CLACKAMAS
WATER ENVIRONMENT SERVICES

GREGORY L. GEIST | DIRECTOR

Water Quality Protection
Surface Water Management
Wastewater Collection & Treatment

December 1, 2023

Mr. Pablo Martos, Senior MS4 Permit Writer
Oregon Dept. of Environmental Quality, NW Region
700 NE Multnomah Street, Ste. 600
Portland, OR 97232

RE: **Clackamas Water Environment Services and the Cities of Happy Valley and Rivergrove NPDES MS4 Discharge Permit 2022-23 Annual Report and Permit Compliance Documents Due December 1, 2023**

Dear Mr. Martos,

Here is the 2022-23 Annual Report for WES and the Cities of Happy Valley and Rivergrove as required by our NPDES Municipal Separate Storm Sewer System Discharge Permit.

This the document of record. A hardcopy is forthcoming.

Also included, as appendices, are several permit compliance documents due December 1 of this year. They are:

- Appendix B: LID/GI Strategy and Post-Construction Site Runoff Control Program Description
- Appendix C: Updated Strategy of Industrial & Commercial Facilities Program
- Appendix D: Infrastructure Retrofit and Hydro-Modification Assessment Update

For your convenience, we have also forwarded an electronic copy to each basin coordinator.

There are a couple of items to note in our MS4 annual report:

- WES missed an annual dry-weather illicit discharge screen at a handful of priority outfalls in 2022-23. The screen did not get done by June 30, 2023. It was, however, conducted soon after we realized it had been missed.

  WES and our partners consistently inspect public and private storm systems for signs of prohibited discharges. For example, you will see in the annual report that we performed a high number of commercial/industrial site inspections this past year. We routinely inspect the publicly owned and operated storm systems in our service area and note any concerns. And we also respond promptly to all water quality complaints that are made to WES or referred by other agencies. For over 10 years WES has implemented once annually a dry-weather illicit discharge screen at a handful of priority outfalls in our system.

Two factors led to missing this screen this past regulatory year. One relates to how we got this work done during the pandemic years and confusion in our 'return to normal' on who internally was doing this work. The other factor was the transition to our new shared Stormwater Management Plan and our development of a new dry-weather screening program, which created confusion about whether or not we were executing the old strategy. During this next regulatory year WES will complete the development of our new dry-weather illicit discharge screen strategy and implement it before June 30, 2024.

- A new Enforcement Response Plan is under development. WES has several permit requirements to create Rule authority and enforce our rules for a variety of reasons, some of which include MS4 permit requirements. Another example is the industrial wastewater pretreatment requirement in our NPDES wastewater discharge permits. Last year, WES initiated a project to update our Enforcement Response Plan for our entire organization. The requirements of several minimum control measures in our MS4 permit to have enforcement procedures will be met with this plan update. This includes enforcement response for illicit discharges, construction runoff i.e. erosion control, post-construction requirements, and commercial/industrial site inspections. We expect to have the updated Enforcement Response Plan complete and implemented this spring, and will reference the plan in a future SWMP update and note it in a future MS4 annual report. In the meantime we continue to use our existing enforcement response steps embodied in our District Rules. As you can see in our annual report our enforcement program has been active this past year.

We look forward to your comments. Please call if you have any questions or need additional information at (503) 742-4581.

Sincerely,

Ron Wierenga
Deputy Director
Clackamas Water Environment Services

cc: Mr. Brian Creutzburg
Ms. Grace Goldrich-Middauch
Mr. Evan Haas
Ms. Andrea Matzke

CLACKAMAS
WATER
ENVIRONMENT
SERVICES

NPDES MS4 Discharge Permit
Annual Report
For
Clackamas Water Environment Services and the Cities of Happy Valley and Rivergrove

July 1, 2022 – June 30, 2023

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December 1, 2023

Clackamas Water Environment Services and the Cities of Happy Valley and Rivergrove

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) DISCHARGE PERMIT No. 101348

We, the undersigned, hereby submit this National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater System Annual Report in accordance with NPDES Permit Number 101348. We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Greg Geist (Nov 30, 2023 13:02 PST)

Gregory L. Geist, Director
Clackamas Water Environment Services

Nov 30, 2023
Date

Jason Tuck
Jason Tuck (Nov 30, 2023 10:58 PST)

Jason Tuck, City Manager
City of Happy Valley

Nov 30, 2023
Date

Analeis Weidlich
Analeis Weidlich (Nov 30, 2023 12:15 PST)

Analeis Weidlich
Interim City Manager / City Recorder
City of Rivergrove

Nov 30, 2023
Date

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Section 1 MS4 Permit requirements for annual reporting

This annual report provides a summary of MS4 Permit program implementation activities by Clackamas Water Environment Services (WES) and the Cities of Rivergrove and Happy Valley from July 1, 2022 to June 30, 2023. WES is a municipal partnership formed under ORS 190 by Clackamas County Service District No. 1 (CCSD#1), the Surface Water Management Agency of Clackamas County (SWMACC) and the Tri-City Service District governed by the Board of County Commissioners but a legally distinct entity from Clackamas County. WES administers MS4 activities within its service area as defined by the underlying boundaries of SWMACC and CCSD#1. On July 1, 2017, SWMACC transferred its assets and permit obligations to WES. CCSD#1 joined the municipal partnership on July 1, 2018. WES works closely within its service area with Clackamas County, which in 2022-2023, administered its own MS4 Stormwater Management Program and will submit a separate annual compliance report. There are references throughout this document to Clackamas County's Department of Transportation and Development (DTD) where program elements are jointly implemented, and reported separately.

The Compliance Evaluation required in the 2021-2026 MS4 Permit's Schedule B(2) was conducted and our progress was evaluated in implementing SWMP control measures in Schedule A, and additional requirements in Schedules B and D. This annual report is the product of this evaluation.

Table 1 (below) includes submittal requirements for the 2022-23 MS4 Permit annual report in accordance with Schedule B.3 and the location in this document with the applicable program implementation information and data.

Table 1: MS4 Permit Annual Report Requirement Locations in Document

Summary of Schedule B(3) Requirements for 2022-23	Section Where Annual Report Requirement is Met:
a. Status of implementing the stormwater management program and each control measure program element in Schedule A.3 including progress in meeting measurable goals and program tracking and assessment metrics identified in the SWMP as well as additional annual reporting requirements identified in each section, or, prior to DEQ's SWMP approval, measurable goals and tracking metrics approved under the previous permit's approved stormwater management plan.	Section 1.1
b. Summary of adaptive management implementation and changes or updates to programs made during the reporting year, including rationales for any proposed changes to the stormwater management program (e.g., new BMPs), and review new and historical monitoring data. Include discussion of the implications of or any findings related to recent years' adaptive management and/or changes made to the SWMP, based on data from tracking measures, measurable goals, and/or any monitoring relating to the change.	Section 1.2
c. Any proposed changes to SWMP program elements designed to reduce TMDL pollutants	Section 1.3

Summary of Schedule B(3) Requirements for 2022-23	Section Where Annual Report Requirement is Met:
d. Summary of education & outreach and public involvement activities, progress toward or achievement of measurable goals, and any relevant assessment of those activities. This should include planned adaptive management or other program enhancements to occur in the following years.	Section 1.4
e. Summary describing the number and nature of enforcement actions, inspections, and public education programs, including the results of ongoing field screening and follow-up activities related to illicit discharges.	Section 1.5
f. List of entities referred to DEQ for possible 1200-Z NPDES general permit coverage based on co-permittee screening activities, a list of categories of facilities inspected, and an overview of the results of inspections of commercial and industrial facilities.	Section 1.6
g. Summary of total stormwater program expenditures and funding sources over the reporting fiscal year, and those anticipated in the next fiscal year.	Section 1.7
h. Summary of monitoring program results, including monitoring data that are accumulated throughout the reporting year submitted in the DEQ-approved Submission Template, and any assessments or evaluations of that data completed by the co-permittees or an authorized third party.	Section 1.8
i. Any proposed modifications to the monitoring plan that are necessary to ensure that adequate data and information are collected to conduct stormwater program assessments.	Section 1.9
j. An overview, as it relates to MS4 discharges, of concept planning, land use changes and new development activities (including the number of new post-construction permit issues) that occurred in the Urban Growth Boundary (UGB) expansion areas during the reporting year, and those forecast for the following year, where such data is available.	Section 1.10
k. Details of all corrective actions implemented associated with Schedule A.1.b.iii (for instream WQ exceedances) during the reporting year.	Section 1.11
l. Compliance with annual reporting requirements found in the following sections:	Section 1.12
• Schedule A.3.c.vii – Illicit Discharge Detection and Elimination	1.12.a
• Schedule A.3.d.vii – Construction Site Runoff Control	1.12.b
• Schedule A.3.e.viii – Post-Construction Site Runoff Program	1.12.c
• Schedule A.3.f.v.c – Winter Maintenance	1.12.d
• Schedule A.3.h.i – Hydro-modification Assessment and Stormwater Retrofit Strategy Updates	1.12.e
• Schedule D.3.b – Mercury Minimization Assessment	1.12.f

1.1 Schedule B.3.a. -- Status of implementing the stormwater management program and each control measure program element in Schedule A.3 including progress in meeting measurable goals and program tracking and assessment metrics identified in the SWMP Document as well as additional annual reporting requirements identified in each section, or, prior to DEQ's SWMP Document approval, measurable goals and tracking metrics approved under the previous permit's approved stormwater management plans.

Implementing Existing 2012 SWMPs with New Permit until Shared SWMP Approved

Clackamas Water Environment Services (WES), under a partnership consisting of CCSD#1, SWMACC, the City of Happy Valley and the City of Rivergrove are submitting this annual report to comply with the current NPDES MS4 permit, which has been in effect since October 1, 2021.

On Feb. 6, 2023, DEQ approved the Shared MS4 Permit Stormwater Management Program Document (SWMP Document), which was originally submitted in 2017 and, in order to comply with Section A.3.a, was recently updated to comply with the 2021 MS4 Permit's new requirements and resubmitted to DEQ in November 2022.

WES, the City of Happy Valley and the City of Rivergrove continued to implement the two existing 2012 Stormwater Management Plans (SWMP) until June 30, 2023. Implementation of the 2022 SWMP Document began on July 1, 2023.

Appendix A of this annual report presents the data and information for this annual report. This appendix includes the tracking measures and measurable goal status from Best Management Practices (BMPs) in the 2012 SWMPs. Appendix B (LID/GI Strategy and Post-Construction Site Runoff Control Program Description), Appendix C (Updated Strategy of Industrial & Commercial Facilities Program), and Appendix D (Infrastructure Retrofit and Hydro-Modification Assessment Update) are permit requirements due December 1st.

1.2 Schedule B.3.b. -- Summary of adaptive management implementation and changes or updates to programs made during the reporting year, including rationales for any proposed changes to the stormwater management program (e.g., new BMPs), and review new and historical monitoring data. Include discussion of the implications of or any findings related to recent years' adaptive management and/or changes made to the SWMP Document, based on data from tracking measures, measurable goals, and/or any monitoring relating to the change.

Ten years ago, our October 2012 "Outline for Adaptive Management Approach" reviewed BMP implementation and analyzed environmental monitoring data, and that adaptive management approach guides how we implement the current 2012 SWMPs, including MS4 activity in 2022-23.

Five years later WES and its co-permittees submitted the Shared MS4 Permit SWMP Document with its MS4 Permit renewal application package in February 2017. During the 2022-2023 MS4 permit year, Clackamas County, WES, and the Cities of Rivergrove and Happy Valley

implemented their MS4 permit programs through three separate SWMPs which were approved by DEQ in 2012.

To improve coordination and overall program effectiveness, WES and its co-permittees, created a single, combined, Shared MS4 Permit SWMP Document (Shared SWMP). To integrate the three SWMPs into one Shared SWMP, WES led and adopted an extensive Adaptive Management-based process to ensure that it fully complies with the October 1, 2021 MS4 Permit

A substantial number of modifications were made to various BMPs (Best Management Practices) during the process of integrating the three existing SWMPs into the Shared SWMP. The Shared SWMP has many BMPs with new, improved measurable goals and tracking measures.

This process included a project kickoff meeting and many workshops and meetings to receive input and direction from attendees, which was subsequently used to determine the depth and breadth of the program described in the Shared SWMP. Attendees at the Workshops and meetings included numerous staff from WES, Clackamas County's DTD and Business and Community Services (BCS), the City of Happy Valley and the City of Rivergrove.

The 2022 Shared SWMP Document was approved by DEQ In Feb. 2023 and it was implemented on July 1, 2023.

1.3 Schedule B.3.c.–- Any proposed changes to SWMP program elements designed to reduce TMDL pollutants

At this time, we do not have any proposed changes to our SWMP program elements. As the three existing SWMPs were integrated into the DEQ-approved 2022 Shared SWMP Document, many BMPs were modified, and several of these proposed modifications are expected to reduce levels of TMDL pollutants which are discharged. Examples include:

- Portions of some proposed Construction Site Runoff BMPs are expected to reduce levels of these pollutants in stormwater: total phosphorus (Tualatin River only), settleable volatile solids (Load Allocation for Tualatin River's dissolved oxygen TMDL), mercury, and DDT and dieldrin (Johnson Creek only)
- Portions of some proposed Post-Construction Site Runoff BMPs and Operation & Maintenance BMPs are expected to reduce levels of these pollutants in stormwater: E. coli, total phosphorus (Tualatin River only), settleable volatile solids (Load Allocation for Tualatin River's dissolved oxygen TMDL), mercury, and DDT and dieldrin (Johnson Creek only). An example is when stormwater runoff is retained on-site by a structural infiltration-type Post-Construction BMP, all of these pollutants will be expected to be filtered from the stormwater as it infiltrates into the earth.

1.4 Schedule B.3.d. -- Summary of education & outreach and public involvement activities, progress toward or achievement of measurable goals, and any relevant assessment of those activities. This should include planned adaptive management or other program enhancements to occur in the following years.

See Appendix A for data and information about progress toward or achievement of measureable goals and tracking measures in 2022-23.

The 2022 Shared SWMP Document and the process undertaken as the Shared SWMP was created enabled WES and its co-permittees to:

- Assess the public education / involvement portion of our program
- Make improvements to our existing program which are now codified in the 2022 Shared SWMP Document.

Adaptive Management

WES' existing education and outreach program reaches and teaches residents about *Alternatives to Pesticide, Herbicides, and Fertilizers* and the *Reporting of Illicit Discharges and Spills and Other Types of Improper Disposal of Materials*. WES is striving to improve its reach in several ways.

First, **WES is taking what it learned from the pandemic to improve its education and outreach.** During the pandemic, which had limited in-person educational opportunities, WES increased its effective use of social media and other digital means such as Zoom to provide a wide variety of educational messages for students, customers and other stakeholders. WES took advantage of the 27,000 followers Clackamas County has on its Facebook page, nearly 18,000 followers on its Twitter account, approximately 130,000 members on NextDoor, and more than 6,000 subscribers to WES updates via Constant Contact. With its *Clean Water Exchange* initiative, WES also gathered insightful information via surveys of customers and other stakeholders to learn about their preferred channels for receiving educational information from WES. Our 2023 Clean Water Exchange Survey, which sought this and other types of information to strengthen our understanding of what customers and stakeholders value the most.

Secondly, **WES employed a more precise measuring tool to gauge the effectiveness of its educational messages and articles on social media** and, therefore, on WES' Public Education management strategies. The difference from years past is that WES can now report well beyond the name of the article and the size of the net cast on Facebook, NextDoor, and Twitter. Articles addressing certain BMPs (*Alternatives to Pesticide, Herbicides, and Fertilizers* and the *Reporting of Illicit Discharges and Spills and Other Types of Improper Disposal of Materials*), can be measured against three ascending levels of impact when collaborating with the public to protect our rivers and streams. They include:

- Impressions – The number of times public education content is displayed
- Reach – The total number of readers who see WES' social media content
- Engagement – This last level of content impact is new and offers insight to the highest form of reader interaction and involvement where the reader engages with the article by "liking" it, "sharing" it with others, or commenting on the content.

Engagement told us how effective WES has been in reaching its target audiences and garnering support. It has also revealed what adjustments to the delivery of messages and method used to ensure maximum community engagement and support with the goal of keeping our rivers clean now and well into the future.

Finally, **WES will begin employing its 2022-2025 Communication and Engagement Roadmap, which is being finalized, to guide its education and community engagement over the next two years.** By leveraging a variety of communication tools and outreach platforms to reach multigenerational and underserved district audiences, the roadmap will help us find deeper and more creative ways to connect our customers, stakeholders and service area communities to our work and how we invest our resources.

The Roadmap will use four strategic initiatives to guide the process:

1. Develop additional educational materials that are visually-engaging, easy-to-understand, and accessible for diverse audiences.
2. Establish innovative partnerships that leverage the strength of the community to achieve shared goals and deliver common messages.
3. Be responsible environmental and fiscal stewards by investing in innovative initiatives that communicate safe, reliable, and affordable services.
4. Invest in community-driven solutions and cultivate a generation of diverse watershed leaders.

In addition, through carefully constructed actions and clear objectives, the Roadmap is intended to paint a picture for a more connected and inclusive future with the many diverse stakeholders, communities and people WES serves. That will ensure that WES moves its needle closer to a clean water future where everyone benefits and rivers thrive.

1.5 Schedule B.3.e. -- Summary describing the number and nature of enforcement actions, inspections, and public education programs, including the results of ongoing field screening and follow-up activities related to illicit discharges.

