



Seattle  
Public  
Utilities

## CSO Reduction Program

# Amended CSO Outfall Rehabilitation Plan: Program Years 2021-2026



TETRA TECH

**JACOBS**

Amended May 2022

# Signature Page

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## SECTION 1

# Introduction

Seattle Public Utilities' (SPU's) wastewater collection system is regulated by the Washington State Department of Ecology (Ecology) via National Pollutant Discharge Elimination System (NPDES) Permit No. WA0031682. This permit went into effect on May 1, 2016, was modified on September 28, 2017, and will expire on April 30, 2021. The permit accomplishes the following:

- Authorizes combined sewer overflows (CSOs) at the outfalls shown on Figure 1;
- Requires that SPU limit the number of CSOs from each "controlled" outfall to no more than one event per outfall per year on a long-term average; and
- Includes a requirement (S9) to submit an outfall rehabilitation plan to Ecology by October 30, 2020 that describes outfalls to be repaired or replaced during the next permit cycle. Section S9 also requires that the plan identify the current number of discharge points in SPU's system and identify outfalls located in close proximity to each other that share a hydraulic connection to a common control structure.

This *Amended Combined Sewer Overflow Outfall Rehabilitation Plan 2021 – 2026* (Plan) was prepared to identify combined sewer overflow (CSO) outfall cleaning and rehabilitation work needed between 2021 and 2026. The Plan also satisfies the requirements of Section S9 of NPDES Permit No. WA0031682.

As of May 2020, SPU has 82 CSO outfalls. The following share a hydraulic connection:

- Outfalls 24 and 25 share a hydraulic connection and overflow in tandem. However, each outfall has its own control structure.
- Outfalls 40 and 41 share a hydraulic connection to a common control structure.
- Overflow Structure 47B and Outfall 171 share a hydraulic connection and overflow in tandem. Each has its own control structure, but the overflow weirs are set at the same elevation.

This Plan provides a brief overview of the approach taken to identify CSO outfall rehabilitation needs and priorities, discusses CIP projects and a description of the planned 2021-2026 rehabilitation work. The report is organized as follows:

- Section 1: Introduction
- Section 2: Background
- Section 3: Assessment Approach
- Section 4: Findings and Conclusions
- Section 5: 2021-2026 Outfall Rehabilitation Schedule



