PROTECTING SEATTLE'S WATERWAYS

WASTEWATER COLLECTION SYSTEM

ANNUAL REPORT | 2024

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Seattle Public Utilities

Document Revision History

Revision Number	Date	Description of Change
1	5/19/2025	Updated the Summary of 2024 Monitoring Results in Section 5.3; updated November 2024 and total 2024 overflow volumes for Outfall 152 in Table 5-4; updated the total 2024 volume for Outfall 152 and the total 2024 volume in Tables 5-5 and 5-6; updated the 2024 overflow volume to Salmon Bay and the total 2024 overflow volume in Table 5-7

Table of Contents

Section 1 Introduction 1

1.1 The Wastewater Collection System 1
1.2 Collection System NPDES Permit 4
1.3 Collection System Consent Decree 4
1.4 Collection System Reporting Requirements 5

Section 2 Planning Activities 9

2.1 Joint City of Seattle/King County Operations and System Optimization Plan 9
2.1.1 Joint System Event Debrief Committee Commitment 9
2.1.2 Data Sharing Commitment 9
2.1.3 Joint Modeling Coordination Committee Commitment 10
2.1.4 Coordination During Startup and Commissioning of CSO Control Facilities Commitment 11
2.1.5 Real-Time CSO Notification Commitment 11
2.1.6 Reduce Saltwater Intrusion Commitment 11
2.1.7 Coordinated Optimized Evaluation Effort 11
2.2 Coordinated Optimization Evaluation 11
2.2.1 What is Optimization? 11
2.2.2 Why Does Optimization Matter? 12
2.2.3 COE Goals 12
2.2.4 2024 Progress 12
2.3 Shape Our Water Plan 12
2.3.1 Shape Our Water: Four Key Stages 12
2.4 Long Term Control Plan Update 14
2.4.1 2024 Progress 14
2.4.2 Next Steps 14

Section 3 Operation & Maintenance Activities 15

3.1 Nine Minimum Control Activities 15
3.1.1 Control 1: Provide System Operations & Maintenance (O&M) 15
3.1.2 Control 2: Maximize Storage of Flows 16
3.1.3 Control 3: Control Nondomestic Sources 17
3.1.4 Control 4: Deliver Flows to the Treatment Plant 18
3.1.5 Control 5: Prevent Dry Weather Overflows 22
3.1.6 Control 6: Control Solids and Floatable Materials 23
3.1.7 Control 7: Prevent Pollution 26
3.1.8 Control 8: Notify the Public 28
3.1.9 Control 9: Monitor CSOs 29
3.2 CMOM Performance Program Activities 29

3.2.1 Sewer Cleaning Initiatives 29
3.2.2 Sewer Condition Assessment Initiatives 29
3.2.3 Sewer Rehabilitation Initiatives 30
3.2.4 SSO Performance 30
3.3 Outfall Inspections and Repair 32
3.4 FOG Control Program Activities 33
3.4.1 FOG Control Program Overview 33
3.4.2 FOG Management Plan 33
3.5 Annual Review of Operations and Maintenance Manuals 40
Section 4 Capital Activities 42
4.1 Sewer System Improvement Projects 42
4.1.1 Delridge (Basin 99) HydroBrake Retrofit Project 42
4.1.2 Magnolia (Basin 60) Pump Station 22 Rehabilitation Project 43
4.1.3 East Montlake (Basin 20) Pump Station 13 and Force Main Rehabilitation Project 44
4.1.4 Portage Bay (Basin 138) HydroBrake Retrofit Project 45
4.1.5 Pearl Street Drainage and Wastewater Improvement Project 46
4.2 Capital Improvement Projects 47
4.2.1 Ship Canal Water Quality Project (Basins 147, 151, 152, and 174) 47
4.2.2 Central Waterfront CSO Reduction Project (Basins 70, 71, 72) 49
4.2.3 Longfellow Starts Here Project (Basins 168, 169) 51
4.2.4 Leschi (Basins 26 – 36) 53
4.3 CSO Control Supplemental Compliance Plans 54
4.3.1 Windermere Supplemental Compliance Plan 54
4.3.2 Genesee Supplemental Compliance Plan 54
4.3.3 South Henderson Supplemental Compliance Plan 55
4.3.4 Magnolia 62 Supplemental Compliance Plan 56
4.4 Stormwater Projects 56
4.4.1 RainWise Program 57
4.4.2 NDS Partnering 58
4.4.3 South Park Water Quality Facility 60
4.4.4 Expanded Arterial Street Sweeping Program 61
Section 5 Monitoring Programs and Results 62
5.1 Precipitation Monitoring Program 62
5.2 Flow Monitoring Program 62
5.3 Summary of 2024 Monitoring Results 62
5.4 CSO Control Post-Construction Monitoring 63
5.5 Integrated Plan Post-Construction Monitoring 64

List of Appendices

Appendix A: Additional CMOM Information 108
Table A-1. 2024 SSO Details 109

Table A-2. Pump Station Location and Capacity 111
Table A-3. 2024 Pump Station Work Order Summary 114

List of Figures

Figure 1-1. City of Seattle Sewer Classification Areas 2
Figure 1-2. City of Seattle Combined Sewer Basins 3
Figure 2-1. Shape Our Water Planning Process 13
Figure 3-1. 2024 Mainline Image Demonstrating Visible FOG Accumulations Resulting in SSO Near the University of Washington 18
Figure 3-2. Force Main Replacement at Wastewater Pump Station 62 19
Figure 3-3. Site Work in Progress at Wastewater Pump Station 62 20
Figure 3-4. Site Work in Progress at Wastewater Pump Station 63 20
Figure 3-5. Completed Pump Room at Wastewater Pump Station 63 21
Figure 3-6. Site Work in Progress at Wastewater Pump Station 71 21
Figure 3-7. Site Work in Progress at Wastewater Pump Station 71 22
Figure 3-8. Redesigned Wastewater Brochure Launched During Fall Outreach 24
Figure 3-9. Image of the Toilet Tossing Game at an Event 25
Figure 3-10. Example of the Branding Re-Design for Toilet Paper Giveaways 25
Figure 3-11. CSO Outfall 140 – Facing Towards Water with Rowers in Background 28
Figure 3-12. Redesigned FOG Brochure That Launched During Our Fall Campaign 34
Figure 3-13. New Sink Strainer Messaging Making It Clearer That Grease and Oil Clog Pipes 34
Figure 3-14. New Pan Scrapers to Help Scrap Off FOG from Pans 35
Figure 3-15. Wastewater Engagement Intern Tabling at a Grocery Store Prior to Thanksgiving Week 36
Figure 3-16. Postcard Featuring Municipal Codes Distributed to Grease Interceptor Training Program Participants 37
Figure 4-1. New Basin 99 Sluice Gate (Left) and Actuator Motor (Right) 43
Figure 4-2. New Basin 60 Pumps Being Installed (Left) and New Basin 60 Connection to King County Trunk Sewer (Right) 44
Figure 4-3. Operational Testing of Upgraded Pump Station 13 (Left) and New Pumps and Valving (Right) 45
Figure 4-4. Installation of Basin 138 Slide Gate (Left) and New Higher Capacity Pumps (Right) 46
Figure 4-5. Construction of a Connector Tunnel Between Storage Tunnel and Drop Shaft 48
Figure 4-6. 8 ft. Drop Shaft in Ballard, Ready for Pump Station Construction 49

Figure 4-7. Central Waterfront Construction – Pike St. Control Structure Orifice Plate 50
Figure 4-8. Activity at the Longfellow Starts Here Community Outreach Event 52
Figure 4-9. SPU Table at the Longfellow Starts Here Community Outreach Event 53
Figure 4-10: Homeowner, Bac Sau Li, Speaks to RainWise Staff About the Importance of Her Cistern to Her Home Garden 58
Figure 4-11. Location Map for NDS Projects 59

List of Tables

Table 1-1. 2024 Annual Reporting Requirements, NPDES Permit 6
Table 1-2. 2024 Annual Reporting Requirements, Consent Decree 7
Table 3-1. 2024 O&M Accomplishments 15
Table 3-2. Dry Weather Overflows (DWOs) and Combined Sewer Overflows (CSOs) and Sanitary Sewer Overflows Exacerbated by System Maintenance Issues 2019 – 2024 23
Table 3-3. 2024 Sanitary Sewer Overflows by Category 30
Table 3-4. 2013-2024 SSO Performance 31
Table 4-1. 2024 Plan Implementation Spending 42
Table 5-1. 2024 Precipitation by Gauge and by Month (inches) 65
Table 5-2. 2020-2024 Average Precipitation by Month (inches) 66
Table 5-3. 2024 Flow Monitoring Performance by Outfall and Month 67
Table 5-4. 2024 CSO Details by Outfall and Date 72
Table 5-5. Comparison of 2024 and Baseline Flows by Outfall 84
Table 5-6. 2020 – 2024 Summary Comparison of CSOs by Outfall 89
Table 5-7. 2020-2024 Summary Comparison of CSOs by Receiving Water 101
Table 5-8. Outfalls Meeting Performance Standard for Controlled CSOs Based on Flow Monitoring Results and Modeling 103
Table 5-9. Integrated Plan Performance Targets and Results to Date 107

List of Abbreviations

Term	Definition
BIPOC	Black, Indigenous, and People of Color
BMP	Best Management Practice
CMOM	Capacity, Management, Operations, and Maintenance
COE	Coordinated Optimization Evaluation
CSO	Combined Sewer Overflow
DOJ	U.S. Department of Justice
DNRP	King County Department of Natural Resources and Parks
DWO	Dry Weather Overflow
Ecology	Washington State Department of Ecology
EBI	King County Elliott Bay Interceptor
EPA	U.S. Environmental Protection Agency
FSE	Food Service Establishment
GSI	Green Stormwater Infrastructure (see also NDS, LID)
LID	Low Impact Development (see also NDS, GSI)
LTCP	Long-Term Control Plan
MG	million gallons
MGD	million gallons per day
NDS	Natural Drainage Systems (see also GSI, LID)
NPDES	National Pollutant Discharge Elimination System
PACP	Pipeline Assessment and Certification Program
Public Health	Public Health - Seattle & King County
RCM	Reliability Centered Maintenance
SCADA	Supervisory Control and Data Acquisition
SDOT	Seattle Department of Transportation
SOP	Standard Operating Procedure
SPU	Seattle Public Utilities
SSO	Sewer Overflow
TSS	Total Suspended Solids
WWPS	Wastewater Pump Station

SECTION 1

Introduction

Seattle Public Utilities (SPU) is committed to keeping our wastewater collection system safe and reliable. This annual report includes updates on the Combined Sewer Overflow (CSO) Reduction Program and the Capacity, Management, Operations, and Maintenance (CMOM) Program, ensuring SPU meets both state and federal requirements. Here's what you'll find in this report:

- Section 1: Introduction
- Section 2: Planning Activities
- Section 3: Operation and Maintenance Activities
- Section 4: Capital Activities
- Section 5: Monitoring Programs and Results

Additional information is available at www.seattle.gov/cso.

1.1 The Wastewater Collection System

SPU manages one of the largest wastewater collection systems in Washington State. The system includes sanitary, combined, and partially separated combined sewers, as shown in Figure 1-1. In areas served by sanitary sewers, stormwater runoff flows into a separate storm drainage system, while sewage travels through City sewers to larger pipelines and treatment facilities owned and operated by King County Department of Natural Resources and Parks (DNRP). In areas of the City with combined sewers, stormwater runoff and sewage flow into the same pipes and are conveyed to DNRP facilities. In areas of the City served by partially separated combined sewers, storm drain separation projects built during the 1960s and 1970s divert street runoff to the storm drainage system, while stormwater from rooftops and private property flows into the combined sewers. Over time private property connects to separated storm drains at the time of redevelopment.

During storms, heavy rainfall can overwhelm the combined sewer system and cause overflows through designated CSO outfalls. These wet weather overflows, known as Combined Sewer Overflows (CSOs), help prevent backups within the wastewater system. SPU's wastewater system has 82 CSO outfalls located along Lake Washington, the Ship Canal, Puget Sound, Elliott Bay, the Duwamish River, and Longfellow Creek (see Figure 1-2). SPU's CSO Reduction Program aims to limit overflows to an average of no more than one overflow per outfall per year, based on a 20-year moving average. DNRP, which owns and operates an additional 38 CSO outfalls in the City of Seattle, has a similar program to reduce CSOs.

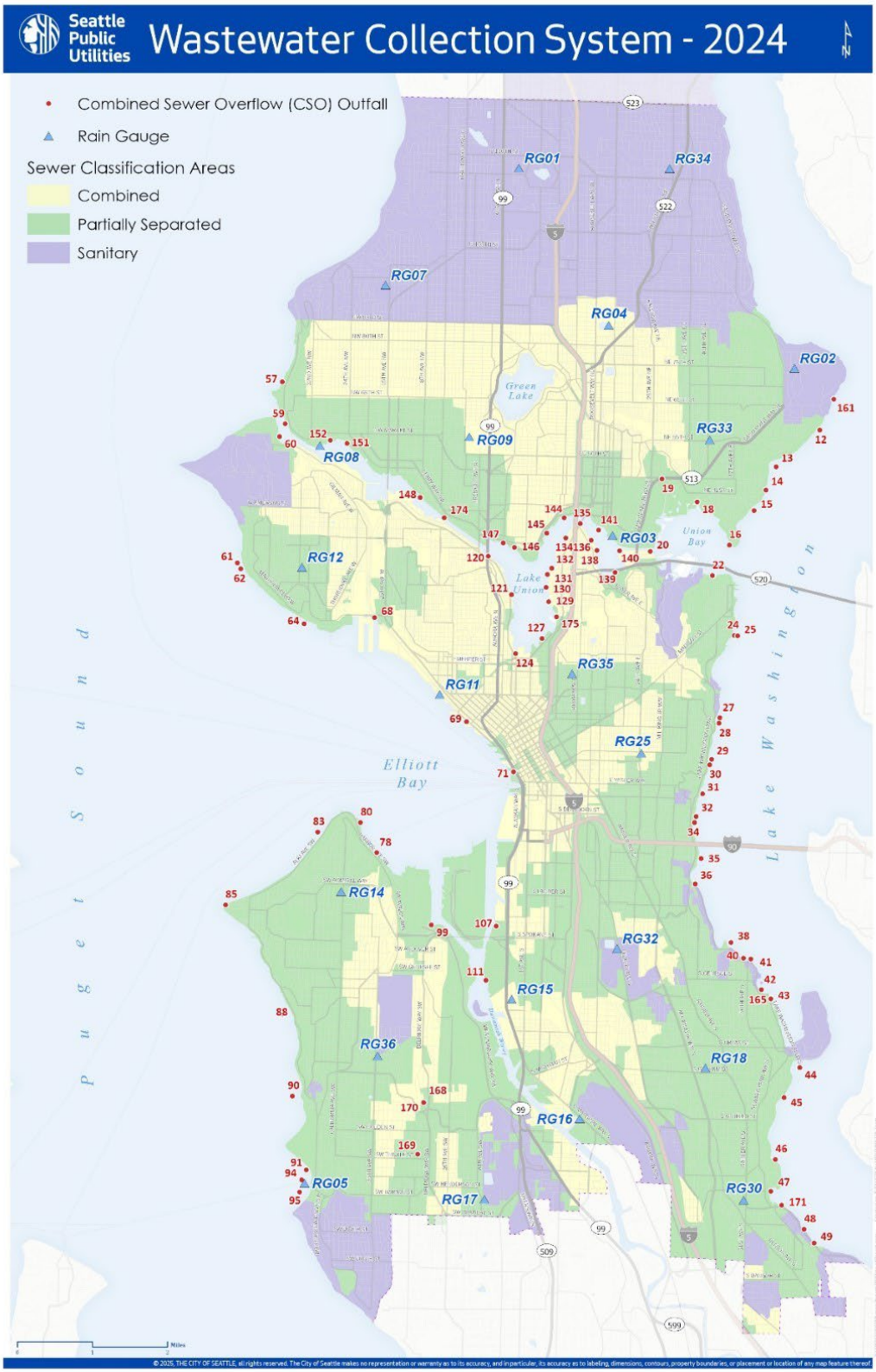

Figure 1-1. City of Seattle Sewer Classification Areas

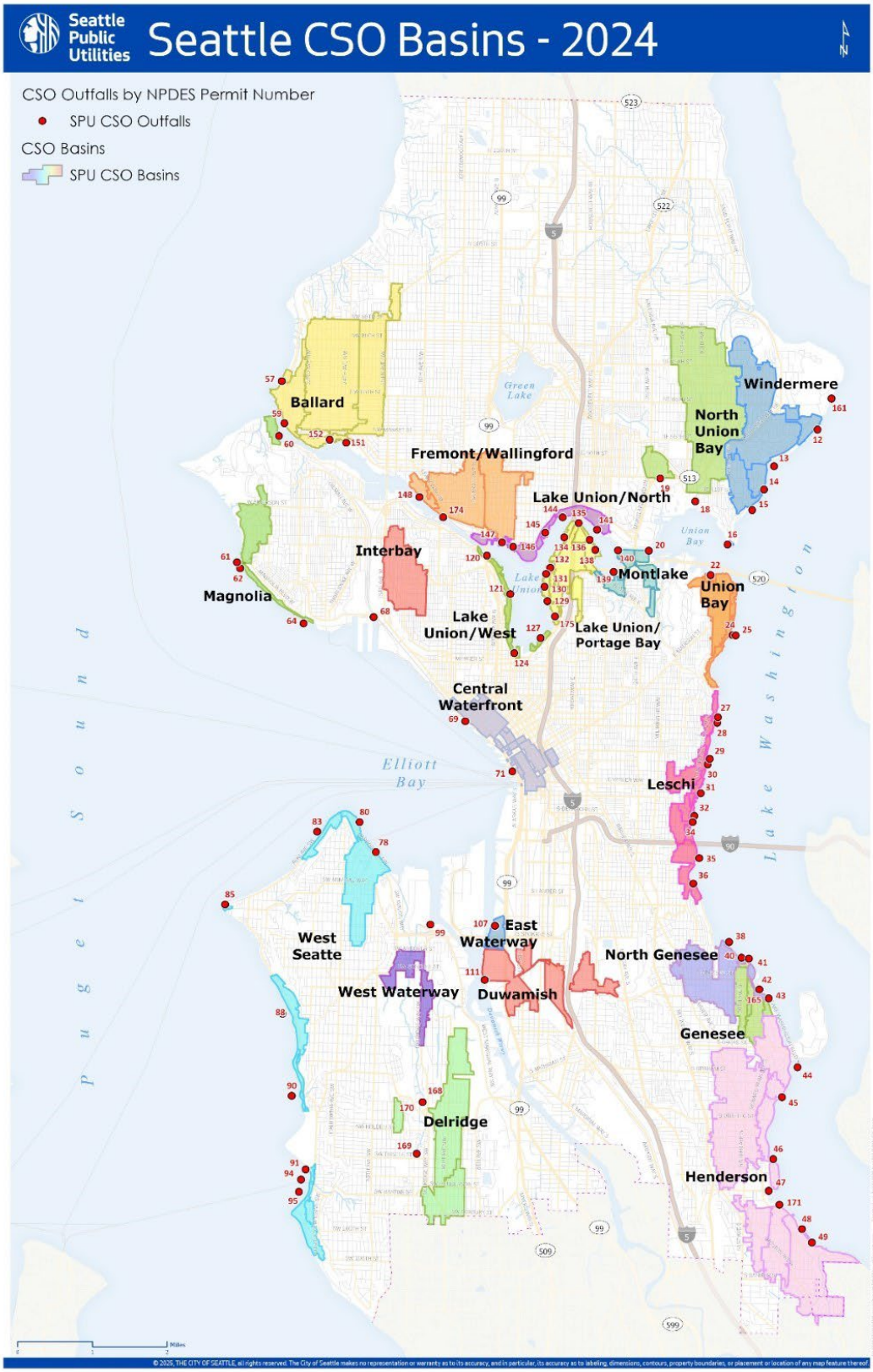

Figure 1-2. City of Seattle Combined Sewer Basins

1.2 Collection System NPDES Permit

The Washington State Department of Ecology (Ecology) regulates the City's wastewater system through a National Pollutant Discharge Elimination System (NPDES) permit. Ecology first issued this permit in 1975 to regulate CSO discharges, and it is reissued approximately every five years. The most recent permit, NPDES Permit WA0031682, was issued on March 30, 2016, and became effective on May 1, 2016. It was modified on September 28, 2017. SPU applied for permit renewal on August 31, 2020, and Ecology reviewed and accepted the application as complete on December 29, 2020, administratively extending the permit until a new one is issued.

The NPDES Permit:

- Authorizes CSOs at the 82 outfalls shown in Figure 1-1 and Figure 1-2
    - Outfall Updates:
        - Outfall 33 (formerly serving the Leschi area) was removed from CSO service on July 22, 2016
        - Outfalls 150 and 151 (formerly serving the Ballard area) were replaced with a single rehabilitated Outfall 151 effective February 27, 2019
        - Outfalls 70 and 72 (formerly serving the Central Waterfront area) were removed from CSO service on April 24, 2020, and May 26, 2020, respectively
- Limits the number of CSOs from each controlled outfall to an average of no more than one overflow per outfall per year, based on a 20-year moving average
- Includes a compliance schedule for CSO control projects and other activities to be completed before the permit expiration date
- Prohibits dry weather overflows (DWOs) from CSO outfalls, regardless of the cause (mechanical failure, blockage, power outage, and/or human error)
    - If a wet weather overflow is worsened due to one of these issues, the event is called an exacerbated CSO, based on Ecology guidance
- Requires reporting of DWOs and sanitary sewer overflows (SSOs), including basement backups and overflows from maintenance holes or other system structures, within specific timeframes
- Required SPU to apply for permit renewal by October 30, 2020

1.3 Collection System Consent Decree

The City also must meet the requirements of a consent decree with the United States Department of Justice (DOJ), United States Environmental Protection Agency (EPA), and Ecology (Civil Action No. 2:13-cv-678; July 3, 2013). The consent decree achieves the following:

- Resolves EPA's and Ecology's complaints that the City had violated the Clean Water Act and its collection system NPDES Permit
- Sets a schedule for the City to come into compliance with state and federal requirements for controlling CSOs
- Requires the City to implement a performance based adaptive management approach to system operation and maintenance (O&M), to prevent DWOs and reduce the number of SSOs and exacerbated CSOs

- Requires the City to work with DNRP to jointly develop and implement a Joint Operations and System Optimization Plan
- Requires the City to report annually on consent decree required activities
- Establishes penalties for non-compliance

SPU, DOJ, and EPA have since executed a proposed modification to the consent decree, which was lodged with the federal District Court for the Western District of Washington and can be found at https://www.justice.gov/enrd/media/1377196/dl?inline. The proposed modification was approved by the Seattle City Council on July 30, 2024. It is currently pending court approval, subject to the DOJ's filing of a motion for entry. DNRP has a similar proposed modification also pending approval.

1.4 Collection System Reporting Requirements

SPU submits several reports as part of its NPDES permit requirements. These include:

- Monthly Discharge Monitoring Reports: Due by the 28th of the following month, these reports document the volume, duration, precipitation, and storm duration for each CSO event
- Reports of SSOs and DWOs:
    - SPU must immediately report DWOs and certain SSOs (those reaching surface waters, the municipal storm system, or public access areas) by phone to Ecology and Public Health – Seattle & King County (Public Health)
    - Other SSOs must be reported within 24 hours online or by phone to Ecology, with a written follow-up report required within five days (except for SSOs contained within buildings, which are summarized quarterly in a spreadsheet)
- Engineering and Compliance Reports: SPU must submit engineering reports, plans, specifications, construction quality assurance plans, and post-construction monitoring plan reports for specific CSO reduction projects, with deadlines specified in the permit

In 2024, SPU:

- Submitted all monthly discharge monitoring reports on time
- Met all deadlines for required engineering reports, plans, specifications, and construction quality assurance plans
- Reported all DWOs and SSOs by their respective deadlines, with all required written follow-up reports submitted on time

SPU also submits an annual report to meet the NPDES permit and consent decree requirements. This report document fulfills those requirements. Table 1-1 and Table 1-2 list the reporting requirements and where to find the related information.

Table 1-1. 2024 Annual Reporting Requirements, NPDES Permit

Source	Requirement	Report Location
S4.B	Detail the past year's frequency and volume of combined sewage discharged from each CSO outfall	Table 5-4
S4.B	For each CSO outfall, indicate whether the number and volume of overflows has increased over the baseline condition and, if so, propose a project and schedule to reduce the number and volume of overflows to baseline or below	Table 5-5, Section 5.3
S4.B	Explain the previous year's CSO reduction accomplishments	Section 1
S4.B	List the CSO reduction projects planned for the next year	Table 4-1, Section 1
S4.B	Document compliance with the Nine Minimum Controls	Section 3.1
S4.B	Include a summary of the number and volume of untreated discharge events per outfall	Table 5-6
S4.B	Determine and list which outfalls are controlled (no more than one overflow per year on average), using up to 20 years of past and present data, modeling, and/or other reasonable methods	Table 5-8
S4.B	Summarize all event-based reporting for all CSO discharges for the year	Table 5-4, Table 5-6, Table 5-7

Table 1-2. 2024 Annual Reporting Requirements, Consent Decree

Source	Requirement	Report Location
V.C.26	Report the metrics regarding sewer overflow (SSO) performance included in Appendix D, Paragraph E (1-7): a. SSO performance b. Number of miles of sewer that were cleaned, inspected, and repaired/replaced/rehabilitated c. Number of pump station inspections and the capacity of each pump station d. Number of maintenance holes and force mains inspected and repaired/replaced/rehabilitated e. Number and type of CSO regulators inspected f. Summaries of inspections and cleanings of each CSO control structure g. Summaries of Fats Oil and Grease (FOG) inspections and enforcement actions taken the preceding year	 a. Tables 3-3, 3-4, A-1, A-2 b. Table 3-1 c. Tables 3-1, A-3, A-4 d. Table 3-1 e. Table 3-1 f. Section 3.1.1 g. Section 3.3
V.D.28	Submit summaries of FOG inspections and enforcement actions taken during the previous year.	Section 3.3
VII.43.a.i	Describe the status of any work plan or report development	Section 2
VII.43.a.ii	Describe the status of any design and construction activities	Section 1
VII.43.a.iii	Describe the status of all Consent Decree compliance measures and specific reporting requirements for each program plan, including: a. The CSO control measures for the Early Action CSO Control Program (Henderson Basins 44, 45, 46, and 47/171) b. The Long-Term Control Plan c. The Post-Construction Monitoring Program Plan d. The CMOM Performance Program Plan e. The FOG Control Program Plan f. The Joint Operations and System Optimization Plan between the City of Seattle and King County	 a. Section 4.6.3 b. Section 2.3 c. Sections 5.4 and 5.5 d. Section 3.2 e. Section 3.3 f. Section 2.1
VII.43.a.iv	Provide the project costs incurred during the reporting period	Table 4-1
VII.43.a.v	Describe any problems anticipated or encountered, along with the proposed or implemented solutions	Sections 3.1.5, 4.2, 4.5, and 5.3
VII.43.a.vi	Describe the status of any wastewater collection system permit applications	Section 1.2
VII.43.a.vii	Describe any wastewater collection system reports submitted to state or local agencies	Section 1.4
VII.43.a.viii	Describe any anticipated or ongoing collection system O&M activities	Section 3

Source	Requirement	Report Location
VII.43.a.ix	Describe any remedial activities that will be performed in the upcoming year to comply with the Consent Decree	Sections 4.7 and 5.3
VII.43.b	Describe any non-compliance with the requirements of the Consent Decree and include an explanation of the likely cause, the duration of the violation, and any remedial steps taken (or to be taken) to prevent or minimize the violation	Sections 4.5, 4.7 and 5.3
Appendix D, Paragraph E	Include the listed CMOM performance metrics	Tables 3-1, 3-3, 3-4, A-1, A-2, A-3, and A-4, and Sections 3.1 and 3.3

SECTION 2

Planning Activities

In 2024, SPU continued planning efforts to ensure compliance with the Clean Water Act, NPDES permit, and consent decree in a way that is cost-effective, community-centered, and delivers the most value to our customers.