In Appendix A, see BMP #12 for more information about our IDDE Public Education work and BMP #1 for more information about our IDDE program's "ongoing field screening" work.

Table 2: Illicit Discharge Events

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken? (Yes or No)
Discharges			
7/14/22	7/14/22	Happy Valley Building department contacted WES with concerns about a cross connection when they smelled sewage in a catch basin near a newly constructed home at SE Mountain Gate Road.	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken? (Yes or No)
		Homeowner was instructed to not use any water. WES investigated and confirmed that the new sewer lateral was mistakenly connected to the storm system. The storm system including a nearby pond was cleaned and the City's plumbing department facilitated the repair with the home builder. WES did not take any enforcement action aside from requiring the builder to correct the piping; unknown what enforcement action, if any, the City took.	
8/5/22	8/5/22	A mixing truck tracked concrete and dirt from the mobile mix company's yard onto SE Fuller Road. WES staff issued written notice; responsible party cleaned street surface.	Yes
8/31/22	8/31/22	Clackamas Fire notified WES of a wood chip fire near SE Jennifer Street and Clackamas River. WES found a minimal amount of fire suppression in the catch basin. A boom was placed around the catch basin to protect it.	No
9/22/22	9/23/22	A citizen reported oil spotting from garbage truck onto Lynda May Drive. No drains threatened, non-recoverable amount of oil stains on a private road. OERS 2022-2206	No
10/12/22	10/12/22	A local freight company reported a leak of an unknown size and substance coming from freight. Dry material released from bags inside truck trailer, no release outside of trailer. Responsible party cleaned up the substance. OERS 2022-2354	No
10/14/22	10/14/22	Citizen reported leaking automobile fluids coming from a garbage truck in Happy Valley. WES relayed report to the City and learned that the City was already working with the responsible party. OERS 2022-2374	No
11/7/22	11/7/22	Citizen reported that an oily sheen had reached a storm drain. The source came from a hidden oil tank located on a permitted Happy Valley demo site. WES followed up with the City Building Official, who visited the site with another City inspector and confirmed the oily sheen. The City instructed the owner to find source and contain fuel from leaving property. Contractor applied booms & absorbents, and removed oil tank. OERS 2022-2534	No
12/18/22	12/19/22	Red dye spilled on surface of SE Jennifer Street affecting multiple WES assets and covering many miles of ODOT roadway. WES and DTD crews cleaned up dye from County road surfaces. WES watershed protection staff checked Cow Creek on the next few	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken? (Yes or No)
		days for dye impact; found no trace of dye in Cow Creek or Phillips Creek. OERS 2022-2867	
2/6/23	2/8/23	WES received a video from citizen showing a restaurant employee washing hood parts outside at the Clackamas Square shopping center and wash water entering private storm drain. Issued written Notice of Non-compliance to manager of restaurant to stop outside washing & clean up.	Yes
3/15/23	3/15/23	Anonymous report of swimming pool being drained to storm drain at SE Wilshire Street. Informed homeowner that pool water is not to be discharged into the public storm system. Just an oral warning as there was no discharge observed during visit and owner denied discharging pool water.	Yes
3/28/23	3/28/23	Caller reported seeing an oil sheen on Kellogg Creek for a couple days near SE Aldercrest Court. WES staff investigate and found an engine block on the adjacent grass with a small oil stain next to it and that oil had leaked into the storm drain. WES staff placed booms and hired US Ecology to perform cleanup of the gravel area and the storm drain the same day of the spill. Sent Notice of Violation to owner and oil spill awareness letters to 5 other neighbors. OERS 2023-0803	Yes
4/19/23	4/19/23	Utility reported that 2 to 5 gallons of transformer oil had spilled from its transformer onto SE Capps Road and had entered storm system. WES met with the utility's Environmental Specialist onsite to coordinate cleanup of WES assets. Utility crews cleaned street surface, catch basins, water quality manhole located at end of Capps Rd. OERS 2023-1000	No
6/7/23	6/7/23	WES received a report that a company on SE Capps Road was dumping an unknown amount of hydraulic fluid and other chemicals into the Clackamas River. Caller was concerned that the caller's former employer was covering up the dumping and that the dumping had been occurring for over a year. WES inspected the site looking for alleged dumping of oils and other chemicals to the Clackamas river via storm system and found no clear evidence of alleged activity at site. WES also found that new and used oils and paints and manifests for disposal by outside vendors were accounted for via containers inside the company's building. OERS 2023-1405	No
6/9/23	6/9/23	WES staff responded to an OERS notification that approximately 50 to 100 gallons of diesel had been released onto the property of a freight distribution	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken? (Yes or No)
		hub located on SE Highway 212 during refueling of its trailers. WES visited the site and learned that the company's adopted refueling procedure required that a nearby catch basin be covered prior to the fuel release. While onsite, WES staff coordinated with the company on where the catch basin was to be covered. During the refueling, other covers, mud flaps, booms, etc. were added in response to amount released while a spill release company sucked up the spill. WES confirmed that both the MS4 storm system and the privately owned CDS stormwater treatment unit located onsite were free of fuel and that the spilt fuel did not affect the public storm system. OERS 2023-1431	
Sanitary Sewer Overflows			
8/12/22	8/12/22	Early Friday morning, a caller observed a sewer spill when walking along the Mt Scott Creek near SE 97th Avenue in Clackamas entering the wastewater system. WES crew members were immediately dispatched to the location and determined that structural damage had caused the spill. The creek had eroded the south bank of Mt. Scott Creek exposing a section of the concrete sewer main which had separated and was allowing wastewater to flow out of the pipe, as well as allowing creek water to enter the wastewater system. After notifying OERS, work began to stop the spill from a pipe-system that was difficult to access. Crews worked through the night and eventually stopped the SSO the following day at 6am. With the SSO contained Saturday morning WES staff inspected downstream locations of the creek for evidence of solids and posted warning signs at five locations up to 2.5 miles downstream. That afternoon, the Clackamas County Public Information Officer issued a press release and used social media to notify adjacent neighborhoods. Downstream jurisdictions were also notified. On Monday, August 15th, WES crews removed the damage sections of concrete pipe and secured a new section of PVC pipe in its place. A pipe-lining contractor lined the pipe adding structural integrity. In addition, WES engaged an environmental spill response company to remove wastewater solids from the creek for about 500 feet downstream of the SSO. WES engineering staff also engaged a consultant to	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken? (Yes or No)
		begin reviewing long-term options to improve this sanitary system, which may include a new stream crossing or an alternative route for the system. OERS 2022-1868	
9/28/22	9/28/22	Caller requested that WES investigate sewage odor whose stench had been persistent for one month near her home at SE Bluff Drive without the odor diminishing. WES responded to the complaint and confirmed the strong smell and the presence of sewage. Crew members investigated and found sewage spilling out of a water quality manhole. Operations supervisor reported the SSO and WES staff cleaned the lines to stop the spillage and then cleaned and inspected other sewer lines in the sewer easement. Liquid from the overflowing manhole was soaking into the ground in a remote section of easement. Solids were removed from the area and lime was used to disinfect the area. Crew members determined that grease, the primary source, had backed up the main line. CCTV inspections showed grease and light root build-up both up and downstream of blockage. The 2,000 foot sewer easement was placed on yearly inspection schedule. No waterways were affected and quantity of overflow was unknown. OERS 2022-2245	No
10/17/22	10/17/22	Owner of a commercial building located on SE 82nd Avenue reported sewage overflowing from out a manhole onto the parking lot. Field crews responded and began inspecting downstream structures to find the location of the blockage. Once located the crew began hydro-cleaning to reinstate flow. With the first pass in the sewer main the blockage was removed and the surcharged system upstream was released. Crews also began cleaning the catch basins that the sewer system was overflowing into as well as the section of parking lot that had come in contact with the sewage. Another crew performed a CCTV inspection of the main to determine the cause, which was grease buildup and root intrusion, and verify that the blockage had been removed. More cleaning was done to this sewer main as well as several sections of pipe upstream to remove all roots and grease buildup. To follow-up WES then met with several restaurants upstream of the blockage to help	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken? (Yes or No)
		minimize grease discharged to the system. OERS 2022-2390	
11/25/22	11/25/22	Crews received a call from a business located on SE 120th Avenue after they noticed wastewater exiting cleanouts in their parking lot. Personnel were able to troubleshoot the problem to the nearby Clackamas - Capps Road Pump Station. The spill was reported to OERS. The station was turned on manually to stop the SSO, then repairs were made to a relay, which controls the bubbler system and in turn controls when the pumps come on and shut off. The spill was contained to a private stormwater system and industrial parking lot. This storm system and industrial parking lot were cleaned and inspected. More detailed inspections were conducted twice weekly to verify that the repairs had fixed any issues at this station. OERS 2022-2660	No
5/15/23	5/15/23	WES investigated a caller's report that a manhole located in front of the caller's business at SE Carpenter Drive was overflowing with raw sewage and found sewage spilling from a private structure on private property. Less than 1 gallon per minute was observed exiting the manhole. WES dispatched a crew to inspect and clean the sewer mainline immediately. After a cleaning pass in the sewer mainline, the blockage was cleared and the spill stopped and crew found a large amount of rags when flow was reinstated. The sewer mainline was CCTV inspected afterward to verify that defects had not caused the mainline back-up. The ground around the structure was disinfected with lime. The ground around the structure was only slightly wet and no pooling of water was observed. The business owner was informed that the cause of this spill was a large number of rags that collected at the lateral connection to the sewer mainline and advised that they be cautious of what they put down the drain. This sewer mainline was added to a yearly maintenance schedule for cleaning. OERS 2023-1211	No

1.6 Schedule B.3.f -- A List of entities referred to DEQ for possible 1200-Z NPDES general permit coverage based on co-permittee screening activities, a list of categories of facilities inspected, and an overview of the results of inspections of commercial and industrial facilities.

Screening for 1200Z permits applicability

WES, operating under the two DEQ-approved SWMPs from the previous MS4 permit (2012-2017), screened industrial facilities for the possibility to be subject to a 1200Z Industrial Stormwater permit during the previous permit term. As of July 1, 2023, WES is screening industrial facilities for the 1200-Z permit on an annual basis.

Categories Inspected

Categories of industrial/commercial facilities that WES inspected during the 2022-23 reporting year included: Shopping Centers, Business Parks, Manufacturers, Car Washes, Freight Hubs, Medical Offices, Restaurants, Auto Service facilities, General Commercial/Retail, and Recyclers.

Overview of Inspection Results

During the 2022-23 reporting year, WES performed 52 inspections of Industrial and Commercial facilities. Of the 52, 37 were found to be in compliance with WES rules regarding stormwater discharges and maintenance of their private stormwater system and required no further interaction. The facilities that were found not in compliance with WES' rules were issued written Notices of Noncompliance and a timeline for completing corrections. Notices could be issued for as little as simple maintenance of catch basins or as significant as restoration of a stormwater management pond. Correction periods ranged from 60 days to up to 24 months to complete required remedies to bring the facility back into compliance. Please see BMPs #4 and #5 in Appendix A of this annual report for more information.

1.7 Schedule B.3.g -- Summary of total stormwater program expenditures and funding sources over the reporting fiscal year, and those anticipated in the next fiscal year.

WES and the City of Happy Valley dedicated sufficient resources to implement the Stormwater Management Program in 2022-23. WES dedicated over 20,690 employee hours or the equivalent of 11.6 full-time employees (FTEs) to the MS4 Permit program, to our Underground Injection Control WPCF Permit program, to our Willamette/Tualatin TMDL non-point source pollution programs, and to our flooding reduction/drainage improvement programs – all of which make up WES' Surface Water Program.

The City of Happy Valley has four and a half FTEs in the Public Works Department who, in part, perform MS4 duties and two FTEs in the Engineering Division. In addition, WES is the service provider in the City of Rivergrove and, as a result, the City dedicates a sufficient but limited amount of staff time to implement the MS4 SWMP; therefore, Rivergrove's expenditures are not worth tracking or reporting in this section.

WES' Operating and Construction Fund and Stormwater System Development Charge Fund resources, including Fund Balances, budgeted in the recent past, during the reporting period and in the current fiscal year, are in Table 3.

Table 2: Stormwater Resources and Requirements for WES

WES	2020-21 Actual	2021-22 Actual	2022-23 Amended Budget	2022-23 Estimate[1]	2023-24 Adopted
Resources	**23,202,305**	**23,496,833**	**25,333,824**	**25,314,625**	**27,327,841**
Materials & Services	4,436,257	4,694,975	5,794,380	4,535,965	5,908,081
Capital Outlay	720,126	755,936	1,370,000	1,361,119	2,333,400
Transfers	3,000,000	3,000,000	2,132,500	2,132,500	2,000,000
Contingency			833,500		2,151,700
Ending Fund Balance	15,045,922	15,861,175	15,203,444	17,285,041	14,934,660
Total Requirements	**23,202,305**	**24,312,086**	**25,333,824**	**25,314,625**	**27,327,841**

[1] "Estimated" year-end expenditures are not shown as "Actual" until the fiscal year closes.

Annual funding for the Stormwater Management Program for WES in FY 2022-2023 came from four sources (unaudited numbers):

Monthly Stormwater Utility Fees	$ 5,643,476
Maintenance Fees, paid Monthly	$ 390,111
Systems Development Charges (SDCs)	$ 72,658
Stormwater and Erosion Control Permit Fees	$ 245,576

In 2022-23, customers in the North Clackamas unit of Rate Zone 2 (CCSD#1) paid a monthly program fee of $8.15 per Equivalent Service Unit (ESU) and customers in Rate Zone 3 (SWMACC) paid a monthly fee of $4.95 per ESU. An ESU is a single-family residence or 2,500 square feet of impervious surface for nonresidential customers. Fees were increased to $8.65 per ESU in Rate Zone 2 and $5.20 per ESU in Rate Zone 3, respectively, soon after this reporting period ended on June 30, 2023.

Most newly constructed single-family residential properties in Rate Zone 2, since 1998, also paid a monthly maintenance agreement fee of $3.00 per ESU which is dedicated for maintenance of local subdivision stormwater conveyance, detention and retention, treatment, and infiltration facilities.

Only a small portion of Rate Zone 3 revenues come from the MS4-permitted area. Rate Zone 3 also includes:

1. A large, rural unincorporated area in the Tualatin River watershed

2. An area near the City of Rivergrove which is served by stormwater injection devices (i.e., drywells), which are regulated by a DEQ-issued Stormwater UIC WPCF permit.

WES collects System Development Charges from new development and dedicates those revenues to planning, design, and construction of additional stormwater infrastructure capacity needed to accommodate growth. The current SDC rate is $233 per Equivalent Dwelling Unit and that rate increased to $240 soon after this reporting period ended on June 30, 2023.

City of Happy Valley

MS4 Permit Program Funding Sources:

- **Permit fees for development** of land (plan review and inspection) are based upon the construction value of the project. In 2022-23, the City generated $3,617 in fees from 4 land development permits. Only a portion of these $3,617 was spent on the implementation of the MS4 Permit Program.
- Six Engineering **Erosion Control Permits** yielded $9,100 in revenue in 2022-23. The City expects to receive a range from $15,000 to $20,000 in Erosion Control Permit revenue in 2023-24. The $9,100 of MS4 permit program revenue is in addition to the land development permit fees of $3,617.
- The Building Division collected $86,800 in Erosion Control Permit fees to cover the cost of their erosion control inspections for 217 building permits.
- $114,720 from the **Streets Maintenance** portion of the budget for street sweeping. Street sweeping is also conducted to improve road safety and for aesthetic reasons. An undefined portion of the $114,720 was spent to improve stormwater quality.
- Approximately $6,070 from the City of Happy Valley's **General Operating Budget** was spent by the City of Happy Valley during 2022-23 to administer the overall MS4 Permit Program (e.g., attendance at monthly Watershed Protection Program meetings, compiling data for this annual report). The City of Happy Valley expects to dedicate a similar amount of money from this portion of this budget during 2023-24 for administration of the overall MS4 Permit Program.

MS4 Permit Program Expenditures:

- **Street Sweeping Program:** The City of Happy Valley spent $114,720 on their street sweeping program in 2022-23. The City expects to spend a similar amount of money on street sweeping in 2023-24.
- **Erosion Control Program**: The City of Happy Valley funds this Program with Erosion Control Permit fee revenue. The City spent approximately $95,900 to administer this program in 2022-23 and the City expects to spend a similar amount in 2023-24.
- **MS4 Permit Program Administration:** The City of Happy Valley spent approximately $6,070 in 2022-23 to administer the overall MS4 Permit Program (e.g., attendance at monthly Watershed Protection Program meetings and compiling data for this annual report). The City of Happy Valley expects to spend a similar amount of money during 2023-24 for administration of the overall MS4 Permit Program.

1.8 Schedule B.3.h. -- Summary of monitoring program results, including monitoring data that are accumulated throughout the reporting year submitted in the DEQ-approved Submission Template, and any assessments or evaluations of that data completed by the co-permittees or an authorized third party.

Our MS4 Permit program's 2022-2023 creek water quality and stormwater quality data was submitted to DEQ in November 2023 by email and via this website: https://www.oregon.gov/deq/wq/wqpermits/Pages/MS4submission.aspx#formMessage

As a result, to conserve space, this large amount of data is not included in this report.

