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CLACKAMAS
WATER
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CLACKAMAS
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GREGORY L. GEIST | DIRECTOR

Water Quality Protection
Surface Water Management
Wastewater Collection & Treatment

November 1, 2025

Ms. Sarah Mattecheck
Sandy, Clackamas, and Molalla Basin Coordinator
700 NE Multnomah St.
Portland, OR 97232
Sarah.Mattecheck@deq.oregon.gov

RE: 2024-25 Annual Report, Nonpoint Source Total Maximum Daily Load Implementation Plan for the Molalla-Pudding Rivers, Sandy River, Tualatin River, and Willamette River Watersheds

Dear Ms. Mattecheck:

Attached please find the 2024–25 Annual Report for the DEQ-approved 2022 Nonpoint Source TMDL Implementation Plan (NPS TMDL IP). The plan is collaboratively implemented by Clackamas County, Clackamas Water Environment Services, and the Cities of Happy Valley and Rivergrove.

The NPS TMDL IP is periodically revised to incorporate an enhanced understanding of program effectiveness, available resources, and current watershed conditions and to comply with the Order that accompanies a revised TMDL. The 2022 NPS TMDL IP was in effect for the entire annual report period which ended on June 30, 2025. The revised 2023 NPS TMDL IP was submitted to DEQ in October 2023 and was approved by DEQ on May 14, 2025. Because the approval occurred late in the reporting cycle, we continued implementing the 2022 NPS TMDL IP through June 30, 2025, and began full implementation of the 2023 NPS TMDL IP on July 1, 2025.

Per Table 13-15 in the final Revised Willamette Basin Mercury TMDL and WQMP, Designated Management Agencies had four and a half years to adopt legal authority that allows for Construction Site Runoff Control. The County through the Department of Transportation and Development (DTD) is undergoing the process of adopting legal authority for county-wide erosion control permitting and is in the final stages of development and, ultimately, implementation of a revised Erosion Prevention and Sediment Control permitting program, i.e., permitting, inspection and enforcement. On September 30, 2025, the County's plan was outlined to the Board of County Commissioners, who directed staff to hold hearings on the additions to County Code that would allow DTD staff to implement the program. The first ordinance adoption hearing was held on October 16, 2025, and the second hearing was held on October 30, 2025. The County anticipates the erosion control permitting program changes will be effective February 1, 2026.

Please, let me know if you have any questions.

Best regards,

Ronald E Wierenga

Ron Wierenga
Deputy Director
Clackamas Water Environment Services

Cc: Greg Geist, Director, Clackamas Water Environment Services
Dan Johnson, Director, Dept. of Transportation and Development
Jason Tuck, City Manager, City of Happy Valley
Analeis Weidlich, City Manager, City of Rivergrove

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NON-POINT SOURCE TOTAL MAXIMUM DAILY LOAD IMPLEMENTATION PLAN FOR THE TUALATIN, WILLAMETTE, MOLALLA-PUDDING, AND SANDY RIVER WATERSHEDS

2024-25 ANNUAL REPORT

Clackamas County, Clackamas Water Environment Services,
And the Cities of Happy Valley and Rivergrove

November 1, 2025

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1. Introduction

The federal Clean Water Act, section 303, requires states to develop water quality standards to support beneficial uses of public waterways. A waterway, or portion of a waterway, that does not meet water quality standards is listed as impaired for the pollutant on the 303(d) list of water quality limited waters. The State of Oregon, through the Oregon Department of Environmental Quality (DEQ), is required to develop total maximum daily loads (TMDLs) to determine how to meet water quality standards for listed pollutants. Each TMDL identifies the maximum amount of a specific pollutant that can enter a waterway so that it can meet water quality standards. After extensive water quality monitoring and modeling efforts, TMDLs establish the difference between the loading capacity and the current pollutant load. TMDLs are expressed as numeric standards or percent pollutant reductions that need to be met to bring waterways into compliance with water quality standards. The difference between the current load and the loading capacity is known as excess load. The excess load is divided between the different sources of pollution according to their contribution to the overall pollution load. Any difference between the waterway's loading capacity and the current pollutant load must be mitigated by pollution reduction activities. The DEQ develops wasteload allocations (WLA) for permitted point sources, such as wastewater treatment plants, stormwater runoff from larger urbanized areas, and industrial discharges, and load allocations (LA) for non-point source (NPS) pollution from agricultural, rural residential, and forestry lands; the smaller non-permitted urbanized areas are also regulated as a NPS.

The Oregon Administrative Rule (OAR) 340-042 regulates TMDL development and implementation and requires local governments and other agencies to develop and implement TMDL Implementation Plans for non-point sources. Responsible parties, such as state agencies, counties, cities, and other organizations that implement pollution reduction strategies, are classified as Designated Management Agencies (DMAs). This 2024-25 annual report is for our DEQ-approved 2022 Non-Point Source (NPS) TMDL Implementation Plan (IP), which includes Management Strategies and other activities that are being implemented to protect and improve surface water quality in the Sandy, Tualatin, Molalla-Pudding, and Willamette River watersheds within Clackamas County.

As is required by OAR 340-042-0080, implementation plans must include the following five elements:

- Management Strategies that will be used to reduce pollutant loading and eventually achieve load allocations
- A timeline for implementing management strategies and a schedule for completing measurable milestones
- Performance monitoring with a plan for periodic review and revision of the implementation plan
- Evidence of compliance with applicable statewide land use requirements
- Any other analyses or information as specified in the TMDL's Water Quality Management Plan

1.1 Co-Owners of this Annual Report's Implementation Plan

This IP for the Sandy, Tualatin, Molalla-Pudding, and Willamette River watersheds is co-owned by the following four DMAs:

- Water Environment Services (WES), which is an intergovernmental entity organized under Oregon Revised Statutes (ORS) 190. Clackamas Water Environment Services, a Dept. of Clackamas County, administers the WES Partnership. The WES Partnership includes two separate Clackamas County Service Districts: the Surface Water Management Agency of Clackamas County (SWMACC) and Clackamas County Service District #1 (CCSD #1), which together comprise the WES Surface Water Management (SWM) Service Area. Because Water Environment Services administers the WES Partnership, the name Clackamas WES will often be used in this document when references are made to this area and to this intergovernmental entity.
- Clackamas County, including but not limited to the Department of Transportation and Development (DTD)
- City of Happy Valley
- City of Rivergrove

In this annual report and in the 2022 NPS TMDL IP, these units of local government are collectively referred to as the Co-Owners of the IP. In previous years, going back to 2003 in the case of the Tualatin River TMDL IP, the Co-Owners of this IP have maintained four separate IPs, each of which only applied to one watershed. In the 2022 NPS TMDL IP, the Co-Owners of the IP chose to implement their non-point source TMDL management strategies for all four TMDL watersheds in one shared IP.

For the previous and current IPs, the jurisdiction associated with each IP and TMDL is summarized in Table 1 below:

Table 1. TMDL IP Jurisdiction and Important Dates

	Tualatin River Watershed TMDL IP	Willamette River Watershed TMDL IP	Molalla-Pudding River Watershed TMDL	Sandy River Watershed TMDL IP
TMDL IP Original Submission and Revision Dates	• August 7, 2003 • Revised March 31, 2008 • Revised January 6, 2011 • Revised February 2014 • Revised September 2022	• June 8, 2009 • Revised January 7, 2011 • Revised September 2022	• February 2012 • Revised September 2022	• March 25, 2008 • Revised September 2022
Designated Management Agencies for each watershed	• SWMACC (WES) • Clackamas County • City of Rivergrove	• Clackamas County • Clackamas County Service District No. 1 (WES) • City of Happy Valley	• Clackamas County	• Clackamas County

2. Management Strategies

This 2024-25 annual report includes information about the implementation of the 2022 NPS TMDL IP's Management Strategies, which are expected to reduce TMDL pollutants from non-point sources to address LAs.

Efforts to reduce TMDL pollutants from point sources – such as a wastewater treatment plant's effluent or discharges from a NPDES-permitted MS4 (municipal separate storm sewer system) – to achieve waste load allocations are addressed separately by NPDES permits issued by the DEQ and they are not addressed by or included in this annual report.

To comply with DEQ NPS requirements for TMDL IPs (provided in OAR 340-042-0080(4)), the Management Strategies and other information provided here in this annual report address each pollutant within the following TMDLs over which Clackamas County, the Clackamas WES SWM service

area, and the Cities of Happy Valley and/or Rivergrove have jurisdiction:

- **Tualatin River TMDL:** water temperature, *E. coli (*bacteria), total phosphorus, dissolved oxygen (DO), and mercury.
- **Willamette River TMDL**: water temperature, *E. coli (*bacteria), mercury, and DDT/Dieldrin (only in the Johnson Creek watershed).
- **Molalla-Pudding River TMDL:** water temperature, *E. coli (*bacteria), mercury, and DDT/Dieldrin and iron (only in the Pudding River).
- **Sandy River TMDL:** water temperature. An *E. coli* TMDL also applies in the Cedar Creek watershed, which is a tributary to the Sandy River.

2.1 Revised Willamette River Mercury TMDL and the 2022 NPS TMDL IP

The February 2021 revised Willamette River mercury TMDL replaced the original 2006 mercury TMDL for the Willamette River. The 2021 revised mercury TMDL fully applies throughout the Willamette River Basin, including in the Tualatin River and Molalla-Pudding sub-basins. The adoption of this revised TMDL by the United States Environmental Protection Agency (EPA) initiated a requirement for DMAs in the watershed to update their IPs to address the new requirements within the 2021 revised mercury TMDL. Our DEQ-approved 2022 NPS TMDL IP was updated to address the revised Willamette River Mercury TMDL's requirements.

3. TMDL Watersheds

This section includes a summary of the 2022 NPS TMDL IP's watersheds. The 2022 NPS TMDL IP incorporates efforts to improve water quality in the Sandy River and the Willamette River and its tributaries in Clackamas County.

The major watersheds of Clackamas County are shown in Figure 1 and summarized in Table 2 (below). A large portion of Clackamas County is drained by the Willamette River and its tributaries, including the Clackamas, Molalla, Pudding, and Tualatin River and creeks such as Johnson Creek. Nearly all of the remaining lands are drained by the Sandy River, which enters the Columbia River in the City of Troutdale. A small portion of Clackamas County appears to be located in a section of the Santiam River's watershed; however, these lands are owned by the United States Forest Service, so Clackamas County doesn't address these lands in the 2022 NPS TMDL IP.

Tualatin River Watershed

Stormwater enters the Tualatin River and tributaries in the Tualatin TMDL's geographic area in Clackamas County from areas regulated by the MS4 Permit program as well as from areas that are not regulated under the MS4 program. Figure 2 shows the MS4 permit area in Clackamas County (i.e., incorporated cities or service areas of WES within the UGB). The DEQ considers these MS4-permitted storm sewer outfalls as point sources, and as a result, they are not addressed in this IP. WES is aware of five outfalls that are regulated by the Clackamas County Group's MS4 Permit that are located in the SWMACC's (Surface Water Management Agency of Clackamas County) MS4-Permitted area. SWMACC's boundaries are shown in Figure 3. It is our understanding that a few pockets of rural unincorporated land in the SWMACC, which are within the Portland metro area's UGB, are also regulated by the MS4 Permit. SWMACC's land uses in the Tualatin River Watershed are shown in Figure 4. Note that the SWMACC is a Clackamas County Service District administered by Clackamas WES, a department of Clackamas County. The SWMACC was created in 1992 for the specific purpose of addressing the Tualatin TMDLs. The SWMACC's boundaries include the following areas: I) All of the unincorporated properties in the Tualatin River Watershed which are in Clackamas County, and II) The

portion of the City of Rivergrove which is located in Clackamas County.

Willamette Watershed

Stormwater enters the Willamette River and tributaries (in the TMDL geographic area) from areas which are and aren't regulated by the MS4 Permit, as shown in Figures 1 and 2. Land uses within the Willamette River watershed are shown in Figure 5.

Molalla-Pudding River Watershed

There are no Clackamas County-owned MS4-Permitted stormwater outfalls within the Molalla-Pudding sub-basin. Land uses within the Molalla-Pudding Watershed are shown in Figure 6.

Sandy River Watershed

The Sandy River watershed is not included in the Clackamas County Group MS4 Permit area. Land uses within the Sandy River Watershed are shown in Figure 7.

Clackamas River Watershed

Stormwater enters the Clackamas River and tributaries from areas which are and aren't regulated by the MS4 Program, as shown in Figures 1 and 2. Land uses within the Clackamas River watershed are shown in Figure 8.

Table 2. Clackamas County Watersheds

Clackamas County Watersheds	Total acres in Watershed	Watershed in Clackamas County, acres	Percent of Watershed in Clackamas County
Clackamas	602,634	542,940	90
Molalla-Pudding	560,301	305,056	54
Tualatin	453,675	12,335	3
Sandy	559,568	235,524	42
Middle Willamette	455,040	74,276	16
Lower Willamette	412,165	33,576	8
Total	3,044,113	1,203,707	40

4. Implementation Responsibility

Clackamas WES plays a leading role in writing, reporting, and implementing portions of the 2022 NPS TMDL IP in the WES SWM service area. General responsibilities of WES, other Clackamas County departments, and the Cities of Happy Valley and Rivergrove related to this TMDL are outlined in Table 3 (below).

Other than the Cities of Happy Valley and Rivergrove, the 2022 NPS TMDL IP does not address or include lands that are in cities. Those cities address their own TMDL requirements.

Table 3. WES, County, and City Responsibilities		
Jurisdiction	**Jurisdictional Area**	**NPS TMDL Implementation Plan Responsibility**
Clackamas WES	Limited to WES' SWM service area	Administers SWMACC and CCSD #1, both of which are all-purpose stormwater management entities. [a]
Clackamas County: DTD	County-wide	Includes planning and road maintenance and engineering. Examples include riparian area land use and other private property land uses, county-maintained road maintenance, and illegal dumping of solid waste on private property.
City of Rivergrove	Within city limits only	Mostly limited to land use authority. Most stormwater management functions are provided by WES/SWMACC & DTD on behalf of the City. [a]
City of Happy Valley	Within city limits only	Roads, erosion control permitting, tree ordinance, and land use. Other stormwater management functions are provided by WES on behalf of the city.

[a] Clackamas WES does not provide SWM services in the portion of the City of Rivergrove that lies within Washington County, and only provides a small number of services (ERCO permitting of construction sites, for example) in the Boring, Fisher's Forest Park, and Hoodland subunits of CCSD #1.