2.1 Joint City of Seattle/King County Operations and System Optimization Plan

The City of Seattle's and King County's consent decrees require both agencies to work together to develop a Joint Operations and System Optimization Plan (Joint Plan) and review it every three years, updating it as needed. DNRP and SPU submitted the original Joint Plan to EPA and Ecology in February 2016. Staff identified key areas for operational optimization and developed a set of multi-basin joint commitments to improve system efficiency. These commitments were reviewed, updated, and approved by SPU's Drainage and Wastewater Line of Business Branch Executive and DNRP's Wastewater Treatment Division Director, and included in the Joint Plan Update submitted to EPA and Ecology in January 2019. The second update of the Joint Plan was submitted to EPA and Ecology on February 28th, 2022. Below is a summary of each commitment and progress made in 2024:

2.1.1 Joint System Event Debrief Committee Commitment

This commitment focuses on storm preparedness and response, including:

- Pre-season planning for wet weather events
- Post-storm debriefing (after major storms) to review system performance
- Reviewing and updating emergency communications protocols
- Analyzing meteorological data and CSO performance
- Assessing operational decision impacts on the combined system

In preparation for the 2024/2025 wet season, the committee held a coordination meeting on October 24, 2024, to discuss pre-season maintenance activities, system changes, meteorological information, and emergency communication protocols.

2.1.2 Data Sharing Commitment

SPU and DNRP work together to:

- Support a Joint Operations Information Sharing Team (JOIST)
- Implement a pilot project for sharing real-time SCADA data
- Develop data sharing protocols
- Improve the region's ability to forecast storms and rainfall intensities

In 2024, JOIST held two meetings (May 29th and August 28th) during which SPU and DNRP staff shared system operations updates, progress of capital projects, and coordination of Joint Plan commitments. The August meeting also included field visits to SPU's East John Detention Pond and Washington Park

Detention Tank. Additionally, on October 21, SPU and DNRP held a workshop to review flow monitoring data collected by each agency and provide recommendations for future monitoring.

2.1.3 Joint Modeling Coordination Committee Commitment

This committee enhances modeling coordination and efficiency between SPU and DNRP by:

- Sharing modeling tools and analysis methods
- Strengthening working relationships between modeling staff
- Improving system operation efficiencies through collaboration

The joint modeling work plan, initially developed in 2018, is periodically updated to reflect current and future work. This plan will continue to provide a framework for coordination, standardization, and communication for upcoming modeling work. Currently, all models are being transitioned to the latest version of the modeling software and tested; this has been a multi-year transition.

Key 2024 Accomplishments:

- Regular meetings to review modeling results and coordinate model developments between each agency
- Continued model conversions and updates and data sharing
- SPU updated the Henderson North CSO model to reflect recent facility improvements
- In January, DNRP hosted a two-day training on software updates for SPU and DNRP staff
- DNRP launched a new SharePoint site to enhance interagency data sharing
- Collaborative modeling efforts included work on the Ship Canal Integrated Tunnel, Henderson, Montlake, University, and the Mouth of Duwamish

Planned 2025 Work:

- Convert the South Henderson CSO basin to the latest software and update the model
- Update the DNRP System Model to include the recent SPU Central Waterfront project, the Georgetown Wet Weather Treatment Station, and an improved Interbay Pump Station control algorithm

Interagency Collaboration Example:

In 2024, SPU's review of DNRP flow monitoring data identified a failure in a weir near the Greenlake - Densmore Diversion structure. SPU shared this information with the DNRP modeling and operations teams, leading to successful repairs.

2.1.4 Coordination During Startup and Commissioning of CSO Control Facilities Commitment

SPU and DNRP collaborate on:

- Conducting document review
- Attending commissioning meetings
- Sharing operational data on CSO control facilities

In 2024, SPU commissioned Wastewater Pump Stations (WWPS) 062 and 063 and provided an overview to DNRP during a JOIST meeting.

2.1.5 Real-Time CSO Notification Commitment

Both agencies updated onsite signage and website information to improve CSO event notifications and public communication. See section 3.1.8.

2.1.6 Reduce Saltwater Intrusion Commitment

This commitment involves continuing to work together on studies, data, and solutions for reducing saltwater intrusion into the wastewater system.

2.1.7 Coordinated Optimized Evaluation Effort

SPU and DNRP advanced the Coordinated Optimization Evaluation (COE) effort initiative in 2024. Refer to Section 2.2.

2.2 Coordinated Optimization Evaluation (COE)

In 2020, SPU, DNRP, and regulators began a process to modify the City of Seattle's and King County's consent decrees with state and federal agencies. The original decrees were entered on July 3, 2013, and the First Material Modifications are expected to be entered in 2025. SPU, Ecology, EPA, and DOJ agreed to the proposed modifications in 2024.

One key commitment of the modified consent decrees is the completion of a COE. Through this evaluation, SPU and DNRP will identify and evaluate optimization opportunities to reduce CSOs by improving system-wide or basin-specific controls and installing minor system components.

2.2.1 What is Optimization?

Optimization refers to adjustable controls, operational improvements, or capacity modifications that enhance flow management with minimal capital investment. Examples include:

- Installing or adjusting controls for gates or pump stations
- Using additional monitoring locations to refine control settings
- Modifying weir elevations to improve flow regulation
- Adding conveyance capacity to address localized constraints

The primary goal is to maximize available storage and conveyance capacity more rapidly and effectively than typical capital projects.

2.2.2 Why Does Optimization Matter?

SPU and DNRP recognize that optimizing existing system capacity can reduce the size and cost of future CSO control investments. The COE will identify opportunities for prioritization in capital portfolio management and long-term control planning.

2.2.3 COE Goals

COE initiative goals include:

- Develop a shared understanding of present and future optimization opportunities in the planning areas
- Maximize wastewater system capacity by optimizing system transport, storage, and treatment infrastructure, particularly during wet weather events
- Evaluate operation of both agencies' combined systems, including potential use of real-time controls that can react and/or anticipate wet weather conditions
- Assess whether operational changes and minor system improvements can increase system capacity, improve climate adaptability, or enhance system efficiency
- Provide detailed optimization concepts for inclusion in long-term control planning activities and capital program decision-making

2.2.4 2024 Progress

SPU and DNRP established the foundation for three priority planning areas: Montlake, University, and Henderson. To support this effort, each agency hired a consultant team. SPU, DNRP, and these two consultant teams developed a COE program management plan. In September, SPU and DNRP held workshops to review both agencies' existing wastewater operations and understand their climate change methodologies. SPU and DNRP prepared for peer agency interviews to gather insights from other agencies on optimization strategies.

SPU and DNRP plan to submit the COE summary report for the Montlake, University, and Henderson planning areas to regulators by March 2027.

2.3 Shape Our Water Plan

SPU's Drainage and Wastewater (DWW) Line of Business is developing Shape Our Water, a 50-year plan for Seattle's water resilience. This plan will guide future investments to improve water quality while providing the greatest community value. Shape Our Water integrates drainage and wastewater system planning, prioritizes community engagement, and leverages effective partnerships to meet Seattle's infrastructure and receiving water body challenges. More details about this initiative can be found at www.shapeourwater.org.

2.3.1 Shape Our Water: Four Key Stages

The Shape Our Water Plan consists of four interrelated stages, shown in Figure 2-1 and described below:

1. Analysis: This stage involved data collection and system analysis to identify drainage, wastewater, and receiving water body challenges and opportunities. The challenges were prioritized based on risk. Three major comprehensive analysis projects were completed in this stage:

- Wastewater System Analysis, completed in 2019
- Drainage System Analysis, completed in 2020
- Seismic Risk Assessment of drainage and wastewater systems, completed in 2022

Final reports from the analysis stage are available at: www.seattle.gov/utilities/about/reports/drainage-and-wastewater/shape-our-water

2. Visioning: SPU developed the Shape Our Water vision and goals in collaboration with the community, City departments, and partner agencies and organizations. In early 2020, SPU launched a community engagement strategy, adapting to COVID-19 related restrictions and shifting community priorities. Engagement activities took place between late 2020 and 2021. The final Community Vision document is available on www.shapeourwater.org.

3. Planning: The planning stage identifies and sequences near- and long-term investment in partnerships, programs, and projects that:

- Improve receiving water quality
- Enhance system performance and resilience
- Optimize social and environmental benefits for the City

This stage is ongoing. In 2024, the Shape Our Water team engaged more than 250 people through 14 workshops.

4. Implementation: The implementation stage will begin when the plan is complete. SPU will monitor progress, track success measures, and adaptively manage implementation to stay accountable to stakeholders. While Shape Our Water is being developed, SPU is also piloting near-term integrated projects in Seattle's neighborhoods to explore innovative approaches and refine strategies.

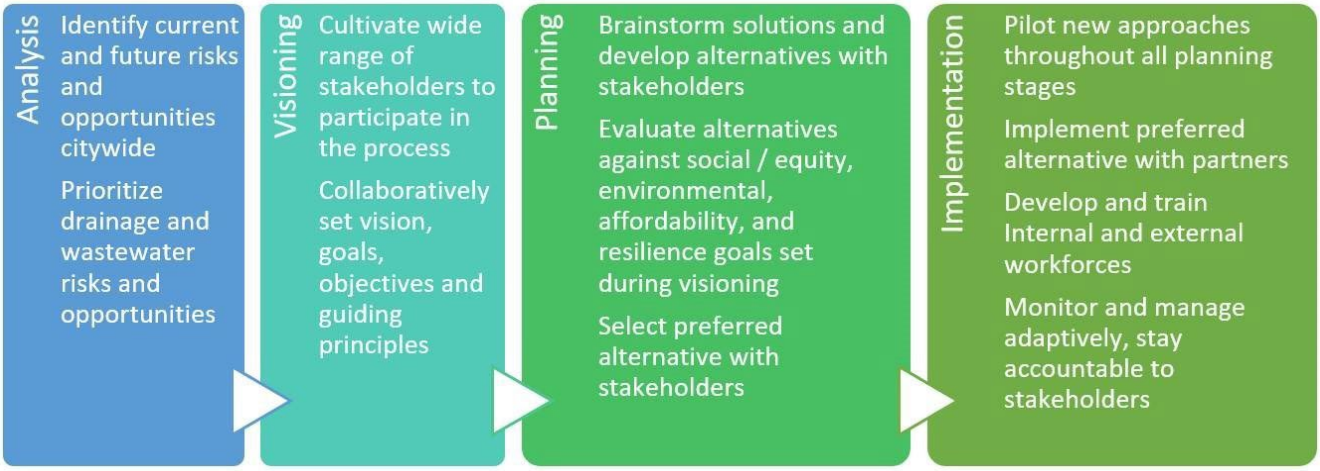

Figure 2-1. Shape Our Water Planning Process

2.4 Long Term Control Plan Update

SPU developed the 2015 Long-Term Control Plan (LTCP) and Integrated Plan—together known as the Plan to Protect Seattle's Waterways—to meet the CSO reduction planning requirements outlined in the 2013 Consent Decree.

SPU is currently updating the LTCP to incorporate joint CSO planning with DNRP and to develop detailed area plans for specific CSO basins. These area plans will:

- Reduce CSOs while addressing short- and long-term drainage and wastewater needs
- Support infrastructure capacity upgrades and rehabilitation
- Improve flood management and climate resilience
- Align future CSO investments with the community vision for Shape Our Water

The LTCP Update is an important opportunity for SPU to partner with other City departments and partner agencies to deliver community benefits, including mobility, open space, and livability improvements.

2.4.1 2024 Progress

SPU focused on developing a project roadmap outlining the planning and engagement approach and data and model improvements needed to support area planning.

2.4.2 Next Steps

- 2025: Complete model updates, characterize uncontrolled CSO areas, refine the toolbox of CSO and drainage solutions, and launch public engagement
- 2026: Focus on area planning, community engagement, and plan development
- Late 2026: Complete the draft LTCP update

SECTION 3

Operation & Maintenance Activities

SPU conducts operation and maintenance (O&M) activities to reduce the number and volume of SSOs, DWOs, and CSOs.

3.1 Nine Minimum Control Activities

The Federal CSO Control Policy requires municipalities with combined sewer systems to implement nine control measures that help reduce sewage overflows without requiring extensive engineering studies or major construction costs. The following paragraphs outline SPU's 2024 progress on each measure.

3.1.1 Control 1: Provide System Operations & Maintenance (O&M)

Control 1: Reduce the magnitude, frequency, and duration of CSOs through proper operation and maintenance (O&M) of the combined sewer system.

SPU performs extensive system O&M activities each year to reduce preventable overflows by ensuring proper system function. Routine maintenance activities include:

- Sewer inspections, cleaning, and non-emergency point repairs
- Catch basin inspections, cleaning, and repairs
- Control and storage structure cleaning
- Valve and flap gate inspection, cleaning, lubricating, and servicing
- Pump station electrical, mechanical, and facilities inspection and servicing

2024 Progress

SPU's 2024 O&M accomplishments are summarized in Table 3-1. Notably, in 2024, SPU:

- Inspected approximately 18% of total mainline pipe (by length)
- Cleaned approximately 17% of total mainline pipe (by length)

Table 3-1. 2024 O&M Accomplishments

Activity	Quantity
Miles of WW Mainline Pipes Cleaned	241.27
Miles of WW Mainline Pipes CCTV'd	261.30
Number of WW Pump Station Inspections	1,749
Number of WW Maintenance Holes Inspected	85
Number of CSO Structure Inspections	270
Number of CSO Structure Cleanings	408
Number of CSO Hydrobrake Inspections	195
Number of Hydrobrake Cleanings	19
Linear Feet of Pipe receiving Chemical Root Treatment	106,298.77
Number of WW Catch Basins Inspected	13,146

Activity	Quantity
Number of Catch Basins Cleaned	1,798
Number of Catch Basins Repaired	18
Number of Catch Basin Traps Replaced	84

Pipeline Inspection & Maintenance

SPU uses the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) defect coding system to identify and prioritize pipes for maintenance or rehabilitation. When a sewer requires maintenance, it is placed on a routine cleaning schedule to prevent future overflows. The cleaning frequency is adjusted over time based on system performance. Corrective maintenance activities include:

- Jetting: Used for light to medium debris
- Hydrocutting: Used to remove roots and grease
- Rodding: Used to clear active blockages
- Chemical Root Treatment: Used when roots are present without grease

SPU's preventive sewer maintenance schedule ranges from monthly to once every ten years, depending on system needs. The goal is to clean as frequently as necessary to maintain system capacity but no more than necessary, as excessive cleaning can shorten a sewer's functional lifespan.

CSO Control Structure Inspections

SPU inspects all 93 CSO control structures upstream of its 82 CSO outfalls one to four times per year. During these inspections, crews assess:

- Flow levels and water conditions
- Sediment, debris, and infiltration
- Structural integrity and system function

Crews perform cleaning and repairs as needed. The 2024 inspections found that all structures were in good working condition, requiring no extensive repairs.

Pump Station Maintenance & Reliability Centered Maintenance

SPU performs maintenance and replaces electrical and mechanical components at pump stations as needed. Since 2008, SPU has used Reliability Centered Maintenance (RCM) at its wastewater pump stations. RCM optimizes maintenance schedules to:

- Reduce life-cycle costs while increasing system reliability
- Ensure the right data is collected and analyzed to inform operational decisions
- Improve spare parts inventory management, maintenance strategies, and data collection

SPU continues to evaluate and adjust its RCM-based management strategies to enhance system performance and reliability.

3.1.2 Control 2: Maximize Storage of Flows

Control 2: Maximize the use of the collection system for wastewater storage, in order to reduce the magnitude, frequency, and duration of CSOs.

SPU works to maximize wastewater storage in the collection system to reduce the magnitude, frequency, and duration of CSOs.

Strategies for Maximizing Storage

- Regular collection system maintenance to ensure full use of existing capacity during storms
- Ongoing monitoring and evaluation of storage use during wet weather events
- Modifying storage facilities to improve capacity utilization
- Raising overflow weirs to increase storage capacity without causing backups
- Reducing inflow and infiltration to minimize excess stormwater entering the system

2024 Progress

SPU continued to design and construct sewer system improvements to optimize existing capacity. Details on these improvements are provided in Section 4.1. Additionally, SPU is working to optimize recently built storage facilities, as described in Section 4.7.

3.1.3 Control 3: Control Nondomestic Sources

Control 3: Implement selected CSO controls to minimize CSO impacts resulting from nondomestic discharges.

SPU implements two important programs to help control nondomestic discharges into the Seattle sewer system:

- Fats, Oils, and Grease (FOG) Control Program
- Industrial Pretreatment Program

FOG Control Program

SPU's Wastewater Source Control team administers the City's FOG Control Program, which enforces Seattle Municipal Code requirements. These regulations:

- Prohibit FOG-laden wastewater that can clog pipes
- Require pretreatment before discharge into the sewer system

When FOG reacts with calcium in wastewater, it forms hardened, soap-like deposits inside sewer pipes (known as saponification), reducing capacity and increasing the risk of blockages and overflows (Figure 3-1). SPU enforces this code on commercial and institutional kitchen facilities and other nondomestic sources through a regulatory education, inspection, and enforcement program. FOG control inspection and enforcement activities conducted in 2024, and work planned in 2025, are summarized in Section 3.3.

Industrial Pretreatment Program

The King County Wastewater Treatment Division – Industrial Wastewater Program (KCIW) administers industrial wastewater pretreatment.

KCIW:

- Issues industrial wastewater pretreatment permits with discharge limits
- Conducts regular site inspections and periodic permit reviews

SPU:

- Reviews KCIW permits for industrial facilities
- Monitors collection system CCTV footage to assess impacts
- Refers problematic discharges to KCIW for enforcement and/or permit modification
- Collaborates with KCIW on unknown-source discharges for further investigation

Figure 3-1. 2024 Mainline Image Demonstrating Visible FOG Accumulations Resulting in SSO Near the University of Washington

3.1.4 Control 4: Deliver Flows to the Treatment Plant

Control 4: Operate the collection system to maximize flows to the treatment plant, within the treatment plant's capacity.

SPU maximizes flow to the treatment plant by implementing the measures described in Controls 1 and 2 and by providing ongoing system performance monitoring and analysis.

System Monitoring & Performance Optimization

SPU's Control Center is staffed 24 hours a day and receives real-time Supervisory Control & Data Acquisition (SCADA) information. Control Center staff respond to pump stations alarms indicating

performance drops or other issues. In addition, SPU monitors pump stations, overflow structures, and outfalls to detect maintenance needs.

2024 Facility Rehabilitation & Upgrades

In 2024, SPU rehabilitated Wastewater Pump Stations 62 and 63 (Lake Union). Rehabilitation of Wastewater Pump Station 71 (West Seattle) began construction, which is anticipated to be completed in early 2025. These projects improve:

- Facility lifespan by replacing force mains and upgrading electrical and mechanical equipment to current standards
- System reliability to reduce CSO frequency and volume of CSOs
- Operator safety and maintenance efficiency

Stabilization Phase for New Facilities

SPU completes a one-year stabilization phase after construction of new facilities to ensure they function as intended. Stabilization includes:

- Monitoring system performance
- Analyzing operational data
- Fine-tuning equipment settings

In 2024, SPU completed the stabilization phase for Wastewater Pump Station 38 (West Seattle) and began the stabilization phases for Wastewater Pump Stations 62 and 63, which are anticipated to be completed in 2025.

Figure 3-2. Force Main Replacement at Wastewater Pump Station 62

Figure 3-3. Site Work in Progress at Wastewater Pump Station 62

Figure 3-4. Site Work in Progress at Wastewater Pump Station 63

Figure 3-5. Completed Pump Room at Wastewater Pump Station 63

Figure 3-6. Site Work in Progress at Wastewater Pump Station 71

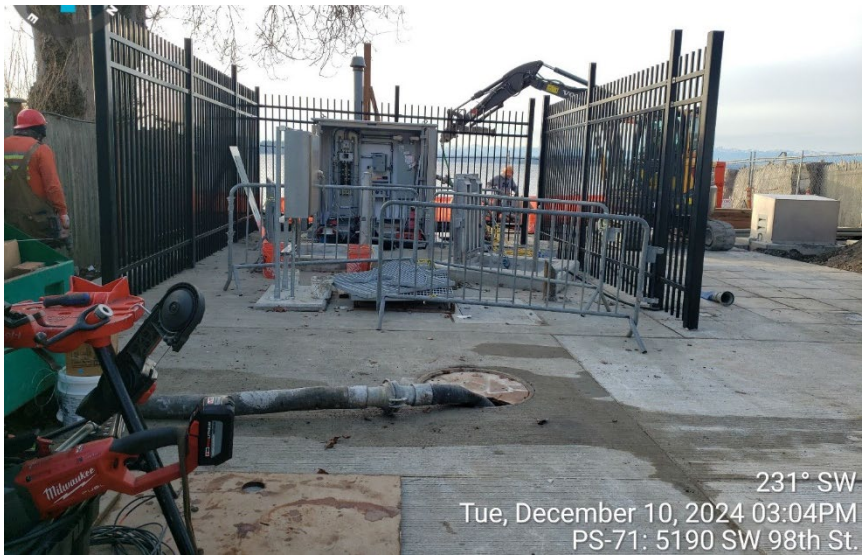

Figure 3-7. Site Work in Progress at Wastewater Pump Station 71

3.1.5 Control 5: Prevent Dry Weather Overflows

Control 5: Prevent dry weather overflows; they are not authorized. Report any dry weather overflows within 24 hours and take prompt corrective action.

Preventative Measures

To help prevent DWOs and exacerbated CSOs, SPU:

- Uses an alarm system at each CSO location to detect potential overflow conditions
- Alerts analysts and field crews when an alarm is triggered, enabling rapid response
- Investigates all DWOs and exacerbated CSOs to identify the cause and implement preventative measures

2024 DWO Incident

SPU recorded one exacerbated DWO in 2024 at outfall 147:

- September 5, 2024 (ERTS 733530): A sewer overflow occurred due to a clog in the temporary bypass line at the Ship Canal Water Quality Project. The temporary bypass was removed, restoring normal flow.

A summary of the DWOs, exacerbated CSOs, and exacerbated SSOs from 2019-2024 is included in Table 3-2.

2024 Prevention Efforts

To reduce the recurrence of exacerbated CSOs, SPU implemented:

- Annual refresher training for machinists, expanded to include tabletop exercises
- Facility training for operations control center staff
- Weekly facility performance reviews for CSOs and pump stations
- Optimization of early warning level alarms

- Pre-storm inspections and cleaning

Table 3-2. DWOs, CSOs, and SSOs Exacerbated by System Maintenance Issues 2019 – 2024

Year	No. of DWOs[a]	Volume of DWOs (gallons)	No. of Exacerbated Overflows[a]	Volume of Exacerbated Overflows (gallons)
2019	3[b]	52,205	2	197,886
2020	1	1,892	3[c]	730,808
2021	4	61,533	0	0
2022	1	91,599	2	197,204
2023	0	0	7	931,798
2024	1	343	0	0

a. *DWOs and exacerbated CSOs are included in the table listing all 2024 overflows (Table 5-4). Exacerbated CSOs are also included in the table comparing 2024 CSOs with 2010 baseline (Table 5-5), the tables comparing 2020-2024 discharges (Tables 5-6 and 5-7), and the table assessing whether outfalls meet the CSO performance standard (Table 5-8). Exacerbated SSOs are not included in Tables 5-4 through 5-8.*

b. *One of these DWOs was caused by a non-City entity.*

c. *One of these events (approximately 250,000-500,000 gallons, conservatively listed as 500,000 gallons in Table 3-2) was an Exacerbated Sewer Overflow.*

3.1.6 Control 6: Control Solids and Floatable Materials

Control 6: Implement measures to control solid and floatable materials in CSOs.

SPU implements several measures to reduce solid and floatable materials in CSOs.

Catch Basin Design & Maintenance

SPU's catch basins are designed to prevent floatables by allowing overflow only when the water level in the catch basin is well above the overflow pipe opening. Because floatables remain on the water surface, they are trapped in the catch basins. Regular inspections and cleaning remove debris and potential floatables. Catch basin inspection, cleaning, and rehabilitation metrics are included in Table 3-1.

2024 Public Engagement & Outreach

In 2024, SPU's wastewater engagement team expanded its efforts from the standalone "What to Flush" campaign to a more comprehensive drain care initiative. This new approach integrates messaging on both FOG disposal and non-flushable behaviors, aiming to protect the overall wastewater system. SPU partnered with Cascadia Consulting to conduct outreach efforts in priority areas:

- A baseline survey assessed resident knowledge and behaviors regarding flushing and FOG disposal
- 2,754 baseline surveys, accompanied by postage-paid return envelopes, were mailed to addresses in four hot spot neighborhoods, achieving an 8% return rate
- Online surveys were also available in multiple languages, with participants eligible for a raffle upon completion

Following the survey, Cascadia visited 110 single family homes and 47 multifamily properties to provide educational materials, practical resources, such as drain snakes, and guidance on better flushing and overall drain care habits. After outreach activities concluded, post-surveys were sent to the same neighborhoods to measure the campaign's effectiveness (results are currently being analyzed).

Additional engagement strategies included a redesign of the wastewater brochure to provide clearer, more concise information on flushable vs. non-flushable items (Figure 3-8). The redesign incorporated community focus group feedback, particularly around FOG education, but also addressed critiques of the previous wastewater brochure, which included flushables. Furthermore, the engagement team attended 13 events, reaching 2,307 attendees. During these events, our popular “toilet-tossing” game engaged children and adults, piquing their interest in demonstrating proper flushing habits by sorting items into garbage vs. toilet disposal. Additionally, SPU consultants also conducted outreach to residents in neighborhoods affected by SSOs caused by ragging.

The engagement team will launch a redesigned branded toilet paper giveaway in 2025 (Figure 3-10). This lighthearted, interactive tool is intended to serve as a reminder of proper flushing behaviors.

