

PRIORITY/ACTION TITLE: Wastewater Pump Stations, Force Mains, and CSO Outfall Rehabilitation

Branch/Division: DWW

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Priority/Action Type:

- 2018-2023 Existing Action Plan with continued funding for 2021-2026
- 2018-2023 Existing Action Plan with increased funding for 2021-2026
- New Priority requiring new funding
- Priority with existing Funding

Summary of the Priority or Action Plan:

This action plan update increases funding for the pump station, force main, rehabilitation capital programs and maintains current funding for the CSO Outfall Rehabilitation program 2021-2026.

SPU's historically low investment in rehabilitation work has resulted in a significant number of facilities and pipes that are at risk of failure and need to be addressed. Facility evaluations indicate that the current investment level is not enough to support the long-term health and sustainability of the Pump Station and Force Mains in service. Under the current plan, we are likely to experience more facility failures or force main failures which lead to overflows, impacts to public health and safety, and risk SPU's ability to meet regulatory requirements.

Original Summary of Project (2018).

This action plan increases funding for the pump station, force main, and CSO outfall capital programs 2018-2023.

Pump Station and Force Main Program: This program includes all capital spending to rehabilitate and replace assets at SPU's 68 sewer pump stations and their associated force mains. Force mains are pipes that convey flow under pressure from the discharge side of a pump to the gravity system downstream.

Outfall Program: This program includes all capital spending to rehabilitate and replace SPU's 86 CSO outfalls, which are the relief pipes where stormwater and sewage discharge to receiving waters during heavy rain.

1. 2021-2026 Funding Recommendation

What is the funding recommendation for this existing investment? Specify:

- Continue Program investments and increase funding.
- Impacts to rates will be presented to the CRP at a later time.

Program Title	Expansion of rehabilitation of pump stations, combined sewer outfalls						
Project name and number(s)	Formerly Action Plan #8 Pump Station, Force Main & CSO Outfall Capital Programs						
(\$M's)	2021	2022	2023	2024	2025	2026	Total
PUMP STATIONS AND FORCE MAINS							
O&M \$ Amount	-	-	-	-	-	-	-
Current Baseline Budget	3.00	3.00	3.00	3.00	3.00	3.00	18.00
Action Plan Increase (2018)	1.37	1.02	1.00	-	-	-	3.39
Action Plan Increase Request (2020)	2.78	6.16	3.37	4.24	4.39	5.60	26.54
Total Request	7.15	10.17	7.37	7.24	7.39	8.59	47.91
FTEs Added/Changed	-	-	-	-	-	-	-
CSO OUTFALLS							
O&M \$ Amount	-	-	-	-	-	-	-
Current Baseline Budget	0.50	0.50	0.50	0.50	0.50	0.50	3.00
Action Plan Increase (2018)	1.00	1.00	1.00	-	-	-	3.00
Action Plan Increase Request (2020)	-	-	-	1.00	1.00	1.00	3.00
Total Request	1.50	1.50	1.50	1.50	1.50	1.50	9.00
FTEs Added/Changed	-	-	-	-	-	-	-

2. Alternatives Considered

What alternatives were considered in addition to what is being recommended (if any)? How would these alternatives impact service levels?

- Each project proposed as part of the Sewer Pump Station and Force Main Program goes through an option analysis and collaborative scoping process to evaluate the appropriate project scope while “future proofing” the facilities to accommodate future capacity and operational needs. Generally, these projects are based on bringing the facilities up to code and replacing failing or substandard assets so that the facilities will perform effectively throughout an industry standard asset management lifecycle.
- Pump Station and Force Main Rehabilitation program work is prioritized based on risk and criticality. Lower priority work is not funded until high priority work is completed.
- Prioritization of and impacts to other programs and projects were not considered in the development of this SBP Initiative.

3. Capacity plan to Deliver (Capital Only)

What is your staffing plan for delivery? If there was difficulty in delivering in the past, what has changed?

- Utilize existing internal staff and supplement staff resource limitations through on-call consultant support.

4. Milestones/performance metrics

What are the short and long-term metrics for measuring progress? How will you measure whether the action has been successful? Note: measures may not be different than your original plan but milestones should be updated to reflect the 2026 time horizon.

Pump Stations and Force Mains

Targeted Commitments	Performance Metrics	Definition of Success
Reduce and eliminate backlog of high-risk degraded assets by 2040	Number of Pump Stations retrofitted	90% or higher achievement of annual goal
	Force Mains replaced	90% or higher achievement of annual goal
	Number of Air Lift type Pump Stations Replaced	90% or higher achievement of annual goal
	Number of non-rehabilitation critical repairs completed	90% or higher achievement of annual goal
	Program Dollars spent	90% or higher achievement of annual goal

CSO Outfalls

Targeted Commitments	Performance Metrics	Definition of Success
Reduce and eliminate increased risk of SSO's due to degraded outfalls	CSO Outfall Asset Management Plan	Complete in 2020-2021
	Number of CSO Outfall cleaned or rehabilitated	90% or higher achievement of annual goal
	Program Dollars spent	90% or higher achievement of annual goal

2018-2023 SBP Action Plan Update (Previously Presented)

Action Plan Title: Pump Station, Force Main & CSO Outfall Capital Programs (#8)

1. Short summary of the project/program

- **Part 1: Summary of Project.**

The action plan increased funding for the pump station, force main, and CSO outfall capital programs 2018-2023.

Pump Station and Force Main Program: This program includes all capital spending to rehabilitate and replace assets at SPU's 68 sewer pump stations and their associated force mains. Force mains are pipes that convey flow under pressure from the discharge side of a pump to the gravity system downstream.