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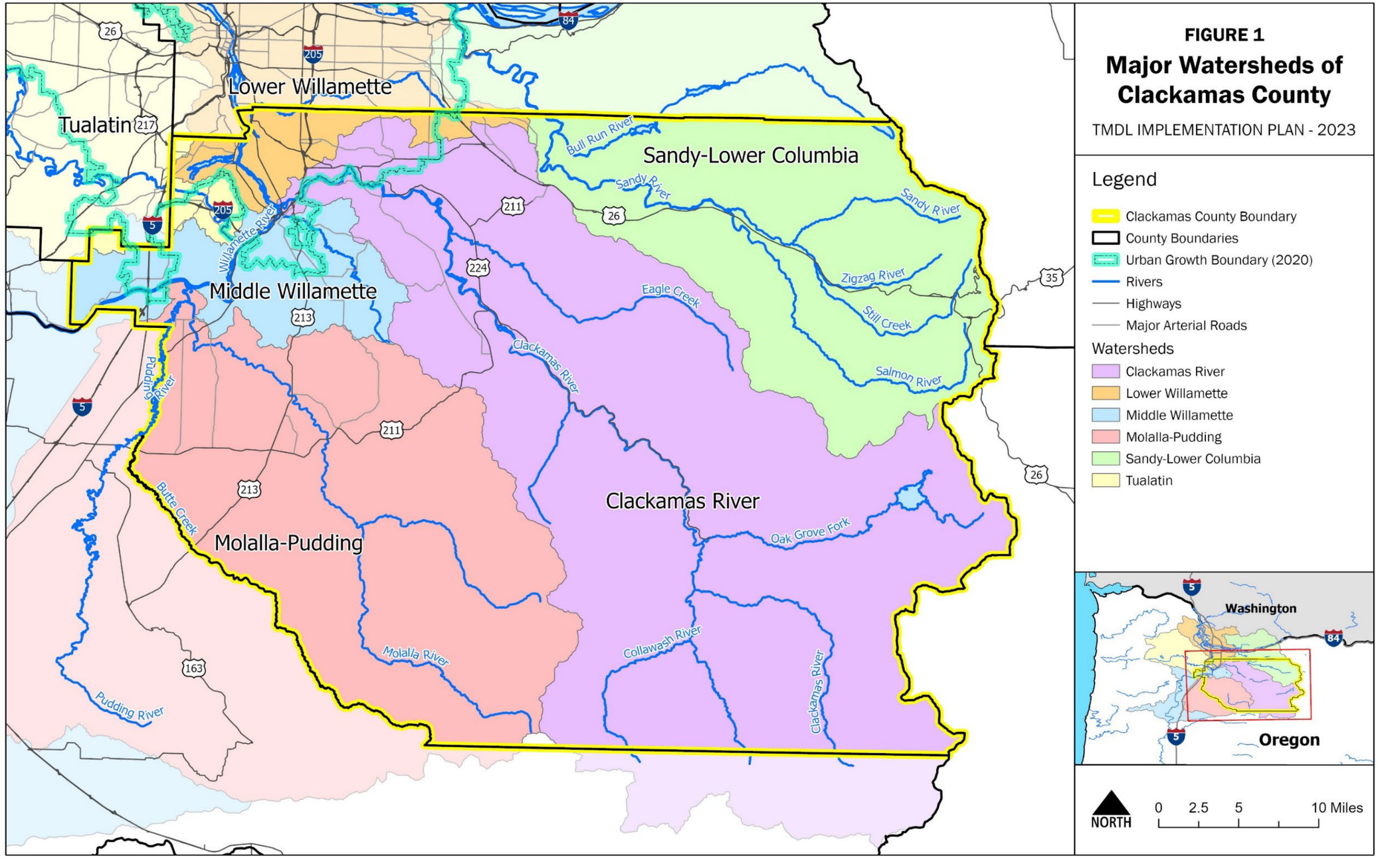