Figure 3-8. Redesigned Wastewater Brochure Launched During Fall Outreach

Figure 3-9. Image of the Toilet Tossing Game at an Event

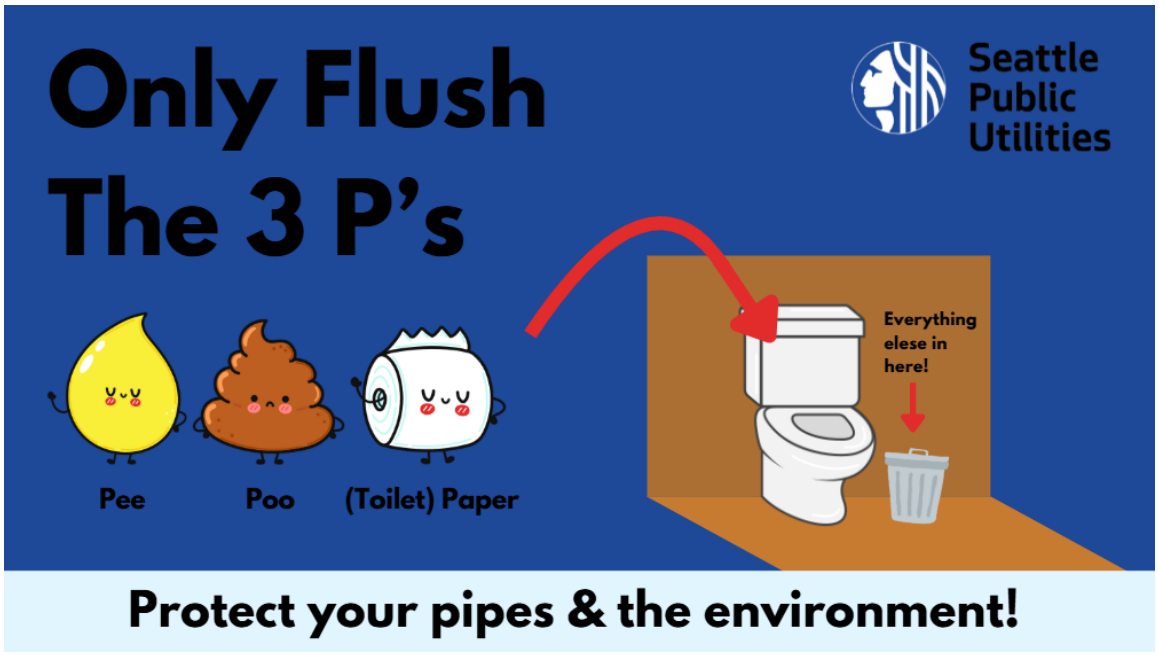

Figure 3-10. Example of the Branding Re-Design for Toilet Paper Giveaways

In addition, the City of Seattle runs several garbage, recycling, and food and yard waste and city cleanup programs to prevent and reduce the amount of street litter, including:

- Street sweeping, including increased efforts for Fall leaf pickup
- Spring cleaning
- Storm drain stenciling
- Event recycling
- Public litter and recycling cans
- Waste free holidays
- Product bans
- Illegal dumping investigation and response

3.1.7 Control 7: Prevent Pollution

Control 7: Implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.

Source Control Pollution Prevention Program

Since the early 2000s, SPU has operated a comprehensive source control program, authorized by the City of Seattle Stormwater Code and Side Sewer Code. This program implements pollution prevention measures in combined sewer basins, including:

- Spill Response: SPU provides spill response city-wide using a 24-hour per day, 7 day per week call out system. Spill responders assess, mitigate, and clean up spills to minimize environmental impact.
- Water Quality Complaint Investigations: SPU investigates water quality complaints citywide and educates residents and businesses on proper best management practices (BMPs)
- Business Inspections: SPU inspects business to assess proper BMP implementation, prioritizing inspections in combined sewer basins as resources allow
- Stormwater Facility Inspections: SPU inspects privately-owned stormwater facilities to evaluate maintenance practices and compliance with drainage requirements, again prioritizing inspections in combined sewer basins as resources allow

Legal Authority and Administrative Procedures Used for Program Implementation

SPU's pollution prevention program is implemented under the following City of Seattle Municipal Codes (SMC):

- Side Sewer Code (SMC 21.16): Regulates side sewers and prohibits improper discharges; requires repair of inoperative or inadequate sewers, drains, or natural watercourses; and regulates the construction, alteration, repair, and connection of side sewers and service drains. The Side Sewer Code was last substantially amended in 2010, signed by the Mayor on December 20, 2010, and effective on January 5, 2011.

- Stormwater Code (SMC 22.800-22.808): Grants the City with the legal authority to address discharges into the combined sewer system owned and operated by Seattle Public Utilities (SMC 22.800.030.C). The Stormwater Code was revised and became effective July 1, 2021.

Appropriate BMPs

The City of Seattle Stormwater Manual, Volume 4: Source Control, outlines BMPs required under the Stormwater Code for properties and businesses citywide. Key BMPs include:

- BMP1: Eliminate Illicit Connections - All properties must inspect systems, obtain permits, and eliminate illicit connections
- BMP2: Perform Routine Maintenance - All properties are required to perform annual inspections and maintenance of drainage systems
- BMP 3: Dispose of Fluids and Wastes Properly - All properties must properly dispose of solid and liquid wastes and contaminated stormwater and sediment
- BMP 4: Proper Storage of Solid Wastes - All properties must implement proper solid waste storage and disposal practices
- BMP 5: Spill Prevention and Cleanup - Businesses and real properties that load, unload, store, or manage liquids or erodible materials (e.g., stockpiles) must maintain spill plans, equipment, and practices to prevent and clean spills, and must follow notification procedures for spills to the drainage and sewer systems
- BMP 6: Provide Oversight and Training for Staff - Businesses and public entities that have activities requiring BMPs must train employees on pollution prevention BMPs
- BMP 7: Site Maintenance - Businesses and public entities that involve materials or wastes that may come into contact with stormwater are required to implement proper housekeeping and contaminant prevent practices. Such practices include inspections, avoidance measures (containment, covering, or locating activities away from drainage systems), and sweeping and cleaning procedures.
- BMP 8: Rooftop Dog Runs – Rooftop dog runs must be sized to minimize stormwater discharges to the sanitary sewer or combined sewer systems

Additionally, Volume 4 of the Source Control Manual (SDCI 10-2021/DWW200) includes minimum requirements for all businesses and public entities for specific activities in Seattle's drainage basins. These activities require source controls to prevent prohibited discharges and contamination of drainage water, the public combined sewer, or receiving waters:

- BMP 9: Fueling at dedicated stations, for new or substantially altered fueling stations
- BMP 10: Mobile fueling of vehicles and heavy equipment
- BMP 11: In-water and over-water fueling
- BMP 12: Maintenance and repair of vehicles and equipment
- BMP 13: Concrete and asphalt mixing and production
- BMP 14: Concrete pouring, concrete/asphalt cutting, and asphalt application
- BMP 15: Recycling, wrecking yard, and scrap yard operations

- BMP 16: Storage of liquids in aboveground tanks

Source controls include segregating or isolating wastes to prevent contact with drainage water; enclosing, covering, or containing the activity to prevent contact with drainage water; developing and implementing inspection and maintenance programs; sweeping; and taking management actions, such as training employees on pollution prevention.

3.1.8 Control 8: Notify the Public

Control 8: Implement a public notification process to inform the citizens of the when and where CSOs Occur.

Improving Public Awareness

CSOs occur when heavy rainfall overwhelms the combined sewer system, causing overflows into local waterways. Overflows can also result from equipment failures, blockages, or maintenance activities.

SPU operates a CSO Notification and Posting Program as a joint project with DNRP and Public Health-Seattle & King County. This program includes signs at publicly accessible CSO locations, an information phone line, websites, and other public outreach activities.

SPU and DNRP collaborated to redesign CSO warning sings to improve visibility and accessibility:

- Increased sign size with high-contrast yellow and black lettering for better readability
- Information in four languages to improve accessibility for diverse communities
- Website and phone number for reporting issues
- Placement for both boaters and pedestrians, aligned with CSO outfall pipe locations as feasible

Since 2019, SPU has replaced 28 damaged or missing signs. In 2024, SPU installed 24 additional signs (two per post). SPU carpenters prioritized accessible CSO outfalls as well as CSO outfalls along their typical routes. SPU will continue to install the signs until completed. To ensure continued sign visibility and accuracy, SPU added CSO warning sign inspections to its regular facility maintenance schedule. DWW crews now inspect for missing or damaged signs and create follow-up work orders as needed for repairs or replacements.

Figure 3-11. CSO Outfall 140 – Facing Towards Water with Rowers in Background

Real-time notification of recent and current CSO discharges is available via a mobile-friendly website maintained by King County (https://kingcounty.gov/en/dept/dnrp/waste-services/wastewater-treatment/sewer-system-services/cso-status.aspx). The website presents a map with overflow status for the majority of Seattle and the County's CSOs, with links to each agency's independent websites. In 2024, SPU and DNRP began coordinating on improvements to the CSO discharge alert system, per the request of Ecology.

3.1.9 Control 9: Monitor CSOs

Control 9: Monitor CSO outfalls to characterize CSOs and the effectiveness of CSO controls.

SPU monitors all CSO outfalls to detect sewage overflows. SPU also tracks flow, precipitation, and flow monitor performance to ensure consistent, high-quality measurements. Monitoring program details and results are summarized in Section 5 of this report.

3.2 CMOM Performance Program Activities

SPU develops and implements program plans to guide multi-year improvements. The last plan was completed in 2020, and a new five-year plan was developed in 2021, covering initiatives in:

- Sewer cleaning
- Sewer condition assessment
- Sewer rehabilitation

3.2.1 Sewer Cleaning Initiatives

SPU's sewer cleaning initiatives aim to improve cleaning efficiency and effectiveness by standardizing procedures, measuring and tracking cleaning quality, providing feedback to field crews, and using technology to optimize cleaning frequency. Work completed in 2024 and planned for 2025 includes:

- High-Risk Preventive Maintenance Schedules Review: In late 2023, Ecology requested a comprehensive review of SPU's preventive maintenance schedules for pipe cleaning. In early 2024, SPU analyzed all short-frequency cleaning schedules, identifying late or past-due work. SPU also validated and adjusted cleaning frequencies to optimize the cleaning schedule. Frontline staff focused on clearing backlogged work throughout 2024.
- Cleaning Frequency Optimization Tools: Based on the High-Risk Preventive Maintenance Schedule Review, SPU identified a need for data management tools to improve planning, scheduling, and resource allocation. Two Tableau tools will be developed in 2025 to support cleaning frequency optimization.

3.2.2 Sewer Condition Assessment Initiatives

SPU conducts condition assessments to reduce sewer overflow risks and make data-driven decisions about maintenance and rehabilitation. Work completed in 2024 and planned for 2025 includes:

- Condition Assessment Strategy: In 2017, SPU developed a 10-year inspection plan for the entire wastewater collection system. The system was divided into 100 management areas, based on system hydraulics, design and flow, and discharge points to the DNRP system. SPU then developed and applied prioritization criteria and adjusted for practical implementation factors. Work was delayed in 2020 due to COVID-19 staffing shortages but resumed in 2021. In 2023, SPU completed the first inspection of the wastewater collection system.

- Condition Assessment Strategy Update (2023-2033): SPU completed planning for the second 10-year cycle of the Condition Assessment Strategy in 2023. Inspections are critical to the Sewer Rehabilitation Strategy, discussed in section 3.2.3. The Sewer Rehabilitation Strategy relies on accurate, up-to-date pipe condition data. The risk-based schedule for systematically renewing the pipe system from the Rehabilitation Strategy heavily influenced the update of the Condition Assessment Strategy. Implementation of the second 10-year cycle began in 2023 and will continue through 2033, with yearly adjustments as needed.

3.2.3 Sewer Rehabilitation Initiatives

SPU prioritizes sewer rehabilitation initiatives to maintain system reliability in a timely, cost-effective manner. Work completed in 2024 and planned for 2025 includes:

- Rehabilitation Strategy: In 2017, SPU began developing a comprehensive wastewater collection system Rehabilitation Strategy that documents SPU's priorities, our approach to making system rehabilitation investments, and process improvements to improve efficiency. As a part of this effort, SPU has implemented a new risk management software, adopted project delivery process improvements, and completed a long-term capital investment forecast. In 2022, SPU initiated a Rehabilitation Strategy to prioritize capital projects based on risk and equity and establish a planning level capital portfolio. SPU plans to continue increasing investment in sewer renewal, spending up to $35 million per year by 2041.
- Addressing an Increase in Reactive Work: With the completion of the first 10-year Condition Assessment Strategy cycle in 2022, SPU continues to identify emergency rehabilitation needs. As new high-risk pipe conditions emerge, these become priority projects for the Sewer Rehabilitation Program. SPU will continue to balance urgent unplanned work with long-term planned rehabilitation projects.

3.2.4 SSO Performance

In 2024, SPU recorded 26 SSOs, summarized by cause in Table 3-3. The leading cause was root intrusion, accounting for seven events.

Table 3-3. 2024 SSOs by Category

Category	Primary Cause of Sewer Overflows	Number of 2024 Sewer Overflows
1	Roots	7
2	FOG	2
3	Debris	3
4	Structural Failure – Gravity	5
5	Structural Failure – Force Main	0
6	Capacity – Gravity	2
7	Pump Station – Mechanical	0
8	Pump Station - Capacity	0
9	Power Outage	0

Category	Primary Cause of Sewer Overflows	Number of 2024 Sewer Overflows
10	Operations Error	0
11	Maintenance Error	2
12	Pressure Release	0
13	City Construction	2
14	New Facility Startup	0
15	Private Side Sewer Issue	0
16	Capacity – King County	1[a]
17	Private Construction	1
18	Other Agency Construction	0
19	Vandalism	1
20	Extreme Weather Event (≥25year)	0
Total for Categories 1 – 20		26
Total for Categories 1 – 15		23

a. *On 2/28/2024, sewage overflowed from a maintenance hole due to surcharging in King County's sewer system during a storm (ERTS #729145). SPU notified King County Wastewater Treatment Division on 2/29/2024.*

SSO Performance (2013-2024)

SSO performance for 2013 through 2024 is summarized in Table 3-4. SSO performance measures the effectiveness of SPU's CMOM Program and helps ensure SPU is focusing its efforts on activities that help prevent sewer overflows. To ensure accurate performance tracking, the calculation excludes overflows beyond SPU's control, such as those caused by:

- Extreme weather events (for example, rainfall exceeding a 25-year recurrence interval)
- Construction activities by other agencies or private developers
- King County capacity constraints
- Vandalism

For more than a decade, SPU has met and exceeded its performance target of no more than 4 SSOs per 100 miles of sewer per year, based on a 2-year moving average.

Table 3-4. 2013-2024 SSO Performance

Year	Number of SSOs[1]	SSOs/100 Miles of Sewer[2]	2-Year Average SSOs/ 100 Miles of Sewer
2013	40	2.8	3.3
2014	36	2.5	2.7
2015	72	5.1	3.8
2016	38	2.7	3.8
2017	41	2.9	2.8

Year	Number of SSOs[1]	SSOs/100 Miles of Sewer[2]	2-Year Average SSOs/ 100 Miles of Sewer
2018	14	1.0	1.9
2019	22	1.5	1.3
2020	44	3.1	2.3
2021	43	3.0	3.1
2022	38	2.7	2.9
2023	27	1.9	2.3
2024	23	1.6	1.8

1. *Numbers in this column include only the sewer overflows included in the SSO performance calculation and exclude sewer overflows caused by extreme weather events, other agency construction, private construction, King County capacity constraints, and vandalism.*
2. *SPU has 1,420 miles of sewers.*

Ongoing Performance Improvements

To maintain high performance and further reduce SSOs, SPU takes the following actions:

- Analyzes each SSO to determine root causes and preventive measures
- Identifies necessary system modifications or increased maintenance
- Reviews SSO data trends to support adaptive management of the CMOM Program

3.3 Outfall Inspections and Repair

Outfall Rehabilitation Plan

SPU's 2016-2021 NPDES Permit required submission of an Outfall Rehabilitation Plan by October 30, 2020. The plan included:

- A list of outfalls to be repaired or replaced during the next permit cycle
- A desktop evaluation of CSO outfalls to determine the total number of discharge points
- An assessment of outfalls sharing a hydraulic connection to a common control structure

SPU submitted the 2021-2026 Outfall Rehabilitation Plan to Ecology on October 26, 2020. The plan recommended:

- Cleaning eight outfalls (Outfalls 13, 25, 38, 40, 41, 43, 139, and 140)
- Lining one outfall (Outfall 169)
- Cleaning and sliplining one outfall (Outfall 59)

Amended 2021-2026 CSO Outfall Rehabilitation Plan

In May 2022, SPU submitted an amended plan, which included:

- Cleaning eight CSO outfalls by 2024
- Repairing or rehabilitating two CSO outfalls by December 2026

2024 Progress & 2025 Plans

SPU completed inspection and cleaning for seven of the eight outfalls in the plan (Outfalls 25, 38, 40, 41, 43, 139, and 140). Outfall 13, in the Windemere basin, requires the installation of an access structure before it can be cleaned or inspected. In 2025, SPU will install the access structure and complete the cleaning and inspection of Outfall 13.

3.4 FOG Control Program Activities

In 2024, SPU worked to balance regulatory enforcement with sensitivity to economic challenges facing businesses. Restaurant owners in Seattle, like many across the country, face rising operating costs, shifting consumer behaviors, and regulatory pressures. FOG hotspots tend to be concentrated in high-urban density areas, such as downtown, Capitol Hill, and Ballard, where commercial rent costs are among the highest in the nation. However, FOG-related SSOs continue to occur, and SPU has a responsibility to resume regulatory inspections as opposed to the educational-based compliance visits that had been taking place prior to 2024 in response to the pandemic.

3.4.1 FOG Control Program Overview

The FOG Program aims to reduce FOG-related SSOs through a structured approach. The program consists of:

1. Implementing the FOG Management Plan
2. Managing the Food Service Establishment (FSE) Inventory Management Plan
3. Updating and implementing Standardized Operating Procedures (SOPs) and Engagement Plan
4. Conducting FOG Inspector Training.

Work completed in 2024 and planned for 2025 is described in the following sections.

3.4.2 FOG Management Plan

Data analysis of FOG hotspots indicates that FOG-related impacts are evenly distributed between residential and commercial sources. To address these sources, the FOG Management Plan focuses on:

Residential – Community Engagement

SPU's residential FOG program is designed to support behavior change by:

- Raising awareness of the impacts of improper FOG disposal
- Providing clear disposal guidance

In 2024, SPU refined its FOG messaging by gathering feedback from residents and field crews who see the direct impacts of FOG buildup. SPU also tested new outreach strategies, including digital advertising, to enhance community engagement. Key accomplishments in 2024 include:

- Conducted four focus groups to better understand interpretations of SPU messaging and residents' behaviors:
    - Two for single family households (English and Spanish)
    - Two for multifamily residents (English and Spanish)
- Redesigned the wastewater brochure (Figure 3-12) to incorporate:
    - Findings from focus groups and 2023 wastewater surveys

- Surprising facts about FOG buildup
- Clearer disposal steps

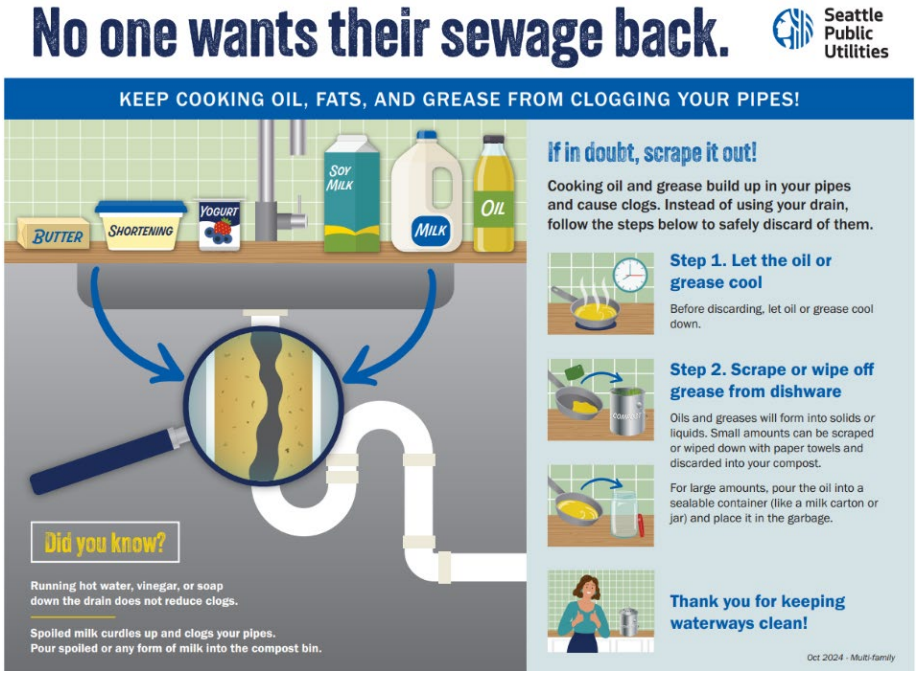

Figure 3-12. Redesigned FOG Brochure That Launched During Our Fall Campaign

- Designed new sink strainer and pan scraper giveaways based on community input from the focus groups (Figures 3-13 and 3-14)

Figure 3-13. New Sink Strainer Messaging Making It Clearer That Grease and Oil Clog Pipes

Figure 3-14. New Pan Scrapers to Help Scrap Off FOG from Pans

- Engaged with 2,300+ residents at community events, primarily in hotspot areas, to proactively influence behavior change and reduce FOG clogs
- Tested the "FOG Isn't Festive" holiday campaign on Hulu and Amazon Prime, running two targeted digital advertisements:
    - Strategy 1: A 30-second video showcasing crew efforts to clear FOG from pump stations and urging residents to dispose of FOG properly during the holiday season
        - Target audience: Residents in priority hotspot zip codes
        - Campaign period: November 28 to January 1
        - Engagement: 115,824 views across both platforms.
    - Strategy 2: A 30-second animated video highlighting unexpected FOG items, environmental impacts, and proper disposal methods
        - Target audience: Residents in priority hotspot zip codes
        - Campaign period: December 9 to January 1
        - Engagement: 100,221 views across both platforms
- Produced and shared a Super Bowl video featuring SPU staff, reminding residents that "No One Wants Their Sewage Back"
    - Key message: The best way to dispose of FOG while cooking is not putting it down the sink
    - Engagement: 30,000+ interactions on Instagram and Facebook
- Conducted targeted outreach to residents in neighborhoods impacted by FOG-related SSOs
- Presented FOG education sessions to community-based organizations, reaching 110 adults

- Distributed over 5,000 FOG educational flyers (primarily to multifamily property owners and managers)
  - Flyers were created in eight languages (English, Amharic, Chinese, Korean, Somali, Spanish, Tigrinya, and Vietnamese)
  - Flyers were distributed through community organizations, individual inquiries, and our customer service web portal
- Engaged with 432 grocery store shoppers at 11 locations during the holiday season, raising awareness of FOG impact on pipes and distributing resources like sink strainers, compost bins, and pan scrapers (Figure 3-15)

Figure 3-15. Wastewater Engagement Intern Tabling at a Grocery Store Prior to Thanksgiving Week

Commercial – Regulatory FOG Program

SPU's commercial FOG program focuses on reducing FOG from FSEs by using a risk-based approach to prioritize inspections and enforcement efforts.

Aquatics Information Platform & Self-Reporting Initiative

In 2020, SPU transitioned to a new Aquatics Informatics Platform. By 2022, the system expanded to Hauler Self Reporting and Facility Portals, allowing businesses and waste haulers to log grease interceptor cleanings directly. In 2024, SPU collaborated with Cascadia Consulting to onboard FSEs into the Facility Self Reporting Portal, starting with restaurants in Ballard and Pike Place. This self-reporting

initiative helps SPU track maintenance activities for grease interceptors, particularly for businesses that manage their own cleanings. The goal is to improve awareness of maintenance schedules, promote regular cleanings, and streamline compliance inspections, ultimately reducing improper wastewater discharges. Onboarding took place from May to September 2024.

The SPU Green Business team visited 113 businesses in Capitol Hill and the University District, conducting:

- Onboarding sessions (Tuesdays – Thursdays, 1-5 pm)
- Engagement with 10-15 businesses per day
- 40 completed FOG-related questions
- 20 businesses onboarded to Aquatic Informatics platform

Challenges identified include:

- Businesses were reluctant to adopt the platform, as self-reporting is not yet required by code
- Slow system loading times (up to 5 minutes) made it difficult to keep business owners and managers engaged

We will continue to work on the software before mandating reporting requirements. Cascadia continues to provide outreach, targeting densely populated business areas in selected neighborhoods for more efficient outreach, and reporting on any software challenges encountered.

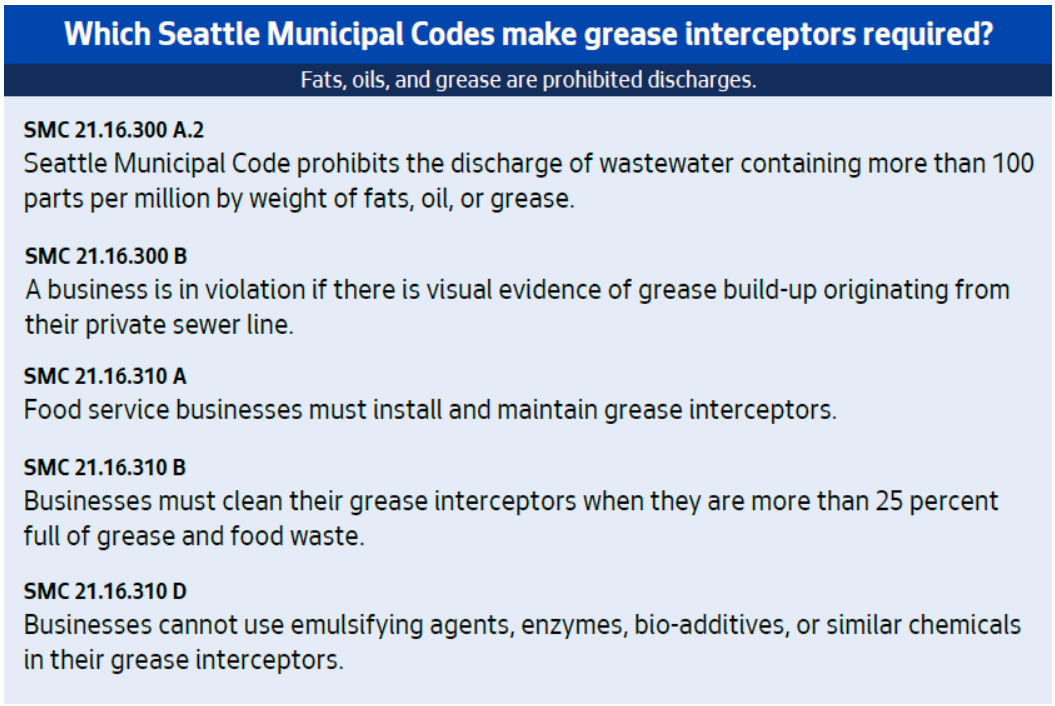

Figure 3-16. Postcard Featuring Municipal Codes Distributed to Grease Interceptor Training Program Participants

Grease Interceptor Training Program (2023-2025)

In September 2023, SPU hosted a Grease Interceptor Training Program aimed at helping individuals interested in starting small businesses that service grease interceptors at Seattle FSEs. Funded by the

Seeds of Resilience grant and supported by Cascadia Consulting Group, the program addressed several key objectives:

- Promoting environmental benefits by preventing grease-related sewer issues
- Fostering the green economy by creating small business opportunities
- Promoting economic equity by targeting foodservice workers, particularly BIPOC individuals impacted by the COVID-19 pandemic

The program recruited eight participants through community-based organizations and provided training on proper cleaning techniques, along with hands-on experience shadowing SPU inspectors. SPU and Cascadia continued to support them with business development resources throughout 2024. Participants received:

- Calls to determine obstacles faced by the businesses, such as identifying disposal locations for waste
- Restock of supplies for their cleaning services
- Postcard featuring Seattle Municipal Code (SMC) language pertaining to FOG requirements
- Tips for FSEs to prevent FOG blockages

SPU also onboarded a new individual into the Grease Interceptor Training Program after being contacted by local company, Vault 89, with a referral.

