing of the system, along with replacement of the existing 1,250 meters with AMI meters, is expected to be completed in 2021 as a result of network communication gaps identified after system deployment. Installation of the second phase of Data Collection Unit (DCU) was completed in 2020.

Because the operations budget cannot pay for future meters at redevelopment or Housing Authority sites, the project will pay for future AMI meters.

Issues and Challenges:

The project is merged with CUH972. No qualified responses to the April 2017 RFP were received, causing delays in the contracting process. The procurement delayed to Fall 2018 to allow enough time to select and procure a vendor. A sole-source contract was signed with Aclara in October 2018.

II POWER Quarterly Report

CUH972 - Load Meter Program

Project Description: The purpose of this project is to identify and then implement the most cost effective method to collect reliable meter data from existing and future SFPUC Power customers in geographically dispersed areas. The project will evaluate the feasibility of implementing an Advanced Metering Infrastructure (AMI) System. The project will also consider the feasibility of replacing all or a portion of the 2000 PG&E meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, or, in the alternative, the Power Enterprise purchasing these meters from PG&E.

Program: Transmission / Distribution		Project Status: Multiple Phase		Environmental Status: Completed	
Project Cost:			Project Schedule:		
Approved		\$4.75 M	Approved Jul-05		Mar-22
Forecast		\$4.75 M	Forecast Jul-05		Jun-22
Actual		\$2.13 M	Project Percent Complete: 95.8%		
					
Key Milestones:	Environmental Approval	Bid+ Advertisement	Construction+ NTP	Construction+ Final Completion	
Current Forecast	09/26/16✓	N/A (B) 11/30/16✓	(A) 07/01/05✓ (B) 03/01/19✓	(A) 03/31/09✓ (B) 06/30/22	

+ The project includes multi-phase construction: (A) Phase 1; (B) Phase 2

Progress and Status:

The Load Meter Project created a strategy to identify, procure, and install an Advanced Metering Infrastructure (AMI) system for Power Enterprise electric meters. After the strategy development is complete, funds remaining in CUH972 and all funds in CUH891 will be used for the purchase and installation of metering and communication equipment. Power Enterprise evaluated CUH972 Load Meter Program in conjunction with this project to refine and delineate the scope of these 2 projects.

The project schedule includes issuing a Request for Proposals (RFP) for procurement of the AMI system. An RFP was issued in April 2017, but no qualified responses were received. A sole-source contract was signed with Aclara in October 2018. A pilot study was initiated in March 2019; and testing of the pilot phase has been completed.

Deployment and testing of the system, along with replacement of the existing 1,250 meters with AMI meters, is expected to be completed in 2021 as a result of network communication gaps identified after system deployment. Installation of the second phase of Data Collection Unit (DCU) was completed in 2020.

Because the operations budget cannot pay for future meters at redevelopment or Housing Authority sites, the project will pay for future AMI meters.

Issues and Challenges:

The project is merged with CUH891.

No qualified responses to the April 2017 RFP were received, causing delays in the contracting process. The procurement delayed to Fall 2018 to allow enough time to select and procure a vendor. A sole-source contract was signed with Aclara in October 2018.

7. ON-GOING CONSTRUCTION

There are no active construction projects with a construction contract amount greater than \$1 million.

8. 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
Efficiency				
CUH995 - Enterprise Fund Dept - Energy Efficiency	06/29/18	03/31/20	\$ 1,195,720	\$ 1,111,089
TOTAL			\$ 1,195,720	\$ 1,111,089

9. COMPLETED PROJECTS*

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Generation				
CUH99302 - Alvarado Elementary School -- Solar Electric (completed)	01/04/13	01/04/13	\$ 582,170	\$ 580,224
CUH99307 - North Beach Library Solar -- Renewable/Generation - Small Renewables (completed)	09/26/14	09/26/14	\$ 212,160	\$ 127,077
CUH99308 - SF Academy Solar Carport	02/01/19	12/17/20	\$ 2,097,949	\$ 2,418,148
Efficiency				
CUH986 - Energy Efficiency General Fund Program	06/30/21	09/25/20	\$ 36,877,376	\$ 26,690,051
Retail Services				
CUH973 - Distribution System Assessment (completed)	11/28/16	06/13/18	\$ 1,000,000	\$ 1,319,755
Street Lights				
CUH91503 - San Bruno Street Light Improvement Project (completed)	03/25/17	03/25/17	\$ 1,240,000	\$ 1,226,894
TOTAL			\$ 42,009,655	\$ 32,362,149

* This table only includes projects listed in the 10-Year CIP Plan for FY2017-2026.

10. PROJECTS WITHIN BUDGET AND SCHEDULE

CUH983 - Civic Center Sustainable District Program

Project Description: This project funds planning, design, and construction of projects in the green district of the Civic Center in accordance with the partnership Memorandum of Understanding (MOU) with the Clinton Climate Initiative. This effort will employ new technologies in energy efficiency for whole-building retrofits and will pursue Leadership in Energy and Environmental Design (LEED) certification from the US Green Building Council (USGBC). The program and its related projects will demonstrate the City's leadership by transforming the historic Civic Center into a green and sustainable resource district by maximizing energy efficiency and showcasing sustainable concepts and technologies.

Program: Efficiency		Project Status: Multiple Phase		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$6.65 M	Approved Jan-08		Dec-21
Forecast		\$6.65 M	Forecast Jan-08		Dec-21
Actual		\$4.18 M	Project Percent Complete: 62.0%		
					
Key Milestones:	Environmental Approval	Bid+ Advertisement	Construction+ NTP	Construction+ Final Completion	
Current Forecast	TBD	Multiple Small JOCs	Various	Various	

+ This is one of the programmatic projects, which include multiple construction contracts.

Progress and Status:

The Civic Center Sustainable District Program for this quarter continued to focus on energy efficiency services, retro-commissioning, and LEED certification for the City's building portfolio in the Civic Center including: City Hall, Asian Art Museum, Main Library, Department of Public Health, Civic Center Garage, Brooks Hall, UN Plaza, and the San Francisco War Memorial: Davies Symphony Hall, Veterans Building, and Opera House.

- Phase 1 City Hall Heat Pumps Replacement Project is in the construction phase. The project was awarded to ACCO Engineered Systems. Construction and engineering management services are with professional service contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 7.
- City Hall Cooling Towers Replacement Project performance specification is in development with professional service contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 10.
- City Hall Fuel Switching Feasibility Study is in development with professional service contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 11.
- City Hall LED Interior Dome Lighting Design was revised to comply with concerns with the Historic

Preservation Commission. Environmental Review is in process with SFPUC Bureau of Environmental Management and the San Francisco Planning Department. Construction services have been assigned to Rubicon Builders through JOC 64-11, pending environmental review approval.

- Additional projects related to HVAC and lighting retrofits are being identified and evaluated for funding requirements.

Issues and Challenges:

None at this time.

10033821 - Intervening Facilities

Project Description: Under the Wholesale Distribution Tariff (WDT), electric service requires intervening facilities between PG&E's service points and SFPUC end-use customers. The installations of intervening facilities are needed for the upgrade of new electric service, conversion of service from secondary to primary service level, and aggregation of electric service to common points of service interconnection where feasible. The electric service improvements cover the installation of service cables, medium voltage switchgears, transformers, switches, service equipment and distribution infrastructures to be owned and maintained by the SFPUC Power Enterprise.

Program: Transmission / Distribution	Project Status: Multiple Phase	Environmental Status: Not Applicable
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Project Cost:		Project Schedule:	
Approved 	\$99.50 M	Approved Dec-18 	Jun-28
Forecast 	\$99.50 M	Forecast Dec-18 	Jun-28
Actual 	\$2.97 M	Project Percent Complete: 1.7%	

 Approved;  Actual Cost; Forecast Status:  Meet Requirements  Need Attention  Exceed Limits

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	N/A	N/A	N/A	N/A

Progress and Status:

No updates on schedule or progress.

Issues and Challenges:

Intervening facilities may be required at various new construction and development projects where PG&E requires primary electric service. Each project is scheduled based on when the customer needs electric service.

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APPENDICES

A PROJECT DESCRIPTIONS

B APPROVED PROJECT-LEVEL SCHEDULE

C LIST OF ACRONYMS

APPENDIX A. PROJECT DESCRIPTIONS

A1-A HETCHY CAPITAL IMPROVEMENT PROJECTS (HCIP)

WATER INFRASTRUCTURE

CUH10001-HCIP - San Joaquin Pipeline Rehabilitation (Completed)

The purpose of the San Joaquin Pipeline Rehabilitation (SJPL) is to extend the useful life of these water conveyance facility assets, including tunnels and pipelines. Baseline dates and budgets for the subprojects below were presented to and approved by the Commission on 09/08/15. Since they are now considered to be active HCIP subprojects, they have been moved from CUH100 R&R.

CUH10003 - Lower Cherry Aqueduct

The Lower Cherry Aqueduct (LCA) delivers water from Cherry Creek to supplement the primary Hetch Hetchy reservoir supply during a drought year. Due to current drought conditions, as described in the Declaration of Emergency issued on February 21, 2014, there is a need for this reliable backup water supply to be re-established in the LCA. However, due to damage during the Rim Fire Emergency and age, the LCA is in need of restoration before it can become a reliable asset. This project consists of improvements such as emergency debris removal and tunnel cleaning, temporary structures installation, monitoring and instrumentation, and forebay and diversion dam repairs.

10035574 - SJPL Tesla Valves Replacement

This project intends to replace all the under rated inline valves, Tesla Ultra Violet (TUV) 101 to 401, with properly rated valves to improve safety and entry into all 4 San Joaquin Pipelines (SJPL). In addition, all cross-over valves and bypass valves may need to be replaced or made safe. Modification to the pipes, flanges, spool pieces, actuators, and

valve controls are needed. The valve vault will need modification to accommodate the new valves. New facilities may need to be constructed if additional new valves are not designed for direct burial.

10035575 - SJPL Valve and Safe Entry Improvement

The San Joaquin Pipeline (SJPL) Entry Assessment and Valve Improvement Project involves the three parallel transmission pipelines that stretch approximately 48-miles across the San Joaquin Valley from Oakdale Portal to Tesla Portal, with a partial fourth pipeline consisting of a 6.4-mile Eastern Segment and an 11-mile Western Segment. The four pipelines were built between 1932 and 2012, respectively, and range from 56- to 79.5-inches in diameter. As part of the Water System Improvement Program (WSIP), valve vaults were constructed along the SJPL System at various locations to increase operational flexibility and the overall reliability of the SJPL System. Since the commissioning of the valve vaults, Hetch Hetchy Water & Power (HHWP) has expressed concern that 1) valves may not be sufficiently rated and may fail due to a pressure transient surge event using certain operational assumptions 2) there is an inability to establish double isolation and bleed configurations along the SJPL System, resulting in insufficient protection for maintenance personnel, and 3) multiple isolation valves are not adequately rated for hydrostatic head. In order to achieve the safety and access goals, the scope is to: install a surge shaft upstream of Tesla Treatment Facility (TTF) to reduce maximum pressure from unplanned reactor valve closure and upgrade line valves to resist transient pressure from unplanned line valve closure; install new double isolation and bleed valves at all locations where major upgrades and construction are required; and retain single isolation where no upgrades are needed. There are four primary locations where major

upgrades and construction are required: Emery, Roselle, Pelican, and Tesla.

10033156 - Moccasin Reservoir Perimeter Security Fence

Hetch Hetchy Water & Power (HHWP) will install an approximately 6,500 feet long perimeter security fence system around Moccasin Reservoir to discourage trespassers. Moccasin Reservoir covers approximately 32 acres. Fence monitoring alarms, signs, lighting, and security camera will be considered as part of the design.

CUH100PD - 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

CUH10102 - Holm and Other Powerhouse Projects

This project will provide funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under \$1 million regarding power generation renewal and equipment replacement. The upgrade and rehabilitation of Holm Unit 2 includes 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 will be done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project includes upgrades to turbine and generators, and alternating current stations intended to extend the life of the unit by 20 years. Lastly, the project will upgrade the existing oil containment system at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators will be replaced, and other modifications will be made to the powerhouse interiors and to the transformer decks to discourage contaminated discharges into the adjacent streams. A monitoring system will be installed to alert Hetch Hetchy Water & Power (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 & cleanup.

CUH10113 - Kirkwood Penstock

Kirkwood Penstock was built in 1964 and conveys the SFPUC water supply from Canyon Tunnel to KPH. Kirkwood Penstock has experienced significant foundation movement without impact to the service utility. In February 2007, however, there was significant movement on the penstock, and the penstock partially detached from one fixed saddle directly below anchor block 2. The scope of this project includes an internal and external inspection; development of an Emergency Action Plan and a Penstock Monitoring Plan; repairs to the damaged saddle; installation of a

monitoring system; and procurement of emergency spare equipment.

CUH10114 - 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. This is a design-build project and was advertised twice in 2011 and 2013. Bids were unresponsive. The project will also involve 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.

CUH10115 - Warnerville Substation Rehabilitation

Warnerville Substation facilities and equipment have reached the end of their life expectancy. The facility needs to be upgraded to meet regulatory and safety requirements. This project will address major renewal and replacement of the substation components, including grounding, fence, circuit breaker, control room, electrical equipment, and disconnect switch. This project will also improve grading in the substation.

CUH10116 - Moccasin Penstock

The Moccasin Penstock conveys San Francisco Public Utilities Commission (SFPUC) water nearly one mile from Moccasin Tunnel to the

Moccasin Powerhouse. 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 back to 1924 and has been in service for more than 90 years. Condition assessments based on external inspection and imaging have identified a number of deficiencies along the original pipe. The 104-inch diameter (narrowing to 98-inch) riveted steel penstocks extend 1,554 feet from the downstream Moccasin Tunnel portal then bifurcate to four 66-inch diameter hammer-forged welded steel conduits extending about 2,384 feet to the lower welded steel pipe. Additionally, in September of 2018 the penstock experienced significant leakage in two separate areas, necessitating emergency repairs. This rehabilitation project is intended to enhance the reliability of the penstock system and will include: repair or replacement of some sections of corroded pipe; repair or replacement of four badly cracked concrete anchors and damaged penstock saddles; installation of new manways and a rollout pipe section to provide better access for inspection and maintenance; and recoating the outside pipe, where needed, to reduce future corrosion. The project scope was expanded to include: 1) The installation of additional penstock pipe between the valve house and the first downstream anchor; 2) The replacement of the butterfly valve pneumatic actuator with an electronic actuator, which will include new controls with SCADA connectivity; and 3) A new backup generator.

CUH10119 - Early Intake Switchyard Slope Hazard Mitigation

The Hetch Hetchy Water and Power (HHWP) Early Intake Switchyard (ISY) is a 230 kV switchyard located alongside the Tuolumne River, downstream of HHWP's Kirkwood Powerhouse (KPH). The switchyard is a critical HHWP asset that provides the transmission of electrical power generated at Kirkwood and

Holm powerhouses to Moccasin, as well as the local distribution of power to HHWP's upcountry facilities. The slope requiring hazard mitigation, located next to ISY, was severely burned in the Rim Fire. The purpose of the project is to reduce the risk of slope failure which may cause damage to the switchyard and loss of power transmission capability.

CUH101PD - 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

10032903 - O'Shaughnessy Dam Outlet Works Phase 1

O'Shaughnessy Dam (OSD) was completed in 1923 and raised in 1938. Condition assessment of the dam outlet works revealed deficiencies. This rehabilitation project addresses deficiencies of the existing outlet works system at OSD, including the drum gates and release system through OSD to Canyon Tunnel and the Tuolumne River. A recent condition assessment identified deficiencies in the OSD release system. Seven projects were identified

and have been prioritized. Phase 1 will include three of these projects: drum gate rehabilitation (upgrading the hinges and rivets, recoating the gate and existing seals, and repairing the spillway concrete), installation of a new bulkhead system, and rehabilitation of slide gates & installation of a diversion pipe butterfly valve.

CUH10214 - Moccasin Facilities New Construction

The existing HHWP shops and buildings are original and vary in age from between 45 to 80 years old. Some maintenance crews are currently working in buildings that were not originally intended to be used as shops. Many of these facilities do not meet current codes, require extensive repairs, and are not efficient work environments. The primary objective of this project is to build a 10,000-square-foot, combined-function building consisting of a plumbing shop, vegetation management shop, right-of-way shop, electric technician chop, lockers, shower facilities, break room, and new materials bins.

CUH10215 - 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.

CUH10216 - Cherry Dam Outlet Works Rehabilitation

The outlet facilities for Cherry Dam have reached the end of their service life at nearly 60 years old. The stream release assets must work sufficiently well to meet U.S. Department of

Interior's stream flow requirements, and these requirements cannot currently be met at low lake elevations. The 66" valves will be replaced in order to safely operate the dam during storm conditions with heavy inflows to Cherry Lake. The valves are critical for maintaining maximum carryover storage and meeting the SFPUC's water supply objectives. The scope of work includes replacement of the stream release valves and associated piping as well as the Low Level Outlet (LLO) 66" hollow jet valves. The project also replaced both butterfly valves that serve as isolation valves upstream of the hollow jet valves as change orders during construction.

CUH10220 - Mountain Tunnel Inspection & Repairs (Completed)

The objective of this project is to assess the current condition of the Mountain Tunnel and complete any urgent interim repairs to reduce the risk of tunnel lining failure until the completion of the long-term Mountain Tunnel Improvements project in 2026. The project consists of:

- A tunnel inspection in 2017 to update the Condition Assessment conducted in 2008; and
- Short term repairs in 2017 and 2018-19 to reduce the risk of failures in the concrete lining.

CUH10221 - 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:

- Initial evaluation of alternatives for the Mountain Tunnel facility, and
- Eventual design and construction of the preferred engineering alternative that will keep this vital component of the Hetch Hetchy

Water and Power System in reliable service for years to come.

The 2016 scope consisted of just the Planning Phase for the project. The primary focus was on the development of viable alternatives for the project including:

- Rehabilitation of the existing tunnel,
- Relining the existing tunnel,
- Construction of a new bypass tunnel within the tunnel right-of-way, and
- Construction of a new bypass tunnel outside the tunnel right-of-way.

In 2017, the existing tunnel was shut down for 60 days and a detail inspection was performed. The inspection and subsequent condition assessment found many defects in the tunnel lining. However, all the defects were repairable, and the tunnel was still structurally sound. This substantiated the viability of the rehabilitation alternative with downstream valve control, and the City adopted this as the preferred project for design and construction in July 2017. The rehabilitation option met almost all of the project performance standards with the least cost. The project consists of:

- Repairs of all significant concrete lining defect with wire mesh reinforcement and shotcrete,
- Contact grouting of the entire lining to further reinforce and seal the lining to the surround rock,
- A new downstream flow control facility at Priest Reservoir with valving to meter flows and keep the tunnel running full during all operations and mitigate future erosion of the lining,
- A new tunnel adit at Priest Reservoir to allow maintenance access to Mountain Tunnel without having to drain the reservoir in order to expose the current access portal,
- An extension of the South Fork Siphon crossing under the Tuolumne River to bypass a problematic section of the tunnel that infiltrates excessive groundwater into the tunnel, and causes adverse water quality issues,

Appendices

- An enlarged concrete portal at Early Intake to accommodate maintenance equipment access at the upstream section of the tunnel,
- Access road widening and improvements to accommodate safer maintenance access to Adit 5/6 and Adit 8/9, and
- Temporary construction staging areas, environmental mitigations, and site restoration improvements.

CUH10223 - OSH Dam Access and Drainage Improvements

The key objective of this project is to provide safe access for Hetch Hetchy Water and Power operators inside the O'Shaughnessy Dam by improving fall protection, access, and drainage. The key elements include:

- Replace Access Structures in Ladder Wells. The existing access structures in the four (4) vertical ladder wells (shafts) include vertical ladders and horizontal grating platforms that are spaced throughout the ladder wells.
- Install Fall Protection Systems. Install new Occupational Safety and Health Administration (OSHA) compliant ladders and landings with safety cage and/or install fall restraint systems.
- Seal or Mitigate Existing Leakage. Address flowing water by sealing leaks or otherwise diverting, collecting and disposing of flows.
- Drainage Improvements. Clear the drains in the dam so that water can drain as designed and/or install sump pumps, if appropriate.
- Replace Watertight Door between Ladder Wells 3 & 4. This scope item includes replacing the existing watertight door between Ladder Wells 3 & 4.

10035086 - Bridge Replacement (4 Bridges)

HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessment has identified the need for rehabilitation and/or replacement (both due to age and to meet current seismic design criteria). Four of the fourteen bridges require substantial

modification or replacement and have been combined into this project. This project includes rehabilitation and/or replacement of Cherry Lake Road Bridge (public access), Early Intake Bridge (public access), and O'Shaughnessy Adit Access Bridge.

CUH102PD - 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.

2018 MOCCASIN STORM EVENT**10033233 - 2018 March Storm Event
Emergency Repairs and Interim
Improvements**

On March 22, 2018, a storm event caused widespread damage to Tuolumne County. Hetch Hetchy Water and Power (HHWP) sustained considerable damage to assets associated with water supply, drainage, and power generation, including Moccasin Lower Dam and auxiliary spillway, Moccasin Upper Diversion Dam, Moccasin Reservoir, Priest Reservoir, Moccasin Powerhouse, and Moccasin Lowhead Powerhouse. On March 29, 2018, the Mayor of SF, Mark E Farrell officially declared the storm damage a Local Emergency Event. This project addresses the emergency repairs and interim improvements to the water-related assets located in Moccasin. Various contracts will be utilized to complete construction activities associated with: debris removal from the Moccasin Upper Diversion Dam and Moccasin Reservoir; repairs to the Moccasin Upper Diversion Dam; repairs to the Moccasin Lower Dam; replacement of the Leithold Line water distribution line; replacement of drainage systems (culverts and piping); access improvements to the Gate 3 structure located in the Moccasin Reservoir; installation of debris barriers upstream of the Moccasin Upper Diversion Dam and within the Moccasin Reservoir; and installation of a flood control berm downstream of the Moccasin Lower Dam.

A1-B HETCHY RENEWAL AND REPLACEMENT PROGRAM

WATER INFRASTRUCTURE

CUH10001 - SJPL Rehabilitation

The San Joaquin Pipelines (SJPLs) convey water from Foothill Tunnel to Coast Range Tunnel. The asset varies in age from 5 to almost 80 years old. Hetch Hetchy Water and Power (HHWP) have developed an annual program to inspect, monitor and manage the SJPLs and extend the life of the asset prior to replacement.

CUH10005 - Priest Pipe Recoating (Completed)

The coating on a 24" pipe located in a tunnel at Priest Reservoir has failed. The project scope will be to recoat the pipe.

POWER INFRASTRUCTURE

CUH10103 - Powerhouse Control Upgrade (Completed)

This project will upgrade the powerhouse protection, control, indication, and monitoring system. The electromechanical relays will be replaced with multifunction digital relays to improve reliability and functionality of the electrical protection system. The scope of work includes de-terminating the wiring, removing relays from the main control board, and installing new relays and internal wiring. Digital relays have diagnostics that will notify or alarm the operator if there is relay trouble, thus preventing potential consequential failures, damage, and electrical safety hazards. The existing electromechanical type relays do not have diagnostic capability and present a higher overall risk of failure. If an electromechanical relay does fail, there is a loss of protection on the electric system that could prevent generation. Furthermore, the digital type requires less maintenance at once every five years instead of annually as required for

the electromechanical type under regulatory requirement PRC-005.

CUH10108 - Step-Up Transformers (Completed)

These projects include replacing step-up transformers at Kirkwood and Cherry Ridge Line.

CUH10109 - Moccasin Low Head Rehabilitation Project (Completed)

This project is for the rehabilitation of the Moccasin Low Head Powerhouse, which includes the following components: Replace Roof - Repair or replacement of the aging powerhouse roof. Oil Spill Containment / Prevention - Provision on an oil separation system or other modification should be installed inside the powerhouse to prevent contamination. Upgrade Excitation System - Replacing the existing excitation system with a modern digital excitation system to improve unit availability. A reliable, functioning excitation system is required for unit generation. Upgrade Electrical Protective System - Replace the single function, solid state relays with multifunctional digital relays to improve reliability and functionality of the electrical protection system. The scope includes de-terminating the wiring, removing relays from the main control board, and installing new relays and internal wiring. Upgrade Unit Control System - this project upgrades the unit control system and re-locates the control panel to improve safety conditions for operations personnel. Governor Upgrades - this project provides for the upgrade of the mechanical governor to digital governor. This project is required so we can backfeed from the low head for the Moccasin Compound while upgrades are performed at Moccasin Switchyard.

CUH10110 - Early Intake Switchyard (Completed)

This project is for the rehabilitation of the Early

Intake Switchyard, which includes the following work: replace existing oil circuit breakers (OCBs) with new gas powered circuit breakers on Kirkwood and Holm section of 230kv bus; install gas powered circuit breakers and related components including bus conductors, structural steel, control cables, and galvanized rigid steel conduits. Install City furnished capacitive voltage transformer (CVTs) and surge arresters. Replace main bus-side and line-side disconnects bay 1 through 7, replace Aux bus disconnects bays 1 through 7, replace main bus-side breaker and aux bus disconnect within bay 0. Replace cap and pin insulator stacks with equivalent replacement post insulators within the main and aux buses, including underhung T-drop bus supports. Replace insulators associated with main bus sectionalizing switch. Removal of wave trap remnants, install new support structures. Remove and dispose of existing above grade oil transfer piping system. Connect into new programmable logic controllers (PLC) system. Install a Shoe-fly-bypass using a job order contract (JOC) contractor.

CUH10111 - Moccasin GSU Transformers & Oil Containment (Completed)

This project will provide replacement for two Generator Step Up transformers. The project scope also includes the concurrent design of oil containment of the specified transformers. The assessment will provide a cost estimate to develop the scope and specification criteria to be provided to a consultant engineer to develop construction drawings and specifications.

CUH10112 - Kirkwood Powerhouse Refurbishment & TSOV (Completed)

This project will provide funding for the rehabilitation of Kirkwood Powerhouse to increase life expectancy of the asset as well as improve safety by replacement of the two turbine shutoff valves (TSOVs). The scope of

work for the proposed project includes the following:

- Remove and replace TSOVs for Unit 1 and Unit 2 at Kirkwood Powerhouse.
- Replace the 480V breakers, complete switchgear lineup, Motor Control Centers (MCCs) and panel board with provision for an additional.
- Refurbish / replace various auxiliary systems including: cooling generators, exciters, turbines, transformers, building mechanical equipment, and building structure.
- Add Partial Discharge Analysis Instrumentation to Generator Unit 3 which includes monitoring the Unit 3 generator stator winding insulation and generator with a partial discharge analysis (PDA) instrument.
- Upgrade Vibrator Monitor System including removing the existing system, installing three independent systems with associated sensors and cabling, and incorporating systems into unit controls.

CUH10117 - Transmission Clearance

Moccasin Powerhouse Generators No. 1 and No. 2 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 the Generator No.1 and/or No. 2 stator cores and coils to uprate from 57.5 (MVA) to new rating of 61 MVA. The scope of work also include 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 to supply a new rotor rim for each generator following inspection and testing.

CUH10121 - MPH Bypass Valves

Following the 2013 Rim-Fire, the City was invited to apply for a FEMA Hazard Mitigation Grant. A grant application was prepared and submitted in 2014 to provide

mitigation measures for the potential hazards posed by the steep mountainside situated southeast of the Early Intake Switchyard (ISY). In the past there have been damage and shutdowns of the switchyard due to mudflows, rock falls, and landslides. The Rim Fire burned vegetation from much of the slope, thereby increasing the likelihood of future damage.

JOINT INFRASTRUCTURE

CUH10203 - Reservoirs and Dams

This project includes a condition assessment on all reservoirs and dams as well as more immediate projects to address safety or environmental concerns. The project includes a condition assessment of all storage and regulating reservoirs (six total) to identify work to be performed. Work is being prioritized and included in the Hetch Hetchy 10-Yr CIP Plan.

CUH10205 - Small Water Systems Upgrades (Completed)

Upgrade small water systems at Moccasin Compound, O'Shaughnessy and Early Intake in order to meet state regulatory compliance requirements. HHWP must upgrade their small water systems with ultraviolet (UV) treatment equipment.

CUH10207 - Existing Hetchy Facilities (Outside Moccasin) (Completed)

This project will fund the rehabilitation of all HHWP facilities outside of Moccasin (approximately 80 facilities). Within the work included are: Maintenance - Painting, Roof Replacement, Gutters, Dry Rot, Foundations and Drainage upgrades. Hazardous Material Abatement - Lead and asbestos removal. Building and Electrical Code Violations, Water Distribution System, Waste Water and or Septic Tanks and Energy Efficient Projects. The scope of work on the Industrial Buildings will consist of repairs to the Arc Flash deficiencies

and provide Emergency Power for the Support Facilities.

CUH10208 - Remote Terminal Unit Replacement (Completed)

The project includes removing the unit annunciator remote terminal unit and installing a Modicom I/O rack, wiring signals to new I/O, and migrating signals through the new programmable logic controllers for access by the new supervisory control and data acquisition system. This project is an upgrade to the existing system and will improve reporting and operations. This project is part of an ongoing HHWP program to upgrade the SCADA and unit controls for both the water and power systems.

CUH10209 - Road Improvements

This project includes maintaining almost 50 miles of paved roads and rehabilitation of eleven bridges. Preliminary findings in the condition assessment indicate that some of the bridges will require replacement and/or retrofit. Also, signage, reflectors, guardrails, slope stabilization, and selective road widening will be required to enhance the safety of road users.

CUH10210 - Hetchy Fiber Projects (Completed)

This project will install fiber between Modesto and Moccasin Peak on lines 5/6 and lines 7/8, as well as replace the fiber system within the Moccasin compound. Fiber will become the primary means of communication, with our existing licensed microwave functioning as the redundant system. Communication channels will include the business network, control network, security network, protection network, and voice over internet protocol (VoIP) network. The upgraded system will not only meet regulatory requirements but provide a more secure, reliable communication and power protection system. By 2022, the fiber electronic hardware will have reached the end

of its technical life expectancy and will require upgrades.

CUH10211 - Facilities Security Project

HHWP is updating security fences and installing card access at remote locations. HHWP is also evaluating new security requirements that are now required to meet North American Electric Reliability Corporation (NERC) regulatory requirements. HHWP only has door alarms at many remote sites. Increased security is required including fencing, card access and camera monitoring to minimize the risk of intrusion at these facilities. In addition, HHWP has to address regulatory security requirements.

CUH10212 - Moccasin Penstock

Moccasin Penstock was built in the early 1920s and conveys the SFPUC water supply from Moccasin Tunnel to Moccasin Powerhouse. HHWP is currently in the process of performing a penstock condition assessment. The penstock includes about four miles of hammer-forged welded steel penstock and may be subject to failure. In addition, issues have been identified regarding the anchor/saddle system. The short-term program includes completing the condition assessment, performing repairs at locations with significant corrosion, and addressing concerns with the anchor/saddle system. In 2015, coating and lining issues will be addressed on the non-hammer-forged welded sections. The long-term project is to replace the hammer-forged welded section if this is the most cost-effective alternative identified during the condition assessment.

CUH10213 - Communication System Upgrade

The project will provide funding for replacement and expansion of the HHWP two-way radio system resulting in better coverage in the up-country river canyons as well as inter-divisional communication with other water enterprise operating divisions in

the Bay Area. In addition, the project will extend 6GHz microwave communication to remote locations such as O'Shaughnessy and Cherry Valley Dams and Cherry Pump Station, allowing for remote monitoring and control of assets, enhanced security capabilities as well as business network connectivity at those sites. Lastly, this project will complete redundant paths of communication for control network systems between critical facilities such as HPH, KPH, and ISY using both microwave and fiber technology for those short hops.

A2 SAN FRANCISCO POWER ENTERPRISE GENERATION

CUH94763 - Go Solar SF Program

GoSolarSF is an incentive program to encourage San Francisco residents to install solar power systems by offering one-time incentive payments to reduce the costs to the homeowners. The program launched in 2008 and provides between \$2 and \$5 Million per year in incentives. This program does not result in construction or capital projects that the City owns and operates. The City simply pays incentives to residents for projects that the resident contracts for and may own or lease from a solar contractor.

CUH99302 - Alvarado Elementary School -- Solar Electric (Completed)

The project scope consists of the design and the installation of a 50kW solar electric system on top of the Alvarado Elementary School. The Design Phase includes DC/AC electrical and structural design for the photovoltaic (PV) stationary rack mounted array and equipment pad area. The Construction Phase includes installation of approximately 250 solar modules and installation of inverters and supporting electrical equipment with interconnection onto the PG&E distribution system. There are no advertisement dates or bid/award dates (not applicable) since this project will be designed by the SFPUC and constructed by DPW.

CUH99307 - North Beach Library Solar - Renewable/Generation - Small Renewables (Completed)

The project scope consists of the design and the installation of a 10.0kW solar electric system on top of the newly constructed North Beach Library. The Design Phase includes DC/AC electrical and structural design for a photovoltaic (PV) stationary rack mounted array and equipment area. The Construction

Phase includes installation of approximately 35 solar modules and installation of an inverter and supporting electrical equipment with interconnection onto the PG&E distribution system.