Figure 1. Major Watersheds of Clackamas County

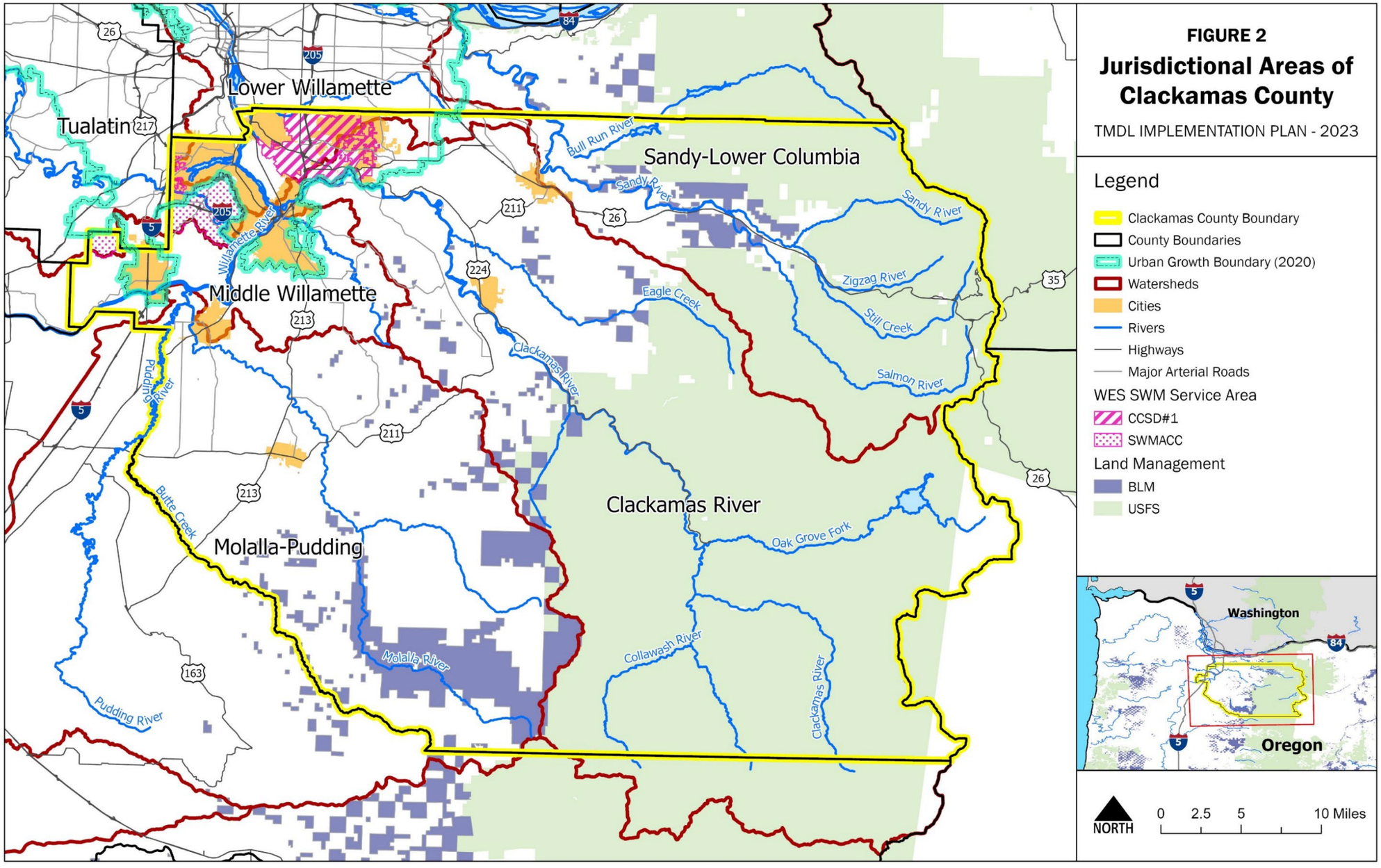

Figure 2. Jurisdicational Areas of Clackamas County

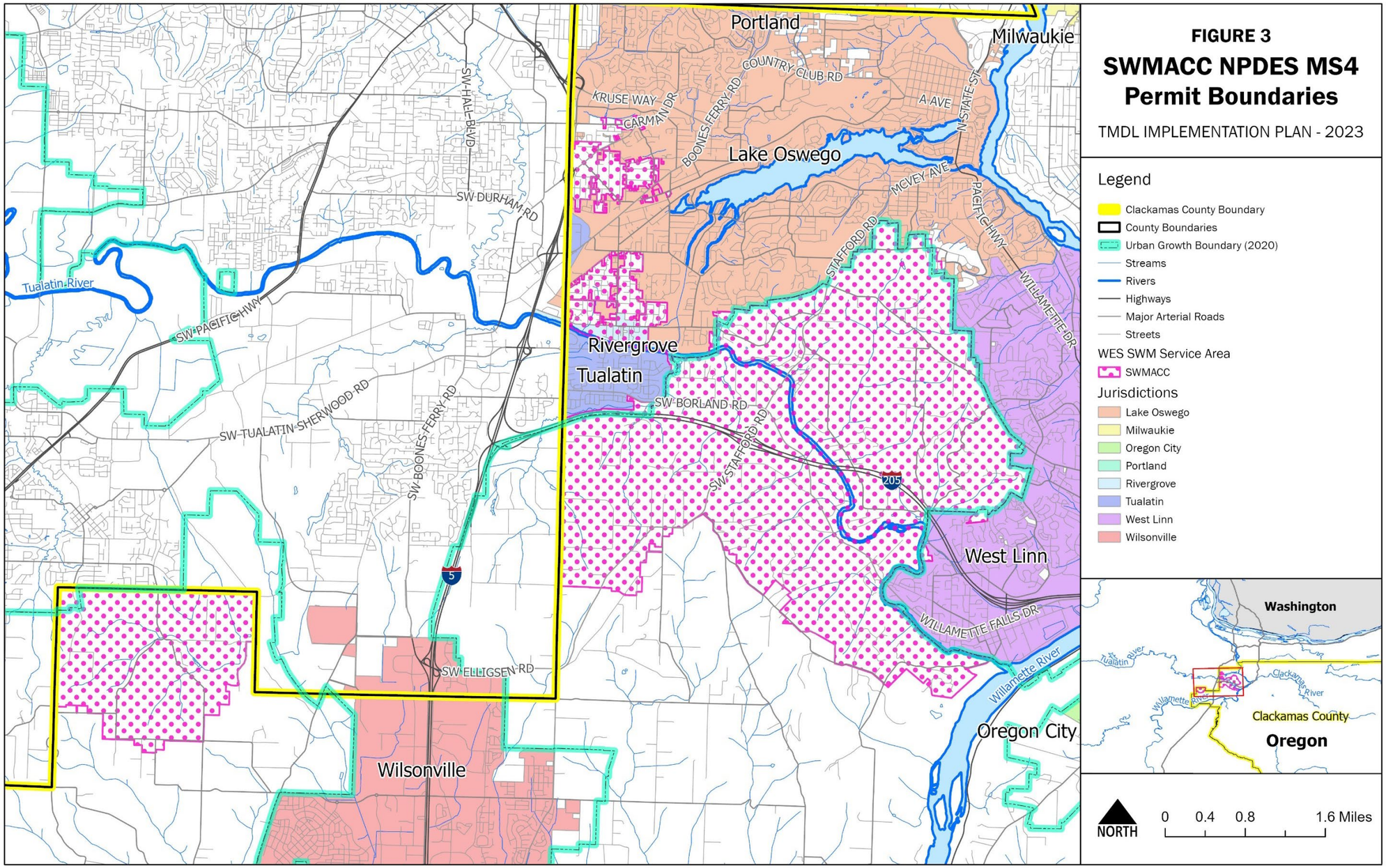

Figure 3. SWMACC NPDES MS4 Permit Boundaries

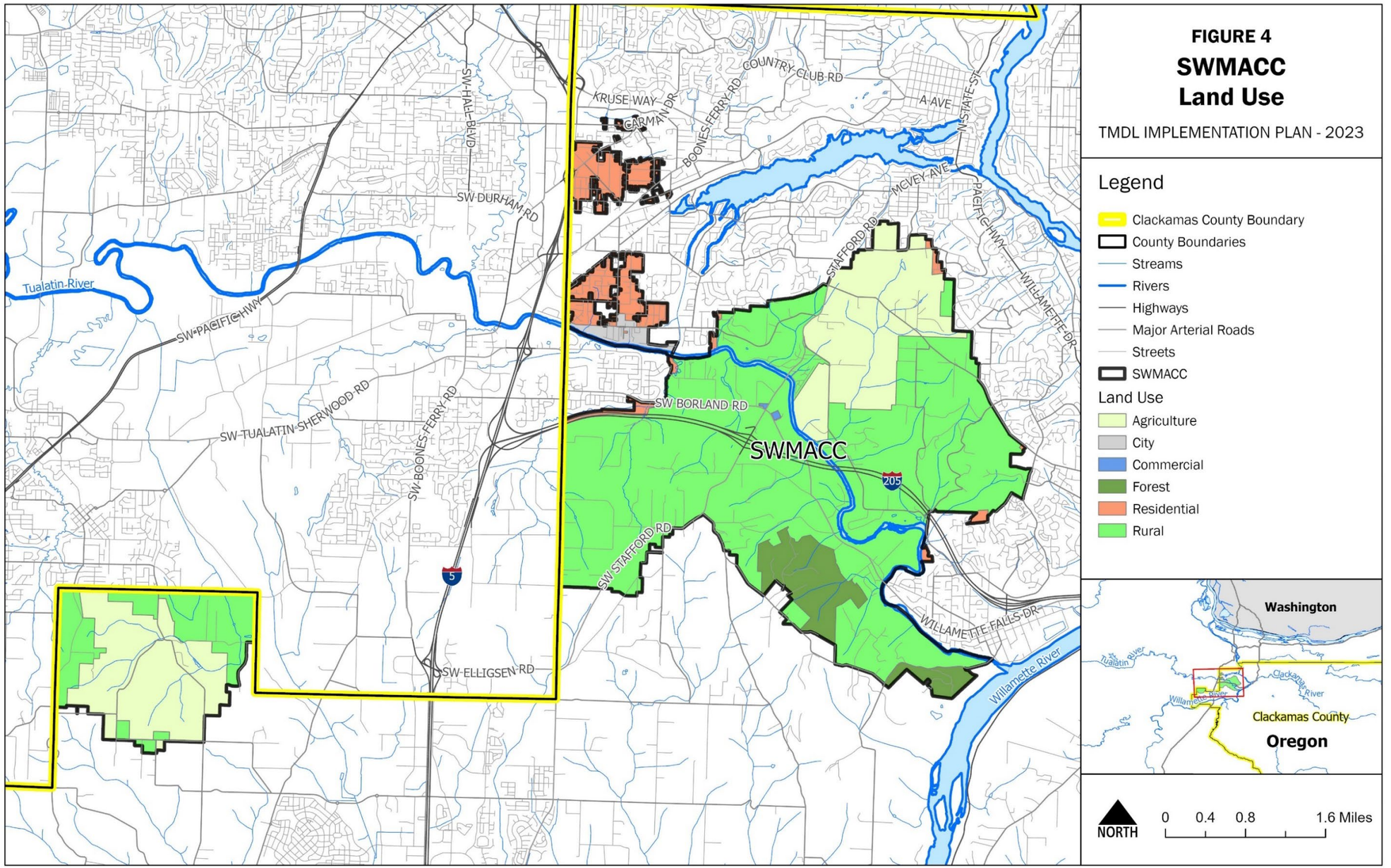

Figure 4. SWMACC Land Use

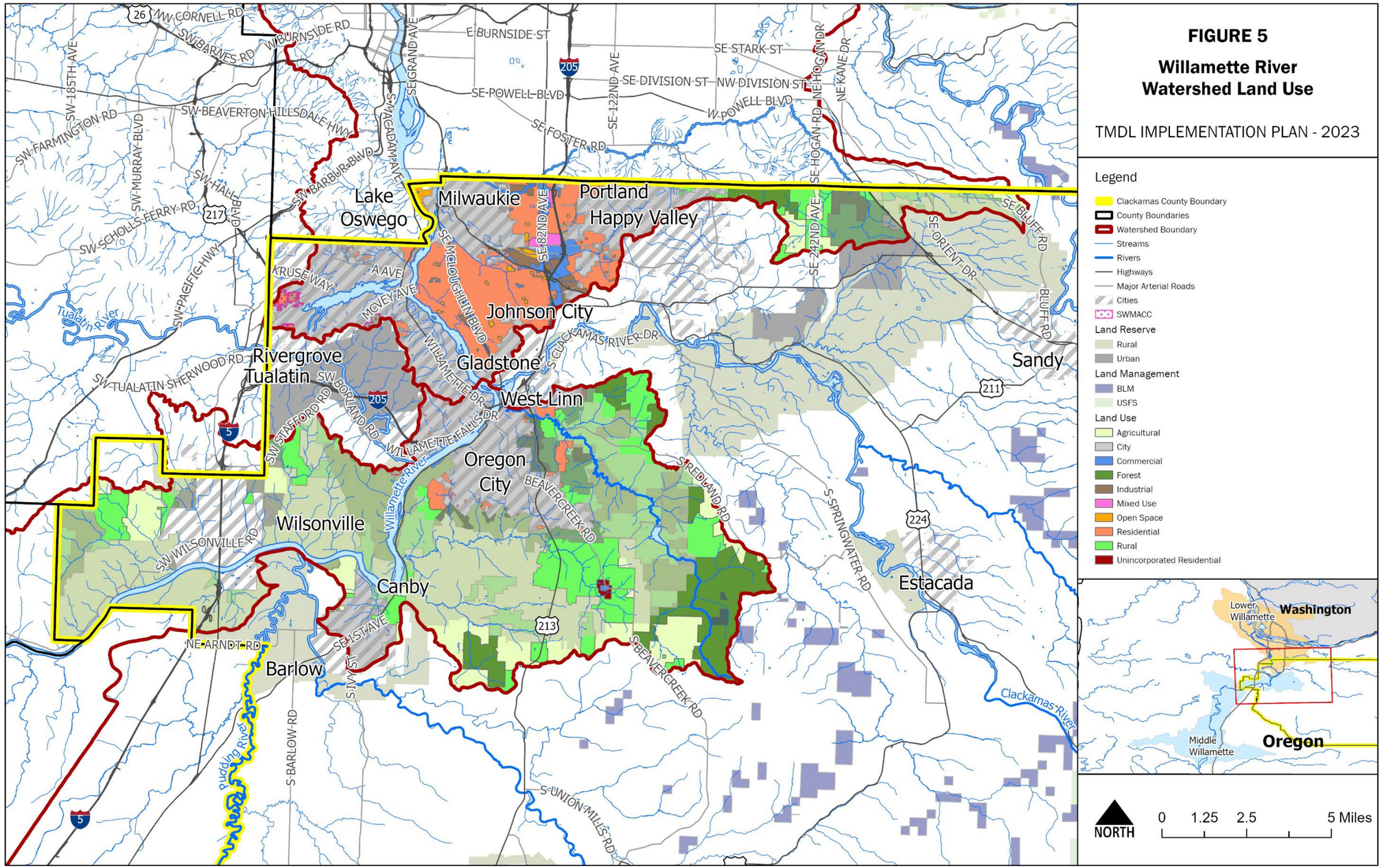

Figure 5. Willamette River Watershed Land Use

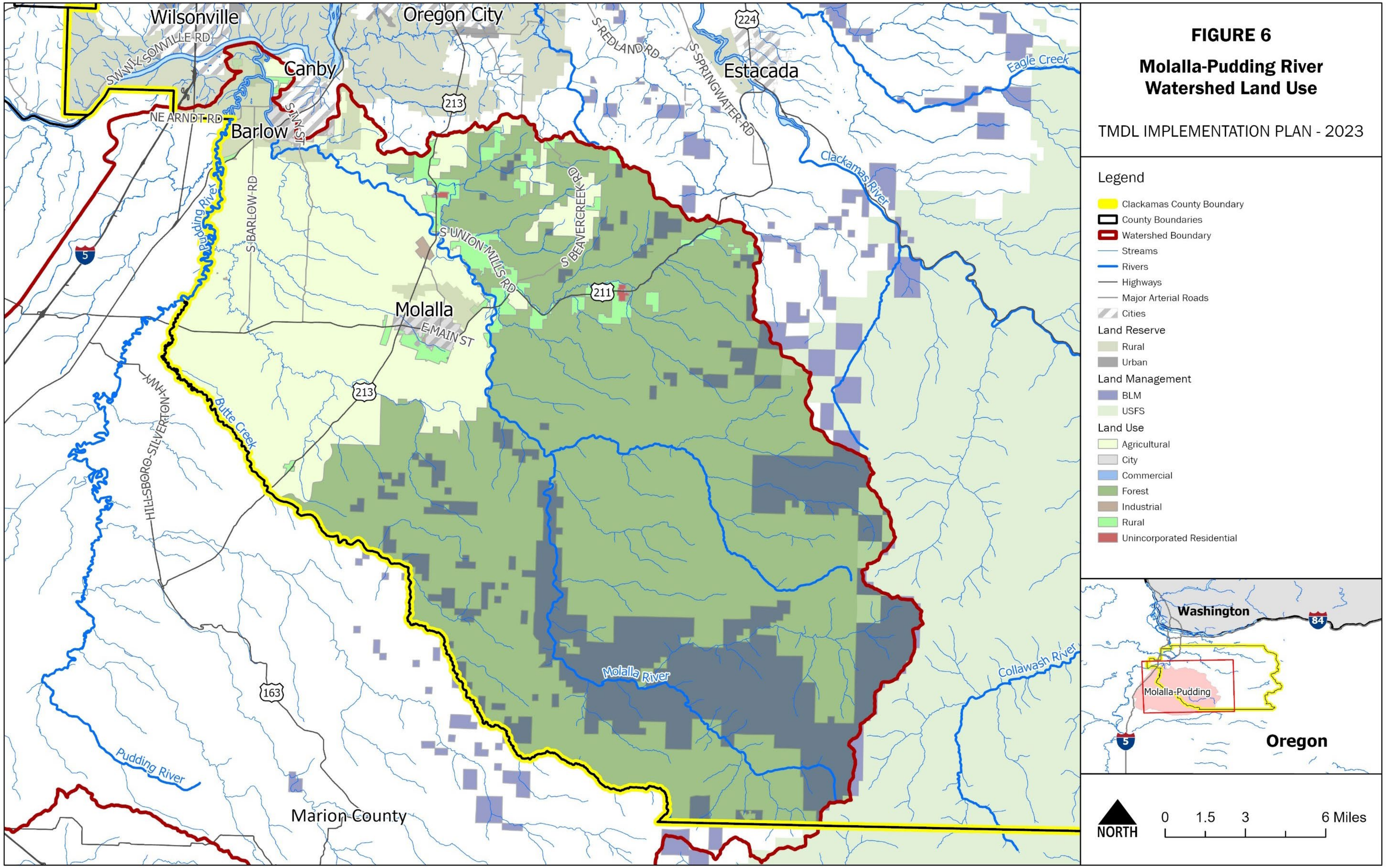

Figure 6. Molalla-Pudding River Watershed Land Use

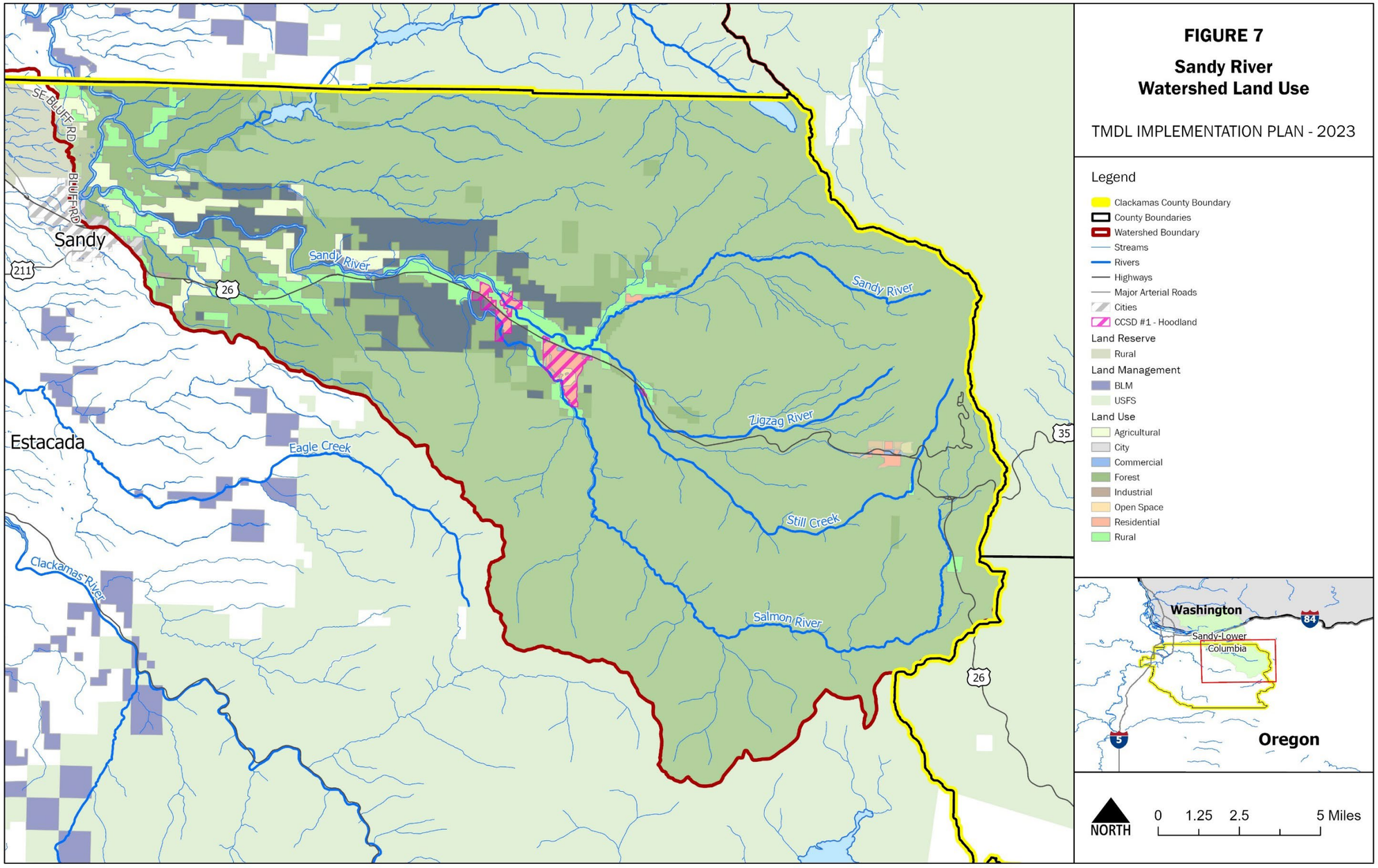

Figure 7. Sandy River Watershed Land Use

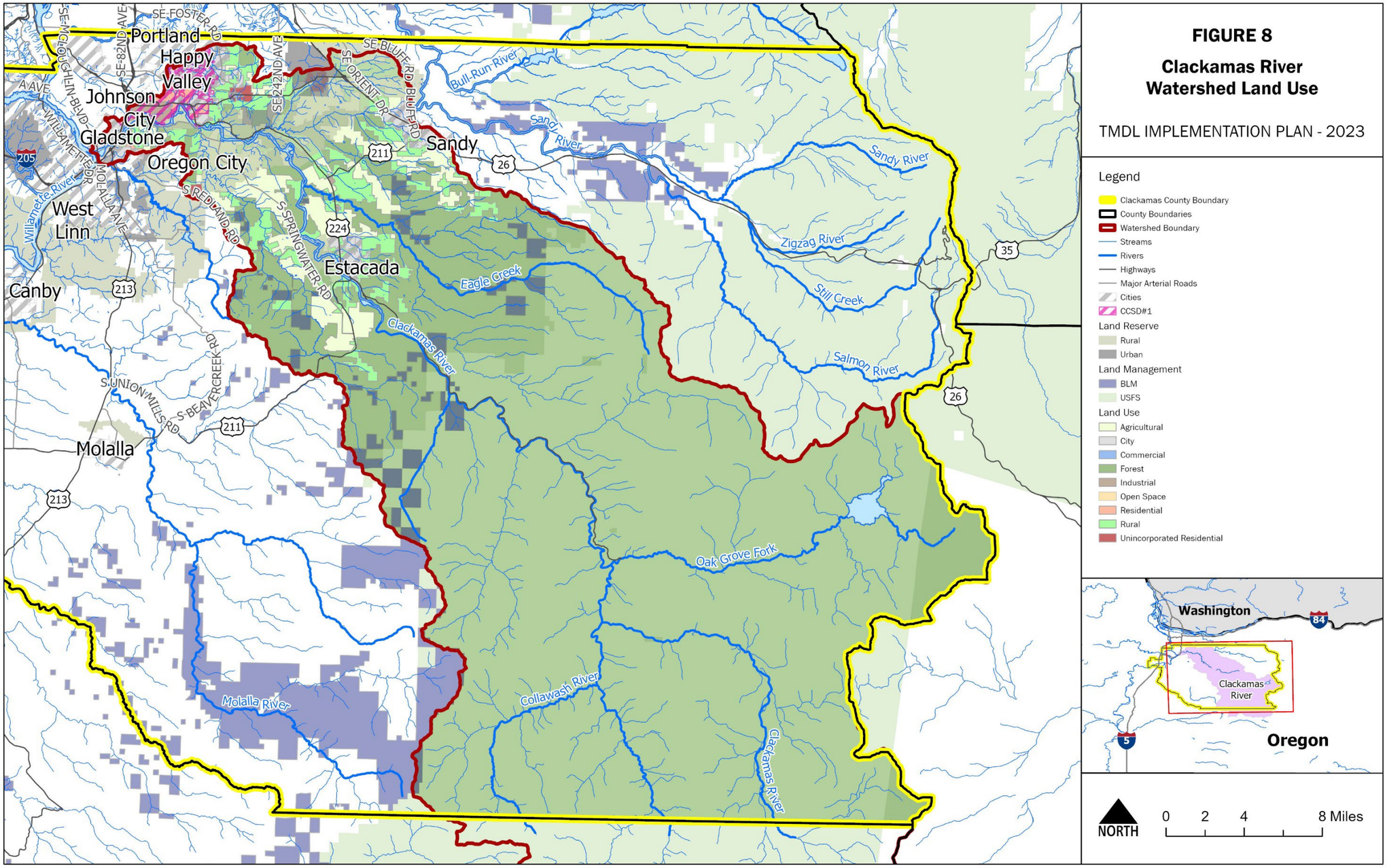

Figure 8. Clackamas River Watershed Land Use

5. TMDL Pollutants and Allocations

Water quality impairments have been identified by DEQ in the Willamette, Tualatin, Molalla-Pudding, and Sandy River Watersheds, which prompted the development of TMDLs. These TMDLs are addressed in this annual report for each of these watersheds as summarized in Table 4.