In 2025, SPU will expand this work further, creating targeted campaigns to promote program graduates as vendors for grease interceptor maintenance. The program also aims to recruit Cantonese- and Mandarin-speaking participants to serve the International District, leveraging existing janitorial or plumbing services. Outreach efforts will be paired with FOG inspectors who are being trained to refer businesses to the Green Business Program for grease interceptor maintenance.

Other 2024 Highlights

- Completed 1,045 FSE FOG discharge risk assessments and regulatory compliance inspections, including:
    - 316 high-priority facility inspections
    - FOG education, data collection, risk evaluation, and regulatory compliance checks
    - Due to ongoing staffing constraints, inspections fell short of the 1,200 annual goal, including the minimum 309 high-priority facility inspections
- Enhanced plan review collaboration with the King County Plumbing and Gas Piping Program better enforcement of plumbing codes
- Cascadia Consulting Group:
    - Conducted FOG site assessments for 335 businesses, including providing FOG maintenance logs, kitchen posters, and sink strainers
    - Delivered free spill kits to 165 facilities, including FSEs, as part of a Seattle EnviroStars Program
    - Tabled at 9 grocery stores, in partnership with SPU staff, engaging 397 residents on FOG disposal in priority areas across Seattle before the holiday cooking season

- Provided site visits to 115 foodservice businesses to introduce them to the Aquatic Informatics platform and provide FOG BMPs and resources

2025 Goals and Planned Efforts

2025 goals and efforts will include the following activities (subject to staffing availability; adjustments will be made as needed):

- Conduct regulatory compliance inspections on a minimum of 90% of all Priority 1 and 2 facilities as identified in the Aquatics Informatics Platform
- Conduct regulatory compliance inspections on 90% of facilities scheduled in 2025 per the periodicity set in Aquatics Informatics Platform.
- Continue initial risk assessments for new FSEs and facilities connected to Category 3, 4, 5, and 6 mainlines
- Conduct follow-up inspections for facilities identified as having a “no” or “inadequate” pretreatment
- Conduct notice of Violation enforcement to achieve SMC compliance
- Collaborate with King County Plumbing and Gas Piping Program and Plumbers and Pipe Fitters Training Center
- Perform community engagement efforts with business districts, neighborhood organizations, and area restaurant associations to collaborate on maintenance reporting and other FOG Program project rollouts
- Craft a Director’s Rule to support and expand existing SMC enforcement (deferred from 2021)
- Launch and pilot online FSE registration and maintenance reporting project (deferred from 2022)
- Establish a Preferred Pumper Program for companies who install, repair, and maintain grease interceptors (deferred from 2022)

3.3.2 FSE Inventory Management Plan

SPU’s FSE Inventory Management Plan outlines our approach for collecting, using, and managing FSE data. SPU uses Aquatics Informatics Platform software to store and maintain FSE-related data. Direct access for FSEs and Service Providers went live in 2022, allowing SPU to obtain maintenance records, photographs, and compliance documentation. This system enhances SPU’s ability to monitor grease interceptor maintenance outside of scheduled compliance inspections.

In 2024, SPU updated the FSE database by uploading an updated listing of FSEs permitted through Seattle & King County Public Health. Automated quarterly reports from the Public Health database ensure current and accurate FSE records.

3.3.3 Standard Operating Procedures (SOPs) and Engagement Plan

SPU’s FOG inspectors conduct an annual review of all FOG SOPs to:

- Ensure field staff familiarity and compliance with SOPs
- Confirm that SOPs accurately reflect current field procedures

- Encourage inspector input in program process development

2024 SOP Review & Updates

SPU reviewed all FOG SOPs in 2024, with updates scheduled for 2025. SPU maintains the following FOG SOPs:

- FOG Regulatory Inspection SOP
- Aquatics Informatics Platform User's Manual and Data Entry SOP (in progress)
- FOG Enforcement SOP
- FOG GIS and Hotspot SOP
- FOG Violation and Enforcement SOP
- FOG Characterization and Risk Assignment SOP
- FOG Remote Inspector User's Manual and SOP

3.3.4 FOG Inspector Training

Ongoing education and training for FOG Inspectors remains a fundamental component of SPU's FOG Program. Training ensures that inspectors remain up to date on:

- Regulatory requirements
- Best practices for inspections and enforcement
- Advancements in technology and program improvements

2024 Training Activities

- Full-day retreat and in-house FOG inspector training to reinforce inspection techniques and program policies
- Monthly discussions on procedural changes due to technology upgrades and program improvements
- Participation in regional and national forums, including:
    - APWA Pre-FOG Sub-Committee meetings
    - Western States Alliance FOG Forum (April 2024) – SPU presented on the Grease Interceptor Training Program

2025 Training Plans

SPU will continue the above activities while expanding training resources and opportunities.

3.5 Annual Review of Operations and Maintenance Manuals

SPU regularly reviews and updates its operations and maintenance (O&M) manuals to ensure they remain relevant and accessible. Manuals are stored on a dedicated SharePoint site for wastewater facility documentation. Equipment specific operations and maintenance instructions and procedures are maintained as job plans in SPU's computer maintenance management system. New and updated manuals are submitted as required, including:

- 2015: SPU submitted O&M manuals to Ecology and EPA for the new operable CSO storage facilities at Windermere and Genesee

- 2016: SPU reviewed and updated the O&M Manuals for Windermere and Genesee. The updates mainly consisted of modifications to control logic made to the facilities operations during the stabilization phase.
- 2018: SPU submitted an O&M Manual for the Henderson North CSO storage facility
- 2019: SPU reviewed and updated the control logic for the Windermere, Genesee, Henderson and Delridge facilities
- 2020: SPU submitted an O&M Manual for the Portage Bay (Basin 138) sewer system improvement project
- 2022: SPU completed review of the 60% Draft O&M Manual for the Ship Canal Water Quality Project
- 2023: SPU submitted the draft O&M Manual for the Central Waterfront CSO Reduction Project to Ecology

SECTION 4

Capital Activities

This section describes SPU's capital improvement activities to reduce the number and volume of sewage overflows and implement the Plan to Protect Seattle's Waterways. During 2024, SPU monitored and controlled scope, schedule, and budget across major capital projects. In addition, SPU applied lessons learned from previous projects to enhance future capital improvements. 2024 project spending is summarized in Table 4-1.

Table 4-1. 2024 Plan Implementation Spending

Project Name	Amount Spent
Ship Canal Water Quality Project	$58,627,639
Central Waterfront CSO Reduction Project (70,71,72)	$38,366
Delridge 168/169 CSO Control	$1,067,549
Sewer System Improvement Projects (Retrofits)	$186,665
Pump Station Rehabilitation	$9,259,265
Outfall Rehabilitation	$4,457
Sewer Renewal	$44,991,822
RainWise	$962,121
NDS Partnering	$194,635
South Park Water Quality Facility	$3,801,074
Expanded Street Arterial Sweeping	$2,099,816
Total	$121,233,410

4.1 Sewer System Improvement Projects

SPU monitored performance on several sewer system improvement projects in 2024, as summarized in the following paragraphs.

4.1.1 Delridge (Basin 99) HydroBrake Retrofit Project

Project Location: North end of the Delridge neighborhood in West Seattle, south of the West Seattle Bridge.

Project Overview and Goals

In 2019, SPU replaced the Basin 99 HydroBrake flow restriction device with an automated sluice gate. This new sluice gate enables:

- Consistent discharge flow rates into the King County regional sewer system
- Improved utilization of the existing offline storage tank

- Reduction in CSO frequency and volume

Project Timeline

- December 9, 2019: Construction completed
- 2020-2021: SPU monitored and optimized operations
    - 2020: Adjusted settings for primary wet-weather mode
    - 2021: Optimized the secondary wet-weather mode
- 2022: Performance monitoring revealed that the facility was not operating optimally. Upon investigation, SPU discovered an error in the code.
- 2024: SPU corrected the programming and monitored the performance. The system is now operating in a fully automated mode as designed.

Figure 4-1. New Basin 99 Sluice Gate (Left) and Actuator Motor (Right)

4.1.2 Magnolia (Basin 60) Pump Station 22 Rehabilitation Project

Project Location: Lawtonwood neighborhood of Magnolia, on the west side of Seattle.

Project Overview and Goals

The Pump Station 22 rehabilitation project involved:

- Increasing pumping capacity from 0.86 MGD to 4.0 MGD
- Rehabilitating station assets
- Replacing the aging 8-inch force main with a new 12-inch force main
- Establishing a new connection to King County's Fort Lawton Tunnel

Project Timeline

- September 2019: Construction began

- 2020: Construction completed ahead of the regulatory construction completion milestone of December 31, 2020. The rehabilitated pump station operates using a variable frequency drive (VFD), which is a new approach to managing system flows through SPU's pump stations.
- 2021: SPU monitored and adjusted the station's VFD performance to ensure optimal pump performance
- 2024:
    - Long-term simulation modeling indicates that Outfall 60 meets regulatory standards (maximum of 1 overflow per year on a 20-year average)
    - SPU verified permit compliance through continued monitoring

Figure 4-2. New Basin 60 Pumps Being Installed (Left) and New Basin 60 Connection to King County Trunk Sewer (Right)

4.1.3 East Montlake (Basin 20) Pump Station 13 and Force Main Rehabilitation Project

Project Location: Central Seattle, south of the Ship Canal Cut and east of Montlake Basin 140.

Project Overview and Goals

The sewer system improvement for this basin, like the project in Magnolia Basin 60, includes:

- Increasing pumping capacity from 0.9 MGD to 2.8 MGD
- Rehabilitating pump station assets
- Replacing the aging 8-inch force main with a new 12-inch force main

Project Timeline

- April 2020: Construction began, scheduled around an eagle breeding window per Washington Department of Fish and Wildlife requirements
- May 28, 2021: SPU completed construction and submitted a construction completion notification to Ecology and EPA
- 2022-2023: SPU monitored and adjusted the pump station's VFDs to align with design performance goals
- 2024: The pump station performed as designed and the basin remains in compliance with regulatory permits

Figure 4-3. Operational Testing of Upgraded Pump Station 13 (Left) and New Pumps and Valving (Right)

4.1.4 Portage Bay (Basin 138) HydroBrake Retrofit Project

Project Location: West side of Portage Bay, bounded by State Highway 520 (south) and Interstate 5 (west).

Project Overview and Goals

The sewer system improvement for this basin includes:

- Replacing the HydroBrake at the existing offline storage tank with an automated sluice gate
- Rehabilitating Pump Station 20 and increasing capacity from 1.1 MGD to 1.5 MGD
- Integrating VFDs to manage pump operations, better utilizing existing offline storage and reducing overflow volumes and frequency

Project Timeline

- Early 2020: Construction began and was completed before the regulatory construction completion milestone of December 31, 2020
- 2021: SPU adjusted and monitored gate settings to optimize complex hydraulic components 2022-2023: SPU monitored gate performance and improved the PID control logic to meet the design intent
- 2024: SPU continued to monitor performance, and the facility now operates in a fully automated mode, performing as designed

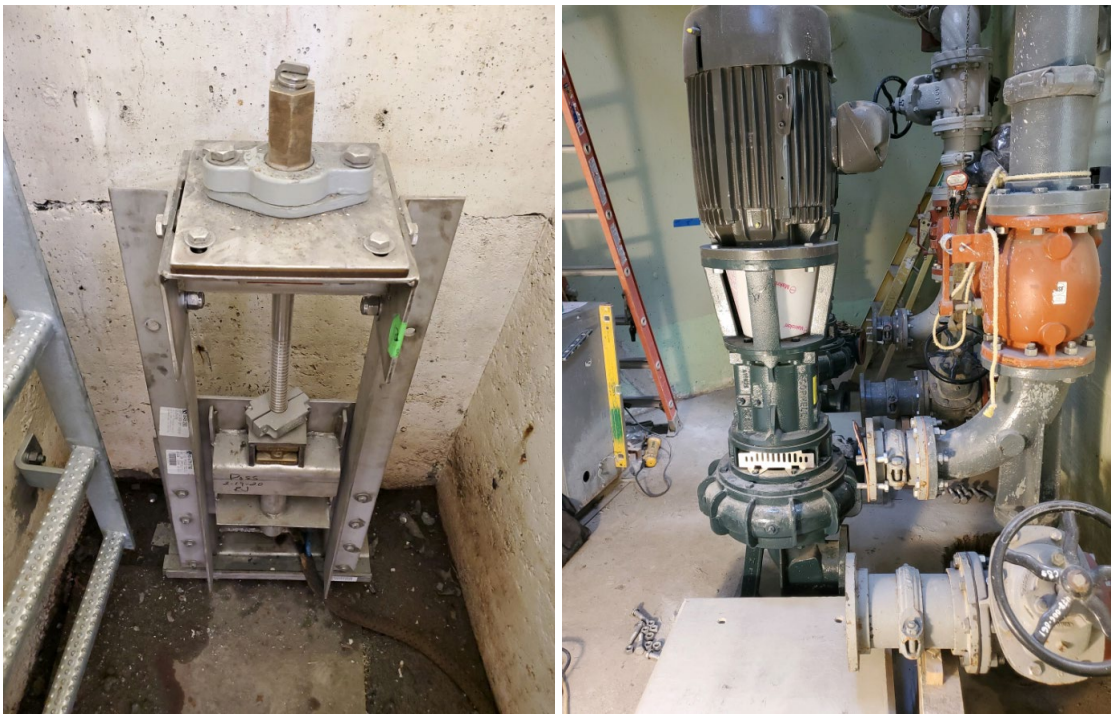

Figure 4-4. Installation of Basin 138 Slide Gate (Left) and New Higher Capacity Pumps (Right)

4.1.5 Pearl Street Drainage and Wastewater Improvement Project

Project Location: West Beacon Hill area of Seattle.

Project Overview and Goals

This neighborhood has experienced repeated combined sewer backups onto the public right-of-way and into homes and private properties as well as stormwater flooding from:

- Maple Elementary School
- Maplewood Playfield (Seattle Department of Parks and Recreation facility)
- High groundwater levels contributing to sewer capacity issues

To improve sewer system capacity, SPU:

- Installed approximately 1,200 linear feet of new sewer pipes were installed
- Upsized approximately 300 linear feet of existing pipes trenchless technologies to meet wastewater capacity needs
- Installed a 250,000-gallon underground storage tank to detain flows during large storm events and to regulate flows leaving the basin

Project Timeline

In 2024, SPU monitored performance of these improvements. SPU will continue to monitor in 2025 and will make operational adjustments, as needed.

4.2 Capital Improvement Projects

4.2.1 Ship Canal Water Quality Project (Basins 147, 151, 152, and 174)

The Ship Canal Water Quality Project (SCWQP) is a joint SPU-DNRP project designed to control CSOs from:

- SPU outfalls: Wallingford, Fremont, and Ballard areas (Outfalls 147, 151, 152, and 174)
- DNRP outfalls: 3rd Ave West (DSN 008) and 11th Ave Northwest (DSN 004)

Project Agreement and Oversight

On July 27, 2016, the City of Seattle and King County signed a Joint Project Agreement (JPA) to guide implementation, operation, and cost-sharing of the SCWQP. SPU is the lead for construction and implementation of the storage tunnel, and will own, operate, and maintain the storage tunnel and its related structures. DNRP retains ownership of its two outfall structures. SPU and DNRP have also chartered both the Joint Oversight and the Project Review and Change Management Committees to provide policy guidance and senior level management oversight, support, and direction to the project.

2024 Project Accomplishments

The project team completed the design phase of work for the program and made significant progress on construction:

- Storage Tunnel Construction: The Ballard site was handed over to the Tunnel Effluent Pump Station/Ballard Conveyance (TEPS/BC) Contractor. The East Ballard site completed commissioning.
- TEPS/BC Re-Bid Process: SPU rebid the TEPS/BC work package, saving $26 million in construction costs. Ecology approved the Final Plans and Specifications (the Conformed Documents), and construction of the work package began in November.
- Wallingford Conveyance Work Package: Construction achieved substantial completion
- SCWQP Program Budget Update: The program budget was formally updated to $710 million at an 80% confidence level following the TEPS/BC bid results and updated cost forecasts by the team.
- 2026 SRF Loan Application: SPU applied for a 2026 SRF loan for the SCWQP

2024 Challenges and Issues

- TEPS/BC Contract Delays:
    - Construction start was delayed ten weeks due to contractor insurance challenges
    - This delay impacted the critical path, and confidence in meeting the Construction Completion milestone by the date proposed in the Consent Decree Modification is now below 20%
- Storage Tunnel Contractor Dispute:
    - Delays at the Fremont Site due to contractor disputes over electrical ductbank location requirements

  - The Disputes Review Board ruled in favor of SPU. Negotiations with the contractor are ongoing.
- Wallingford Conveyance Bypass Overflow:
  - A DWO occurred on a long-term flow bypass system, unrelated to construction activities
  - The bypass was removed as planned a few weeks later

Figure 4-5. Construction of a Connector Tunnel Between Storage Tunnel and Drop Shaft

2024 Community Outreach Highlights

SPU delivered project briefings and updates to:

- SPU's Customer Review Panel (providing input and review progress on SPU's Strategic Business Plan)
- Community groups, business associations, and nonprofits
- Seattle Mayor's Office, Seattle City Council members, Ecology, and EPA
- Priority owners and business stakeholders along the tunnel alignment and proposed project sites, with a focus on the Wallingford Conveyance and Ballard Conveyance construction areas
- Over 2,000 listserv subscribers with monthly construction progress updates on the Storage Tunnel, Wallingford, and TEPS/BC work
- Professional organizations, including the American Society of Civil Engineers, to share project information and lessons learned

Figure 4-6. 8 ft. Drop Shaft in Ballard, Ready for Pump Station Construction

2025 Projected Activities and Outreach Plans

SPU will continue SCWQP construction in 2025, with the following activities and accomplishments anticipated:

- Storage Tunnel and Wallingford Conveyance:
    - Construction completion expected, but the system will not be placed into service until the TEPS/BC work package is finished
    - SPU will monitor equipment and alarms and perform equipment maintenance until full system activation
- TEPS/BC Work Package: Continue construction, including microtunneling shafts and launching of the microtunnel boring machine
- Property Acquisition: Complete purchase of the Storage Tunnel site in the Wallingford neighborhood from another City Department

SPU's planned 2025 outreach activities include:

- Deliver project briefings to organizations focused on potential project impacts to trees, bicycles, pedestrians, residents, and industry stakeholders
- Continue listserv updates, notices, and mailers to inform affected communities
- Continue stakeholder briefings and attend community meetings with a focus on the TEPS/BC work package.
- Distribute project fact sheets and maintain website and outreach materials

4.2.2 Central Waterfront CSO Reduction Project (Basins 70, 71, 72)

To control CSOs from the south end of the Central Waterfront, SPU:

- Installed approximately 2,000 linear feet of new 24- to 36-inch sewer

- Connected combined sewer basins 70, 71, and 72
- Eliminated Outfalls 70 (University Street) and 72 (Washington Street)
- Limited CSOs from Outfall 71 (Madison Street) to an average of one overflow per year

Project Coordination and Timeline

SPU coordinated construction with the Seattle Office of the Waterfront as part of the Waterfront Seattle Alaskan Way-Elliott Way (S King St to Bell St) project.

- The CSO control project could not begin until the Alaskan Way Viaduct was demolished
- SPU originally planned construction to begin in 2017 (complete in 2020), aligning with the expected Washington Department of Transportation (WSDOT) completion of SR-99 and the viaduct removal
- October 22, 2015: WSDOT and its contractor notified the Washington State Legislature's Joint Transportation Committee that SR-99 tunneling was delayed
- SPU immediately submitted a force majeure notification due to impacts on the project timeline
- Late 2019: Viaduct demolition was completed
- 2019-2020:
    - The CSO reduction project was bid, awarded and construction commenced
    - SPU completed the final measures to mitigate impacts of the completed project on our customers
- April 24 and May 26, 2020: Outfalls 70 and 72 were permanently removed from CSO service
- 2023: SPU completed construction of the Madison Ave Outfall Weir Structure, the final operational system component
- November 4, 2024: SPU submitted a notice of project completion to Ecology

Environmental and Public Health Considerations

WSDOT's tunnel delay did not pose risks to public health, welfare, or the environment. Outfalls 70 and 72 were controlled prior to construction, minimizing overflow impacts. Outfall 71 discharges a relatively small volume of Seattle's overall CSO load.

Figure 4-7. Central Waterfront Construction – Pike St. Control Structure Orifice Plate

4.2.3 Longfellow Starts Here Project (Basins 168, 169)

The Longfellow Starts Here (LSH) project is a community driven, long-term initiative to control CSOs from Delridge Basins 168 and 169. The project aims to:

- Identify the best CSO reduction strategies to bring basins 168 and 169 into compliance
- Improve Longfellow Creek's water quality while aligning with the community needs and vision
- Use a racial equity lens to guide planning and decision-making

Options Analysis Phase

LSH is currently in the Options Analysis phase, which is divided into:

- Phase A: Development of tools and frameworks for evaluating options
- Phase B: Collaborative option development and stakeholder evaluation

Each option consists of multiple projects and programs designed to meet performance goals over time, while providing other co-benefits beyond CSO reduction.

2020-2023 Project Development and Early Actions

Phase A (2020-2021)

SPU delivered the majority of Phase A in 2020, which included:

- Developing cost and performance assessments for CSO reduction and stormwater quality projects and programs
- Identifying urban design considerations for project integration
- Mapping opportunities, needs, and limitations within the basins
- Exploring workforce development and arts-based engagement strategies to empower communities of color within the area

In 2021, SPU finished documenting Phase A and worked on developing a plan for Phase B.

Phase B Initiation (2022-2023)

In mid-year 2022, Phase B officially launched, beginning with:

- Initiating a City Family Engagement Coordination Group:
    - SPU established this group to align efforts across City departments working in the Delridge community
    - The goal was to coordinate engagement efforts, reducing the burden of multiple City engagement processes on the community
- Inflow and Infiltration (I&) Early Action Projects:
    - SPU started developing a scope of work to test I&I strategies
    - These projects will provide valuable data on I&I control approaches, support future LSH project options, and inform citywide CSO basin management strategies

In 2023, work continued with City Family coordination and consultant negotiations for expanded community outreach and development of the I&I early action projects.

2024 Project Focus and Community Engagement

SPU strengthened community relationships and supported City Family collaboration, including:

- Completing a Racial Equity Toolkit analysis for the Delridge community work

- Hosting outreach events to gather community input on project priorities (Figures 4-8 and 4-9), providing early project updates to Delridge residents
- Advancing I&I early action projects by:
    - Installing monitoring equipment to gather pre-project data
    - Defining the scope for basin planning and Phase B
    - Developing a strategy for implementation
- Enhancing system understanding and modeling by:
    - Refining CSO control volumes to meet compliance requirements
    - Updating system models for improved performance analysis

Figure 4-8. Activity at the Longfellow Starts Here Community Outreach Event

2025 Project Plans

SPU will develop and evaluate options for managing CSO control volumes for each in Basins 168 and 169. This work will be done in collaboration with City Family and community stakeholders to identify CSO reduction approaches that align with South Delridge's community vision. Work in 2025 will also include advancing early action projects for I&I reduction toward implementation.

Figure 4-9. SPU Table at the Longfellow Starts Here Community Outreach Event

4.2.4 Leschi (Basins 26 – 36)

The Leschi area, located in east Seattle along Lake Washington, includes Basins 26 through 36. SPU implemented more than a dozen individual sewer system improvements in this area in two phases:

- Phase 1, which was completed in 2015 and detailed in the 2014 Annual Report
- Phase 2, which was completed in 2016 and detailed in the 2016 Annual Report

As part of these improvements, Outfalls 26 and 33 were sealed and removed from service.

Post-Construction Flow Monitoring and Performance Findings

SPU's flow monitoring and modeling data (2018-2024) indicate that:

- Outfalls 27, 29, 34, 35, and 36 meet CSO performance standards
- Outfalls 28, 30, 31, and 32 do not meet CSO control standards (see Table 5-8)

The flow characteristics of the Leschi Area have changed because of the construction improvements and recent changes in precipitation patterns, and the improvements did not reduce CSOs as much as expected. Due to these changes and because the location of the CSO control issue had shifted (for example, Basin 30 was not previously identified in the "if needed" Leschi CSO Control Project), SPU will reevaluate control options before implementing the originally planned off-line storage pipes. SPU is

working with DNRP to explore collaboration on DNRP's Montlake (DSN 014) CSO control project. This analysis will be completed as part of DNRP's future LTCP update.

Regulatory and Coordination Updates

- June 14, 2018: SPU submitted a Notification of Potential Milestone Violation to Ecology and EPA, indicating potential delays in the Leschi CSO Control Project Engineering Report
- June 26, 2019: SPU formally requested an Engineering Report Milestone modification to allow time for control alternatives development and partnership opportunities with DNRP
- June 12, 2024: The DOJ pre-approved the City and the County's Consent Decree modifications, establishing a new Engineering Report submittal milestone for Outfalls 28, 30, 31, 32, and 24 (now included in the City's Consent Decree modification)
- 2024: SPU and DNRP continued to collaborate. The Leschi/Montlake basin is one of the three priority areas identified for joint evaluation as part of the COE. See Section 2.2 for details.

4.3 CSO Control Supplemental Compliance Plans

4.3.1 Windermere Supplemental Compliance Plan

In 2015, SPU completed construction of a 2.05 million-gallon (MG) storage tank near Magnuson Park on the south side of NE 65th St to reduce the number of overflows from Outfall 13. Hydraulic modeling to assess facility performance was completed in Summer 2016. Modeling showed that, although the project significantly reduced overflows from Basin 13, the 20-year average was 1.6 CSOs/year. On October 4, 2016, SPU submitted a Supplemental Compliance Plan to Ecology and EPA outlining the steps SPU plans to take to meet the CSO standard. Ecology and EPA approved the plan on January 5, 2017.

Per the approved plan, in 2017, SPU evaluated operational adjustments to the recently constructed control structures and submitted a technical memorandum summarizing its findings on December 28, 2017. SPU found that the two main control gates in the Windermere Area needed to be reprogrammed and recalibrated to better respond to changes in flow. The evaluation also found that Basin 15 was barely exceeding the CSO standard (at 1.1 CSO per year based on modeling), so SPU submitted a Supplemental Compliance Plan for Basin 15 on April 17, 2018.

In 2018, SPU implemented the recommended gate programming changes. In 2019, the system was updated from step control logic to a proportional integrative and derivative (PID) control logic to reduce gate oscillations. In 2021, the control point was relocated to a structure with improved hydraulics and accessibility. Since then, SPU has continued to monitor their performance. In 2025, SPU will continue to work with DNRP to identify other short-term system operational improvements. SPU's LTCP Update will include a comprehensive review of Windermere outfalls to identify if further control measures are required and what additional long-term control projects are needed.

4.3.2 Genesee Supplemental Compliance Plan

In 2015, SPU completed the construction of a 380,000-gallon storage tank and a 120,000-gallon storage tank to reduce overflows from Outfalls 40, 41, and 43. The project was constructed in two parking lots along Lake Washington Blvd S at 49th Ave S and at 53rd Ave S. Each has a facility vault, diversion sewer, and a force main with motor-operated gates to control the flow of wastewater like the Windermere storage facility.