CUH99308 - SF Academy Solar Carport

The project consists of the design and installation of carports mounted with a solar electric system in the existing carpark located at the San Francisco Police Academy, 350 Amber Drive, in the Diamond Heights Neighborhood. The design phase includes electrical and structural design for the carport structure and integrated photovoltaic (PV) array. The Construction Phase will include the installation of the carports and mounting of a grid-connected PV system of approximately 220kW in size. Once completed, the PV system will be interconnected to the PG&E electrical distribution system and supply the building load.

CUH99309 - Marina Middle School Solar

The project scope consists of the design and the installation of a rooftop solar electric system at Marina Middle School. The design phase includes DC/AC electrical and structural design for a photovoltaic (PV) rack mounted array and related electrical equipment. The Construction Phase will include the installation of a grid connected PV system. Once completed, the PV system will be interconnected to the PG&E electrical distribution system.

EFFICIENCY

CUH983 - Civic Center Sustainable District Program

The Civic Center Sustainable District Program involves retrofitting City buildings and facilities in the Civic Center to create a substantial reduction in building carbon footprint, electricity, natural gas, and operating costs, while improving operations and

occupant comfort. Buildings and facilities included in this program are: City Hall, Asian Art Museum, Main Library, Department of Public Health, Civic Center Garage, Brooks Hall, UN Plaza, San Francisco War Memorial: Davies Symphony Hall, Veterans Building, and Opera House.

CUH986 - Energy Efficiency - General Fund Program

This project funds the planning, design and construction of Energy Efficiency (EE) projects at General Fund facilities. Energy retrofits include lighting, heating and ventilation, energy management systems, and demand response projects. These EE projects provide reductions in greenhouse gas emissions, upgrades to these public facilities, and result in long-term utility cost savings for the General Fund. The FY15 funds the staff and consultants to implement projects from previous fiscal years, along with limited other project technical and implementation expenses for new EE projects. FY16 and later fiscal year budgets will primarily fund staff expenses and will focus on project planning and development (for non-PUC funding sources), support for departments which have project funds available, and lower-cost EE projects and services (e.g. building retro-commissioning). Budgets also support staff and consultants related to the Benchmarking and Auditing Ordinance.

CUH995 - Energy Efficiency - Enterprise Fund Program

This project funds planning and operating energy efficiency services for new residential and other customers (e.g., at Hunter's Point Shipyard and Treasure Island), Enterprise Departments, and direct-paying customers of the Power Enterprise. Municipal customers served by this capital fund include the Port and Port Tenants, San Francisco Airport, SFPUC, MUNI, Convention Facilities, City College and, San Francisco Unified School

District (SFUSD). There are multiple sub-projects under this program. Milestones for individual sub-projects are not shown.

STREET LIGHTS

CUH896 - Streetlight Replacement

The SFPUC maintains approximately 25,500 street lights in the City of San Francisco. This Program funds various street lighting programs; street light engineering and capital support services; electric vehicle charger installations; community benefits capital projects; small and large street lighting capital projects; and street lighting Repair and Replacement (R&R) projects. The overall program provides funding for multiple projects over multiple years with varying start and ending dates.

CUH91503 - San Bruno Street Light Improvement Project (Completed)

San Bruno Street Light (SL) Improvement Project will upgrade the streetlights at San Bruno Ave. between Silver Ave. and Wilde Ave. Approximately 51 Light-emitting diode (LED) fixtures, 68-Lumec Optima Post-top light poles with High Pressure Sodium Vapor (HPSV) luminaires, will be replaced with LED luminaires. The proposed new poles will match the existing 16 foot poles with post top fixtures. The majority of the scope of work includes LED swapping of HPS luminaires, sidewalk removal, trenching, foundation and electrical conduit work, installation of light poles and fixtures, and more than 37 Pacific Gas and Electric Company (PG&E) power connections. Several Department of Public Works (DPW) banner poles would be utilized as streetlights.

RETAIL SERVICES

CUH870 - Distribution Services Retail Customers

A program to develop SFPUC-owned electrical

transmission and distribution facilities along the Bayside of San Francisco has been initiated. The long term geographical area of interest stretches from City of Brisbane boundary in the South, to China Basin in the North. System planning studies are currently being conducted by PG&E. The objective is to have a transmission agreement with PG&E to receive transmission level voltage from PG&E Potrero substation at 115kV or 230kV, transform this high voltage to 34.5 kV, and then distribute this lower voltage to SFPUC Power Enterprise electrical customers. A pool of 4 qualified contractors has been selected for distribution work. A Request for Bids (RFB) (DB-128R) will be issued to these qualified bidders February 2017, with a planned contract award date at end of March 2017. The scope of Phase One of the program (DB-128R plus other supplementary contracts) encompasses ductbanks, conduits, cables, electrical equipment and vaults underground from 23rd Street along Illinois to 16th St, and then Terry Francois Boulevard to South Street. The Phase One work is planned to be completed by end of December 2018. Contract arrangements, and design and construction of the SFPUC substation will proceed in parallel with the Phase One distribution project. The balance of the Bay Corridor Transmission Distribution project will be built in subsequent stages.

CUH891 - Metering and Load Monitoring

The purpose of this project is to install metering and communication infrastructure to cost effectively collect reliable meter data from existing and future PUC customers in geographically dispersed areas. Replacement of outdated EMON meters at Moscone Center, Pier 80 and other locations are within the scope of this project. Based upon the evaluation performed by CUH972, the following procurements may be pursued by the Power Enterprise: (1) procurement of an AMI system for meter data communication as part of CUH891, (2) replacement of all or a portion of

the 2000-Pacific Gas & Electric Company (PG&E) meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, or (3) purchase of PG&E owned meters from PG&E.

CUH973 - Distribution System Assessment (Completed)

This project will fund a feasibility study to assess the general condition of Pacific Gas and Electric Company's (PG&E) electric distribution system within the boundaries of the City and County of San Francisco. In particular, this will include an assessment of the general condition (age, condition, and technology) of the facilities (including overhead/underground wires, poles, substations, transformers, and meters) and an assessment of the connection of the distribution system to the existing grid. This feasibility study is the first phase toward evaluating the costs and benefits of either purchasing PG&E's distribution system or constructing a City-owned distribution system. The specific focus of this study will be to assess the feasibility of installing intervening facilities and distribution in order to aggregate current load served under the PG&E Interconnection Agreement (IA), additional load on City-owned property (such as the Port), and redevelopment load (such as the Transbay Terminal) under new Wholesale Distribution Tariff Agreements after the IA expires. Total Estimated Cost: \$1,000,000. This project is a study with no physical construction envisioned.

TRANSMISSION - DISTRIBUTION SYSTEM

CUH972 - Load Meter Project

The purpose of this project is to identify and then implement the most cost effective method to collect reliable meter data from existing and future SFPUC Power customers in geographically dispersed areas. The project

will evaluate the feasibility of implementing an Advanced Metering Infrastructure (AMI) System with the intent to identify a meter data acquisition strategy that is technically and financially in the best interest of the PUC. Based upon this evaluation, the Power Enterprise may opt to procure an AMI system. The feasibility study will entail a needs assessment to determine the SFPUC operational requirements, followed by an evaluation of contractual and regulatory factors, meter and wireless communication systems capabilities, equipment and software cost, and the feasibility of using PG&E's existing AMI infrastructure to gather municipal meter data. In tandem, a meter inventory will be performed. Alternatives will be developed, including among others (1) replacing all or a portion of the 2000-Pacific Gas & Electric Company (PG&E) meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, and (2) the Power Enterprise purchasing these meters from PG&E. A cost benefit analysis will be performed on each alternative to determine the preferred strategy. The remote meter data acquisition strategy that provides the greatest value for SFPUC customers will be identified, followed by system procurement and implementation.

CUH985 - Transbay Transit Center

The City and County of San Francisco ("the City"), through its Public Utilities Commission (SFPUC), will provide construction and permanent electric services to the new Transbay Transit Center, including adjacent bus ramps, and the new bus storage facility at Stillman Street, in San Francisco, California. The SFPUC, in agreement with the Transbay Joint Powers Authority (TJPA), will provide electric service to the Transit Center by installing two 12-kilovolt (kV) electric circuits, 12-kV switchgears, transformers, and other electrical equipment.

10033821 - Intervening Facilities

Under the Wholesale Distribution Tariff (WDT), electric service requires intervening facilities between PG&E's service points and SFPUC end-use customers. The installations of intervening facilities are needed for the upgrade of new electric service, conversion of service from secondary to primary service level, and aggregation of electric service to common points of service interconnection where feasible. The electric service improvements cover the installation of service cables, medium voltage switchgears, transformers, switches, service equipment and distribution infrastructures to be owned and maintained by the SFPUC Power Enterprise.

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APPENDIX C. LIST OF ACRONYMS

AC	Alternating Current	NERC	North American Electric Reliability Corporation
AMI	Advanced Metering Infrastructure	NHPA	National Historic Preservation Act
BCTD	Bay Corridor Transmission Distribution	NPS	National Park Service
CATEX	Categorical Exemption	NTP	Notice to Proceed
CCSF	City and County of San Francisco	O&M	Operations and Maintenance
CEQA	California Environmental Quality Act	OCA	Office of Contract Administration
CER	Conceptual Engineering Report	OCB	Oil Circuit Breakers
CIP	Capital Improvement Program	OSD	O'Shaughnessy Dam
CM	Construction Management	OSHA	Occupational Safety and Health Administration
COVID-19	Coronavirus Disease of 2019	PD	Project Development
CVT	Capacitor Voltage Transformers	PG&E	Pacific Gas and Electric Company
DB	Design, Build	PLC	Programmable Logic Controllers
DC	Direct Current	PUC	Public Utilities Commission
DC/AC	Direct Current/Alternating Current	PV	Photovoltaic
DCU	Data Collection Unit	R&R	Renewal and Replacement
DPH	Department of Public Health	RFP	Request for Proposal
DPW	Department of Public Works	ROW	Right-of-Way
EE	Energy Efficiency	RTU	Remote Terminal Unit
FEMA	Federal Emergency Management Agency	SCADA	Supervisory Control and Data Acquisition
FY	Fiscal Year	SF	San Francisco
Ghz	Gigahertz	SFO	San Francisco Airport
GSU	Generator Step-Up	SFPUC	San Francisco Public Utilities Commission
GWH	Gigawatt Hours	SFUSD	San Francisco Unified School District
HCIP	Hetchy Capital Improvement Projects	SJPL	San Joaquin Pipeline
HH	Hetch Hetchy	SJVH	San Joaquin Valvehouse
HHWP	Hetch Hetchy Water and Power	TBD	To be determined
HMGP	Hazard Mitigation Grant Program	TI/YBI	Treasure Island/Yerba Buena Island
HPH	Holm Powerhouse	TJPA	Transbay Joint Powers Authority
HVAC	Heating, Ventilation, and Air Conditioning	TTC	Transbay Transit Center
IA	Interconnection Agreement	TTF	Tesla Treatment Facility
ISY	Intake Swithyard	TUV	Tesla Ultra Violet
JOC	Job Order Contract	USFS	United States Forest Service
KPH	Kirkwood Powerhouse	USGBC	United States Green Building Council
kV	kiloVolt	VoIP	Voice Over Internet Protocol
kW	kilowatt	WDT	Wholesale Distribution Tariff
LCA	Lower Cherry Aqueduct	WSIP	Water System Improvement Program
LED	Light Emitting Diodes		
LEED	Leadership in Energy and Environmental Design		
LLO	Low Level Outlet		
MOU	Memorandum of Understanding		
MPH	Moccasin Powerhouse		
MUNI	Municipal Railway		
MW	Megawatt		



DATE: May 17, 2021

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

FROM: Michael Carlin, Acting General Manager



RE: Hetch Hetchy Capital Improvement Programs Quarterly Report
 3rd Quarter / Fiscal Year 2020-2021

Enclosed please find the Hetch Hetchy Capital Improvement Programs Quarterly Report for the 3rd Quarter (Q3) of Fiscal Year (FY) 2020-2021. 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 January 1, 2021 to March 31, 2021.

This quarterly report incorporates the Hetch Hetchy Capital Improvement Programs 2018 Baseline that was approved by the San Francisco Public Utilities Commission (SFPUC) on December 11, 2018. The scopes, schedules, and budgets are included for individual projects over \$5M that are currently active or planned to be active within FY19/20 or FY20/21 and are part of the Hetchy Capital Improvement Projects (HCIP), a sub-set of projects within the adopted SFPUC Ten-Year Capital Plan for FY18/19 through FY27/28 for the Hetch Hetchy Water and Power (HHWP) Division of the Water Enterprise.

This report also includes a status summary of the Hetch Hetchy Renewal and Replacement (R&R) programs, including Water, Power, and Joint assets. The progress of these R&R programs is measured and reported upon based on the status of planned milestones at the end of the reporting quarter and forecast milestones for the subsequent quarter.

This will be the last quarter to report the Power Section (see Section II entitled San Francisco Power Enterprise Capital Improvement Programs (Power). More

London N. Breed
 Mayor

Sophie Maxwell
 President

Anson Moran
 Vice President

Tim Paulson
 Commissioner

Ed Harrington
 Commissioner

Newsha Ajami
 Commissioner

Michael Carlin
 Acting
 General Manager



information about alternate reporting for status updates on the Power Enterprise-led capital projects will be shared in the future.

The highlights for this reporting period are as follows:

For Contract HH-1000R, Mountain Tunnel Improvement project, the Notice to Proceed for construction was issued on January 29, 2021. The contractor is preparing submittals for approval and has completed construction of environmental fencing and staging areas. Safety improvements for access roadways are under construction. The contractor has mobilized to begin site excavations for the new tunnel portal, tunnel access adit, and flow control facility construction at the Priest Reservoir site next quarter. Forecast construction completion is at the end of 2026.

For Moccasin Penstock Rehabilitation project, Notice to proceed (NTP) was issued for a JOC Contractor to provide field support for the internal inspection. The internal inspection was completed in February 2021. Condition Assessment Report is being developed for distribution in April 2021.

For Design-Build Contract DB-121R2, Moccasin Powerhouse Generator Rehabilitation, one bid was received. Through Commission approval, the Project Team was allowed to negotiate with any qualified bidder. The recommendation for award is anticipated in late April.

For Contract HH-1003R, Moccasin Powerhouse Generator Step-up Transformers Installation, the contract went out to bid in January. Two bids were received. The contract will go the Commission for award in April.

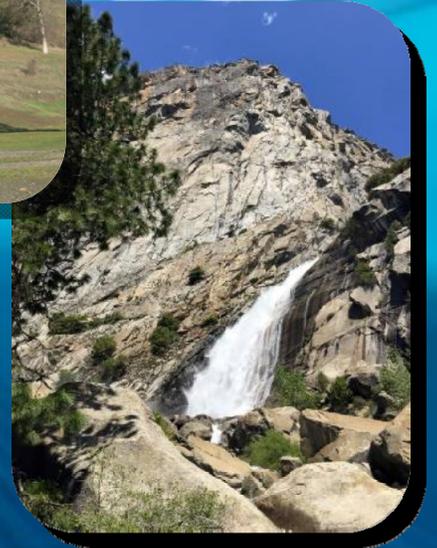
For Contract HH-1002R, O'Shaughnessy Dam Access and Drainage Improvements, the scope of work was reduced and rebid in March. Four bids were received. The qualifications for the apparent low bidder are being reviewed. The contract will go to the Commission for award next quarter.

For Contract HH-1001, Moccasin Reservoir Perimeter Security Fence, construction has completed. The contractor achieved substantial completion on January 19, 2021 and final completion notification was issued on March 17, 2021.

Attachment



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



QUARTERLY REPORT

Hetch Hetchy Capital Improvement Programs
January 2021 – March 2021

Published: May 17, 2021

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Quarterly Report

Hetch Hetchy Capital Improvement Programs

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**I. HETCH HETCHY WATER AND POWER (HHWP)-
WATER DIVISION CAPITAL IMPROVEMENT PROGRAMS**

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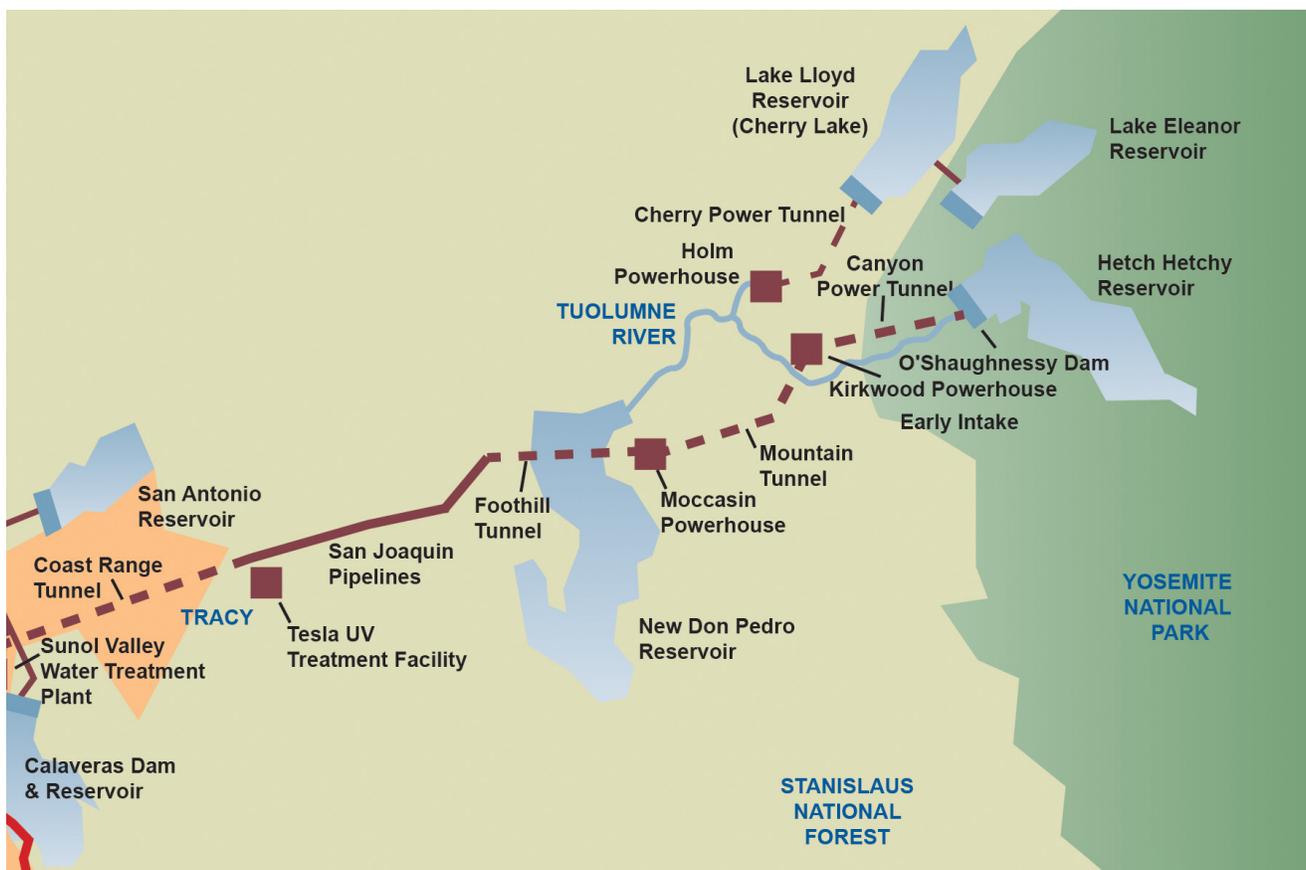
INTRODUCTION

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.

The HHWP Water Division's capital improvement programs are divided into two programs: Hetchy Capital Improvement Projects (HCIP) and Renewal and Replacement (R&R).

A majority of HHWP staff is based in Moccasin, CA, which is 140 miles east of San Francisco. The map below shows the location of the assets and facilities associated with HHWP.



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I.A. 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 program includes only asset improvements benefiting the SFPUC's water customers. The Power program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint program includes projects for assets that are used for both water and power delivery. In addition, projects in each program have been further organized by asset type to align with the Hetch Hetchy 10-Year Capital Improvement Program (CIP) Plan for Fiscal Years (FY) 2019-2028. These sub-programs include the following:

- Buildings - projects to provide safe and code compliant work spaces for HHWP operations and maintenance crews.
- Dams & Reservoirs - projects to improve assets used for storage and delivery of water to SFPUC customers, as well as 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 third (3rd) quarter report for FY2020-2021 presents the progress made on the HCIP between January 1, 2021 and March 31, 2021. The data reported herein as the "approved" project budget and schedule conforms to the annual update of the Hetch Hetchy 10-Year CIP for FY2019-2028, approved by the Water and Power Enterprise Managers and adopted by the Public Utilities Commission on February 13, 2018.

On December 11, 2018, SFPUC approved the Hetch Hetchy Capital Improvement Programs 2018 Proposed Baseline of \$682.93M, a subset of the Hetch Hetchy 10-Year CIP for FY2019-2028. The Approved Baseline included projects over \$5M that were then active or were intended to be active by FY2020. The status of these projects included in the 2018 Approved Baseline are discussed in this quarterly report and can be found in sections I.A.6 and I.A.10.

I.A Hetchy Capital Improvement Projects Quarterly Report

The CUH10215 – Canyon Tunnel Rehabilitation project remains in “On-Hold” status.

Project Development (PD) accounts for program-level expenditures for each of the Water, Power, and Joint Programs were created in the 2018 Approved Baseline to capture overall programmatic costs. The accrued PD expenditures are included in Program Delivery Costs in Table 3.1 in order to give an accurate report of the overall HCIP cost performance.

In addition to the nineteen (19) projects presented in the 2018 Approved Baseline, this quarterly report includes the status of the 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets) project, which is in the closeout phase and is reported on in Section 8 of the report.

On March 22, 2018, HHWP experienced excessive rainfall and subsequent flash flooding with a large volume of debris, consisting of silt, downed trees, and logs. This affected various assets associated with Priest Reservoir, Moccasin Reservoir, and adjacent areas. The project (with funding budgeted at \$17.92M) includes debris removal and emergency repairs at the water-related assets.

The budget baseline for the project is based on initial cost estimates and contract pricing, but has not been formally approved by the Commission. This project has been funded by deferring money from Water projects included in the Hetch Hetchy 10-Year CIP for FY2019-2028. Progress reporting for this project is included in Section I.A.6.

Figure 2.1 shows the total Approved Budget for all twenty (20) projects in each phase of the program as of March 31, 2021 (excluding PD

accounts). The number of projects currently in each phase is shown in parentheses.

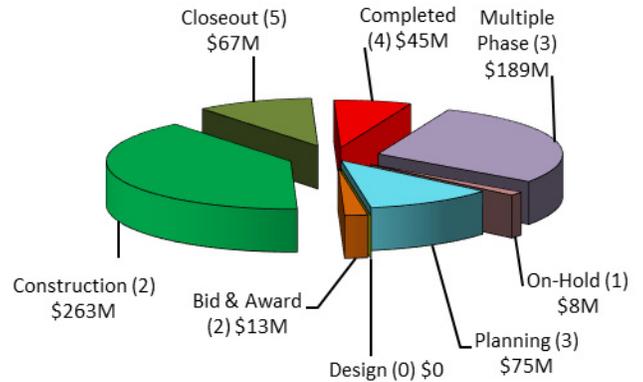


Figure 2.1 Approved Budget for Projects in Each Phase

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

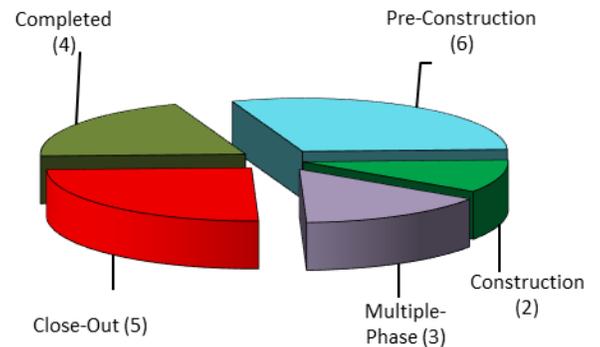


Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-Construction

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

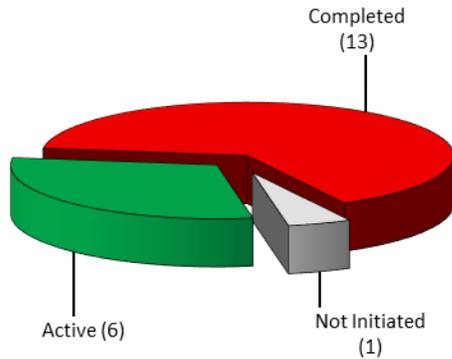


Figure 2.3 Program Environmental Review

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall cost summary of the 20 approved HCIP projects included in this report, as well as PD costs. It shows the Expenditures to Date, Current Approved Budget, Current Forecast Cost, and the Cost Variance between the Approved and Forecast Costs. The Current Approved Budget has been increased by \$17.92M over the 2018 Approved Baseline with the addition of the 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets) project.

The overall program negative Cost Variance of \$34.12M in Table 3.1 can be attributed to the following factors:

- Water Infrastructure - the overall positive Cost Variance of \$5.99M is due to the following project reevaluations:
 - o The CUH10001 SJPL Rehabilitation project has been completed at \$0.75M under budget.
 - o The CUH10003 Lower Cherry Aqueduct Forecasted Costs were reevaluated and reduced by \$6.03M.
 - o The 10035574 SJPL Tesla Valves Replacement Forecasted Costs were

- o decreased by \$3.64M due to a transfer of scope to 10035575.
- o The 10035575 SJPL Valve and Safe Entry Improvements Forecasted Costs were increased by \$3.64M due to a transfer of scope from 10035574.
- o The CUH100PD WATER ONLY/PROJ DEV Forecasted Costs increased by \$0.79M.
- Power Infrastructure - the overall negative Cost Variance of \$36.62M is due to the following project reevaluations:
 - o The CUH10102 Holm and Other Powerhouse Projects' Forecasted Costs were reduced by \$3.67M.
 - o The CUH10113 Kirkwood Penstock achieved Closeout \$1.82M under budget.
 - o The CUH10115 Warnerville Substation Rehabilitation Forecasted Costs were increased by \$9.94M for additional design and construction to complete project work; this work has been funded as part of the approved 10-Year CIP for FY2021-30.
 - o The CUH10116 Moccasin Penstock Rehabilitation Forecasted Costs were increased by \$34.09M, to match the approved 10-Year CIP for FY2021-30.
 - o The CUH10119 Early Intake Switchyard Slope Hazard Mitigation Forecasted Costs were reduced by \$2.91M.
 - o The CUH101PD POWER ONLY/PROJ DEV Forecasted Costs were increased by \$0.99M.
- Joint Infrastructure - the overall positive Cost Variance of \$0.72M is due to the following project reevaluations:
 - o The CUH10214 Moccasin Facilities New Construction achieved Closeout at \$1.33M under budget.

I.A Hetchy Capital Improvement Projects Quarterly Report

- o The CUH10216 Cherry Dam Outlet Works Rehabilitation achieved Closeout \$0.65M under budget.
- o The CUH10220 Mountain Tunnel Inspection & Repairs project was completed at \$2.09M under budget.
- o The 10032903 OSD Outlet Works Phase I Forecasted Costs were increased by \$4.00M to account for initial design and construction estimates being higher than expected.
- o The CUH102PD JOINT/PROJ DEV Forecasted Costs were increased by \$1.23M.
- o 2018 March Storm Event - the negative Cost Variance of \$4.04M is due to increased construction cost for the flood control berm and associated construction management costs.

Table 3.1 Program Cost Summary

Cost Categories	Expenditures To Date (\$ Million) (A)	2018 Approved Budget (\$ Million) (B)	Current Approved Budget (\$ Million) (C)	Q3/FY20-21 Forecasted Costs (\$ Million) (D)	Cost Variance (\$ Million) (E = C - D)
Water Infrastructure	\$26.14	\$137.94	\$137.94	\$131.94	\$5.99
Construction Costs ⁽¹⁾	\$10.43	\$74.87	\$74.87	\$68.44	\$6.43
Program Delivery Costs ⁽²⁾	\$15.39	\$52.40	\$47.75	\$50.97	(\$3.22)
Other Costs ⁽³⁾	\$0.32	\$10.67	\$15.32	\$12.54	\$2.78
Power Infrastructure	\$55.23	\$151.19	\$151.19	\$187.81	(\$36.62)
Construction Costs ⁽¹⁾	\$26.73	\$80.79	\$80.79	\$112.13	(\$31.34)
Program Delivery Costs ⁽²⁾	\$26.83	\$57.73	\$57.76	\$69.79	(\$12.03)
Other Costs ⁽³⁾	\$1.67	\$12.68	\$12.65	\$5.89	\$6.76
Joint Infrastructure	\$84.24	\$393.81	\$393.81	\$393.08	\$0.72
Construction Costs ⁽¹⁾	\$31.54	\$215.69	\$212.69	\$224.13	(\$11.45)
Program Delivery Costs ⁽²⁾	\$52.60	\$156.05	\$159.05	\$145.71	\$13.34
Other Costs ⁽³⁾	\$0.10	\$22.07	\$22.07	\$23.24	(\$1.17)
2018 March Storm Event Emergency Repair and Interim Improvements (Water-Only Assets)	\$21.67	-	\$17.92	\$21.97	(\$4.04)
Overall Program Total	\$187.29	\$682.93	\$700.86	\$734.80	(\$33.94)

Notes:

- 1. Construction Costs** include the Construction Base Bid and owner-provided equipment/material for all projects. Those costs include any construction contingency.
- 2. Delivery Costs** include program management (i.e. Project Development), project management, planning, environmental (CEQA, permitting, construction compliance), design, construction management, and engineering support during construction.
- 3. Other Costs** include environmental mitigation, art enrichment, security improvements, real estate expenses, and director's reserve.

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2018 Approved Schedule and the Current Forecast Schedule for the HCIP. As shown in Table 4.1, the overall HCIP is currently forecast to be completed in May 2037.

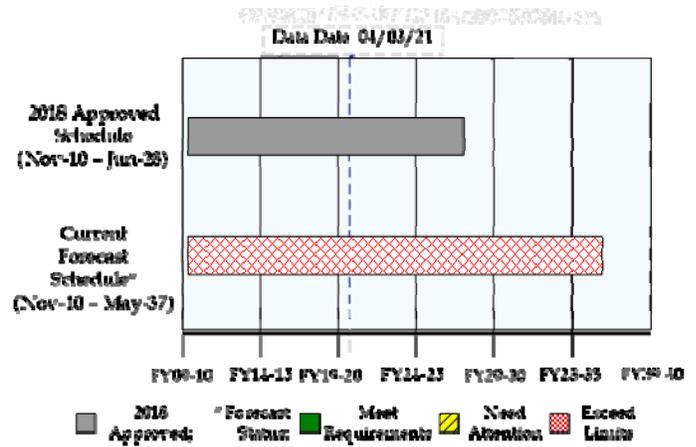


Figure 4.1 Program Schedule Summary

Table 4.1 2018 Approved vs. Current Forecast Schedule Dates

Sub-Program	2018 Approved Project Start	Actual Start	2018 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Water Infrastructure	11/08/10	11/08/10✓	06/30/28	06/30/31	36
Power Infrastructure	05/29/12	05/29/12✓	06/30/28	06/30/31	36
Joint Infrastructure	10/03/11	10/03/11✓	06/30/28	05/25/37	106.9
Overall HCIP Projects	11/08/10	11/08/10✓	06/30/28	05/25/37	106.9

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5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in \$1,000s as of 04/03/21

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Water Conveyance (Water)											
Water Conveyance (Water)											
10035574 - SJPL Tesla Valves Replacement	BA	\$ 7,380	\$ 3,740	\$ 875	\$ 3,640	★	06/28/24	12/30/22	18.0 mo. Early	★	See Section 10
10035575 - SJPL Valve and Safe Entry Improvement	MP	\$ 95,284	\$ 98,924	\$ 1,466	(\$3,640)	⚠	07/01/25	03/13/28	32.4 mo. Late	●	See Section 6
Power Infrastructure											
Water Conveyance (Power)											
CUH10116 - Moccasin Penstock	PL	\$ 13,158	\$ 47,251	\$ 4,715	(\$34,093)	●	12/31/24	02/28/28	37.9 mo. Late	●	See Section 6
Powerhouse											
CUH10102 - Holm and Other Powerhouse Projects	MP	\$ 26,733	\$ 23,061	\$ 19,717	\$ 3,672	★	03/30/20	10/07/21	18.3 mo. Late	●	See Section 6
CUH10114 - Moccasin Powerhouse and GSU Rehabilitation	MP	\$ 66,714	\$ 66,714	\$ 2,835	-	★	06/28/24	04/13/27	33.5 mo. Late	●	See Section 6
Switchyard & Substations (Power)											
CUH10115 - Warnerville Substation Rehabilitation	CN	\$ 24,305	\$ 34,248	\$ 21,166	(\$9,943)	●	03/04/20	11/25/26	80.8 mo. Late	●	See Section 6

* 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		

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Joint Infrastructure											
Dams & Reservoirs (Joint)											
10032903 - O'Shaughnessy Dam Outlet Works Phase I	PL	\$ 17,206	\$ 21,206	\$ 433	(\$4,000)	●	08/25/22	09/25/26	49.1 mo. Late	●	See Section 6
CUH10223 - OSH Dam Access and Drainage Improvements	BA	\$ 5,830	\$ 3,952	\$ 887	\$ 1,878	★	02/26/21	02/28/23	24.1 mo. Late	●	See Section 6
Mountain Tunnel											
CUH10221 - Mountain Tunnel Improvement Project	CN	\$ 238,219	\$ 238,219	\$ 27,333	-	★	12/31/26	06/03/27	5.1 mo. Late	⚠	See Section 6
Roads & Bridges (Joint)											
10035086 - Bridge Replacement (4 - Bridges)	PL	\$ 44,287	\$ 44,287	\$ 323	-	★	12/30/25	05/25/37	136.9 mo. Late	●	See Section 6

* 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		

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROJECTS NOT WITHIN BUDGET AND/OR SCHEDULE

10035575 - SJPL Valve and Safe Entry Improvement

Project Description: The San Joaquin Pipeline (SJPL) Entry Assessment and Valve Improvement Project involves the three parallel transmission pipelines that stretch approximately 48-miles across the San Joaquin Valley from Oakdale Portal to Tesla Portal, with a partial fourth pipeline consisting of a 6.4-mile Eastern Segment and an 11-mile Western Segment. The four pipelines were built between 1932 and 2012, respectively, and range from 56- to 79.5-inches in diameter. As part of the Water System Improvement Program (WSIP), valve vaults were constructed along the SJPL System at various locations to increase operational flexibility and the overall reliability of the SJPL System. Since the commissioning of the valve vaults, Hetch Hetchy Water & Power (HHWP) has expressed concern that 1) valves may not be sufficiently rated and may fail due to a pressure transient surge event using certain operational assumptions 2) there is an inability to establish double isolation and bleed configurations along the SJPL System, resulting in insufficient protection for maintenance personnel, and 3) multiple isolation valves are not adequately rated for hydrostatic head. In order to achieve the safety and access goals, the scope is to: install a surge shaft upstream of Tesla Treatment Facility (TTF) to reduce maximum pressure from unplanned reactor valve closure and upgrade line valves to resist transient pressure from unplanned line valve closure; install new double isolation and bleed valves at all locations where major upgrades and construction are required; and retain single isolation where no upgrades are needed. There are four primary locations where major upgrades and construction are required: Emery, Roselle, Pelican, and Tesla.