Table 4. TMDL Summary for each Watershed

	Tualatin River Watershed TMDL	Willamette River Watershed TMDL	Molalla-Pudding River Watershed TMDL	Sandy River Watershed TMDL
TMDL Pollutants	• Temperature • *E. coli* (bacteria) • Mercury • pH and chlorophyll A (total phosphorus) • DO	• Temperature • *E. coli* (bacteria) • Mercury • DDT and dieldrin in the Johnson Creek watershed • Cold water refugia in the Willamette River	• Temperature • *E. coli* (bacteria) • Mercury • DDT and dieldrin • Nitrates [a] • Iron (Pudding River only)	• Temperature • *E. coli* (bacteria) only in the Cedar Creek sub-watershed

[a] The nitrate TMDL applies only to Zollner Creek. None of Zollner Creek, nor any portion of the contributing area, is within Clackamas County. Therefore, nitrate will not be addressed as part of this TMDL implementation plan.

6. Goal and Objective of the 2022 NPS TMDL IP

The goal of the 2022 NPS TMDL IP is to identify the ongoing and planned Management Strategies to improve watershed health and address requirements of the applicable TMDLs related to the Non-Point Sources of TMDL pollutants. The objective of the IP is to apply the plan's Management Strategies for water pollution reduction (e.g., erosion control program for construction sites). To achieve this goal and objective, this IP's Co-Owners (Clackamas County, Clackamas WES, and the Cities of Happy Valley and Rivergrove) implemented the portions of this plan that they are responsible for during 2024-25.

6.1 2022 NPS TMDL Implementation Plan Exclusions

The 2022 NPS TMDL IP only addresses non-point sources (NPS) of water pollution.

Discharges from and into surface-discharging storm sewer systems that are regulated by the MS4 Permit are not addressed by the IP.

Stormwater runoff directed to 1) subsurface discharge through shallow injection systems, such as drywells, and 2) infiltration systems are not addressed by the IP.

Lands subject to Oregon Department of Forestry (ODF) and Oregon Department of Agriculture (ODA) jurisdiction are not addressed by the IP.

The IP does not address NPS pollution from lands owned by the State of Oregon (including state highways and their storm sewer systems) or the federal government.

6.2 Areas where 2022 NPS TMDL Implementation Plan Applies

The IP addresses stormwater runoff-related TMDL pollutants that are discharged by these three types of stormwater drainage systems:

- Clackamas County, Happy Valley, Rivergrove, and Clackamas WES-owned/maintained surface-discharging storm sewer systems that are not subject to the MS4 Permit requirements. (See the areas outside the MS4 Permit boundaries in Figures 2 and 3). These storm sewer systems, which

are defined as NPSs of pollution, are typically ditches that serve Clackamas County-maintained/owned roads in rural areas. Note that Clackamas County's, Clackamas WES', and the City of Happy Valley and Rivergrove's authority to control sources of pollution from storm sewer systems that they own is limited, especially when these systems are in rural areas, but reasonable efforts will continue to be made to control and reduce their discharge of TMDL pollutants.

- Privately-owned surface-discharging storm sewer system outfalls if they do not drain agricultural (ODA) and timber management (ODF) areas. These outfalls, unless they are permitted by an NPDES permit such as a 1200Z, are NPSs of pollution. Note that Clackamas County, Clackamas WES, and the Cities of Happy Valley and Rivergrove often have only minimal authority to control sources of pollution from storm sewer systems that they do not own if these systems discharge directly to waters of the State of Oregon, but reasonable efforts will continue to be made to control and reduce their discharge of TMDL pollutants.
- Overland sheet flow of stormwater that does not flow through any type of storm sewer system. These are also defined as NPSs of pollution and are found on lands with every type of land use. These flows, when they are not located in agricultural (ODA) and timber management (ODF) areas, are addressed by the 2022 NPS TMDL IP. Note that Clackamas County, Clackamas WES, and the Cities of Happy Valley and Rivergrove typically have no authority whatsoever to control pollution in these types of flows on private property, but reasonable efforts will continue to be made to control and reduce their discharge of TMDL pollutants.

If Clackamas County, Clackamas WES, and/or the Cities of Happy Valley or Rivergrove are aware of a discharge that does not flow through a storm sewer system that they own, which is a significant known or suspected source of TMDL pollution, the matter will be referred to the DEQ if public education and/or technical assistance fail to yield the necessary water quality improvement.

Clackamas County, Clackamas WES, and the Cities of Happy Valley and Rivergrove cannot and do not accept sole responsibility for reducing TMDL pollutant loads in any river or tributary in order to attain any TMDL LA. All of the sources of a TMDL pollutant in a creek or river need to do their part to solve the problem if the LA will ever be attained.

Clackamas County, Clackamas WES, and the Cities of Happy Valley and Rivergrove do accept some of the responsibility for reducing the following fractions of the NPS TMDL pollutant loading:

- The amount that originates on those private lands that they have the authority to regulate
- The amount that is generated by the specific land uses or activities that they have the authority to regulate
- The amount that originates on land they own

This IP also addresses riparian areas on lands owned by Clackamas County, Clackamas WES, and the Cities of Happy Valley and Rivergrove. One exception is the acres of timberland that Clackamas County owns; NPS water pollution on these lands is regulated by Oregon Department of Forestry and is not addressed in this IP. This IP also addresses riparian areas on privately owned land that are not in an agricultural (ODA) or timber management (ODF) area, and reasonable effort will be made by the public education program to try to persuade these private property owners to protect and enhance their riparian areas. Refer to Management Strategies 7.4 and 7.11 for more information about this IP's role in managing riparian areas on privately owned lands.

7. Management Strategies

A variety of management strategies are employed by Clackamas County, Clackamas WES, and the Cities of Happy Valley and Rivergrove to improve and protect water quality and overall watershed

health. This portion of the 2024-25 annual report complies with OAR 340-042-0080(4)(a)(A) and (B), which state, *"The implementation plan must…Identify the management strategies the DMA or other responsible person will use to achieve load allocations and reduce pollutant loading"* and *"(B) Provide a timeline for implementing management strategies and a schedule for completing measurable milestones."*

The Management Strategies that were implemented in 2024-25, or which are planned for implementation in the future, from the 2022 NPS TMDL IP are listed below:

- 7.1 Stormwater Regulations for New/Redevelopment and for Capital Improvement Projects (CIPs)
- 7.2 Operation and Maintenance for Publicly Owned Storm Sewer Systems
- 7.3 Regulated Private Storm Sewer System Inspection and Maintenance Program
- 7.4 Riparian Area Shade: Other Development-Related Regulations
- 7.5 Erosion Prevention and Sediment Control
- 7.6 Public Education
- 7.7 Septic System Management
- 7.8 Illegal Dumping Management
- 7.9 Respond to Reports of Impaired Stormwater Quality
- 7.10 Illicit Discharge, Detection, and Elimination Program, which includes Spill Response
- 7.11 Riparian Area Assessment and Management
- 7.12 Cold Water Refugia Assessment and Management

These management strategies are described in detail in the sections below. A summary of these management strategies and associated pollutants addressed is provided in **Table 6** at the end of this section.

7.1 Stormwater Regulations for New/Redevelopment and for Capital Improvement Projects

Stormwater policies, regulations, and administrative procedures are essential for implementing the TMDLs. This portion of the 2024-25 annual report describes the planning procedures for developing, implementing, and enforcing controls to reduce the discharge of TMDL pollutants from storm sewers that collect stormwater runoff from lands that have been significantly developed or redeveloped.

TMDL pollutants addressed:

- ✓ *E. coli*
- ✓ Total phosphorus and DO in the Tualatin River watershed
- ✓ Mercury
- ✓ DDT and dieldrin in the Johnson Creek watershed
- ✓ Dieldrin and iron in the Pudding River watershed

Description of the potential sources: After construction has been completed on a property, the storm sewer system and landscaping-related planning procedures and regulations that are followed during site design and construction can influence the amount of non-point sediment-bound and other pollutants that are washed from the property into the nearest surface water body over the lifetime of the

property's improvements.

Description of the management strategy: This management strategy refers to the planning procedures for developing, implementing, and enforcing controls to reduce the discharge of TMDL pollutants from storm sewers that collect runoff from areas that experience land development or redevelopment. Specific strategies are described below. These post-construction controls are applied to the following:

- Development on private property
- CIPs, including road and building construction projects, that are funded by the Co-Owners of this IP

Erosion control permitting for construction site runoff is addressed in Section 7.5.

Geographic area where this management strategy is implemented

- **Properties within the 1) WES SWM Service Area, 2) Rural Portion of the City of Happy Valley, and 3) CCSD #1's Boring, Hoodland, and Fischer's Forest Park Subunits**

  Within the WES SWM service area and these three CCSD #1 subunits, new/redevelopment construction projects are expected to construct stormwater management facilities in compliance with WES's new stormwater standards effective July 1, 2023. The Stormwater Standards present the technical standards and specification requirements necessary to meet all policies of the WES Rules and Regulations related to providing stormwater and surface water services. Projects are required to adhere to the updated Stormwater Standards, which include Water Quality Performance (Stormwater Standards, Section 6.1.1), Flow Control Performance (Stormwater Standards, Section 6.1.2), Onsite Infiltration (Stormwater Standards, Section 6.2.1), and Fee In Lieu (Stormwater Standards, Section 6.1.4). Implementing these Standards meets DEQ requirements to minimize the impacts of development to protect water resources which, in turn, will benefit human health, fish and wildlife habitat, recreational resources, and drinking water.

  Properties in the rural portion of the City of Happy Valley that receive rural-style development (i.e. these properties do not have public sanitary sewer service) are authorized by the City of Happy Valley. The City of Happy Valley has adopted WES' stormwater standards for use in the rural area outside WES' service district.

  Much of the WES SWM service area, plus the rural portion of Happy Valley, fall within the MS4 Permit's geographic coverage area. Happy Valley and Clackamas WES apply their stormwater management controls on all development sites in their service areas whether or not they discharge to their MS4. For detailed information about management strategy 7.1, please see the MS4 Permit Stormwater Management Program document for more information about these controls. Finally, for the three CCSD #1 subunits, although they are not in the WES SWM service area, WES does implements management strategy 7.1 in these subunits.

Other properties NOT within these areas

- **The Oak Lodge Water Services District.** For NPS stormwater runoff generated by real estate development in the Oak Lodge Water Services District see the Oak Lodge Water Services District's TMDL IP.
- **Land Development in Unincorporated Rural Areas.** For development in unincorporated rural areas, Clackamas County prescribes the stormwater management requirements. In June of 2020, Clackamas County made improvements related to low impact development and onsite stormwater management requirements for areas outside of the MS4 Permit geographic area.

  Per Clackamas County Roadway Standards section 420.1 (Best Management Practices and Low

Impact Development Approaches), Clackamas County engineering acknowledges the need for best management practices for land development and encourages engineers to submit designs for review to meet the water quality and flow control requirements outlined in Clackamas WES' stormwater standards. Private improvements in rural areas may work with DTD to provide a simplified approach to stormwater management that uses vegetation and infiltration if the site conditions warrant it.

Additionally, Clackamas County Roadway Standards section 420.2 allows for the use of acreage as a best management practice. Development outside of the MS4 permitted area is predominated by larger lot sizes. The applicant must demonstrate that water quality, detention, and/or infiltration requirements are met using the acreage best management practice if this approach is proposed. Clackamas County Roadway Standards section 420.3 (Surface Water Management Applicability) requires surface water management plans for any of the following instances:

  - When 5,000 square feet or more of new or reconstructed impervious surface is proposed within the Portland metro area's UGB.
  - When 10,000 square feet or more of new or reconstructed impervious surface is proposed outside the Portland metro area's UGB.
  - When grading or any new or reconstructed impervious surface is proposed or replaced within 50 feet of a perennial stream, creek, wetland, or lake, or within 10 feet of a property line.

- **Capital Improvement Projects funded by the Co-Owners of this IP.** When a CIP, including road and building construction projects, funded by one or more of the Co-Owners of this IP, is designed, it must comply with the stormwater management requirements—infiltration (if possible), water quality treatment, and detention—of the community in which the CIP is proposed. For example, when a CIP is proposed to be constructed in the WES SWM service area, it is expected to comply with the same stormwater management requirements and riparian area setback/buffer requirements that would be applied to development on any nearby piece of private property.

Measurable milestones (if any): None.

Fiscal analysis: This management strategy is currently funded by fees.

Timeline for implementation: This management strategy is currently being implemented and is an ongoing activity.

7.2 Operation and Maintenance for Publicly Owned Storm Sewer Systems

A key strategy for protecting receiving water quality from NPS pollution is thorough adequate operation and maintenance (O&M) of publicly owned stormwater infrastructure to confirm that systems are functioning properly and issues are addressed before they become problematic.