1.9 Schedule B.3.i. -- Any proposed modifications to the monitoring plan that are necessary to ensure that adequate data and information are collected to conduct stormwater program assessments

No additional modifications are proposed in this annual report. WES, on behalf of Clackamas County, and the Cities of Rivergrove and Happy Valley, implements a combined DEQ-approved Comprehensive Clackamas County NPDES MS4 Stormwater Monitoring Plan (Monitoring Plan). Other co-implementers of this Monitoring Plan include, but are not limited to, the Cities of Milwaukie and Oregon City. This Monitoring Plan was revised most recently in May 2023 and was implemented on July 1, 2023. The Monitoring Plan was revised in order to comply with numerous new requirements in the 2021-2026 MS4 Permit, which was modified by DEQ in May 2023 to include new pesticide monitoring requirements in stormwater runoff.

1.10 Schedule B.3.j. -- An overview, as it relates to MS4 discharges, of concept planning, land use changes and new development activities (including the number of new post-construction permits issued) that occurred in the Urban Growth Boundary (UGB) expansion areas during the reporting year, and those forecast for the following year, where such data is available.

<u>Land Use Changes</u>

- Number of zone changes approved in Happy Valley: 2
- Number of new residential building lots approved by partition, subdivision, and planned unit development in Happy Valley: 5
- Number of Approved Zone Changes in Clackamas County[1]: 2

[1] These land use statistics capture the entire unincorporated area of Clackamas County regulated by the MS4 permit, which is primarily comprised of lands in the Oak Lodge Water Services district and in the WES service area.

- Number of New Land Partitions[2]: 1
- Number of New Land Subdivisions[3]: 10

UGB Expansion

- The UGB was not expanded in or near the Cities of Happy Valley or Rivergrove, or any other portion of WES' MS4-permitted service area.

Land Annexations

- Acreage annexed into WES' SWM service area: 51.5
- Acreage de-annexed from WES' SWM service area: None
- Acreage annexed into the City of Happy Valley: None

The Number of New Post-Construction Permits Issued and related information

- Number of development permits reviewed by Clackamas County[4]: 43
- Number of building division permits in Happy Valley: 217
- Number of engineering division development permits in Happy Valley: 4
- Total number of plans reviewed and approved by WES: 50
- Number of building division site plan reviews in Happy Valley: 217
- Number of engineering division site plan reviews in Happy Valley: 23
- Number of new units of multi-family housing approved in Happy Valley: 0
- Square feet of new commercial/office development approved in Happy Valley: 3,584

Estimated total new and replaced impervious surface area related to development projects

- 21.3 acres

When the lands described here were developed, post-construction stormwater management program requirements implemented by the City of Happy Valley, Clackamas County, and/or WES reduced storm sewer system pollution levels to the maximum extent practicable. For more information, see the post-construction program-related sections of this annual report.

City of Happy Valley

As discussed above, no UGB expansion occurred in the City of Happy Valley in 2022-23 and the UGB is not expected to be expanded in 2023-24. There were no acres annexed into the City of Happy Valley in 2022-23. With respect to annexations anticipated for 2023-24, the City has adopted the Pleasant Valley North Carver Comprehensive Plan, which is approximately 2,700-acre plan area. When these lands are eventually urbanized, regulations are expected to be

[2] Ibid.

[3] Ibid.

[4] ibid

applied by the City of Happy Valley and WES (formerly CCSD#1) as properties are developed (to construct stormwater treatment systems, for example) which will reduce pollution levels to the maximum extent practicable.

Clackamas County

No UGB expansion occurred in 2022-23 in or near the WES-Rivergrove-Happy Valley MS4 Permit area, nor is it expected to occur in 2023-24.

1.11 Schedule B.3.k. -- Details of all corrective actions implemented associated with Schedule A.1.b.iii (for Water Quality Standards) during the reporting year.

No corrective actions were implemented in 2022-23.

1.12 Schedule B.3.l. -- Compliance with annual reporting requirements found in the following sections:

- Schedule A.3.c.vii – IDDE
- Schedule A.3.d.vii – Construction Site Runoff Control
- Schedule A.3.e.viii – Post-Construction Site Runoff Program
- Schedule A.3.f.v.c – Winter Maintenance
- Schedule A.3.h.i – Hydro-modification Assessment and Stormwater Retrofit Strategy Updates
- Schedule D.3.b – Mercury Minimization Assessment

WES and its co-permittees are required to summarize metrics to track and assess their progress with the Stormwater Management Program Control Measures. These other requirements are found in Table 4 and include the following:

Table 3: Other Compliance Requirements

Citation	Description	2022-23 Update
A.3.c.vii – IDDE	Tracking and Assessment: Track implementation of IDDE program requirements. In each corresponding Annual Report, co-permittees must summarize or report on metrics or tracking measures related to implementation of the program. The report should include updates regarding any capital improvements needed or implemented associated with the IDDE program.	See Appendix A for more data and information about the implementation of these BMPs.

Citation	Description	2022-23 Update
A.3.d.vii – Construction Site Runoff Control	Tracking and Assessment: Routinely or continuously track all construction sites that result in a total land disturbance of equal to or greater than 1,000 square feet. The inventory must include relevant contact information for each project (name, address, phone, etcetera), the size of the project including area and/or volume of disturbance, the date the co-permittees approved the ESCP in accordance with Schedule A.4.d.iii or in accordance with coverage under the 1200-CN permit as applicable, and whether any complaints have been received or inspections made. Co-permittees must also track implementation of all activities required by the Construction Site Runoff program. In each corresponding annual report, co-permittees must summarize metrics or tracking measures related to implementation of the program, which may include but is not limited to number of regulated construction projects, number of inspections, and number of enforcement actions.	WES tracks this information in its database software. For additional information, see BMPs in Appendix A, including BMP #9.
A.3.e.viii – Post-Construction Site Runoff Program	Tracking and Assessment: Co-permittees must maintain records for activities conducted to meet the requirements of the Post-Construction Site Runoff program, and include a summary of their activities and report on metrics or tracking measures related to implementation of the program in the corresponding annual report.	WES already complies with this requirement. See Appendix A for more detail on the Post Construction BMPs which were implemented
A.3.f.v.c – Winter Maintenance	Tracking and Reporting: Winter Maintenance activities for streets and roads must be included as an element of the annual report beginning in the annual report due December 1, 2022 or no later than	During winter/ice events, the City of Happy Valley uses Magnesium Chloride for de-icing and applies sand to temporary increase traction on icy roads and surfaces. Within 10 days, the City removes the sand that remains.

Citation	Description	2022-23 Update
	upon DEQ's approval of the 2017 SWMP. Each year, the information needs to include but not limited to the following: a list of materials used, the number of winter weather events where maintenance materials are used, quantities and general location of each material used in relation to distance (for example, pounds per mile), and any other actions taken to protect waters of the state for areas that data is available or becomes available during the permit term.	In 2022-23, the City applied 17,500 gallons of Magnesium Chloride (at a rate of 25 gallons per lane mile) and applied 177 yards of sand (at a rate of 1.5 yards per lane mile) as a result of five snow/ice events. Following the end of the snow-/ice events, the City picked up 136.3 yards of sand within the required 10 days after the snow/ice events. See Appendix A's BMP #20 (HV-CCSD#1 SWMP) for more data and information. Learn more about Clackamas County's Winter Maintenance work in DTD's 2022-23 MS4 Annual Report.
A.3.h.i – Hydro-modification Assessment and Stormwater Retrofit Strategy Updates	Co-Permittee are required to include in the third annual report (due Dec. 1, 2023) of this permit term, an assessment of any outcomes related to the Hydro-modification Assessment and Stormwater Retrofit Strategy reports.	See Appendix D of this report
Schedule D.3.b – Mercury Minimization Assessment	The following requirement is found in the 2021-2026 MS4 Permit's Schedule D(3)(b): Develop and submit a mercury minimization assessment with the annual report due December 1, 2022, that documents the current actions, such as BMPs implemented, that reduce the amount of solids discharged into and from the permitted MS4 system (similar to the actions currently required in Schedule A). If the assessment indicates that mercury and sediment reducing BMPs are fully incorporated into the SWMP Document, a report documenting the results as such is sufficient.	During the 2022-2023 permit year, Clackamas County, Clackamas WES, and the Cities of Rivergrove and Happy Valley continued to implement three separate MS4 Permit Stormwater Management Plans (SWMPs) which were approved by DEQ in 2012. Each of these three SWMPs contain numerous effective BMPs which reduce the amount of solids and mercury which are discharged into and from the permitted MS4 system. The Construction Site Runoff Control BMPs (ie. Erosion and Sediment Control) are just one of many examples. The original Willamette River watershed mercury TMDL was issued as an order by DEQ in 2006. These three SWMPs were created to comply with the MS4 Permit which was renewed in 2012. In summary, these SWMPs were intentionally designed to reduce the amount of mercury which was discharged. Please see these three

Citation	Description	2022-23 Update
		SWMPs for additional information about these BMPs. The revised Willamette River watershed mercury TMDL became effective in Feb. 2021. Updated sub-basin-specific Waste Load Allocations for mercury in MS4-permitted discharges are included in the revised TMDL. For example, in the WLAs for the Clackamas River and Tualatin River sub-basins, discharges of mercury are expected to be reduced by 75% over time relative to the baseline time period. The 2022 Shared MS4 Permit Stormwater Management Program Document (SWMP Document) was created to comply with the MS4 Permit that was renewed in October 2021. The SWMP Document is co-owned/implemented by Clackamas County, Clackamas WES, and the Cities of Rivergrove and Happy Valley. The SWMP Document, which has been fully implemented since July 1, 2023, contains many BMPs which reduce the amount of solids and mercury which are discharged into and from the permitted MS4 system, and which reduce the amount of mercury which is discharged by the MS4. The Construction Site Runoff Control BMPs (i.e., Erosion and Sediment Control) are one of many examples. In summary, the SWMP Document was intentionally designed to reduce the amount of mercury which will be discharged into and from the MS4. Please see the SWMP Document for additional information about these BMPs. This mercury minimization assessment's conclusion is that effective mercury and sediment reducing BMPs have been fully incorporated into the SWMP Document.

Appendix A: Best Management Practices

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2022-23 Best Management Practices

Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
1	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of outfalls inspected during dry-weather	Not Attained	During the 2022-2023 year, the team who is responsible for conducting these inspections did not conduct them. Controls have been put in place to ensure that this does not happen again. And the dry weather inspections for the 2023-2024 year have already been completed.
2	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number and type of illicit discharges that were encountered and controlled	None	None
3	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Status of updating procedures to address new permit requirements	Attained	Schedule A(3)(c)(v) of the current MS4 Permit – which was renewed on October 1, 2021, and then modified on May 5, 2023 – includes a requirement to "…review and update the prioritization criteria for dry weather screening locations…" which are used by our Illicit Discharge Detection & Elimination (IDDE) monitoring program prior to Dec. 1, 2023. These dry weather screening locations are also known as Priority Locations. This required review and update was conducted and the following new BMP Measurable Goal will be implemented beginning on July 1, 2024: All of our known MS4-Permitted storm sewer systems in the WES SWM service area will be monitored once during a 10 year period. A BMP Tracking Measure for this measurable goal will provide the number of these Priority Locations which were monitored during each MS4 Permit year. Although many illicit discharges have been found during dry-weather monitoring at our Priority Locations since 1999, it has been several years since any illicit discharges have been found at any of the existing designated Priority Locations (43 priority locations in 2023-2024). By setting a new MG to monitor all of our known MS4s once over a 10 year period, no consideration of any relevant factors (such as drainage area, population density, land use, or age of the buildings in the drainage area) needs to be conducted to justify why some MS4s were monitored and not others, because all MS4s will be monitored if this MG is attained. Through implementing this new monitoring approach, WES expects our field personnel to find more illicit discharges per year during this 10 year period than they've found in recent years by visiting the same 43 Priority Locations year after year. In January 2023, WES generated an updated storm sewer system inventory which indicates that Clackamas WES, Clackamas County and the Cities of Rivergrove and Happy Valley combined own and/or operate 654 MS4-Permitted storm sewer systems in the WES SWM service area. Because Priority Locations in 43 of these storm sewer systems were inspected during the July 1, 2023 to June 30, 2024 year (year 1), inspecting the remaining 611 MS4s over the next 9 years would require monitoring about 68 MS4s per year in order to attain the MG of inspecting all of them once during a 10 year period.

2022-23 Best Management Practices

Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
												We began implementing the 2022 Shared Stormwater Management Program Document on July 1, 2023. BMP IDDE-4 in the SWMP Document accurately describes the dry-weather Priority Location monitoring that was done in Summer 2023. We intend to revise BMP IDDE-4 prior to July 1, 2024 to reflect this new Priority Location monitoring approach.
4	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Inspect major or priority outfalls for the presence of illicit discharges at least once per year	Not Attained	See response in Row No. 1.
5	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Update maps of major outfalls on an annual basis	Attained	This map of outfalls was updated during the 2022-2023 permit year
6	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Update dry weather field screening program to address new permit requirements by November 1, 2012	Attained	
7	**Component #1: Illicit Discharge Detection and Elimination**	**Implement the Spill Response Program**	**2**	**2**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of reported spills to the MS4 system	14	There were 14 illicit discharges reported that WES staff investigated. Of those 14, six were spills. Of those six, four entered the MS4 system. See Section 1.5 for additional information.
8	**Component #1: Illicit Discharge Detection and Elimination**	**Implement the Spill Response Program**	**2**	**2**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number and type of response to the reported spills	6	WES investigated six spills that occurred in the MS4 service area. The spills consisted of liquid waste (various oil & diesel fuel spills, wash water and dye). All were controlled by either WES staff or the responsible party. For more information on the type of response to the reported spills, see Table 1. Illicit Discharge Events. See Section 1.5 for additional information.
9	**Component #1: Illicit Discharge Detection and Elimination**	**Implement the Spill Response Program**	**2**	**2**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Implement the spill response program and associated protocols.	Attained	WES has developed and maintains an appropriate spill response program. The spill response standard operating procedure has been reviewed for improvements and WES staff has been trained on its use.
10	**Component #1: Illicit Discharge Detection and Elimination**	**Respond to reports involving illicit discharges**	**3**	**3**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of alleged illicit discharges and non-stormwater (i.e., fire suppression flows and dechlorinated flows from swimming pools) discharges which were reported each year	2 non-stormwater discharges For illicit discharges, see previous rows in this table.	One authorized non-stormwater discharge (excess fire-suppression flow) discharge is inferred to have occurred from a reported wood chip fire that took place in August. The second was from an anonymous caller who said witnessed a swimming pool being drained to storm drain at SE Wilshire Street See enforcement details in Table 4, Section 1.5.

2022-23 Best Management Practices

Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
												Informed homeowner that pool water is not to be discharged into the public storm system. Just an oral warning as there was no discharge observed during visit and owner denied discharging pool water.
11	**Component #1: Illicit Discharge Detection and Elimination**	**Respond to reports involving illicit discharges**	**3**	**3**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of illicit discharges that were controlled	14	All of the 14 reported illicit discharges were confirmed and located in the MS4 permitted area and all were controlled by either WES staff or the responsible party. See Section 1.5 for additional information.
12	**Component #1: Illicit Discharge Detection and Elimination**	**Respond to reports involving illicit discharges**	**3**	**3**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Respond to reports involving alleged illicit discharges within two weeks.	Attained	All illicit discharges were responded to within two weeks of receiving the report.
13	**Component #2: Industrial and Commercial Facilities**	**Screen Existing and New Industrial Facilities**	**4**	**4**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track the number of existing or new industrial facilities subject to a stormwater industrial NPDES permit during the permit term.	24 1200-Z permits	Nineteen facilities have a 1200-Z permit within our MS4 Permit area in zip code 97015 and 5 have 1200-Z permits in zip code 97206. Note: some of these facilities discharge to our MS4, and some do not.
14	**Component #2: Industrial and Commercial Facilities**	**Screen Existing and New Industrial Facilities**	**4**	**4**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Review new industrial development applications once during the permit term to identify additional facilities needing to obtain 1200-Z permits.	Attained	This review of building permit applications for new industrial facilities was completed in March 2017.
15	**Component #2: Industrial and Commercial Facilities**	**Address Other Industrial Facilities**	**5**	**5**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	The number of inspections performed, and where applicable, monitoring data collected	52 Inspections	52 inspections were performed by WES staff from the list of prioritized commercial/industrial facilities. In addition, on behalf of WES in WES' service area, the Pacific NW Pollution Prevention Resource Center (PPRC) offered technical assistance to 7 auto repair shops and 13 landscaping companies located in WES' service area that PCC contacted through its industrial / commercial stormwater outreach.
16	**Component #2: Industrial and Commercial Facilities**	**Address Other Industrial Facilities**	**5**	**5**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	The number of letters, enforcement actions, or other contacts made	17 Correction Notices	17 sites were given corrective notices by WES for correcting deferred maintenance of their storm system or for other issues related to the property's storm system.