In June of 2018, SPU submitted a Revised Supplemental Compliance Plan to Ecology, noting that the storage tanks had significantly reduced overflows in the Genesee Area but Basins 40, 41, 42 and 43 were still exceeding one CSO per year. Similar to the steps taken in the Windermere Area, SPU evaluated possible operational improvements in the Genesee Area, which led to the recommendation to revise the programming of two control gates and install a new gate controller on CSO Storage Facility 9. In 2019, SPU implemented these operational improvements. SPU began to monitor those improvements in 2020, and several program refinements have been made. Monitoring continued throughout 2021 – 2024 and will continue in 2025. SPU's LTCP Update will evaluate long-term CSO control strategies for the Genesee outfalls.

4.3.3 South Henderson Supplemental Compliance Plan

In 2015-2016 SPU constructed the following improvements to the combined system in the South Henderson Area:

- The 52nd Ave S Conveyance Project (Basins 47B and 171): New diversion system and pipeline to convey peak flows to DNRP's Henderson Pump Station
- Pump Station 9 Upgrade (Basin 46): Pumping and mechanical upgrades to better handle peak flows from the sewer lake line
- Henderson 47C Retrofit (Basin 47C): New higher weir in the 47C control structure to optimize upstream storage and improve overflow monitoring

In late 2016, hydraulic modeling assessing the improvement performance showed that Basin 46 meets the CSO performance standard and Basins 47 and 171 do not. Prior to construction of these improvements, Basin 47 averaged 15.7 CSOs per year and Basin 171 averaged 7.4 CSOs per year. Based on 2016 modeling, the completed projects decreased the average frequency to 4.1 CSOs per year from Basin 47 and 3.3 CSOs per year from Basin 171.

Because the two basins were not yet meeting the CSO performance standard, on March 22, 2017, SPU submitted a Supplemental Compliance Plan to Ecology and EPA, describing the additional steps to control CSOs from Basins 47 and 171. Ecology and EPA approved the plan on May 19, 2017.

In 2017, SPU evaluated these basins and identified operational adjustments to the recently constructed control structures. SPU submitted a Technical Memorandum summarizing the evaluation on September 29, 2017. The main recommendation was to remove an orifice plate in Sub-Basin 47B to achieve the desired design flowrate, and this adjustment was implemented by December 29, 2017.

SPU then conducted flow monitoring and hydraulic modeling to assess the effectiveness of the orifice plate removal. In March 2019, SPU submitted a technical memorandum summarizing results. Orifice plate removal reduced Basin 47 overflows to 3.1 CSOs/year and Basin 171 overflows to 2.5 CSOs/year. However, both outfalls still exceed the one CSO per year standard. In 2020, SPU identified and modeled potential operational adjustments.

In 2021 through 2024, SPU coordinated with DNRP to evaluate the impact of the operational adjustments on downstream DNRP infrastructure. The basin is reviewed annually at modeling and monitoring meetings with King County. In 2025, SPU will continue to coordinate with DNRP on the operational adjustments. Outfalls 47 and 171 are included in SPU's LTCP Update to identify if further control measures are required and what additional long-term control projects are needed.

4.3.4 Magnolia 62 Supplemental Compliance Plan

In the 2016 Annual Report, SPU noted that CSO frequency at Magnolia Outfall 62 had increased in recent years to one per year (1997 – 2016). On March 21, 2018, SPU verbally notified Ecology and EPA that the frequency of CSOs from Outfall 62 had increased to a 20-year average of 1.1 per year (1998 – 2017) and that Outfall 62 no longer met the CSO performance standard. On April 3, 2018, SPU submitted a Supplemental Compliance Plan to Ecology and EPA, describing the remedial measures SPU will pursue to control the outfall. Following receipt of comments from Ecology and EPA on April 19, 2018, and a site visit with Ecology during Summer 2018, SPU submitted a revised Supplemental Compliance Plan on September 6, 2018.

The revised Supplemental Compliance Plan was approved on October 24, 2018. SPU committed to raise the Basin 62 CSO weir by December 31, 2018, and report on its functionality by March 31, 2019. On August 27, 2018, SPU installed a metal weir plate on the existing concrete weir wall, raising the weir 6.4 inches. SPU also evaluated how to inspect and clean (if required) the beach line (gravity conveyance from Basin 61 to Basin 64) as this line may be partially occluded with sediment. SPU submitted a technical memorandum to Ecology on June 27, 2019, summarizing the inspection and cleaning approach. However, preliminary monitoring data collected in 2018 and 2019 showed that the new weir plate is effective in reducing overflows. To determine if the weir raising was successful in keeping overflows to one or less per year, SPU submitted a revised Supplemental Compliance plan on June 27, 2019, requesting additional time to deploy flow monitors in 2019 and 2020 to be able to recalibrate the hydraulic model. In 2021, SPU recalibrated the model, performed long term simulations, and found that weir raising was effective and the outfall is now meeting the performance standard.

No additional work was completed in 2023-2024, and no additional work is expected in 2025.

4.4 Stormwater Projects

Green Stormwater Infrastructure (GSI) refers to measures that use soil and vegetation to absorb, slow, or retain stormwater before it enters the sewer system. By controlling stormwater at its source, GSI reduces pollution, prevents runoff into nearby waterways, and minimizes CSOs. GSI facilities are also referred to as Natural Drainage Systems (NDS) and are a type of Low Impact Development (LID).

Examples of GSI include:

- RainWise Program: Offers homeowners rebates for installing rain gardens and cisterns on their own property
- Roadside Bioretention: Features deep-rooted native plants and grasses planted in shallow depressions within the public right-of-way, such as planting strips next to homes

2024 GSI Collaborative Efforts

SPU and DNRP continue to work together to ensure a consistent approach to GSI projects in the City. Key 2024 efforts included:

- Finalizing design standards for weirs
- Finalizing design guidance for use of structural soil cells in bioretention facilities
- Finalizing design guidance for underdrain design
- Updating inlet design guidance
- Exploring potential BMP for shallow groundwater applications

- Establishing guidance for use of proprietary tree boxes in the right-of-way
- Meeting the target to manage 700 MG of stormwater annually using GSI in the City

In 2025, planned collaborative work includes:

- Updating design and guidance for the conveyance swale BMP
- Updating GSI Guidance Manuals for Design, Options Analysis, Construction and Operations and Maintenance
- Updating website resources and celebration of passing the 700 MG target

4.4.1 RainWise Program

Since 2010, the RainWise program has offered rebates for rain gardens and cisterns to property owners in the combined sewer areas of Seattle. Eligible property owners are alerted about the program through regular mailings, public meetings, and media events. By visiting the RainWise website at www.700milliongallons.org/rainwise, property owners can learn about green stormwater technologies and are presented with solutions appropriate for their property. Through this site, they are also able to find trained contractors.

Over 800 contractors, landscape designers, and similar professionals have been trained in the program since 2009. In 2024, the RainWise Program developed and released a new self-paced online orientation platform. Contractors who complete the online training must also attend an in-person field training before being eligible to perform installations that receive program rebates.

There are currently 20 active contractors listed on the RainWise website available to bid and install systems for RainWise customers. Of them, ten are multilingual. In 2024, SPU continued to update the list to include only those contractors that have current state and local business licenses and have completed installations in the last two years.

Additionally, the RainWise program and its community partners held seven informational webinars and nine in-person events for potential RainWise customers to learn about the program, talk with satisfied participants, and meet contractors. The RainWise team staffed informational tables or provided educational materials at 32 community events and knocked on over 1,200 doors to talk to residents in eligible basins.

Due to SPU staffing limitations in 2024, RainWise outreach was reduced in SPU basins. However, staff continued to monitor improved conversion rates for customers who opted in to last year's pilot virtual pre-consultation service. Translation and transcreation of materials continued to be provided.

Upon completion, RainWise installations are inspected by an inspector, and property owners apply for a rebate that reflects the value to the utility of the stormwater being diverted or slowed from entering the combined system. In 2024, RainWise increased rebate rates to reflect annual inflation. The program now offers up to $7.57 per square foot of roof area controlled for rain gardens and up to $5.78 per square foot for cisterns.

In 2024, SPU rebated 34 projects in the Ballard, Delridge, Duwamish, Fremont, Genessee, Henderson, Highland Park, Leschi, Montlake, North Union Bay, Queen Anne, and Windermere basins. Since the program's inception, 1,318 installations have been rebated in combined sewer basins managed by SPU. These installations control over 41 acres of impervious roof area and an estimated 19.9 MG per year of stormwater, and they provide an estimated 361,811 gallons of CSO control volume.

The RainWise Program continues to operate under a memorandum of agreement with DNRP to make RainWise rebates available to customers whose properties are located in the City of Seattle and within CSO basins served by DNRP, in University, Green Lake, Montlake, Capitol Hill/ Central District, Highland Park, Barton and South Park.

SPU will continue to offer its RainWise Program in 2025.

Figure 4-10: Homeowner, Bac Sau Li, Speaks to RainWise Staff About the Importance of Her Cistern to Her Home Garden

4.4.2 NDS Partnering

In 2015, the NDS Partnering Program developed the methodology, budget, and schedule required to achieve the program commitments in the approved Plan to Protect Seattle's Waterways.

In 2018, the program began construction of the 30th Ave NE Sidewalk and NDS Project, the first partnership project with the Seattle Department of Transportation (SDOT), meeting the NDS Partnering regulatory milestone of issuing construction NTP by July 2019. Construction was completed in early 2019. In 2020, the second partnership project with SDOT was constructed, the 12th Ave NE Sidewalk and NDS Project. Similar to the 30th Ave NE project, this project constructed sidewalk and NDS along two blocks within the Thornton Creek Basin. The NDS provides separation between the street and the new sidewalk and treats stormwater runoff from 12th Ave NE.

In 2023, SPU continued construction of the Longfellow NDS Project. This project includes three sites, two with a significant partnership with SDOT for pedestrian improvements. This project's construction was delayed due to poor contractor performance and a water main break over Longfellow Creek at the Kenyon site. In addition, the Sylvan site will be completed under a separate construction contract. Construction of the South Thornton NDS Project began in Q4 2023 and will address localized flooding issues and improve pedestrian mobility through construction of bioretention cells and walkways at four

project sites. This project will also include the piloting of the Bioretention Kit of Part, which are small art elements that will be incorporated into this project's right-of-way bioretention facilities.

The work under this program in 2024 included 60% design on the North Thornton NDS Project, and 90% design on the Broadview NDS Project and Holden NDS Project. Work under all these projects included contined outreach and engagement with community as the designs were being refined. The Pipers NDS Project also kicked off Options Analysis.

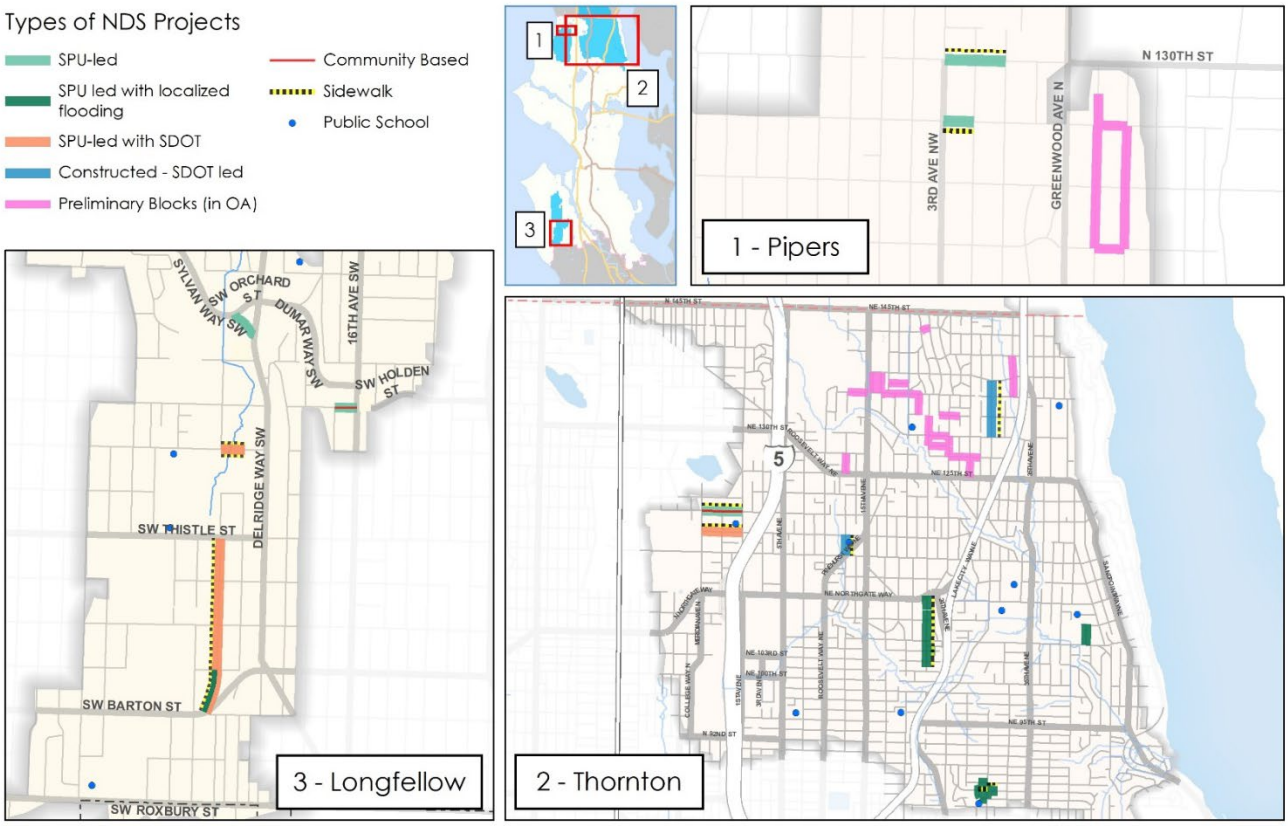

Figure 4-11. Location Map for NDS Projects

In 2025, construction for the South Thornton NDS (Figure 4-12) and Longfellow NDS, which was delayed due to contractor issues, will wrap up and begin for the Broadview NDS Project and Holden NDS projects. The Broadview NDS Project will build bioretention along three blocks to improve water quality to Pipers Creek, and the Holden NDS Project will construct bioretention along two blocks to narrow the roadway, provide traffic calming where SDOT and the community identified a need, and also treat arterial water from an adjacent street. In 2025, flow and water quality monitoring at the Longfellow NDS Project and the South Thornton NDS Project will begin. The Pipers NDS Project will advance design to 30% and look for opportunities to coordinate with SDOT to improve pedestian mobility in the neighborhood. The North Thornton NDS Project will complete 90% design and continue to work with community to keep them updated on the project. All projects are on schedule to meet the regulatory deadline.

Figure 4-12. Looking East from 24th Ave SW and SW Kenyon St – The New Bioretention Facility, Walkway, and Bridge

4.4.3 South Park Water Quality Facility

The South Park Water Quality Facility is one of the stormwater improvement projects included in the approved Plan to Protect Seattle's Waterways. The intent of the facility is to treat stormwater runoff from the existing 7th Ave S drainage basin, a highly industrial basin in the City's South Park neighborhood, and discharge treated water to the Lower Duwamish Waterway. The South Park Water Quality Facility will work in conjunction with the South Park Pump Station, which completed construction in 2023, and will enable the existing stormwater collection system and outfall to function during all tidal conditions in the Lower Duwamish Waterway.

SPU has three consultant teams to support the site cleanup, water quality facility, and community investment aspects of the project. In 2024, SPU purchased property at 816 S Kenyon St and completed options analysis of the treatment technology options for the Water Quality Facility (WQF). The WQF treatment train will consist of roughing filters followed by bioretention. In 2025, the project will develop a comprehensive site plan for the WQF with input from community engagement. Soil and groundwater remedial investigations were completed on-site in the fall of 2024. Review of data and preparation of the remedial investigations report is planned to be completed in 2025. The project is currently on schedule to be complete by the consent decree deadline of December 31, 2030.

4.4.4 Expanded Arterial Street Sweeping Program

This program expanded the City's arterial street sweeping program, per commitments in the Plan to Protect Seattle's Waterways.

2024 Program Implementation

In 2024, the team continued implementing the expanded program, with SDOT street sweeping crews covering:

- Nearly 15,000 broom-miles (provisional estimate) in the municipal separate storm sewer system area
- More than 122 dry tons of total suspended solids (TSS) equivalent, exceeding the Integrated Plan target

Key tasks included:

- Continued to utilize overtime staffing to address crew shortages caused by a tight labor market and high turnover
- Developed eSweep, a mobile app for street sweeping operators to digitally record daily performance while onboard their sweepers

2025 Planned Tasks and Program Adaptations

During 2025, the team will continue to implement the expanded program and adapt as needed to meet the regulatory targets. The key tasks planned for this year include:

- Continue sweeping established routes
- Rollout the eSweep app
- Increase sample collection frequency
- Continue to incorporate protected bike lanes into the program

The City remains on schedule to meet the annual commitment of capturing 122 tons of TSS equivalent in 2025.

SECTION 5

Monitoring Programs and Results

This section provides a brief overview of SPU's precipitation and flow monitoring programs and presents 2024 results, including CSO overflow details, 5-year average overflow frequencies, and a summary of the outfalls meeting the CSO control standard.

5.1 Precipitation Monitoring Program

SPU collects precipitation data from a network of 22 rain gauges located throughout the City of Seattle, as shown in Figure 1-1. No changes to the network of permanent rain gauges were made in 2024.

Two tables summarizing 2024 precipitation monitoring results are included in this report:

- Table 5-1 provides precipitation by gauge and by month
- Table 5-2 summarizes the last five years of precipitation monitoring results by year and month

5.2 Flow Monitoring Program

In 2024, SPU's flow monitoring consultant operated and maintained 69 monitoring points while SPU staff managed an additional 24 monitoring points, for a total of 93 continuous monitoring sites.

Dedicated monitoring program staff regularly review flow monitoring results, assess data quality, and evaluate flow monitor performance. If emerging problems are identified—such as slow drainage in storage tanks or missing data—they are quickly addressed through:

- Field service requests to the monitoring consultant or SPU Drainage and Wastewater crews
- Site-specific troubleshooting by consultant and SPU staff

Each month, the consultant's lead data analyst and senior engineer, along with SPU monitoring staff, review and analyze apparent overflows from the previous month, considering rainfall, site hydraulics, and the best available monitoring data. When needed, SPU and consultant staff meet to make a final determination on overflow events. Any required follow-up actions are documented.

5.3 Summary of 2024 Monitoring Results

Several tables summarizing 2024 flow monitoring and flow monitor performance are included in the following pages of this report:

- Table 5-3 shows the 2024 flow monitor performance by outfall and month
- Table 5-4 provides the details of all 2024 discharges by outfall and date
- Table 5-5 includes the most recent five-year overflow frequency for each outfall and compares 2024 and baseline CSO conditions
- Table 5-6 compares 2020-2024 CSOs by outfall
- Table 5-7 compares 2020-2024 CSOs by receiving waterbody
- Table 5-8 shows which outfalls met the CSO performance standard for controlled outfalls in 2024

- Exacerbated CSOs and DWOs are included in the table listing all 2024 overflows (Table 5-4).

Observations and conclusions from these tables include:

- System-wide, flow monitors were in service an average of 99.9 percent. Each SPU flow monitoring station was in service over 99 percent of the time.
- There were 161 CSOs in 2024, totaling 19.5 MG
- As noted in Section 3.1.5, there were no exacerbated CSOs
- Approximately 63 percent of the 2024 CSO volume was discharged from Outfall 152 (Ballard), which serves the largest combined sewer area of any of the City of Seattle combined sewer basins
- The four outfalls that will be controlled by the Ship Canal Water Quality Project (Outfalls 147, 151, 152, and 174) contributed 80 percent of the 2024 CSOs (129 of the 161 CSOs) and 97 percent of the 2024 CSO volume (19.0 of the 19.5 MG).

One outfall that was reported to be controlled in SPU's baseline report and has been uncontrolled in recent years is Outfall 139 in the Montlake Area. Wastewater Pump Station 25 is downstream of the outfall. In July 2016, SPU increased the pumping capacity of Wastewater Pump Station 25 by approximately 20 percent to increase the rate of flow to DNRP. SPU will continue to monitor the performance of the pump station to maximize the existing system performance and to refine the remaining control volume estimate ahead of possible partnership with DNRP on a Montlake area CSO storage project.

Table 5-8 indicates that the 2005-2024 20-year moving average number of CSOs per year at 2 outfalls identified as controlled in SPU's NPDES Permit exceeded the State CSO performance standard: Outfalls 59 and 68. SPU notified Ecology and EPA of the Outfall 59 noncompliance in the 2018 Annual Report, attributed to the unexpected failure of a force main serving Wastewater Pump Station (WWPS) 43. The 2018 Annual Report reported that SPU was in the process of replacing the force main using emergency contracting procedures. Prior to the force main break, Outfall 59 averaged 0.4 CSOs/year. For the period 2005-2024, Outfall 59 averaged 1.2 CSOs/year, including 11 exacerbated CSOs that occurred while WWPS 43 was bypassed in 2017-2019. Now that the WWPS 43 force main has been replaced, SPU believes that Outfall 59 is once again controlled.

SPU notified Ecology and EPA of the Outfall 68 noncompliance in the 2019 Annual Report. As noted in Table 5-8, some of the five CSOs that occurred in 2015-2016 and contributed to the 2001-2020 average of 1.2 CSOs/year were likely exacerbated by a partially clogged HydroBrake. SPU plans to continue monitoring this outfall to determine whether additional action is needed and, if so, the type of action.

In 2017, SPU notified Ecology and EPA that Outfall 62 no longer met the CSO performance standard and submitted a Supplemental Compliance Plan. On August 27, 2018, SPU raised the Basin 62 overflow weir to optimize use of the existing sewer system. Based on hydraulic modeling conducted in February 2021, and using modeling from 2001 through August 27, 2018, and flow monitoring for the remaining period, the 2005-2024 average number of CSOs is 0.6 CSOs/year and the outfall is considered controlled.

5.4 CSO Control Post-Construction Monitoring

Post-Construction Monitoring Program (PCMP) Quality Assurance Project Plan (QAPP) development and monitoring activities are conducted in accordance with the requirements of the CSO NPDES permit and

schedule for CSO outfall monitoring presented in the PCMP. No monitoring activities were conducted in 2024.

5.5 Integrated Plan Post-Construction Monitoring

The Integrated Plan, Volume 3 of the Plan to Protect Seattle Waterways, included a commitment to monitor the individual performance of the three Integrated Plan projects (NDS Partnering, South Park WQF, and Expanded Arterial Street Sweeping) as data is available and to monitor overall performance once data is available from all three projects. Table 5-9 summarizes the Integrated Plan performance targets and the data that is available to date. As noted, overall performance is not assessed because performance data is not yet available on the South Park WQF and NDS Partnering.

City staff completed the Expanded Arterial Street Sweeping Program post-construction monitoring sampling activities on December 20, 2018. A final report on the Street Sweeping Program post-construction monitoring was submitted with the 2018 Annual Report. As described in Section 4.7 and Section 4.8.2, the South Park Water Quality Facility and many of the NDS Partnering projects have not completed construction, so no post-construction monitoring was conducted during 2024.

Table 5-1. 2024 Precipitation by Gauge and by Month (inches)

Rain Gauge	January	February	March	April	May	June	July	August	September	October	November	December
RG01	6.80	3.54	2.50	1.89	1.86	1.66	0.24	2.25	0.81	3.85	5.94	6.82
RG02	6.64	3.51	2.94	2.41	2.56	1.38	0.21	2.42	0.96	4.21	5.66	7.21
RG03	6.21	3.67	2.80	1.95	2.40	1.08	0.18	2.34	1.00	3.95	5.47	6.92
RG04	6.41	3.74	2.86	2.09	2.35	1.59	0.21	2.53	1.07	4.08	5.66	6.71
RG05	5.81	3.60	2.58	0.88	1.01	0.90	0.18	1.29	0.70	2.76	5.07	6.29
RG07	6.35	3.36	2.53	1.71	1.73	1.45	0.20	2.37	0.80	3.72	5.43	6.24
RG08	6.97	3.40	2.36	1.56	1.92	0.98	0.21	2.17	0.67	3.52	5.46	6.62
RG09	6.71	3.73	2.79	1.97	2.43	1.28	0.24	2.73	0.86	4.12	5.78	6.97
RG11	6.12	3.38	2.36	1.39	2.17	0.97	0.14	2.25	0.77	3.46	5.34	6.42
RG12	6.21	3.30	2.28	1.35	1.93	0.95	0.17	2.16	0.67	3.20	5.04	5.91
RG14	7.39	3.72	3.16	1.04	1.89	1.20	0.25	2.09	0.67	4.08	6.31	7.75
RG15	5.87	3.25	2.87	0.98	1.50	1.03	0.11	1.41	0.76	2.80	4.85	5.86
RG16	6.38	3.71	3.15	1.20	1.38	1.53	0.13	1.70	0.69	2.84	5.40	6.11
RG17	6.25	3.58	2.96	1.21	1.56	1.51	0.17	1.78	0.76	2.66	5.25	6.15
RG18	6.43	3.86	2.97	1.56	1.85	1.54	0.16	1.75	0.84	2.85	5.38	5.93
RG25	5.90	3.81	2.68	1.69	2.21	1.21	0.20	2.15	0.81	3.20	5.60	7.03
RG30	6.94	4.11	3.04	1.77	1.90	1.64	0.16	1.93	0.71	3.02	5.90	6.33
RG32	6.53	3.86	3.31	1.56	1.87	1.39	0.17	1.73	0.96	3.21	5.67	7.03
RG33	6.36	3.76	2.86	2.44	2.29	1.23	0.19	2.60	1.14	4.39	5.63	7.01
RG34	6.45	3.48	2.81	2.06	1.89	1.81	0.26	2.41	0.88	4.05	5.62	6.60
RG35	6.48	4.02	2.67	1.79	2.54	1.32	0.21	2.11	0.83	3.59	5.95	7.00
RG36	6.73	3.81	3.19	1.18	1.90	1.28	0.22	1.90	0.82	3.25	5.80	7.06
Monthly Average	**6.45**	**3.65**	**2.80**	**1.62**	**1.96**	**1.31**	**0.19**	**2.09**	**0.83**	**3.49**	**5.55**	**6.63**

Table 5-2. 2020-2024 Average Precipitation by Month (inches)

Month/Year	2020	2021	2022	2023	2024
January	8.40	8.51	7.21	4.23	6.45
February	4.11	3.87	3.98	2.58	3.65
March	3.38	3.13	2.97	2.92	2.80
April	1.69	0.84	2.93	3.46	1.62
May	3.28	1.04	3.73	0.83	1.96
June	1.82	2.03	2.75	1.15	1.31
July	0.15	0.02	0.27	0.09	0.19
August	0.42	0.20	0.12	0.41	2.09
September	2.94	2.99	0.10	3.74	0.83
October	2.89	4.71	2.54	2.72	3.49
November	5.43	8.44	6.10	4.79	5.55
December	6.28	5.19	8.29	8.63	6.63
Annual Total	**40.79**	**40.96**	**40.98**	**35.56**	**36.59**