Program: Water Conveyance (Water)		Project Status: Multiple Phase		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$95.28 M	Approved Jul-19		Jul-25
Forecast		\$98.92 M	Forecast Jul-19		Mar-28
Actual		\$1.47 M	Project Percent Complete: 15.0%		
					
Key Milestones:	Environmental Approval	Bid* Advertisement	Construction NTP*	Construction* Final Completion	
Current Forecast	10/14/21	(A) 09/16/21 (B) 12/03/21 (C) 12/06/22 (D) 05/20/22	(A) 02/21/22 (B) 05/23/22 (C) 06/19/23 (D) 11/21/22	(A) 06/12/23 (B) 06/07/24 (C) 05/24/27 (D) 06/07/24	

* A) Phase 1A - Pipeline 2 Tesla & Oakdale Entry Improvements, B) Phase 1B - Pipelines 3&4 Tesla & Oakdale Entry Improvements, 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 3 phases: Phase 1 - Tesla and Oakdale Entry Improvements; Phase 2 - Pelican, Roselle, Emery and P4J Entry Improvements and Phase 3 - Tesla Surge Stack. Phase 1 is sub-divided into Phase 1A and 1B based on pipeline location as indicated in the footnote above.

The project team presented the draft conceptual engineering report (CER) to the SFPUC Technical Steering Committee on January 7, 2021 and obtained approval to proceed to the design phase. A design team was formed and started the design for Phase 1 work in this quarter.

Issues and Challenges:

The forecasted cost and schedule are greater than the approved budget and schedule due to updated cost estimate during CER and resequencing of construction contracts. Construction must be coordinated with system shutdowns in Fall/Winter to minimize the impact on water delivery. The construction sequences are being considered to minimize the time of returning the asset to service in case of emergency.

CUH10116 - Moccasin Penstock

Project Description: The Moccasin Penstock conveys San Francisco Public Utilities Commission (SFPUC) water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. 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 back to 1924 and has been in service for more than 90 years. Condition assessments based on external inspection and imaging have identified a number of deficiencies along the original pipe. The 104-inch diameter (narrowing to 98-inch) riveted steel penstocks extend 1,554 feet from the downstream Moccasin Tunnel portal then bifurcate to four 66-inch diameter hammer-forged welded steel conduits extending about 2,384 feet to the lower welded steel pipe. Additionally, in September of 2018 the penstock experienced significant leakage in two separate areas, necessitating emergency repairs. This rehabilitation project is intended to enhance the reliability of the penstock system and will include: repair or replacement of some sections of corroded pipe; repair or replacement of four badly cracked concrete anchors and damaged penstock saddles; installation of new manways and a rollout pipe section to provide better access for inspection and maintenance; and recoating the outside pipe, where needed, to reduce future corrosion. The project scope was expanded to include: 1) The installation of additional penstock pipe between the valve house and the first downstream anchor; 2) The replacement of the butterfly valve pneumatic actuator with an electronic actuator, which will include new controls with SCADA connectivity; and 3) A new backup generator.

Program: Power Infrastructure	Project Status: Planning	Environmental Status: Active
Project Cost:		Project Schedule:
Approved 	\$13.16 M	Approved Feb-16  Dec-24
Forecast 	\$47.25 M	Forecast Feb-16  Feb-28
Actual 	\$4.71 M	Project Percent Complete: 93.1%
		

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:

Notice to proceed (NTP) was issued for a JOC Contractor to provide field support for the internal inspection of the penstock. The internal inspection was completed in February 2021. A Condition Assessment Report is being developed and is anticipated to be distributed for review in April.

Issues and Challenges:

This project will continue, during the planning phase, to use remaining encumbered Power funds. Starting fiscal year 2021-2022, funding will be jointly provided by Water and Power for this project.



Moccasin Penstock – JOC field support for internal inspection

CUH10102 - Holm and Other Powerhouse Projects

Project Description: This project will provide funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under \$1 million regarding power generation renewal and equipment replacement. The upgrade and rehabilitation of Holm Unit 2 includes 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 will be done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project includes upgrades to turbine and generators, and alternating current stations intended to extend the life of the unit by 20 years. Lastly, the project will upgrade the existing oil containment system at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators will be replaced, and other modifications will be made to the powerhouse interiors and to the transformer decks to discourage contaminated discharges into the adjacent streams. A monitoring system will be installed to alert Hetch Hetchy Water & Power (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 & cleanup.

Program: Power Infrastructure	Project Status: Multiple Phase	Environmental Status: Completed
Project Cost:		Project Schedule:
Approved  \$26.73 M	Approved Sep-13  Mar-20	
Forecast  \$23.06 M	Forecast Sep-13  Oct-21	
Actual  \$19.72 M	Project Percent Complete: 98.9%	
		

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	01/17/17✓	04/21/17✓	01/29/18✓	11/29/20✓

Progress and Status:

The breakdown below shows the number of subprojects summarized according to current status and/or active phase during this reporting period. The eleven (11) subprojects are distributed as follows:
Construction: 2 subprojects

J101-02.010 Cherry Valve House - Bypass Fill Valve for Cherry Power Tunnel: The bypass valve was delivered in January. The valve installation by HHWP staff was delayed due to recent February system outage staffing requirements; HHWP plans to install the valve and piping in the next quarter.

J101-02.003 Holm Powerhouse Rehabilitation and Kirkwood Powerhouse Oil Containment Upgrade: The Project Team is working on closeout documents.
Completed: 9 subprojects



Oil Water separator tank removal at Kirkwood Powerhouse

Issues and Challenges:

The variance between the forecasted schedule over the approved schedule is due to the initial delay in issuing NTP, additional delay from COVID-19 work stoppage

required rescheduling work that could only be performed during a shutdown, and scope that will be performed by HHWP crews after the construction contract is complete.

CUH10114 - 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. This is a design-build project and was advertised twice in 2011 and 2013. Bids were unresponsive. The project will also involve 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  Jun-24	
Forecast  \$66.71 M	Forecast Jan-16  Apr-27	
Actual  \$2.83 M	Project Percent Complete: 23.3%	
		

Key Milestones:	Environmental Approval	Bid* Advertisement	Construction NTP*	Construction* Final Completion
Current Forecast	09/28/20✓	(A) 11/20/20✓ (B) 10/30/20✓ (C) 09/06/23	(A) 05/27/21 (B) 06/21/21 (C) 03/05/24	(A) 08/28/23 (B) 12/02/24 (C) 10/13/26

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

Progress and Status:

This project is divided into 3 sub-projects: A) the purchasing and installation of the Moccasin Powerhouse Generator Step-Up Transformers (GSU's); B) the rewind of the Moccasin generators; and C) the overall plant rehabilitation.

Subproject A: HH-1003R Moccasin Powerhouse GSU Installation was advertised in January, bids were opened in February, and the contract will go to the Commission for award in April. The Purchase Order for the GSU's was issued in January. Delivery of the first GSU is anticipated in October/November 2021.

Sub-project B: Contract DB-121R2 Moccasin Powerhouse Generators Rehabilitation: Only one bid was received on February 4 and it was deemed nonresponsive due to inclusion of exceptions to the SFPUC's contract terms and conditions. On February 23 (Resolution No. 21-0029), the Commission authorized the General Manager to negotiate a Design Build Agreement for this project with any qualified contractor. Negotiations are underway, and it is

anticipated that Commission (and Board of Supervisors if needed) approvals will be sought next quarter. The goal is to award the contract by next quarter in order to meet planned shutdown schedules.

Sub-project C: The Project Team conducted condition assessment workshops with HHWP. This information will be used to develop a Needs Assessment Report. A professional services contract for engineering planning and design services is anticipated to be awarded in August 2021.

Issues and Challenges:

Sub-project A: Delays to the procurement process may affect the equipment delivery schedule; the project team will work with the GSU vendor after the PO is issued next quarter to determine if the GSU can still be delivered by October/November 2021; this timing is critical to the HH-1003 GSU installation contract and the fixed Mountain Tunnel outage in December 2021. Sub-project C: The variance in the forecasted completion date from the approved completion date is due to the extended time to procure a professional services contract for planning and design.

CUH10115 - Warnerville Substation Rehabilitation

Project Description: Warnerville Substation facilities and equipment have reached the end of their life expectancy. The facility needs to be upgraded to meet regulatory and safety requirements. This project will address major renewal and replacement of the substation components including grounding, fence, circuit breaker, control room upgrade, electrical equipment, and disconnect switch. This project will also improve grading in the substation.

Program: Power Infrastructure		Project Status: Construction		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$24.31 M	Approved Sep-15		Mar-20
Forecast		\$34.25 M	Forecast Sep-15		Nov-26
Actual		\$21.17 M	Project Percent Complete: 84.9%		
					
Key Milestones:	Environmental Approval	Bid* Advertisement	Construction NTP*	Construction* Final Completion	
Current Forecast	03/31/16✓	(A) 01/24/17✓ (B) 06/12/24	(A) 10/05/17✓ (B) 12/02/24	(A) 07/05/21 (B) 05/25/26	

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

Progress and Status:

DB-127R Warnerville Substation Rehabilitation - Negotiations for settlement with the contractor (who is no longer working) are continuing. A mediation meeting occurred in March.

Oil Circuit Breaker Replacement Contingency Plan - Notice to Proceed for a professional services task order was issued in January to develop a contingency plan in case a breaker fails. The final design will result in a complete, biddable set of specifications, drawings, and calculations. The 100% design is anticipated in early August.

Phase II - Replace 4 Oil Circuit Breakers and Associated Equipment - A Professional Service Contract for planning, design, and construction support for the Phase 2 work is out for bids. Notice to Proceed for this contract is anticipated by August.



Old Oil Circuit Breakers to be Replaced

Issues and Challenges:

HHWP Operations have requested the installation of the four remaining breakers and associated equipment in 2023/2024. This will be challenging because the design contract will not be available until August 2021. The Project Team is looking for ways to reduce the Planning and Design Phases.

10032903 - O'Shaughnessy Dam Outlet Works Phase I

Project Description: O'Shaughnessy Dam (OSD) was completed in 1923 and raised in 1938. Condition assessment of the dam outlet works revealed deficiencies. This rehabilitation project addresses deficiencies of the existing outlet works system at OSD, including the drum gates and release system through OSD to Canyon Tunnel and the Tuolumne River. Seven projects were identified and have been prioritized. Phase 1 will include three of these projects: drum gate rehabilitation (upgrading the hinges and rivets, recoating the gate and existing seals, and repairing the spillway concrete), installation of a new bulkhead system, and rehabilitation of slide gates & installation of a diversion pipe butterfly valve.

Program: Joint Infrastructure	Project Status: Planning	Environmental Status: Active
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Project Cost:		Project Schedule:	
Approved	\$17.21 M	Approved Feb-18	Aug-22
Forecast	\$21.21 M	Forecast Feb-18	Sep-26
Actual	\$0.43 M	Project Percent Complete: 3.5%	
■ Approved; ■ Actual Cost; ■ Forecast Status: ■ Meet Requirements ■ Need Attention ■ Exceed Limits			

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	06/30/23	12/30/22	06/30/23	12/31/25

Progress and Status:

In this quarter, the consultant addressed SFPUC's comments on the conceptual bulkhead system relating to hoisting, sealing, diving, and seating/unseating procedures. The bulkhead conceptual design was fine-tuned to address leakage control and self-positioning issues. The draft Conceptual Engineering Report will be revised next quarter to incorporate these changes. The recent project cost estimate forecasts that the current budget is inadequate for the original scope of work in Phase 1. In consultation with HHWP, the priorities of Phase 1 have been identified as completing planning for the original scope and designing and constructing the bulkheads, slide gates, and access/drainage improvements. The remaining scope, including work on the drum gates and isolation valve, would be deferred to Phase 2. These changes will be reflected in the HCIP 2021 Revised Baseline and the Q4 report.



Bulkhead gate slot at top of dam and setup for underwater camera inspection

Issues and Challenges:

The current planning-level design and construction estimates are higher than budgeted due to the addition of diver inspections and the higher level of detail included in the most recent construction cost estimate. The schedule forecast has been extended to allow time for additional inspections, underwater modification of the existing slots and corroded inlet surfaces, and installation of the bulkheads using divers. In addition, the project team re-evaluated the overall project schedule and sequencing and considered the best

combination of sub-projects and contracts. Based on this analysis, it is forecasted that the construction will be completed under multiple contracts, and the final subproject will be completed in late 2026. This sequencing and the overall project schedule will be updated in the HCIP 2021 Revised Baseline and in the Q4 report.

CUH10223 - OSH Dam Access and Drainage Improvements

Project Description: The key objective of this project is to provide safe access for Hetch Hetchy Water and Power operators inside the O’Shaughnessy Dam by improving fall protection, access, and drainage. The key elements include:

- Replace Access Structures in Ladder Wells. The existing access structures in the four (4) vertical ladder wells (shafts) include vertical ladders and horizontal grating platforms that are spaced throughout the ladder wells.
- Install Fall Protection Systems. Install new Occupational Safety and Health Administration (OSHA)"compliant ladders and landings with safety cage and/or install fall restraint systems.
- Seal or Mitigate Existing Leakage. Address flowing water by sealing leaks or otherwise diverting, collecting and disposing of flows.
- Drainage Improvements. Clear the drains in the dam so that water can drain as designed and/or install sump pumps, if appropriate.
- Replace Watertight Door between Ladder Wells 3 & 4. This scope item includes replacing the existing watertight door between Ladder Wells 3 & 4.

Program: Joint Infrastructure		Project Status: Bid and Award		Environmental Status: Completed (CatEx)	
Project Cost:			Project Schedule:		
Approved		\$5.83 M	Approved Mar-17		Feb-21
Forecast		\$3.95 M	Forecast Mar-17		Feb-23
Actual		\$0.89 M	Project Percent Complete: 26.8%		
					
Key Milestones:	Environmental Approval*	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	07/16/20✓	03/18/21✓	10/01/21	08/29/22	

* The O’Shaughnessy Dam Fall Protection and Spillway Access construction contract [HH-1002] was re-advertised on 3/18/21

Progress and Status:

The scope for Contract HH-1002R was reduced in order to prioritize immediate repairs with the remaining available funds. The anticipated contract has also been renamed O’Shaughnessy Dam Fall Protection and Spillway Access to reflect the narrowed scope. The new scope includes fall protection on exiting ladders and stairs, new spillway access, and control room improvements. The scope that was deleted will be added to the scope under Project 10032903 O’Shaughnessy Dam Outlet Works Phase I. The contract with revised scope was re-advertised in March. Notice to Proceed is scheduled for early October.



Inclined Stairway OSH Dam

Issues and Challenges:

The forecasted cost is less than the approved budget due to the reduced scope of work. The forecasted schedule is longer than the approved schedule due to contracting delays, added complexity of the work, and the need to revised the contract documents and rebid with the reduced scope.

CUH10221 - 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 for design and construction of an engineering alternative that will keep this vital component of the Hetch Hetchy Water and Power System in reliable service for years to come.

Up until 2016, the scope consisted of just the Planning Phase for the project. The primary focus was on the development of viable alternatives for the project including rehabilitation or relining the existing tunnel or construction of a new tunnel.

In 2017, the City adopted the rehabilitation alternative as the preferred project for design and construction. The rehabilitation option met almost all of the project performance standards with the least cost. The project consists of tunnel lining repairs, contact grouting, downstream flow control valving, a new tunnel adit at Priest Reservoir, a South Fork Siphon extension tunnel, access road widening and tunnel access improvements, and environmental mitigations, and site restoration.

Program: Joint Infrastructure		Project Status: Construction		Environmental Status: Completed	
Project Cost:			Project Schedule:		
Approved		\$238.22 M	Approved Oct-11		Dec-26
Forecast		\$238.22 M	Forecast Oct-11		Jun-27
Actual		\$27.33 M	Project Percent Complete: 16.2%		
					
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:

During the quarter, on January 29, the Notice to Proceed for construction was issued to Michels Tunneling for HH-1000R Mountain Tunnel Improvements. The contractor has started providing submittals for approval. The contractor has constructed environmental fencing and staging areas. Safety improvements to access roadways are under construction. The contractor has mobilized to begin site excavations for the new tunnel portal, the tunnel access adit, and the flow control facility at the Priest Reservoir site next quarter. The State Water Resources Control Board is nearing completion of review of the City's application for \$238.2M in low interest loan funding for this project from the State Revolving Fund.



South Fork Access Rd. Surveying Prior to Improvements

Issues and Challenges:

The Schedule Variance between the Current Forecast and Approved schedule is due to delays associated with re-bidding the project and COVID-19 challenges. The delays have been reduced through mitigation efforts, including resequencing of the tunnel shutdowns to minimize schedule impact. The team will evaluate the contractor's schedule for potential adjustments to further mitigate the delay.

10035086 - Bridge Replacement (4 - Bridges)

Project Description: HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessment has identified the need for rehabilitation and/or replacement (both due to age and to meet current seismic design criteria). Four of the fourteen bridges require substantial modification or replacement and have been combined into this project. This project includes rehabilitation and/or replacement of Cherry Lake Road Bridge (public access), Early Intake Bridge (public access), O'Shaughnessy Adit Access Bridge, and Lake Eleanor Dam Bridge.

Program: Roads & Bridges (Joint)	Project Status: Planning	Environmental Status: Not Initiated
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Project Cost:		Project Schedule:	
Approved  \$44.29 M	Approved Jul-19 	Dec-25	
Forecast  \$44.29 M	Forecast Feb-20 	May-37	
Actual \$0.32 M	Project Percent Complete: 10.0%		
 Approved;  Actual Cost; Forecast Status:  Meet Requirements  Need Attention  Exceed Limits			

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	02/27/23	(A) 08/02/23 (B) 07/31/24	(A) 01/31/24 (B) 02/03/25	(A) 03/09/26 (B) 03/09/27

Progress and Status:

This project is in the planning phase. For the O'Shaughnessy Adit Access Bridge, the consultant completed bathymetry near the bridge in this quarter. The topographic survey was delayed due to weather conditions and will continue in the next quarter. Also, the Department of Public Works (DPW) revised its work plan for the planning and design of the bridge improvements to better align with the final Memorandum of Understanding (MOU) which was signed on February 3 between SFPUC and DPW. For Lake Eleanor Dam Bridge, the consultants collected and reviewed the background information as part of the planning efforts. The alternatives analysis for this bridge will commence in Q4.



O'Shaughnessy Adit Access Bridge

Issues and Challenges:

The variance between the approved schedule and forecasted schedule dates is due to the reforecasting for this project based on the funding for two of the bridges being deferred to after the 10-Year CIP (with completion in 2037). Funding for only the two bridges discussed above, the O'Shaughnessy Adit Access Bridge and the Lake Eleanor Dam Bridge, is included in this approved project budget.

7. 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								
CUH101-15.001 Warnerville Switchyard - DB-127R **	10/05/17	07/09/19	07/05/21	\$ 14,591,450	\$ 14,591,450	(727)	-	90.0%

Program Total for On-Going Construction	Approved Contract Cost	Current Forecast Cost*	Variance	
			Cost	Percent
	\$ 14,591,450	\$ 14,591,450	\$-	- %

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.

8. 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*
Water Infrastructure				
Dams & Reservoirs				
10033156 - Moccasin Reservoir Perimeter Security Fence	10/30/20	03/17/21	\$ 3,135,031	\$ 1,620,466
Water Conveyance (Water)				
CUH10003 - Lower Cherry Aqueduct	01/31/20	11/26/19	\$ 11,526,985	\$ 6,425,961
Power Infrastructure				
Water Conveyance (Power)				
CUH10113 - Kirkwood Penstock	12/31/18	02/05/19	\$ 1,893,834	\$ 1,164,263
Joint Infrastructure				
Buildings (Joint)				
CUH10214 - Moccasin Facilities New Construction	06/11/18	06/11/18	\$ 4,775,795	\$ 10,053,964
2018 Moccasin Storm Event				
2018 Moccasin Storm Event				
10033233 - 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets)	11/27/19	04/20/20	\$ 11,454,122	\$ 13,712,568
TOTAL			\$ 32,785,766	\$ 32,977,222

* It should be noted that this report does not include all phase-level expenditures that have been accrued for work completed due to challenges associated with the migration of the City financial system from FAMIS to PeopleSoft.

9. COMPLETED PROJECTS

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Water Infrastructure				
Water Conveyance (Water)				
CUH10001-HCIP - SJPL Rehabilitation	12/31/18	02/28/19	\$ 5,370,000	\$ 4,622,228
Power Infrastructure				
Switchyard & Substations (Power)				
CUH10119 - Early Intake Switchyard Slope Hazard Mitigation	09/30/20	09/30/20	\$ 5,533,855	\$ 2,174,899
Joint Infrastructure				
Dams & Reservoirs (Joint)				
CUH10216 - Cherry Dam Outlet Works Rehabilitation	06/28/19	06/30/20	\$ 10,382,439	\$ 9,512,645
Mountain Tunnel				
CUH10220 - Mountain Tunnel Inspection & Repairs (completed)	12/31/19	12/02/19	\$ 23,500,000	\$ 21,412,754
TOTAL			\$ 44,786,294	\$ 37,722,526

10. PROJECTS WITHIN BUDGET AND SCHEDULE

10035574 - SJPL Tesla Valves Replacement

Project Description: This project intends to replace all the inline valves that are under-rated for pressure, Tesla Ultra Violet (TUV) 101 to 401, with properly rated valves to improve safety and entry into all four (4) San Joaquin Pipelines (SJPL). In addition, all cross-over valves and bypass valves may need to be replaced or made safe. Modification to the pipes, flanges, spool pieces, actuators, and valve controls are needed. The valve vault will need modification to accommodate the new valves. New facilities may need to be constructed if additional new valves are not designed for direct burial.

Program: Water Conveyance (Water)		Project Status: Bid and Award		Environmental Status: Completed	
Project Cost:			Project Schedule:		
Approved		\$7.38 M	Approved Jan-20		Jun-24
Forecast		\$3.74 M	Forecast Jan-20		Dec-22
Actual		\$0.88 M	Project Percent Complete: 19.5%		
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 purchase order for a 66-inch butterfly valve and actuator was advertised on January 29. Five bids were received on February 24, and the Office of Contract Administration issued the award of the purchase order on March 26. The project team has commenced the process of reviewing the cost proposal for a JOC contract for installation of the 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. This change will be included in the proposed 2021 HCIP Revised Baseline.



SJPL#1-4 with isolation valves within Tesla Valvehouse

Issues and Challenges:

The variances between the approved schedule and budget and the forecasted schedule and cost are in anticipation of scope and budget to be transferred to the SJPL Valve and Safe Entry Improvement project.

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I.B. HETCHY RENEWAL AND REPLACEMENT PROGRAM (R&R)



1. PROGRAM DESCRIPTION

The Hetchy Renewal and Replacement (R&R) Program is an ongoing annual program that addresses deficiencies in three areas: Water Infrastructure, Power Infrastructure, and Joint Infrastructure. The Water program includes only asset improvements benefiting the SFPUC's water customers. The Power program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint program includes projects for assets that are used for both water and power delivery. The objective of the R&R Program is to meet level of service goals and objectives, to ensure regulatory permit compliance, to obtain system reliability and functionality, and to continue sustainable operation of the system.

The R&R Program consists of a series of projects specifically developed to address the needs of an aging infrastructure associated with the Hetch Hetchy Water and Power System. The projects are designed to better the system through inspections, assessments, protective and corrective measures, and routine equipment replacement. Due to the nature of these ongoing projects that are funded on an annual basis, progress is measured by achievement of short-term goals. These goals are discussed in further detail in Section I.B.10, and are referred to as Planned Milestones for the Reporting Quarter (goals that are expected to be achieved during the quarter), Status of Planned Milestones for the Reporting Quarter (progress made in achieving these goals), and Planned Milestones for the Subsequent Quarter (goals for the upcoming quarter).

2. PROGRAM STATUS

This Quarterly Report presents the progress made on the R&R projects between January 1, 2021 and March 31, 2021. The data reported herein as the "approved" project budget and schedule conforms to the most recent annual update of the Hetch Hetchy 10-Year CIP for FY2019-2028, which was approved by the Water

and Power Enterprise Managers and adopted by the Public Utilities Commission on February 13, 2018. The 10-Year CIP for FY2019-2028 re-prioritizes the R&R program by defunding several projects that were determined to be lower priority, and re-allocating a portion of the funding to projects determined to be higher priority. Overall, this constituted an increase of \$85.75M in the program budget, from \$227.05M in FY2017-2026 to \$312.08M. The project budget and schedule were developed and approved based on the project team's best assessment HHWP's infrastructure needs at the time. It should be noted that the project team continues the process of re-validating these earlier assessments.

Figures 2.1 to 2.3 show the total number of subprojects remaining in each phase of the R&R Water, Power, and Joint Infrastructure programs as of March 31, 2021. As reported in previous quarters, the following CUH10001 - SJPL Rehabilitation subprojects were removed from the R&R program and included in the Hetch Hetchy Capital Improvement Programs 2018 Proposed Baseline with a budget of \$5.37M (it should be noted that these subprojects have been subsequently completed under the HCIP Program:

- CUH10001 - SJPL Rehabilitation
 - CUH10001.011 - SJPL No. 1 Replacement at Cashman Creek
 - CUH10001.018 - SJPL No. 1 Replacement at SJVH
 - CUH10001.022 - Tesla Valves Replacement

The remaining subprojects under project CUH10001 will continue to be reported under the R&R Program. The CUH10001 approved budget, expenditures to date, and current forecast cost have been reduced to reflect the transfer of the three subprojects to the HCIP program.

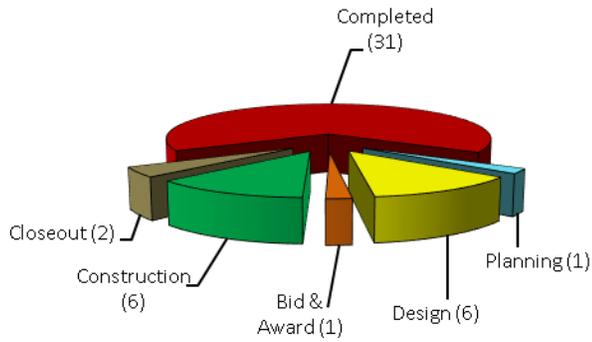


Figure 2.1 Total Number of Water Infrastructure Sub-Projects in R&R Program

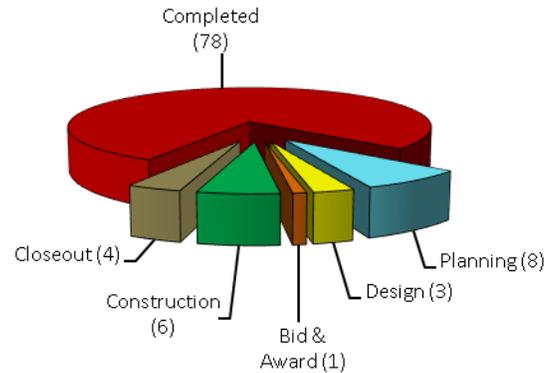


Figure 2.3 Total Number of Joint Infrastructure Sub-Projects in R&R Program

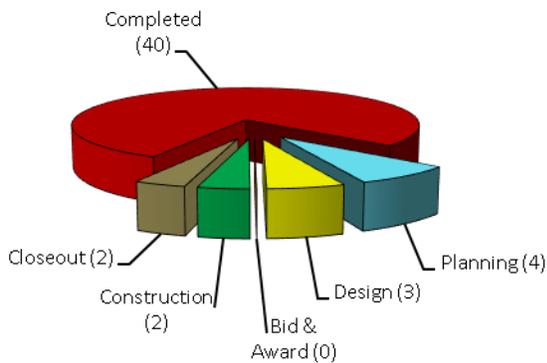


Figure 2.2 Total Number of Power Infrastructure Sub-Projects in R&R Program

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall current program level cost summary of the R&R Program included in this report. It shows the Expenditures to Date, Approved Budget, Current Forecast Cost, and Cost Variance between Approved Budget and Current Forecast Cost. There were no adjustments to the Approved Budget or Current Forecast Cost during the quarter.

Table 3.1 Program Cost Summary

	Expenditures to Date (\$ Million) (A)	Approved Budget** (\$ Million) (B)	Current Forecast Cost (\$ Million) (C)	Cost Variance (\$ Million) (D = B - C)
Water Infrastructure	\$19.38	\$115.70	\$115.70	-
Power Infrastructure	\$39.59	\$89.51	\$89.51	-
Joint Infrastructure	\$45.04	\$106.88	\$106.88	-
Hetchy R&R Program Total*	\$104.00	\$312.08	\$312.08	-

*The program total values include completed, not-initiated, and on-hold projects.

**The approved budget includes the 10-Year CIP Plan, as well as the previous fiscal year's appropriated budget

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 compares the 2018 Approved Schedule and Current Forecast Schedule for the R&R program. Refer to the “Cost and Schedule Status” notes in Section 5 for the criteria associated with the three color-coded Forecast Status levels in Figure 4.1 – Meet Requirements, Need Attention, and Exceed Limits.

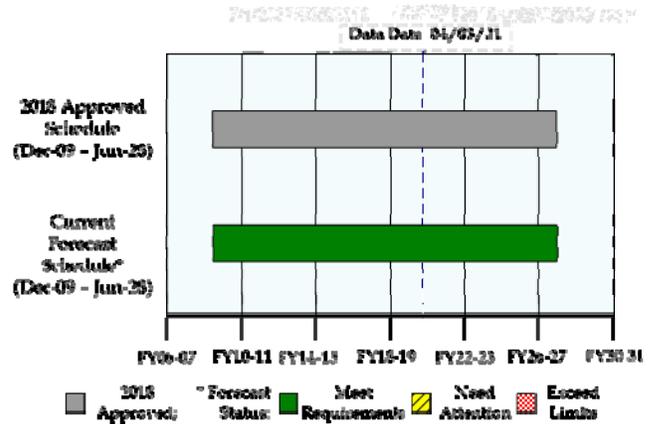


Figure 4.1 R&R Program Schedule Summary

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5. PROGRAM PERFORMANCE SUMMARY

All costs are shown in \$1,000s as of 04/03/21

Program Name	Active Phase (**)	Approved Budget (A)	Current Forecast Cost (B)	Expenditures To Date (C)	Cost Variance (D= A - B)	Cost Status (+)	Approved Completion (E)	Current Forecast Completion (F)	Schedule Variance (G = E - F)	Schedule Status (+)	Program Data Sheet
Water Infrastructure											
CUH100 - Water Infrastructure	MP	\$ 115,698	\$ 115,698	\$ 19,380	-	★	06/30/28	06/30/28	-	★	See Section 10
Power Infrastructure											
CUH101 - Power Infrastructure	MP	\$ 89,509	\$ 89,509	\$ 39,585	-	★	06/30/28	06/30/28	-	★	See Section 10
Joint Infrastructure											
CUH102 - Joint Infrastructure	MP	\$ 106,875	\$ 106,875	\$ 45,039	-	★	06/30/28	06/30/28	-	★	See Section 10

** Phase Status Legend

PL Planning DS Design
BA Bid & Award CN Construction MP Multiple-Phase

+ Cost and Schedule Status

- ★ Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
- ⚠ Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
- Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROGRAMS NOT WITHIN BUDGET AND/OR SCHEDULE

All programs are within the current approved budget and schedule.