2022-23 Best Management Practices

Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
17	**Component #2: Industrial and Commercial Facilities**	**Address Other Industrial Facilities**	**5**	**5**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of pretreatment inspections performed (CCSD#1- only)	25 Pretreatment Inspections	The Industrial Permits group conducted 16 annual storm sewer system inspections of permitted industrial users with sanitary sewer system discharge permits. Five (5) additional inspections were performed on categorical non-discharging industrial users and four (4) additional inspections were done in response to NRQ surveys received, as first-time visits, or in response to industrial user requests. In total, 25 inspections occurred. Certain inspections occurred at places that are technically in former CCSD#1 AND in the City of Milwaukie limits. The reason is that WES conducts pretreatment on behalf of the City of Milwaukie through an IJA/IGA. Two examples are Oregon Tool and American Metal Specialties, which are included in the count.
18	**Component #2: Industrial and Commercial Facilities**	**Address Other Industrial Facilities**	**5**	**5**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Notify and work with industries to improve stormwater management if an inspection is conducted that indicates improvement is needed.	Attained	Refer to enforcement actions response listed above or contact Watershed Protection staff at (503) 742-4567.
19	**Component #3 Construction Site Runoff**	**Conduct Procedures for Site Planning**	**6**	**6**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of permitted, active construction projects (i.e., those projects disturbing 800 sq. ft. or more)	452	There were 217 dwellings, 1 commercial building and 4 site development permits in Happy Valley. WES had 230 active construction projects.
20	**Component #3 Construction Site Runoff**	**Conduct Procedures for Site Planning**	**6**	**6**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of site plan reviews and approved plans	49 approved plans of 453 reviews conducted	WES reviewed and approved 20 single-family and reviewed 193 non-single family site plans. Of the 193 plans, WES approved 25 non-single family site plans located within WES' service areas. In addition, there were 217 building division site plan reviews and 23 engineering division site plan reviews in Happy Valley. Of the 23 engineering division site plan reviews, the City approved 4 plans.
21	**Component #3 Construction Site Runoff**	**Conduct Procedures for Site Planning**	**6**	**6**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Measurable Goal	Review all applicable erosion and sediment control plans submitted as part of the building permit process	Attained	All applicable erosion and sediment control plans were reviewed, approved and permitted.
22	**Component #3 Construction Site Runoff**	**Implement Requirements for Structural and Non-Structural Best Management Practices**	**7**	**7**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of permitted, active construction projects (i.e., those projects disturbing 800 sq. ft. or more)	230	See tracking measure comment in BMP #6.
23	**Component #3 Construction Site Runoff**	**Implement Requirements for Structural and Non-Structural Best Management Practices**	**7**	**7**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of site plan reviews and approved plans	25 site plans approved of the 193 reviewed	See tracking measure comment in BMP #6.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
24	**Component #3 Construction Site Runoff**	**Implement Requirements for Structural and Non-Structural Best Management Practices**	**7**	**7**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Measurable Goal	WES and Happy Valley require structural and non-structural BMPs for erosion prevention and sediment control on all construction sites disturbing 800 sq. ft. of land or more	Attained	All construction sites disturbing 800 sq.ft. of land or more require structural and non-structural BMPs for erosion prevention and sediment control.
25	**Component #3 Construction Site Runoff**	**Conduct Training for Construction Site Operators**	**8**	**8**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Track the number and type of educational and training events the District conducts and/or participates in annually	WES uses one online manual for the public's use, focusing on erosion prevention and sediment control, to train construction site operators.	WES has made the **Erosion Prevention and Sediment Control Planning and Design Manual** available on the County website while providing in-the-field training during ERCO inspections. This year, the City of Happy Valley did not sponsor training courses for construction site operators.
26	**Component #3 Construction Site Runoff**	**Conduct Training for Construction Site Operators**	**8**	**8**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Measurable Goal	Conduct training for new employees as appropriate and whenever there is a significant update to the Erosion Prevention and Sediment Control Planning and Design Manual.	Attained	WES and the City of Happy Valley did not have new employees to receive the training. Additional training is provided to existing employees as needed and as available.
27	**Component #3 Construction Site Runoff**	**Identify Priorities for Inspecting Sites and Conducting Enforcement Actions**	**9**	**9**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of permitted sites and percentage of sites inspected	100%	Inspected 100% of 222 permitted sites in Happy Valley and 230 permitted sites in WES' ERCO service area.
28	**Component #3 Construction Site Runoff**	**Identify Priorities for Inspecting Sites and Conducting Enforcement Actions**	**9**	**9**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of erosion control inspections conducted	3,016 inspections	WES inspections – 1,635 Happy Valley Building Division Inspections - 1,109 Happy Valley Engineering Division Inspections - 272
29	**Component #3 Construction Site Runoff**	**Identify Priorities for Inspecting Sites and Conducting Enforcement Actions**	**9**	**9**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of enforcement actions	34 enforcement actions	8 Happy Valley enforcement actions and 26 WES Erosion Control enforcement actions
30	**Component #3 Construction Site Runoff**	**Identify Priorities for Inspecting Sites and Conducting Enforcement Actions**	**9**	**9**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Measurable Goal	Inspect construction sites disturbing 800 s.f. of land or more a minimum of three times during construction to verify proper implementation of required BMPs	Attained	100% of the erosion control permits that WES and Happy Valley issued were inspected a minimum of three times.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
31	**Component #3 Construction Site Runoff**	**Identify Priorities for Inspecting Sites and Conducting Enforcement Actions**	**9**	**9**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Measurable Goal	Monitor compliance with the erosion control regulations for sites disturbing 800 square feet of land or more and, when necessary, issue deficiency notices, charge re-inspection fees, issue fines and stop land-disturbing development work at the site until provisions of the regulations are met	Attained	WES issued 26 erosion control inspection deficiency notices that required corrective actions, and no subsequent stop work orders, fines or re-inspection fees were issued. In Happy Valley, 4 of the 8 erosion control cases resulted in fines. Happy Valley posted no Stop-Work orders. Happy Valley did not charge any re-inspection fees but did issue deficiency notices. After being issued the enforcement action, the violator corrected the erosion violation to comply with the provisions of the regulation.
32	**Component #4 Education and Outreach**	**Public Education to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**10**	**10**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track program messages delivered, type of communication piece, and where appropriate, the number of people affected.	Attained	• Facebook article, March 21, 2023: Pesticide Tips (proper use tips to prevent discharges of pesticides, herbicides and fertilizer when doing yard work). 1,363 views • Facebook article, August 23, 2022 - How to prevent spills and leaks (including pesticides and fertilizers) 1,448 views • WES Newsletter article, May 7, 2023 - Pesticide Tips (proper use tips to prevent discharges of pesticides, herbicides and fertilizer when doing yard work). 3,166 views • WES Newsletter article, January 2023 Preventing and Cleaning up Spills and Leaks to protect our water ((including pesticides, herbicides, fertilizer) 1634 views • MyClackCo Magazine article, Spring 2023 – Lawn care tips (proper use tips to prevent discharges of pesticides, herbicides and fertilizer when doing yard work)Circulation 180,000
33	**Component #4 Education and Outreach**	**Public Education to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**10**	**10**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Continue to maintain relevant public education materials on the County's website	Attained	• Website article: Spills and Leaks (Pesticides, Fertilizers - how to prevent contaminating waterways) - 189 Views • Website article: Looking to Hire a Landscape Maintenance Service? (Addresses tips to prevent misuse of fertilizer, pesticides, herbicides) 231 Views • Website article: Lawn Care Tips to Help Protect Our Water (includes extensive information about pesticides. Also includes insecticides and fertilizer) 175 Views
34	**Component #4 Education and Outreach**	**Public Education to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**10**	**10**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Prepare a minimum of one relevant article per year for inclusion with Clackamas County customer billing statements	Attained	"Lawn Care Tips to Help Protect Our Water" was in April's bill insert. The insert links WES' Education page, which includes articles about reducing pollution in rivers and streams caused by stormwater runoff, surface water and stormwater management, educating and assisting customers to be clean water stewards, water resource recovery, protecting water quality, online reporting tool, tips for pressure washing and surface cleaning, spills and leaks, landscaping tips to avoid pesticides, herbicides, and other toxic chemicals, and reducing pollutants by keeping storm drains clean.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
35	**Component #4 Education and Outreach**	**Public Education to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**10**	**10**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Pursue additional relevant USGS studies if the opportunity presents itself.	Attained	No additional USGS studies were funded during the 2022-23 MS4 permit year. Note that WES and the Cities of Rivergrove and Happy Valley contributed funds towards a USGS-led pesticide monitoring study, which assessed pesticide concentrations in creek water, creek bed sediments, and discharges from MS4 outfalls, during the current previous (2012-2017) MS4 permit term. This monitoring study satisfied the pesticide monitoring requirement in table B-1 of the 2012-2017 MS4 permit. The USGS wrote an article about this study which was published in the Journal of Environmental Monitoring Assessment, a scientific journal, in May 2016.
36	**Component #4 Education and Outreach**	**Proper Disposal Practices to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**11**	**11**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of calls received and referred to Metro annually.	None	WES did not receive customer inquiries about the proper way to dispose of these dangerous and/or hazardous materials. Hence, WES did not refer any customers to Metro.
37	**Component #4 Education and Outreach**	**Proper Disposal Practices to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**11**	**11**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Refer all pesticide/herbicide disposal related calls to Metro.	Not applicable	No customers were referred to Metro because did not WES receive inquiries on disposing of these dangerous and/or hazardous materials.
38	**Component #4 Education and Outreach**	**Facilitate Public Reporting of Illicit Discharges and Spills and Other Types of Improper Disposal of Materials**	**12**	**12**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Describe news articles reported per year when appropriate	Attained	For a description of news articles that address illicit discharges, see Row 40, BMP #12.
39	**Component #4 Education and Outreach**	**Facilitate Public Reporting of Illicit Discharges and Spills and Other Types of Improper Disposal of Materials**	**12**	**12**	**Formerly, CCSD#1 and SWMACC**		**Public & Government Relations**	WES (formerly, SWMACC and CCSD#1) Public & Government Affairs	Tracking Measure	Describe type of public complaints received. Resulting follow up actions per year will be kept in a database.	Attained	WES investigates all illicit discharge complaints received as well as those that WES staff encounter. Section 1.5 in this annual report provides additional information about the types of illicit discharge reports/complaints which were received during 2022-2023.
40	**Component #4 Education and Outreach**	**Facilitate Public Reporting of Illicit Discharges and Spills and Other Types of Improper Disposal of Materials**	**12**	**12**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Include a relevant article in The Citizen News (for the County) once a permit term (where permit term is from March 2012 through March 1, 2017)	Attained	In 2022-23, WES provided the following: • WES Newsletter article, January 2023 Preventing and Cleaning up Spills and Leaks to protect our water ((including pesticides, herbicides, fertilizer) 1,634 views • MyClackCo Magazine article, Spring 2023 - You Can Prevent Water Pollution (includes reporting of spills as well as prevention of water pollution due to pesticides, herbicides, fertilizer) Circulation 180,000.
41	**Component #4 Education and Outreach**	**Facilitate Public Reporting of Illicit Discharges and Spills and Other Types of Improper Disposal of Materials**	**12**	**12**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Continue to include area for public complaints on the County's website and track number of complaints for reporting	Attained	WES replaced the online form with a link (https://www.clackamas.us/wes/reportaproblem.html) directing the community to a webpage offering options to reporting a discharge or disposal. One can email or call in information during the day or afterhours. Customer service enters the information into WES' maintenance tracking software, Lucity, so the appropriate staff can respond and investigate the alleged illicit discharge or improper disposal.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
42	**Component #4 Education and Outreach**	**Participate in a Public Education Effectiveness Evaluation**	**13**	**13**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Report on activities annually.	Attained	This was a one-time requirement for an evaluation that WES submitted in 2015. We do continue to measure progress in our Watershed Health Education Program in the schools by conducting before and after tests.
43	**Component #4 Education and Outreach**	**Participate in a Public Education Effectiveness Evaluation**	**13**	**13**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Provide/compile information regarding a public education effectiveness evaluation over the permit term.	Attained	This was a one-time requirement for an evaluation that WES submitted in 2015. We do continue to measure progress in our Watershed Health Education Program in the schools by conducting before and after tests.
44	**Component #4 Education and Outreach**	**Training for Employees**	**14**	**14**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track the number of employees receiving training in stormwater management annually.	40	Forty employees received stormwater management training in 13 different workshops relevant to stormwater management.
45	**Component #4 Education and Outreach**	**Training for Employees**	**14**	**14**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Attend relevant stormwater management related training based on need and availability	Attained	Forty employees from WES attended one or more of the following: • American Public Works Association • Association of Clean Water Agencies • Certified Erosion & Sediment Control Lead Recertification Training • Erosion Control • Environmental Law Education Center Clean Water Conference • National Planning Conference • Northwest Environmental Business Council • National Environmental Monitoring Conference • Oregon Water Education Foundation • OTAK WES MS4 Stormwater Management Plan Workshops • River Restoration NW • Street Maintenance & Collection System • WateReuse Pacific Northwest Water Summit Four WES Development Review staff attended six training sessions in the following topics: **Certified Erosion & Sediment Control Lead Recertification Training**, **Erosion Control & Stormwater Management Summit**, **OTAK WES MS4 Stormwater Management Plan Workshops**, National Planning Conference, and **ORWEF Water Environment School**. The Public Works had 4.5 employees attend the following trainings: **ORWEF Water Environment School** – June 2023, **APWA Street Maintenance & Collection Systems School** – March 2023; Road Scholar Classes (RS1, RS2 & RS3) – April 2023; and **Pesticide Training** – (21) credit hours.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
46	**Component #4 Education and Outreach**	**Training for Employees**	**14**	**14**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Check in with the Fire Department regarding stormwater issues during the permit's 5-year term.	Attained	This was a one-time requirement during the 2012-2017 permit term, but WES has checked in with the Clackamas Fire District over several subsequent annual reporting periods, including the most recent full inspection conducted in 2019-2020, to ensure that the Fire District has operated their facility's storm/sewer valve in the correct position. WES has inspected CCFD's training facility and reviewed their Environmental Protection SOP, which contains procedures on how the Fire District manages stormwater on their facility and operates valves during training that divert fire-fighting foam towards the sanitary sewer. Under the new WES SWMP, WES will perform annual inspections of the Fire District's storm/sewer valves and confirm their proper operation. Review of the latest version of CCFD's SOP for operation of the training facility will be part of the inspection.
47	**Component # 5 Public Involvement and Participation**	**Provide for Public Participation with SWMP and Benchmark Submittals**	**15**	**15**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Provide for public participation with the SWMP and pollutant load reduction benchmarks prior to the permit renewal application deadline	Attained	The public comment period for documents related to the MS4 Permit Renewal Application submittal ran from January 20, 2017 to February 21, 2017. WES submitted these documents to DEQ on February 24, 2017.
48	**Component # 5 Public Involvement and Participation**	**Provide for Public Participation with SWMP and Benchmark Submittals**	**15**	**15**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Provide for public participation with the monitoring plan due to the Department by September 1, 2012	Attained	This public participation opportunity was provided in 2012.
49	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	The number and type of flow control, water quality treatment or infiltration facilities installed in accordance with the requirements	24	Includes water quality, infiltration and flow control ponds.
50	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Narrative to describe the status of the private facility database	Attained	The upgrades to the GIS and maintenance management system software and databases is undergoing testing and further customization to develop a private facility database for commercial/industrial properties.
51	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Narrative to describe results of tracking compliance with private facility maintenance agreements	Attained	The commercial maintenance agreements (CMA's) include any private storm system owned/managed by commercial, industrial, and residential. Many of the CMA's are for home owner associations. 213 Commercial Maintenance Agreements in the MS4 area 10 CMA properties submitted reports in calendar year 2022 with 56 structures cleaned See BMP 28 in this table for information about WES' SCAP.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
52	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Continue to implement and enforce controls for stormwater quality treatment from new and re-development	Attained	WES continues to implement and enforce controls for stormwater quality treatment from new and re-development.
53	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Track the location, type, and drainage area of new water quality facilities using GIS	Attained	WES staff tracks areas that drain to water quality and flow control facilities by mapping project areas from as-builts. Staff continues work improving the existing GIS data and mapping new projects.
54	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Continue with work to compile a database of private facilities	Attained	During this 12 month reporting period, WES improved and maintained our database of private facilities.
55	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Annually, check in on compliance with terms of private facility maintenance agreements	Attained	WES provides the maintenance for those storm sewer systems which have been enrolled in the private, single-family residential maintenance agreement program. Properties which drain into these storm sewer systems pay an extra $3/month per house (or $3 per ESU for other properties) to WES to compensate WES for this significant additional effort and expense. For more information about this maintenance agreement program, see the sections for BMPs #25, #26, and #29 in this report. Since reporting from commercial, industrial and institutional (churches and schools, for example) properties is due by December 31st of each year, the following information is for calendar year 2022 rather than permit year 2022-23: • WES sent one mailing and had one cleaning campaign in 2022 to not only the properties within the MS4 area that had these Maintenance Agreements, but rather to all commercial/industrial stormwater accounts that had storm systems. The letter was to remind them of the annual inspection and reporting requirements as well as to offer them an opportunity for discounted cleaning through the Stormdrain Cleaning Assistance Program (SCAP). • WES continues to conduct site inspections to encourage compliance with maintenance agreement requirements. The COVID pandemic and employment situation continues to affect compliance as businesses and institutions are constrained by financial and labor shortages. In addition, the failure of some businesses and the sale of others has resulted in some owners needing to become aware of local requirements. In 2022-23, places of worship (churches/temples) and schools were inspected and cleaned through the SCAP program and the WES private inspection program. Total cleaning of all private commercial/industrial/institutional facilities through SCAP (See BMP 28) and other methods: 210 businesses, 1,426 devices and over 132,300 gallons of material removed.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
56	**Component # 6 Post-Construction Site Runoff**	**Update Procedures for New Development and Significant Redevelopment**	**17**	**17**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track status of adopting proposed changes to the stormwater standards for new and re-development.	Attained	The Clackamas County Board of County Commissioners adopted the revised rules, regulations and standards in May 2023, which took effect July 1, 2023 of this year. In March 2022 the WES Advisory Committee voted to recommend that the Board adopt the revised draft of the WES Rules and Regulations and the WES Stormwater Standards. In 2018, WES staff implemented a comprehensive outreach and engagement process to form the foundation of the revised rules and regulations and revised standards. Ultimately, 12 key policy updates were identified through this process. WES staff put together an updated set of rules incorporating the 12 key policy updates, in addition to other revisions intended to modernize and streamline the rules and their administration.
57	**Component # 6 Post-Construction Site Runoff**	**Update Procedures for New Development and Significant Redevelopment**	**17**	**17**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	CCSD#1: Complete updates to standards to meet new permit requirements by June 30, 2013	Attained	WES completed updates to standards to meet new permit requirements in 2012. Most recently, the Clackamas County Board of County Commissioners adopted the revised rules, regulations and standards in May 2023, which took effect July 1, 2023 of this year.
58	**Component # 6 Post-Construction Site Runoff**	**Update Procedures for New Development and Significant Redevelopment**	**17**	**17**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	CCSD#1: Complete guidance manual for developers to facilitate the implementation of the new standards by June 30, 2013	Attained	WES completed its guidance manual by June 20, 2013. Most recently, the Clackamas County Board of County Commissioners adopted the revised rules, regulations and standards in May 2023, which took effect July 1, 2023 of this year.
59	**Component # 6 Post-Construction Site Runoff**	**Update Procedures for New Development and Significant Redevelopment**	**17**	**17**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	SWMACC: Policy development and implementation by November 1, 2014.	Attained	WES its developed and implemented policy for SWMACC development and redevelopment by November 1, 2014. Most recently, the Clackamas County Board of County Commissioners adopted the revised rules, regulations and standards in May 2023, which took effect July 1, 2023 of this year.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
60	**Component # 6 Post-Construction Site Runoff**	**Sizing Tool Development to Address Hydro-modification**	**18**	**N/A**	**Formerly, CCSD#1**			WES (formerly, CCSD#1)	Tracking Measure	Net impervious area treated by LID	53.5 acres	The WES Development Services team approved twenty-five development permits which treated stormwater runoff by LID BMPs with the net impervious area of 53.5 acres.
61	**Component # 6 Post-Construction Site Runoff**	**Sizing Tool Development to Address Hydro-modification**	**18**	**N/A**	**Formerly, CCSD#1**			WES (formerly, CCSD#1)	Tracking Measure	Number of applications submitted using sizing tool	12	Twelve development projects applied the BMP Sizing Tool to control stormwater runoff.
62	**Component # 6 Post-Construction Site Runoff**	**Sizing Tool Development to Address Hydro-modification**	**18**	**N/A**	**Formerly, CCSD#1**			WES (formerly, CCSD#1)	Tracking Measure	Customer feedback and community relations about the simplified tool (for development engineers) that sizes LID BMPs (in order to address the duration of elevated flow levels in addition to addressing flow volumes and peaks; and in order to address the long-term impacts of increased runoff from development).	Attained	WES in partnership with Brown and Caldwell conducted a robust public outreach and comment period on proposed changes alongside WES Staff, meeting with major WES stakeholders such as regional watershed councils, and community planning organizations. See rows 56 and 57 for additional information.
63	**Component # 6 Post-Construction Site Runoff**	**Sizing Tool Development to Address Hydro-modification**	**18**	**N/A**	**Formerly, CCSD#1**			WES (formerly, CCSD#1)	Measurable Goal	The primary goal is to develop, by June 30, 2013, a tool to assist development engineers with the design/sizing of stormwater management facilities in order to reduce target pollutants and stream degradation impacts (i.e., hydro-modification) associated with the development of impervious surfaces.	Attained	The revised rules and regulations and standards, discussed in rows 56 and 57, includes this process, which requires capture and treatment of 80% of the annual average runoff volume; that roughly equates to 1" of rainfall on a development site. The new standards prioritize Low Impact Development Approach (LIDA) to mitigate stormwater runoff.
64	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Street Sweeping**	**19**	**18**		**HV**	**DTD**	Happy Valley DTD	Tracking Measure	Number of miles that were swept in Happy Valley	1,546 miles	The City of Happy Valley swept 1,546 miles that included streets within its city limits and in the remaining WES MS4 service area. Depending on frequency of use, some roads may be swept multiple times while others may be swept only once. For miles swept by Clackamas County DTD sweepers, please see DTD's 2022-23 MS4 annual report.
65	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Street Sweeping**	**19**	**18**		**HV**	**DTD**	Happy Valley DTD	Tracking Measure	Mass or volume of material removed during sweeping in Happy Valley	1,351 cubic yards	Happy Valley removed 1,351 cubic yards. The cubic yards include the WES MS4 service area that falls within its city limits. For the mass or volume of debris that Clackamas County DTD removed, see DTD's 2022-23 MS4 annual report.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
66	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Street Sweeping**	**19**	**18**		**HV**	**DTD**	Happy Valley DTD	Measurable Goal	City of Happy Valley sweeps approximately 100 lane miles of curbed streets per year on average	Attained	City of Happy Valley exceeded its goal of 100 miles and swept 1,546 miles of curbed streets. For Clackamas County roads, see DTD's 2022-23 MS4 Annual Report.
67	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**		**HV**	**DTD**	Happy Valley DTD	Tracking Measure	Mass or volume of material removed by the City of Happy Valley "Adopt-a-Road" program	Not Applicable	Happy Valley no longer has an Adopt-a-Road program as part of its operations and maintenance of public streets. Instead, the City captures litter from its streets through its street sweeping program. Happy Valley removed 23 yards of material. The DEQ-approved Shared SWMP Document, which began to be implemented on July 1, 2023, does not include this Tracking Measure.
68	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**		**HV**	**DTD**	Happy Valley	Tracking Measure	Number of illegal solid waste dumps that are removed in the City of Happy Valley	Unknown	Happy Valley partners with Metro's RID Patrol program to remove the illegal dump sites in the City. Metro tracks the amount of material removed in Happy Valley. Please contact Metro at (503) 797-1700 or (503) 234-3000 for more information.
69	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**		**HV**	**DTD**	Happy Valley DTD	Tracking Measure	Mass or volume of material that is removed by the elimination of illegal solid waste dumping sites in the City of Happy Valley	Unknown	See row 68's response.
70	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**		**HV**	**DTD**	Happy Valley DTD	Tracking Measure	Amount of sand applied and then removed by Happy Valley as a result of a snow/ice event and time of removal after the event	177 yards applied of sand and 136.3 yards of sand removed	Happy Valley applied 177 yards of sand as a result of this year's snow/ice events and picked up 136.3 yards of sand within 10 days after the events.
71	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**		**HV**	**DTD**	Happy Valley DTD	Measurable Goal	Remove illegal solid waste dumps as they are discovered	Attained	Metro partners with Happy Valley to remove the illegal dump sites in the City. Metro tracks the amount of material removed in Happy Valley.
72	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**		**HV**	**DTD**	Happy Valley DTD	Measurable Goal	Collect sand applied for ice/snow events within 10 days of the end of the event	Attained	Happy Valley collected 136.3 yards of sand within 10 days of the end of the snow/ice events this past year. Happy Valley used 17,500 gallons of Magnesium Chloride for deicing. See DTD's 2022-23 MS4 Annual Report for the work DTD performed on County-maintained roads.
73	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**		**HV**	**DTD**	Happy Valley DTD	Measurable Goal	DTD: See DTD's MS4 NPDES SWMP	See DTD's 2022-23 MS4 Annual Report	See DTD's 2022-23 MS4 Annual Report for the work DTD performed on County-maintained roads.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
74	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Proper Road Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**21**	**20**		**HV**	**DTD**	Happy Valley DTD	Tracking Measure	Happy Valley - The quantity of herbicide products used per zip code. This is the same data that will be reported to Oregon's Department of Agriculture per the Pesticide Use Reporting System.	See the list in the adjacent column	Although BMP #21 is only for herbicide used during the maintenance of roads which are owned and operated by Happy Valley, the following data, which was reported in the Oregon Department of Agriculture's Pesticide Use Reporting Systems includes road usage as well as usage on the following properties: • City Hall: Speed Zone – .24 oz, Lime – 195.84 oz, Ferrous Sulfate – 51lbs, Barricade – 24 oz, Gallery – 6 oz, Vessel – 27.2 oz, Wisdom TC – 10.2 oz • Public Works Yard: Rodeo – 10 oz, LI 700 – 5 oz • Happy Valley Park: Rodeo – 92 oz, LI 700 – 46 oz • CPC/Annex: Lime – 57.6 oz, Ferrous Sulphate – 15lbs, Barricade 2.4 oz, Gallery – .9 oz, Vessel – 8 oz, Wisdom TC – 8 oz • Library: Speed Zone - .24 oz, Lime – 11.52 oz, Ferrous Sulfate – 3lbs, Barricade - 4.8 oz, Gallery – 1.8 oz, Vastlan – 20 oz, Hi Light – 1 oz, Vessel – 1.6 oz, Wisdom TC - .6 oz • City Owned Spaces: Rodeo – 30 oz, LI 700 – 15 oz, Snapshot – 12lbs, Horsepower – 48 oz • Monument Sign: Lime – 80.6 oz, Ferrous Sulfate 21lbs, Barricade – 2.08 oz, Gallery – .78 oz, Wisdom TC 2.5 oz • Happy Valley Nature Park: None • Ashley Meadows Park: Speed Zone – .1 oz, Lime – 1267.2 oz, Barricade - 6.24 oz, Gallery – 2.34 oz, Vessel – 176 oz, Ferrous Sulfate – 330lbs, Wisdom TC 26.4 oz • Village Green Park: Lime – 115.2 oz, Speed Zone - .2 oz, Ferrous Sulfate – 30 lbs, Vessel – 16 oz, Wisdom TC – 16 oz • Southern Lites Park: Speed Zone – 24 oz, Vessel – 16 oz, Sedgehammer – 1 oz, Lime – 288 oz, Ferrous Sulfate 75lbs, Barricade – 6.2 oz, Gallery – 2.3 oz, Wisdom TC – 15 oz • Hidden Falls: Vastlan – 90oz, Competitor – 36 oz, Hi-light – 2 oz
75	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Proper Road Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**21**	**20**		**HV**	**DTD**	Happy Valley DTD	Tracking Measure	DTD roads: See tracking measures in the DTD MS4 NPDES SWMP	See DTD's 2022-23 MS4 Annual Report	See DTD's 2022-23 MS4 Annual Report for the County's pesticide, herbicide and fertilizer use in County-maintained roads.
76	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Proper Road Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**21**	**20**		**HV**	**DTD**	Happy Valley DTD	Measurable Goal	Happy Valley Roads: Continue to implement the integrated pest management portion of the ODOT Routine Road Maintenance Manual	Attained	City of Happy Valley continues to implement the IPM portion of the ODOT Routine Road Maintenance Manual and held 3 meetings.
77	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Landscape Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**22**	**21**	**Formerly, CCSD#1 and SWMACC**	**HV**	**DTD**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	The number of meetings conducted	Attained	No meetings were held in 2022-23 because the meetings which were required to be held during the permit term have already been held. Note: The meetings with the local government agencies and districts who are not MS4 co-permittees have also been held.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
								DTD				
78	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Landscape Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**22**	**21**	**Formerly, CCSD#1 and SWMACC**	**HV**	**DTD**	WES (formerly, SWMACC and CCSD#1) Happy Valley DTD	Tracking Measure	The results and follow-up activities conducted as a result of the meetings	Attained	During the 2022-23 permit year, WES did not conduct follow-up activities as a result of the meetings which were held in previous years during this permit term, since this work has already been done.
79	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Landscape Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**22**	**21**	**Formerly, CCSD#1 and SWMACC**	**HV**	**DTD**	WES (formerly, SWMACC and CCSD#1) Happy Valley DTD	Measurable Goal	Check back in with all County & City of Happy Valley buildings and facilities that were visited (during the last permit cycle) at least once during this permit cycle	Attained	This check-in process occurred during meetings which were held during this time period: June 2016 to February 2017. WES sent a follow-up letter to each public agency after the meetings were held.
80	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Landscape Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**22**	**21**	**Formerly, CCSD#1 and SWMACC**	**HV**		WES (formerly, SWMACC and CCSD#1) Happy Valley	Measurable Goal	Develop and implement an Integrated Pest Management plan by December 31, 2012	Attained	This IPM plan was developed and implemented prior to December 31, 2012 and it continued to be implemented in 2022-23.
81	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Control Infiltration and Cross Connections to the District's Stormwater System**	**23**	**22**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of cross-connections / sanitary discharges identified	1	Happy Valley Building department contacted WES with concerns about a cross connection when they smelled sewage in a catch basin near a newly constructed home. Homeowner was instructed to not use any water. WES investigated and confirmed the new sewer lateral was mistakenly connected to the storm system. The storm system including a nearby pond was cleaned and the City's plumbing department facilitated the repair with the home builder. For more information see July 14, 2022 entry in Table 2. Illicit Discharge Events.
82	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Control Infiltration and Cross Connections to the District's Stormwater System**	**23**	**22**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	The number and type of inspections performed, abatement actions and enforcement actions taken	3,224 stormwater facilities inspected for cross connections	Through preventative maintenance activities within the MS4, which includes cleaning (ie. removing pollution), staff visually inspect some structures for condition assessment to include evidence of cross connections. WES staff looks for evidence of cross connection during daily inspection and cleaning activities. Staff also conducts routine video surveillance using closed-circuit television inspections of the sanitary sewer system in an effort to find and eliminate any cross connection (when conducting these inspections, the absence of a sewage discharge into the sanitary sewer system has led to WES' discovery on at least one occasion of sewage that was being unintentionally discharged into a storm sewer system through a piped cross-connection).