TMDL pollutants addressed:

- ✓ Mercury
- ✓ Total phosphorus
- ✓ DO (i.e., SVS) in the Tualatin River watershed
- ✓ DDT and dieldrin in Johnson Creek
- ✓ Dieldrin/DDT and iron in the Pudding River Watershed

Description of the management strategy: The O&M of publicly owned storm sewer systems in this TMDL IP's geographic area reduces the amount of NPS pollution that is discharged to creeks,

wetlands, and rivers from these systems. Typically, these storm sewer systems are roadside ditches along the edges of Clackamas County-maintained/owned roads in rural areas. Potential sources of pollution could be the road itself (e.g., automotive fluids dripped onto the road as the vehicle drives by), but most of the pollutants come from adjacent and nearby properties, which are typically privately owned. This management strategy encourages the optimization of the water pollution removal and stormwater infiltration functions of these storm sewer systems (i.e., ditches). Examples of this strategy may include the following activities:

- Retrofitting one or more ditches through the addition of one or more rock "check dams" to trap some sediment that can be removed later and properly disposed of.
- Cleaning the few catch basins and other types of storm sewer system structures in the geographic area covered by this IP on an as-needed basis.
- Installing erosion control measures (such as a hydroseed mulch), where appropriate, after the ditch has been cleaned with a Gradall machine.

Geographic area where this management strategy is implemented: The City of Happy Valley-owned surface-discharging storm sewer systems are regulated by the MS4 Permit. Therefore, this management strategy only applies to those Clackamas County-maintained/owned surface-discharging storm sewer systems that are not regulated by the MS4 Permit. Note: If Clackamas WES owns or operates any surface-discharging storm sewer systems in the rural portion of the SWMACC subsection of the WES SWM service area, this management strategy will also apply to these systems because they are also not regulated by the MS4 Permit.

Measurable milestones:

- Report the road mile(s) or mile point(s), as well as the road's name(s), where one or more new rock check dams were installed.

  Response

  Clackamas County Transportation Maintenance did not install any rock check dams during the 2024-25 reporting year. However, this has been and will continue to be a BMP that is utilized when and where appropriate.

- Clackamas County's Transportation Maintenance Division can perform "skip-ditching," which is when solids and vegetation are only removed from a section of ditch, while the adjacent sections of ditch are left untouched. In the untouched sections, the vegetation and soil are left undisturbed, which provides potentially significant treatment for stormwater runoff and potentially better infiltration and/or evapotranspiration of stormwater runoff. This measurable milestone is the annual number of miles of ditches that were skip-ditched during the July 1 to June 30 TMDL IP year.
- Total number of miles skip-ditched on County maintained roads (not in MS4 permit area):

  Response

  14.91 miles

- If any section of ditch is discovered to provide a reasonably good stormwater infiltration rate, provide this information in that year's TMDL IP annual report.

  Response

  None were identified during 2024-25.

Fiscal analysis: This management strategy is currently funded.

Timeline for implementation: This management strategy is currently being implemented and is an ongoing activity.

7.3 Regulated Private Storm Sewer System Inspection & Maint. Program

Inspection of privately owned storm sewer systems helps improve receiving water quality by ensuring that detention, infiltration, and water quality treatment facilities are being maintained and are functioning properly.

TMDL pollutants addressed:

- ✓ *E. coli*
- ✓ Mercury
- ✓ Total phosphorus and DO in the Tualatin River watershed
- ✓ DDT/dieldrin in the Johnson Creek Watershed

Description of the potential sources: Stormwater from commercial, industrial, residential, or institutional land uses can be NPSs of TMDL pollutants such *E. coli*, phosphorus, or mercury. Potential sources of contamination at these sites include land deposition of air pollutants, spills, fertilizer applied to landscaped areas, poor housekeeping practices, and leachate that leaks from solid waste dumpsters. The most common sources of *E. coli* at these sites may be feces deposited on impervious and landscaped surfaces from wild birds and mammals.

Description of the management strategy: The maintenance agreements require operators/owners to inspect and maintain the property's stormwater facilities and to report their activities annually to Clackamas WES.

WES participates in the voluntary regional Storm Drain Cleaning Assistance Program (SCAP) with its partners in the Portland metro area. This program uses voluntary measures paired with an inspection and enforcement program to verify and track maintenance of regulated private stormwater systems. This management strategy contains two elements, SCAP and inspection/enforcement, that WES may use interchangeably or in combination at its discretion.

Geographic area where this management strategy is implemented: This management strategy, which is only provided within the WES SWM service area, is expected to reduce stormwater runoff rates, volume, and pollution by verifying that regulated privately-owned storm sewer systems are operated to maintain their pollutant removal, stormwater infiltration/retention, and flow control functions. This strategy applies to privately owned storm sewer systems with a signed WES Maintenance Agreement, which typically include those that serve multi-family residential properties, commercial and industrial properties, or institutions (religious, civic, etc.). This management strategy has been included in this TMDL IP because some of these privately owned storm sewer systems discharge directly to waters of the state, and as a result, are NPSs of pollutants.

Measurable milestone: Implement the SCAP program each year and provide the following information in annual TMDL IP reports to the DEQ: 1) The number of SCAP participants and 2) the total number of catch basins/drains that were cleaned. This data to be reported to the DEQ will include all program participants in the entire WES SWM service area, and all catch basins/drains that were cleaned, including those basins/drains that are NPSs of pollutants.

Response

WES collaborated 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.

SCAP and other commercial-industrial-institutional privately owned storm drain cleaning tracking is calendar year reporting rather than permit year. The information cited is for the 2024 calendar year.

- One hundred and five (105) businesses signed up through WES for the SCAP program during the 2024 calendar year.

- The 2024 SCAP vendor cleaned:
    - 403 catch basins

  One hundred and fourteen (114) businesses submitted separate annual reports to WES, documenting the inspection and maintenance of privately owned storm sewer systems during the 2024 calendar year. The structures that were maintained include:
    - 671 catch basins
    - 22 water quality manholes
    - 11 hydrodynamic separators
    - 21 oil water separators
    - 13 cartridge filters
    - 42 vegetated water quality facilities
    - 15 other structures

Fiscal analysis: WES has budgeted the funds necessary to implement this program in the WES SWM service area.

Timeline for implementation: This management strategy is currently being implemented and is an ongoing activity.

7.4 Riparian Area Shade: Other Development-Related Regulations

Riparian vegetation provides shading and can reduce river/stream warming from direct sunlight, in addition to providing a myriad of water quality improvement and bank stabilization benefits. Protection and restoration of riparian areas can be encouraged and enforced through real estate development-related regulations. Reduction of the riparian canopy can also change the microclimate near streams, increasing air flow and heat exchange with the stream and thereby further elevating water temperatures.

TMDL pollutants addressed:

- ✓ Temperature
- ✓ Mercury (because stream bank stabilization provided by this management strategy reduces stream channel erosion)
- ✓ DO in the Tualatin River watershed (because cooler stream water can hold more DO)

Description of the management strategy: Protection and restoration of system potential vegetation and effective shade in riparian areas is one of the primary mechanisms for achieving LAs for temperature. These watershed protection regulations that protect streamside vegetation are implemented by Clackamas County, Clackamas WES, and the Cities of Happy Valley and Rivergrove.

Many lands that include at least some riparian areas are subject to the following “riparian area buffer

regulations" when these lands are developed or redeveloped in a significant manner under Clackamas County's, Clackamas WES', and the City of Happy Valley's and Rivergrove's building permitting process:

- **Metro Title 3, Clackamas County.** Clackamas County's Planning Department administers WES' equivalent of Metro Title 3 regulations in the WES SWM service area through an agreement with WES. Clackamas County's Planning Department administers these regulations in the other unincorporated areas within the Portland metro area's UGB and metro service district boundary in Clackamas County, such as the Oak Lodge Water Services District.
- **Happy Valley and Rivergrove.** The cities of Happy Valley and Rivergrove have their own equivalent of Metro Title 3 regulations that they apply within the city limits.
- **Zoning and Development Ordinance 709, Clackamas County.** Clackamas County's Zoning and Development Ordinance (ZDO) 709 applies in unincorporated, urban areas. The provisions regulate disturbances and specify setback distances for wetlands and riparian areas (also known as Water Quality Resource Areas). Disturbances and setbacks to these areas are reviewed in accordance with applicable provisions of the ZDO and are dependent upon several factors that are determined on a case-by-case basis. ZDO 709 is administered by Clackamas County's DTD. Wetlands are included in this IP because many wetlands discharge their waters directly to creeks and rivers.
- **Metro Title 13 (Goal 5), Clackamas County.** Clackamas County's ZDO 706 is the county's version of the Metro Title 13 (Goal 5) model ordinance and associated maps and plans. The purpose of Title 13 is to (1) conserve, protect, and restore a continuous ecologically viable streamside corridor system, from the streams' headwaters to their confluence with other streams and rivers and with their floodplains in a manner that is integrated with upland wildlife habitat and with the surrounding urban landscape and (2) to control and prevent water pollution for the protection of the public health and safety and to maintain and improve water quality throughout the region.

  Metro has mapped the areas deemed to be regionally significant and has further designated as Habitat Conservation Areas (HCAs) those areas requiring protection. HCAs shall be protected, maintained, enhanced, and restored as specified in the Metro Code Section 3.07.1340, and city and county development codes shall include provisions for enforcement of these performance standards and best management practices. Discretionary development approval standards are designed to first avoid HCAs, next to minimize impacts on HCAs and water quality, and finally to mitigate the impacts to these areas.
- **Willamette River Greenway, ZDO 705, Clackamas County.** The Willamette River Design Plan, described in the Clackamas County Comprehensive Plan, provides policy for reducing pollutants and protecting water quality outside of the WES SWM service area. Those policies are codified through Section 705 of the ZDO. Section 705 (Willamette River Greenway) states that the purpose, in part, is "to maintain the integrity of the Willamette River by minimizing erosion, promoting bank stability and maintaining and enhancing the water quality and fish and wildlife habitats." All intensification or change in the use (aka, development) requires a Greenway Conditional Use permit.
- **River and Stream Conservation Area, ZDO 704, Clackamas County.** This ordinance applies to all unincorporated private lands in Clackamas County that are outside the Portland metro area UGB, outside the Metro Service District boundary, and outside the Willamette River Greenway. It is administered by DTD pursuant to the applicable provisions of the ZDO. New and redevelopment that is regulated by Clackamas County that occurs on land lots that are on or near rivers and qualifying creeks. ZDO 704 does not cover smaller (non-fish-bearing) streams and all wetlands are unprotected by ZDO 704's provisions. All riparian areas around creeks and rivers that are eligible for protection under ZDO 704 are on Water Protection Rule Classification maps that were compiled

pursuant to OAR 629-635-000.

- **Floodplain Management District, ZDO 703, Clackamas County.** This ordinance, administered by Clackamas County DTD, applies on all lands within the Special Flood Hazard Area. This ZDO section may in some instances limit the scope of development within the floodplain. This ZDO section tends to direct development away from areas that are directly adjacent to a creek or river's low and high flow channels, making it more likely that native vegetation will be allowed to provide shade to the water body.
- **River and Stream Corridors, ZDO Subsection 1002.05, Clackamas County.** This ordinance applies within rural Clackamas County but only where River and Stream Conservation Areas subject to 704 do not apply, and only for certain developments such as subdivisions, partitions, etc.
- **Significant Natural Areas, ZDO Subsection 1002.8, Clackamas County.** This regulation protects only four key water resources (Williams Lake Bog, the Land at Marmot, Multorpor Bog, and Wilhoit Springs) that are designated as Scenic and Distinctive Resources.
- **Standards for Flood Hazard Areas, ZDO Subsection 1003.03.** This regulation augments ZDO Section 703 during the development process by limiting clearing, vegetation removal, construction of roads and structures, etc. within all areas of the floodplain to be sited in a manner that minimizes alteration of terrain and other natural features.
- **Riparian Area Protection Regulation Administered by the City of Happy Valley.**
  - **Natural Resources Overlay Zone.** This zone implements natural resource, open space, and environmental goals/policies within the Happy Valley Comprehensive Plan and provides compliance with portions of Statewide Planning Goals 5 and 6 as well as Titles 3 and 13 of Metro's Urban Growth Management Functional Plan. The Natural Resources Overlay Zone protects and improves the natural resource functions and values by discouraging most development near intermittent/perennial creeks, rivers, streams, wetlands, natural lakes, springs, or other significant features. Unless exempt, applications are subject to a public land use review process to assure compliance as well as provide awareness.
- **Riparian Area Protection Regulations Administered by the City of Rivergrove.** The Tualatin River borders the City of Rivergrove to the south. Some lands in the City of Rivergrove contain wetland areas or are within the floodway or floodplain. All of these lands are managed by Flood Ordinance #70-2001 (www.cityofrivergrove.org under the heading ORDINANCES/ Flood Ordinance). Ordinance 70-2001 is in conformance with Metro Title 3; it applies a protected water quality resource area overlay zone along protected water features, as defined in the ordinance, including wetlands, streams, springs, and the river.

Measurable milestone: Continue to implement the applicable riparian area protection regulations when properties are permitted to develop by Clackamas County, Clackamas WES, and the Cities of Happy Valley and Rivergrove. Were these applicable regulations implemented? In each TMDL IP annual report, a simple "Yes" or "No" answer will be provided for each of the Co-Owners of this IP.

Response

Clackamas County – Yes

- ZDO 709 implements Metro Title 3
- Habitat Conservation Areas, ZDO 706 implements Metro Title 13 (Goal 5)
- Willamette River Greenway, ZDO 705
- River and Stream Conservation Area, ZDO 704
- Floodplain Management District, ZDO 703
- Standards for Flood Hazard Areas, ZDO Subsection 1003.03

- River and Stream Corridors, ZDO Subsection 1002.05, which has been renumbered to 1002.4
- Significant Natural Areas, ZDO Subsection 1002.8, which has been renumbered to 1002.7

Happy Valley -- Yes
- Equivalent Metro Title 3 regulations
- Habitat Conservation Areas
- Natural Resources Overlay Zone

Rivergrove – Yes
- Equivalent Metro Title 3 regulations
- Habitat Conservation Areas
- Flood Ordinance #70-2001

Fiscal analysis: This management strategy is currently funded.

Timeline for implementation: This management strategy is currently being implemented and is an ongoing activity.

7.5 Erosion Prevention and Sediment Control

Temporary and permanent erosion and sediment control at construction sites can help reduce pollutant-laden stormwater from entering receiving waters.

TMDL pollutants addressed:

- ✓ Total phosphorus
- ✓ DO (i.e., SVS) in the Tualatin River watershed
- ✓ Mercury
- ✓ DDT/dieldrin in Johnson Creek
- ✓ Dieldrin/DDT and iron in the Pudding River watershed

Description of the management strategy: Erosion control is addressed through the issuance of erosion control permits for construction sites undergoing significant development or redevelopment. These permits require measures, such as catch basin silt sacks, to reduce the amount of soil leaving the site and subsequent mercury, TSS, and/or SVS, DDT, etc. in stormwater washing from the property. By reducing TSS in stormwater, it is presumed that the concentration in stormwater of TMDL pollutants adhered to soil (such as DDT and mercury) or mixed with soil (such as organic matter with high SVS level), if present, is also reduced.