7. ON-GOING CONSTRUCTION

There are no active construction projects with a construction contract amount greater than \$1 million.

8. PROGRAMS IN CLOSE-OUT

No program is currently in close-out.

9. COMPLETED PROJECTS

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Water Infrastructure				
CUH10005 - Priest Pipe Recoating	06/30/18	06/30/18	\$ 39,407	\$ 38,368
CUH10006 - Moccasin Gate No. 3 Shaft Replacement and Automation	12/31/18	12/31/18	\$ 1,049,557	\$ 133,278
Power Infrastructure				
CUH10103 - Powerhouse Control Upgrade	07/31/15	07/31/15	\$ 1,724,231	\$ 1,724,231
CUH10108 - Step-Up Transformers	04/04/17	04/04/17	\$ 221,995	\$ 182,525
CUH10109 - Moccasin Low Head Rehabilitation Project	05/31/18	05/31/18	\$ 619,140	\$ 568,367
CUH10111 - Moccasin GSU Transformers & Oil Containment	02/27/15	02/27/15	\$ 84,343	\$ 82,369
CUH10112 - Kirkwood Powerhouse Refurbishment & TSOV	06/30/17	06/30/17	\$ 62,177	\$ 47,473
CUH10118 - Kirkwood PH Valve Dissipation	06/30/17	06/30/17	\$ 810,613	\$ 718,117
Joint Infrastructure				
CUH10205 - Small Water Systems Upgrades	06/30/14	06/30/14	\$ 1,922,482	\$ 1,922,482
CUH10207 - Existing Hetchy Facilities (Outside Moccasin)	11/02/18	11/02/18	\$ 1,588,814	\$ 1,231,168
CUH10208 - Remote Terminal Unit Replacement	09/28/18	09/28/18	\$ 1,648,985	\$ 1,134,513
CUH10210 - Hetchy Fiber Projects	05/29/15	05/29/15	\$ 167,531	\$ 115,621
TOTAL			\$ 9,939,275	\$ 7,898,512

10. PROGRAMS WITHIN BUDGET AND SCHEDULE

CUH100 - Water Infrastructure

Program Description: The purpose of the Hetchy R&R Water Infrastructure Program is to extend the useful life of the water conveyance facility assets including tunnels and pipelines. The R&R projects are prioritized based upon regulatory compliance, condition assessment, operation staff recommendations, and level of service goals.

Program: Water Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost:		Program Schedule:
Approved  \$115.70 M	Approved Nov-10  Jun-28	
Forecast  \$115.70 M	Forecast Nov-10  Jun-28	
Actual  \$19.38 M	Program Percent Complete: 30.2%	
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

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

Progress and Status:

The CUH100 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 47 subprojects.

Planning: 1 subproject

- 10034364.007 SJPL No 1 Alternatives Analysis Report (December 02, 2019)

Design: 6 subprojects

- J100-01.019 San Joaquin Pipeline System Wide Testing (April 01, 2015)
- J100-01.038 SJPL Improvement at Claratina Crossing (February 01, 2018)
- J100-01.021 SJPL Isolation Assessment and Valve Replacement (April 01, 2015)
- J100-05.001 Priest Outlet 24 (inch) Pipe Recoating (February 03, 2014)
- 10034364.002 Foothill Tunnel Lining Repair at Oakdale Portal (October 02, 2019)
- 10034364.006 Oakdale Portal Standpipe and Anchors System Repairs (December 02, 2019)

Bid and Award:1 subproject

- 10034364.005 SJPL No 4 Oakdale Portal Flowmeter Replacement (September 03, 2019)

Construction: 6 subprojects

- J100-01.031 San Joaquin Pipeline No 1 East of River Road Damage Assessment (December 01, 2016)
- J100-01.033 SJPL No 1 Oakdale Portal to Emery Inspection and Repair (September 01, 2017)

- 10034364.001 SJPL No 1 Oakdale Portal and Tesla Roll Out Installation (December 14, 2018)

- 10034364.003 SJPL No 1 Pipe Replacement 2020 Outage (September 03, 2019)

- 10034364.004 SJPL No 1 Air Guard and Blow-off Valve Replacement (October 01, 2019)

- 10034364.008 San Joaquin Pipeline No.1 Pipe Replacement - Mile Post 91 (May 12, 2020)

Closeout: 2 subprojects

- J100-01.010 Rankin Property Acquisition (April 01, 2013)

- 10034520.001 Moccasin Dam and Outlet Works (September 02, 2019)

Completed: 31 subprojects

Planned Milestones for Reporting Quarter:

Complete Closeout: Two subprojects 100-01.035 and 100-01.036 closed this quarter.

Status of Milestones for Reporting Quarter:

One subproject moved from Planning to Design, One subproject moved from Design to Bid and Award, and one subproject moved from Planning to Construction and two subprojects moved from Bid and Award to Construction. One subproject moved from Planning to Closeout.

Planned Milestones for Subsequent Quarter:

Complete Closeout: 1 subproject

Start Planning: 1 subproject

Issues and Challenges:

No new issues or challenges at this time.

CUH101 - Power Infrastructure

Program Description: The purpose of the Hetchy R&R Power Infrastructure Program is to extend the useful life of the power generation facility assets including powerhouse, switchyards, power distribution towers, and electrical distribution lines. The R&R projects are prioritized based upon regulatory compliance, condition assessments, Operations staff recommendations, and level of service goals.

Program: Power Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost:		Program Schedule:
Approved 	\$89.51 M	Approved Dec-09  Jun-28
Forecast 	\$89.51 M	Forecast Dec-09  Jun-28
Actual 	\$39.59 M	Program Percent Complete: 48.7%
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

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

Progress and Status:

The CUH101 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 51 subprojects.

Planning: 4 subprojects

- 101-18.002 Kirkwood PH Bypass Interim Repairs (November 01, 2019)
- 10036104.001 Modicon Quantum Programmable Logic Controller Upgrade to M580 (March 02, 2020)
- 10036104.002 Moccasin Low Head Powerhouse Exterior and Interior Repairs (March 02, 2020)
- 10036265.001 Riverbank Transmission Line Service Extension (February 10, 2020)

Design: 3 subprojects

- 101-18.004 Critical Spare Procurement for Kirkwood Powerhouse Energy Dissipation Cone (August 31, 2020)
- 10036104.003 Moccasin Powerhouse Gates and Valves Automation (April 02, 2020)
- 10036265.002 Warnerville and Early Intake Switchyard Control Room Roof Replacements (April 13, 2020)

Construction: 2 subprojects

- 101-01.021 Moccasin Switchyard Isolation Transformer Protection (September 01, 2016)
- 101-17.003 Transmission Line Clearance Mitigation Project (July 03, 2017)

Closeout: 2 subprojects

- 10034521.001 Moccasin Powerhouse Gantry Crane Upgrade (October 01, 2019)
- 101-01.013 HPH/KPH Ridge Line Transformer Protection (October 04, 2012)

Completed : 40 subprojects



Generator Shaft at Moccasin Powerhouse

Planned Milestones for Reporting Quarter:

Complete closeout: No subprojects closed this quarter.

Status of Milestones for Reporting Quarter:

One (1) new subproject started this quarter and is already in design, 101-18.004. One (1) subproject moved from planning to design. One (1) subproject moved from planning to closeout this quarter. One (1) subproject moved from design to construction.

Planned Milestones for Subsequent Quarter:

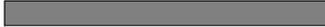
Complete closeout of one (1) project.

Issues and Challenges:

No new issues or challenges at this time.

CUH102 - Joint Infrastructure

Program Description: The purpose of the Hetchy R&R Joint Infrastructure Program is to extend the useful life of the joint-facilities assets including dams, roads, communication systems, wastewater treatment facilities, cottages, and operational yard facilities. The R&R projects are prioritized based upon regulatory compliance, condition assessments, and Operations staff recommendations.

Program: Joint Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost:		Program Schedule:
Approved  \$106.88 M	Approved Nov-10  Jun-28	
Forecast  \$106.88 M	Forecast Nov-10  Jun-28	
Actual  \$45.04 M	Program Percent Complete: 36.4%	
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

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

Progress and Status:

The CUH102 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 100 subprojects.

Planning: 8 subprojects

- 102-03.011 Early Intake Dam Stability and Spillway Repairs (June 20, 2013)
- 102-08.001 KPH Unit 3 Remote Terminal Unit (RTU) Replacement and PLC Stop Logic Implementation (June 20, 2013)
- 102-09.016 Yosemite Park Hetch Hetchy Road Guard Rail Improvements (January 01, 2015)
- 102-09.018 Hetch Hetchy Roads FY 2019-2020 (August 01, 2019)
- 102-11.007 Rock River and Microwave Sites Physical Security Upgrade (September 23, 2019)
- 10034501.002 Distribution PRC 4292 Equipment Replacement (November 01, 2019)
- 10034501.004 Overhead Electrical Distribution Line (March 16, 2020)
- 102-13.005 Moccasin Peak Communication Building Air Conditioner Replacement (May 04, 2020)

Design: 3 subprojects

- 102-02.006 Moccasin Sewer Pond Upgrade (November 01, 2012)
- 102-03.010 O’Shaughnessy Dam Spillway Condition Assessment (September 01, 2017)
- 10034501.001 Cherry Ridgeline Transformer Rehabilitation (April 01, 2019)

Bid and Award: 1 subproject

- 10034501.003 Cherry Camp Power System Upgrade (December 15, 2019)

Construction: 6 subprojects

- 102-01.005 Upcountry Microwave Improvement (March 09, 2017)
 - 102-02.025 Moccasin Village and Shops Transformers (April 03, 2017)
 - 102-09.010 Small Bridge Improvement Project (January 15, 2016)
 - 102-09.012 Kearny Lateral Crossing (August 08, 2016)
 - 102-11.005 Security Upgrade for Mixed Facilities (March 27, 2017)
 - 102-02.028 Early Cottage No 1, 2, 3, & 4 Roof Replacement (November 01, 2019)
- Closeout: 4 subprojects
- 102-02.019 Moccasin Control and Server Building Boiler Work (March 01, 2016)
 - 102-03.005 Cherry Dam Condition Assessment (February 03, 2014)
 - 102-09.008 Road and Bridge Improvement (July 06, 2015)
 - 102-09.014 Cherry Lake Road Guardrail C-3 and 4 (May 01, 2017)
- Completed : 78 subprojects

Planned Milestones for Reporting Quarter:

Complete Closeout of one (1) subproject.

Status of Milestones for Reporting Quarter:

One (1) subproject closed: 102-13.004 Duckwall Communication Site Power System Repair. One (1) new subproject moved from Planning to Design. One (1) subproject moved from Design to Bid and Award. One (1) subproject moved from Bid and Award to Construction. One (1) subproject moved from Design to Construction. One (1) subproject completed this quarter.

Planned Milestones for Subsequent Quarter:

Complete Closeout of one (1) subproject.

Issues and Challenges:

No new issues or challenges at this time.

**II. SAN FRANCISCO POWER ENTERPRISE
CAPITAL IMPROVEMENT PROGRAMS (POWER)**



INTRODUCTION

The San Francisco Power Enterprise (Power) is responsible for the marketing and sale of the clean hydro-generated power produced by the Hetch Hetchy system, and balances that supply with purchases or sales to meet customer demand. Power transmits, distributes, meters, and prepares the electric bills for its customers, comprised of all City and County of San Francisco offices, facilities, and their tenants, ranging from neighborhood Police Stations and Fire Houses, the Ferry Building, and City Hall, to the Airport, General Hospital, Wastewater pumping and treatment facilities, the Regional Water Treatment Facilities, and the Municipal Railway (MUNI). Power is also the full-service electricity provider to Treasure and Yerba Buena Islands, and the newly developing Hunters Point Shipyard. Power operates and maintains four substations and switchgear, and many miles of distribution wires, to provide reliable electric service to its customers.

Power also owns, operates, manages, and maintains approximately 25,000 street lights and related circuitry throughout San Francisco.

Power provides the full complement of electricity services to its vital City service customers, which includes identifying and implementing energy efficiency improvements and on-site renewable power generation. Power has developed and owns 2 Megawatts (MW) of rooftop solar projects, developed and owns the output of the 5 MW Sunset Solar Generating project, and developed 2 MW of methane gas-fired co-generation facilities at the Southeast Wastewater Treatment Plant.



1. PROGRAM DESCRIPTION

The SFPUC Power Enterprise’s capital improvement projects are divided into six groups: Generation, Energy Efficiency, Retail Services, Street Lights, Transmission/Distribution System, and Redevelopment-Treasure Island Projects.

2. PROGRAM STATUS

This Quarterly Report presents the progress made between January 1, 2021 and March 31, 2021. The data reported herein as the “approved” project budget and schedule conforms to the Power Capital Improvement Program’s 10-Year Plan, which was approved by the Water and Power Enterprise Managers and became effective on February 9, 2016.

Figure 2.1 shows the Approved Budget for the projects in each phase of the program as of March 31, 2021. The number of projects currently in each phase is shown in parentheses. Multiple Phase projects are currently active in several phases as indicated by their respective project status sheets (Sections 6 and 10 of this report).

There are three (3) projects whose status is “on-hold”, CUHCAP02, CUH98001, and CUH985, and are consequently not being reported in this quarterly report. However, funding status related to these on-hold projects is included in Table 3.1, in order to give an accurate report of the overall program’s cost performance. Progress reporting for these projects will be included in subsequent editions of this report upon their initiation or resumption.

Figure 2.2 summarizes the environmental review status of the Hetch Hetchy projects as of March 31, 2021.

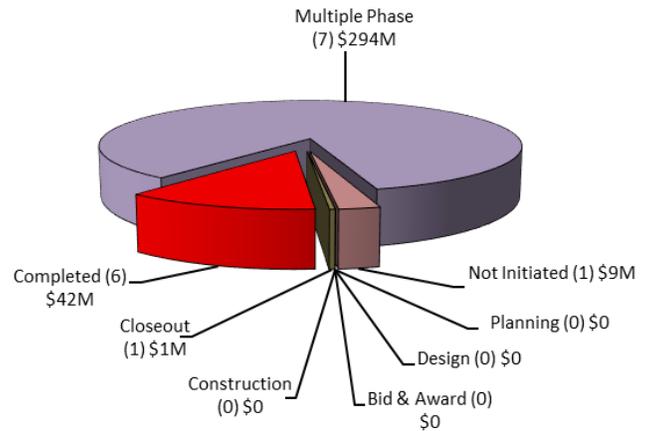
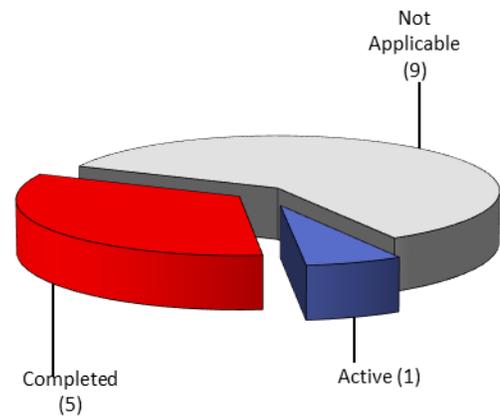


Figure 2.1 Approved Budget for Projects in Each Phase



* Environmental review does not apply to the projects not under CEQA requirements or with no environmental phase.

Figure 2.2 Program Environmental Status

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall current program-level funding status of the Power projects included in this report. It shows the Approved Budget as of 2018 Hetch Hetchy 10-Year CIP Plan, Appropriated Budget to Date, Not Appropriated Budget to Date, Total Expenditures to Date, and Remaining Appropriated Budget.

Table 3.2 reflects the total number of projects by their status. Table 3.3 provides an overall current program-level cost summary of the active projects included in this report. It shows the Expenditures to Date, Current Approved

Budget and Current Forecast Cost, and the Cost Variance between the Current Approved Budget and the Current Forecast Cost. The total Current Approved Budget for active projects included in this report is \$256.01M, and the current Forecast Cost is \$153.00M over budget.

The staffing and development of schedules for new and inactive projects are underway. Progress reporting for these projects will be included in subsequent editions of this report upon their initiation or resumption.

Table 3.1 - Status of Funding Appropriated to Date

	Approved Budget as of Hetch Hetchy 10-Year CIP Plan (\$ Million) (A)	Appropriated Budget to Date (\$ Million) (B)	Not Appropriated Budget to Date (\$ Million) (C=A-B)	Total Expenditures to Date (\$ Million) (D)	Remaining Appropriated Budget (\$ Million) (E=B-D)
Generation	\$55.57	\$45.77	\$9.80	\$39.47	\$6.30
Efficiency	\$49.01	\$36.31	\$12.70	\$33.56	\$2.75
Street Lights	\$109.34	\$84.57	\$24.76	\$64.93	\$19.64
Retail Services	\$41.70	\$166.78	(\$125.08)	\$54.00	\$112.77
Transmission/ Distribution System**	\$117.47	\$34.30	\$83.17	\$19.72	\$14.58
Redevelopment - Treasure Island	\$43.75	\$41.88	\$1.87	\$9.84	\$32.03
Power Enterprise Total*	\$416.83	\$409.61	\$7.23	\$221.53	\$188.08

*The Total Values include Project Development related costs, On-Hold, Completed, and Not Initiated projects.

**A new project, Intervening Facilities, with budget cost of \$99.5M was added in March 2019.

Table 3.2 - Number of Projects by Status

	# of Active Projects (A)	# of Completed Projects (B)	# of Not Initiated Projects (C)
Generation	1	3	0
Efficiency	2	1	0
Street Lights	1	1	0
Retail Services	2	1	0
Transmission/ Distribution System	2	0	0
Redevelopment - Treasure Island	0	0	1
Power Enterprise Total	8	6	1

Table 3.3 Active Projects Cost Summary

	Expenditures to Date (\$ Million) (A)	Current Approved Budget (\$ Million) (B)	Current Forecast Cost (\$ Million) (C)	Cost Variance (\$ Million) (D= B-C)
Generation	\$32.98	\$34.12	\$34.12	-
Efficiency	\$5.29	\$7.85	\$7.85	-
Street Lights	\$63.71	\$108.10	\$108.10	-
Retail Services	\$47.87	\$1.70	\$154.70	(\$153.00)
Transmission/ Distribution System	\$6.38	\$104.25	\$104.25	-
Redevelopment - Treasure Island	-	-	-	-
Power Enterprise Total*	\$156.23	\$256.01	\$409.01	(\$153.00)

*The Total Values do not include Project Development related costs, On-Hold, Completed, and Not Initiated projects.

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2016 Approved Schedule and Current Forecast Schedule for the Power program. As shown in Table 4.1 the Overall Power Enterprise Program is currently forecast to be completed in June 2028.

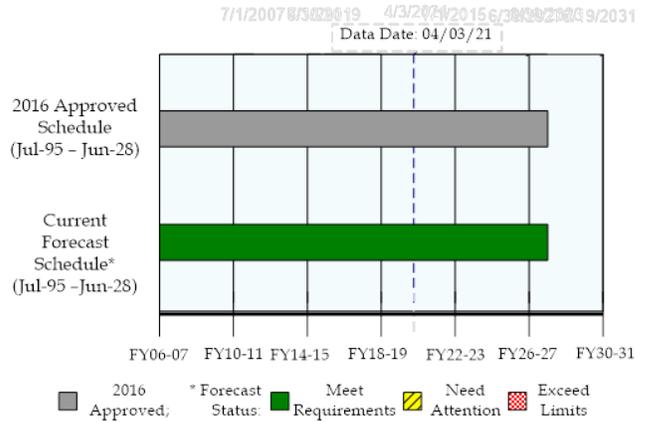


Figure 4.1 Program Schedule Summary

Table 4.1 2016 Approved vs. Current Forecast Schedule Dates

Sub-Program	2016 Approved Project Start	Actual Start	2016 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Generation	07/01/08	07/01/08✓	06/29/18	06/28/24	72.0
Efficiency	01/01/08	01/01/08✓	12/30/21	12/30/21	-
Street Lights	09/08/08	09/08/08✓	05/12/25	06/30/27	25.6
Retail Services	07/01/95	07/01/95✓	03/01/22	06/30/22	4.0
Transmission/ Distribution System	07/01/05	07/01/05✓	06/30/28	06/30/28	-
Redevelopment - Treasure Island	-	-	-	-	-
Overall Power Enterprise*	07/01/95	07/01/95✓	06/30/28	06/30/28	-

*The Overall Schedule does not include On-Hold and Not Initiated projects.

5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in \$1,000s as of 04/03/21

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Generation											
CUH94763 - Go Solar SF Program	MP	\$ 34,120	\$ 34,120	\$ 32,981	-	★	06/29/18	06/28/24	72.0 mo. Late	●	See Section 6
Efficiency											
CUH983 - Civic Center Sustainable District Program	MP	\$ 6,650	\$ 6,650	\$ 4,179	-	★	12/30/21	12/30/21	-	★	See Section 10
Street Lights											
CUH896 - Streetlight Replacement	MP	\$ 108,096	\$ 108,096	\$ 63,707	-	★	05/12/25	06/30/27	25.6 mo. Late	●	See Section 6
Retail Services											
CUH870 - Distribution Services Retail Customers	MP	\$ 40,000	\$ 168,452	\$ 52,348	(\$128,452)	●	07/02/20	06/30/22	23.9 mo. Late	●	See Section 6
CUH891 - Metering and Load Monitoring	MP	\$ 699	\$ 699	\$ 337	-	★	03/01/22	06/30/22	4.0 mo. Late	⚠	See Section 6

* 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		

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Transmission / Distribution											
10033821 - Intervening Facilities	MP	\$ 99,500	\$ 99,500	\$ 3,705	-	★	06/30/28	06/30/28	-	★	See Section 10
CUH972 - Load Meter Program	MP	\$ 4,750	\$ 4,750	\$ 2,679	-	★	03/01/22	06/30/22	4.0 mo. Late	⚠	See Section 6

* 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

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROJECTS NOT WITHIN BUDGET AND/OR SCHEDULE

CUH94763 - Go Solar SF Program

Project Description: GoSolarSF is an incentive program to encourage San Francisco residents to install solar power systems by offering one-time incentive payments to reduce the costs to the homeowners. The program launched in 2008 and provides between \$2 and \$5 Million per year in incentives to residents of San Francisco.

Program: Generation		Project Status: Multiple Phase		Environmental Status: Not Applicable	
Project Cost:			Project Schedule:		
Approved		\$34.12 M	Approved Jul-08		Jun-18
Forecast		\$34.12 M	Forecast Jul-08		Jun-24
Actual		\$32.98 M	Project Percent Complete: 97.0%		
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits					
Key Milestones:	Environmental Approval+	Bid+ Advertisement	Construction+ NTP	Construction+ Final Completion	
Current Forecast	See Note	N/A	N/A	N/A	

+ This is one of the programmatic projects; it does not result in construction projects that the City bids out, manages, or owns.

Progress and Status:

GoSolarSF recently ended the programs first quarter for calendar year 2021, providing incentives to 63 applicants. As of March 31, 2021, \$251,004.00 in incentives were paid in the reporting quarter. On Jan 1, 2021 according to the Solar ordinance the incentives rates that were reduced annually over the last 4-years reached \$0, concluding most of the programs offerings. Currently only a small amount of funding for Non-Profit and Low-Income incentives remain.

Issues and Challenges:

GoSolarSF is also providing relief to applicants that are not able to meet stipulated deadlines when impacted by Covid-19.

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CUH896 - Streetlight Replacement

Project Description: The SFPUC maintains approximately 25,500 street lights in the City of San Francisco. This Program funds various street lighting projects, street light engineering and capital support services, electric vehicle charger installations, community benefits capital projects, small and large street lighting capital projects, and street lighting Repair and Replacement (R&R) projects. The overall program provides funding for multiple projects over multiple years with varying start and end dates.

Program: Street Lights		Project Status: Multiple Phase		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$108.10 M	Approved Sep-08		May-25
Forecast		\$108.10 M	Forecast Sep-08		Jun-27
Actual		\$63.71 M	Project Percent Complete: 59.0%		
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	Various	Various	Various	Various	

Progress and Status:

-CUH896.01 is an ongoing capital project for the streetlights of San Francisco. 52 sub-level projects are each composed of several mini-streetlight projects at various milestone stages.

-CUH 896.48 - 3rd Street Rehabilitation. This project is complete and fully operational.

-CUH 896.32 - Van Ness Bus Rapid Transit. This is a cost share project with MTA. SFPUC is only providing funds for the ongoing project. Installation of new street and sidewalk light pole foundations are in progress.

-CUH 896.49 - Holiday and Festival Lighting. This is an ongoing project with annual work during the holiday season. SFPUC crews install holiday lighting on Market St. and Third St.

-CUH896.50 Pedestrian Lighting. This project is still awaiting sub-projects to be engineered. This will be an ongoing project which will add pedestrian lighting based on community requests.

-CUH 896.51 - Street Light and Pedestrian Pole Assessment. Project is ongoing and currently in Phase II. Phase I is completed and has assessed 23,219 street light poles to date. Phase II is underway and has assessed 1,275 poles to date.

-CUH 896.52 - San Bruno Street Light Improvement. This project is complete and fully operational.

-CUH896.52 Streetlight Pole Rehabilitation. We have completed the replacement of 626 deteriorated poles to date. The poles are identified by pole inspections.

-CUH 896.40 Series Loop Conversions. We have completed 6 conversions to date and have 2 remaining to complete the project. We are estimating completion in June 2022.

-CUH896.27 LED Street Light Conversion Project. We have completed 21,100 LED conversions to date. The cobra head portion of this project is completed. Maintenance and the decorative portion of this project is ongoing.

-CUH896.47 Tenderloin Street Light Improvements. Phase 1 has been completed and Phase 2 is in design.

-CUH896.30 Street Light Repair and Replacement. This is an ongoing project for replacement of street light facilities requested through 311 or by the Board of Supervisors.

-CUH896.31 Street Light Area Improvements. This is an ongoing project for addition of street light facilities requested through 311 or by the Board of Supervisors.

-CUH896.DA- Distributed Antenna System. This is an ongoing project to install wireless 4G and 5G equipment on City-owned streetlights. The existing 12-year license agreements with wireless telecommunications providers will expire in 2027 but may be extended indefinitely. To date, there are 811 DAS sites on City-owned poles. Installation is on-going as carriers continue to submit requests to add poles to their agreements.

Issues and Challenges:

Schedule variance was due to CUH896.DA which the existing agreement would expire in 2027.

CUH870 - Distribution Services Retail Customers

Project Description: A program to develop SFPUC-owned transmission and electrical distribution facilities along the Bayside of San Francisco has been initiated. The objective is to receive transmission level voltage from PG&E Potrero substation at 230kV, transform this high voltage to 34.5 kV, and then distribute this lower voltage to SFPUC Power Enterprise electrical customers. The scope of Phase One of the program encompasses ductbanks, conduits, cables, electrical equipment and vaults underground from 23rd Street along Illinois to 16th St, and then Terry Francois Boulevard to South Street. The Phase One work is planned to be completed by end of December 2018. The balance of the Bay Corridor Transmission Distribution (BCTD) project will be built in subsequent stages, with the SFPUC substation to be built in parallel with the Phase One distribution work.

Program: Retail Services		Project Status: Multiple Phase		Environmental Status: Completed (CatEx)	
Project Cost:			Project Schedule:		
Approved		\$40.00 M	Approved Dec-15		Jul-20
Forecast		\$168.45 M	Forecast Dec-15		Jun-22
Actual		\$52.35 M	Project Percent Complete: 28.1%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	Various	Various	Various	Various	

Progress and Status:

CUH870 has 5 subprojects:

1. CUH870.01 Distribution Services Retail Customers: This subproject holds unallocated budget for use by other subprojects.
2. CUH870.02 Bay Corridor Transmission Distribution (BCTD): This subproject contains multiple contracts. Forecasted cost at completion is \$154M.
3. CUH870.03 Distribution Interface - New Customers: This subproject will be ongoing for the foreseeable future.
4. CUH870.04 Electrical Service Improvements: This subproject will be ongoing for the foreseeable future.
5. CUH870.05 HHP-EE Programs for New Retail Customers: This subproject will be ongoing for the foreseeable future.

CUH870.02 is the only active subproject in CUH870.

- (a) Contract DB-128R2: Final Completion (FC) date is being negotiated.
- (b) Contract DB-129.1: Construction work occurring. Construction completion in 2021.
- (c) Contract DB-129.2: Design and construction work occurring. Construction completion in 2021.
- (d) Contract DB-130: Construction work occurring. Construction completion in 2021.

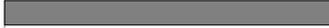
Issues and Challenges:

None at this time.

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CUH891 - Metering and Load Monitoring

Project Description: The purpose of this project is to upgrade existing metering to revenue quality meters, and to upgrade any associated equipment as needed. Metering and communication equipment will be installed and replaced according to the meter data acquisition strategy developed by CUH972 Load Meter Project.

Program: Retail Services		Project Status: Multiple Phase		Environmental Status: Completed	
Project Cost:			Project Schedule:		
Approved		\$0.70 M	Approved Jul-95		Mar-22
Forecast		\$0.70 M	Forecast Jul-95		Jun-22
Actual		\$0.34 M	Project Percent Complete: 96.2%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	09/26/16✓	N/A	03/01/19✓	06/30/22	

Progress and Status:

Progress: The Load Meter Project created a strategy to identify, procure, and install an Advanced Metering Infrastructure (AMI) system for Power Enterprise electric meters. After the strategy development is complete, funds remaining in CUH972 and all funds in CUH891 will be used for the purchase and installation of metering and communication equipment. Power Enterprise evaluated CUH972 Load Meter Program in conjunction with this project to refine and delineate the scope of these 2 projects.

The project schedule includes issuing a Request for Proposals (RFP) for procurement of the AMI system. An RFP was issued in April 2017, but no qualified responses were received. A sole-source contract was signed with Aclara in October 2018. A pilot study was initiated in March 2019; and testing of the pilot phase has been completed.

Deployment and testing of the system, along with replacement of the existing 1,250 meters with AMI meters, is expected to be completed in 2021 as a result of network communication gaps identified after system deployment. Installation of the second phase of Data Collection Unit (DCU) was completed in 2020, and installation of the third phase of DCUs will begin in April 2021.

Because the operations budget cannot pay for future meters at redevelopment or Housing Authority sites, the project will pay for future AMI meters.

Issues and Challenges:

The project is merged with CUH972.

No qualified responses to the April 2017 RFP were received, causing delays in the contracting process. The procurement delayed to Fall 2018 to allow enough time to select and procure a vendor. A sole-source contract was signed with Aclara in October 2018.

CUH972 - Load Meter Program

Project Description: The purpose of this project is to identify and then implement the most cost effective method to collect reliable meter data from existing and future SFPUC Power customers in geographically dispersed areas. The project will evaluate the feasibility of implementing an Advanced Metering Infrastructure (AMI) System. The project will also consider the feasibility of replacing all or a portion of the 2000 PG&E meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, or, in the alternative, the Power Enterprise purchasing these meters from PG&E.

Program: Transmission / Distribution		Project Status: Multiple Phase		Environmental Status: Completed	
Project Cost:			Project Schedule:		
Approved		\$4.75 M	Approved Jul-05		Mar-22
Forecast		\$4.75 M	Forecast Jul-05		Jun-22
Actual		\$2.68 M	Project Percent Complete: 95.8%		
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits					
Key Milestones:	Environmental Approval	Bid+ Advertisement	Construction+ NTP	Construction+ Final Completion	
Current Forecast	09/26/16✓	N/A (B) 11/30/16✓	(A) 07/01/05✓ (B) 03/01/19✓	(A) 03/31/09✓ (B) 06/30/22	

+ The project includes multi-phase construction: (A) Phase 1; (B) Phase 2

Progress and Status:

The Load Meter Project created a strategy to identify, procure, and install an Advanced Metering Infrastructure (AMI) system for Power Enterprise electric meters. After the strategy development is complete, funds remaining in CUH972 and all funds in CUH891 will be used for the purchase and installation of metering and communication equipment. Power Enterprise evaluated CUH972 Load Meter Program in conjunction with this project to refine and delineate the scope of these 2 projects.

The project schedule includes issuing a Request for Proposals (RFP) for procurement of the AMI system. An RFP was issued in April 2017, but no qualified responses were received. A sole-source contract was signed with Aclara in October 2018. A pilot study was initiated in March 2019; and testing of the pilot phase has been completed.

Deployment and testing of the system, along with replacement of the existing 1,250 meters with AMI meters, is expected to be completed in 2021 as a result of network communication gaps identified after system deployment. Installation of the second phase of Data Collection Unit (DCU) was completed in 2020, and installation of the third phase of DCUs will begin in April 2021.