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
83	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Control Infiltration and Cross Connections to the District's Stormwater System**	**23**	**22**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Eliminate any identified sanitary discharges to the storm system.	1	See Row No. 81 for response.
84	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Flood Management Projects and Water Quality**	**24**	**N/A**	**Formerly, CCSD#1**			WES (formerly, CCSD#1)	Tracking Measure	Number of retrofits constructed that address water quality treatment	None	No projects of this type were completed in 2022-2023. WES recently completed the Storm System Master Plan. WES is starting implementation of the Master Plan, which includes a Water Quality Retrofit Program.
85	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Flood Management Projects and Water Quality**	**24**	**N/A**	**Formerly, CCSD#1**			WES (formerly, CCSD#1)	Tracking Measure	Number of flood management projects implemented or constructed and the percentage of those projects that include water quality components	3 flood management projects were completed. None of the projects included a water quality component.	WES completed the following flood management projects in 2022-2023: • Solomon Court Inlet Project: Completed October 2022. Solomon Court is a steep road that had chronic drainage issues due to stormwater bypassing inlets. WES added several inlets along Solomon Court to reduce the bypass of stormwater and reduce the flooding of roads and private property. • SE 95th/SE 96th & SE 130th Inlet Project: Completed March 2023. SE 95th/SE 96th and SE 130th both had chronic drainage issues due to stormwater bypassing inlets. WES added several inlets at both locations to reduce the bypass of stormwater and reduce the flooding of roads and private property. • Slipline Storm Pipe on Scott Creek Trail: We completed sliplining on a storm pipe along Scott Creek Trail in Happy Valley. This pipe was severely eroded and resulted in flooding of the trail and Mt. Scott Creek. This projected was completed in September 2022 None of the completed projects included water quality components.
86	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Flood Management Projects and Water Quality**	**24**	**N/A**	**Formerly, CCSD#1**			WES (formerly, CCSD#1)	Measurable Goal	Ensure all planned stormwater CIPs include consideration of water quality.	Attained	WES recently completed its Storm System Master Plan. WES is starting implementation of the Master Plan, which includes a Small Drainage Program, Water Quality Retrofit Program and Priority Capital Improvement Program. All CIPs consider opportunities for water quality improvements.
87	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Detention Pond Retrofit Program**	**25**	**N/A**	**Formerly, CCSD#1**			WES (formerly, CCSD#1)	Tracking Measure	Track pilot testing activities	No detention pond retrofit projects were completed in 2022-2023, but we are working on plans for doing this type of work in future years	Opti equipment, which was planned, constructed and test piloted before 2018-19, is fully operational in three detention ponds. Performance data shows an increase in detention time and a decrease in wet weather discharge rates from the ponds.
88	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Detention Pond Retrofit Program**	**25**	**N/A**	**Formerly, CCSD#1**			WES (formerly, CCSD#1)	Tracking Measure	Number, type, and location of retrofits	No detention pond retrofit projects were completed in 2022-2023, but we are working on plans for doing this type of work in future years	WES recently completed the Storm System Master Plan. WES is starting implementation of the Master Plan, which includes a Water Quality Retrofit Program, Stormwater Pond Repair and Rehabilitation Program and Priority Capital Improvement Program.