Geographic areas where this management strategy is implemented:

- **Sites within the 1) rural portion of the City of Happy Valley; 2) WES' SWM service area, including SWMACC; and 3) CCSD #1's Boring, Hoodland, and Fischer's Forest Park subunits:** Because many of these areas are within the MS4 Permit's geographic coverage area, Happy Valley and Clackamas WES issue and administer erosion prevention and sediment control (EPSC) Permits for land development to all qualifying construction sites whether or not they discharge to their MS4. To avoid duplication, please see the MS4 Permit Stormwater Management Program document. For the CCSD #1 subunits, WES provides the same EPSC Permit program that WES provides in the MS4 Permit area.
- **Sites not within the rural portion of the City of Happy Valley; the WES SWM service area; and CCSD #1's Boring, Hoodland, and Fischer's Forest Park subunits:** For the construction sites in this geographic area, a comprehensive and Clackamas County-wide erosion control permitting, inspection, and enforcement program is currently under development. Clackamas County DTD is in the process of creating new policy which will include erosion control permit triggers, inspection requirements, associated fees, and escalating enforcement procedures. This program is being created with the intent of complying with new Willamette River mercury TMDL requirements, as well as with the intent of facilitating improved tracking and documentation. These changes will be updated in the Clackamas County Code and will ultimately be approved by the Board of Clackamas County Commissioners.

  Clackamas County DTD is in the final stages of development and, ultimately, implementation of an Erosion Prevention and Sediment Control permitting, inspection and enforcement program. On September 30, 2025, the county's plan was outlined to the Board of County Commissioners, who directed staff to schedule the first required public hearing on the additions to County Code that would allow County staff to implement this new program. The first ordinance adoption hearing was held on October 16, 2025.

  Proposed Erosion Control Requirements
  To comply with the requirements imposed by DEQ, County Code Chapter 9.04 proposes for the Building Codes Program to regulate erosion control within the unincorporated County outside cities and districts, for work that falls within the following thresholds:

  - Construction activities including clearing, grading & excavation that will disturb ½ acre (21,780sq. ft.) or more.
  - Construction activities including clearing, grading & excavation that will disturb less than ½ acre but are part of a common plan of development or sale that will ultimately disturb 1/2 acre or more.
  - Construction activities including clearing, grading & excavation that will disturb 500 square feet or more within 50 feet of surface waters of the state.
  - All development activity within Clackamas County which disturbs 1 acre or greater is currently required to obtain a DEQ 1200-C Construction Stormwater (Erosion Control) Permit or obtain coverage from WES under their 1200-CN Permit, as a result, these sites will not require an erosion control permit from DTD.

  Proposed new County Code gives Clackamas County Building Codes the authority to perform permitting, review, inspections and enforcement of erosion prevention and sediment control. The Code intentionally aligns with WES EPSC standards to ensure that the County applies a comprehensive approach towards controlling erosion on construction sites located in unincorporated Clackamas

County.

Measurable milestones: In the City of Happy Valley, Clackamas WES' SWM service area, and the CCSD #1 subunits:

- The number of active EPSC Permits in each jurisdiction during the TMDL's July 1 to June 30 year: Happy Valley and WES (the CCSD #1 subunits shall be included in WES' number).

  Response

  - Happy Valley issued 219 (13 engineering and 206 building) ESC permits
  - WES has 159 active erosion control permits in CCSD1
  - WES has 59 active erosion control permits in SWMACC

- The number of inspections performed during each TMDL IP year in each jurisdiction: Happy Valley and WES (the CCSD #1 subunits shall be included in WES' number).

  Response

  - Happy Valley performed 1,386 (443 engineering and 943 building) ESC inspections
  - WES conducted 1,049 erosion control inspections in CCSD1
  - WES conducted 479 erosion control inspections in SWMACC

- The number of enforcement actions taken, if any, in each TMDL IP year in each jurisdiction: Happy Valley and WES (the CCSD #1 subunits shall be included in WES' number).

  Response

  - Happy Valley took 12 enforcement actions
  - WES took 8 enforcement actions in CCSD1
  - WES took 3 enforcement actions in SWMACC

Fiscal analysis: This management strategy is currently funded.

Timeline for implementation: For the WES SWM service area, the CCSD #1 subunits, and Happy Valley, this management strategy is currently being fully implemented and is an ongoing activity. For the other geographic area, the program is being developed and is expected to be implemented **no later than January 2026**.

7.6 Public Education

Public education is a key component of reducing the community's nonpoint source pollution. This section addresses efforts that are believed to be effective in informing the public and encouraging behavioral change to reduce pollutant loading. WES regularly provides, and expects to continue to provide in the future, riparian area enhancement and protection messaging and stormwater management messaging to the public through its extensive public involvement and education program. Educating the public about the way its practices can negatively or positively impact the health of the watershed is an important component in managing NPS water pollution.

TMDL pollutants addressed:

- ✓ *E. coli*
- ✓ Mercury

- ✓ Temperature
- ✓ Total phosphorus and DO in the Tualatin River watershed
- ✓ DDT and dieldrin in the Johnson Creek watershed
- ✓ DDT, dieldrin, and iron in the Pudding River watershed

Selected messages, such as those for erosion control/prevention, are also expected to be provided by Clackamas County from time to time for DDT/dieldrin in the rural portion of Johnson Creek's watershed and DDT, dieldrin, and iron in the Pudding River.

Description of the management strategy: Clackamas County DTD, Clackamas WES, and the Cities of Happy Valley and Rivergrove provide public involvement and education to encourage citizens to work and live in ways that protect or improve water quality. Public involvement and education are relevant to many of this IP's management strategies, including, but not limited to, public education about proper care for septic systems, responding to and preventing illegal solid waste dumping, and public education about the importance of notifying the appropriate government agency when a spill occurs.

Strategies and messages employed to reduce potential sources of TMDL pollutants are described in the MS4 Permit Stormwater Management Program document.

Messages tailored specifically for rural residents and/or businesses, such as tips for the management of horse manure, are already provided by partners such as the Clackamas County Soil and Water Conservation District, but Clackamas County may choose to also share messages that are tailored for rural residents and/or businesses.

Measurable milestones: During the TMDL IP year, was the public education program which is required by the MS4 Permit implemented? A yes/no answer shall be provided in each TMDL IP annual report.

Response

- WES – Yes
- Clackamas County – Yes
- Happy Valley – Yes
- Rivergrove – Yes

During 2025-26, Clackamas County and Clackamas WES are planning to conduct public education and outreach to reduce non-point source discharges of stormwater which contain mercury and mercury-related pollutants such as sediment from privately owned land. A status report on the implementation of this education and outreach is expected to be provided in our 2025-26 annual report. More information about this mercury TMDL requirement is in Table 5 of this annual report.

Fiscal analysis: This management strategy is currently funded.

Timeline for implementation: This management strategy is currently being implemented and is an ongoing activity.

7.7 Septic System Management

A potential source of bacteria, mercury, SVS, and total phosphorus to surface waters is failing and failed septic systems and cesspools. A septic system or cesspool that is failing or has failed can discharge pollutants in improperly treated or untreated sewage directly into a surface water body, or the wastewater can be pushed into the surface water body by stormwater runoff, or it can pollute shallow groundwater, which can then, in some instances, enter a nearby surface water body through a spring.

TMDL pollutants addressed:

- ✓ *E. coli*
- ✓ Mercury
- ✓ Total phosphorus and dissolved oxygen (SVS) in the Tualatin River watershed

Description of the management strategy: Clackamas County's DTD administers the Septic and Onsite Wastewater (Onsite) Program as an agent of the DEQ throughout Clackamas County; this management strategy is administered in the entire geographic area that is addressed by this IP. The Onsite Program is for the most common and smaller types of septic systems and cesspools; the largest septic systems in Clackamas County, such as those that serve restaurants and schools, are directly regulated by the DEQ through its Water Pollution Control Facility (WPCF) Permit Program.

The goals of Clackamas County's program are to have no septic system/cesspool failures and for all septic systems and cesspools to be in a properly functioning condition. To achieve these goals, Clackamas County implements a process to address suspected failed or failing septic systems and cesspools when they have been referred to Clackamas County.

Discharges from failed/failing septic systems and cesspools to the ground's surface and into waterways are not allowed, and these systems are given the shortest time that is feasible for construction of repairs and for short-term alternatives such as from limiting the use of the septic system to vacating the premises until the problem is resolved.

If a public sanitary sewer system is within 300 feet of a property, the failed system cannot be replaced, and the dwelling and/or other structures with plumbing fixtures must be connected to the public sanitary sewer system, according to State of Oregon requirements.

Code Violations

Clackamas County DTD's Code Enforcement group brings violators into compliance if initial efforts to do so are unsuccessful. Initial efforts that are made encourage voluntary compliance. All failing septic systems and cesspools are an enforcement priority. Clackamas County has the ability to levy both fines and fees for code violations.

Measurable milestones:

- The number of reports of failing/failed septic systems and cesspools received by Clackamas County during the TMDL IP year:

  Response

  More than 117, which represents confirmed failures. This excludes all reports alleging septic tank violations, a number that the County does not record but is considering, as intended in the Implementation Plan.

- The number of confirmed septic systems and cesspools that failed during the TMDL IP year:

  Response

  117

- The number of repair permits issued for septic systems and cesspools during the TMDL IP year.

  Response

  395

- The number of septic systems and cesspools which were decommissioned during the 2024-25 TMDL year, where the property then subsequently connected to a public sanitary sewer system.

  Response

  WES connected 26 existing residences with on-site septic system that were decommissioned to the public sanitary system.

  Clackamas County's Septic Program tracks the number of decommissioned onsite septic systems but does not record those that connect to a public sewer system. The County received 19 signed "Certification of Existing System Decommissioning" forms from County residents that elected to decommission a septic or cesspool. To provide this information in the future, the County is exploring the possibility of adding this to its data management system.

Fiscal analysis: This management strategy is currently funded.

Timeline for implementation: This management strategy is currently being implemented and is an ongoing activity.

7.8 Illegal Dumping Management

Solid waste can be illegally dumped on public and privately owned and lands, which can contribute TMDL pollutants to surface waters if not cleaned up properly in a timely manner.

TMDL pollutants addressed:

- ✓ *E. coli*
- ✓ Mercury
- ✓ Total phosphorus and DO in the Tualatin River watershed

Description of the potential sources: Illegal dumping of selected types of solid waste can cause TMDL pollutants to be transported via stormwater runoff into surface waters. Examples are listed below:

- *E. coli* from biological waste
- Mercury from some fluorescent light bulbs, batteries, thermometers, and electronics
- SVS, which can cause instream DO levels to be depleted, from items such as discarded food and yard debris
- Total phosphorus in items such as discarded food, soiled diapers, and yard debris

Description of the management strategy: Illegal dumping of solid waste is addressed by different programs and regulations depending on the place where the solid waste was dumped in Clackamas County.

Metro's Regional Illegal Dumping program

Illegal solid waste dump sites can be cleaned up by the regional illegal dumping program if it is dumped on public land and within the Portland metro area's UGB. Co-Owners of this IP will continue to refer these sites to the regional illegal dumping program when they're reported or discovered, unless the public landowner chooses to clean it up without assistance.

Public Roads that Receive Full Clackamas County Maintenance

Solid waste that is illegally dumped on roads that receive full Clackamas County maintenance can be reported to Clackamas County's Transportation Maintenance Division.

Illegal Solid Waste Dump Sites on other Private Properties

If the dumped solid waste is private land, cleanup is the responsibility of the landowner, although law enforcement can play a role if the person(s)/business who dumped the material can be identified. For illegal solid waste dump sites within the urban area, Clackamas County Code Enforcement Division can be contacted. That division can administer a solid waste nuisance ordinance, which pertains to illegal dumping on public and private property. This ordinance is administered on a priority-rated basis, and illegal dumping that involves household garbage is a high priority for enforcement and resolution. Mediation is an additional tool that Clackamas County Code Enforcement Division uses to resolve certain types of solid waste issues that cause a condition of unsightliness on private property.

Measurable milestones:

- The number of reports of illegal solid waste dumping received by Transportation Maintenance during the TMDL IP year.

  Response

  179. Two (2) of these reports included hazardous and/or construction waste which DTD had removed by a contractor who specializes in this type of work (NRC, US Ecology, Republic Services) Note that when these solid waste reports were investigated, some were found to be unsupported by the evidence (no visible solid waste was present).

- The number of solid waste-related enforcement actions conducted by Clackamas County Code Enforcement during the TMDL IP year.

  Response

  Clackamas County Code Enforcement received 213 separate reports about alleged solid waste violations. The actual number of enforcement actions which were initiated is not tracked. Enforcement actions, however, were conducted in all instances where illegal solid waste was confirmed and when the responsible party could be located

- Estimated number of pounds of illegally dumped solid waste that was removed by the Dump Stoppers program during the TMDL IP year. If available, the number of dumping sites cleaned up will also be provided.

  Response

  The Dump Stoppers Program was officially closed on June 30, 2023 due to lack of available funding for the program. In its place, Forestry employees removed approximately 600 pounds of trash from Clackamas County owned areas affected by illegal shooting. Clackamas County partnered with two Molalla River Cleanups, removing a total of 4,200 pounds of trash from these events. Cleanliness in these areas has improved and County employees continue to provide education to the public on preservation of natural resources.

  DTD's Transportation Maintenance group conducted the following work along County maintained roads in 2024-25:
  - Number of reports of illegal solid waste dumping on County maintained roads: 179

- Transportation Maintenance also responded to and cleaned up/removed 11 houseless encampments, a source of illegal solid waste dumping
- DTD also had 132 Adopt-A-Road participants report trash pickup along County-maintained roadways
- An additional 14 illegal dump locations were forwarded to Metro (RID)
- Estimated number of pounds of illegally dumped solid waste removed by Clackamas County Transportation Maintenance on County maintained roads:
  - 13,219 pounds removed by County by Adopt-A-Road participants
  - 23,222 pounds removed by County (illegal dumps).
  - 375 pounds of hazardous (contained) and/or construction waste removed by contractor ((NRC, US Ecology, Republic Services)
  - 30,980 pounds of houseless encampment waste removed
  - Total weight of illegal waste materials removed by Metro (RID) is unknown.

Fiscal analysis: This management strategy is currently funded.

Timeline for implementation: This management strategy is currently being implemented and is an ongoing activity.

7.9 Respond to Reports of Impaired Stormwater Quality

This management strategy applies to all properties throughout this TMDL IP's geographic area.