Because the operations budget cannot pay for future meters at redevelopment or Housing Authority sites, the project will pay for future AMI meters.

Issues and Challenges:

The project is merged with CUH891. No qualified responses to the April 2017 RFP were received, causing delays in the contracting process. The procurement delayed to Fall 2018 to allow enough time to select and procure a vendor. A sole-source contract was signed with Aclara in October 2018.

7. ON-GOING CONSTRUCTION

There are no active construction projects with a construction contract amount greater than \$1 million.

8. 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
Efficiency				
CUH995 - Enterprise Fund Dept - Energy Efficiency	06/29/18	03/31/20	\$ 1,195,720	\$ 1,111,089
TOTAL			\$ 1,195,720	\$ 1,111,089

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9. COMPLETED PROJECTS*

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Generation				
CUH99302 - Alvarado Elementary School -- Solar Electric (completed)	01/04/13	01/04/13	\$ 582,170	\$ 580,224
CUH99307 - North Beach Library Solar -- Renewable/Generation - Small Renewables (completed)	09/26/14	09/26/14	\$ 212,160	\$ 127,077
CUH99308 - SF Academy Solar Carport	02/01/19	12/17/20	\$ 2,097,949	\$ 2,454,340
Efficiency				
CUH986 - Energy Efficiency General Fund Program	06/30/21	09/25/20	\$ 36,877,376	\$ 26,690,051
Retail Services				
CUH973 - Distribution System Assessment (completed)	11/28/16	06/13/18	\$ 1,000,000	\$ 1,319,755
Street Lights				
CUH91503 - San Bruno Street Light Improvement Project (completed)	03/25/17	03/25/17	\$ 1,240,000	\$ 1,226,894
TOTAL			\$ 42,009,655	\$ 32,398,341

* This table only includes projects listed in the 10-Year CIP Plan for FY2017-2026.

10. PROJECTS WITHIN BUDGET AND SCHEDULE

CUH983 - Civic Center Sustainable District Program

Project Description: This project funds planning, design, and construction of projects in the green district of the Civic Center in accordance with the partnership Memorandum of Understanding (MOU) with the Clinton Climate Initiative. This effort will employ new technologies in energy efficiency for whole-building retrofits and will pursue Leadership in Energy and Environmental Design (LEED) certification from the US Green Building Council (USGBC). The program and its related projects will demonstrate the City’s leadership by transforming the historic Civic Center into a green and sustainable resource district by maximizing energy efficiency and showcasing sustainable concepts and technologies.

Program: Efficiency		Project Status: Multiple Phase		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$6.65 M	Approved Jan-08		Dec-21
Forecast		\$6.65 M	Forecast Jan-08		Dec-21
Actual		\$4.18 M	Project Percent Complete: 63.0%		
Key Milestones:	Environmental Approval	Bid+ Advertisement	Construction+ NTP	Construction+ Final Completion	
Current Forecast	TBD	Multiple Small JOCs	Various	Various	

+ This is one of the programmatic projects, which include multiple construction contracts.

Progress and Status:

The Civic Center Sustainable District Program for this quarter continued to focus on energy efficiency services, retro-commissioning, and LEED certification for the City’s building portfolio in the Civic Center including: City Hall, Asian Art Museum, Main Library, Department of Public Health, Civic Center Garage, Brooks Hall, UN Plaza, and the San Francisco War Memorial: Davies Symphony Hall, Veterans Building, and Opera House.

- JOC 64-11 City Hall Interior Dome LED Lighting Project: The San Francisco Planning Department - Environmental Planning Division approved the exemption request under the Environmental Quality Act (CEQA) Section 15301, Class 1 (Existing Facilities). The project is in the construction phase with Rubecon Builders and Paganini Electric. Construction management and engineering services are being provided by professional service contractor kW Engineering through PRO.0106.A Task Order 3.
- City Hall Heat Pumps Replacement Project is in the construction phase with ACCO Engineered Systems. Construction management and engineering services are being provided by professional service contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 7.

- City Hall Cooling Towers Replacement Project performance specification is in development with professional service contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 10.
- City Hall Fuel Switching Feasibility Study is in development with professional service contractors kW Engineering and Engineering 350 through PRO.0106.A Task Order 11.
- Additional projects related to HVAC and lighting retrofits are being identified and evaluated for funding requirements.

Issues and Challenges:

None at this time.

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10033821 - Intervening Facilities

Project Description: Under the Wholesale Distribution Tariff (WDT), electric service requires intervening facilities between PG&E's service points and SFPUC end-use customers. The installations of intervening facilities are needed for the upgrade of new electric service, conversion of service from secondary to primary service level, and aggregation of electric service to common points of service interconnection where feasible. The electric service improvements cover the installation of service cables, medium voltage switchgears, transformers, switches, service equipment and distribution infrastructures to be owned and maintained by the SFPUC Power Enterprise.

Program: Transmission / Distribution		Project Status: Multiple Phase		Environmental Status: Not Applicable	
Project Cost:			Project Schedule:		
Approved		\$99.50 M	Approved Dec-18		Jun-28
Forecast		\$99.50 M	Forecast Dec-18		Jun-28
Actual		\$3.71 M	Project Percent Complete: 2.3%		
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	N/A	N/A	N/A	N/A	

Progress and Status:

No updates on schedule or progress.

Issues and Challenges:

Intervening facilities may be required at various new construction and development projects where PG&E requires primary electric service. Each project is scheduled based on when the customer needs electric service.

APPENDICES

A PROJECT DESCRIPTIONS

B APPROVED PROJECT-LEVEL SCHEDULE

C LIST OF ACRONYMS

APPENDIX A. PROJECT DESCRIPTIONS

A1-A HETCHY CAPITAL IMPROVEMENT PROJECTS (HCIP)

WATER INFRASTRUCTURE

CUH10001-HCIP - San Joaquin Pipeline Rehabilitation (Completed)

The purpose of the San Joaquin Pipeline Rehabilitation (SJPL) is to extend the useful life of these water conveyance facility assets, including tunnels and pipelines. Baseline dates and budgets for the subprojects below were presented to and approved by the Commission on 09/08/15. Since they are now considered to be active HCIP subprojects, they have been moved from CUH100 R&R.

CUH10003 - Lower Cherry Aqueduct

The Lower Cherry Aqueduct (LCA) delivers water from Cherry Creek to supplement the primary Hetch Hetchy reservoir supply during a drought year. Due to current drought conditions, as described in the Declaration of Emergency issued on February 21, 2014, there is a need for this reliable backup water supply to be re-established in the LCA. However, due to damage during the Rim Fire Emergency and age, the LCA is in need of restoration before it can become a reliable asset. This project consists of improvements such as emergency debris removal and tunnel cleaning, temporary structures installation, monitoring and instrumentation, and forebay and diversion dam repairs.

10035574 - SJPL Tesla Valves Replacement

This project intends to replace all the under rated inline valves, Tesla Ultra Violet (TUV) 101 to 401, with properly rated valves to improve safety and entry into all 4 San Joaquin Pipelines (SJPL). In addition, all cross-over valves and bypass valves may need to be replaced or made safe. Modification to the pipes, flanges, spool pieces, actuators, and

valve controls are needed. The valve vault will need modification to accommodate the new valves. New facilities may need to be constructed if additional new valves are not designed for direct burial.

10035575 - SJPL Valve and Safe Entry Improvement

The San Joaquin Pipeline (SJPL) Entry Assessment and Valve Improvement Project involves the three parallel transmission pipelines that stretch approximately 48-miles across the San Joaquin Valley from Oakdale Portal to Tesla Portal, with a partial fourth pipeline consisting of a 6.4-mile Eastern Segment and an 11-mile Western Segment. The four pipelines were built between 1932 and 2012, respectively, and range from 56- to 79.5-inches in diameter. As part of the Water System Improvement Program (WSIP), valve vaults were constructed along the SJPL System at various locations to increase operational flexibility and the overall reliability of the SJPL System. Since the commissioning of the valve vaults, Hetch Hetchy Water & Power (HHWP) has expressed concern that 1) valves may not be sufficiently rated and may fail due to a pressure transient surge event using certain operational assumptions 2) there is an inability to establish double isolation and bleed configurations along the SJPL System, resulting in insufficient protection for maintenance personnel, and 3) multiple isolation valves are not adequately rated for hydrostatic head. In order to achieve the safety and access goals, the scope is to: install a surge shaft upstream of Tesla Treatment Facility (TTF) to reduce maximum pressure from unplanned reactor valve closure and upgrade line valves to resist transient pressure from unplanned line valve closure; install new double isolation and bleed valves at all locations where major upgrades and construction are required; and retain single isolation where no upgrades are needed. There are four primary locations where major

upgrades and construction are required: Emery, Roselle, Pelican, and Tesla.

10033156 - Moccasin Reservoir Perimeter Security Fence

Hetch Hetchy Water & Power (HHWP) will install an approximately 6,500 feet long perimeter security fence system around Moccasin Reservoir to discourage trespassers. Moccasin Reservoir covers approximately 32 acres. Fence monitoring alarms, signs, lighting, and security camera will be considered as part of the design.

CUH100PD - 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

CUH10102 - Holm and Other Powerhouse Projects

This project will provide funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under \$1 million regarding power generation renewal and equipment replacement. The upgrade and rehabilitation of Holm Unit 2 includes 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 will be done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project includes upgrades to turbine and generators, and alternating current stations intended to extend the life of the unit by 20 years. Lastly, the project will upgrade the existing oil containment system at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators will be replaced, and other modifications will be made to the powerhouse interiors and to the transformer decks to discourage contaminated discharges into the adjacent streams. A monitoring system will be installed to alert Hetch Hetchy Water & Power (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 & cleanup.

CUH10113 - Kirkwood Penstock

Kirkwood Penstock was built in 1964 and conveys the SFPUC water supply from Canyon Tunnel to KPH. Kirkwood Penstock has experienced significant foundation movement without impact to the service utility. In February 2007, however, there was significant movement on the penstock, and the penstock partially detached from one fixed saddle directly below anchor block 2. The scope of this project includes an internal and external inspection; development of an Emergency Action Plan and a Penstock Monitoring Plan; repairs to the damaged saddle; installation of a

monitoring system; and procurement of emergency spare equipment.

CUH10114 - 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. This is a design-build project and was advertised twice in 2011 and 2013. Bids were unresponsive. The project will also involve 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.

CUH10115 - Warnerville Substation Rehabilitation

Warnerville Substation facilities and equipment have reached the end of their life expectancy. The facility needs to be upgraded to meet regulatory and safety requirements. This project will address major renewal and replacement of the substation components, including grounding, fence, circuit breaker, control room, electrical equipment, and disconnect switch. This project will also improve grading in the substation.

CUH10116 - Moccasin Penstock

The Moccasin Penstock conveys San Francisco Public Utilities Commission (SFPUC) water nearly one mile from Moccasin Tunnel to the

Moccasin Powerhouse. 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 back to 1924 and has been in service for more than 90 years. Condition assessments based on external inspection and imaging have identified a number of deficiencies along the original pipe. The 104-inch diameter (narrowing to 98-inch) riveted steel penstocks extend 1,554 feet from the downstream Moccasin Tunnel portal then bifurcate to four 66-inch diameter hammer-forged welded steel conduits extending about 2,384 feet to the lower welded steel pipe. Additionally, in September of 2018 the penstock experienced significant leakage in two separate areas, necessitating emergency repairs. This rehabilitation project is intended to enhance the reliability of the penstock system and will include: repair or replacement of some sections of corroded pipe; repair or replacement of four badly cracked concrete anchors and damaged penstock saddles; installation of new manways and a rollout pipe section to provide better access for inspection and maintenance; and recoating the outside pipe, where needed, to reduce future corrosion. The project scope was expanded to include: 1) The installation of additional penstock pipe between the valve house and the first downstream anchor; 2) The replacement of the butterfly valve pneumatic actuator with an electronic actuator, which will include new controls with SCADA connectivity; and 3) A new backup generator.

CUH10119 - Early Intake Switchyard Slope Hazard Mitigation

The Hetch Hetchy Water and Power (HHWP) Early Intake Switchyard (ISY) is a 230 kV switchyard located alongside the Tuolumne River, downstream of HHWP's Kirkwood Powerhouse (KPH). The switchyard is a critical HHWP asset that provides the transmission of electrical power generated at Kirkwood and

Holm powerhouses to Moccasin, as well as the local distribution of power to HHWP's upcountry facilities. The slope requiring hazard mitigation, located next to ISY, was severely burned in the Rim Fire. The purpose of the project is to reduce the risk of slope failure which may cause damage to the switchyard and loss of power transmission capability.

CUH101PD - 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

10032903 - O'Shaughnessy Dam Outlet Works Phase 1

O'Shaughnessy Dam (OSD) was completed in 1923 and raised in 1938. Condition assessment of the dam outlet works revealed deficiencies. This rehabilitation project addresses deficiencies of the existing outlet works system at OSD, including the drum gates and release system through OSD to Canyon Tunnel and the Tuolumne River. A recent condition assessment identified deficiencies in the OSD release system. Seven projects were identified

and have been prioritized. Phase 1 will include three of these projects: drum gate rehabilitation (upgrading the hinges and rivets, recoating the gate and existing seals, and repairing the spillway concrete), installation of a new bulkhead system, and rehabilitation of slide gates & installation of a diversion pipe butterfly valve.

CUH10214 - Moccasin Facilities New Construction

The existing HHWP shops and buildings are original and vary in age from between 45 to 80 years old. Some maintenance crews are currently working in buildings that were not originally intended to be used as shops. Many of these facilities do not meet current codes, require extensive repairs, and are not efficient work environments. The primary objective of this project is to build a 10,000-square-foot, combined-function building consisting of a plumbing shop, vegetation management shop, right-of-way shop, electric technician chop, lockers, shower facilities, break room, and new materials bins.

CUH10215 - 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.

CUH10216 - Cherry Dam Outlet Works Rehabilitation

The outlet facilities for Cherry Dam have reached the end of their service life at nearly 60 years old. The stream release assets must work sufficiently well to meet U.S. Department of

Interior's stream flow requirements, and these requirements cannot currently be met at low lake elevations. The 66" valves will be replaced in order to safely operate the dam during storm conditions with heavy inflows to Cherry Lake. The valves are critical for maintaining maximum carryover storage and meeting the SFPUC's water supply objectives. The scope of work includes replacement of the stream release valves and associated piping as well as the Low Level Outlet (LLO) 66" hollow jet valves. The project also replaced both butterfly valves that serve as isolation valves upstream of the hollow jet valves as change orders during construction.

CUH10220 - Mountain Tunnel Inspection & Repairs (Completed)

The objective of this project is to assess the current condition of the Mountain Tunnel and complete any urgent interim repairs to reduce the risk of tunnel lining failure until the completion of the long-term Mountain Tunnel Improvements project in 2026. The project consists of:

- A tunnel inspection in 2017 to update the Condition Assessment conducted in 2008; and
- Short term repairs in 2017 and 2018-19 to reduce the risk of failures in the concrete lining.

CUH10221 - 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:

- Initial evaluation of alternatives for the Mountain Tunnel facility, and
- Eventual design and construction of the preferred engineering alternative that will keep this vital component of the Hetch Hetchy

Water and Power System in reliable service for years to come.

The 2016 scope consisted of just the Planning Phase for the project. The primary focus was on the development of viable alternatives for the project including:

- Rehabilitation of the existing tunnel,
- Relining the existing tunnel,
- Construction of a new bypass tunnel within the tunnel right-of-way, and
- Construction of a new bypass tunnel outside the tunnel right-of-way.

In 2017, the existing tunnel was shut down for 60 days and a detail inspection was performed. The inspection and subsequent condition assessment found many defects in the tunnel lining. However, all the defects were repairable, and the tunnel was still structurally sound. This substantiated the viability of the rehabilitation alternative with downstream valve control, and the City adopted this as the preferred project for design and construction in July 2017. The rehabilitation option met almost all of the project performance standards with the least cost. The project consists of:

- Repairs of all significant concrete lining defect with wire mesh reinforcement and shotcrete,
- Contact grouting of the entire lining to further reinforce and seal the lining to the surround rock,
- A new downstream flow control facility at Priest Reservoir with valving to meter flows and keep the tunnel running full during all operations and mitigate future erosion of the lining,
- A new tunnel adit at Priest Reservoir to allow maintenance access to Mountain Tunnel without having to drain the reservoir in order to expose the current access portal,
- An extension of the South Fork Siphon crossing under the Tuolumne River to bypass a problematic section of the tunnel that infiltrates excessive groundwater into the tunnel, and causes adverse water quality issues,

Appendices

- An enlarged concrete portal at Early Intake to accommodate maintenance equipment access at the upstream section of the tunnel,
- Access road widening and improvements to accommodate safer maintenance access to Adit 5/6 and Adit 8/9, and
- Temporary construction staging areas, environmental mitigations, and site restoration improvements.

CUH10223 - OSH Dam Access and Drainage Improvements

The key objective of this project is to provide safe access for Hetch Hetchy Water and Power operators inside the O'Shaughnessy Dam by improving fall protection, access, and drainage. The key elements include:

- Replace Access Structures in Ladder Wells. The existing access structures in the four (4) vertical ladder wells (shafts) include vertical ladders and horizontal grating platforms that are spaced throughout the ladder wells.
- Install Fall Protection Systems. Install new Occupational Safety and Health Administration (OSHA) compliant ladders and landings with safety cage and/or install fall restraint systems.
- Seal or Mitigate Existing Leakage. Address flowing water by sealing leaks or otherwise diverting, collecting and disposing of flows.
- Drainage Improvements. Clear the drains in the dam so that water can drain as designed and/or install sump pumps, if appropriate.
- Replace Watertight Door between Ladder Wells 3 & 4. This scope item includes replacing the existing watertight door between Ladder Wells 3 & 4.

10035086 - Bridge Replacement (4 Bridges)

HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessment has identified the need for rehabilitation and/or replacement (both due to age and to meet current seismic design criteria). Four of the fourteen bridges require substantial

modification or replacement and have been combined into this project. This project includes rehabilitation and/or replacement of Cherry Lake Road Bridge (public access), Early Intake Bridge (public access), and O'Shaughnessy Adit Access Bridge.

CUH102PD - 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.

2018 MOCCASIN STORM EVENT**10033233 - 2018 March Storm Event
Emergency Repairs and Interim
Improvements**

On March 22, 2018, a storm event caused widespread damage to Tuolumne County. Hetch Hetchy Water and Power (HHWP) sustained considerable damage to assets associated with water supply, drainage, and power generation, including Moccasin Lower Dam and auxiliary spillway, Moccasin Upper Diversion Dam, Moccasin Reservoir, Priest Reservoir, Moccasin Powerhouse, and Moccasin Lowhead Powerhouse. On March 29, 2018, the Mayor of SF, Mark E Farrell officially declared the storm damage a Local Emergency Event. This project addresses the emergency repairs and interim improvements to the water-related assets located in Moccasin. Various contracts will be utilized to complete construction activities associated with: debris removal from the Moccasin Upper Diversion Dam and Moccasin Reservoir; repairs to the Moccasin Upper Diversion Dam; repairs to the Moccasin Lower Dam; replacement of the Leithold Line water distribution line; replacement of drainage systems (culverts and piping); access improvements to the Gate 3 structure located in the Moccasin Reservoir; installation of debris barriers upstream of the Moccasin Upper Diversion Dam and within the Moccasin Reservoir; and installation of a flood control berm downstream of the Moccasin Lower Dam.

A1-B HETCHY RENEWAL AND REPLACEMENT PROGRAM

WATER INFRASTRUCTURE

CUH10001 - SJPL Rehabilitation

The San Joaquin Pipelines (SJPLs) convey water from Foothill Tunnel to Coast Range Tunnel. The asset varies in age from 5 to almost 80 years old. Hetch Hetchy Water and Power (HHWP) have developed an annual program to inspect, monitor and manage the SJPLs and extend the life of the asset prior to replacement.

CUH10005 - Priest Pipe Recoating (Completed)

The coating on a 24" pipe located in a tunnel at Priest Reservoir has failed. The project scope will be to recoat the pipe.

POWER INFRASTRUCTURE

CUH10103 - Powerhouse Control Upgrade (Completed)

This project will upgrade the powerhouse protection, control, indication, and monitoring system. The electromechanical relays will be replaced with multifunction digital relays to improve reliability and functionality of the electrical protection system. The scope of work includes de-terminating the wiring, removing relays from the main control board, and installing new relays and internal wiring. Digital relays have diagnostics that will notify or alarm the operator if there is relay trouble, thus preventing potential consequential failures, damage, and electrical safety hazards. The existing electromechanical type relays do not have diagnostic capability and present a higher overall risk of failure. If an electromechanical relay does fail, there is a loss of protection on the electric system that could prevent generation. Furthermore, the digital type requires less maintenance at once every five years instead of annually as required for

the electromechanical type under regulatory requirement PRC-005.

CUH10108 - Step-Up Transformers (Completed)

These projects include replacing step-up transformers at Kirkwood and Cherry Ridge Line.

CUH10109 - Moccasin Low Head Rehabilitation Project (Completed)

This project is for the rehabilitation of the Moccasin Low Head Powerhouse, which includes the following components: Replace Roof - Repair or replacement of the aging powerhouse roof. Oil Spill Containment / Prevention - Provision on an oil separation system or other modification should be installed inside the powerhouse to prevent contamination. Upgrade Excitation System - Replacing the existing excitation system with a modern digital excitation system to improve unit availability. A reliable, functioning excitation system is required for unit generation. Upgrade Electrical Protective System - Replace the single function, solid state relays with multifunctional digital relays to improve reliability and functionality of the electrical protection system. The scope includes de-terminating the wiring, removing relays from the main control board, and installing new relays and internal wiring. Upgrade Unit Control System - this project upgrades the unit control system and re-locates the control panel to improve safety conditions for operations personnel. Governor Upgrades - this project provides for the upgrade of the mechanical governor to digital governor. This project is required so we can backfeed from the low head for the Moccasin Compound while upgrades are performed at Moccasin Switchyard.

CUH10110 - Early Intake Switchyard (Completed)

This project is for the rehabilitation of the Early

Intake Switchyard, which includes the following work: replace existing oil circuit breakers (OCBs) with new gas powered circuit breakers on Kirkwood and Holm section of 230kv bus; install gas powered circuit breakers and related components including bus conductors, structural steel, control cables, and galvanized rigid steel conduits. Install City furnished capacitive voltage transformer (CVTs) and surge arresters. Replace main bus-side and line-side disconnects bay 1 through 7, replace Aux bus disconnects bays 1 through 7, replace main bus-side breaker and aux bus disconnect within bay 0. Replace cap and pin insulator stacks with equivalent replacement post insulators within the main and aux buses, including underhung T-drop bus supports. Replace insulators associated with main bus sectionalizing switch. Removal of wave trap remnants, install new support structures. Remove and dispose of existing above grade oil transfer piping system. Connect into new programmable logic controllers (PLC) system. Install a Shoe-fly-bypass using a job order contract (JOC) contractor.

CUH10111 - Moccasin GSU Transformers & Oil Containment (Completed)

This project will provide replacement for two Generator Step Up transformers. The project scope also includes the concurrent design of oil containment of the specified transformers. The assessment will provide a cost estimate to develop the scope and specification criteria to be provided to a consultant engineer to develop construction drawings and specifications.

CUH10112 - Kirkwood Powerhouse Refurbishment & TSOV (Completed)

This project will provide funding for the rehabilitation of Kirkwood Powerhouse to increase life expectancy of the asset as well as improve safety by replacement of the two turbine shutoff valves (TSOVs). The scope of

work for the proposed project includes the following:

- Remove and replace TSOVs for Unit 1 and Unit 2 at Kirkwood Powerhouse.
- Replace the 480V breakers, complete switchgear lineup, Motor Control Centers (MCCs) and panel board with provision for an additional.
- Refurbish / replace various auxiliary systems including: cooling generators, exciters, turbines, transformers, building mechanical equipment, and building structure.
- Add Partial Discharge Analysis Instrumentation to Generator Unit 3 which includes monitoring the Unit 3 generator stator winding insulation and generator with a partial discharge analysis (PDA) instrument.
- Upgrade Vibrator Monitor System including removing the existing system, installing three independent systems with associated sensors and cabling, and incorporating systems into unit controls.

CUH10117 - Transmission Clearance

Moccasin Powerhouse Generators No. 1 and No. 2 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 the Generator No.1 and/or No. 2 stator cores and coils to uprate from 57.5 (MVA) to new rating of 61 MVA. The scope of work also include 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 to supply a new rotor rim for each generator following inspection and testing.

CUH10121 - MPH Bypass Valves

Following the 2013 Rim-Fire, the City was invited to apply for a FEMA Hazard Mitigation Grant. A grant application was prepared and submitted in 2014 to provide

mitigation measures for the potential hazards posed by the steep mountainside situated southeast of the Early Intake Switchyard (ISY). In the past there have been damage and shutdowns of the switchyard due to mudflows, rock falls, and landslides. The Rim Fire burned vegetation from much of the slope, thereby increasing the likelihood of future damage.

JOINT INFRASTRUCTURE

CUH10203 - Reservoirs and Dams

This project includes a condition assessment on all reservoirs and dams as well as more immediate projects to address safety or environmental concerns. The project includes a condition assessment of all storage and regulating reservoirs (six total) to identify work to be performed. Work is being prioritized and included in the Hetch Hetchy 10-Yr CIP Plan.

CUH10205 - Small Water Systems Upgrades (Completed)

Upgrade small water systems at Moccasin Compound, O'Shaughnessy and Early Intake in order to meet state regulatory compliance requirements. HHWP must upgrade their small water systems with ultraviolet (UV) treatment equipment.

CUH10207 - Existing Hetchy Facilities (Outside Moccasin) (Completed)

This project will fund the rehabilitation of all HHWP facilities outside of Moccasin (approximately 80 facilities). Within the work included are: Maintenance - Painting, Roof Replacement, Gutters, Dry Rot, Foundations and Drainage upgrades. Hazardous Material Abatement - Lead and asbestos removal. Building and Electrical Code Violations, Water Distribution System, Waste Water and or Septic Tanks and Energy Efficient Projects. The scope of work on the Industrial Buildings will consist of repairs to the Arc Flash deficiencies

and provide Emergency Power for the Support Facilities.

CUH10208 - Remote Terminal Unit Replacement (Completed)

The project includes removing the unit annunciator remote terminal unit and installing a Modicom I/O rack, wiring signals to new I/O, and migrating signals through the new programmable logic controllers for access by the new supervisory control and data acquisition system. This project is an upgrade to the existing system and will improve reporting and operations. This project is part of an ongoing HHWP program to upgrade the SCADA and unit controls for both the water and power systems.

CUH10209 - Road Improvements

This project includes maintaining almost 50 miles of paved roads and rehabilitation of eleven bridges. Preliminary findings in the condition assessment indicate that some of the bridges will require replacement and/or retrofit. Also, signage, reflectors, guardrails, slope stabilization, and selective road widening will be required to enhance the safety of road users.

CUH10210 - Hetchy Fiber Projects (Completed)

This project will install fiber between Modesto and Moccasin Peak on lines 5/6 and lines 7/8, as well as replace the fiber system within the Moccasin compound. Fiber will become the primary means of communication, with our existing licensed microwave functioning as the redundant system. Communication channels will include the business network, control network, security network, protection network, and voice over internet protocol (VoIP) network. The upgraded system will not only meet regulatory requirements but provide a more secure, reliable communication and power protection system. By 2022, the fiber electronic hardware will have reached the end

of its technical life expectancy and will require upgrades.

CUH10211 - Facilities Security Project

HHWP is updating security fences and installing card access at remote locations. HHWP is also evaluating new security requirements that are now required to meet North American Electric Reliability Corporation (NERC) regulatory requirements. HHWP only has door alarms at many remote sites. Increased security is required including fencing, card access and camera monitoring to minimize the risk of intrusion at these facilities. In addition, HHWP has to address regulatory security requirements.

CUH10212 - Moccasin Penstock

Moccasin Penstock was built in the early 1920s and conveys the SFPUC water supply from Moccasin Tunnel to Moccasin Powerhouse. HHWP is currently in the process of performing a penstock condition assessment. The penstock includes about four miles of hammer-forged welded steel penstock and may be subject to failure. In addition, issues have been identified regarding the anchor/saddle system. The short-term program includes completing the condition assessment, performing repairs at locations with significant corrosion, and addressing concerns with the anchor/saddle system. In 2015, coating and lining issues will be addressed on the non-hammer-forged welded sections. The long-term project is to replace the hammer-forged welded section if this is the most cost-effective alternative identified during the condition assessment.

CUH10213 - Communication System Upgrade

The project will provide funding for replacement and expansion of the HHWP two-way radio system resulting in better coverage in the up-country river canyons as well as inter-divisional communication with other water enterprise operating divisions in

the Bay Area. In addition, the project will extend 6GHz microwave communication to remote locations such as O'Shaughnessy and Cherry Valley Dams and Cherry Pump Station, allowing for remote monitoring and control of assets, enhanced security capabilities as well as business network connectivity at those sites. Lastly, this project will complete redundant paths of communication for control network systems between critical facilities such as HPH, KPH, and ISY using both microwave and fiber technology for those short hops.

A2 SAN FRANCISCO POWER ENTERPRISE GENERATION

CUH94763 - Go Solar SF Program

GoSolarSF is an incentive program to encourage San Francisco residents to install solar power systems by offering one-time incentive payments to reduce the costs to the homeowners. The program launched in 2008 and provides between \$2 and \$5 Million per year in incentives. This program does not result in construction or capital projects that the City owns and operates. The City simply pays incentives to residents for projects that the resident contracts for and may own or lease from a solar contractor.

CUH99302 - Alvarado Elementary School -- Solar Electric (Completed)

The project scope consists of the design and the installation of a 50kW solar electric system on top of the Alvarado Elementary School. The Design Phase includes DC/AC electrical and structural design for the photovoltaic (PV) stationary rack mounted array and equipment pad area. The Construction Phase includes installation of approximately 250 solar modules and installation of inverters and supporting electrical equipment with interconnection onto the PG&E distribution system. There are no advertisement dates or bid/award dates (not applicable) since this project will be designed by the SFPUC and constructed by DPW.

CUH99307 - North Beach Library Solar - Renewable/Generation - Small Renewables (Completed)

The project scope consists of the design and the installation of a 10.0kW solar electric system on top of the newly constructed North Beach Library. The Design Phase includes DC/AC electrical and structural design for a photovoltaic (PV) stationary rack mounted array and equipment area. The Construction

Phase includes installation of approximately 35 solar modules and installation of an inverter and supporting electrical equipment with interconnection onto the PG&E distribution system.

CUH99308 - SF Academy Solar Carport

The project consists of the design and installation of carports mounted with a solar electric system in the existing carpark located at the San Francisco Police Academy, 350 Amber Drive, in the Diamond Heights Neighborhood. The design phase includes electrical and structural design for the carport structure and integrated photovoltaic (PV) array. The Construction Phase will include the installation of the carports and mounting of a grid-connected PV system of approximately 220kW in size. Once completed, the PV system will be interconnected to the PG&E electrical distribution system and supply the building load.

CUH99309 - Marina Middle School Solar

The project scope consists of the design and the installation of a rooftop solar electric system at Marina Middle School. The design phase includes DC/AC electrical and structural design for a photovoltaic (PV) rack mounted array and related electrical equipment. The Construction Phase will include the installation of a grid connected PV system. Once completed, the PV system will be interconnected to the PG&E electrical distribution system.

EFFICIENCY

CUH983 - Civic Center Sustainable District Program

The Civic Center Sustainable District Program involves retrofitting City buildings and facilities in the Civic Center to create a substantial reduction in building carbon footprint, electricity, natural gas, and operating costs, while improving operations and

occupant comfort. Buildings and facilities included in this program are: City Hall, Asian Art Museum, Main Library, Department of Public Health, Civic Center Garage, Brooks Hall, UN Plaza, San Francisco War Memorial: Davies Symphony Hall, Veterans Building, and Opera House.

CUH986 - Energy Efficiency - General Fund Program

This project funds the planning, design and construction of Energy Efficiency (EE) projects at General Fund facilities. Energy retrofits include lighting, heating and ventilation, energy management systems, and demand response projects. These EE projects provide reductions in greenhouse gas emissions, upgrades to these public facilities, and result in long-term utility cost savings for the General Fund. The FY15 funds the staff and consultants to implement projects from previous fiscal years, along with limited other project technical and implementation expenses for new EE projects. FY16 and later fiscal year budgets will primarily fund staff expenses and will focus on project planning and development (for non-PUC funding sources), support for departments which have project funds available, and lower-cost EE projects and services (e.g. building retro-commissioning). Budgets also support staff and consultants related to the Benchmarking and Auditing Ordinance.

CUH995 - Energy Efficiency - Enterprise Fund Program

This project funds planning and operating energy efficiency services for new residential and other customers (e.g., at Hunter's Point Shipyard and Treasure Island), Enterprise Departments, and direct-paying customers of the Power Enterprise. Municipal customers served by this capital fund include the Port and Port Tenants, San Francisco Airport, SFPUC, MUNI, Convention Facilities, City College and, San Francisco Unified School

District (SFUSD). There are multiple sub-projects under this program. Milestones for individual sub-projects are not shown.