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
89	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Detention Pond Retrofit Program**	**25**	**N/A**	**Formerly, CCSD#1**			WES (formerly, CCSD#1)	Measurable Goal	The primary goal of the retrofit program is to retrofit existing ponds to improve their function to better meet watershed health goals. The goal will be to conduct 2 to 5 retrofits per year.	Not attained. No detention pond retrofit projects were completed in 2022-2023, but we are working on plans for doing this type of work in future years	WES recently completed the Storm System Master Plan. WES is starting implementation of the Master Plan, which includes a Water Quality Retrofit Program, Stormwater Pond Repair and Rehabilitation Program and Priority Capital Improvement Program.
90	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Miles of ditches and storm lines maintained	4.6 miles	WES provided maintenance on 23,811 feet (or 4.5 miles) of Stormwater pipe. Happy Valley maintained 700 linear feet (or 0.133 miles) of ditches. For ditch cleaning that DTD has performed, please, see DTD's MS4 Annual Report.
91	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number and type of components inspected and/or cleaned	3,239 assets	WES inspected and /or provided maintenance of 41 manholes, 263 pipes, 20 cleanouts, 15 control points, 402 vegetated facilities, 16 discharge points, and 2,467 inlets. Happy Valley inspected and 5 catch basins and 10 field inlets.
92	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Mass or volume of material removed during cleaning	440 Cubic yards	Of the total cubic yards removed during the cleaning of catch basins, manholes, ponds, swales and other stormwater assets, the vast majority comes from catch basin cleaning where a standard catch basin sump is 60% full and has 0.172 cubic yards of debris. The volume removed from manholes, ponds and other assets are de minimis and therefore are not included in the cubic yards removed. Happy Valley removed approximately 40 cubic yards of material from catch basins and field inlets.
93	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	WES: Clean storm lines and ditches on an as-needed basis. Identify inspection frequency.	Attained	WES inspects and cleans conveyance system components and structural controls as needed in response to requests for service.
94	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	WES: Maintain structural water quality facilities on a 3-year cycle.	Not Attained	WES is transitioning to an inspection based maintenance program where all water quality structures are inspected and/or cleaned within a three-year cycle. Our greatest challenge in the future will be to remove sediments from stormwater management ponds on a more frequent basis. Catch Basins: The targeted 2022-23 goal was 1/3rd of the total 8,904 WES-maintained catch basins. WES came close to achieving the 1/3rd with a performance of 28 percent.
95	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	WES: Conduct conveyance system assessment by January 31, 2013.	Attained	WES conducted the initial conveyance system assessment prior to January 31, 2013. As part of its operations, WES continues to improve its asset management best practices. WES has made improvements to GIS and the computerized maintenance management system (CMMS). Maintenance crews have field tablets with access to current mapping and the CMMS to

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
												improve the tracking of activities pertaining to the conveyance system assets.
96	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Conduct Catch Basin Cleaning and Maintenance**	**27**	**24**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track the percent of District owned or District operated/maintained catch basins cleaned per year	28%	2,467 inlets were cleaned.
97	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Conduct Catch Basin Cleaning and Maintenance**	**27**	**24**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track the volume of debris removed during cleaning activities	400 cubic yards	WES removed approximately 400 cubic yards of material from catch basins. A standard catch basin sump that is 60% full has 0.172 cubic yards of debris, which is removed during cleaning and totaled 468 cubic yards.
98	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Conduct Catch Basin Cleaning and Maintenance**	**27**	**24**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Clean 50% of District owned or District operated/maintained public catch basins each year.	Not Attained	WES cleaned 28% of all district operated catch basins cleaned (or 2,467 inlets). In WES's DEQ approved shared SWMP the new annual goal is 20% of catch basins cleaned.
99	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Conduct Catch Basin Cleaning and Maintenance**	**27**	**24**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Schedule repair or replacement of catch basins based on inspection results	Attained	Repairs were completed as discovered by inspections or referred to our capital engineering staff for a larger repair project.
100	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Storm Drain Cleaning Assistance Program**	**28**	**25**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of agreement holders compared with the number of annual reports received and the number devices being serviced by the vendor	213 Active Commercial-Industrial-Institutional Maintenance Agreements in the MS4 area 10 of these properties submitted reports (4.7%) 56 structures cleaned (12 by the vendor)	SCAP and other commercial private storm drain cleaning tracking has been changed to calendar year reporting rather than permit year. The information cited is the 2022 calendar year.
101	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Storm Drain Cleaning Assistance Program**	**28**	**25**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Total number of businesses serviced by the vendor with total number of devices maintained and volume of debris removed	• 252 businesses • 1,573 devices • 160,259 gallons of debris removed	By Vendor: 42 businesses, 147 devices and over 27,959 gallons of material removed. By Vendor and others: 210 businesses, 1,426 devices and over 132,300 gallons of material removed. SCAP and other commercial private storm drain cleaning tracking is calendar year reporting rather than permit year. The information cited is for the 2022 calendar year. The COVID-19 pandemic and employment situation continued to be constraints on compliance as it restricted the staffing and financial resources of many businesses to meet the inspection and cleaning requirements. In addition, some businesses have failed or were sold and

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
												new owners are coming up to speed on local requirements and the volume of material was not captured from many sites.
102	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Storm Drain Cleaning Assistance Program**	**28**	**25**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Continue to provide assistance to commercial and industrial facilities to support their water quality facility maintenance.	Attained	WES partnered with the cities of Milwaukie, Gresham, Fairview, Oregon City, Wood Village and Oak Lodge Water Services District on a Storm Drain Cleaning Assistance Program (SCAP) for private stormwater facilities. The program consisted of a Spring and Fall campaign with a USPS mailing for the Fall portion. In 2022-2023, WES staff continued to conduct a large number of prioritized onsite inspections that included assessments and guidance on avoiding possible onsite practices that could serve as sources of pollution to the MS4. These inspections and follow-up communications were specifically focused on providing assistance which supports the site owner/operator's effort to maintain their stormwater quality facilities. Where deficiencies were identified by WES staff, corrections were required of the properties.
103	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of structures inspected and cleaned	1,834 structures	BMP #29 is only for those storm sewer systems constructed since approximately 1996 which are located in single-family residential areas (a small number of properties which aren't used for single-family homes have also been enrolled in this program); homeowners and property owners in these areas pay an additional $3 fee to WES per month per home (or per ESU) which funds the operation and maintenance of these storm sewer systems.
104	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Inspect 70% of our maintenance agreement sub-divisions annually	Not Attained	WES completed inspections in 195 of 355 or 55% of maintenance agreement subdivisions.
105	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Cleaning and repair schedules will be developed based on inspection outcomes	Attained	WES uses inspection results to schedule repairs and cleaning. Some maintenance is generated from service request investigations, others come from annual facility inspections, and once our catch basin cleaning crew finds maintenance issues as they inspect structures in a basin. All vegetated facilities are inspected at a minimum of once per year and maintenance is prioritized and scheduled as crew availability permits. WES' biggest priority is always to keep these facilities functioning to transport water and prevent property damage caused by flooding when they fail as well as structural defects that could compromise the right of way and become a safety concern. We are working on better inspection forms to capture and then use to provide the capital improvement group prioritized facility retrofits that would include some of the major work like sediment removal.
106	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	All non-maintenance agreement cleaning and repairs will be request or service driven	Attained	Any non-maintenance agreement cleanings and/or repairs were initiated by requests for service.

2022-23 Best Management Practices

Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	WES	Happy Valley	Other	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2022 - 23 Tracking Measure or Measurable Goal Response	2022 - 23 Response Comment
107	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Emergency driven cleaning and maintenance will be addressed within 24 hours of the call being received	Attained	All emergency requests were responded to once the requests were received.
108	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	**Formerly, CCSD#1 and SWMACC**			WES (formerly, SWMACC and CCSD#1)	Measurable Goal	All non-emergency requests for service will be addressed within 72 hours of the call received	Attained	On average, most non-emergency request were responded to or completed within the 72 hour time frame

Appendix B: LID/GI Strategy and Post-Construction Site Runoff Control Program Description

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Prepared for: Clackamas Water Environment Services

Project Title: Clackamas Water Environment Services NPDES 2023-24 Support

Project No.: 186261

Technical Memorandum

Subject: WES LID-GI Strategy Document

Date: November 21, 2023

To: Leah Johanson, PE Water Environment Services

From: Angela Wieland, P.E, Project Manager

Prepared by: _____
Angela Wieland, PE and Melissa Jannusch, PE

Reviewed by: _____
Krista Reininga, PE

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List of Abbreviations

BC	Brown and Caldwell
DEQ	Oregon Department of Environmental Quality
GI	Green Infrastructure
LID	Low Impact Development
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NSRR	Numeric Stormwater Retention Requirement
NPDES MS4 Permit	NPDES Phase I Municipal Separate Storm Sewer System Permit
TM	Technical Memorandum
TSS	Total Suspended Solids
WES	(Clackamas) Water Environment Services

Introduction/Background

Schedule A.3.e.ii of the Clackamas County Phase I National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) Permit (Permit) requires co-permittees by December 1, 2023, to:

"review and update or develop and begin implementation of a strategy to require to the maximum extent feasible, the use of Low Impact Development (LID) and Green Infrastructure (GI) design, planning and engineering strategies intended to minimize effective impervious area or surfaces, and reduce the volume of stormwater discharge and the discharge of pollutants in stormwater runoff from development and redevelopment projects".

In accordance with definitions listed in the NPDES MS4 Permit, DEQ defines LID and GI as follows:

- 2021 NPDES MS4 **Permit** DEFINITION FOR GREEN INFRASTRUCTURE (GI): *a specific type of stormwater control using vegetation, soils, and natural processes to manage stormwater. At the scale of a neighborhood or site, green infrastructure refers to stormwater management systems designed to mimic nature by*
  reducing and/or storing stormwater through infiltration, evaporation, and transpiration. At the site level, such measures may include the use of plant or soil systems, permeable pavement or other pervious surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters. At the scale of city, green infrastructure refers to the patchwork of natural areas that provides flood protection and natural processes that remove pollutants from stormwater.
- 2021 MS4 PERMIT DEFINITION FOR LOW IMPACT DEVELOPMENT (LID): Low Impact Development (LID) means *a stormwater management approach that seeks to mitigate the impacts of increased runoff and stormwater pollution using a set of planning, design and construction approaches and stormwater management practices that promote the use of natural systems, green infrastructure, and other techniques for infiltration, filtration, evapotranspiration, and reuse of rainwater, and can occur at a wide range of landscape scales (e.g., regional, community and site). Low impact development is a comprehensive land planning and engineering design approach to stormwater management with a goal of mimicking the pre-development hydrologic regime of urban and developing watersheds.*

The Permit requires the co-permittees to document the LID/ GI Strategy in the subsequent annual report (due December 1, 2023) and incorporate or reference the strategy in the Stormwater Management Program Document (SWMP) after completion and Department of Environmental Quality (DEQ) approval.

Clackamas Water Environment Services' (WES or Districts') Stormwater Standards (WES SS) and Rules and Regulations (WES RR) were updated in 2023 to clarify technical standards and specifications related to stormwater management within the Districts' service area, which includes the cities of Happy Valley and Rivergrove, and within the urbanized portion of unincorporated Clackamas County that is regulated by the MS4 Permit.

The purpose of this document is to summarize and document the Districts current LID/GI Strategy to meet the 2021 Permit requirements. The Strategy includes a review of the LID/GI requirements in the WES-SS.

This Strategy is organized as follows:

- **Section 2** provides the District's existing LID/GI Strategy as outlined by planning objectives, stormwater management facility (SMF) selection, and use of infiltration to support stormwater management.
- **Section 3** provides a summary of next steps.

LID/GI Strategy

The WES SS and WES RR provide policy and design requirements for the management of post-construction stormwater runoff and is the primary mechanism by which the District complies with Schedule A.3.e of the NPDES MS4 Permit requirements. All applicable public and private new and redevelopment projects meeting the permit-specified impervious area threshold must adhere to the Districts' water quality treatment standards and flow control performance standards (WES SS Section 6.1.2), as well as show how onsite infiltration is used in the achievement of the performance standards (WES SS Section 6.2.1).

This section summarizes how the WES SS and WES RR incorporate LID approaches and GI facilities in the requirements for development and redevelopment projects.

The District adheres to the Alternative Compliance Performance Standard in Schedule A.3.e.iii.(B) of the NPDES MS4 Permit with focus on prioritization of infiltration in order to target natural surface or pre-development site hydrology and reduction of pollutant discharge from new and replaced impervious surfaces. There are multiple references to "infiltration-first" as a preference in the WES SS. Implementation of infiltration where possible is beneficial in meeting the Districts' water quality and flow control performance standards. Adherence to a flow control performance standard that requires mimicking pre-development (historic) peak flow and flow duration matching using of peak flow rates from a long-term rainfall record, and facility sizing will be optimized if infiltration is accounted for.

LID is not explicitly defined in the WES SS or WES RR, but WES does require various site assessment and site planning principals to be addressed with applicable new and redevelopment activities in conjunction with receipt of a Service Provider Letter (SPL), which is due prior to submitting for land use or design approval. WES views implementation of LID as a comprehensive approach, and adherence to the flow control performance standard ensures more direct adherence to the goal of mimicking the pre-development hydrologic regime of urban and developing watersheds, and reducing runoff where feasible.

The District plans to clarify the application of LID per the Permit definition. Use of LID will be clarified in updates to the WES SS and/or supporting guidance documents by December 1, 2024.

Table 1 summarizes aspects of the District's LID/GI Strategy as referenced throughout the WES SS and WES RR. Direct language is reflected in *italics*.

Table 1. Summary of the WES LID/GI Strategy	
WES SS Section Reference	**Content/Short Description**
Section 1 Definitions	
Section 1 Definitions	Relevant definitions are listed in both the WES SS and WES RR. The District's current definition for GI and SMF is similar with the NPDES MS4 permit definition of GI in that applies to facilities that may retain and infiltrate stormwater runoff. The WES SS definition of GI and the Permit definition of GI both relate to the ability of the facility to mimic nature (or natural surface hydrological function). • **WES SS definition for Green Infrastructure (GI)**: *a stormwater management facility (SMF) that mitigates stormwater runoff similar to the natural surface hydrological functions through infiltration or evapotranspiration, or that involves stormwater reuse.* • **WES RR definition for Stormwater Management Facility (SMF)**: *Any facility that is designed, constructed, and maintained to collect, treat, filter, retain, or detain surface water runoff during and after a storm event for the purpose of controlling flows and/or reducing pollutants in stormwater runoff. SMFs include, but are not limited to constructed wetlands, rain gardens, water quality swales, stormwater planters, infiltration facilities, and ponds. SMFs can be privately or publicly owned and maintained.*
Section 2 General Information	
Section 2.2 Objectives	Two of the 13 documented objectives of the WES SS relate to LID and the use of GI: • *Minimize stormwater runoff volumes and maximize groundwater recharge through the process of infiltration of runoff into vegetated stormwater facilities.* • *Maintain the pre-development stormwater runoff characteristics to minimize effects on the drainageways, such as erosion and degradation, generally associated with urbanization.*
Section 3 General Stormwater Standards	
Section 3.2 Development Policy	The Service Provider Letter (SPL) is required early in the development process, prior to applying for Land Use/ Design Review and is intended to demonstrate that the proposed development is viable in accordance with the WES SS and WES RR. *…The Service Provider Letter will only be issued once the Applicant has provided sufficient plans, reports, and studies needed for preliminary review by the District. Based on the preliminary review, the District may request additional information prior to issuance of the letter or as part of the forthcoming land use application. Receipt of the Service Provider Letter does not imply that all District requirements have been met or guarantee that land use approval for the development will be granted….* Service Provider Letter submittal requirements are detailed in this table below in conjunction with Appendix A.

Table 1. Summary of the WES LID/GI Strategy	
WES SS Section Reference	**Content/Short Description**
Section 6 Stormwater Management Facility Design	
Section 6 Stormwater Management Facility Design	Section 6 of WES' SS state that infiltration is the preferred method to meeting the flow control and water quality standards and provide guidance on site-specific stormwater plans for site assessment activities. Specific references to infiltration and site planning are underlined in the quoted content. *SMFs include a variety of methods to mitigate stormwater runoff and remove pollutants from stormwater, including detention, infiltration/retention, sedimentation, filtration, plant uptake, ion exchange, adsorption, and bacterial decomposition. Infiltration is the preferred method to address stormwater runoff for water quality and flow control requirements. In some cases, using a combination of SMFs may be the most effective strategy for removal of specific pollutants of concern in designated high-risk areas……Site-specific Stormwater Management Plans are most effective when developed early in the site planning process. Strategies for meeting the requirements in these standards depend on several site factors, including soil infiltration capacity, available infrastructure, proposed development plans, and downstream conveyance….*
6.1.1 Water Quality Performance Standard	In the WES SS, adherence to the water quality performance standard is addressed by requiring treatment of a design storm representing 80% of average annual runoff which is a 1-inch design storm event. SMFs including raingardens, swales and planters are considered effective treatment facilities, by definition of an SMF and as implied by reference to the MEP standard below: *SMFs shall be designed to capture and treat 80 percent of the average annual runoff volume, to the maximum extent practicable with the goal of 80 percent total suspended solids removal. In this context, "maximum extent practicable" means less-effective treatment may not be substituted when it is practicable to provide more effective treatment…..Hydrodynamic separators, when used as a sole method of stormwater treatment, do not meet the "maximum extent practicable" requirement for stormwater treatment effectiveness with regard to these Standards.*
6.1.2 Flow Control Performance Standard	In the WES SS, adherence to the flow control performance standard is addressed by requiring peak flow and flow duration matching for flows that are considered to have the greatest potential for hydromodification impacts (i.e., 42% of the 2-year peak flow to the 10-year peak flow). Full infiltration of the 10-year, 24-hour storm may also be implemented to adhere to the flow control performance standard (as detailed under Section 6.2.1 below). *Flow control facilities shall be designed so that the duration of peak flow rates from Post-Development Conditions shall be less than or equal to the duration of peak flow rates from pre-development conditions for all peak flows between 42 percent of the 2-year peak flow rate up to the 10-year peak flow rate.*