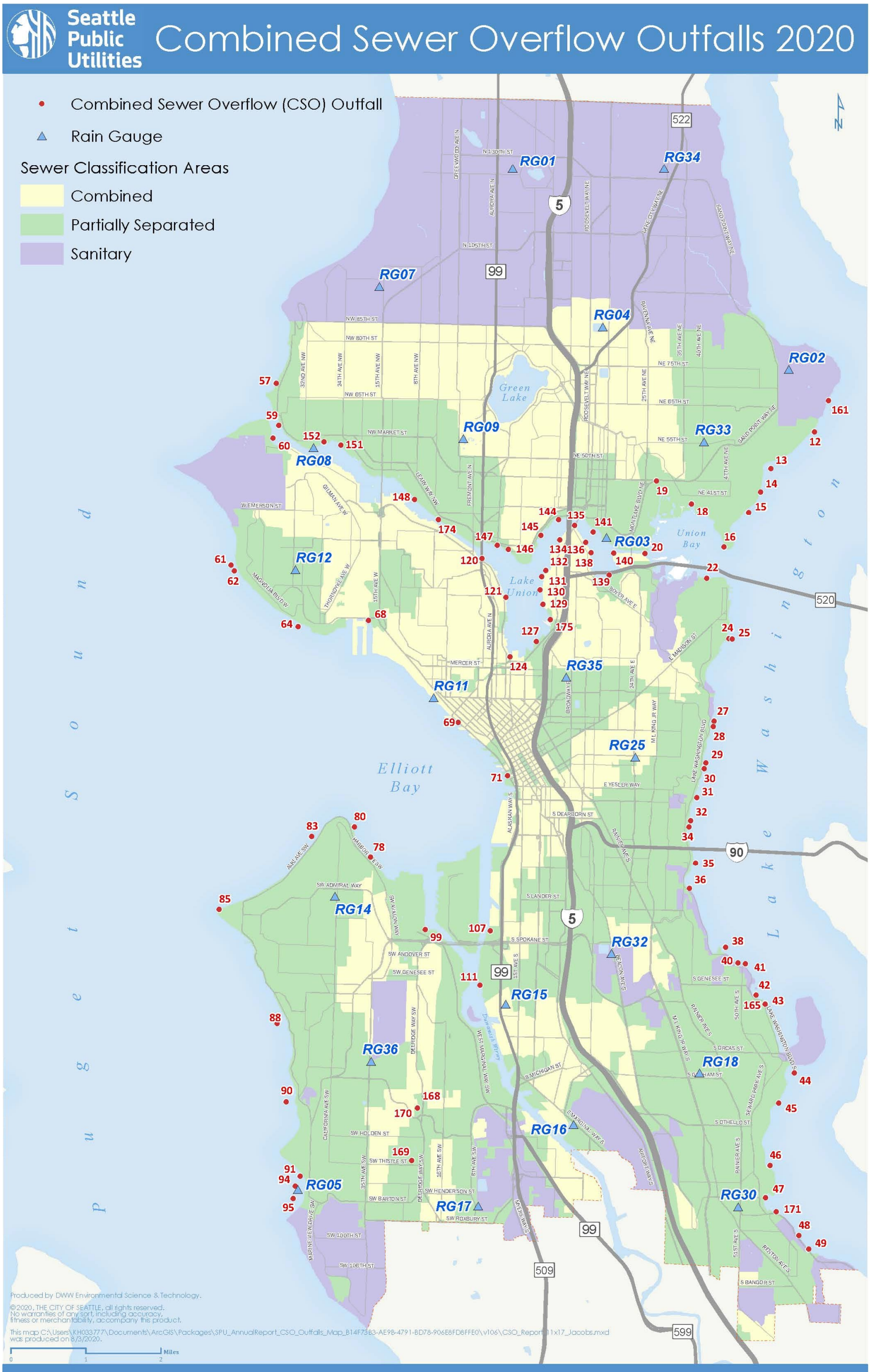


Figure 1-1. 2020 Combined Sewer Overflow Outfalls

## SECTION 2

# Background

In 2017, SPU conducted a risk assessment to identify which outfalls had the highest likelihood and consequence of failure based on updated data reflecting recently completed rehabilitation projects. Based on the results of the 2017 assessment and taking into consideration outfalls that had not previously been inspected or have upcoming CSO control projects, SPU identified 18 outfalls for inspection in 2019. Inspections were in-water visual assessments focusing on the pipe from the last maintenance hole (MH) to the end of the outfall looking for the level of sediment, the parts of outfall pipe needing repair, and the marine growth along the walls of pipe. The inspections identified specific work needed for 10 of the outfalls. Inspections also identified outfalls where additional analysis and assessment are necessary to determine whether additional future outfall rehabilitation work is needed.

## SECTION 3

# Assessment Approach

To prioritize the outfall rehabilitation work, SPU conducted a risk assessment of all active outfalls and conducted in-water visual inspections of the 18 outfalls with the highest risk score. Each of the 18 outfalls were assessed for capital improvement and/or cleaning needs based on the inspection results and desktop analysis of as-built drawings. This analysis concluded that ten outfalls require rehabilitation either through cleaning or a capital improvement program (CIP) project.

Once cleaning is completed additional inspection and analysis will be performed, if needed, to determine if future CIP rehabilitation projects are necessary.

## SECTION 4

## Findings and Conclusions

Findings and conclusions are summarized by outfall below:

CSO Outfall 13: Outfall 13 is located on Lake Washington near the physical address 5561 NE Ambleside Rd Seattle, WA. The 36-inch-diameter concrete pipe is blocked with sediment comprised of heavy woody debris, leaves, and floating debris for 71 feet of the outfall. The concrete pipe was not visible, and the debris blocked the camera from getting a proper inspection. The diver could not physically locate outfall ID 017-201.

*Conclusion: Clean outfall to remove blockage*

CSO Outfall 25: Outfall 25 is located along Lake Washington near the physical address 4245 E Lee St Seattle, WA. The divers were not able to find the upstream MH for the 20-inch-diameter cast iron outfall; CCTV inspection was performed from the water end upstream for 71 feet of the outfall. The outfall had rust nodules and small amounts of sediment. CCTV stopped at an obstruction that appeared to be a welded fitting inside the pipe.