TMDL pollutants addressed:

- ✓ *E. coli*
- ✓ Mercury
- ✓ DO and total phosphorus in the Tualatin River watershed
- ✓ DDT and dieldrin in Johnson Creek's watershed
- ✓ Dieldrin, DDT, and iron in the Pudding River watershed

Description of the management strategy: Clackamas County, WES, or Happy Valley staff will contact facilities and properties that are the subject of a stormwater quality complaint or request for service in a timely manner. Staff decides if a site visit is required or if the investigation should be referred out to partner organizations such as the Clackamas Soil and Water Conservation District, or DEQ, for follow-up and resolution. Staff will refer the complaint or request for service to Oregon Dept. of Agriculture if it pertains to agricultural stormwater or to Oregon's Department of Forestry if it stormwater runoff comes from forested privately-owned lands.

For construction site runoff complaints or requests for service, an erosion control inspector will respond (see Management Strategy 7.5).

For properties and facilities that are in the WES SWM service area, control measures for NPS stormwater discharges from these facilities will be deemed necessary by WES if the presence of excess levels of a TMDL pollutant can be confirmed to be present in a facility's discharge.

WES staff provides guidance and technical assistance when a discharger's NPS stormwater quality does not produce the required improvement. If the discharger fails to achieve the required improvement with WES' assistance, WES staff will contact the DEQ and request its support. The DEQ has the authority to compel most NPS stormwater dischargers to halt or modify their discharge if it contains a significant concentration of TMDL pollutants and flows, or is likely to flow, directly to waters of the state.

Measurable milestone: Did the Co-Owners of this IP respond to all complaints and requests for service that pertain to allegedly impaired non-erosion control program stormwater quality? In each TMDL IP annual report, a yes/no answer shall be provided by Clackamas County DTD, Clackamas WES, and the City of Happy Valley. For this measurable milestone, a field visit or site inspection is not required to "respond" in a satisfactory manner.

Response

Yes, WES, DTD, and Happy Valley responded to all complaints and requests for service that pertain to allegedly impaired non-ERCO / EPSC program stormwater quality.

Fiscal analysis: This management strategy is currently funded.

Timeline for implementation: This management strategy is currently being implemented and is an ongoing activity.

7.10 Illicit Discharge Detection and Elimination Program (i.e., spills)

Illicit discharges can contain one or more of several different NPS TMDL pollutants. Stopping and preventing illicit discharges is an effective strategy for protecting receiving water quality.

TMDL pollutants addressed:

- ✓ *E. coli*
- ✓ Mercury
- ✓ Total phosphorus and DO in the Tualatin River watershed

Description of the potential sources: The illicit discharge of certain liquid substances, such as wastewater, containing NPS TMDL pollutants such as *E. coli* or mercury can cause watershed health impairment. Potential sources of this NPS contamination are listed below:

- *E. coli* in sewage spilled from privately owned sanitary sewer lines due to pipe failure, etc.
- Mercury can be spilled from a broken older thermometer that contained mercury.
- Total phosphorus from illicitly discharged sewage, such as from a recreational vehicle.
- SVS from illicitly discharged sewage, such as from a recreational vehicle.

Description of the management strategy: Stopping the discharge and overseeing the cleanup by the responsible party, if cleanup is feasible and if the responsible party is known, is one of the primary functions of this program. A second primary function of the program is to try to prevent illicit discharges from occurring in the future. The Illicit Discharge Detection and Elimination (IDDE) program work described here is limited to the following types of illicit discharges:

- Discharges that flow into, pass through, or move towards privately owned storm sewer outfalls
- Discharges that move by overland sheet flow on private property
- Discharges that flow into, pass through, or move towards Clackamas County-owned/maintained storm sewer systems that are not regulated by the MS4 Permit or the Water Pollution Control Facility Permit. Nearly all of the publicly owned, surface-discharging NPS storm sewer systems that are addressed by this NPS TMDL IP are those that serve Clackamas County-maintained roads in rural areas.

Geographic area where this management strategy is implemented:

Portions of this IDDE management strategy are implemented by Happy Valley, Clackamas County DTD, and WES for the following service areas:

- **Areas not within the WES SWM service area and not within the rural portion of the City of Happy Valley.** This portion of the management strategy is administered by Clackamas County DTD Transportation Maintenance Division. If materials that potentially contain harmful pollutants (such as *E. coli* or mercury) are spilled or illicitly discharged onto a transportation maintenance-maintained road right-of-way (i.e., the impacted road segment is eligible for "full county maintenance"), staff will respond if they are notified about the incident, and it is determined that a response is appropriate. They'll ensure that the release of the material is halted and the material is subsequently cleaned up in a manner that prevents harmful substances from entering waters, if possible, or minimizes the amount of pollution that enters the nearest waterways if that is not possible.

  The Clackamas County Transportation Maintenance Division adheres to the ODOT Guide. Roadway spill response work is addressed in these two sections of this document: "Accident Cleanup" (Activity 149) on page 32 and "Spill Prevention and Cleanup" on page 15 of the ODOT Guide.

  For spills involving agricultural materials that contain TMDL pollutants (e.g., *E. coli* from animal manure), Oregon's Department of Agriculture may assume the lead role in responding to the report and resolving the matter.

  The WES SWM service area and the rural portion of the City of Happy Valley. Most commonly, WES provides IDDE program services in this NPS geographic area, but Happy Valley provides services in the rural portion of the city. Staff will make reasonable efforts during regular business hours to halt the release of spilled and illicitly discharged material in NPS areas and to persuade/motivate the responsible party to clean up the material. The goal is to prevent or to minimize the release of TMDL pollutants and other pollutants into waterways or into groundwater.

  If efforts by staff fail to halt the release of the material containing TMDL pollutants that are likely to enter surface waters and/or storm sewers, staff will contact the DEQ and request its support. The DEQ has the authority to compel most dischargers to halt or modify their illicitly discharged material if it contains a significant amount of pollution and is flowing, or is likely to flow, into waters of the state.

Measurable milestone: The number of illicit discharges that were verified to have occurred during the TMDL IP year in the NPS water pollution locations in the WES SWM service area. Also, for these incidents, provide 1) the type of material spilled (e.g., sewage), 2) whether any of the material entered a creek, wetland, or river, 3) an estimated total volume spilled and the volume that entered the water body, if this occurred, 4) the name of the responsible party, if known, and 5) the location where the material was spilled.

Response

Clackamas County and WES reported four (4) non-point source illicit discharges; all of them were spills. Happy Valley did not receive reports of non-point source illicit discharges.

Clackamas County
Transportation Maintenance responded to three incidents of spilled or illicitly discharged material occurring in the Transportation-Maintenance right-of-way. Although these spilled or illicitly discharged materials contain little or no TMDL pollutants (mercury and E. coli, for example) they're provided here for the benefit of the reader. The three incidents included:

1) Vehicle fire on S. Bakers Ferry Road at the Barton Bridge

a) Unknown amount of hydraulic fluid
b) Mostly contained to roadway, however some fluid did enter the Clackamas River
c) Maintenance staff, NRC and Clackamas Fire Department employed multiple BMPS including absorbent pads, absorbent booms on roadway, and absorbent booms spanning the wetted channel of the Clackamas River
d) Responsible party is Clackamas County Transportation Maintenance
e) Date of discharge: 10/23/2024
f) Date of response: 10/23/2024

2) Vehicle leaking hydraulic fluid on S. Henrici Road
   a) Approximately 30 gallons leaked across 2.2 miles of roadway
   b) Contained to roadway (roadway was dry this day)
   c) Staff applied sand to the roadway for vehicle safety
   d) Responsible party is Clackamas County Transportation Maintenance
   e) Date of incident: 12/2/2024
   f) Date of response: 12/2/2024

3) Vehicle accident on S. Beavercreek Road
   a) Approximately 2 gallons of motor oil
   b) Contained to roadway
   c) Staff applied absorbent material (Floor Sweep), scrubbed it in, and picked up with a pickup broom
   d) Reported by Transportation Maintenance Supervisor. No County vehicles involved. Responsible party unknown.
   e) Date of incident: 9/5/2024
   f) Date of response: 9/5/2024

WES
One illicit discharge, described below, occurred in the non-point source water pollution locations in WES' Surface Water Management service area.

4) June 4, 2025 - Over 100 dead fish and wildlife were found in Mt. Scott Creek near SE 117th Ave. WES conducted sampling and inspections but found no pollutant source. Surface water was impacted; no enforcement action or abatement was required. Responsible Party was unknown. OERS #2025-1375.

Fiscal analysis: This management strategy is currently funded.

Timeline for implementation: This management strategy is currently being implemented and is an ongoing activity.

7.11 Riparian Area Assessment and Management

Riparian area assessment and management can provide shading and can reduce river/stream warming from direct sunlight, in addition to providing a myriad of water quality improvement and bank stabilization benefits. Reduction of the riparian canopy can also change the microclimate near streams, increasing air flow and heat exchange with the stream and thereby further elevating water temperatures.

TMDL pollutants addressed:

- ✓ Temperature
- ✓ Mercury (because stream bank stabilization reduces stream channel erosion)
- ✓ DO in the Tualatin River watershed (because cooler stream water can hold more DO)

Description of the management strategy: Protection and restoration of riparian areas along the rivers and their tributaries in the TMDL IP's geographic area is conducted to attain the load allocations for temperature over time. Management Strategy 7.4 (named "Riparian Area Shade: Other Development-Related Regulations) also addresses riparian area shade, but it only applies to properties that are being developed/redeveloped under a permit issued by Clackamas County or the Cities of Happy Valley and Rivergrove. This management strategy applies to all of the other privately-owned and publicly-owned properties with riparian areas.

Geographic area where this management strategy is implemented

- **Tualatin River Watershed: WES SWM service area.**

  Since the 2023-24 TMDL year, WES has awarded the TRWC a RiverHealth Stewardship Program grant annually to plant native plants in riparian areas on private land. Additional riparian area planting work is expected to occur on private lands in the future.

  The City of Rivergrove also owns some properties with riparian areas, and riparian area planting has occurred on some of these properties as well over the years (Tualatin River riparian area at SW 65th Avenue near Childs Road, for example).

- **Other Watersheds in WES' SWM service area.**

  Other watersheds in the WES SWM area include Kellogg-Mt. Scott Creek, Johnson Creek, and the Clackamas River. Beginning in 1993, many trees and other native plants have been planted with WES' financial support in many privately owned and publicly owned riparian areas in the WES SWM service area.

  Funding from WES has supported tree planting on many pieces of publicly-owned land, including some lands owned by Clackamas WES, Clackamas County, and the City of Happy Valley. WES owns and maintains about a dozen natural areas, and riparian area vegetation is maintained and enhanced, which includes weed control, on those sites. WES often accomplishes this maintenance through an intergovernmental agreement with North Clackamas Parks & Recreation District. The City of Happy Valley also owns many properties with riparian areas, and riparian area planting and weed control work has occurred on most of them as well over the years (e.g., Mt. Scott Creek riparian area in Happy Valley Park). More of this work on public lands is expected to occur in the future.

  For private lands, thousands of trees have been planted at dozens of riparian area sites over the years with funding or other support from WES. A summary of the RiverHealth Stewardship Grant program results from 2013 (program inception) to 2025 is below:

RiverHealth Stewardship Grant Accomplishments 2013–2025	
# grants	136
# projects or sites	673
# students or volunteer participants	24,245
length of stream worked on, linear feet	262,565
acres of project area	1,137
acres invasives removed	895
# trees planted	40,407
# shrubs planted	140,783

Other grant deliverables through this RiverHealth Stewardship Grant include workshops (in-person and online), presentations, site visits, handouts, and videos. Additional riparian area planting work is expected to occur on private lands in the future.

Enforcement of Riparian Area Protection Regulations in the WES SWM Service Area, including Rural Happy Valley

When WES is notified that inappropriate tree removal, land clearing, etc. has occurred or is occurring on privately-owned land with a permanently protected riparian area, WES and/or Clackamas County will strive to resolve the matter promptly and attempt to persuade / motivate the responsible party to mitigate the damage and re-plant in the places where removal occurred. For enforcement of alleged violations of riparian area protection regulations in the City of Happy Valley, its staff will respond to the allegation; WES coordinates with and provides support to the city upon request.

Installed with the intention to prevent inappropriate tree removal and land clearing from occurring, signs along the edges of these riparian areas notify the reader that the riparian area behind the sign is protected.

Enforcement of Riparian Area Protection Regulations in Areas Not Within the WES SWM Service Area and in the Rural Portion of Happy Valley

In these places, when alleged violations of riparian area protection regulations are reported to Clackamas County's Code Enforcement Division, its investigators will respond to the allegation.

Measurable milestones:

- The number of project sites where WES provided funding when native vegetation was planted in riparian areas in the WES SWM service area, and
- The number of native plants that were planted at these sites (either the total number or the number at each of the sites in Management Strategy 7.11, or both).

Response

WES

- Funded native riparian planting at 25 sites in 2024-25.
- Total of 3,948 trees, 6,057 shrubs and 2,225 herbaceous plants were installed for a total of 12,230 plants.

Additional Information Regarding Riparian Area Plantings

Happy Valley:

- 2.31 acres of mitigation performed by development
- 2,957 native plants planted

Clackamas County:

- 2 sites
- 460 plants including trees, shrubs, and plants

Fiscal analysis: This management strategy is currently funded.

Timeline for implementation: This management strategy is currently being implemented and is an ongoing activity.

7.12 Cold Water Refugia Assessment and Management

CWR are areas within rivers that maintain cooler temperatures in late spring, summer, and early fall when water temperature elsewhere in the river is significantly warmer. For example, a CWR can be a place where a colder tributary stream enters a river. CWR offer migrating salmonids, and other native fish and aquatic species, relief from the warmer water in the other parts of the river.

TMDL pollutants addressed:

✓ Water temperature/CWR

Description of the potential sources: The 2006 temperature TMDL includes requirements to assess and protect CWR in the Willamette River in Clackamas County. Although the Willamette River watershed temperature TMDL was revised in 2024 – and approved by the EQC on August 6, 2024 – it is our understanding that the CWR portion of this new TMDL is similar to the CWR requirements in the 2006 TMDL. Alteration to river channel structure including removal or lack of large woody debris and modifications to deep pools and overhanging bank areas can reduce the presence of CWR or potentially eliminate it. Reductions in infiltration of stormwater from development, farming, etc. in upland areas, the resulting reduction in groundwater replenishment, and the corresponding reduction or elimination of flow from springs, are expected to increase temperatures of tributary streams, which can also reduce the quality and size of a CWR.

Description of the management strategy: Clackamas County does not own, control, or regulate the CWR in the Willamette River. And the other Co-Owners of this IP (Clackamas WES' SWM service area and the Cities of Happy Valley and Rivergrove) do not own or regulate any lands near CWR. However, this management strategy does describe work that the Co-Owners of this IP expect to have a positive influence on the enhancement and protection of these CWR.