Table 5-3. 2024 Flow Monitoring Performance by Outfall and Month

Outfall Number	Jan Downtime (hrs)	Jan Uptime (%)	Feb Downtime (hrs)	Feb Uptime (%)	Mar Downtime (hrs)	Mar Uptime (%)	Apr Downtime (hrs)	Apr Uptime (%)	May Downtime (hrs)	May Uptime (%)	Jun Downtime (hrs)	Jun Uptime (%)	Jul Downtime (hrs)	Jul Uptime (%)	Aug Downtime (hrs)	Aug Uptime (%)	Sep Downtime (hrs)	Sep Uptime (%)	Oct Downtime (hrs)	Oct Uptime (%)	Nov Downtime (hrs)	Nov Uptime (%)	Dec Downtime (hrs)	Dec Uptime (%)	2024 Total Downtime (hrs)	2024 Total Uptime (%)
12	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
13	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	16.2	97.8	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	16.2	99.8
14	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
15	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	14.9	98.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	14.9	99.8
16	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
18	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
19	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
20	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
22	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
24	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
25	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
27	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
28	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
29	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
30	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
31	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	1.7	99.8	0.0	100.0	0.0	100.0	1.7	100.0
32	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
33	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	N/A	0.0	NA	0.0	NA
34	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0

Outfall Number	Jan Downtime (hrs)	Jan Uptime (%)	Feb Downtime (hrs)	Feb Uptime (%)	Mar Downtime (hrs)	Mar Uptime (%)	Apr Downtime (hrs)	Apr Uptime (%)	May Downtime (hrs)	May Uptime (%)	Jun Downtime (hrs)	Jun Uptime (%)	Jul Downtime (hrs)	Jul Uptime (%)	Aug Downtime (hrs)	Aug Uptime (%)	Sep Downtime (hrs)	Sep Uptime (%)	Oct Downtime (hrs)	Oct Uptime (%)	Nov Downtime (hrs)	Nov Uptime (%)	Dec Downtime (hrs)	Dec Uptime (%)	2024 Total Downtime (hrs)	2024 Total Uptime (%)
35	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
36	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
38	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
40	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
41	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
42	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
43	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
44	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	62.5	91.3	0.0	100.0	62.5	99.3
45	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	60.6	91.6	0.0	100.0	60.6	99.3
46	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	5.0	99.3	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	5.0	99.9
47	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
48	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	14.8	97.9	0.0	100.0	14.8	99.8
49	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	16.1	97.8	0.0	100.0	16.1	99.8
57	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
59	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	7.5	99.0	7.5	99.9
60	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
61	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
62	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
64	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
68	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0

Outfall Number	Jan Downtime (hrs)	Jan Uptime (%)	Feb Downtime (hrs)	Feb Uptime (%)	Mar Downtime (hrs)	Mar Uptime (%)	Apr Downtime (hrs)	Apr Uptime (%)	May Downtime (hrs)	May Uptime (%)	Jun Downtime (hrs)	Jun Uptime (%)	Jul Downtime (hrs)	Jul Uptime (%)	Aug Downtime (hrs)	Aug Uptime (%)	Sep Downtime (hrs)	Sep Uptime (%)	Oct Downtime (hrs)	Oct Uptime (%)	Nov Downtime (hrs)	Nov Uptime (%)	Dec Downtime (hrs)	Dec Uptime (%)	2024 Total Downtime (hrs)	2024 Total Uptime (%)
69	0.0	100.0	0.0	100.0	0.0	100.0	3.8	99.5	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	3.8	100.0
70	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	N/A	0.0	NA	0.0	NA
71	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
72	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	N/A	0.0	NA	0.0	NA
78	0.0	100.0	0.0	100.0	4.7	99.4	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	4.7	99.9
80	0.0	100.0	0.0	100.0	1.8	99.8	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	1.8	100.0
83	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	2.6	99.7	55.0	92.4	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	57.6	99.3
85	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
88	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
90	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
91	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
94	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
95	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
99	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
107	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
111	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	1.2	99.8	0.0	100.0	1.2	100.0
120	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
121	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
124	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
127	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0

Outfall Number	Jan Downtime (hrs)	Jan Uptime (%)	Feb Downtime (hrs)	Feb Uptime (%)	Mar Downtime (hrs)	Mar Uptime (%)	Apr Downtime (hrs)	Apr Uptime (%)	May Downtime (hrs)	May Uptime (%)	Jun Downtime (hrs)	Jun Uptime (%)	Jul Downtime (hrs)	Jul Uptime (%)	Aug Downtime (hrs)	Aug Uptime (%)	Sep Downtime (hrs)	Sep Uptime (%)	Oct Downtime (hrs)	Oct Uptime (%)	Nov Downtime (hrs)	Nov Uptime (%)	Dec Downtime (hrs)	Dec Uptime (%)	2024 Total Downtime (hrs)	2024 Total Uptime (%)
129	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
130	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
131	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
132	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
134	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
135	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
136	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
138	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
139	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
140	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
141	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
144	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	46.5	93.5	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	46.5	99.5
145	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	49.5	93.1	0.0	100.0	49.5	99.4
146	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
147	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
148	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
150/151	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
152	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	1.4	99.8	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	1.4	100.0
161	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
165	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	20.9	97.2	0.0	100.0	0.0	100.0	20.9	99.8

Outfall Number	Jan Downtime (hrs)	Jan Uptime (%)	Feb Downtime (hrs)	Feb Uptime (%)	Mar Downtime (hrs)	Mar Uptime (%)	Apr Downtime (hrs)	Apr Uptime (%)	May Downtime (hrs)	May Uptime (%)	Jun Downtime (hrs)	Jun Uptime (%)	Jul Downtime (hrs)	Jul Uptime (%)	Aug Downtime (hrs)	Aug Uptime (%)	Sep Downtime (hrs)	Sep Uptime (%)	Oct Downtime (hrs)	Oct Uptime (%)	Nov Downtime (hrs)	Nov Uptime (%)	Dec Downtime (hrs)	Dec Uptime (%)	2024 Total Downtime (hrs)	2024 Total Uptime (%)
168	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
169	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	12.3	98.3	0.0	100.0	12.3	99.9
170	0.0	100.0	0.0	100.0	9.6	98.7	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	9.6	99.9
171	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
174	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
175	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0	0.0	100.0
TOTAL:	**0.0**	**100.0**	**0.0**	**100.0**	**16.1**	**100.0**	**3.8**	**100.0**	**2.6**	**100.0**	**106.5**	**99.8**	**32.5**	**99.9**	**0.0**	**100.0**	**0.0**	**100.0**	**22.6**	**100.0**	**217.0**	**99.6**	**7.5**	**100.0**	**408.6**	**99.9**

Notes:

1. Downtime refers to the number of hours that the CSO monitor was out of service, and therefore, no overflow data is available.

2. Uptime refers to the percentage of time during the month that the CSO monitor was in service and therefore, overflow data is available

Table 5-4. 2024 CSO Details by Outfall and Date

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
12	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
13	Lake Washington	10/27/24	35,009	1.18	29.55	1.15
13	Lake Washington	Total	35,009	1.18	29.55	1.15
13	Lake Washington	Average	35,009	1.18	29.55	1.15
14	Lake Washington	10/27/24	566	0.08	28.33	0.96
14	Lake Washington	Total	566	0.08	28.33	0.96
14	Lake Washington	Average	566	0.08	28.33	0.96
15	Lake Washington	10/27/24	9,781	0.67	29.15	1.11
15	Lake Washington	Total	9,781	0.67	29.15	1.11
15	Lake Washington	Average	9,781	0.67	29.15	1.11
16	Union Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
18	Union Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
19	Union Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
20	Union Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
22	Union Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
24	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
25	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
27	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
28	Lake Washington	01/28/24	998	0.13	96.95	1.61
28	Lake Washington	08/17/24	2,364	0.33	0.70	0.32
28	Lake Washington	10/08/24	4,275	0.27	16.67	0.42
28	Lake Washington	Total	7,637	0.73	114.32	2.35
28	Lake Washington	Average	2,546	0.24	38.11	0.78
29	Lake Washington	01/28/24	1,722	0.37	97.28	1.64
29	Lake Washington	Total	1,722	0.37	97.28	1.64
29	Lake Washington	Average	1,722	0.37	97.28	1.64
30	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
31	Lake Washington	01/28/24	26,593	1.37	98.28	1.64
31	Lake Washington	02/28/24	15,094	1.87	69.43	0.97
31	Lake Washington	Total	41,687	3.24	167.72	2.61
31	Lake Washington	Average	20,844	1.62	83.86	1.31
32	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
33	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
34	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
35	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
36	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
38	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
40	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
41	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
42	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
43	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
44	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
45	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
46	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
47	Lake Washington	01/09/24	10,033	0.43	159.50	2.14
47	Lake Washington	01/28/24	12,678	0.97	178.43	3.23
47	Lake Washington	Total	22,711	1.40	337.93	5.37
47	Lake Washington	Average	11,356	0.70	168.97	2.69
48	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
49	Lake Washington	01/28/24	18,489	1.57	179.93	3.23
49	Lake Washington	Total	18,489	1.57	179.93	3.23
49	Lake Washington	Average	18,489	1.57	179.93	3.23
57	Puget Sound - Central	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
59	Salmon Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
60	Salmon Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
61	Elliott Bay	10/27/24	7,199	0.17	28.07	0.87
61	Elliott Bay	Total	7,199	0.17	28.07	0.87

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
61	Elliott Bay	Average	7,199	0.17	28.07	0.87
62	Elliott Bay	10/27/24	41	0.03	28.00	0.86
62	Elliott Bay	Total	41	0.03	28.00	0.86
62	Elliott Bay	Average	41	0.03	28.00	0.86
64	Elliott Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
68	Elliott Bay	10/27/24	171	1.27	28.03	0.86
68	Elliott Bay	Total	171	1.27	28.03	0.86
68	Elliott Bay	Average	171	1.27	28.03	0.86
69	Elliott Bay	08/17/24	38,380	0.27	0.50	0.31
69	Elliott Bay	10/27/24	96,303	0.43	28.65	0.97
69	Elliott Bay	Total	134,683	0.70	29.15	1.28
69	Elliott Bay	Average	67,342	0.35	14.58	0.64
70	Elliott Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
71	Elliott Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
72	Elliott Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
78	Elliott Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
80	Puget Sound	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
83	Puget Sound	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
85	Puget Sound	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
88	Puget Sound	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
90	Puget Sound	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
91	Puget Sound	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
94	Puget Sound	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
95	Puget Sound	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
99	Duwamish River	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
107	Duwamish River	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
111	Duwamish River	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
120	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
121	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
124	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
127	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
129	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
130	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
131	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
132	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
134	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
135	Lake Union	04/29/24	119	0.17	108.97	0.84
135	Lake Union	08/17/24	184	0.58	0.75	0.43
135	Lake Union	10/27/24	1,920	16.00	44.17	1.92
135	Lake Union	11/11/24	34	0.50	42.98	0.93
135	Lake Union	11/13/24	3	0.08	95.90	2.12
135	Lake Union	12/07/24	5	0.08	8.57	0.66
135	Lake Union	12/14/24	58	0.25	52.38	0.94
135	Lake Union	12/17/24	163	7.33	47.72	1.60
135	Lake Union	12/25/24	236	11.33	15.22	0.99
135	Lake Union	12/27/24	2	0.25	55.30	1.59
135	Lake Union	Total	2,724	36.57	471.95	12.02
135	Lake Union	Average	272	3.66	47.19	1.20
136	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
138	Portage Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
139	Portage Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
140	Portage Bay	08/17/24	21,429	2.33	2.67	0.86
140	Portage Bay	10/27/24	51,549	15.75	43.83	1.82
140	Portage Bay	Total	72,978	18.08	46.50	2.68
140	Portage Bay	Average	36,489	9.04	23.25	1.34
141	Portage Bay	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
144	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
145	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
146	Lake Union	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
147	Lake Union	01/05/24	19,913	24.92	102.72	1.21
147	Lake Union	01/08/24	7,978	1.83	158.30	2.02
147	Lake Union	01/17/24	32,371	0.67	14.00	0.54
147	Lake Union	01/26/24	404,387	35.63	98.53	2.12
147	Lake Union	02/09/24	4,356	0.37	11.08	0.14
147	Lake Union	02/21/24	4,278	0.33	48.57	0.30
147	Lake Union	02/28/24	158,332	8.30	34.70	1.28
147	Lake Union	03/21/24	14,630	0.27	22.22	0.14
147	Lake Union	04/02/24	40,482	0.73	1.42	0.24
147	Lake Union	04/29/24	39,652	14.30	15.62	0.59
147	Lake Union	05/06/24	90,791	1.20	2.33	0.42
147	Lake Union	05/19/24	11,317	0.30	19.78	0.35
147	Lake Union	05/22/24	60,391	1.67	21.02	0.81
147	Lake Union	05/29/24	20,670	3.57	3.78	0.13
147	Lake Union	06/03/24	88,684	0.90	18.33	0.84
147	Lake Union	08/17/24	438,423	2.88	3.00	1.01
147	Lake Union	08/23/24	3,000	0.23	15.93	0.20
147	Lake Union	08/26/24	67,388	2.30	2.90	0.36
147	Lake Union	09/25/24	7,230	4.58	16.70	0.32
147	Lake Union	10/04/24	85,927	3.67	4.18	0.57
147	Lake Union	10/08/24	36,165	0.83	1.53	0.33
147	Lake Union	10/21/24	1,520	0.25	49.08	0.33
147	Lake Union	10/25/24	549,923	66.67	68.30	1.86
147	Lake Union	10/30/24	13,593	1.42	2.82	0.23
147	Lake Union	10/31/24	14,497	2.00	33.07	0.54
147	Lake Union	11/04/24	33,157	2.00	7.63	0.33
147	Lake Union	11/05/24	22,886	0.42	0.63	0.14

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
147	Lake Union	11/10/24	248,421	21.33	58.18	1.43
147	Lake Union	11/12/24	131,336	40.00	122.85	2.75
147	Lake Union	11/17/24	3,237	0.33	28.15	0.32
147	Lake Union	11/18/24	6,259	27.92	87.07	0.79
147	Lake Union	11/22/24	14,040	5.67	19.18	0.44
147	Lake Union	11/24/24	8,500	10.25	30.32	0.54
147	Lake Union	12/07/24	159,465	5.37	9.80	0.72
147	Lake Union	12/13/24	227,044	24.97	44.65	0.80
147	Lake Union	12/16/24	24,966	1.97	4.72	0.26
147	Lake Union	12/17/24	875,794	23.30	51.23	2.06
147	Lake Union	12/19/24	36,884	4.70	5.83	0.28
147	Lake Union	12/21/24	74,621	25.90	27.35	0.53
147	Lake Union	12/23/24	17,903	3.63	64.18	0.91
147	Lake Union	12/25/24	601,424	19.63	22.60	1.28
147	Lake Union	12/27/24	44,722	17.10	72.00	1.87
147	Lake Union	12/29/24	56,972	1.17	98.17	2.05
147	Lake Union	Total	4,803,529	415.48	1524.47	34.38
147	Lake Union	Average	111,710	9.66	35.45	0.80
148	Lake Washington Canal	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
150/151	Salmon Bay	01/05/24	1,865	18.87	103.65	1.22
150/151	Salmon Bay	01/09/24	24	0.13	159.28	2.08
150/151	Salmon Bay	01/17/24	208	2.50	15.63	0.53
150/151	Salmon Bay	01/27/24	66,622	21.67	37.08	1.80
150/151	Salmon Bay	02/09/24	6	0.50	10.57	0.07
150/151	Salmon Bay	02/11/24	6	4.00	6.77	0.22
150/151	Salmon Bay	02/28/24	3,773	5.05	28.08	1.01
150/151	Salmon Bay	04/02/24	4	0.17	1.03	0.20
150/151	Salmon Bay	04/29/24	4,670	0.78	2.10	0.35
150/151	Salmon Bay	05/06/24	5,142	0.50	1.82	0.37

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
150/151	Salmon Bay	05/22/24	11,406	1.38	20.73	0.66
150/151	Salmon Bay	06/02/24	12,514	3.53	18.07	0.69
150/151	Salmon Bay	08/17/24	272,491	2.37	2.58	0.79
150/151	Salmon Bay	09/25/24	216	0.17	14.00	0.20
150/151	Salmon Bay	10/04/24	9,207	8.52	9.88	0.63
150/151	Salmon Bay	10/08/24	27,190	0.63	1.25	0.30
150/151	Salmon Bay	10/17/24	2,453	0.25	0.27	0.06
150/151	Salmon Bay	10/27/24	264,650	14.48	41.38	1.48
150/151	Salmon Bay	11/10/24	153,236	20.80	57.92	1.47
150/151	Salmon Bay	11/13/24	95,711	6.23	95.32	2.44
150/151	Salmon Bay	11/20/24	5	0.03	87.08	0.72
150/151	Salmon Bay	12/07/24	12,715	2.87	8.97	0.61
150/151	Salmon Bay	12/17/24	251,084	11.30	51.27	2.11
150/151	Salmon Bay	12/21/24	540	0.27	4.10	0.33
150/151	Salmon Bay	12/25/24	535	11.57	14.77	0.96
150/151	Salmon Bay	12/29/24	40	0.20	97.57	1.88
150/151	Salmon Bay	Total	1,196,313	138.77	891.17	23.18
150/151	Salmon Bay	Average	46,012	5.34	34.28	0.89
152	Salmon Bay	01/02/24	7,365	0.80	3.92	0.17
152	Salmon Bay	01/05/24	299,405	27.32	104.02	1.24
152	Salmon Bay	01/08/24	197,688	26.67	168.45	2.11
152	Salmon Bay	01/17/24	117,188	32.25	36.97	0.75
152	Salmon Bay	01/20/24	423,624	38.42	40.68	1.25
152	Salmon Bay	01/24/24	38,997	10.67	11.80	0.30
152	Salmon Bay	01/26/24	1,043,573	44.55	46.38	1.82
152	Salmon Bay	02/09/24	11,707	0.53	10.57	0.07
152	Salmon Bay	02/11/24	66,880	11.97	17.32	0.41
152	Salmon Bay	02/15/24	30,938	13.03	31.30	0.60
152	Salmon Bay	02/21/24	35,944	5.92	54.00	0.38
152	Salmon Bay	02/28/24	723,705	35.08	50.20	1.29

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
152	Salmon Bay	03/01/24	57,307	7.50	68.20	1.62
152	Salmon Bay	03/02/24	10,249	15.88	111.42	1.85
152	Salmon Bay	03/10/24	3,666	3.00	29.25	0.22
152	Salmon Bay	03/11/24	41,535	1.67	55.67	0.47
152	Salmon Bay	03/23/24	475	0.33	58.13	0.45
152	Salmon Bay	03/27/24	42,726	31.67	58.67	0.71
152	Salmon Bay	04/02/24	81,385	2.80	3.25	0.42
152	Salmon Bay	04/09/24	19,465	0.60	25.03	0.04
152	Salmon Bay	04/29/24	122,249	13.52	14.83	0.47
152	Salmon Bay	05/06/24	268,842	1.50	2.22	0.40
152	Salmon Bay	05/21/24	160,837	10.58	20.93	0.67
152	Salmon Bay	05/30/24	35,439	0.83	14.32	0.30
152	Salmon Bay	06/02/24	152,774	14.50	18.28	0.69
152	Salmon Bay	08/17/24	271,186	2.83	3.05	0.81
152	Salmon Bay	08/23/24	20,700	30.42	31.87	0.88
152	Salmon Bay	08/26/24	23,089	2.50	3.03	0.24
152	Salmon Bay	09/14/24	450	0.17	23.27	0.23
152	Salmon Bay	09/25/24	18,344	0.58	14.32	0.21
152	Salmon Bay	10/04/24	265,868	9.50	10.12	0.63
152	Salmon Bay	10/08/24	222,230	1.13	1.25	0.30
152	Salmon Bay	10/26/24	390,980	19.30	41.75	1.49
152	Salmon Bay	10/28/24	1,039	0.17	68.02	1.53
152	Salmon Bay	10/30/24	84,617	1.50	2.98	0.26
152	Salmon Bay	10/31/24	81,778	17.60	18.97	0.67
152	Salmon Bay	11/04/24	145,174	2.20	7.62	0.29
152	Salmon Bay	11/10/24	830,201	21.23	58.12	1.47
152	Salmon Bay	11/12/24	443,532	25.37	108.42	2.65
152	Salmon Bay	11/17/24	6,227	0.32	28.25	0.22
152	Salmon Bay	11/18/24	98,531	28.47	87.62	0.74
152	Salmon Bay	11/22/24	67,823	5.87	19.33	0.42
152	Salmon Bay	11/24/24	1,781	5.83	26.28	0.41

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
152	Salmon Bay	12/07/24	206,310	3.90	9.57	0.62
152	Salmon Bay	12/13/24	455,156	7.43	40.20	0.81
152	Salmon Bay	12/16/24	60,197	1.90	4.83	0.29
152	Salmon Bay	12/17/24	2,162,696	26.18	51.27	2.11
152	Salmon Bay	12/19/24	71,324	4.42	5.38	0.27
152	Salmon Bay	12/21/24	93,624	33.25	34.82	0.53
152	Salmon Bay	12/23/24	51,100	4.33	64.88	0.84
152	Salmon Bay	12/25/24	2,089,741	21.50	24.20	1.19
152	Salmon Bay	12/27/24	121,916	12.00	71.95	1.73
152	Salmon Bay	12/29/24	31,307	1.00	98.03	1.89
152	Salmon Bay	Total	12,310,884	642.49	2015.18	42.43
152	Salmon Bay	Average	232,281	12.12	38.02	0.80
161	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
165	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
168	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
169	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
170	Lake Washington	*No CSOs in 2024*	*No CSOs in 2024*	*No CSOs in 2024*	n/a	n/a
171	Lake Washington	01/09/24	44,316	0.42	159.48	2.14
171	Lake Washington	01/28/24	82,772	1.00	178.47	3.23
171	Lake Washington	Total	127,088	1.42	337.95	5.37
171	Lake Washington	Average	63,544	0.71	168.98	2.69
174	Lake Washington Canal	01/27/24	184,798	19.33	98.77	2.12
174	Lake Washington Canal	02/28/24	213	7.10	56.62	1.46
174	Lake Washington Canal	08/17/24	38,983	2.47	2.87	1.01

Outfall Number	Receiving Water	CSO Event Starting Date	Volume (gallons)	CSO Event Duration (hours)	Storm Duration (hours)	Precipitation (inches)
174	Lake Washington Canal	10/27/24	155,710	1.63	29.87	1.12
174	Lake Washington Canal	11/11/24	11,581	1.43	43.78	1.17
174	Lake Washington Canal	12/17/24	172,879	6.70	48.98	1.87
174	Lake Washington Canal	12/25/24	151,663	2.67	16.47	1.06
174	Lake Washington Canal	Total	715,827	41.33	297.35	9.81
174	Lake Washington Canal	Average	102,261	5.90	42.48	1.40
175	Lake Union	10/27/24	229	0.13	28.52	1.02
175	Lake Union	Total	229	0.13	28.52	1.02
175	Lake Union	Average	229	0.13	28.52	1.02

Note: All outfalls under NPDES Permit # WA0031682, City of Seattle

Table 5-5. Comparison of 2024 and Baseline Flows by Outfall

Outfall Number	2020 - 2024 Average CSO Frequency (#/yr)	2024 CSO Event Frequency #	2024 CSO Event Duration (hours)	2024 CSO Event Volume (MG)	Receiving Water	2010 Baseline CSO Event Frequency (#/year)	2010 Baseline CSO Event Volume (MG/year)	2024 CSOs Compared to 2010 Baseline CSOs
12	1.4	0	0.00	0	Lake Washington	0	0.0	Equals
13	3.8	1	1.18	0.035	Lake Washington	12	6.7	Below
14	0.6	1	0.08	0.00057	Lake Washington	0	0.0	Above
15	2.0	1	0.67	0.0098	Lake Washington	1.2	0.3	Below
16	0.4	0	0.00	0	Lake Washington	0	0.0	Equals
18	1.6	0	0.00	0	Union Bay	6.6	0.5	Below
19	0.2	0	0.00	0	Union Bay	0.2	0.0	Frequency Below, Volume Equals
20	1.2	0	0.00	0	Union Bay	2.6	0.1	Below
22	0.2	0	0.00	0	Union Bay	0.7	0.1	Below
24	0.6	0	0.00	0	Lake Washington	0.2	0.0	Frequency Below, Volume Equals
25	0.6	0	0.00	0	Lake Washington	2.8	1.6	Below
27	0.0	0	0.00	0	Lake Washington	0	0.0	Equals
28	4.6	3	0.73	0.0076	Lake Washington	15	0.4	Below
29	2.2	1	0.37	0.0017	Lake Washington	4.7	0.3	Below
30	1.8	0	0.00	0	Lake Washington	5.4	0.7	Below
31	3.6	2	3.24	0.0412	Lake Washington	9.3	0.5	Below
32	2.0	0	0.00	0	Lake Washington	8.4	0.3	Below
33	NA	NA	NA	NA	Lake Washington	NA	NA	Removed from service 2016
34	0.6	0	0.00	0	Lake Washington	1.4	0.5	Below
35	0.4	0	0.00	0	Lake Washington	2	0.3	Below

Outfall Number	2020 - 2024 Average CSO Frequency (#/yr)	2024 CSO Event Frequency #	2024 CSO Event Duration (hours)	2024 CSO Event Volume (MG)	Receiving Water	2010 Baseline CSO Event Frequency (#/year)	2010 Baseline CSO Event Volume (MG/year)	2024 CSOs Compared to 2010 Baseline CSOs
36	0.2	0	0.00	0	Lake Washington	2.7	0.1	Below
38	1.6	0	0.00	0	Lake Washington	0.7	0.4	Below
40	1.6	0	0.00	0	Lake Washington	6	0.8	Below
41	1.6	0	0.00	0	Lake Washington	7.5	0.9	Below
42	1.6	0	0.00	0	Lake Washington	0.6	0.0	Below
43	2.4	0	0.00	0	Lake Washington	7	0.7	Below
44	1.8	0	0.00	0	Lake Washington	13	9.3	Below
45	1.2	0	0.00	0	Lake Washington	5.9	1.1	Below
46	0.6	0	0.00	0	Lake Washington	6.5	0.9	Below
47	3.8	2	1.40	0.0223	Lake Washington	5.6	1.8	Below
48	0.0	0	0.00	0	Lake Washington	0	0.0	Equals
49	4.0	1	1.57	0.018	Lake Washington	1.6	0.8	Below
57	0.2	0	0.00	0	Puget Sound	0	0.0	Equals
59	1.0	0	0.00	0	Salmon Bay	0.2	0.4	Below
60	0.2	0	0.00	0	Salmon Bay	1.7	0.8	Below
61	1.8	1	0.17	0.0072	Elliott Bay	0	0.0	Above
62	1.0	1	0.03	0.000041	Elliott Bay	0.7	0.0	Above
64	0.0	0	0.00	0	Elliott Bay	0.1	0.0	Frequency Below, Volume Equals
68	1.6	1	1.27	0.00017	Elliott Bay	1.4	1.3	Below
69	2.2	2	0.70	0.13	Elliott Bay	4.4	1.4	Below
70	NA	NA	NA	NA	Elliott Bay	0.9	0.2	Removed from service 2020