*Conclusion: Clean outfall to remove sediment and confirm/remove obstruction*

CSO Outfall 38: Outfall 38 is located along Lake Washington near the physical address 2808 Lake Washington Blvd Seattle, WA. The 36-inch-diameter cast iron pipe was inspected from the last maintenance hole (059-346) and from the water (059-345). There was a large rock at 52 feet from 059-346 that prevented the crawler remotely operated vehicle (ROV) from continuing the inspection. There was a large debris pile 199 feet from 059-345 that prevented the crawler ROV from continuing inspection.

*Conclusion: Clean outfall to remove debris*

CSO Outfall 40: Outfall 40 is located along Lake Washington near the physical address 4002 49<sup>th</sup> Ave S Seattle, WA. The shallow 24-inch-diameter concrete outfall pipe was inspected from the water. The end of the pipe was covered with marine growth and sediment. The diver removed as much debris as he could to allow the crawler ROV to enter the pipe. The debris that was built up past what the diver could reach prevented the crawler ROV from continuing the inspection. The entrance of the outfall was damaged with heavy deterioration.

*Conclusion: Clean outfall to remove debris*

CSO Outfall 41: Outfall 41 is located along Lake Washington near the physical address 4002 49<sup>th</sup> Ave S Seattle, WA. The 16-inch-diameter DIP outfall could not be located from the water. The CCTV from the upstream MH was unable to inspect the pipe due to black debris-filled water.

*Conclusion: Clean outfall to remove debris*



CSO Outfall 43: Outfall 43 is located along Lake Washington near the physical address 4703 Lake Washington Blvd S Seattle, WA. The 16-inch-diameter RCP outfall was inspected from the last MH and from water. After traveling roughly 30 feet, the debris depth increased to roughly 3 to 4 inches, and large sticks prevented the crawler ROV from continuing the inspection. Heavy corrosion was noted.

*Conclusion: Clean outfall to remove debris*

CSO Outfall 59: Outfall 59 is located along Salmon Bay near the physical address 5635 Seaview Ave NW and 56<sup>th</sup> Ave NW Seattle, WA. The 36-inch-diameter cast iron outfall was inspected with ROV. Light sediment was observed in 140 feet of the 180-foot-long pipe. Sediment depth ranged from less than a 0.25 to 1 inch. In water, the ROV found a section of pipe that appeared to be a diffuser at the 12 o'clock position. The pipe section was severely rusted, and was not connected to the remaining outfall. The ROV inspected inshore looking to see if the outfall pipe emerged from natural bottom. The outfall pipe was located roughly 10 feet away buried in natural bottom but only from the 9 o'clock to the 3 o'clock position.

*Conclusion: Implement rehabilitation project to remove gravels and rehabilitate/replace outfall pipe*

CSO Outfall 139: Outfall 139 is in Portage Bay near the physical address 1601 E Calhoun St Seattle, WA. The 42-inch-diameter HDPE outfall pipe had 12 inches of sediment in it and a branch that prevented visual inspection.

*Conclusion: Clean outfall to remove debris*

CSO Outfall 140: Outfall 140 is in Portage Bay near the physical address 1800 E Shelby St Seattle, WA. The 18-inch-diameter cast iron outfall had large amounts of sediment that prevented visual inspection. No sign of damage such as rust or pitting was found.

*Conclusion: Clean outfall to remove debris*

CSO Outfall 169: Outfall 169 is located near the physical address 8141 24<sup>th</sup> Ave SW Seattle, WA. The approximately 12-feet-long 36-inch-diameter corrugated metal outfall pipe was missing 4 feet of pipe below the waterline due to corrosion.

*Conclusion: Implement rehabilitation project to rehabilitate/replace end section of outfall pipe*

## SECTION 5

## 2021-2026 Outfall Rehabilitation Schedule

The following list summarizes the work to be performed on CSO outfalls in the 2021-2026 period and the projected completion date:

- Clean eight (8) CSO outfalls by December 2024
- Repair/Rehabilitate two (2) CSO outfalls by December 2026

The specific outfalls to be cleaned and rehabilitated may be the ones listed in Section 4 or may be others that are prioritized as a result of new information being acquired over time.