From river mile 0 to river mile 50, the Willamette River has been designated as a salmon and steelhead migration corridor. The biologically based numeric temperature criteria here is 20 degrees Celsius (68 degrees Fahrenheit) and applies throughout the year. The following narrative temperature criteria for salmon/steelhead migration use also apply to this section of the Willamette River: CWR shall be *"sufficiently distributed to allow salmon and steelhead migration without significant adverse effects from higher water temperatures elsewhere in the water body."*

According to OAR 340-041-0002, CWR are defined as those portions of the water body where, or at times during the diel temperature cycle when, the water temperature is at least 2 degrees Celsius colder than the daily maximum temperature of the adjacent well mixed flow of the water body. These refugia include habitats and locations where temperature-sensitive cold-water species may find refuge when ambient stream temperatures are stressful. The DEQ's 2006 Willamette Temperature TMDL includes a CWR section that states the following information:

- DMAs could or should play a role in 1) locating and protecting existing CWR and 2) improving/enhancing the function of existing CWR. In this instance, the DEQ's precise expectation for Clackamas County (a DMA) is unclear.
- CWR in the Willamette River can be created by colder water from perennial creeks that join the Willamette River. Tryon Creek is an example. Protection and enhancement of riparian areas and floodplains along these tributaries is important for maintaining and restoring CWR in the Willamette River.
- Cold water refuges in the Willamette River can also be created by hyporheic flow and groundwater inflows (aka springs) into the main channel and side channels.

Action items in this management strategy for the Co-Owners of this IP:

- Continue to try to obtain more infiltration and shallow injection (with drywells, for example) of stormwater in upland areas to replenish the supply of groundwater. This can increase the discharge of cool water from springs, which then flow into creeks and rivers.
- Continue to try to have more trees planted in riparian areas of creeks and rivers in the Tualatin, Clackamas, Molalla-Pudding and other places in the Willamette River watersheds. And continue to try to protect the existing riparian area trees that are in these places.
- Administrators of the Clackamas County-DTD and/or Happy Valley Floodplain Management Program may choose to assess their options for potential CWR-related changes to the administration of their programs to protect and/or enhance colder water in creeks in rivers, including the enhancement or protection of hyporheic flows.

Unrelated to this TMDL Implementation Plan but of note is the recent modification of the WES owned and operated Tri-City WRRF outfall. Since 1986, the Tri-City WRRF has discharged its treated effluent into the Willamette River in Oregon City. WES is in the process of constructing a new outfall, moving the discharge point further upstream near the I-205 bridge. Moving the discharge point farther from the Willamette River's confluence with the Clackamas River helps preserve this significant Cold Water Refuge, which provides crucial seasonal habitat for fish and other aquatic life.

Measurable milestones: None.

Fiscal analysis: This management strategy is currently funded.

Timeline for implementation: This management strategy is currently being implemented and is an ongoing activity.

8. TMDL Implementation

This section of the 2024-25 NPS TMDL IP annual report addresses how Management Strategies were implemented and includes some potential barriers to implementation as well as timelines for implementation.

8.1 Implementation Monitoring and Evaluation Reports

According to OAR 340-042-0080(4)(a)(C), the 2022 NPS TMDL IP shall *"Provide for performance monitoring...."* The definition of performance monitoring, as provided in OAR 340-042-0030(7) is *"…monitoring implementation of management strategies, including sector-specific and source-specific implementation plans, and resulting water quality changes."* During the 2024-25 year, implementation monitoring was conducted by Clackamas County, Clackamas WES, and/or the Cities of Happy Valley and Rivergrove to confirm that this IP's Management Strategies were implemented as described in the IP.

From time to time, when deemed appropriate, the NPS TMDL IP will be revised to reflect enhanced understanding of the program's effectiveness, the resources available to our programs, and to reflect current watershed conditions. The 2022 NPS TMDL IP was revised in 2023. This 2023 NPS TMDL IP was submitted to DEQ in October 2023. On May 14, 2025, DEQ approved the implementation of the 2023 NPS TMDL IP. Because the 2024-2025 NPS TMDL reporting year ended on June 30, 2025, the Co-owners continued to implement the 2022 NPS TMDL IP until June 30, 2025. The 2023 NPS TMDL IP was implemented beginning on July 1, 2025.

8.2 Barriers to Implementation

Land ownership categories that are potential NPSs of pollutants that Clackamas County, Clackamas WES, and the Cities of Happy Valley and Rivergrove have very little or no authority to regulate or control include, but are not limited to, the following areas:

- Privately owned timberlands
- Privately owned farm, ranch, and orchard lands
- Lands within the other cities in the TMDL's geographic area, such as West Linn and Estacada
- Highways, such as I-205, and other state-owned lands

Specific barriers include, but are not limited to, the following issues:

- The bacteria LAs may be exceedingly difficult and prohibitively expensive to attain if much of the instream *E. coli* loading is from the feces of wild birds and mammals.
- The predominant NPSs of nearly all of these TMDL pollutants are privately owned lands, and the Co-Owners of this IP, as units of local government, typically have little or no authority to compel these thousands of residents and businesses to reduce their contributions of these pollutants by significant amounts. In most instances, their right to use their privately owned property as they wish outweighs and outranks the local government's power to regulate the use of their land.

8.3 Adaptive Management Approach to Attaining Load Allocations

The Co-Owners' goal is to attain the LAs that have been issued to them for each TMDL pollutant through an adaptive management process. The Co-Owners are committed to investing in activities and programs that contribute to overall watershed health and are currently implementing and tracking the effectiveness of a variety of Management Strategies to improve and maintain water quality, as described in Chapter 7.

It is unknown at this time whether the current and planned level of management activities will provide enough pollutant load reduction to meet the load allocations given the barriers to implementation described above. As progress is made toward pollutant reduction, the Co-Owners will adaptively manage activities and programs to work toward attaining the LAs.

9. Mercury TMDL Implementation Update

In 2006, the DEQ issued a mercury TMDL for the entire Willamette River Basin to protect and restore the beneficial uses of the Willamette River, including fish consumption. Given data limitations for mercury at that time, load allocations (LA) and waste load allocations (WLA) were not provided for mercury. In 2019, the DEQ issued the revised Willamette River Mercury TMDL. After revising some of the DEQ's proposed LAs and WLAs, EPA approved the revised Mercury TMDL on February 4, 2021. The DEQ gave DMAs 18 months from TMDL issuance to submit updated NPS TMDL IPs to address

the new mercury requirements. The DEQ-approved 2022 NPS TMDL IP complies with this requirement. Our 2023 NPS TMDL IP, which DEQ approved on May 14, 2025 and began to be implemented on July 1, 2025, also fully complies with the Mercury TMDL.

9.1 Management Strategies

In the November 22, 2019, final revised Willamette River Mercury TMDL's WQMP (Water Quality Management Plan), the DEQ established four minimum measures for counties to control non-point sources of mercury (see page 97-221 in the TMDL). **Table 5** (below) references those minimum measures and includes the Management Strategies from the 2022 NPS TMDL IP that the Co-Owners of the IP implemented during the 2024-25 year to address each measure. **Table 6** includes a description of the additional mercury reduction measures which were conducted during the year.

Table 5. Minimum Mercury Requirements for Counties

Stormwater Measure	Requirements	Measures Implemented and Described
Pollution Prevention and Good Housekeeping for County Operations	Counties must properly operate and maintain lands, properties, and facilities using prudent pollution prevention and good housekeeping measures and through appropriate staff training to reduce the non-point source discharge of mercury-related pollutants to waterbodies. Counties must maintain records for meeting these requirements and include a descriptive summary of their activities in the TMDL annual report. **2024-25 annual report's descriptive summary:** Clackamas County and Clackamas WES did properly operate and maintain lands, properties, and facilities they own and operate using prudent pollution prevention and good housekeeping measures and through appropriate staff training to reduce the NPS discharge of mercury (and related pollutants, such as TSS) to waterbodies. Records for meeting these requirements are available upon request. See *"O & M for Publicly Owned Storm Sewer Systems (MS 7.2)"* for more information.	O & M for Publicly Owned Storm Sewer Systems (MS 7.2)
Public Education and Outreach (PE & O)	Counties must conduct public education and outreach to reduce NPS discharges of mercury and mercury-related pollutants, such as sediment, on county lands and properties, as applicable. Such activities should include outreach to property owners adjacent to county roads and ditches. In addition, public education must include efforts to encourage and facilitate reporting of sediment-related issues or concerns from the public. Public outreach should be tailored to meet the needs and diversity of the county population (e.g., signs, social media, website presence, etc.). Counties must track implementation of the public education and outreach requirements and describe all activities in the TMDL annual report. **2024-25 annual report's description of activities:** During 2025-26, Clackamas County and Clackamas WES are planning to conduct public education and outreach to reduce non-point source discharges of stormwater which contain mercury and mercury-related pollutants such as sediment from privately owned land. A status report on the implementation of this education and outreach is expected to be provided in our 2025-26 annual report.	Public Education (MS 7.6) and Respond to Reports of Impaired Stormwater Quality (MS 7.9)
Enforcement of Prohibited Pollutants	Counties must reduce conveyance of mercury and mercury-related pollutants to waterbodies from county lands and properties and have the capability of enforcing on other entities that contribute mercury-related pollutants, such as sediment, to county property and assets. The DEQ recognizes that county ordinances already in place or that must be adopted will likely be more comprehensive and prohibit discharges of other pollutants, rather than only those pollutants associated with mercury.	Illegal Dumping Management. (7.8), and Respond to Reports of Impaired Stormwater Quality (7.9), and Illicit Discharge Detection and Elimination Program (7.10)

	The program must also maintain a procedure or system to document all complaints or reports of mercury and mercury-related pollutant discharges to county lands and properties (and to water bodies from county lands and properties). Counties must track implementation of their enforcement program and describe all activities in the TMDL annual report. **2024-25 annual report's description of activities:** The implementation of Clackamas County's and Clackamas WES' program for the enforcement of prohibited pollutants was tracked and is addressed by the following 3 Management Strategies in the 2022 NPS TMDL IP: "*Illegal Dumping Management. (7.8)"*, and "*Respond to Reports of Impaired Stormwater Quality (7.9)",* and *"Illicit Discharge Detection and Elimination Program (7.10)".* See those sections of this annual report for a description of activities which were implemented. All complaints and reports of mercury and mercury-related NPS pollutant discharges to County-owned and WES-owned lands/properties – as well as from County and WES-owned lands/properties to water bodies – were responded to, addressed, and documented. Note that because this Prohibited Pollutants requirement in the TMDL also includes mercury-related pollutants, such as TSS (total suspended solids), discharges of stormwater runoff from construction sites probably contained less mercury due to the implementation of Management Strategy 7.5, *"Erosion Prevention and Sediment Control".* See a description of the County's proposed program in MS 7.5 Erosion Prevention and Sediment Control.	
Construction Site Runoff Control	To minimize mercury and control potential sediment runoff from construction sites, counties must incorporate erosion control requirements into county building and grading permit applications. Permit language must require erosion, sediment, and waste material management controls to be used and maintained at construction sites from initial clearing through final stabilization. Counties may prioritize where these building and grading permit requirements are applied, for example where increased development is occurring, according to county zoning regulations, or where large subdivisions or large-scale dense development is allowed. Through an ordinance or other regulatory mechanism, counties must be able to pursue enforcement and technical assistance, as appropriate, at construction sites where pollutants could discharge to waters of the state, either directly to a stream or through a conveyance system. In each TMDL annual report, the county must track implementation of its construction site runoff control program and describe all activities. **2024-25 annual report's description of activities:** The implementation of Clackamas County's and Clackamas WES' ERCO programs was tracked and their implementation is described in the Management Strategy 7.5 *"Erosion Prevention and Sediment Control"* section of this annual report. In addition, MS 7.11 *("Riparian Area Assessment and Management*") was also implemented during 2024-25; riparian areas can remove some sediments and their associated pollutants, such as mercury, from sheet-flowing stormwater runoff before the cleansed runoff enters its surface water body.	Erosion Prevention and Sediment Control. (7.5), and Riparian Area Assessment and Management. (7.11)

This table was adapted from the Final Revised Nov. 2019 Willamette Basin Mercury TMDL's WQMP

In addition to the minimum measures addressed in the table above, the following mercury reduction recommendations were implemented or were partially implemented. Table 6's content was adapted from Table 13-13 for Counties in the Final November 22, 2019, final revised Willamette Basin Mercury TMDL's WQMP (see page 98-221 in the TMDL). Table 6 (below) includes a summary of these recommendations for Counties in the Willamette River basin and its connection to the applicable Management Strategies in the 2022 NPS TMDL IP.

Table 6. Additional Mercury Reduction Measures	
Recommendations for Counties from Table 13-13 in the Final Revised Nov. 2019 Willamette Basin Mercury TMDL's WQMP	**Applicable Management Strategy being Implemented that is Relevant to this Recommendation (see these sections of this annual report for more information about implementation of these MS's in 2024-25)**
Roads	
Identify and prioritize county roads and ditches that contribute sediment and runoff to waterbodies. Best practices could include planting/retaining vegetation in ditches and reducing use of pesticides when appropriate to site conditions. Special attention should be focused on the following situations: unimproved/gravel roads in higher traffic areas, roads where traffic consists of heavy machinery use, near quarries or other activities that can exacerbate dust and track-out concerns.	O & M for Publicly Owned Storm Sewer Systems (7.2)
Develop and implement an O & M program with a schedule of regular and long-term inspection and maintenance ensuring the proper operation and effectiveness of both structural and source controls, e.g., stormwater system maintenance and/or road maintenance actions that prevent erosion of road surfaces	O & M for Publicly Owned Storm Sewer Systems (7.2)
Riparian Buffers	
Retain or plant adequate riparian buffers along waterbodies on county properties, such as a park, to provide natural filtering of sediment. Percent effective shade targets to meet the 2006 Willamette Basin TMDL for temperature are available in the 2006 TMDL document. Meeting shade targets will help provide shade for reducing heat impacts, as well as buffers to filter runoff. Counties that were identified as DMAs in the 2006 TMDL should already be conducting activities in support of this goal.	Riparian Area Assessment and Management (7.11)
Develop an enforceable ordinance that establishes a minimum buffer along streams, wetlands, lakes, and other waterbodies.	Riparian Area Shade: Other Development-Related Regulations (7.4)
Onsite Stormwater Management	
Strive to reduce the percent of new impervious surfaces by prioritizing onsite stormwater infiltration on county-owned properties for existing properties, new development, and redevelopment.	Stormwater Regulations for New/Redevelopment and for CIPs (7.1)
Encourage and incentivize developers to implement low-impact design standards on large development sites.	Stormwater Regulations for New/Redevelopment and for CIPs (7.1)

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