Table 1. Summary of the WES LID/GI Strategy	
WES SS Section Reference	**Content/Short Description**
6.2.1 Infiltration	Infiltration is the preferred facility sizing method in the WES SS: *… When a SMF is designed to fully infiltrate the 10-year,24-hour Design Storm, the facility is assumed to meet the flow control performance standard without further analysis…When site conditions do not allow infiltration of the full 10-ytear, 24 hour Design Storm, infiltration can still be incorporated into the flow control facility design to reduce the volume of discharge released from the site….* *When a rain garden, planter, swale, or pond is designed to fully infiltrate the 10-year, 24-hour Design Storm, the facility is also assumed to meet the water quality performance standard, without further analysis.* *SMFs shall be designed with an infiltration component, unless otherwise stipulated by the design professional.* Guidance on use of design infiltration rates and technical infeasibility criteria is also provided in this section to support the application of infiltration into water quality and flow control facilities. Infiltration limitations are required to be identified early in the design process and are assessed prior to receipt of the SPL. Sites without limiting conditions have the potential to use infiltration as part of the stormwater management strategy.
6.3 General Design Requirements	*When a SMF is required, green infrastructure, such as planters, swales, rain gardens, ponds, and other vegetated facilities are the preferred strategy to meet the stormwater management requirements for water quality treatment and flow control. The best way to control the rate and duration of runoff is through the incorporation of infiltration using green infrastructure.*
6.5 Stormwater Facility Design Requirements	GI facilities are defined in Chapter 6 of the Manual. This section details design and site planning specifications, including minimum infiltration rates, for the following GI SMFs with infiltration incorporated as part of their design: • Vegetated Swales (infiltration and filtration) • Stormwater planters (infiltration and filtration) • Rain Gardens (infiltration and filtration) • Ponds (infiltration and filtration) • Green Roofs (filtration and impervious area reduction) • Pervious pavements (filtration and impervious area reduction)

Table 1. Summary of the WES LID/GI Strategy	
WES SS Section Reference	**Content/Short Description**
Section 7 Storm Drainage System Design	
7.2.2 Onsite Storm Drainage System	This section references the District's goals to preserve pre-development hydrologic function through maintenance of existing drainage patterns: *The site shall be planned and designed to generally conform to onsite natural drainage patterns and discharge to natural drainage paths within a drainage area.....*
Appendix A Permitting and Submittal Requirements	
Section 1 Review and Permitting Requirements	Various site planning activities and results are required to be submitted with the Service Provider Letter (SPL), as detailed below: • *Preliminary Stormwater Management Plan and Drainage Report* • *Site assessment and maps* • *Proposed drainage system and stormwater facilities, including infiltration, detention and water quality.* • *Infiltration testing results* • *Other supporting reports and information (as deemed necessary by the District)* • *BMP Sizing Tool calculations* • *WQRA Boundary Verification or Natural Resource Assessment* The BMP Sizing Tool method is one option to size the stormwater facilities to meet the water quality and flow control performance standards. The BMP Sizing Tool User Guide also includes provisions for site planning to optimize the site layout by preserving natural drainage features and minimizing the impervious area footprint through pervious surfaces or LID facilities.

Summary and Next Steps

The Districts' LID/ GI Strategy as described above in Table 1 outlines existing design, planning, and engineering strategies implemented by WES that prioritize the use of LID/GI for development and redevelopment projects.

In conjunction with development of this LID/ GI Strategy document, in the fall 2023, the District conducted a comparative analysis on the WES SS for adherence to the NPDES MS4 Permit performance standards as outlined in Schedule A.3.e.iii. As a result of the comparative analysis and other identified editorial needs, WES anticipates minor refinement of their standards by the December 1, 2024 compliance deadline. Such refinement is anticipated to include adjustment of site planning requirements for the SPL submittal; clarification regarding the application and use of referenced tools (i.e., BMP Sizing Tool) to meet water quality and flow control performance standards; and terminology around design versus measured infiltration rates and associated, allowable infiltration rates associated with design of SMFs in accordance with the use of a sizing method other than the BMP Sizing Tool.

Finally, as the WES SS and WES RR apply to NPDES MS4 permit coverage areas beyond WES' service area, additional effort related to ongoing application and implementation of the WES SS will occur with partner agencies including Clackamas DTD and the city of Happy Valley.

References

Clackamas Water Environment Services Stormwater Management Program Plan, Clackamas Water Environment Services, November 2022.

NPDES MS4 Phase I Permit, Oregon Department of Environmental Quality, 2023.

Water Environment Services Rules and Regulations, Clackamas Water Environment Services, April 2023.

Water Environment Services Stormwater Standards, Clackamas Water Environment Services, April 2023.

Appendix C: Updated Strategy of Industrial & Commercial Facilities Program

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CLACKAMAS WATER ENVIRONMENT SERVICES INDUSTRIAL STORMWATER SCREENING STRATEGY

CLACKAMAS

WATER ENVIRONMENT SERVICES

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Public Comment Start Date:	October 11, 2023
Public Comment End Date:	November 10, 2023

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Contents

Acronyms

BMP	Best Management Practice
CR2K	Community Right to Know
ECHO	Environmental Compliance History Online
EPCRA	Emergency Planning and Community Right to Know Act
GIS	Geographic Information System
IU	Industrial User, as defined in 40 CFR 403.3(j)
MS4	Municipal Separate Storm Sewer System
NAICS	North American Industry Classification System
NRQ	Non-residential Questionnaire
RCRA	Resource Conservation and Recovery Act
SIC	Standard Industrial Classification
SWMP	Stormwater Management Plan
TRI	Toxics Release Inventory

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UPDATED SCREENING STRATEGY

Schedule A(3)(g) in the September 15, 2021 MS4 Permit (No. 101348) requires all co-permittees, including Clackamas County, Clackamas Water Environment Services ("WES"), and the Cities of Happy Valley and Rivergrove, to continue to implement a program to reduce pollutants in stormwater discharges to the MS4 from industrial and commercial facilities including, at a minimum, the categories of facilities covered in the Sections below. These Section detail a short description, priorities/procedures for inspection and implementation of stormwater control measures, rationale, and tracking/assessment measures.

In response to these requirements, for the City of Happy Valley and for the portions of WES service districts which are regulated by the MS4 permit, including a portion of the City of Rivergrove, an updated Strategy for the industrial/commercial stormwater program is described in this document. The updated Strategy is divided into these five sections:

A. 1200Z-permitted facilities
B. Hazardous waste treatment, disposal and recovery facilities
C. Industrial facilities that are subject to section 313 of SARA title III
D. Facilities subject to Section 313 of the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. 11023
E. Sites flagged by a pretreatment program or Industrial User Survey as potentially contributing, or housing activities that may contribute, pollutants to the MS4; and facilities or activities that have been identified by the co-permittee as potentially contributing a significant pollutant load to the MS4.

Each of these above-noted five sections is addressed separately below.

A. 1200Z-permitted facilities

Description:
Water Environment Services is aware of twenty-four (24) industrial facilities in WES' Service
Areas which are actively covered by the 1200-Z NPDES Industrial Stormwater Discharge General Permit issued by Oregon Department of Environmental quality ("DEQ") issued on March 25, 2021 ("1200-Z Permit")

Priorities and procedures for inspection/implementation of stormwater control measures:
The State of Oregon's DEQ administers the 1200-Z permits in our Service Areas.

For new facilities:
A minimum of one time each year, WES Development Review will review development applications for new industrial sites to determine whether any new facilities would be

subject to a 1200-Z Permit. Alternately, WES may elect to perform this review at the time of post-construction stormwater plan review.
The determination will be based on a review of a facility's proposed activities and the applicable Standard Industrial Classification ("SIC") codes identified in the 1200-Z Permit. If a site is identified as potentially meeting the eligibility requirements of the 1200-Z Permit or the No Exposure Conditional Exclusion Waiver from the requirement to have this permit, WES will notify the facility operator and DEQ of its findings within 30 days.

For existing facilities:
A minimum of one time each year, WES Source Control will review a sub-set of all existing industrial sites in the MS4-permitted portion of the WES SWM Service Area to determine whether any facilities may require, but do not currently hold, a 1200-Z Permit, or a DEQ-approved No Exposure Conditional Exclusion Waiver from this requirement. WES Source Control plans to use the annual WES Rate Zone #2 Industrial Pretreatment Users Survey to conduct this review. WES Source Control will include in the survey questions relating to a facility's eligibility for a 1200-Z Permit. During this process, if WES Source Control identifies an existing industrial site that may require 1200-Z Permit or a NEC waiver, WES Source Control will notify the facility operator and DEQ of its findings within 30 days.

Both new and existing facilities deemed appropriate for 1200-Z Permit coverage would be considered prioritized sites included in WES' Industrial/Commercial Inspection program and inspected for compliance with WES rules and regulations independently from EPA/DEQ program requirements. WES feels these procedures satisfy the permit requirements in Schedule A(3)(g)(i).

B. Hazardous Waste Treatment, Disposal, and Recovery ("TDR") Facilities

Description:
WES is aware of only one facility in our service areas which meets the definition of a Hazardous Waste TDR Facility. This facility, which is owned and operated by Safety Kleen Systems, Inc., is located at 16540 SE 130th Avenue, Clackamas. This facility is currently covered by a 1200-Z Permit by DEQ.

Priorities and procedures for inspection/implementation of stormwater control measures:

WES staff will perform a search of DEQ's Public Permit Records database for TDR facilities and ensure facilities found in the search are included in WES' Industrial/Commercial Inspection program. Hazardous Waste TDR facilities would be considered prioritized sites included in WES' Industrial/Commercial Inspection program and inspected for compliance with WES rules and regulations independently from EPA/DEQ program requirements.

C. Industrial Facilities Subject to Section 313 of SARA Title III

Description:
Facilities that are subject to the requirements in Section 313 of SARA Title III are required to report the following to the U.S. EPA: Air, water, and land discharges of certain toxic chemicals which are used in industrial processes if specified threshold usage levels are exceeded. The data in these reports are added to the EPA's Toxic Release Inventory ("TRI") database. To the best of the District's knowledge, there are seven (7) facilities in WES Service Areas which are currently subject to the reporting requirements of Section 313 of SARA Title III.

Priorities and procedures for inspection/implementation of stormwater control measures:

WES staff will perform a search annually of EPA's TRI database to ensure facilities found in the search are included in WES' Industrial/Commercial Inspection program. Facilities identified in the TRI database that have reportable quantities of toxic chemicals released would be considered prioritized sites included in WES' Industrial/Commercial Inspection program and inspected for compliance with WES Rules and Regulations independently from EPA/DEQ program requirements.

D. Facilities subject to Section 313 of the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. 11023

Description:

Industries that are subject to the requirements of Section 313 of the Emergency Planning and Right-to-Know Act ("EPCRA"), 42 U.S.C. 11023, will be included in WES' Industrial/Commercial Inspection program and inspected for compliance with WES rules and regulations. Section 313 of the EPCRA requires certain facilities manufacturing, processing, or otherwise using listed toxic chemicals to report the annual quantity of such chemicals entering different environmental media.

Priorities and procedures for inspection/implementation of stormwater control measures:

WES staff perform a search of the Oregon State Fire Marshall's Community Right to Know ("CR2K") database which tracks reporting under Section 313 of the EPCRA. Also, WES will perform a search annually of EPA's TRI database to ensure facilities found in the search are included in WES' Industrial/Commercial Inspection program.

Facilities subject to Section 313 of EPCRA would be considered prioritized sites included in WES' Industrial/Commercial Inspection program and inspected for compliance with WES rules and regulations independently from EPA/DEQ program requirements.

E. Other Industrial and Commercial Facilities

Description:
The permit's Schedule A(3)(g)(i) states that the co-permittees must continue to screen existing and new industrial facilities to assess whether they may be subject to the DEQ-issued 1200-Z Permit or have the potential to contribute a significant pollutant load to the MS4.

- New facilities identified as needing 1200-Z Permit coverage will be screened as part of the development review process while under review. Facility owners will be informed of the possible need for coverage based upon intended facility use according to the site's associated SIC code. Both the Facility owner and DEQ will be notified within 30 days of making this determination.
- Existing facilities will also be screened for the need of permit coverage on a routine basis during the permit term; no less than annually. WES' Source Control workgroup will use WES' customer database, Industrial Pretreatment database, Non-Residential Questionnaires ("NRQ"), and other information to screen their existing industrial/commercial customer base for facilities that conduct business that aligns with the SIC codes in *Table 1. Sources Covered*, listed in DEQ's 1200Z permit. Both the Facility owner and DEQ will be notified within 30 days of making this determination.
- Inspection of WES prioritized industrial/commercial sites will occur whether or not they hold a 1200-Z Permit through an inspection program independent of DEQ's permitting process.

Rationale for identifying commercial and industrial facilities as significant contributors:

WES' MS4 Permit, Schedule A(3)(g)(ii)(A), requires providing rationale for identifying "significant contributors." WES has identified selected commercial and industrial facilities as possible "significant contributors" of pollutants by utilizing a prioritization tool to identify properties having a variety of stormwater risk factors where WES will conduct site inspections. Parameters chosen to filter WES' billing database for commercial/industrial properties included the site characteristics (land use, ESUs, class code), 1200Z permit, and WES IPT permit holders. Site specific notations were considered and included in the selections (potential for release, inspection observations, past history, etc.) along with a site exposure profile identifying water quality BMPs onsite and contaminant risk.

When an existing industrial facility has been identified as a potentially significant contributor of pollutants, their potential eligibility for a 1200-Z permit will be assessed by WES, as is required by the permit's Schedule A(3)(g)(i).

Priorities and procedures for the inspection/implementation of stormwater control measures:
WES has initiated an inspection program of prioritized commercial/industrial properties identified in the rationale above, where WES staff will inform selected property owners of a pending site inspection. The site will be given a thorough physical inspection of all stormwater systems on the property and a risk assessment of materials, equipment, vehicles, and practices occurring outside exposed to rainfall. When deficiencies are noted, the property owner will be given a timeline for making corrections, and appropriate enforcement may follow for corrections not made according to WES' Enforcement Response

Plan. An inspection SOP has been updated to reflect the current efforts- titled, *Inspection of Industrial/Commercial Properties, Standard Operating Procedure 7/21/2023*.

Compliance with Schedule A(3)(g)(ii)(C) is accomplished by the evaluation of inspection results of the facilities and if corrections are needed at the site, enforcement actions are initiated. If, during the course of an inspection, deficiencies are noted, the facility owner will be issued a written notice detailing the issues that are out of compliance with a timeline in which to complete corrective action. If necessary, enforcement actions taken by WES will be escalating on a case-by-case basis, in accordance with the WES Enforcement Response Plan.

Staff responsible for making determinations on evaluating and the prioritization of inspected sites are in these positions because they possess many years of broad pollution prevention experience. Experience in Industrial Pretreatment, Erosion Control, Source Control Pollution Prevention site inspections, Natural Resources, Illicit Discharge Response and other disciplines have been prerequisites for these positions and routine training reinforces staff credibility. The determination of training needs will be detailed in a strategy within WES' SWMP document Section COMM 3.1 satisfying permit Schedule A(3)(g)(iii).

Tracking and Assessment

Through WES' Industrial/Commercial stormwater program, staff will maintain records of program activities (inspections, enforcement actions, correspondence, compliance achievement, etc.) through a variety of methods. The primary tool for such record keeping will be WES' Maintenance Management System, Lucity. Staff will complete program activities in Lucity as work orders and inspection reports, which can be recalled creating a year-end tabulation of records for WES' MS4 Annual Report meeting the requirements in A(3)(g)(iv).

Periodic surveys of categories of facilities in Sections A-D above will be tracked and reported in each year's Annual Report to DEQ.

This strategy and appropriate tracking measures will be updated and integrated into WES' SWMP upon approval by Oregon DEQ and as the program is adaptively managed.

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Appendix D: Infrastructure Retrofit and Hydro-Modification Assessment Update

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WES Hydromodification Assessment and Retrofit Assessment Update Template

Section 1: Introduction/Background

Clackamas Water Environment Services (WES or District) 2012 Phase 1 National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer system (MS4) permit (Permit), Schedule A.5 required the District to conduct a hydromodification assessment to examine hydromodification impacts related to MS4 discharges, including erosion, sedimentation and/or alteration to stormwater flow, volume and duration that may cause or contribute to water quality degradation. The assessment and resulting report were required to "identify strategies and priorities for preventing or reducing hydromodification impacts related to the permittees MS4 discharges… and identify or develop effective tools to reduce hydromodification". The report was required for submittal to DEQ by July 1, 2015.

Also included in the 2012 Permit, in Schedule A.6., the District was required to develop a stormwater quality retrofit strategy applicable to developed areas of the District identified as impacting water quality and underserved or lacking stormwater controls. The strategy and resulting plan were required to include "a retrofit control measure project or approach priority list, including rationale, identification and map of potential stormwater retrofit locations where appropriate, and an estimated timeline and cost for implementation of each project or approach." As with the hydromodification assessment, the plan was also due to DEQ by July 1, 2015.

Schedule A.3.h of the District's 2021 NPDES MS4 Permit requires permittees by December 1, 2023, to "consider the impacts of policy, capital improvements, and retrofit projects on MS4 discharges to receiving waters, considering the goals and proposed actions described in the 2012 permit's Hydromodification Assessment and Stormwater Retrofit Plan (i.e., the 2015 submittals). Specifically, permittees are required to prepare "an assessment of any outcomes related to the Hydromodification Assessment and Stormwater Retrofit Strategy Reports." This assessment is required to include the following:

1. An assessment of how the Hydromodification Assessment and Stormwater Retrofit Strategy have been used, considered, or implemented since the time the reports were completed (see Sections 2.1 and 3.1);
2. Progress toward or completion of projects identified in the Retrofit Strategy priority list, and a qualitative assessment of the benefits of those projects (see Section 2.2);
3. Description of any further actions taken as a result of the Hydromodification Assessment, and a rationale for those actions since the writing of the reports (see Section 3.3);
4. Narrative describing progress toward addressing gaps in the hydromodification information or data related to waterbodies within the permittees' jurisdiction as identified in the Hydromodification Assessment (see Section 3.2); and,

5. New goals, tools, priorities, and planned or potential projects for addressing ongoing hydromodification and/or water quality impacts resulting from historical development/infrastructure, and for improving retrofit planning, considering information gathered in the time since the completion of the reports (*see* Sections 2.3 and 3.4).