STREET LIGHTS

CUH896 - Streetlight Replacement

The SFPUC maintains approximately 25,500 street lights in the City of San Francisco. This Program funds various street lighting programs; street light engineering and capital support services; electric vehicle charger installations; community benefits capital projects; small and large street lighting capital projects; and street lighting Repair and Replacement (R&R) projects. The overall program provides funding for multiple projects over multiple years with varying start and ending dates.

CUH91503 - San Bruno Street Light Improvement Project (Completed)

San Bruno Street Light (SL) Improvement Project will upgrade the streetlights at San Bruno Ave. between Silver Ave. and Wilde Ave. Approximately 51 Light-emitting diode (LED) fixtures, 68-Lumec Optima Post-top light poles with High Pressure Sodium Vapor (HPSV) luminaires, will be replaced with LED luminaires. The proposed new poles will match the existing 16 foot poles with post top fixtures. The majority of the scope of work includes LED swapping of HPS luminaires, sidewalk removal, trenching, foundation and electrical conduit work, installation of light poles and fixtures, and more than 37 Pacific Gas and Electric Company (PG&E) power connections. Several Department of Public Works (DPW) banner poles would be utilized as streetlights.

RETAIL SERVICES

CUH870 - Distribution Services Retail Customers

A program to develop SFPUC-owned electrical

transmission and distribution facilities along the Bayside of San Francisco has been initiated. The long term geographical area of interest stretches from City of Brisbane boundary in the South, to China Basin in the North. System planning studies are currently being conducted by PG&E. The objective is to have a transmission agreement with PG&E to receive transmission level voltage from PG&E Potrero substation at 115kV or 230kV, transform this high voltage to 34.5 kV, and then distribute this lower voltage to SFPUC Power Enterprise electrical customers. A pool of 4 qualified contractors has been selected for distribution work. A Request for Bids (RFB) (DB-128R) will be issued to these qualified bidders February 2017, with a planned contract award date at end of March 2017. The scope of Phase One of the program (DB-128R plus other supplementary contracts) encompasses ductbanks, conduits, cables, electrical equipment and vaults underground from 23rd Street along Illinois to 16th St, and then Terry Francois Boulevard to South Street. The Phase One work is planned to be completed by end of December 2018. Contract arrangements, and design and construction of the SFPUC substation will proceed in parallel with the Phase One distribution project. The balance of the Bay Corridor Transmission Distribution project will be built in subsequent stages.

CUH891 - Metering and Load Monitoring

The purpose of this project is to install metering and communication infrastructure to cost effectively collect reliable meter data from existing and future PUC customers in geographically dispersed areas. Replacement of outdated EMON meters at Moscone Center, Pier 80 and other locations are within the scope of this project. Based upon the evaluation performed by CUH972, the following procurements may be pursued by the Power Enterprise: (1) procurement of an AMI system for meter data communication as part of CUH891, (2) replacement of all or a portion of

the 2000-Pacific Gas & Electric Company (PG&E) meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, or (3) purchase of PG&E owned meters from PG&E.

CUH973 - Distribution System Assessment (Completed)

This project will fund a feasibility study to assess the general condition of Pacific Gas and Electric Company's (PG&E) electric distribution system within the boundaries of the City and County of San Francisco. In particular, this will include an assessment of the general condition (age, condition, and technology) of the facilities (including overhead/underground wires, poles, substations, transformers, and meters) and an assessment of the connection of the distribution system to the existing grid. This feasibility study is the first phase toward evaluating the costs and benefits of either purchasing PG&E's distribution system or constructing a City-owned distribution system. The specific focus of this study will be to assess the feasibility of installing intervening facilities and distribution in order to aggregate current load served under the PG&E Interconnection Agreement (IA), additional load on City-owned property (such as the Port), and redevelopment load (such as the Transbay Terminal) under new Wholesale Distribution Tariff Agreements after the IA expires. Total Estimated Cost: \$1,000,000. This project is a study with no physical construction envisioned.

TRANSMISSION - DISTRIBUTION SYSTEM

CUH972 - Load Meter Project

The purpose of this project is to identify and then implement the most cost effective method to collect reliable meter data from existing and future SFPUC Power customers in geographically dispersed areas. The project

will evaluate the feasibility of implementing an Advanced Metering Infrastructure (AMI) System with the intent to identify a meter data acquisition strategy that is technically and financially in the best interest of the PUC. Based upon this evaluation, the Power Enterprise may opt to procure an AMI system. The feasibility study will entail a needs assessment to determine the SFPUC operational requirements, followed by an evaluation of contractual and regulatory factors, meter and wireless communication systems capabilities, equipment and software cost, and the feasibility of using PG&E's existing AMI infrastructure to gather municipal meter data. In tandem, a meter inventory will be performed. Alternatives will be developed, including among others (1) replacing all or a portion of the 2000-Pacific Gas & Electric Company (PG&E) meters used to serve our municipal load customers with meters that would be owned by the Power Enterprise, and (2) the Power Enterprise purchasing these meters from PG&E. A cost benefit analysis will be performed on each alternative to determine the preferred strategy. The remote meter data acquisition strategy that provides the greatest value for SFPUC customers will be identified, followed by system procurement and implementation.

CUH985 - Transbay Transit Center

The City and County of San Francisco ("the City"), through its Public Utilities Commission (SFPUC), will provide construction and permanent electric services to the new Transbay Transit Center, including adjacent bus ramps, and the new bus storage facility at Stillman Street, in San Francisco, California. The SFPUC, in agreement with the Transbay Joint Powers Authority (TJPA), will provide electric service to the Transit Center by installing two 12-kilovolt (kV) electric circuits, 12-kV switchgears, transformers, and other electrical equipment.

10033821 - Intervening Facilities

Under the Wholesale Distribution Tariff (WDT), electric service requires intervening facilities between PG&E's service points and SFPUC end-use customers. The installations of intervening facilities are needed for the upgrade of new electric service, conversion of service from secondary to primary service level, and aggregation of electric service to common points of service interconnection where feasible. The electric service improvements cover the installation of service cables, medium voltage switchgears, transformers, switches, service equipment and distribution infrastructures to be owned and maintained by the SFPUC Power Enterprise.

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APPENDIX C. LIST OF ACRONYMS

AC	Alternating Current	NERC	North American Electric Reliability Corporation
AMI	Advanced Metering Infrastructure	NHPA	National Historic Preservation Act
BCTD	Bay Corridor Transmission Distribution	NPS	National Park Service
CATEX	Categorical Exemption	NTP	Notice to Proceed
CCSF	City and County of San Francisco	O&M	Operations and Maintenance
CEQA	California Environmental Quality Act	OCA	Office of Contract Administration
CER	Conceptual Engineering Report	OCB	Oil Circuit Breakers
CIP	Capital Improvement Program	OSD	O'Shaughnessy Dam
CM	Construction Management	OSHA	Occupational Safety and Health Administration
COVID-19	Coronavirus Disease of 2019	PD	Project Development
CVT	Capacitor Voltage Transformers	PG&E	Pacific Gas and Electric Company
DB	Design, Build	PLC	Programmable Logic Controllers
DC	Direct Current	PUC	Public Utilities Commission
DC/AC	Direct Current/Alternating Current	PV	Photovoltaic
DCU	Data Collection Unit	R&R	Renewal and Replacement
DPH	Department of Public Health	RFP	Request for Proposal
DPW	Department of Public Works	ROW	Right-of-Way
EE	Energy Efficiency	RTU	Remote Terminal Unit
FEMA	Federal Emergency Management Agency	SCADA	Supervisory Control and Data Acquisition
FY	Fiscal Year	SF	San Francisco
Ghz	Gigahertz	SFO	San Francisco Airport
GSU	Generator Step-Up	SFPUC	San Francisco Public Utilities Commission
GWH	Gigawatt Hours	SFUSD	San Francisco Unified School District
HCIP	Hetchy Capital Improvement Projects	SJPL	San Joaquin Pipeline
HH	Hetch Hetchy	SJVH	San Joaquin Valvehouse
HHWP	Hetch Hetchy Water and Power	TBD	To be determined
HMGP	Hazard Mitigation Grant Program	TI/YBI	Treasure Island/Yerba Buena Island
HPH	Holm Powerhouse	TJPA	Transbay Joint Powers Authority
HVAC	Heating, Ventilation, and Air Conditioning	TTC	Transbay Transit Center
IA	Interconnection Agreement	TTF	Tesla Treatment Facility
ISY	Intake Swithyard	TUV	Tesla Ultra Violet
JOC	Job Order Contract	USFS	United States Forest Service
KPH	Kirkwood Powerhouse	USGBC	United States Green Building Council
kV	kiloVolt	VoIP	Voice Over Internet Protocol
kW	kilowatt	WDT	Wholesale Distribution Tariff
LCA	Lower Cherry Aqueduct	WSIP	Water System Improvement Program
LED	Light Emitting Diodes		
LEED	Leadership in Energy and Environmental Design		
LLO	Low Level Outlet		
MOU	Memorandum of Understanding		
MPH	Moccasin Powerhouse		
MUNI	Municipal Railway		
MW	Megawatt		



DATE: September 2, 2021

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

FROM: Michael Carlin, Acting General Manager



RE: Hetch Hetchy Capital Improvement Programs Quarterly Report
 4th Quarter / Fiscal Year 2020-2021

Enclosed please find the Hetch Hetchy Capital Improvement Programs Quarterly Report for the 4th Quarter (Q4) of Fiscal Year (FY) 2020-2021. 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 April 1, 2021 to June 30, 2021.

This quarterly report incorporates the Hetch Hetchy Capital Improvement Programs 2018 Baseline that was approved by the San Francisco Public Utilities Commission (SFPUC) on December 11, 2018. The scopes, schedules, and budgets are included for individual projects over \$5M that are currently active or planned to be active within FY19/20 or FY20/21 and are part of the Hetchy Capital Improvement Projects (HCIP), a sub-set of projects within the adopted SFPUC Ten-Year Capital Plan for FY18/19 through FY27/28 for the Hetch Hetchy Water and Power (HHWP) Division of the Water Enterprise.

This report also includes a status summary of the Hetch Hetchy Renewal and Replacement (R&R) programs, including Water, Power, and Joint assets. The progress of these R&R programs is measured and reported upon based on the status of planned milestones at the end of the reporting quarter and forecast milestones for the subsequent quarter.

As reported last quarter, the Power Enterprise Capital Improvement Program will no longer be reported in these quarterly reports commencing with this quarter.

London N. Breed
 Mayor

Sophie Maxwell
 President

Anson Moran
 Vice President

Tim Paulson
 Commissioner

Ed Harrington
 Commissioner

Newsha Ajami
 Commissioner

Michael Carlin
 Acting
 General Manager



The highlights for this reporting period are as follows:

For Contract HH-1000R, Mountain Tunnel Improvement project, the contractor has set up all office trailers and most staging areas needed for the project. The large excavation crane was mobilized at Priest Reservoir. Construction of the retaining walls and mass excavation of the hillside to build the access shaft and pad for the Flow Control Facility (FCF) and also for the Priest adit portal were initiated. The large keyway armored spoil areas were constructed to receive excavation material from the FCF shaft and Priest adit portal. Safety improvements for the access roads continued to be constructed. In depth planning and coordination is taking place for construction work that will be performed during the first Mountain Tunnel outage in early 2022. Forecast construction completion is at the end of 2026.

For Moccasin Penstock Rehabilitation project, the draft condition assessment and structural evaluation reports were distributed for review. The reports are anticipated to be finalized in September.

For Design Build Contract DB-121R2 Moccasin Powerhouse Generators Rewind, two qualified contractors actively participated in negotiations with the City over contract terms including modifications to the City's standard indemnification requirements that were proposed by both contractors, which would require Board of Supervisors' (BOS) approval to change. The Acting General Manager recommended that the Commission award the contract to General Electric Renewables US LLC (GE) based on more favorable terms provided, and subject to BOS approval of the modified indemnification language. On May 11, 2021, the contract was awarded to GE by the Commission subject to BOS approval, and on June 8, the BOS approved the non-standard indemnification language based on the City Risk Manager's recommendation. Notice to Proceed No. 1 (for design) was issued on June 21, 2021.

For Contract HH-1003R, Moccasin Powerhouse Generator Step-Transformer Installation, Big Valley Electric was awarded the contract by the Commission on April 27, 2021. Notice to Proceed was issued on June 7, 2021.

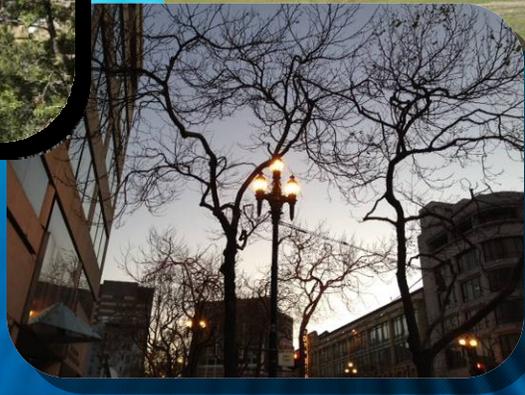
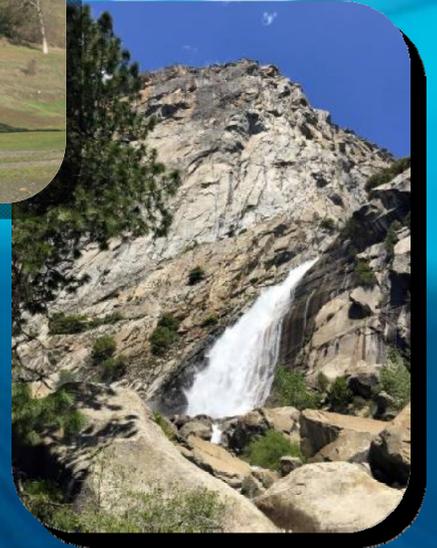
For Contract HH-1002R, O'Shaughnessy Dam Access and Drainage Improvements, four bids were received. Mountain Cascade was awarded the contract by the Commission on June 8, 2021. Notice to Proceed is anticipated in Early October.

For Contract HH-1001, Moccasin Reservoir Perimeter Security Fence, the Commission accepted and authorized final payment for the work completed under contract No. HH-1001 by Resolution No. 21-0072 at its May 11, 2021 meeting.

Attachment



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



QUARTERLY REPORT

Hetch Hetchy Capital Improvement Programs
April 2021 – June 2021

Published: August 31, 2021

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Quarterly Report

Hetch Hetchy Capital Improvement Programs

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**I. HETCH HETCHY WATER AND POWER (HHWP)-
WATER DIVISION CAPITAL IMPROVEMENT PROGRAMS**

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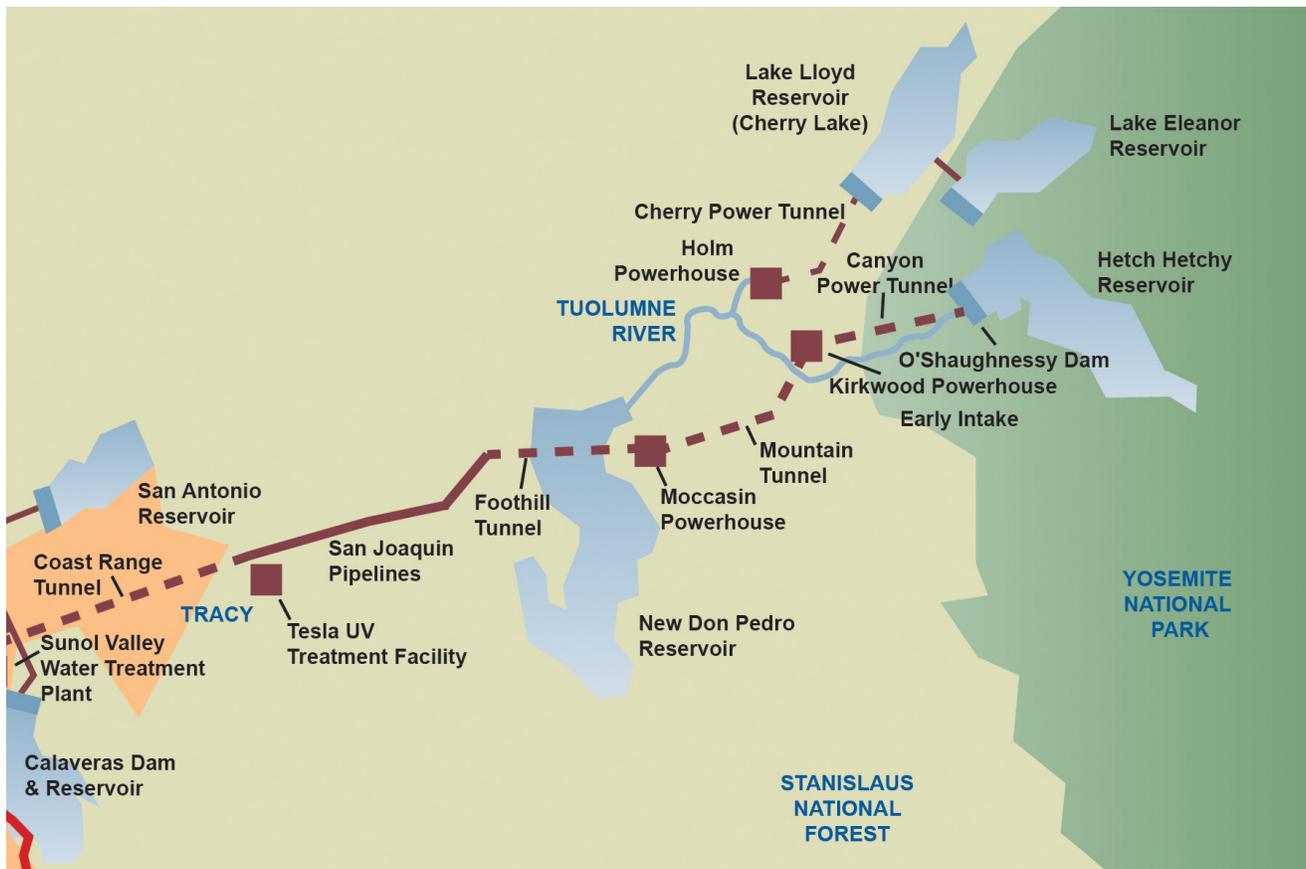
INTRODUCTION

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.

The HHWP Water Division's capital improvement programs are divided into two programs: Hetchy Capital Improvement Projects (HCIP) and Renewal and Replacement (R&R).

A majority of HHWP staff is based in Moccasin, CA, which is 140 miles east of San Francisco. The map below shows the location of the assets and facilities associated with HHWP.



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I.A. 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 to align with the Hetch Hetchy 10-Year Capital Improvement Program (CIP) Plan for Fiscal Years (FY) 2019-2028. These asset groupings consist 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 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 fourth (4th) quarter report for FY2020-2021 presents the progress made on the HCIP between April 1, 2021 and June 30, 2021. The data reported herein as the "approved" project budget and schedule conforms to the annual update of the Hetch Hetchy 10-Year CIP for FY2019-2028, approved by the Water and Power Enterprise Managers and adopted by the Public Utilities Commission on February 13, 2018.

On December 11, 2018, SFPUC approved the Hetch Hetchy Capital Improvement Programs 2018 Proposed Baseline of \$682.93M, a subset of the Hetch Hetchy 10-Year CIP for FY2019-2028. The Approved Baseline included projects over \$5M that were then active or were intended to be active by FY2020. The status of these projects included in the 2018 Approved Baseline are discussed in this quarterly report and can be found in sections I.A.6 and I.A.10.

I.A Hetchy Capital Improvement Projects Quarterly Report

The CUH10215 – Canyon Tunnel Rehabilitation project remains in “On-Hold” status.

Project Development (PD) accounts for program-level expenditures for each of the Water, Power, and Joint Programs were created in the 2018 Approved Baseline to capture overall programmatic costs. The accrued PD expenditures are included in Program Delivery Costs in Table 3.1 in order to give an accurate report of the overall HCIP cost performance.

In addition to the nineteen (19) projects presented in the 2018 Approved Baseline, this quarterly report includes the status of the 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets) project, which is in the closeout phase and is reported on in Section 8 of the report.

On March 22, 2018, HHWP experienced excessive rainfall and subsequent flash flooding with a large volume of debris, consisting of silt, downed trees, and logs. This affected various assets associated with Priest Reservoir, Moccasin Reservoir, and adjacent areas. The project (with funding budgeted at \$17.92M) includes debris removal and emergency repairs at the water-related assets.

The budget baseline for the project was based on initial cost estimates and contract pricing, but was not formally approved by the Commission. This project was funded by deferring money from Water projects included in the Hetch Hetchy 10-Year CIP for FY2019-2028. This project is now in closeout, with each of the three emergency contracts having received Commission acceptance of work performed.

Figure 2.1 shows the total Approved Budget for all twenty (20) projects in each phase of the program as of June 30, 2021 (excluding PD

accounts). The number of projects currently in each phase is shown in parentheses.

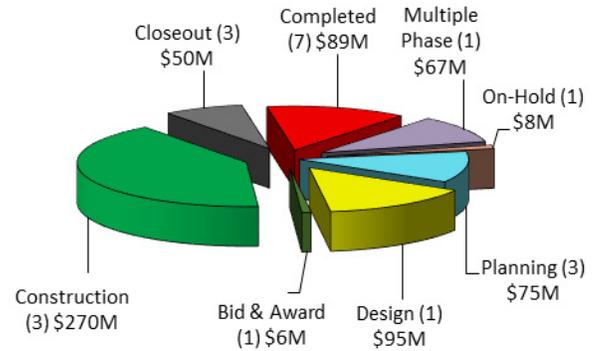


Figure 2.1 Approved Budget for Projects in Each Phase

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

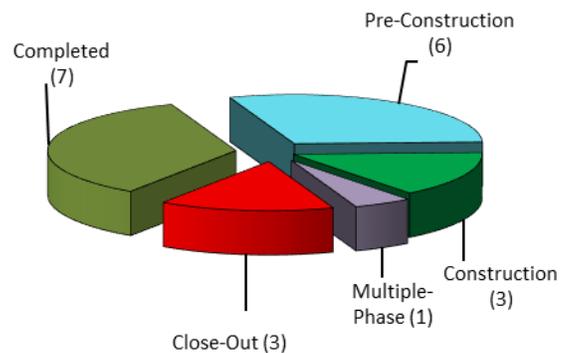


Figure 2.2 Number of Projects in Pre-construction, Construction, and Post-Construction

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

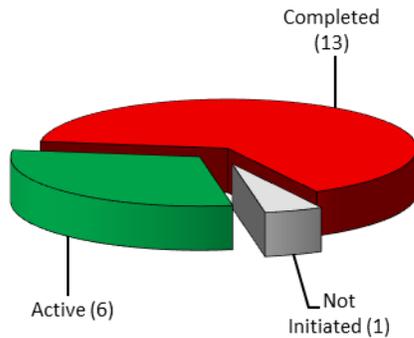


Figure 2.3 Program Environmental Review

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall cost summary of the 20 approved HCIP projects included in this report, as well as PD costs. It shows the Expenditures to Date, Current Approved Budget, Current Forecast Cost, and the Cost Variance between the Approved and Forecast Costs. The Current Approved Budget was increased by \$17.92M over the 2018 Approved Baseline with the addition of the 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets) project.

The overall program negative Cost Variance of \$34.12M in Table 3.1 can be attributed to the following factors:

- Water Infrastructure - the overall positive Cost Variance of \$5.99M is due to the following project reevaluations:
 - o The CUH10001 SJPL Rehabilitation project has been completed at \$0.75M under budget.
 - o The CUH10003 Lower Cherry Aqueduct has been completed at \$6.03M under budget.

- o The 10035574 SJPL Tesla Valves Replacement Forecasted Costs were decreased by \$3.64M due to a transfer of scope to 10035575.
- o The 10035575 SJPL Valve and Safe Entry Improvements Forecasted Costs were increased by \$3.64M due to a transfer of scope from 10035574.
- o The CUH100PD WATER ONLY/PROJ DEV Forecasted Costs increased by \$0.79M to match the 10-Year CIP Plan.
- Power Infrastructure - the overall negative Cost Variance of \$36.17M is due to the following project reevaluations:
 - o The CUH10102 Holm and Other Powerhouse Projects' Forecasted Costs were reduced by \$3.67M.
 - o The CUH10113 Kirkwood Penstock has been completed at \$1.82M under budget.
 - o The CUH10115 Warnerville Substation Rehabilitation Forecasted Costs were increased by \$9.94M for additional design and construction to complete project work; this work has been funded as part of the approved 10-Year CIP for FY2021-30.
 - o The CUH10116 Moccasin Penstock Rehabilitation Forecasted Costs were increased by \$34.09M, to match the approved 10-Year CIP for FY2021-30.
 - o The CUH10119 Early Intake Switchyard Slope Hazard Mitigation completed at \$3.36M under budget.
 - o The CUH101PD POWER ONLY/PROJ DEV Forecasted Costs were increased by \$0.99M to match the 10-Year CIP Plan.
- Joint Infrastructure - the overall positive Cost Variance of \$1.45M is due to the following project reevaluations:

I.A Hetchy Capital Improvement Projects Quarterly Report

- o The CUH10214 Moccasin Facilities New Construction was completed at \$1.33M under budget.
- o The CUH10216 Cherry Dam Outlet Works Rehabilitation has been completed at \$1.47M under budget.
- o The CUH10220 Mountain Tunnel Inspection & Repairs project was completed at \$1.99M under budget.
- o The CUH10223 OSH Dam Access and Drainage Improvements is forecasted at \$1.88M under budget.
- o The 10032903 OSD Outlet Works Phase I Forecasted Costs were increased by \$4.00M to account for initial design and construction estimates being higher than expected.
- o The CUH102PD JOINT/PROJ DEV Forecasted Costs were increased by \$1.23M to match the 10-Year CIP Plan.
- o 2018 March Storm Event – the negative Cost Variance of \$4.04M was due to increased construction cost for the flood control berm and associated construction management costs.

Table 3.1 Program Cost Summary

Cost Categories	Expenditures To Date (\$ Million) (A)	2018 Approved Budget (\$ Million) (B)	Current Approved Budget (\$ Million) (C)	Q4/FY20-21 Forecasted Costs (\$ Million) (D)	Cost Variance (\$ Million) (E = C - D)
Water Infrastructure	\$27.44	\$137.94	\$137.94	\$131.95	\$5.99
Construction Costs ⁽¹⁾	\$10.44	\$74.87	\$74.87	\$68.19	\$6.68
Program Delivery Costs ⁽²⁾	\$16.77	\$52.40	\$47.75	\$50.01	(\$2.26)
Other Costs ⁽³⁾	\$0.23	\$10.67	\$15.32	\$13.75	\$1.57
Power Infrastructure	\$57.59	\$151.19	\$151.19	\$187.36	(\$36.17)
Construction Costs ⁽¹⁾	\$26.97	\$80.79	\$80.79	\$117.82	(\$37.04)
Program Delivery Costs ⁽²⁾	\$30.45	\$57.73	\$57.79	\$66.92	(\$9.13)
Other Costs ⁽³⁾	\$0.17	\$12.68	\$12.62	\$2.62	\$9.99
Joint Infrastructure	\$89.70	\$393.81	\$393.81	\$392.36	\$1.45
Construction Costs ⁽¹⁾	\$34.87	\$215.69	\$235.69	\$237.69	(\$2.00)
Program Delivery Costs ⁽²⁾	\$54.70	\$156.05	\$156.05	\$148.70	\$7.35
Other Costs ⁽³⁾	\$0.13	\$22.07	\$2.07	\$5.97	(\$3.90)
2018 March Storm Event Emergency Repair and Interim Improvements (Water-Only Assets)	\$21.67	-	\$17.92	\$21.97	(\$4.04)
Overall Program Total	\$196.41	\$682.93	\$700.86	\$733.64	(\$32.78)

Notes:

- 1. Construction Costs** include the Construction Base Bid and owner-provided equipment/material for all projects. Those costs include any construction contingency.
- 2. Delivery Costs** include program management (i.e. Project Development), project management, planning, environmental (CEQA, permitting, construction compliance), design, construction management, and engineering support during construction.
- 3. Other Costs** include environmental mitigation, art enrichment, security improvements, real estate expenses, and director's reserve.

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 and Table 4.1 compare the 2018 Approved Schedule and the Current Forecast Schedule for the HCIP. As shown in Table 4.1, the overall HCIP is currently forecast to be completed in May 2037.

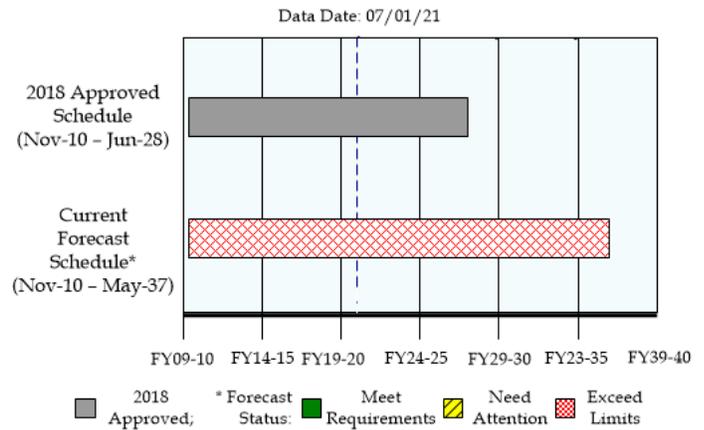


Figure 4.1 Program Schedule Summary

Table 4.1 2018 Approved vs. Current Forecast Schedule Dates

Sub-Program	2018 Approved Project Start	Actual Start	2018 Approved Completion	Current Forecast Completion	Schedule Variance (Months)
Water Infrastructure	11/08/10	11/08/10✓	06/30/28	06/30/31	36
Power Infrastructure	05/29/12	05/29/12✓	06/30/28	06/30/31	36
Joint Infrastructure	10/03/11	10/03/11✓	06/30/28	05/25/37	106.9
Overall HCIP Projects	11/08/10	11/08/10✓	06/30/28	05/25/37	106.9

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5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in \$1,000s as of 07/01/21

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Water Conveyance (Water)											
Water Conveyance (Water)											
10035574 - SJPL Tesla Valves Replacement	CN	\$ 7,380	\$ 3,740	\$ 973	\$ 3,640	★	06/28/24	12/30/22	18.0 mo. Early	★	See Section 10
10035575 - SJPL Valve and Safe Entry Improvement	DS	\$ 95,284	\$ 98,924	\$ 2,279	(\$3,640)	⚠	07/01/25	03/13/28	32.4 mo. Late	●	See Section 6
Power Infrastructure											
Powerhouse (cont'd)											
CUH10114 - Moccasin Powerhouse and GSU Rehabilitation	MP	\$ 66,714	\$ 66,714	\$ 3,598	-	★	06/28/24	04/13/27	33.5 mo. Late	●	See Section 6
Switchyard & Substations (Power)											
CUH10115 - Warnerville Substation Rehabilitation	CN	\$ 24,305	\$ 34,248	\$ 21,532	(\$9,943)	●	03/04/20	11/25/26	80.8 mo. Late	●	See Section 6
Joint Infrastructure											
Water Conveyance (Power)											
CUH10116 - Moccasin Penstock	PL	\$ 13,158	\$ 47,251	\$ 5,080	(\$34,093)	●	12/31/24	02/25/28	37.8 mo. Late	●	See Section 6

* 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		

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Joint Infrastructure											
Dams & Reservoirs (Joint)											
10032903 - O'Shaughnessy Dam Outlet Works Phase I	PL	\$ 17,206	\$ 21,206	\$ 720	(\$4,000)	●	08/25/22	09/16/25	36.8 mo. Late	●	See Section 6
CUH10223 - OSH Dam Access and Drainage Improvements	BA	\$ 5,830	\$ 3,952	\$ 988	\$ 1,878	★	02/26/21	02/28/23	24.1 mo. Late	●	See Section 6
Mountain Tunnel											
CUH10221 - Mountain Tunnel Improvement Project	CN	\$ 238,219	\$ 238,219	\$ 32,057	-	★	12/31/26	06/03/27	5.1 mo. Late	⚠	See Section 6
Roads & Bridges (Joint)											
10035086 - Bridge Replacement (4 - Bridges)	PL	\$ 44,287	\$ 44,287	\$ 710	-	★	12/30/25	05/25/37	136.9 mo. Late	●	See Section 6

* 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		

+ Cost and Schedule Status	
★	Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
⚠	Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
●	Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROJECTS NOT WITHIN BUDGET AND/OR SCHEDULE

10035575 - SJPL Valve and Safe Entry Improvement

Project Description: The San Joaquin Pipeline (SJPL) Entry Assessment and Valve Improvement Project involves the three parallel transmission pipelines that stretch approximately 48-miles across the San Joaquin Valley from Oakdale Portal to Tesla Portal, with a partial fourth pipeline consisting of a 6.4-mile Eastern Segment and an 11-mile Western Segment. The four pipelines were built between 1932 and 2012, respectively, and range from 56- to 79.5-inches in diameter. As part of the Water System Improvement Program (WSIP), valve vaults were constructed along the SJPL System at various locations to increase operational flexibility and the overall reliability of the SJPL System. Since the commissioning of the valve vaults, Hetch Hetchy Water & Power (HHWP) has expressed concern that 1) valves may not be sufficiently rated and may fail due to a pressure transient surge event using certain operational assumptions 2) there is an inability to establish double isolation and bleed configurations along the SJPL System, resulting in insufficient protection for maintenance personnel, and 3) multiple isolation valves are not adequately rated for hydrostatic head. In order to achieve the safety and access goals, the scope is to: install a surge shaft upstream of Tesla Treatment Facility (TTF) to reduce maximum pressure from unplanned reactor valve closure and upgrade line valves to resist transient pressure from unplanned line valve closure; install new double isolation and bleed valves at all locations where major upgrades and construction are required; and retain single isolation where no upgrades are needed. There are four primary locations where major upgrades and construction are required: Emery, Roselle, Pelican, and Tesla.