Outfall Number	2020 - 2024 Average CSO Frequency (#/yr)	2024 CSO Event Frequency #	2024 CSO Event Duration (hours)	2024 CSO Event Volume (MG)	Receiving Water	2010 Baseline CSO Event Frequency (#/year)	2010 Baseline CSO Event Volume (MG/year)	2024 CSOs Compared to 2010 Baseline CSOs
71	0.2	0	0.00	0	Elliott Bay	4.3	1.3	Below
72	NA	NA	NA	NA	Elliott Bay	1.2	0.3	Removed from service 2020
78	0.0	0	0.00	0	Elliott Bay	0.3	0.2	Below
80	0.0	0	0.00	0	Elliott Bay	0	0.0	Equals
83	0.0	0	0.00	0	Puget Sound	0	0.0	Equals
85	0.0	0	0.00	0	Puget Sound	0	0.0	Equals
88	0.4	0	0.00	0	Puget Sound	0.3	0.2	Below
90	0.0	0	0.00	0	Puget Sound	0.2	0.0	Frequency Below, Volume Equals
91	0.4	0	0.00	0	Puget Sound	0	0.0	Equals
94	0.0	0	0.00	0	Puget Sound	0.1	0.0	Frequency Below, Volume Equals
95	2.0	0	0.00	0	Puget Sound	3	0.4	Below
99	1.2	0	0.00	0	W Waterway - Duwamish River	0.5	2.8	Below
107	2.6	0	0.00	0	E Waterway - Duwamish River	3.8	1.9	Below
111	1.6	0	0.00	0	Duwamish River	3	7.9	Below
120	0.0	0	0.00	0	Lake Union	0	0.0	Equals
121	0.2	0	0.00	0	Lake Union	0.1	0.0	Frequency Below, Volume Equals
124	0.0	0	0.00	0	Lake Union	0	0.0	Equals
127	0.0	0	0.00	0	Lake Union	0.7	0.1	Below
129	0.0	0	0.00	0	Lake Union	0.1	0.0	Frequency Below, Volume Equals
130	0.6	0	0.00	0	Lake Union	0	0.0	Equals
131	0.0	0	0.00	0	Lake Union	0.1	0.0	Frequency Below, Volume Equals

Outfall Number	2020 - 2024 Average CSO Frequency (#/yr)	2024 CSO Event Frequency #	2024 CSO Event Duration (hours)	2024 CSO Event Volume (MG)	Receiving Water	2010 Baseline CSO Event Frequency (#/year)	2010 Baseline CSO Event Volume (MG/year)	2024 CSOs Compared to 2010 Baseline CSOs
132	1.2	0	0.00	0	Lake Union	0.7	0.0	Frequency Below, Volume Equals
134	0.0	0	0.00	0	Lake Union	0	0.0	Equals
135	3.4	10	36.57	0.0027	Lake Union	0.3	0.0	Above
136	0.0	0	0.00	0	Lake Union	0	0.0	Equals
138	2.2	0	0.00	0	Portage Bay	2.3	2.0	Below
139	2.2	0	0.00	0	Portage Bay	0.7	1.4	Below
140	3.2	2	18.08	0.073	Portage Bay	4.1	0.3	Below
141	0.0	0	0.00	0	Portage Bay	0.1	0.0	Frequency Below, Volume Equals
144	0.0	0	0.00	0	Lake Union	0.1	0.2	Below
145	0.0	0	0.00	0	Lake Union	0	0.0	Equals
146	0.0	0	0.00	0	Lake Union	0	0.0	Equals
147	40.0	43	415.48	4.80	Lake Union	33	19.0	Frequency Above, Volume Below
148	0.4	0	0.00	0	Lake Washington Ship Canal	0	0.0	Equals
150/151	25.4	26	138.77	1.20	Salmon Bay	15	2.0	Frequency Above, Volume Below
152	47.4	53	642.49	12.31	Salmon Bay	15	9.7	Above
161	0.0	0	0.00	0	Lake Washington	0	0.0	Equals
165	1.2	0	0.00	0	Lake Washington	1.1	0.0	Below
168	1.6	0	0.00	0	Longfellow Creek	3.9	1.6	Below
169	1.8	0	0.00	0	Longfellow Creek	2.2	49.0	Below
170	0.2	0	0.00	0	Longfellow Creek	0.4	0.1	Below
171	3.8	2	1.42	0.13	Lake Washington	4.1	0.8	Below

Outfall Number	2020 - 2024 Average CSO Frequency (#/yr)	2024 CSO Event Frequency #	2024 CSO Event Duration (hours)	2024 CSO Event Volume (MG)	Receiving Water	2010 Baseline CSO Event Frequency (#/year)	2010 Baseline CSO Event Volume (MG/year)	2024 CSOs Compared to 2010 Baseline CSOs
174	7.2	7	41.33	0.72	Lake Washington Ship Canal	11	5.9	Below
175	0.8	1	0.13	0.00023	Lake Union	0.7	0.0	Above
Total	**207.4**	**161**	**1306**	**19.5**		**251**	**140.3**	

Table 5-6. 2020 – 2024 Summary Comparison of CSOs by Outfall

Outfall Number	2020	2021	2022	2023	2024
Outfall 12 (Lake Washington)					
Frequency	3	0	2	2	0
Duration (hours)	5.57	0.00	3.37	13.83	0
Volume (gallons)	73,378	0	9,543	92967	0
Outfall 13 (Lake Washington)					
Frequency	5	4	6	3	1
Duration (hours)	36.11	25.35	86.98	38.72	1.18
Volume (gallons)	7,707,124	4,068,045	7,979,211	7,452,928	35,009
Outfall 14 (Lake Washington)					
Frequency	1	0	0	1	1
Duration (hours)	1.00	0.00	0.00	0.17	0.08
Volume (gallons)	5,005	0	0	1,777	566
Outfall 15 (Lake Washington)					
Frequency	1	2	4	2	1
Duration (hours)	3.73	24.37	12.83	22.42	0.67
Volume (gallons)	372,636	47,778	284,941	284,807	9,781
Outfall 16 (Lake Washington)					
Frequency	1	0	0	1	0
Duration (hours)	0.33	0.00	0.00	0.23	0.00
Volume (gallons)	575	0	0	605	0
Outfall 18 (Union Bay)					
Frequency	2	2	3	1	0
Duration (hours)	25.75	4.08	20.83	20.42	0.00
Volume (gallons)	2,421,116	986,572	3,397,459	4,224,779	0
Outfall 19 (Union Bay)					
Frequency	1	0	0	0	0
Duration (hours)	0.16	0.00	0.00	0.00	0.00
Volume (gallons)	215	0	0	0	0
Outfall 20 (Union Bay)					
Frequency	3	1	2	0	0

Outfall Number	2020	2021	2022	2023	2024
Duration (hours)	30.56	1.33	4.50	0.00	0.00
Volume (gallons)	834,150	27,907	142,943	0	0
Outfall 22 (Union Bay)					
Frequency	1	0	0	0	0
Duration (hours)	0.95	0.00	0.00	0.00	0.00
Volume (gallons)	461	0	0	0	0
Outfall 24 (Lake Washington)					
Frequency	1	0	2	0	0
Duration (hours)	2.33	0.00	13.00	0.00	0.00
Volume (gallons)	540,526	0	100,808	0	0
Outfall 25 (Lake Washington)					
Frequency	1	0	2	0	0
Duration (hours)	2.30	0.00	12.86	0.00	0.00
Volume (gallons)	812,813	0	105,746	0	0
Outfall 27 (Lake Washington)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 28 (Lake Washington)					
Frequency	4	7	5	4	3
Duration (hours)	2.52	9.15	5.16	11.06	0.73
Volume (gallons)	55,823	214,831	34,487	33,484	7,637
Outfall 29 (Lake Washington)					
Frequency	2	2	4	2	1
Duration (hours)	3.70	26.86	25.70	22.47	0.37
Volume (gallons)	105,678	199,900	291,733	263,444	1,722
Outfall 30 (Lake Washington)					
Frequency	3	2	3	1	0
Duration (hours)	4.51	26.73	23.00	17.75	0.00
Volume (gallons)	89,469	69,534	83,495	95,416	0

Outfall Number	2020	2021	2022	2023	2024
Outfall 31 (Lake Washington)					
Frequency	6	3	5	2	2
Duration (hours)	42.16	47.67	56.83	25.83	3.24
Volume (gallons)	864,078	918,527	2,277,912	1,147,385	41,687
Outfall 32 (Lake Washington)					
Frequency	3	2	3	2	0
Duration (hours)	12.63	29.50	32.27	19.07	0.00
Volume (gallons)	279,919	191,926	286,718	537,581	0
Outfall 33 (Lake Washington)					
Frequency	NA	NA	NA	0	0
Duration (hours)	NA	NA	NA	0.00	0.00
Volume (gallons)	N/A	N/A	N/A	0	0
Outfall 34 (Lake Washington)					
Frequency	1	1	1	0	0
Duration (hours)	2.75	1.25	1.00	0.00	0.00
Volume (gallons)	139,256	15,606	4,552	0	0
Outfall 35 (Lake Washington)					
Frequency	1	0	0	1	0
Duration (hours)	0.27	0.00	0.00	0.23	0.00
Volume (gallons)	2,972	0	0	4,787	0
Outfall 36 (Lake Washington)					
Frequency	0	0	0	1	0
Duration (hours)	0.00	0.00	0.00	0.08	0.00
Volume (gallons)	0	0	0	586	0
Outfall 38 (Lake Washington)					
Frequency	1	2	4	1	0
Duration (hours)	3.75	5.48	34.80	20.87	0.00
Volume (gallons)	355,975	256,102	1,008,881	616,118	0
Outfall 40 (Lake Washington)					
Frequency	2	2	3	1	0
Duration (hours)	52.97	48.05	53.52	26.03	0.00

Outfall Number	2020	2021	2022	2023	2024
Volume (gallons)	327,145	684,204	1,838,620	983,920	0
Outfall 41 (Lake Washington)					
Frequency	2	2	3	1	0
Duration (hours)	52.97	48.05	53.52	26.03	0.00
Volume (gallons)	327,145	684,204	1,838,620	983,920	0
Outfall 42 (Lake Washington)					
Frequency	1	3	3	1	0
Duration (hours)	7.40	33.61	32.50	17.33	0.00
Volume (gallons)	176,049	335,339	347,470	294,165	0
Outfall 43 (Lake Washington)					
Frequency	4	3	3	2	0
Duration (hours)	81.42	96.92	79.00	35.75	0.00
Volume (gallons)	785,242	1,018,332	1,475,969	436,608	0
Outfall 44 (Lake Washington)					
Frequency	1	3	3	2	0
Duration (hours)	0.40	90.12	81.23	61.35	0.00
Volume (gallons)	3,068	5,115,155	8,944,053	3,911,285	0
Outfall 45 (Lake Washington)					
Frequency	1	2	2	1	0
Duration (hours)	2.43	22.63	2.07	0.28	0.00
Volume (gallons)	113,592	68,754	55,260	15,137	0
Outfall 46 (Lake Washington)					
Frequency	2	0	0	1	0
Duration (hours)	13.15	0.00	0.00	1.80	0.00
Volume (gallons)	220,085	0	0	57,186	0
Outfall 47 (Lake Washington)					
Frequency	2	5	8	2	2
Duration (hours)	8.56	54.61	82.83	32.72	1.40
Volume (gallons)	1,144,837	1,532,159	3,140,221	1,676,388	22,711
Outfall 48 (Lake Washington)					

Outfall Number	2020	2021	2022	2023	2024
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 49 (Lake Washington)					
Frequency	4	6	7	2	1
Duration (hours)	27.19	60.43	107.39	33.23	1.57
Volume (gallons)	2,877,370	5,315,419	8,514,038	4,173,992	18,489
Outfall 57 (Puget Sound)					
Frequency	0	0	1	0	0
Duration (hours)	0.00	0.00	2.03	0.00	0.00
Volume (gallons)	0	0	307,223	0	0
Outfall 59 (Salmon Bay)					
Frequency	1	0	2	2	0
Duration (hours)	0.92	0.00	2.07	0.30	0.00
Volume (gallons)	119,284	0	40,806	10,713	0
Outfall 60 (Salmon Bay)					
Frequency	0	0	1	0	0
Duration (hours)	0.00	0.00	0.07	0.00	0.00
Volume (gallons)	0	0	15	0	0
Outfall 61 (Elliott Bay)					
Frequency	2	1	3	2	1
Duration (hours)	1.21	0.17	3.54	0.90	0.17
Volume (gallons)	71,812	2,113	36,680	51,298	7,199
Outfall 62 (Elliott Bay)					
Frequency	2	0	1	1	1
Duration (hours)	0.50	0.00	0.07	0.17	0.03
Volume (gallons)	8,674	0	133	5,126	41
Outfall 64 (Elliott Bay)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0

Outfall Number	2020	2021	2022	2023	2024
Outfall 68 (Elliott Bay)					
Frequency	2	1	2	2	1
Duration (hours)	8.51	1.43	5.85	11.90	1.27
Volume (gallons)	660,538	24,184	477,574	279,756	171
Outfall 69 (Elliott Bay)					
Frequency	2	1	4	2	2
Duration (hours)	2.12	0.08	5.68	0.40	0.70
Volume (gallons)	717,160	2,345	432,472	55,462	134,683
Outfall 70 (Elliott Bay)					
Frequency	0	NA	NA	0	0
Duration (hours)	0.00	NA	NA	0.00	0.00
Volume (gallons)	0	N/A	N/A	0	0
Outfall 71 (Elliott Bay)					
Frequency	1	0	0	0	0
Duration (hours)	1.40	0.00	0.00	0.00	0.00
Volume (gallons)	309,386	0	0	0	0
Outfall 72 (Elliott Bay)					
Frequency	0	NA	NA	0	0
Duration (hours)	0.00	NA	NA	0.00	0.00
Volume (gallons)	0	N/A	N/A	0	0
Outfall 78 (Elliott Bay)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 80 (Elliott Bay)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 83 (Puget Sound)					
Frequency	0	0	0	0	0

Outfall Number	2020	2021	2022	2023	2024
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 85 (Puget Sound)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 88 (Puget Sound)					
Frequency	1	0	1	0	0
Duration (hours)	1.03	0.00	1.95	0.00	0.00
Volume (gallons)	1,047,258	0	42,430	0	0
Outfall 90 (Puget Sound)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 91 (Puget Sound)					
Frequency	0	0	2	0	0
Duration (hours)	0.00	0.00	2.08	0.00	0.00
Volume (gallons)	0	0	18	0	0
Outfall 94 (Puget Sound)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 95 (Puget Sound)					
Frequency	2	3	3	2	0
Duration (hours)	3.07	29.99	3.67	0.28	0.00
Volume (gallons)	28,802	42,394	12,505	3,453	0
Outfall 99 (West Waterway Duwamish River)					
Frequency	2	0	3	1	0
Duration (hours)	12.02	0.00	26.55	16.05	0.00
Volume (gallons)	1,144,773	0	1,087,950	801,303	0

Outfall Number	2020	2021	2022	2023	2024
Outfall 107 (East Waterway Duwamish River)					
Frequency	1	1	9	2	0
Duration (hours)	4.57	1.60	60.56	14.93	0.00
Volume (gallons)	90,815	14,358	186,131	104,254	0
Outfall 111 (Duwamish River)					
Frequency	1	2	4	1	0
Duration (hours)	4.47	4.91	11.38	15.17	0.00
Volume (gallons)	292,182	309,788	444,498	138,803	0
Outfall 120 (Lake Union)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 121 (Lake Union)					
Frequency	1	0	0	0	0
Duration (hours)	0.70	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 124 (Lake Union)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 127 (Lake Union)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 129 (Lake Union)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 130 (Lake Union)					
Frequency	1	0	1	1	0
Duration (hours)	0.92	0.00	0.20	0.07	0.00

Outfall Number	2020	2021	2022	2023	2024
Volume (gallons)	86,940	0	36,864	9,400	0
Outfall 131 (Lake Union)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 132 (Lake Union)					
Frequency	2	2	1	1	0
Duration (hours)	1.50	0.34	0.43	0.20	0.00
Volume (gallons)	441,749	64,169	165,695	45,368	0
Outfall 134 (Lake Union)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 135 (Lake Union)					
Frequency	3	1	1	2	10
Duration (hours)	2.16	0.42	0.43	12.90	36.57
Volume (gallons)	11,528	5,065	6,225	49,494	2,724
Outfall 136 (Lake Union)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 138 (Portage Bay)					
Frequency	3	2	4	2	0
Duration (hours)	28.00	25.70	10.53	7.60	0.00
Volume (gallons)	429,730	329,070	634,607	147,266	0
Outfall 139 (Portage Bay)					
Frequency	2	3	5	1	0
Duration (hours)	5.75	6.92	10.92	0.08	0.00
Volume (gallons)	334,584	265,003	399,154	4,633	0
Outfall 140 (Portage Bay)					

Outfall Number	2020	2021	2022	2023	2024
Frequency	3	2	6	3	2
Duration (hours)	8.91	27.00	32.50	17.50	18.08
Volume (gallons)	267,340	401,757	850,854	561,609	72,978
Outfall 141 (Portage Bay)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 144 (Lake Union)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 145 (Lake Union)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 146 (Lake Union)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 147 (Lake Union)					
Frequency	47	40	42	28	43
Duration (hours)	358.40	573.00	372.67	263.78	415.48
Volume (gallons)	21,102,048	6,380,778	9,849,427	5,528,196	4,803,529
Outfall 148 (Lake Washington Ship Canal)					
Frequency	0	0	2	0	0
Duration (hours)	0.00	0.00	2.87	0.00	0.00
Volume (gallons)	0	0	137,907	0	0
Outfall 150/151 (Salmon Bay)					
Frequency	21	31	35	14	26
Duration (hours)	111.01	236.11	272.30	148.42	138.77
Volume (gallons)	2,056,525	1,422,363	2,672,440	1,814,626	1,196,313

Outfall Number	2020	2021	2022	2023	2024
Outfall 152 (Salmon Bay)					
Frequency	49	41	44	50	53
Duration (hours)	589.37	733.78	554.73	510.65	642.49
Volume (gallons)	27,157,824	33,277,406	42,006,279	18,725,811	12,310,884
Outfall 161 (Lake Washington)					
Frequency	0	0	0	0	0
Duration (hours)	0.00	0.00	0.00	0.00	0.00
Volume (gallons)	0	0	0	0	0
Outfall 165 (Lake Washington)					
Frequency	1	2	1	2	0
Duration (hours)	13.42	1.33	1.75	1.00	0.00
Volume (gallons)	127,525	1,806	446	5,741	0
Outfall 168 (Longfellow Creek)					
Frequency	2	2	3	1	0
Duration (hours)	11.84	19.12	52.55	30.27	0.00
Volume (gallons)	528,881	1,798,523	7,576,097	2,760,242	0
Outfall 169 (Longfellow Creek)					
Frequency	2	2	4	1	0
Duration (hours)	20.70	35.18	66.93	26.10	0.00
Volume (gallons)	1,253,119	2,416,798	7,159,239	3,439,765	0
Outfall 170 (Longfellow Creek)					
Frequency	1	0	0	0	0
Duration (hours)	1.33	0.00	0.00	0.00	0.00
Volume (gallons)	13,634	0	0	0	0
Outfall 171 (Lake Washington)					
Frequency	2	5	8	2	2
Duration (hours)	8.73	55.00	83.26	32.83	1.42
Volume (gallons)	844,280	2,673,547	6,115,060	3,223,120	127,088
Outfall 174 (Lake Washington Ship Canal)					
Frequency	6	11	7	5	7

Outfall Number	2020	2021	2022	2023	2024
Duration (hours)	53.25	81.46	56.59	39.66	41.33
Volume (gallons)	5,599,153	7,401,924	8,651,075	3,765,160	715,827
Outfall 175 (Lake Union)					
Frequency	1	0	1	1	1
Duration (hours)	1.55	0.00	0.40	0.37	0.13
Volume (gallons)	327,474	0	78,276	62,003	229
Total					
Frequency	224	207	279	166	161
Duration (hours)	1,685	2,490	2,470	1,599	1,306
Volume (gallons)	85,708,718	78,583,685	131,570,761	68,881,868	19,509,268

Table 5-7. 2020-2024 Summary Comparison of CSOs by Receiving Water

Outfall Number	2020	2021	2022	2023	2024
Duwamish River					
Frequency	1	2	4	1	0
Duration (hours)	5	5	11	15	0
Volume (gallons)	292,182	309,788	444,498	138,803	0
East Waterway					
Frequency	1	1	9	2	0
Duration (hours)	5	2	61	15	0
Volume (gallons)	90,815	14,358	186,131	104,254	0
Elliott Bay					
Frequency	9	3	10	7	5
Duration (hours)	14	2	15	13	2
Volume (gallons)	1,767,570	28,642	946,859	391,642	142,094
Lake Union					
Frequency	54	43	46	33	54
Duration (hours)	364	574	374	277	452
Volume (gallons)	21,969,739	6,450,012	10,136,487	5,694,461	4,806,482
Lake Washington					
Frequency	56	58	82	40	14
Duration (hours)	393	707	885	461	11
Volume (gallons)	18,351,564	23,411,168	44,737,784	26,293,348	264,690
Lake Washington Ship Canal					
Frequency	6	11	9	5	7
Duration (hours)	53	81	59	40	41
Volume (gallons)	5,599,153	7,401,924	8,788,982	3,765,160	715,827
Longfellow Creek					
Frequency	5	4	7	2	0
Duration (hours)	34	54	119	56	0
Volume (gallons)	1,795,633	4,215,321	14,735,336	6,200,007	0
Portage Bay					
Frequency	8	7	15	6	2

Outfall Number	2020	2021	2022	2023	2024
Duration (hours)	43	60	54	25	18
Volume (gallons)	1,031,654	995,830	1,884,615	713,508	72,978
Puget Sound					
Frequency	3	3	7	2	0
Duration (hours)	4	30	10	0	0
Volume (gallons)	1,076,060	42,394	362,176	3,453	0
Salmon Bay					
Frequency	71	72	82	66	79
Duration (hours)	701	970	829	659	781
Volume (gallons)	29,333,633	34,699,769	44,719,540	20,551,150	13,507,194
Union Bay					
Frequency	7	3	5	1	0
Duration (hours)	57	5	25	20	0
Volume (gallons)	3,255,942	1,014,479	3,540,402	4,224,779	0
West Waterway					
Frequency	2	0	3	1	0
Duration (hours)	12	0	27	16	0
Volume (gallons)	1,144,773	0	1,087,950	801,303	0
Total					
Frequency	224	207	279	166	161
Duration (hours)	1,685	2,490	2,470	1,599	1,306
Volume (gallons)	85,708,718	78,583,685	131,570,761	68,881,868	19,509,268

Table 5-8. Outfalls Meeting Performance Standard for Controlled CSOs Based on Flow Monitoring Results and Modeling

Outfall Number	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2024 Average Annual Frequency	Meets Performance Standard (2024)[2]	Long-Term Simulation Source	Notes
12	0	0	0	0	0	1	0	1	1	2	1	0	1	1	1	3	0	2	2	0	0.8	Yes	N/A	4
13	1	2	1	0	2	1	0	1	1	4	5	2	4	1	2	5	4	6	3	1	2.3	No	Mike URBAN results, March 2017	3
14	NA	NA	1	0	1	0	0	0	0	0	1	1	1	0	0	1	0	0	1	1	0.4	Yes	N/A	4
15	1	3	1	0	2	1	1	1	2	6	7	3	4	2	1	1	2	4	2	1	2.3	No	Mike URBAN results, March 2017	3
16	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0.3	Yes	N/A	4
18	1	0	3	1	0	0	1	0	1	0	1	1	0	1	1	2	2	3	1	0	1.0	Yes	Mike URBAN results, October 2019	5
19	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0.2	Yes	N/A	4
20	0	1	1	0	0	1	0	1	1	0	3	0	0	0	1	1	1	2	0	0	0.7	Yes	SWMM5 results, December 2022	7
22	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0.2	Yes	EPA-SWMM results, February 2019	8
24	2	0	4	1	0	1	1	0	1	1	0	0	1	1	0	1	1	2	0	0	0.9	Yes	LTCP Long Term Simulation Results February 2013	6
25	1	0	3	1	1	2	1	0	1	1	0	0	1	1	0	1	1	2	0	0	0.9	Yes	LTCP Long Term Simulation Results February 2013	9
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	Mike URBAN results, January 2019	11
28	0	1	1	1	0	0	0	0	2	2	2	2	3	1	5	4	7	5	4	3	2.2	No	Mike URBAN results, January 2019	11
29	0	1	0	0	0	0	0	0	0	0	1	1	2	1	2	2	2	4	2	1	1.0	Yes	Mike URBAN results, January 2019	11
30	1	4	1	1	2	1	1	3	3	5	5	3	4	1	1	3	2	3	1	0	2.3	No	Mike URBAN results, January 2019	11
31	2	4	1	1	5	2	2	4	3	9	9	6	7	3	1	6	3	5	2	2	3.9	No	Mike URBAN results, January 2019	11
32	0	1	1	1	0	0	0	1	2	2	2	2	1	3	1	3	2	3	2	0	1.4	No	Mike URBAN results, January 2019	11
33	0	1	0	0	1	0	0	1	0	0	0	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6, 10
34	0	2	1	1	0	1	1	1	1	2	1	1	1	1	1	1	1	1	0	0	0.9	Yes	Mike URBAN results, January 2019	11
35	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0.2	Yes	Mike URBAN results, January 2019	11
36	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.1	Yes	Mike URBAN results, January 2019	11
38	0	2	1	0	1	1	1	1	1	0	0	0	3	1	1	1	2	4	1	0	1.1	No	Mike URBAN results, June 2018	12
40	1	5	1	0	3	1	2	2	1	2	3	1	3	1	1	2	2	3	1	0	1.8	No	Mike URBAN results, June 2018	12
41	1	5	1	0	3	1	2	2	1	2	3	1	3	1	1	2	2	3	1	0	1.8	No	Mike URBAN results, June 2018	12
42	0	3	1	1	1	1	1	1	1	0	3	0	2	1	1	1	3	3	1	0	1.3	No	Mike URBAN results, June 2018	12
43	2	6	1	1	5	3	2	5	2	4	5	4	5	3	3	4	3	3	2	0	3.2	No	Mike URBAN results, June 2018	12
44	0	0	1	0	0	1	0	1	0	0	3	0	0	0	1	1	0	3	2	0	0.7	Yes	Mike URBAN results, February 2025	13
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0.1	Yes	Mike URBAN results, February 2025	13

Outfall Number	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2024 Average Annual Frequency	Meets Performance Standard (2024)[2]	Long-Term Simulation Source	Notes
46	0	1	1	0	3	1	1	2	0	1	2	0	0	0	0	2	0	0	1	0	0.8	Yes	InfoWorks results, December 2016	14
47	4	5	3	2	6	4	2	5	3	4	6	4	2	1	3	2	5	8	2	2	3.7	No	Mike URBAN results, December 2018	15
48				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	6
49	3	8	3	1	4	5	4	7	3	6	5	4	5	3	2	4	6	7	2	1	4.2	No	Mike URBAN results, February 2018	15
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0.1	Yes	N/A	4
59	0	0	1	0	0	0	1	2	1	0	0	1	8	4	1	1	0	2	2	0	1.2	No	N/A	4
60	4	4	3	0	3	4	2	6	1	2	4	2	3	0	2	0	0	1	0	0	2.1	No	LTCP Long Term Simulation Results February 2013	6
61	1	1	1	0	0	0	1	2	1	0	2	0	0	0	1	2	1	3	2	1	1.0	Yes	N/A	6
62	1	1	1	0	0	0	0	1	1	0	2	0	0	0	0	2	0	1	1	1	0.6	Yes	EPA-SWMM results, February 2021	16
64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	6
68	1	1	1	0	1	1	0	1	1	2	4	1	2	1	2	2	1	2	2	1	1.4	No	LTCP Long Term Simulation Results February 2013	6
69	1	2	1	1	3	1	2	2	3	3	4	4	2	0	1	2	1	4	2	2	2.1	No	LTCP Long Term Simulation Results February 2013	6
70	0	1	1	0	1	0	0	0	1	0	1	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	AWVSRP Modeling Support Alternative Modeling Report May 2012, Appendix D	17
71	1	2	1	2	9	7	3	5	3	2	5	2	5	2	2	1	0	0	0	0	2.6	No	AWVSRP Modeling Support Alternative Modeling Report May 2012, Appendix D	6
72	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	N/A/	N/A	N/A	N/A	N/A	N/A	AWVSRP Modeling Support Alternative Modeling Report May 2012, Appendix D	18
78	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	Yes	N/A	4
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	4
83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	4
85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	4
88	0	0	2	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0.3	Yes	N/A	4
90	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	Yes	N/A	4
91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0.1	Yes	N/A	4
94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	4
95	0	2	1	1	2	1	0	1	1	0	0	0	2	0	2	2	3	3	2	0	1.2	No	EPA-SWMM results, February 2019	19
99	0	0	1	0	0	1	0	1	0	0	0	0	1	0	0	2	0	3	1	0	0.5	Yes	SWMM5 results, December 2022	20
107	NA	9	3	1	9	11	4	4	2	4	5	5	5	2	1	1	1	9	2	0	4.1	No	EPA-SWMM results, February 2019	21