Outfall Program: This program includes all capital spending to rehabilitate and replace SPU's 85 CSO outfalls, which are the relief pipes where stormwater and sewage discharge to receiving waters during heavy rain.

- **Part 2. Targeted Commitments & Actuals (2018-19).**

Pump Station and Force Main Program

Targeted commitments were identified for 2018-2023:

Essential improvements to 15 conventional pump stations (Ahead of Schedule)

- SPU will complete essential improvements at more than 15 stations by 2023
 - PS Ventilation Improvements: 25 pump stations, Completed 2019
 - Electrical Improvements: Disconnect installs at 23 pump stations, Completed 2019
 - PS 2 and 35 generator Replacements: Completed 2019
 - PS 9 Side Gate and Hatch Replacements: Completed 2019
 - PS 1 Pump and Valve Replacements: Completed 2019
 - PS 19 Drive and Pump Replacements: Completed 2019
 - PS 49 Pump Replacements: Completed 2019
 - PS 59 Pump Replacements: Completed 2019
 - PS 84 Pump and Valve Replacements: Completed 2019
 - PS 2,72,73: Full facility upgrade, PS 2 and 73 Completed 2019, PS 72 2020
 - PS 17, 20, 118 Improvements: Full facility upgrade, PS 17 and 118 in design, PS 20 in construction
 - PS 62,63,71,76 Improvements: Full facility upgrade, In design

Replacement of 5 airlift type pump stations that are old and high maintenance (On schedule for 2 stations by 2023)

- SPU will complete 2 airlift type pump station replacements by 2023 with available funding
 - Airlift PS 38 Conversion: Airlift PS replacement, In design
 - Airlift PS 56 Conversion: Airlift PS replacement, In design



- Cost per station is significantly above projections due to project complexity and public works construction bidding environment

Replacement of 4 force mains that are already more than 80 years old (On Schedule)

- SPU will complete 4 force main replacements by 2023
 - PS 43 Force Main Replacement: Completed 2019
 - PS 71: Replacement part of station rehabilitation project, In design
 - PS 38: Replacement part of station rehabilitation project, In design
 - PS 38: Replacement part of station rehabilitation project, In design
- 2 force mains will be replaced as part of the CSO Program
 - PS 13 and PS 22
- 3 force mains will be replaced as part of the SDOT Partnering Program
 - PS 62, 63, and 65: Part of SDOT RapidRide Roosevelt Project

Outfall Program

The action plan increase in funding was to complete 4 condition assessments and 4 outfall repairs/replacements by 2023. SPU completed the assessment of 18 CSO outfalls in 2019, replaced 4 outfalls as part of other CIP projects and is on track to clean or repair 4 outfalls by 2023.

● **Part 3. Financial Plan & Actuals for 2018-2019.**

		2018	2018 Actuals	2019	2019 Actuals	2020	2021	2022	2023
	O&M (Non-Labor) Budget								
Capital Budget PS and FM	Capital Budget	11,885,754	3,005,047 ⁽¹⁾	13,025,589	14,172,371	5,920,942	7,861,613	4,121,747	4,000,000
	Baseline Budget	9,452,754		7,036,347		3,440,151	6,491,613	3,101,747	3,000,000
	Action Plan Budget	2,433,000		5,989,242		2,480,791	1,370,000	1,020,000	1,000,000
Capital Budget Outfalls	Capital Budget	647,000	1,080,848	1,100,000	1,917,922	338,095 ⁽²⁾	1,509,149	1,500,000	1,500,000
	Baseline Budget	647,000		1,098,470			509,149	509,149	500,000
	Action Plan Budget			1,530		1,003,442 ⁽²⁾	1,000,000	1,000,000	1,000,000

(1) PS 43 Emergency Force Main Project (\$7.2 Mil) was delayed to 2019

(2) 2020 Outfall Action Plan Budget moved into the 2021,2022,2023 Budget to accommodate Outfall Action Plan development in 2020

2. Have there been any significant changes in scope or assumptions since this action plan was approved in 2017? If so, please describe.

Pump Station and Force Main Program

Scopes and assumptions are relatively consistent since the plan was approved. SPU has underspent relative to plan for several reasons; significant project risk events in large projects did not occur and project reserves allocated were not spent, project delays due to permitting/regulatory issues, staff resourcing limitations, and consultant contracting limitations. SPU is working to improve spending vs plan by changing practices around allocation/management of project reserves, improved project planning and resourcing integration, further developing internal staff project competencies, supporting more crew led pump station rehabilitation, and improving the availability/flexibility of consulting contracting resources.

Outfall Program

There have not been significant changes in scope since the action plan was approved. However, findings from the assessment conducted in 2019 have found that the number of outfalls that require cleaning or repairs is higher than anticipated.

- 3. Do we anticipate this investment continuing in the next strategic plan? Will funding and targets be above or below 2018-2023 levels? Why?**

Pump Station and Force Main Program

This action plan will continue in the next strategic business plan. The current funding levels reflected in the 2018-2023 SBP have allowed SPU to make significant improvements to the pump station and force main assets. This funding level will allow for all non-airlift pump stations to be rehabilitated (replacing assets in kind) by 2040-2050. However, this funding level is not enough to replace airlifts on a desirable replacement rate. In addition, some larger more complex force main replacements will need additional funding in the later years (2023-2026). Therefore, we anticipate this action plan will asked for increased funding in the next SBP update.

In addition to the 6-year CIP discussed in the SBP, SPU has performed long term investment projections for this asset class which shows we are making sustainable levels of investment to prevent a bow wave of deferred maintenance activities in the future.

Outfall Program

This action plan will continue in the next strategic business plans. Funding levels will need to increase for Outfalls in order to replace or repair 2 outfalls a year, which is anticipated to address deficient outfalls moving forward.