Program: Water Infrastructure	Project Status: Multiple Phase	Environmental Status: Active
Project Cost: Approved  \$95.28 M Forecast  \$98.92 M Actual  \$2.28 M		Project Schedule: Approved Jul-19  Jul-25 Forecast Jul-19  Mar-28 Project Percent Complete: 2.3%
		

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) 09/16/21 (B) 12/03/21 (C) 12/21/22 (D) 05/20/22	(A) 02/21/22 (B) 05/23/22 (C) 06/19/23 (D) 11/21/22	(A) 06/12/23 (B) 06/07/24 (C) 05/24/27 (D) 06/07/24

*(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, 65% design was completed in May. The project team continued to work towards the 95% design. For Phase 1B, the design started this quarter. The design of the other two phases has not started yet.

Issues and Challenges:

The forecasted cost and schedule are greater than the approved budget and schedule due to scope refinements to improve safe entry and resequencing of construction contract schedules and scopes 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

CUH10114 - 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. This is a design-build project and was advertised twice in 2011 and 2013. Bids were unresponsive. The project will also involve 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  \$3.60 M		Project Schedule: Approved Jan-16  Jun-24 Forecast Jan-16  Apr-27 Project Percent Complete: 5.4%
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 09/28/20✓ (B) 09/28/20✓ (C) 12/30/22	(A) 11/20/20✓ (B) 10/30/20✓ (C) 09/06/23	(A) 06/07/21✓ (B) 06/21/21✓ (C) 03/05/24	(A) 05/23/23 (B) 06/17/24 (C) 10/13/26

* (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.

Sub-project A: HH-1003R Moccasin Powerhouse GSU Transformer Installation was awarded to Big Valley Electric by the Commission in April. Notice to Proceed was on June 7. The submittal for the GSU design was approved in June, and fabrication will commence in July. Delivery of the first GSU is anticipated in September/October 2021 .

Sub-project B: Contract DB-121R2 Moccasin Powerhouse Generators Rewind - Negotiations for a Design Build Agreement was opened to any qualified contractor due to the inability to secure a responsive bid through advertisement. Two qualified contractors actively participated in the negotiations. General Electric Renewable LLC (GE) provided a proposal that was deemed responsive and most favorable. In May, the Commission awarded the contract to GE subject to the Board of Supervisors' (BOS) approval of negotiated non-standard indemnification terms. In June, the BOS approved the non-standard indemnification terms that had been negotiated with

GE based on the City Risk Manager's recommendation. Notice to Proceed 1 (for design) was issued on June 21. Sub-project C: Moccasin Powerhouse Systems Upgrade - Planning workshops with the project team were conducted to assess the current condition of the powerhouse systems, ongoing maintenance issues, and upgrades needed to meet regulatory and design standards. A Needs Assessment Report will be issued next quarter.

Issues and Challenges:

Sub-project A: Delay to the GSU delivery may affect the installation schedule. If the GSU cannot be delivered for installation within the scheduled first shutdown for the Mountain Tunnel Improvements Project, the project may be delayed for one year. The shop drawing and design for the GSU is anticipated to be available for review in early July. Sub-project C: The variance between the forecasted completion date and the approved completion date is due to the extended time that was required to procure a professional services contract for planning and design.

CUH10115 - 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
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Project Cost:		Project Schedule:	
Approved 	\$24.31 M	Approved Sep-15 	Mar-20
Forecast 	\$34.25 M	Forecast Sep-15 	Nov-26
Actual 	\$21.53 M	Project Percent Complete: 84.9%	
			

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

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

Progress and Status:

Breaker Failure Contingency Plan: The project team completed the 65% design for the breaker failure contingency plan. 100% design is expected next quarter.

Warnerville Substation Rehabilitation - Phase II: The project team continued to evaluate system outages and power delivery schedules.

DB-127R Warnerville Substation Rehabilitation: The project team continued to evaluate the contractual implications due to the incompleting work.

Issues and Challenges:

The forecasted cost and schedule are higher than the approved budget and schedule due to the need to procure a design contract in order to complete plans and specifications for a construction contract to install the four remaining breakers and associated equipment that were not installed under the original design-build construction contract DB-127R.



Oil Circuit Breakers

CUH10116 - Moccasin Penstock

Project Description: The Moccasin Penstock conveys San Francisco Public Utilities Commission (SFPUC) water nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. 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 back to 1924 and has been in service for more than 90 years. Condition assessments based on external inspection and imaging have identified a number of deficiencies along the original pipe. The 104-inch diameter (narrowing to 98-inch) riveted steel penstocks extend 1,554 feet from the downstream Moccasin Tunnel portal then bifurcate to four 66-inch diameter hammer-forged welded steel conduits extending about 2,384 feet to the lower welded steel pipe. Additionally, in September of 2018 the penstock experienced significant leakage in two separate areas, necessitating emergency repairs. This rehabilitation project is intended to enhance the reliability of the penstock system and will include: repair or replacement of some sections of corroded pipe; repair or replacement of four badly cracked concrete anchors and damaged penstock saddles; installation of new manways and a rollout pipe section to provide better access for inspection and maintenance; and recoating the outside pipe, where needed, to reduce future corrosion. The project scope was expanded to include: 1) The installation of additional penstock pipe between the valve house and the first downstream anchor; 2) The replacement of the butterfly valve pneumatic actuator with an electronic actuator, which will include new controls with SCADA connectivity; and 3) A new backup generator.

Program: Joint Infrastructure		Project Status: Planning		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$13.16 M	Approved Feb-16		Dec-24
Forecast		\$47.25 M	Forecast Feb-16		Feb-28
Actual		\$5.08 M	Project Percent Complete: 10.8%		
					
Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion	
Current Forecast	10/07/24	10/07/24	04/15/25	08/23/27	

Progress and Status:

The draft condition assessment and structural evaluation reports were completed by the project team and are under review. Comments are being addressed and the reports are anticipated to be finalized during the next reporting period.

Issues and Challenges:

Due to the age and vulnerability of the asset, Water Enterprise staff decided to increase the scope of work from rehabilitating one penstock to rehabilitating two penstocks. Also, the scope is expanded to include the improvement at West Portal Valve House and the isolation point at the surge tower which are upstream of the penstocks. The increase in scope resulted in an increase of the forecasted budget and later forecasted completion date.



Interior inspection rope access

10032903 - O'Shaughnessy Dam Outlet Works Phase I

Project Description: O'Shaughnessy Dam (OSD) was completed in 1923 and raised in 1938. Condition assessment of the dam outlet works revealed deficiencies. This rehabilitation project addresses deficiencies of the existing outlet works system at OSD, including the drum gates and release system through OSD to Canyon Tunnel and the Tuolumne River. Seven projects were identified and have been prioritized. Phase 1 will include three of these projects: drum gate rehabilitation (upgrading the hinges and rivets, recoating the gate and existing seals, and repairing the spillway concrete), installation of a new bulkhead system, and rehabilitation of slide gates & installation of a diversion pipe butterfly valve.

Program: Joint Infrastructure		Project Status: Planning		Environmental Status: Active	
Project Cost:			Project Schedule:		
Approved		\$17.21 M	Approved Feb-18		Aug-22
Forecast		\$21.21 M	Forecast Feb-18		Sep-25
Actual		\$0.72 M	Project Percent Complete: 3.6%		
					
Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion	
Current Forecast	(A) 08/25/23	(A) 05/31/22 (B) 04/14/23	(A) 12/30/22 (B) 09/15/23	(A) 03/14/25 (B) 11/29/24	

* (A) Bulkheads; (B) Instream Flow Release

Progress and Status:

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.

During this quarter, the Conceptual Engineering Report was revised to address this modified scope. Additionally, during the quarter, work began on Planning for the IFR Valve Replacement Project.

Issues and Challenges:

The current planning-level design and construction



Discharge from the Instream Flow Release Valve

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.

CUH10223 - OSH Dam Access and Drainage Improvements

Project Description: The key objective of this project is to provide safe access for Hetch Hetchy Water and Power operators inside the O’Shaughnessy Dam by improving fall protection, access, and drainage. The key elements include:

- Replace Access Structures in Ladder Wells. The existing access structures in the four (4) vertical ladder wells (shafts) include vertical ladders and horizontal grating platforms that are spaced throughout the ladder wells.
- Install Fall Protection Systems. Install new Occupational Safety and Health Administration (OSHA)"compliant ladders and landings with safety cage and/or install fall restraint systems.
- Seal or Mitigate Existing Leakage. Address flowing water by sealing leaks or otherwise diverting, collecting and disposing of flows.
- Drainage Improvements. Clear the drains in the dam so that water can drain as designed and/or install sump pumps, if appropriate.
- Replace Watertight Door between Ladder Wells 3 & 4. This scope item includes replacing the existing watertight door between Ladder Wells 3 & 4.

Program: Joint Infrastructure	Project Status: Bid and Award	Environmental Status: Completed (CatEx)
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Project Cost:		Project Schedule:	
Approved	 \$5.83 M	Approved Mar-17	 Feb-21
Forecast	 \$3.95 M	Forecast Mar-17	 Feb-23
Actual	 \$0.99 M	Project Percent Complete: 25.0%	
			

Key Milestones:	Environmental Approval	Bid Advertisement	Construction NTP	Construction Final Completion
Current Forecast	07/16/20✓	03/18/21✓	10/01/21	08/29/22

Progress and Status:

Three bids were received in April for the construction contract that had been reduced in scope and rebid. On May 11, by Resolution No. 21-0087, the Commission awarded the construction contract to Mountain Cascade. Notice to Proceed is expected in early October 2021.

Issues and Challenges:

The forecast cost is less than the approved budget due to a reduction in the scope of work; scope was transferred to the O’Shaughnessy Dam Outlet Works Phase 1 project. The forecast schedule is longer than the approved schedule due to contracting delays, added complexity of the remaining scope, and the need to revise the construction contract documents with the reduced scope and to rebid.



Inclined Stairway OSH Dam

CUH10221 - 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 for design and construction of an engineering alternative that will keep this vital component of the Hetch Hetchy Water and Power System in reliable service for years to come.

Up until 2016, the scope consisted of just the Planning Phase for the project. The primary focus was on the development of viable alternatives for the project including rehabilitation or relining the existing tunnel or construction of a new tunnel.

In 2017, the City adopted the rehabilitation alternative as the preferred project for design and construction. The rehabilitation option met almost all of the project performance standards with the least cost. The project consists of tunnel lining repairs, contact grouting, downstream flow control valving, a new tunnel adit at Priest Reservoir, a South Fork Siphon extension tunnel, access road widening and tunnel access improvements, and environmental mitigations, and site restoration.

Program: Joint Infrastructure		Project Status: Construction		Environmental Status: Completed	
Project Cost:			Project Schedule:		
Approved		\$238.22 M	Approved Oct-11		Dec-26
Forecast		\$238.22 M	Forecast Oct-11		Jun-27
Actual		\$32.06 M	Project Percent Complete: 13.5%		
					
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:

Mountain Tunnel Improvement Project HH-1000R: 4th quarter progress to date included obtaining approvals for submittals for the ongoing and future work, setting up multiple site specific offices and staging areas, mobilization of equipment, including the crane that will be used for excavating and constructing the Flow Control Facility (FCF) shaft, creating large scale excavation disposal areas at Priest Reservoir, and beginning the mass excavation and retaining wall construction around the Priest Reservoir FCF shaft site. Excavation work has also begun for the retaining walls that will support the excavation pit for the Priest Reservoir tunnel adit. It is expected that large scale FCF shaft excavation and Priest Reservoir tunnel adit excavation will be in full construction at the beginning of FY2021-2022. Safety improvement work continued during the quarter for site access roads. Planning and coordination is taking place for the project’s first planned tunnel outage in January 2022.



Priest Spoils Disposal Site Development underway

The project team is working with the contractor to close this schedule variance gap by having the contractor perform a time impact analysis. This analysis will be used by the project team to manage and prevent delays that might impact critical work. Some management options being evaluated include the use of twelve hour work shifts, the use of two ten hour shifts for critical work, and the addition of an eight hour Saturday maintenance shift.

Issues and Challenges:

The Schedule Variance between the current forecast and the approved schedule is due to having had to re-bid the project and also due to COVID 19 challenges.

I.A Hetchy Capital Improvement Projects Quarterly Report

10035086 - Bridge Replacement (4 - Bridges)

Project Description: HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessment has identified the need for rehabilitation and/or replacement (both due to age and to meet current seismic design criteria). Four of the fourteen bridges require substantial modification or replacement and have been combined into this project. This project includes rehabilitation and/or replacement of Cherry Lake Road Bridge (public access), Early Intake Bridge (public access), O'Shaughnessy Adit Access Bridge, and Lake Eleanor Dam Bridge.

Program: Joint Infrastructure	Project Status: Planning	Environmental Status: Not Initiated
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Project Cost:		Project Schedule:	
Approved  \$44.29 M		Approved Jul-19  Dec-25	
Forecast  \$44.29 M		Forecast Feb-20  May-37	
Actual  \$0.71 M		Project Percent Complete: 1.6%	
			

Key Milestones:	Environmental* Approval	Bid* Advertisement	Construction* NTP	Construction* Final Completion
Current Forecast	(A) 02/27/23 (B) 06/28/24	(A) 08/01/23 (B) 07/31/24	(A) 01/31/24 (B) 02/03/25	(A) 03/09/26 (B) 03/09/27

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

** The forecasted May-2037 project completion is for the two remaining bridges and assumes that additional funding is available in 2031.

Progress and Status:

For the O'Shaughnessy Adit Access Bridge, the topographic survey and seismic refraction study were completed during the quarter. For Lake Eleanor Dam Bridge, the planning phase and alternative analysis for rehabilitation of the existing bridge began in this quarter. The project team completed the document review, site visit, and evaluation of criteria.

Issues and Challenges:

The variance between the approved schedule and forecasted completion date is based on the deferment of funding for two of the four bridges until 2031 (with planned completion in 2037).



Lake Eleanor Dam Bridge

7. 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								
CUH101-14.001 Moccasin Powerhouse Generator Rehab - DB-121R2	06/21/21	06/17/24	06/17/24	\$ 28,898,986	\$ 28,898,986	-	-	0.0%
CUH101-14.001 Moccasin Powerhouse Transformers Installation - H-1003R	06/07/21	05/23/23	05/23/23	\$ 3,653,575	\$ 3,653,575	-	-	0.0%
CUH101-15.001 Warnerville Switchyard - DB-127R **	10/05/17	07/09/19	12/31/21	\$ 14,591,450	\$ 14,591,450	(906)	-	90.0%
Joint Infrastructure								
CUH102-21.001 Mountain Tunnel Improvement - H-1000R	01/29/21	12/03/26	12/03/26	\$ 152,870,508	\$ 152,870,508	-	-	2.4%

Program Total for On-Going Construction	Approved Contract Cost	Current Forecast Cost*	Variance	
			Cost	Percent
	\$ 200,014,519	\$ 200,014,519	\$-	- %

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.

8. 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*
Water Infrastructure				
Dams & Reservoirs				
10033156 - Moccasin Reservoir Perimeter Security Fence	10/30/20	03/17/21	\$ 3,135,031	\$ 1,626,886
Power Infrastructure				
Powerhouse				
CUH10102 - Holm and Other Powerhouse Projects	09/03/19	05/14/21	\$ 21,042,058	\$ 12,872,280
2018 Moccasin Storm Event				
2018 Moccasin Storm Event				
10033233 - 2018 March Storm Event Emergency Repairs and Interim Improvements (Water-Only Assets)	11/27/19	04/20/20	\$ 11,454,122	\$ 13,712,568
TOTAL			\$ 35,631,211	\$ 28,211,734

* It should be noted that this report does not include all phase-level expenditures that have been accrued for work completed due to challenges associated with the migration of the City financial system from FAMIS to PeopleSoft.

9. COMPLETED PROJECTS

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Water Infrastructure				
Water Conveyance (Water)				
CUH10001-HCIP - SJPL Rehabilitation	12/31/18	02/28/19	\$ 5,370,000	\$ 4,622,228
CUH10003 - Lower Cherry Aqueduct	01/31/20	04/30/21	\$ 18,515,315	\$ 12,486,246
Power Infrastructure				
Switchyard & Substations (Power)				
CUH10119 - Early Intake Switchyard Slope Hazard Mitigation	09/30/20	09/30/20	\$ 5,533,855	\$ 2,175,083
Water Conveyance (Power)				
CUH10113 - Kirkwood Penstock	06/28/19	04/30/21	\$ 4,647,523	\$ 2,826,822
Joint Infrastructure				
Buildings (Joint)				
CUH10214 - Moccasin Facilities New Construction	06/28/19	04/30/21	\$ 20,839,420	\$ 19,504,642
Dams & Reservoirs (Joint)				
CUH10216 - Cherry Dam Outlet Works Rehabilitation	06/28/19	06/30/20	\$ 10,382,439	\$ 8,907,636
Mountain Tunnel				
CUH10220 - Mountain Tunnel Inspection & Repairs (completed)	12/31/19	12/02/19	\$ 23,500,000	\$ 21,508,468
TOTAL			\$ 88,788,552	\$ 72,031,125

10. PROJECTS WITHIN BUDGET AND SCHEDULE

10035574 - SJPL Tesla Valves Replacement

Project Description: This project intends to replace all the inline valves that are under-rated for pressure, Tesla Ultra Violet (TUV) 101 to 401, with properly rated valves to improve safety and entry into all four (4) San Joaquin Pipelines (SJPL). In addition, all cross-over valves and bypass valves may need to be replaced or made safe. Modification to the pipes, flanges, spool pieces, actuators, and valve controls are needed. The valve vault will need modification to accommodate the new valves. New facilities may need to be constructed if additional new valves are not designed for direct burial.

Program: Water Conveyance (Water)	Project Status: Construction	Environmental Status: Completed		
Project Cost:		Project Schedule:		
Approved 	\$7.38 M	Approved Jan-20		Jun-24
Forecast 	\$3.74 M	Forecast May-19		Dec-22
Actual 	\$0.97 M	Project Percent Complete: 26.0%		
				
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 Tesla Valves TUV-201, TUV-301 & TUV-401.

Subproject A: For the purchase order, the submittals for a 66-inch butterfly valve and actuator were reviewed and approved. The vendor started production of the valve and the actuator in June. For valve and actuator installation, the Job Order Contract (JOC) task order cost proposal was finalized and the Notice to Proceed (NTP) was issued in April. The JOC contractor has been working on the submittals during the quarter.

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. This change will be included in the next 10-year capital plan.



Picture of TUV101 66" BFF @Tesla Valve House
TUV101 Valve Replacement

Issues and Challenges:

The variances between the approved schedule and budget and the forecasted schedule and cost are in anticipation of scope and budget to be transferred to the SJPL Valve and Safe Entry Improvement project.

I.B. HETCHY RENEWAL AND REPLACEMENT PROGRAM (R&R)



1. PROGRAM DESCRIPTION

The Hetchy Renewal and Replacement (R&R) Program is an ongoing annual program that addresses deficiencies in three areas: Water Infrastructure, Power Infrastructure, and Joint Infrastructure. The Water program includes only asset improvements benefiting the SFPUC's water customers. The Power program includes only asset improvements used to generate environmentally friendly hydroelectric energy. The Joint program includes projects for assets that are used for both water and power delivery. The objective of the R&R Program is to meet level of service goals and objectives, to ensure regulatory permit compliance, to obtain system reliability and functionality, and to continue sustainable operation of the system.

The R&R Program consists of a series of projects specifically developed to address the needs of an aging infrastructure associated with the Hetch Hetchy Water and Power System. The projects are designed to better the system through inspections, assessments, protective and corrective measures, and routine equipment replacement. Due to the nature of these ongoing projects that are funded on an annual basis, progress is measured by achievement of short-term goals. These goals are discussed in further detail in Section I.B.10, and are referred to as Planned Milestones for the Reporting Quarter (goals that are expected to be achieved during the quarter), Status of Planned Milestones for the Reporting Quarter (progress made in achieving these goals), and Planned Milestones for the Subsequent Quarter (goals for the upcoming quarter).

2. PROGRAM STATUS

This Quarterly Report presents the progress made on the R&R projects between April 1, 2021 and June 30, 2021. The data reported herein as the "approved" project budget and schedule conforms to the most recent annual update of the Hetch Hetchy 10-Year CIP for FY2019-2028, which was approved by the Water and Power

Enterprise Managers and adopted by the Public Utilities Commission on February 13, 2018. The 10-Year CIP for FY2019-2028 re-prioritizes the R&R program by defunding several projects that were determined to be lower priority, and re-allocating a portion of the funding to projects determined to be higher priority. Overall, this constituted an increase of \$85.75M in the program budget, from \$227.05M in FY2017-2026 to \$312.08M. The project budget and schedule were developed and approved based on the project team's best assessment HHWP's infrastructure needs at the time. It should be noted that the project team continues the process of re-validating these earlier assessments.

Figures 2.1 to 2.3 show the total number of subprojects remaining in each phase of the R&R Water, Power, and Joint Infrastructure programs as of June 30, 2021. As reported in previous quarters, the following CUH10001 - SJPL Rehabilitation subprojects were removed from the R&R program and included in the Hetch Hetchy Capital Improvement Programs 2018 Proposed Baseline with a budget of \$5.37M (it should be noted that these subprojects have been subsequently completed under the HCIP Program:

CUH10001 - SJPL Rehabilitation

- CUH10001.011 - SJPL No. 1 Replacement at Cashman Creek
- CUH10001.018 - SJPL No. 1 Replacement at SJVH
- CUH10001.022 - Tesla Valves Replacement

The remaining subprojects under project CUH10001 will continue to be reported under the R&R Program. The CUH10001 approved budget, expenditures to date, and current forecast cost have been reduced to reflect the transfer of the three subprojects to the HCIP program.

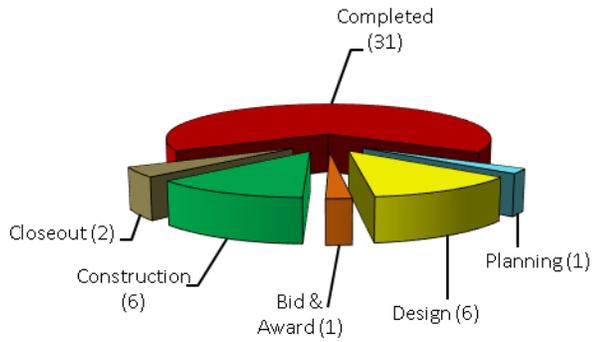


Figure 2.1 Total Number of Water Infrastructure Sub-Projects in R&R Program

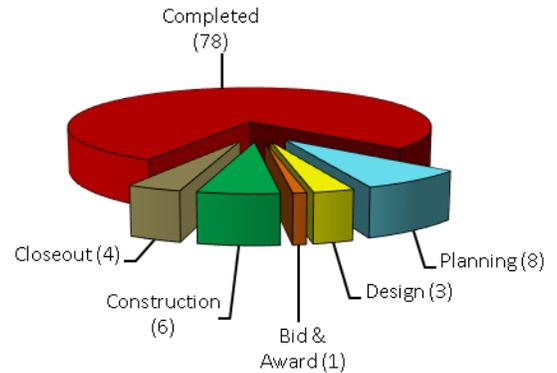


Figure 2.3 Total Number of Joint Infrastructure Sub-Projects in R&R Program

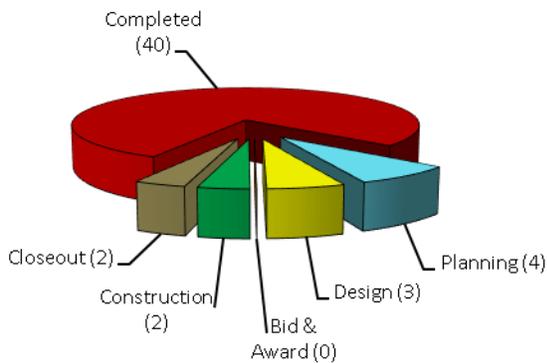


Figure 2.2 Total Number of Power Infrastructure Sub-Projects in R&R Program

3. PROGRAM COST SUMMARY

Table 3.1 provides an overall current program level cost summary of the R&R Program included in this report. It shows the Expenditures to Date, Approved Budget, Current Forecast Cost, and Cost Variance between Approved Budget and Current Forecast Cost. There were no adjustments to the Approved Budget or Current Forecast Cost during the quarter.

Table 3.1 Program Cost Summary

	Expenditures to Date (\$ Million) (A)	Approved Budget** (\$ Million) (B)	Current Forecast Cost (\$ Million) (C)	Cost Variance (\$ Million) (D = B - C)
Water Infrastructure	\$19.38	\$115.70	\$115.70	-
Power Infrastructure	\$39.59	\$89.51	\$89.51	-
Joint Infrastructure	\$45.04	\$106.88	\$106.88	-
Hetchy R&R Program Total*	\$104.00	\$312.08	\$312.08	-

*The program total values include completed, not-initiated, and on-hold projects.

**The approved budget includes the 10-Year CIP Plan, as well as the previous fiscal year's appropriated budget

4. PROGRAM SCHEDULE SUMMARY

Figure 4.1 compares the 2018 Approved Schedule and Current Forecast Schedule for the R&R program. Refer to the “Cost and Schedule Status” notes in Section 5 for the criteria associated with the three color-coded Forecast Status levels in Figure 4.1 – Meet Requirements, Need Attention, and Exceed Limits.

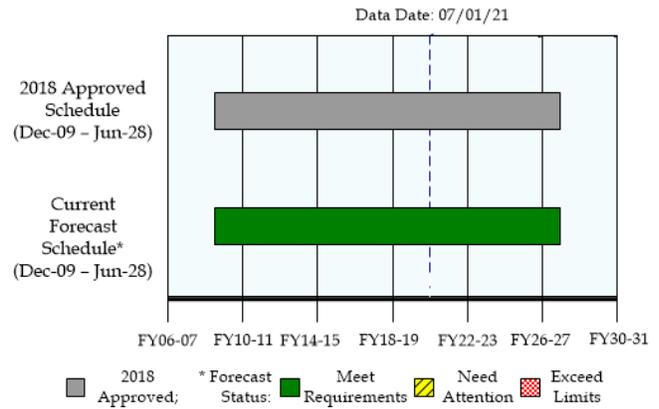


Figure 4.1 R&R Program Schedule Summary

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5. PROJECT PERFORMANCE SUMMARY*

All costs are shown in \$1,000s as of 07/01/21

Project Name	Active Phase (**)	Approved Budget (a)	Current Forecast Cost (b)	Expenditures To Date (c)	Cost Variance (d= a - b)	Cost Status (+)	Approved Completion (e)	Current Forecast Completion (f)	Schedule Variance (g = e - f)	Schedule Status (+)	Project Data Sheet
Water Infrastructure											
CUH100 - Water Infrastructure	MP	\$ 115,698	\$ 115,698	\$ 19,380	-	★	06/30/28	06/30/28	-	★	See Section 10
Power Infrastructure											
CUH101 - Power Infrastructure	MP	\$ 89,509	\$ 89,509	\$ 39,585	-	★	06/30/28	06/30/28	-	★	See Section 10
Joint Infrastructure											
CUH102 - Joint Infrastructure	MP	\$ 106,875	\$ 106,875	\$ 45,039	-	★	06/30/28	06/30/28	-	★	See Section 10

* 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

+ Cost and Schedule Status

- ★ Meet Requirements: Forecast Cost/Schedule is within Approved Budget/Schedule.
- ⚠ Need Attention: Forecast Cost is over Current Approved Budget by greater than 1% and less than 10%. Or Forecast Schedule is over Current Approved Schedule by greater than 2 months and less than 6 months and less than 10%.
- Exceed Limits: Forecast Cost is over Current Approved Budget by 10% or more. Or Forecast Schedule is over Current Approved Schedule by greater than 6 month or 10% or more.

6. PROGRAMS NOT WITHIN BUDGET AND/OR SCHEDULE

All programs are within the current approved budget and schedule.

7. ON-GOING CONSTRUCTION

There are no active construction projects with a construction contract amount greater than \$1 million.

8. PROGRAMS IN CLOSE-OUT

No program is currently in close-out.

9. COMPLETED PROJECTS

Project Title	Approved Project Completion	Actual Project Completion	Approved Project Budget	Project Expenditures To Date
Water Infrastructure				
CUH10005 - Priest Pipe Recoating	06/30/18	06/30/18	\$ 39,407	\$ 38,368
CUH10006 - Moccasin Gate No. 3 Shaft Replacement and Automation	12/31/18	12/31/18	\$ 1,049,557	\$ 133,278
Power Infrastructure				
CUH10103 - Powerhouse Control Upgrade	07/31/15	07/31/15	\$ 1,724,231	\$ 1,724,231
CUH10108 - Step-Up Transformers	04/04/17	04/04/17	\$ 221,995	\$ 182,525
CUH10109 - Moccasin Low Head Rehabilitation Project	05/31/18	05/31/18	\$ 619,140	\$ 568,367
CUH10111 - Moccasin GSU Transformers & Oil Containment	02/27/15	02/27/15	\$ 84,343	\$ 82,369
CUH10112 - Kirkwood Powerhouse Refurbishment & TSOV	06/30/17	06/30/17	\$ 62,177	\$ 47,473
CUH10118 - Kirkwood PH Valve Dissipation	06/30/17	06/30/17	\$ 810,613	\$ 718,117
Joint Infrastructure				
CUH10205 - Small Water Systems Upgrades	06/30/14	06/30/14	\$ 1,922,482	\$ 1,922,482
CUH10207 - Existing Hetchy Facilities (Outside Moccasin)	11/02/18	11/02/18	\$ 1,588,814	\$ 1,231,168
CUH10208 - Remote Terminal Unit Replacement	09/28/18	09/28/18	\$ 1,648,985	\$ 1,134,513
CUH10210 - Hetchy Fiber Projects	05/29/15	05/29/15	\$ 167,531	\$ 115,621
TOTAL			\$ 9,939,275	\$ 7,898,512

10. PROGRAMS WITHIN BUDGET AND SCHEDULE

CUH100 - Water Infrastructure

Program Description: The purpose of the Hetchy R&R Water Infrastructure Program is to extend the useful life of the water conveyance facility assets including tunnels and pipelines. The R&R projects are prioritized based upon regulatory compliance, condition assessment, operation staff recommendations, and level of service goals.

Program: Water Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost:		Program Schedule:
Approved  \$115.70 M	Approved Nov-10  Jun-28	
Forecast  \$115.70 M	Forecast Nov-10  Jun-28	
Actual  \$19.38 M	Program Percent Complete: 30.2%	
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

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

Progress and Status:

The CUH100 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 47 subprojects.

Planning: 1 subproject

- 10034364.007 SJPL No 1 Alternatives Analysis Report (December 02, 2019)

Design: 6 subprojects

- J100-01.019 San Joaquin Pipeline System Wide Testing (April 01, 2015)
- J100-01.038 SJPL Improvement at Claratina Crossing (February 01, 2018)
- J100-01.021 SJPL Isolation Assessment and Valve Replacement (April 01, 2015)
- J100-05.001 Priest Outlet 24 (inch) Pipe Recoating (February 03, 2014)
- 10034364.002 Foothill Tunnel Lining Repair at Oakdale Portal (October 02, 2019)
- 10034364.006 Oakdale Portal Standpipe and Anchors System Repairs (December 02, 2019)

Bid and Award:1 subproject

- 10034364.005 SJPL No 4 Oakdale Portal Flowmeter Replacement (September 03, 2019)

Construction: 6 subprojects

- J100-01.031 San Joaquin Pipeline No 1 East of River Road Damage Assessment (December 01, 2016)
- J100-01.033 SJPL No 1 Oakdale Portal to Emery Inspection and Repair (September 01, 2017)

- 10034364.001 SJPL No 1 Oakdale Portal and Tesla Roll Out Installation (December 14, 2018)

- 10034364.003 SJPL No 1 Pipe Replacement 2020 Outage (September 03, 2019)

- 10034364.004 SJPL No 1 Air Guard and Blow-off Valve Replacement (October 01, 2019)

- 10034364.008 San Joaquin Pipeline No.1 Pipe Replacement - Mile Post 91 (May 12, 2020)

Closeout: 2 subprojects

- J100-01.010 Rankin Property Acquisition (April 01, 2013)
- 10034520.001 Moccasin Dam and Outlet Works (September 02, 2019)

Completed: 31 subprojects

Planned Milestones for Reporting Quarter:

Complete Closeout: Two subprojects 100-01.035 and 100-01.036 closed this quarter.