Outfall Number	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2024 Average Annual Frequency	Meets Performance Standard (2024)[2]	Long-Term Simulation Source	Notes
111	2	2	1	0	1	1	0	1	3	2	3	0	2	1	1	1	2	4	1	0	1.4	No	EPA-SWMM results, February 2019	22
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	4
121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0.1	Yes	N/A	4
124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	4
127	0	3	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.3	Yes	N/A	4
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0.1	Yes	N/A	4
130				0	0	0	0	0	0	0	3	0	0	0	0	1	0	1	1	0	0.4	Yes	N/A	4
131	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	Yes	N/A	4
132	NA	NA	NA	0	0	0	1	0	2	0	3	0	0	0	0	2	2	1	1	0	0.7	Yes	N/A	4
134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	4
135	NA	NA	NA	0	1	0	0	0	0	0	2	0	0	0	0	3	1	1	2	10	1.2	No	N/A	4
136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	4
138	0	1	1	0	1	1	0	1	1	0	3	0	0	0	1	1	0	4	2	0	0.9	Yes	SWMM5 results, December 2022	23
139	1	1	1	0	1	1	0	1	4	0	3	0	3	3	3	2	3	5	1	0	1.7	No	EPA-SWMM results, February 2019	24
140	6	5	1	1	7	8	2	4	5	13	10	10	7	4	5	3	2	6	3	2	5.2	No	LTCP Long Term Simulation Results February 2013	6
141	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	Yes	N/A	4
144	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	Yes	N/A	4
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	4
146	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	4
147	37	45	35	50	45	63	40	47	27	49	32	58	42	37	34	47	40	42	28	43	42.1	No	LTCP Long Term Simulation Results February 2013	6
148	0	0	0	0	0	1	2	0	0	0	1	0	0	0	1	0	0	2	0	0	0.4	Yes	N/A	4
150/151	15	23	11	2	22	29	25	31	14	34	28	31	29	22	9	21	31	35	14	26	22.6	No	LTCP Long Term Simulation Results February 2013	25
152	46	42	43	11	29	63	48	57	44	53	34	63	50	45	33	49	41	44	50	53	44.9	No	LTCP Long Term Simulation Results February 2013	6
161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	Yes	N/A	4
165	0	1	2	0	0	2	1	2	2	0	2	0	2	1	1	1	2	1	2	0	1.1	No	Mike URBAN results, June 2018	12
168	2	5	2	0	1	1	0	2	0	2	2	0	2	1	1	2	2	3	1	0	1.5	No	EPA-SWMM results, February 2019	26
169	3	5	2	1	1	2	2	3	0	2	3	1	3	0	1	2	2	4	1	0	1.9	No	EPA-SWMM results, February 2019	26

Outfall Number	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2024 Average Annual Frequency	Meets Performance Standard (2024)[2]	Long-Term Simulation Source	Notes
170	NA	NA	NA	0	2	1	0	1	0	0	0	0	1	0	1	1	0	0	0	0	0.4	Yes	N/A	6
171	3	5	2	1	6	4	2	4	2	4	6	3	1	1	3	2	5	8	2	2	3.3	No	Mike URBAN results, December 2018	15
174	10	21	6	6	14	13	10	17	7	20	15	12	7	6	2	6	11	7	5	7	10.1	No	LTCP Long Term Simulation Results February 2013	6
175				0	1	0	0	0	2	0	4	0	0	1	0	1	0	1	1	1	0.7	Yes	N/A	6

Notes:

1. Per Section S4.B of the NPDES Permit, the determination of whether an outfall is meeting the performance standard for controlled outfalls has been made based on up to 20 years of data and modeling. Numbers in the unshaded cells were obtained from flow monitoring. Numbers in shaded cells were obtained using precipitation data and basin-specific models and are used in the long-term average annual overflow calculation for years when flow monitoring data either is not available, or the accuracy of the flow monitoring data cannot be confirmed.
2. Responses in this column are “Yes” if the calculated Average Annual Overflow Frequency is no more than 1 per year and “No” if the calculated Average Annual Overflow Frequency is more than 1 per year.
3. The Basin 13 storage tank was operationally complete on July 21, 2015. Due to the hydraulic connectivity between Basin 13 and Basin 15 via the Lake Line, flow modeling data is used to estimate overflow events from both basins prior to this date.
4. The flow monitoring configuration prior to 2007 cannot be confirmed and the pre-2007 data accuracy is questionable, so the calculated Average Annual Overflow Frequency uses data from flow monitoring conducted between 2007 and 2019.
5. In October 2012, SPU completed sewer system improvements in Sub-Basin 18A. Flow modeling is used to predict Sub-Basin 18A overflows prior to this date. In April 2017, SPU completed sewer system improvements in Sub-Basin 18B. Flow modeling is used to predict Sub-Basin 18B overflows prior to this date.
6. The flow monitoring configuration prior to 2008 cannot be confirmed and the pre-2008 data accuracy is questionable, so the calculated Average Annual Overflow Frequency uses data from flow monitoring conducted between 2008 and 2019.
7. The Basin 20 sewer system improvement project was completed in July 2021. Hydraulic modeling data is used prior to that date and flow monitoring data is used thereafter.
8. Several exacerbated CSOs occurred at Outfall 22 in recent years because of the deteriorating performance of WWPS 50. The pump station was rehabilitated and existing air-lift style pumps replaced with submersible pumps. WWPS 50 began pumping at its design rate on December 20, 2016. Flow modeling data is used prior to this date.
9. SPU raised the weir at Outfall 25 in early 2008, so the calculated Average Annual Overflow Frequency uses flow modeling through 2008 and flow monitoring for subsequent years.
10. The CSO overflow pipe to Outfall 33 was sealed and the outfall was removed from CSO service on July 22, 2016.
11. The weir at Outfall 34 was lowered on February 15, 2017, to protect WWPS 2 from an elevated grade line. Due to the hydraulic connectivity of the Leschi basins along the Lake Line, flow modeling data is used for all Leschi outfalls prior to this date.
12. The Lake Line connecting the Genesee CSO basins was jet cleaned on March 17, 2016, allowing for maximum hydraulic conveyance capacity. Due to the connectivity of the Genesee CSO basins along the Lake Line, flow modeling data is used for all Genesee outfalls prior to this date.
13. The hydraulic model for Basins 44 and 45 was updated in July 2018 to reflect the constructed North Henderson CSO Reduction Project and October 2024 to reflect the impeller improvements at Pump Station 10 that occurred in July 2022. Hydraulic modeling results are presented through July 2022.
14. SPU completed the Pump Station 9 Rehabilitation Project in 2016 and subsequently updated the hydraulic model for Basin 46 to reflect the constructed facilities.
15. On July 19, 2013, SPU replaced a HydroBrake in South Henderson Basin 49 with an orifice plate. Flow modeling is used to predict Basin 49 CSOs prior to this date. SPU completed the South Henderson CSO Reduction Projects (weir retrofits and 52nd Ave Conveyance Project) in August 2015 and, on November 9, 2017, removed the orifice in the 52nd Ave South flow control structure that was restricting flows. Flow modeling is used to predict Basin 47 and 171 flows prior to this date.
16. The Basin 62 overflow weir was raised on August 27, 2018, optimizing use of the existing sewer system. Flow modeling data is used prior to this date.
17. The CSO overflow pipe to Outfall 70 was sealed and the outfall was removed from CSO service on April 20, 2020.
18. The CSO overflow pipe to Outfall 72 was sealed and the outfall was removed from CSO service on May 26, 2020.
19. The Basin 95 retrofit project was substantially complete on April 4, 2013. Flow modeling is used prior to this date.
20. The Basin 99 sewer system improvement project was completed in November 2021. Hydraulic modeling data is used prior to that date and flow monitoring data is used thereafter.
21. Basin 107 overflows are induced by an elevated hydraulic grade line (HGL) in the Elliot Bay Interceptor. Reliable HGL data, necessary for flow modeling, is available from 2006 to present. The backwater valve retrofit was installed on August 19, 2017. Hydraulic modeling data is used for January 1, 2006, through August 19, 2017, with flow monitoring data used thereafter.
22. The last hydraulic modification in Basin 111 was performed on December 1, 2014. Flow modeling data is used prior to this date.
23. The Basin 138 sewer system improvement project was completed in December 2021. Hydraulic modeling data is used prior to that date and flow monitoring data is used thereafter.
24. The Basin 139 sewer system improvement project was completed in July 2016. Hydraulic modeling data is used prior to that date and flow monitoring data is used thereafter.
25. SPU removed Outfall 150 from service on February 27, 2019. Any Basin 150/151 CSOs now discharge from Outfall 151.
26. SPU completed the valve retrofit for Basins 168 and 169 on November 5, 2015. Flow modeling data is used prior to this date.

Table 5-9. Integrated Plan Performance Targets and Results to Date

Status	Project Name	Average volume treated or removed (MG/year)	Fecal coliform (billion CFU/year)[1]	PCB (g/year)[1]	Total phosphorus (kg/year)[1]	Total copper (kg/year)[1]	TSS (kg/year)[1]	Total zinc (kg/year)[1]
Target	NDS Partnering	32[1]	10,649	1.3	11	1.1	6,478	9.2
	South Park Water Quality Facility	67[1]	31,000	5.2	38	3.8	20,935	25
	Expanded Arterial Street Sweeping	1,477[1,2]	1,380	2.0	14	3.3	20,700	6.3
	Total	1,576	43,029	9	63	8.2	48,113	41
2017 Interim Results	Expanded Arterial Street Sweeping[3,4]	1,900	1,464	4.0	44	9.1	59,000	20
2018 Interim Results	Expanded Arterial Street Sweeping[3,4]	1,700	801	2.6	41	8.4	53,000	18
2019 Interim Results	Expanded Arterial Street Sweeping[3,4]	1,700	-70,724	2.9	70	7.8	95	23
2020 Interim Results	Expanded Arterial Street Sweeping[3,4]	1,700	-18,037	-0.9	41	2.8	63	9
2021 Interim Results	Expanded Arterial Street Sweeping[3,4]	1,700	-53,674	5.0	75	10.2	111	26

Notes:

1. These values represent the 95 percent lower confidence limits (LCL) from the Integrated Plan pollutant load model (PLM) results.
2. Volume of runoff from swept streets.
3. Provisional.
4. Data is only available for the Expanded Arterial Street Sweeping Program. NDS Partnering and South Park WQF monitoring has not begun. Post-construction monitoring results will not be compared to the total performance monitoring targets until monitoring has been completed for all three stormwater projects, because the goals are based on the total load reductions for the three projects combined.

Appendix A: Additional CMOM Information

Table A-1. 2024 SSO Details

Event Number	ERTS Number	Location	Event Date and Time	Estimated Total Overflow Volume (gallons)	Estimated Volume to Receiving Water (gallons)	Receiving Water, if applicable	Primary Cause
24001	728262	315 1st Ave N	01/19/2024 8:36 PM	200	0	N/A	Private Construction
24002	728327	12354 24th Ave NE	01/27/2024 11:03 AM	10,000	10,000	Thornton Creek	Structural Failure - Gravity
24003	728436	1801 16th Ave SW	01/31/2024 8:46 AM	14,800	14,800	Duwamish West Waterway	Debris
24004	728631	12354 24th Ave NE	02/06/2024 4:00 PM	5,156	5,156	Thornton Creek	Maintenance Error
24005	728817	2222 Ne 92nd St	02/11/2024 2:23 PM	50	0	N/A	Roots
24006	728882	226 1st Ave N	02/18/2024 3:20 PM	200	0	N/A	Vandalism
24007	728948	1703 California Ave SW	02/21/2024 2:42 PM	15,428	0	N/A	Roots
24008	729036	2557 21st Ave W	02/23/2024 10:46 PM	16,100	16,100	N/A	Capacity- Gravity
24009	729145	S Riverside Dr/S Holden St	02/28/2024 9:08 PM	105,000	105,000	Duwamish River	Capacity - King County[1]
24010	729239	84 Union St	03/01/2024 5:26 PM	600	0	N/A	Structural Failure - Gravity
24011	729498	Western Ave/Union St	03/14/2024 10:32 AM	450	450	Elliott Bay	Structural Failure - Gravity
24012	731360	9902 Rainier Ave S	06/04/2024 4:18 PM	5	5	Lake Washington	Fog
24013	731918	4th Ave/ Virginia St	07/01/2024 12:28 PM	28,260	0	N/A	Debris
24014	732242	1429 1st Ave	07/16/2024 2:40 PM	10	0	N/A	City Construction
24015	732797	3214 SW Spokane St	08/06/2024 11:00 AM	300	0	N/A	Structural Failure - Gravity
24016	733253	2206 41st Ave SW	08/23/2024 3:00 PM	20	0	N/A	Roots
24017	733787	5444 Delridge Way SW	09/14/2024 8:23 PM	100	0	N/A	Fog
24018	734617	10 W Garfield St Unit B	10/27/2024 3:02 AM	50	0	N/A	Roots
24019	734636	1137 Harvard Ave E	10/27/2024 2:36 PM	25	0	N/A	Roots
24020	734640	8056 20th Ave Ne	10/27/2024 4:18 PM	50	0	N/A	Capacity- Gravity
24021	734804	12346 24th Ave Ne	11/05/2024 5:59 AM	13,500	13,000	Thornton Creek	Maintenance Error
24022	734925	410 Valley St	11/08/2024 7:24 PM	2,500	0	N/A	Roots

Event Number	ERTS Number	Location	Event Date and Time	Estimated Total Overflow Volume (gallons)	Estimated Volume to Receiving Water (gallons)	Receiving Water, if applicable	Primary Cause
24023	735019	401 E Pike St	11/13/2024 10:16 AM	15	0	N/A	Roots
24024	735637	13740 Riviera Pl NE	12/11/2024 7:16 PM	1,000	0	N/A	Structural Failure - Gravity
24025	735910	1408 NW 85th St	12/21/2024 1:34 PM	50	0	N/A	City Construction
DWO-2024-1	733530	N 34th St/Stone Way N	09/05/2024 4:52 PM	342	342	Lake Union	Debris

1. *On 2/28/2024, sewage overflowed from a maintenance hole due to surcharging in King County's sewer system during a storm (ERTS #729145). SPU notified King County Wastewater Treatment Division on 2/29/2024.*

Table A-2. Pump Station Location and Capacity

Number	Name	Address	Type [1]	Basin Area (acres)	Average Annual Inflow (gpm)	Average Wet Weather Inflow (gpm)	Number of Pumps and Rating	Static Head (feet)	Average Annual Storage Time (hours)	Average Wet Weather Storage Time (hours)
1	Lawton Wood	5645 45th Ave W	WW/DW	31.8	10	27	2 at 350 gpm each	60.5	25.7	9.5
2	Charles Street	901 Lakeside Dr	WW/DW	108.1	180	303	2 at 450 gpm each	20	7.6	4.5
4	South Director Street	5135 South Director St	Air Lift	3.1	33	48	2 at 150 gpm each	28.5	2.1	1.4
5	46th Avenue South	3800 Lake Washington Blvd	WW/DW	198.2	250	715	2 at 1000 gpm each	13.9	4.7	1.7
6	South Alaska Street	4645 Lake Washington Blvd	WW/DW	10.2	24	88	2 at 300 gpm each	14	3.0	0.82
7	East Lee Street	4214 E Lee St	WW/DW	227	373	961	2 at 2800 gpm each	50	11.8	4.6
9	South Grattan Street	8400 55th Ave S	WW/DW	422.2	372	1074	2 at 2700 gpm each	13.9	2.8	1.1
10	South Holly Street	5711 S Holly St	WW/DW	188.4	201	494	2 at 1000 gpm each	13.5	1.7	0.70
11	North Sand Point	63rd Ave NE and NE 78th St	Submersible	32.8	45	80	2 at 180 gpm each	23	6.9	3.9
13	Montlake	2160 E Shelby St	WW/DW	64.9	49	154	2 at 600 gpm each	29.7	44.2	14.0
17	Empire Way	42nd Ave S and S Norfolk St	WW/DW	395	546	804	2 at 2000 gpm each	27.7	4.5	3.0
18	South 116th Place	6700 S 116th Pl	Submersible	2.5	2.8	3.7	2 at 150 gpm each	45	21.7	16.4
19	Leroy Place South	9400 Leroy Pl S	Submersible	6.84	4.3	5.5	2 at 150 gpm each	45	14.9	11.6
20	East Shelby Street	1205 E Shelby St	WW/DW	48.6	94	278	2 at 600 gpm each	45	20.5	6.9
21	21st Avenue West	2557 21st Ave W	Submersible	3.55	6.7	7.2	2 at 150 gpm each	45	9.8	9.2
22	West Cramer Street	5400 38th Ave W	WW/DW	26.9	44	224	2 at 750 gpm each	62	6.0	1.2
25	Calhoun Street	1812 E Calhoun St	WW/DW	52.2	123	328	2 at 850 gpm each	36	2.9	1.1
28	North Beach	9001 View Ave NW	Submersible	4.8	2.7	6.0	2 at 150 gpm each	40.7	17.5	7.9
30	Esplanade	3206 NW Esplanade St	Submersible	5.7	8.7	19	2 at 150 gpm each	63	14.0	6.6
31	11th Avenue NW	12007 11th Ave NW	Submersible	2	0.81	1.1	2 at 150 gpm each	20	41.0	30.8
35	25th Avenue NE	2734 NE 45th St	WW/DW	71	170	202	2 at 600 gpm each 1 at 900 gpm	39.8	1.2	0.98

Number	Name	Address	Type [1]	Basin Area (acres)	Average Annual Inflow (gpm)	Average Wet Weather Inflow (gpm)	Number of Pumps and Rating	Static Head (feet)	Average Annual Storage Time (hours)	Average Wet Weather Storage Time (hours)
36	Maryland	1122 Harbor Ave SW	Air Lift	12.2	60	83	2 at 150 gpm each	10	5.0	3.6
37	Fairmont	1751 Harbor Ave SW	WW/DW	281.5	275	744	2 at 3000 gpm each	12.8	5.1	1.9
38	Arkansas	1411 Alki Ave SW	Air Lift	46.5	108	164	2 at 300 gpm each	10	5.4	3.6
39	Dawson	5080 Beach Dr SW	WW/DW	55	114	340	2 at 850 gpm each	36.7	5.4	1.8
42	Lincoln Park	8617 Fauntleroy Way SW	WW/DW	6.5	18	35	2 at 200 gpm each	55.5	6.3	3.2
43	Seaview No. 1	5635 Seaview Ave NW	WW/DW	177.4	82	211	2 at 2750 gpm each	40.4	19.7	7.7
44	Boeing No. 1	6820 Perimeter Rd S	WW/DW	168.5	196	361	2 at 800 gpm each	19	2.4	1.3
45	Boeing No. 2	7609 Perimeter Rd S	WW/DW	133.5	92	167	2 at 350 gpm each	16.5	3.8	2.1
46	Seaview No. 2	6541 Seaview Ave NW	Air Lift	52.6	64	96	2 at 150 gpm each	14.6	1.9	1.2
47	Seaview No. 3	7242 Seaview Ave NW	Air Lift	11	14	17	2 at 150 gpm each	9.5	6.8	5.6
48	Brooklyn	3701 Brooklyn Ave NE	WW/DW	31.4	91	108	2 at 1000 gpm each	53.3	3.8	3.2
49	Latona	3750 Latona Ave NE	WW/DW	22.4	20	40	2 at 250 gpm each	33.3	19.0	9.6
50	39th Avenue East	2534 39th Ave E	Submersible	10.6	5.3	14	2 at 120 gpm each	17	19.6	7.3
51	NE 60th Street	6670 NE 60th St	WW/DW	44.5	38	94	2 at 325 gpm each	126.3	3.5	1.4
53	SW Hinds Street	4951 SW Hinds St	WW/DW	10.6	7.1	22	2 at 150 gpm each	66	10.9	3.5
54	NW 41st Street	647 NW 41st St	WW/DW	24.5	50	149	2 at 350 gpm each	27	5.1	1.7
55	Webster Street	3021 West Laurelhurst NE	Air Lift	2.4	5.6	8.8	2 at 150 gpm each	31	1.1	0.7
56	Bedford Court	10334 Bedford Ct NW	Air Lift	1.6	4.8	12	2 at 150 gpm each	30.3	0.62	0.26
57	Sunnyside	3600 Sunnyside Ave N	WW/DW	16.3	12	17	2 at 300 gpm each	31.5	14.3	10.0
58	Woodlawn	1350 North Northlake Way	WW/DW	33.4	34	41	2 at 685 gpm each	30	8.0	6.7
59	Halliday	2590 Westlake Ave N	WW/DW	21.2	8.5	8.0	2 at 325 gpm each	17.7	25.7	27.4
60	Newton	2010 Westlake Ave N	WW/DW	57.6	65	94	2 at 250 gpm each	67.4	4.4	3.1

Number	Name	Address	Type [1]	Basin Area (acres)	Average Annual Inflow (gpm)	Average Wet Weather Inflow (gpm)	Number of Pumps and Rating	Static Head (feet)	Average Annual Storage Time (hours)	Average Wet Weather Storage Time (hours)
61	Aloha	912 Westlake Ave N	WW/DW	26.3	13	11	2 at 450 gpm each	19.1	15.8	19.4
62	Yale	1103 Fairview Ave N	WW/DW	12.2	27	27	2 at 300 gpm each	18.4	6.0	6.0
63	East Blaine	140 E Blaine St	WW/DW	33.1	103	136	2 at 600 gpm each	31	2.4	1.8
64	East Lynn Street No. 2	2390 Fairview Ave E	WW/DW	9.4	63	103	2 at 300 gpm each	16.2	2.4	1.4
65	East Allison Street	2955 Fairview Ave E	WW/DW	19.2	23	31	2 at 200 gpm each	47.2	10.4	7.8
66	Portage Bay No. 1	3190 Portage Bay Pl E	WW/DW	6.5	20	20	2 at 200 gpm each	12.2	7.2	7.2
67	Portage Bay No. 2	1209 E Shelby St	WW/DW	14.7	30	30	2 at 250 gpm each	17	5.0	5.0
69	Sand Point	6451 65th Ave NE	WW/DW	15.5	44	58	2 at 300 gpm each	79	2.0	1.5
70	Barton No. 2	4890 SW Barton St	WW/DW	73	37	76	2 at 290 gpm each	29	12.5	6.1
71	SW 98th Street	5190 SW 98th St	WW/DW	36.3	26	46	2 at 450 gpm each	16	6.2	3.5
72	SW Lander Street	2600 13th Ave SW	WW/DW	203.5	98	272	3 at 2100 gpm each	22.8	12.2	4.4
73	SW Spokane St	1190 SW Spokane St	WW/DW	336.5	96	258	3 at 2400 gpm each	16.3	9.5	3.5
74	26th Avenue SW	2799 26th Ave SW	Submersible	144	26	38	2 at 300 gpm each	30	12.3	8.4
75	Point Place SW	3200 Point Pl SW	Air Lift	4.9	n/a	n/a	2 at 150 gpm each	12.2	n/a	n/a
76	Lowman Park	7025 Beach Dr SW	WW/DW	20.4	15	22	2 at 100 gpm each	34	18.8	13.0
77	32nd Avenue West	1499 32nd Ave W	WW/DW	206.5	84	256	2 at 1400 gpm each	48	21.0	6.9
78	Airport Way South	8415 Airport Way S	Air Lift	18.4	11	12	2 at 150 gpm each	14.5	4.5	4.1
80	South Perry Street	9724 Rainier Ave S	Air Lift	4.6	4.8	5.2	2 at 150 gpm each	22	14.1	13.1
81	72nd Avenue South	10199 Rainier Ave S	WW/DW	11	10	13	2 at 200 gpm each	53.3	19.0	14.7
82	Arroyo Beach Place	11013 Arroyo Beach Pl SW	Air Lift	6	4.5	4.8	2 at 150 gpm each	19.8	16.2	15.2
83	West Ewing Street	390 W Ewing St	Air Lift	6.1	44	29	2 at 150 gpm each	19	1.4	2.1
84	28th Avenue NW	5390 28th Ave NW	WW/DW	691.4	81	191	2 at 500 gpm each	24.4	3.9	1.6

1. WW/DW = Wet Well/Dry Well

Table A-3. 2024 Pump Station Work Order Summary

WWPS Number	Inspection	Maintenance	Total Work Orders
WWPS001	15	4	19
WWPS002	25	23	48
WWPS004	29	8	37
WWPS005	22	18	40
WWPS006	20	7	27
WWPS007	40	11	51
WWPS009	30	24	54
WWPS010	31	13	44
WWPS011	16	15	31
WWPS013	29	27	56
WWPS017	31	52	83
WWPS018	15	8	23
WWPS019	26	39	65
WWPS020	41	14	55
WWPS021	22	10	32
WWPS022	36	9	45
WWPS025	23	15	38
WWPS028	25	10	35
WWPS030	13	22	35
WWPS031	33	10	43
WWPS035	46	23	69
WWPS036	22	7	29
WWPS037	30	22	52
WWPS038	35	11	46
WWPS039	31	13	44
WWPS042	32	19	51
WWPS043	36	30	66
WWPS044	34	23	57
WWPS045	60	25	85
WWPS046	38	8	46
WWPS047	28	10	38

WWPS Number	Inspection	Maintenance	Total Work Orders
WWPS048	20	10	30
WWPS049	19	36	55
WWPS050	17	12	29
WWPS051	18	34	52
WWPS053	12	7	19
WWPS054	50	8	58
WWPS055	24	6	30
WWPS056	47	8	55
WWPS057	24	31	55
WWPS058	26	7	33
WWPS059	22	8	30
WWPS060	22	5	27
WWPS061	21	9	30
WWPS062	8	29	37
WWPS063	16	14	30
WWPS064	22	11	33
WWPS065	20	3	23
WWPS066	20	5	25
WWPS067	14	2	16
WWPS069	29	7	36
WWPS070	20	12	32
WWPS071	24	9	33
WWPS072	22	5	27
WWPS073	27	9	36
WWPS074	22	9	31
WWPS075	24	6	30
WWPS076	32	38	70
WWPS077	20	16	36
WWPS078	21	5	26
WWPS080	21	16	37
WWPS081	8	18	26
WWPS082	26	9	35

WWPS Number	Inspection	Maintenance	Total Work Orders
WWPS083	16	7	23
WWPS084	35	6	41
WWPS114	31	14	45
WWPS118	27	3	30
Grand Total	**1,741**	**964**	**2,705**