The Permit requires the permittees to document this assessment in the third annual report (i.e., the 2023 annual report) as an appendix or subsection. This documented assessment was prepared to fulfill this requirement.

Section 2: 2015 Retrofit Strategy Summary

1.1 - What was included in the Retrofit Strategy and how has it been used, considered, or implemented since 2015?

Incorporating water quality facilities into the existing stormwater system is known as a stormwater treatment retrofit. The 2015 WES Stormwater Retrofit Plan (Retrofit Plan) documented the District's stormwater retrofit objectives and identified retrofit opportunities (projects) for future implementation.

The District's Retrofit Plan identified the following objectives:

- Reduce water quality impacts resulting from development and historic urbanization.
- Reduce hydrologic impacts resulting from development and historic urbanization.
- Provide education and outreach to District customers.
- Reduce recurring flooding related to stormwater infrastructure.

These objectives aim to improve and protect water quality and reduce the impacts of urbanization on hydrology in District streams. The District's retrofit strategy was developed in alignment with goals that had previously been set forth in the District's Watershed Action Plans (WAPs) for Kellogg/Mt Scott Creeks and Rock Creek. These WAPs were completed in 2009 to help improve water quality and restore, enhance, and protect watersheds. They included basin-specific strategies to prioritize activities and investments in watershed management.

Four types of ongoing retrofit measures are described in the Retrofit Plan including: 1) retrofit of detention ponds for water quality treatment historically constructed for flood control purposes in accordance with WES' Stormwater Facility Retrofit and Performance Optimization Program;
2) instream restoration projects in accordance with the WAPs; 3) development plan review and permitting, applying the District's Rules and Regulations and Stormwater Standards to new and redevelopment projects; and 4) retrofit execution as part of education and outreach activities (e.g., rain gardens addressing runoff from school or church roofs or parking lots).

The Retrofit Plan states the District will identify retrofits on an annual basis such that they can be included in the program budget. The Retrofit Plan references completion of the Carli Creek Water Quality and Habitat project in 2016 and includes a plan to complete two detention pond retrofits on average each year, and one instream restoration project on average each year. The status of project implementation is provided in Section 2.2.

As documented in the Retrofit Plan, retrofit projects will be evaluated and ranked based on the following information:

1. Watershed Action Plan High Priority Reaches
2. Impervious Area & Land Use
3. Age of Treatment Facility
4. Flood Prone Areas

2.2 - What progress has been made toward completion of projects identified in the Retrofit Plan, and what have been the benefits of those projects?

As detailed in the 2015 Retrofit Plan, retrofit projects will be identified and completed annually (on average) to reflect District's objectives to: 1) reduce water quality impacts resulting from development and historic urbanization; 2) reduce hydrologic impacts resulting from development and historic urbanization; 3) provide education and outreach to District customers; and 4) reduce recurring flooding related to stormwater infrastructure.

Projects detailed in Table 1 include referenced, retrofit projects scheduled for completion following submittal of the 2015 Retrofit Plan, as well as additional projects completed since 2015 in accordance with the implementation of the Retrofit Plan. Projects listed also include those with a hydromodification benefit, as discussed in Section 3.

Table. 1 Completed and Planned Retrofit/Hydromodification Projects				
Project Name	**Status**	**Construction Date**	**Project Features/ Benefits**	**Hydromodification Mitigation? (Y/N)**
Completed Projects				
Clackamas High School Stormwater Planter	Complete	2015	Improved water quality Education and outreach	N
Mountain Sun Pond Retrofit	Complete	2017	New outlet structure Improved hydrologic control Reduced recurring flooding	Y
Sunnyside Village Green/Opti Installation	Complete	2017	Retrofit with Opti Real Time Control Improved hydrologic control	Y
Happy Valley Regional Pond A/Opti	Complete	2017	Retrofit with Opti Real Time Control Improved hydrologic control	Y
Happy Valley Regional Pond B/Opti	Complete	2017	Retrofit with Opti Real Time Control Improved hydrologic control	Y
5 Detention Ponds Rehabilitation	Complete	2018	Restored treatment and flow control performance	N
Carli Creek Water Quality and Habitat Project	Complete	2017/2018	Improved water quality Education and outreach Improved habitat and stream channel stability	Y
ClackaCraft Rain Garden (RiverHealth Stewardship Project)	Complete	2019/2020	Improve water quality, Outreach	
Planned Projects				
CIP 1005 - SE Wildlife Estates Dr. Ditch Inlet & Upstream Detention	In Progress	2024/2025	Reduce erosion and improve habitat in Tributary C of Kellogg Creek Reduce flooding of road and private property Improve water quality in Kellogg Creek Reduce maintenance requirements for WES staff	Y
CIP 1055 - Thiessen Culvert Replacement & Kellogg Creek Restoration	In Progress	2024/2025	Prevent flooding of private property Prevent flooding of roadway Improve fish passage	Y
CIP 1079 - Aldercrest Culvert Replacement & Kellogg Creek Restoration	In Progress	2024/2025	Reduce flooding Improve fish and wildlife habitat	Y

Table. 1 Completed and Planned Retrofit/Hydromodification Projects				
Project Name	**Status**	**Construction Date**	**Project Features/ Benefits**	**Hydromodification Mitigation? (Y/N)**
3Creeks	In Progress	2024/2025	Reduce downstream flooding. Reconnect Mt. Scott to floodplain Improve habitat Improve bank erosion Improve water quality in Mt. Scott Creek Education and Outreach	Y
CIP 1091 - SE Clackamas Road Drainage Infrastructure	In Progress	2024/2025	Reduce flooding on roadway and private property. Improve habitat and stream channel stability.	Y

2.2 - What are the new goals, tools, priorities and planned or potential projects for improving retrofit planning to address water quality impacts resulting from historical development/infrastructure?

The District anticipates continuation of its retrofit strategy in conjunction with the following plans and activities. In-progress and pending future retrofit projects are also identified in Table 1.

2.3.1 Storm System Master Plan Update and Project Implementation

The District completed the Storm System Master Plan (Master Plan) in 2022, providing recommendations for the implementation of stormwater capital improvement projects (CIPs) and programmatic system improvements. The Master Plan built upon the work completed in the WAP. A total of 10 capital projects and 5 Programs are scheduled for implementation over the next 10 years as specified in the Master Plan. Per the Master Plan, stormwater capital projects were prioritized based on various criteria, including the following that support water quality retrofit initiatives:

- Pollutant Reduction
- Treated Land Use
- Acres Treated

Capital projects will continually be prioritized and scheduled to support water quality and hydromodification objectives. Proposed capital projects with a retrofit/water quality focus are detailed in Table 1.

2.3.2 Stormwater Pond Repair/Rehabilitation Program

A budget line item is included in the Master Plan for a Stormwater Pond Repair and Rehabilitation Program. This program will provide an ongoing funding mechanism to support repair and rehabilitation of stormwater quality and flow control facilities. Repair and rehabilitation extend the life and function of these assets, delays the need for asset replacement, maintains water quality treatment functions, and maintains flow control functions that prevent increases in erosive runoff discharging to stream channels. Within this program, WES will identify potential pond retrofit opportunities on a case by case basis.

2.3.3 Water Quality Retrofit Program

A budget line item is included in the Master Plan for a Water Quality Retrofit Program. Water quality retrofits generally include new facilities in unserved areas or enhancements which add or increase water quality treatment within existing stormwater infrastructure. New facilities serving existing impervious surfaces may be placed in the right-of-way or on public property. Enhancements of existing facilities could include installation of cartridge filter systems, conversion of swales to rain gardens or wet ponds, and other improvements to stormwater facilities or conveyance systems where water quality treatment is either inadequate or can be significantly improved. This program

will provide an ongoing funding mechanism to support various retrofit projects where a clear benefit to a nearby stream has been identified.

Section 3: 2015 Hydromodification Assessment Summary

3.1 What were the results of the Hydromodification Assessment? How has it been used, considered, or implemented?

The District's 2015 Hydromodification Assessment confirmed that hydromodification impacts have occurred and continue to occur throughout the District's watersheds. A lack of large wood supply, lack of riparian vegetation, and urbanization have contributed to channel straightening and modified hydrology. As a result of these impacts, channel incision has been observed at various locations throughout all monitored watersheds.

The District conducts a stream health monitoring program that incorporates four factors: water quality, hydrology (continuous flow), biology (benthic macroinvertebrates), and physical habitat (geomorphic monitoring). WES also conducts erosion control program monitoring at locations throughout the District. The water quality and flow monitoring occur throughout the year each year. The macroinvertebrate and geomorphic monitoring occur approximately every three to four years, most recently during 2021-22. The last round of macroinvertebrate/geomorphic monitoring covered 55 miles of stream length on 19 tributaries. The geomorphic monitoring program was revised this round. The reconnaissance-level methods developed for this monitoring effort emphasized collection of rapid stream measurements and observations to inform the degree of past and ongoing channel changes in response to stream disturbance. Each surveyed reach was evaluated for current stream condition and its stage according to the Stream Evolution Model (SEM) of Cluer and Thorne (2014) to determine its inferred trajectory of change. Current stream condition was based on four geomorphic/riparian condition categories: stream entrenchment, floodplain connectivity, complexity, and riparian cover.

Physical habitat findings

Entrenchment is mixed throughout the study watershed, with six, five, and eight streams in the high, medium, and low entrenchment categories, respectively. Most of the streams have a notably high incision potential based on their SEM stage and substrate erodibility, which means the general trajectory is likely worsening. Only four streams are classified as having low incision potential due to bedrock exposures in the streambed. Restoration actions to improve highly entrenched streams range from placement of beaver dam analogues and large wood to reducing erosive energy through added connectivity through grading or channel filling.

Stream complexity scoring is almost entirely in low to moderate categories, with only two streams (Carli and Mt. Scott Creeks) having high complexity scores. These general patterns indicate that wood and pools are limited in the assessed streams. However, general trajectories were assessed to be positive based on relatively extensive canopy cover, which implies a relatively high potential for future wood recruitment and pool scour. Actions to improve complexity include placing beaver dam analogues, large wood placement, and maintaining/restoring riparian zones.

Floodplain connectivity scoring revealed that most streams were either in low to moderate categories, with only three (Carli, Richardson, and Wilson) falling in the high category. In general, these findings suggest that connection to adjacent wetlands and side channels is limited and could be improved through restoration efforts. Actions discussed in categories above (e.g. grading, beaver dam analogue placement, LWD placement) offer potential solutions to adding connectivity.

Riparian condition throughout the assessed streams are generally low to moderate. Only Fields Creek and Unnamed Tributary 2 scored in the high condition category. The general prevalence of low to moderate scores reflects the broad presence of invasive plant species in the riparian zones of most (~80%) monitoring locations. In contrast, canopy coverage is relatively high along the study streams, with the exceptions being Cow, Phillips, and Trillium Creeks where canopy coverage is less than 40%.

General management approaches were developed for each stream based on its current condition and trajectory scores. See Table 7 in Stream Health in Surface Water Areas Served by WES, June 2022 https://dochub.clackamas.us/documents/drupal/626d2fb3-f993-4f1e-a4a6-0b03604b2acd.

Overall stream health was also assessed according to the four categories hydrology, water quality, physical habitat, and biology. The nineteen streams can be organized into three broad categories:

- Higher health streams include Richardson, Wilson, Rock, Fields, and Pecan creeks. In general, these creeks have relatively low impervious areas (<20%), mixed water quality scores, moderate to high physical habitat scores, and macroinvertebrate communities with slight to moderate disturbance.

- Mixed health streams include Tate, Mt. Scott, Unnamed Tributaries 2 and 4, Shipley, Trillium, Carli, Cedar, and Sieben creeks. These creeks have mixed scores in all categories (without consistently low or high scores).

- Low health streams include Saum, Athey, Cow, Kellogg, and Phillips creeks. These creeks have consistently low scores in all or most sub-indices.

In general, watersheds with high and recent development pressure were found most likely to experience hydromodification, water quality, and stream habitat impacts. Summary of overall stream health condition is found in Table 11 of Stream Health in Surface Water Areas Served by WES, June 2022 https://dochub.clackamas.us/documents/drupal/626d2fb3-f993-4f1e-a4a6-0b03604b2acd.

Prior to the completion of the 2015 Hydromodification Assessment, the WAPs already included ongoing strategies to address hydromodification impacts. These strategies have been implemented by the District on an ongoing basis and include implementation of stormwater design standards to promote LID; erosion and sediment control practices in areas at high risk for erosion and more frequent inspections in these areas; stream buffer requirements to improve riparian conditions around stream channels; detention pond retrofits for older detention facilities in order to provide flow

control and treatment for smaller storm events; and a restoration program to increase upland tree canopy in watersheds.

To supplement the WAPs, the 2015 Hydromodification Assessment included a variety of recommendations, which have been continuously supported (see Section 3.3) and include:

1. Continuing and, where appropriate, enhancing current programs such as the Stream Corridor Protection Program, Better Site Design Program, and Erosion and Sediment Control;
2. Continuing use of monitoring data to inform and adaptively manage the surface water program, as well as confirm trends and changes to instream water quality and physical stream condition, helping inform and reduce the impacts of urbanization on hydrology in District streams;
3. Continuing use (and refinement) of flow-duration based stormwater design standards to encourage Low Impact Development (LID) techniques that promote infiltration and prevent erosive flows due to changed hydrology from development; and
4. Funding of stream corridor protection projects through the RiverHealth Stewardship Grant Program, as well as through other capital projects with restoration elements.

In addition, outcomes from the Hydromodification Assessment have informed the identification and prioritization of capital projects as part of the District's 2022 Master Plan update and capital improvement program (see Table 1 and Section 2.3), as well as updates to design standards and code/policies. Additional details on the updates to design standards and code/policies is provided in Section 3.3 of this assessment.

3.2 Were there any identified gaps in the hydromodification information or data related to waterbodies within the City's jurisdiction and, if so, what progress has been made in addressing gaps?

While the District's Hydromodification Assessment did not identify any gaps in information or data, WES intends to continue its periodic monitoring and evaluation of stream health. The update will guide future stream corridor protection and stormwater system improvements to reduce ongoing impacts of hydromodification.

In addition, WES will continue to use the stream health monitoring data to inform and adaptively manage the surface water program to meet WES' over-arching goals to improve and protect water quality and reduce the impacts of urbanization on hydrology in District streams.

3.3 What further actions have been taken as a result of the Hydromodification Assessment, and what was the rationale for those actions?

In accordance with recommendations made in the 2015 Hydromodification Assessment, the following activities have been continued to address hydromodification as follows:

- Stormwater Design Standards
- Erosion Control Program
- Ongoing Monitoring Activities
- Stream Corridor Protection, Restoration and Property Acquisition

- Stormwater Improvements
- Storm System Master Plan

Stormwater Design Standards: The District adopted their Rules and Regulations and Technical Stormwater Design Standards in June 2023 for consistency with the District's current NPDES MS4 permit and to require use of infiltration. The stormwater design standards establish a preferred strategy to infiltrate and use of infiltration-based facilities (i.e., Green Stormwater Infrastructure) and vegetated stormwater standards to the maximum extent practicable. The updated Standards also require that flow control facilities are designed for peak flow and flow duration matching to mitigate hydromodification risk.

Erosion Control Program: The District updated its Erosion Prevention and Sediment Control Planning and Design Manual in June 2020. Erosion control inspections are prioritized based on proximity of site to sensitive areas, size of site, slope of site, time of year, nature of construction activity, and type of development occurring. On average, construction sites are inspected monthly.

Ongoing Monitoring Activities: The District, with other Clackamas co-permittees, updated its Coordinated Clackamas County Monitoring Plan (CCCSMP) in 2023 for consistency with the current NPDES MS4 permit. In addition to required stormwater-related sampling and monitoring, the District conducts physical condition monitoring in conjunction with its macroinvertebrate sampling efforts (as described above as part of stream health monitoring). WES completed physical habitat & macroinvertebrate monitoring in 2021-22 and plans to repeat the monitoring in 2024-25.

Stream Corridor Protection: A budget line item is included in the Master Plan for the Restoration and Property Acquisition Program. This program would fund one to five largescale in-stream restoration projects and property acquisition to support habitat and restoration projects. These projects restore the ecological and stormwater benefits of the properties, supporting habitat improvement, and floodplain management. Additional stream corridor restoration projects are identified in Table 1.

Stormwater Improvements: A budget line item is included in the Master Plan for Small Drainage Repairs and Stormwater Pond Repair and Rehabilitation. When possible, projects identified within these programs will include elements to improve flow control and hydromodification issues. Stormwater capital and retrofit projects with a hydromodification benefit are identified in Table 1.

Storm System Master Plan Implementation: WES will implement the Master Plan over the next 10 years. As noted above, several large CIP and Programs within the Master Plan meet the goals of the WES Retrofit and Hydromodification strategies.

3.4 What are the City's new goals, tools, priorities, and planned or potential projects for addressing ongoing hydromodification?

Ongoing and new goals to address hydromodification impacts, specific to design standards and programs are outlined in Section 3.3 above.