Status of Milestones for Reporting Quarter:

One subproject moved from Planning to Design, One subproject moved from Design to Bid and Award, and one subproject moved from Planning to Construction and two subprojects moved from Bid and Award to Construction. One subproject moved from Planning to Closeout.

Planned Milestones for Subsequent Quarter:

Complete Closeout: 1 subproject

Start Planning: 1 subproject

Issues and Challenges:

No new issues or challenges at this time.

CUH101 - Power Infrastructure

Program Description: The purpose of the Hetchy R&R Power Infrastructure Program is to extend the useful life of the power generation facility assets including powerhouse, switchyards, power distribution towers, and electrical distribution lines. The R&R projects are prioritized based upon regulatory compliance, condition assessments, Operations staff recommendations, and level of service goals.

Program: Power Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost:		Program Schedule:
Approved 	\$89.51 M	Approved Dec-09  Jun-28
Forecast 	\$89.51 M	Forecast Dec-09  Jun-28
Actual 	\$39.59 M	Program Percent Complete: 48.7%
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

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

Progress and Status:

The CUH101 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 51 subprojects.

Planning: 4 subprojects

- 101-18.002 Kirkwood PH Bypass Interim Repairs (November 01, 2019)
- 10036104.001 Modicon Quantum Programmable Logic Controller Upgrade to M580 (March 02, 2020)
- 10036104.002 Moccasin Low Head Powerhouse Exterior and Interior Repairs (March 02, 2020)
- 10036265.001 Riverbank Transmission Line Service Extension (February 10, 2020)

Design: 3 subprojects

- 101-18.004 Critical Spare Procurement for Kirkwood Powerhouse Energy Dissipation Cone (August 31, 2020)
- 10036104.003 Moccasin Powerhouse Gates and Valves Automation (April 02, 2020)
- 10036265.002 Warnerville and Early Intake Switchyard Control Room Roof Replacements (April 13, 2020)

Construction: 2 subprojects

- 101-01.021 Moccasin Switchyard Isolation Transformer Protection (September 01, 2016)
- 101-17.003 Transmission Line Clearance Mitigation Project (July 03, 2017)

Closeout: 2 subprojects

- 10034521.001 Moccasin Powerhouse Gantry Crane Upgrade (October 01, 2019)
- 101-01.013 HPH/KPH Ridge Line Transformer Protection (October 04, 2012)

Completed : 40 subprojects



Generator Shaft at Moccasin Powerhouse

Planned Milestones for Reporting Quarter:

Complete closeout: No subprojects closed this quarter.

Status of Milestones for Reporting Quarter:

One (1) new subproject started this quarter and is already in design, 101-18.004. One (1) subproject moved from planning to design. One (1) subproject moved from planning to closeout this quarter. One (1) subproject moved from design to construction.

Planned Milestones for Subsequent Quarter:

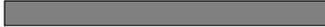
Complete closeout of one (1) project.

Issues and Challenges:

No new issues or challenges at this time.

CUH102 - Joint Infrastructure

Program Description: The purpose of the Hetchy R&R Joint Infrastructure Program is to extend the useful life of the joint-facilities assets including dams, roads, communication systems, wastewater treatment facilities, cottages, and operational yard facilities. The R&R projects are prioritized based upon regulatory compliance, condition assessments, and Operations staff recommendations.

Program: Joint Infrastructure	Program Status: Multiple Phase	Environmental Status: Active (Various)
Program Cost:		Program Schedule:
Approved  \$106.88 M	Approved Nov-10  Jun-28	
Forecast  \$106.88 M	Forecast Nov-10  Jun-28	
Actual  \$45.04 M	Program Percent Complete: 36.4%	
 Approved;  Actual Cost; * Forecast Status:  Meet Requirements  Need Attention  Exceed Limits		

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

Progress and Status:

The CUH102 breakdown below shows the number of subprojects according to their status and / or active phase during this reporting period. Start dates for each subproject are included in parentheses. Currently there are 100 subprojects.

Planning: 8 subprojects

- 102-03.011 Early Intake Dam Stability and Spillway Repairs (June 20, 2013)
- 102-08.001 KPH Unit 3 Remote Terminal Unit (RTU) Replacement and PLC Stop Logic Implementation (June 20, 2013)
- 102-09.016 Yosemite Park Hetch Hetchy Road Guard Rail Improvements (January 01, 2015)
- 102-09.018 Hetch Hetchy Roads FY 2019-2020 (August 01, 2019)
- 102-11.007 Rock River and Microwave Sites Physical Security Upgrade (September 23, 2019)
- 10034501.002 Distribution PRC 4292 Equipment Replacement (November 01, 2019)
- 10034501.004 Overhead Electrical Distribution Line (March 16, 2020)
- 102-13.005 Moccasin Peak Communication Building Air Conditioner Replacement (May 04, 2020)

Design: 3 subprojects

- 102-02.006 Moccasin Sewer Pond Upgrade (November 01, 2012)
- 102-03.010 O’Shaughnessy Dam Spillway Condition Assessment (September 01, 2017)
- 10034501.001 Cherry Ridgeline Transformer Rehabilitation (April 01, 2019)

Bid and Award: 1 subproject

- 10034501.003 Cherry Camp Power System Upgrade (December 15, 2019)

Construction: 6 subprojects

- 102-01.005 Upcountry Microwave Improvement (March 09, 2017)
 - 102-02.025 Moccasin Village and Shops Transformers (April 03, 2017)
 - 102-09.010 Small Bridge Improvement Project (January 15, 2016)
 - 102-09.012 Kearny Lateral Crossing (August 08, 2016)
 - 102-11.005 Security Upgrade for Mixed Facilities (March 27, 2017)
 - 102-02.028 Early Cottage No 1, 2, 3, & 4 Roof Replacement (November 01, 2019)
- Closeout: 4 subprojects
- 102-02.019 Moccasin Control and Server Building Boiler Work (March 01, 2016)
 - 102-03.005 Cherry Dam Condition Assessment (February 03, 2014)
 - 102-09.008 Road and Bridge Improvement (July 06, 2015)
 - 102-09.014 Cherry Lake Road Guardrail C-3 and 4 (May 01, 2017)
- Completed : 78 subprojects

Planned Milestones for Reporting Quarter:

Complete Closeout of one (1) subproject.

Status of Milestones for Reporting Quarter:

One (1) subproject closed: 102-13.004 Duckwall Communication Site Power System Repair. One (1) new subproject moved from Planning to Design. One (1) subproject moved from Design to Bid and Award. One (1) subproject moved from Bid and Award to Construction. One (1) subproject moved from Design to Construction. One (1) subproject completed this quarter.

Planned Milestones for Subsequent Quarter:

Complete Closeout of one (1) subproject.

Issues and Challenges:

No new issues or challenges at this time.

APPENDICES

A PROJECT DESCRIPTIONS

B APPROVED PROJECT-LEVEL SCHEDULE

C LIST OF ACRONYMS

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APPENDIX A. PROJECT DESCRIPTIONS

A1-A HETCHY CAPITAL IMPROVEMENT PROJECTS (HCIP)

WATER INFRASTRUCTURE

CUH10001-HCIP - San Joaquin Pipeline Rehabilitation (Completed)

The purpose of the San Joaquin Pipeline Rehabilitation (SJPL) is to extend the useful life of these water conveyance facility assets, including tunnels and pipelines. Baseline dates and budgets for the subprojects below were presented to and approved by the Commission on 09/08/15. Since they are now considered to be active HCIP subprojects, they have been moved from CUH100 R&R.

CUH10003 - Lower Cherry Aqueduct (Completed)

The Lower Cherry Aqueduct (LCA) delivers water from Cherry Creek to supplement the primary Hetch Hetchy reservoir supply during a drought year. Due to current drought conditions, as described in the Declaration of Emergency issued on February 21, 2014, there is a need for this reliable backup water supply to be re-established in the LCA. However, due to damage during the Rim Fire Emergency and age, the LCA is in need of restoration before it can become a reliable asset. This project consists of improvements such as emergency debris removal and tunnel cleaning, temporary structures installation, monitoring and instrumentation, and forebay and diversion dam repairs.

10035574 - SJPL Tesla Valves Replacement

This project intends to replace all the under rated inline valves, Tesla Ultra Violet (TUV) 101 to 401, with properly rated valves to improve safety and entry into all 4 San Joaquin Pipelines (SJPL). In addition, all cross-over valves and bypass valves may need to be replaced or made safe. Modification to the

pipes, flanges, spool pieces, actuators, and valve controls are needed. The valve vault will need modification to accommodate the new valves. New facilities may need to be constructed if additional new valves are not designed for direct burial.

10035575 - SJPL Valve and Safe Entry Improvement

The San Joaquin Pipeline (SJPL) Entry Assessment and Valve Improvement Project involves the three parallel transmission pipelines that stretch approximately 48-miles across the San Joaquin Valley from Oakdale Portal to Tesla Portal, with a partial fourth pipeline consisting of a 6.4-mile Eastern Segment and an 11-mile Western Segment. The four pipelines were built between 1932 and 2012, respectively, and range from 56- to 79.5-inches in diameter. As part of the Water System Improvement Program (WSIP), valve vaults were constructed along the SJPL System at various locations to increase operational flexibility and the overall reliability of the SJPL System. Since the commissioning of the valve vaults, Hetch Hetchy Water & Power (HHWP) has expressed concern that 1) valves may not be sufficiently rated and may fail due to a pressure transient surge event using certain operational assumptions 2) there is an inability to establish double isolation and bleed configurations along the SJPL System, resulting in insufficient protection for maintenance personnel, and 3) multiple isolation valves are not adequately rated for hydrostatic head. In order to achieve the safety and access goals, the scope is to: install a surge shaft upstream of Tesla Treatment Facility (TTF) to reduce maximum pressure from unplanned reactor valve closure and upgrade line valves to resist transient pressure from unplanned line valve closure; install new double isolation and bleed valves at all locations where major upgrades and construction are required; and retain single isolation where no upgrades are needed. There

are four primary locations where major upgrades and construction are required: Emery, Roselle, Pelican, and Tesla.

10033156 - Moccasin Reservoir Perimeter Security Fence

Hetch Hetchy Water & Power (HHWP) will install an approximately 6,500 feet long perimeter security fence system around Moccasin Reservoir to discourage trespassers. Moccasin Reservoir covers approximately 32 acres. Fence monitoring alarms, signs, lighting, and security camera will be considered as part of the design.

CUH100PD - 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

CUH10102 - Holm and Other Powerhouse Projects

This project will provide funding for Holm Powerhouse (HPH) Unit 2 upgrades and other items under \$1 million regarding power generation renewal and equipment replacement. The upgrade and rehabilitation of

Holm Unit 2 includes 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 will be done to integrate exciter, governor Programmable Logic Controllers (PLC), and Generator 2 PLCs into existing plant control and Supervisory Control and Data Acquisition (SCADA) system. Additionally, this project includes upgrades to turbine and generators, and alternating current stations intended to extend the life of the unit by 20 years. Lastly, the project will upgrade the existing oil containment system at Kirkwood Powerhouse (KPH) and HPH to prevent oil discharge into the environment. The existing oil-water separators will be replaced, and other modifications will be made to the powerhouse interiors and to the transformer decks to discourage contaminated discharges into the adjacent streams. A monitoring system will be installed to alert Hetch Hetchy Water & Power (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 & cleanup.

CUH10113 - Kirkwood Penstock (Completed)

Kirkwood Penstock was built in 1964 and conveys the SFPUC water supply from Canyon Tunnel to KPH. Kirkwood Penstock has experienced significant foundation movement without impact to the service utility. In February 2007, however, there was significant movement on the penstock, and the penstock partially detached from one fixed saddle directly below anchor block 2. The scope of this project includes an internal and external inspection; development of an Emergency Action Plan and a Penstock Monitoring Plan;

repairs to the damaged saddle; installation of a monitoring system; and procurement of emergency spare equipment.

CUH10114 - 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. This is a design-build project and was advertised twice in 2011 and 2013. Bids were unresponsive. The project will also involve 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.

CUH10115 - Warnerville Substation Rehabilitation

Warnerville Substation facilities and equipment have reached the end of their life expectancy. The facility needs to be upgraded to meet regulatory and safety requirements. This project will address major renewal and replacement of the substation components, including grounding, fence, circuit breaker, control room, electrical equipment, and disconnect switch. This project will also improve grading in the substation.

CUH10116 - Moccasin Penstock

The Moccasin Penstock conveys San Francisco Public Utilities Commission (SFPUC) water

nearly one mile from Moccasin Tunnel to the Moccasin Powerhouse. 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 back to 1924 and has been in service for more than 90 years. Condition assessments based on external inspection and imaging have identified a number of deficiencies along the original pipe. The 104-inch diameter (narrowing to 98-inch) riveted steel penstocks extend 1,554 feet from the downstream Moccasin Tunnel portal then bifurcate to four 66-inch diameter hammer-forged welded steel conduits extending about 2,384 feet to the lower welded steel pipe. Additionally, in September of 2018 the penstock experienced significant leakage in two separate areas, necessitating emergency repairs. This rehabilitation project is intended to enhance the reliability of the penstock system and will include: repair or replacement of some sections of corroded pipe; repair or replacement of four badly cracked concrete anchors and damaged penstock saddles; installation of new manways and a rollout pipe section to provide better access for inspection and maintenance; and recoating the outside pipe, where needed, to reduce future corrosion. The project scope was expanded to include: 1) The installation of additional penstock pipe between the valve house and the first downstream anchor; 2) The replacement of the butterfly valve pneumatic actuator with an electronic actuator, which will include new controls with SCADA connectivity; and 3) A new backup generator.

CUH10119 - Early Intake Switchyard Slope Hazard Mitigation (Completed)

The Hetch Hetchy Water and Power (HHWP) Early Intake Switchyard (ISY) is a 230 kV switchyard located alongside the Tuolumne River, downstream of HHWP's Kirkwood Powerhouse (KPH). The switchyard is a critical HHWP asset that provides the transmission of

electrical power generated at Kirkwood and Holm powerhouses to Moccasin, as well as the local distribution of power to HHWP's upcountry facilities. The slope requiring hazard mitigation, located next to ISY, was severely burned in the Rim Fire. The purpose of the project is to reduce the risk of slope failure which may cause damage to the switchyard and loss of power transmission capability.

CUH101PD - 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

10032903 - O'Shaughnessy Dam Outlet Works Phase 1

O'Shaughnessy Dam (OSD) was completed in 1923 and raised in 1938. Condition assessment of the dam outlet works revealed deficiencies. This rehabilitation project addresses deficiencies of the existing outlet works system at OSD, including the drum gates and release system through OSD to Canyon Tunnel and the Tuolumne River. A recent condition assessment identified deficiencies in the OSD

release system. Seven projects were identified and have been prioritized. Phase 1 will include three of these projects: drum gate rehabilitation (upgrading the hinges and rivets, recoating the gate and existing seals, and repairing the spillway concrete), installation of a new bulkhead system, and rehabilitation of slide gates & installation of a diversion pipe butterfly valve.

CUH10214 - Moccasin Facilities New Construction (Completed)

The existing HHWP shops and buildings are original and vary in age from between 45 to 80 years old. Some maintenance crews are currently working in buildings that were not originally intended to be used as shops. Many of these facilities do not meet current codes, require extensive repairs, and are not efficient work environments. The primary objective of this project is to build a 10,000-square-foot, combined-function building consisting of a plumbing shop, vegetation management shop, right-of-way shop, electric technician chop, lockers, shower facilities, break room, and new materials bins.

CUH10215 - 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.

CUH10216 - Cherry Dam Outlet Works Rehabilitation (Completed)

The outlet facilities for Cherry Dam have reached the end of their service life at nearly 60 years old. The stream release assets must work

sufficiently well to meet U.S. Department of Interior's stream flow requirements, and these requirements cannot currently be met at low lake elevations. The 66" valves will be replaced in order to safely operate the dam during storm conditions with heavy inflows to Cherry Lake. The valves are critical for maintaining maximum carryover storage and meeting the SFPUC's water supply objectives. The scope of work includes replacement of the stream release valves and associated piping as well as the Low Level Outlet (LLO) 66" hollow jet valves. The project also replaced both butterfly valves that serve as isolation valves upstream of the hollow jet valves as change orders during construction.

CUH10220 - Mountain Tunnel Inspection & Repairs (Completed)

The objective of this project is to assess the current condition of the Mountain Tunnel and complete any urgent interim repairs to reduce the risk of tunnel lining failure until the completion of the long-term Mountain Tunnel Improvements project in 2026. The project consists of:

- A tunnel inspection in 2017 to update the Condition Assessment conducted in 2008; and
- Short term repairs in 2017 and 2018-19 to reduce the risk of failures in the concrete lining.

CUH10221 - 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:

- Initial evaluation of alternatives for the Mountain Tunnel facility, and
- Eventual design and construction of the preferred engineering alternative that will

keep this vital component of the Hetch Hetchy Water and Power System in reliable service for years to come.

The 2016 scope consisted of just the Planning Phase for the project. The primary focus was on the development of viable alternatives for the project including:

- Rehabilitation of the existing tunnel,
- Relining the existing tunnel,
- Construction of a new bypass tunnel within the tunnel right-of-way, and
- Construction of a new bypass tunnel outside the tunnel right-of-way.

In 2017, the existing tunnel was shut down for 60 days and a detail inspection was performed. The inspection and subsequent condition assessment found many defects in the tunnel lining. However, all the defects were repairable, and the tunnel was still structurally sound. This substantiated the viability of the rehabilitation alternative with downstream valve control, and the City adopted this as the preferred project for design and construction in July 2017. The rehabilitation option met almost all of the project performance standards with the least cost. The project consists of:

- Repairs of all significant concrete lining defect with wire mesh reinforcement and shotcrete,
- Contact grouting of the entire lining to further reinforce and seal the lining to the surround rock,
- A new downstream flow control facility at Priest Reservoir with valving to meter flows and keep the tunnel running full during all operations and mitigate future erosion of the lining,
- A new tunnel adit at Priest Reservoir to allow maintenance access to Mountain Tunnel without having to drain the reservoir in order to expose the current access portal,
- An extension of the South Fork Siphon crossing under the Tuolumne River to bypass a problematic section of the tunnel that infiltrates excessive groundwater into the tunnel, and causes adverse water quality

issues,

- An enlarged concrete portal at Early Intake to accommodate maintenance equipment access at the upstream section of the tunnel,
- Access road widening and improvements to accommodate safer maintenance access to Adit 5/6 and Adit 8/9, and
- Temporary construction staging areas, environmental mitigations, and site restoration improvements.

CUH10223 - OSH Dam Access and Drainage Improvements

The key objective of this project is to provide safe access for Hetch Hetchy Water and Power operators inside the O'Shaughnessy Dam by improving fall protection, access, and drainage. The key elements include:

- Replace Access Structures in Ladder Wells. The existing access structures in the four (4) vertical ladder wells (shafts) include vertical ladders and horizontal grating platforms that are spaced throughout the ladder wells.
- Install Fall Protection Systems. Install new Occupational Safety and Health Administration (OSHA) compliant ladders and landings with safety cage and/or install fall restraint systems.
- Seal or Mitigate Existing Leakage. Address flowing water by sealing leaks or otherwise diverting, collecting and disposing of flows.
- Drainage Improvements. Clear the drains in the dam so that water can drain as designed and/or install sump pumps, if appropriate.
- Replace Watertight Door between Ladder Wells 3 & 4. This scope item includes replacing the existing watertight door between Ladder Wells 3 & 4.

10035086 - Bridge Replacement (4 Bridges)

HHWP is responsible for maintaining 14 bridges located in the Cherry, Eleanor, and Hetch Hetchy region. Condition assessment has identified the need for rehabilitation and/or replacement (both due to age and to meet current seismic design criteria). Four of

the fourteen bridges require substantial modification or replacement and have been combined into this project. This project includes rehabilitation and/or replacement of Cherry Lake Road Bridge (public access), Early Intake Bridge (public access), and O'Shaughnessy Adit Access Bridge.

CUH102PD - 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.

2018 MOCCASIN STORM EVENT**10033233 - 2018 March Storm Event
Emergency Repairs and Interim
Improvements**

On March 22, 2018, a storm event caused widespread damage to Tuolumne County. Hetch Hetchy Water and Power (HHWP) sustained considerable damage to assets associated with water supply, drainage, and power generation, including Moccasin Lower Dam and auxiliary spillway, Moccasin Upper Diversion Dam, Moccasin Reservoir, Priest Reservoir, Moccasin Powerhouse, and Moccasin Lowhead Powerhouse. On March 29, 2018, the Mayor of SF, Mark E Farrell officially declared the storm damage a Local Emergency Event. This project addresses the emergency repairs and interim improvements to the water-related assets located in Moccasin. Various contracts will be utilized to complete construction activities associated with: debris removal from the Moccasin Upper Diversion Dam and Moccasin Reservoir; repairs to the Moccasin Upper Diversion Dam; repairs to the Moccasin Lower Dam; replacement of the Leithold Line water distribution line; replacement of drainage systems (culverts and piping); access improvements to the Gate 3 structure located in the Moccasin Reservoir; installation of debris barriers upstream of the Moccasin Upper Diversion Dam and within the Moccasin Reservoir; and installation of a flood control berm downstream of the Moccasin Lower Dam.

A1-B HETCHY RENEWAL AND REPLACEMENT PROGRAM

WATER INFRASTRUCTURE

CUH10001 - SJPL Rehabilitation

The San Joaquin Pipelines (SJPLs) convey water from Foothill Tunnel to Coast Range Tunnel. The asset varies in age from 5 to almost 80 years old. Hetch Hetchy Water and Power (HHWP) have developed an annual program to inspect, monitor and manage the SJPLs and extend the life of the asset prior to replacement.

CUH10005 - Priest Pipe Recoating (Completed)

The coating on a 24" pipe located in a tunnel at Priest Reservoir has failed. The project scope will be to recoat the pipe.

POWER INFRASTRUCTURE

CUH10103 - Powerhouse Control Upgrade (Completed)

This project will upgrade the powerhouse protection, control, indication, and monitoring system. The electromechanical relays will be replaced with multifunction digital relays to improve reliability and functionality of the electrical protection system. The scope of work includes de-terminating the wiring, removing relays from the main control board, and installing new relays and internal wiring. Digital relays have diagnostics that will notify or alarm the operator if there is relay trouble, thus preventing potential consequential failures, damage, and electrical safety hazards. The existing electromechanical type relays do not have diagnostic capability and present a higher overall risk of failure. If an electromechanical relay does fail, there is a loss of protection on the electric system that could prevent generation. Furthermore, the digital type requires less maintenance at once every five years instead of annually as required for

the electromechanical type under regulatory requirement PRC-005.

CUH10108 - Step-Up Transformers (Completed)

These projects include replacing step-up transformers at Kirkwood and Cherry Ridge Line.

CUH10109 - Moccasin Low Head Rehabilitation Project (Completed)

This project is for the rehabilitation of the Moccasin Low Head Powerhouse, which includes the following components: Replace Roof - Repair or replacement of the aging powerhouse roof. Oil Spill Containment / Prevention - Provision on an oil separation system or other modification should be installed inside the powerhouse to prevent contamination. Upgrade Excitation System - Replacing the existing excitation system with a modern digital excitation system to improve unit availability. A reliable, functioning excitation system is required for unit generation. Upgrade Electrical Protective System - Replace the single function, solid state relays with multifunctional digital relays to improve reliability and functionality of the electrical protection system. The scope includes de-terminating the wiring, removing relays from the main control board, and installing new relays and internal wiring. Upgrade Unit Control System - this project upgrades the unit control system and re-locates the control panel to improve safety conditions for operations personnel. Governor Upgrades - this project provides for the upgrade of the mechanical governor to digital governor. This project is required so we can backfeed from the low head for the Moccasin Compound while upgrades are performed at Moccasin Switchyard.

CUH10110 - Early Intake Switchyard (Completed)

This project is for the rehabilitation of the Early

Intake Switchyard, which includes the following work: replace existing oil circuit breakers (OCBs) with new gas powered circuit breakers on Kirkwood and Holm section of 230kv bus; install gas powered circuit breakers and related components including bus conductors, structural steel, control cables, and galvanized rigid steel conduits. Install City furnished capacitive voltage transformer (CVTs) and surge arresters. Replace main bus-side and line-side disconnects bay 1 through 7, replace Aux bus disconnects bays 1 through 7, replace main bus-side breaker and aux bus disconnect within bay 0. Replace cap and pin insulator stacks with equivalent replacement post insulators within the main and aux buses, including underhung T-drop bus supports. Replace insulators associated with main bus sectionalizing switch. Removal of wave trap remnants, install new support structures. Remove and dispose of existing above grade oil transfer piping system. Connect into new programmable logic controllers (PLC) system. Install a Shoe-fly-bypass using a job order contract (JOC) contractor.

CUH10111 - Moccasin GSU Transformers & Oil Containment (Completed)

This project will provide replacement for two Generator Step Up transformers. The project scope also includes the concurrent design of oil containment of the specified transformers. The assessment will provide a cost estimate to develop the scope and specification criteria to be provided to a consultant engineer to develop construction drawings and specifications.

CUH10112 - Kirkwood Powerhouse Refurbishment & TSOV (Completed)

This project will provide funding for the rehabilitation of Kirkwood Powerhouse to increase life expectancy of the asset as well as improve safety by replacement of the two turbine shutoff valves (TSOVs). The scope of

work for the proposed project includes the following:

- Remove and replace TSOVs for Unit 1 and Unit 2 at Kirkwood Powerhouse.
- Replace the 480V breakers, complete switchgear lineup, Motor Control Centers (MCCs) and panel board with provision for an additional.
- Refurbish / replace various auxiliary systems including: cooling generators, exciters, turbines, transformers, building mechanical equipment, and building structure.
- Add Partial Discharge Analysis Instrumentation to Generator Unit 3 which includes monitoring the Unit 3 generator stator winding insulation and generator with a partial discharge analysis (PDA) instrument.
- Upgrade Vibrator Monitor System including removing the existing system, installing three independent systems with associated sensors and cabling, and incorporating systems into unit controls.

CUH10117 - Transmission Clearance

Moccasin Powerhouse Generators No. 1 and No. 2 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 the Generator No.1 and/or No. 2 stator cores and coils to uprate from 57.5 (MVA) to new rating of 61 MVA. The scope of work also include 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 to supply a new rotor rim for each generator following inspection and testing.

CUH10121 - MPH Bypass Valves

Following the 2013 Rim-Fire, the City was invited to apply for a FEMA Hazard Mitigation Grant. A grant application was prepared and submitted in 2014 to provide

mitigation measures for the potential hazards posed by the steep mountainside situated southeast of the Early Intake Switchyard (ISY). In the past there have been damage and shutdowns of the switchyard due to mudflows, rock falls, and landslides. The Rim Fire burned vegetation from much of the slope, thereby increasing the likelihood of future damage.

JOINT INFRASTRUCTURE

CUH10203 - Reservoirs and Dams

This project includes a condition assessment on all reservoirs and dams as well as more immediate projects to address safety or environmental concerns. The project includes a condition assessment of all storage and regulating reservoirs (six total) to identify work to be performed. Work is being prioritized and included in the Hetch Hetchy 10-Yr CIP Plan.

CUH10205 - Small Water Systems Upgrades (Completed)

Upgrade small water systems at Moccasin Compound, O'Shaughnessy and Early Intake in order to meet state regulatory compliance requirements. HHWP must upgrade their small water systems with ultraviolet (UV) treatment equipment.

CUH10207 - Existing Hetchy Facilities (Outside Moccasin) (Completed)

This project will fund the rehabilitation of all HHWP facilities outside of Moccasin (approximately 80 facilities). Within the work included are: Maintenance - Painting, Roof Replacement, Gutters, Dry Rot, Foundations and Drainage upgrades. Hazardous Material Abatement - Lead and asbestos removal. Building and Electrical Code Violations, Water Distribution System, Waste Water and or Septic Tanks and Energy Efficient Projects. The scope of work on the Industrial Buildings will consist of repairs to the Arc Flash deficiencies

and provide Emergency Power for the Support Facilities.

CUH10208 - Remote Terminal Unit Replacement (Completed)

The project includes removing the unit annunciator remote terminal unit and installing a Modicom I/O rack, wiring signals to new I/O, and migrating signals through the new programmable logic controllers for access by the new supervisory control and data acquisition system. This project is an upgrade to the existing system and will improve reporting and operations. This project is part of an ongoing HHWP program to upgrade the SCADA and unit controls for both the water and power systems.

CUH10209 - Road Improvements

This project includes maintaining almost 50 miles of paved roads and rehabilitation of eleven bridges. Preliminary findings in the condition assessment indicate that some of the bridges will require replacement and/or retrofit. Also, signage, reflectors, guardrails, slope stabilization, and selective road widening will be required to enhance the safety of road users.

CUH10210 - Hetchy Fiber Projects (Completed)

This project will install fiber between Modesto and Moccasin Peak on lines 5/6 and lines 7/8, as well as replace the fiber system within the Moccasin compound. Fiber will become the primary means of communication, with our existing licensed microwave functioning as the redundant system. Communication channels will include the business network, control network, security network, protection network, and voice over internet protocol (VoIP) network. The upgraded system will not only meet regulatory requirements but provide a more secure, reliable communication and power protection system. By 2022, the fiber electronic hardware will have reached the end

of its technical life expectancy and will require upgrades.

CUH10211 - Facilities Security Project

HHWP is updating security fences and installing card access at remote locations. HHWP is also evaluating new security requirements that are now required to meet North American Electric Reliability Corporation (NERC) regulatory requirements. HHWP only has door alarms at many remote sites. Increased security is required including fencing, card access and camera monitoring to minimize the risk of intrusion at these facilities. In addition, HHWP has to address regulatory security requirements.

CUH10212 - Moccasin Penstock

Moccasin Penstock was built in the early 1920s and conveys the SFPUC water supply from Moccasin Tunnel to Moccasin Powerhouse. HHWP is currently in the process of performing a penstock condition assessment. The penstock includes about four miles of hammer-forged welded steel penstock and may be subject to failure. In addition, issues have been identified regarding the anchor/saddle system. The short-term program includes completing the condition assessment, performing repairs at locations with significant corrosion, and addressing concerns with the anchor/saddle system. In 2015, coating and lining issues will be addressed on the non-hammer-forged welded sections. The long-term project is to replace the hammer-forged welded section if this is the most cost-effective alternative identified during the condition assessment.

CUH10213 - Communication System Upgrade

The project will provide funding for replacement and expansion of the HHWP two-way radio system resulting in better coverage in the up-country river canyons as well as inter-divisional communication with other water enterprise operating divisions in

the Bay Area. In addition, the project will extend 6GHz microwave communication to remote locations such as O'Shaughnessy and Cherry Valley Dams and Cherry Pump Station, allowing for remote monitoring and control of assets, enhanced security capabilities as well as business network connectivity at those sites. Lastly, this project will complete redundant paths of communication for control network systems between critical facilities such as HPH, KPH, and ISY using both microwave and fiber technology for those short hops.

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APPENDIX C. LIST OF ACRONYMS

AC	Alternating Current	SJVH	San Joaquin Valvehouse
AMI	Advanced Metering Infrastructure	TSOV	Turbine Shutoff Valves
CATEX	Categorical Exemption	TTF	Tesla Treatment Facility
CEQA	California Environmental Quality Act	TUV	Tesla Ultra Violet
CER	Conceptual Engineering Report	UV	Ultra Violet
CIP	Capital Improvement Program	VoIP	Voice Over Internet Protocol
COVID-19	Coronavirus Disease of 2019	WSIP	Water System Improvement Program
CVT	Capacitor Voltage Transformers		
DB	Design, Build		
FEMA	Federal Emergency Management Agency		
FY	Fiscal Year		
Ghz	Gigahertz		
GSU	Generator Step-Up		
GWH	Gigawatt Hours		
HCIP	Hetchy Capital Improvement Projects		
HH	Hetch Hetchy		
HHWP	Hetch Hetchy Water and Power		
HPH	Holm Powerhouse		
ISY	Intake Swithyard		
JOC	Job Order Contract		
KPH	Kirkwood Powerhouse		
LCA	Lower Cherry Aqueduct		
LLO	Low Level Outlet		
MCC	Motor Control Centers		
MPH	Moccasin Powerhouse		
NERC	North American Electric Reliability Corporation		
NTP	Notice to Proceed		
OCB	Oil Circuit Breakers		
OSD	O'Shaughnessy Dam		
OSHA	Occupational Safety and Health Administration		
PD	Project Development		
PDA	Partial Discharge Analysis		
PG&E	Pacific Gas and Electric Company		
PLC	Programmable Logic Controllers		
PUC	Public Utilities Commission		
R&R	Renewal and Replacement		
RTU	Remote Terminal Unit		
SCADA	Supervisory Control and Data Acquisition		
SF	San Francisco		
SFPUC	San Francisco Public Utilities Commission		
SJPL	San Joaquin Pipeline		

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