Total Maximum Daily Load (TMDL) Implementation Plan

City of Aurora, OR

Date

May 2010

Rev Aug 2022 by City of Aurora

Prepared By

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Introduction

This document is the Total Maximum Daily Load (TMDL) Implementation Plan for the City of Aurora. The City of Aurora is required to develop a TMDL Implementation Plan in order to comply with the Molalla-Pudding Subbasin TMDL order issued by the Oregon Department of Environmental Quality (DEQ), as approved by the US Environmental Protection Agency (EPA) in December 2008. The overall goal of this TMDL Implementation Plan is to effectively outline the various procedures and best management practices the City will use to address water quality pollution concerns with the Pudding River and with other surface waters within the city limits of Aurora.

DEQ revised the 2006 TMDL for mercury and issued *DEQ's Revised Mercury Total Maximum Daily Load Water Quality Management Plan*, November 22, 2019. There are new mercury allocations specified in EPA's 2021 TMDL which are effective for designated management agencies, City of Aurora being one of them.

This TMDL Implementation Plan is organized as follows:

Section 1- Introduction, provides a brief introduction of this Plan;
Section 2 - City Information, provides pertinent information about the City of Aurora; **Section 3 - Background and Implementation Plan Goals,** provides a summary of the TMDL requirements, describes each of the major pollutants addressed in the Molalla-Pudding Subbasin TMDL, and explains the subbasin's water resources, land use, and important issues related to water quality;
Section 4 - Inventory of Existing Water Quality Management Activities, provides key information about the City of Aurora existing policies, programs, and practices, and identifies areas where the City should focus their efforts on strengthening mechanisms to address water quality concerns;
Section 5 - Plan Implementation and Reporting Requirements, describes what the City plans to do to address the TMDL parameters. The matrix included in this section clearly displays when and how strategies will be implemented and identifies how effective implementation will be measured.
Section 6 - References, provides a listing of references and relevant TMDL information.

Attached to this TMDL Implementation Plan is a Management Strategy Matrix (see Appendix A), which displays the pollutant being addressed, the strategy used by the

City to address it, when that strategy will be implemented, and how to measure progress and successful implementation within the next five years. The City intends to track TMDL implementation activities and report to DEQ annually (before December 31, unless otherwise directed by DEQ) on progress and accomplishments by filling in the "status" column of the matrix for each strategy and submitting the updated matrix to DEQ.

The City also intends to evaluate this TMDL Implementation Plan every five years following submittal. The evaluation will include a review of existing water quality data and other information to evaluate the effectiveness of the Plan relative to the pollution reduction goals. In addition, the City will review and revise this TMDL Implementation Plan as needed following DEQ re-evaluation of the Molalla-Pudding Subbasin TMDL.

City Information

Summary

Receiving Waterbodies:
Pudding and Mill Creek
Designated Management Agency: Aurora
City of Aurora
21420 Main Street NE
Aurora, OR 97002
County: Marion
Contact Name: Mark Gunter
Title: Public Works Superintendent
Telephone: 971-930-3597
Email: PWS@ci.aurora.or.us

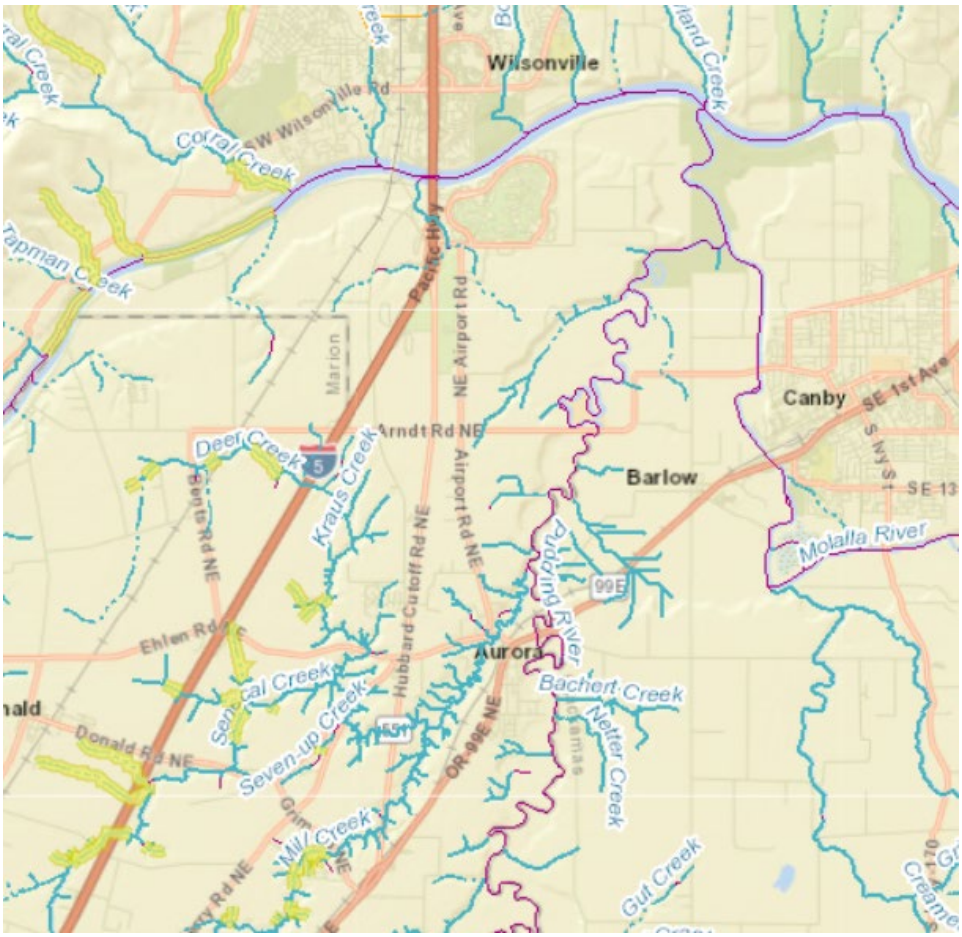

Figure 1 – City of Aurora

Location

The City of Aurora is located in Marion County, approximately 25 miles south of Portland and 5 miles east of Interstate 5 south and west of the Pudding River. The City is located along, and bisected by, State Highway 99E and is located between the cities of Canby and Hubbard along the 99E corridor. The City of Aurora currently has a population of approximately 980 and continues to predominantly be a growing small residential community. See **Figure 1** above.

The City of Aurora is situated just south of the confluence of Mill Creek with the Pudding River at approximately river mile (RM) 8 of the Pudding River, within the Molalla-Pudding Subbasin in the Willamette Basin. The Pudding River runs approximately 2 river miles adjacent to the City of Aurora. There is approximately 218 acres within the current city limits.

Point Source (WWTP)

The City of Aurora Wastewater Treatment Plant (WWTP) seasonally discharges treated effluent into the Pudding River at approximately river mile 8.8 within the current National Pollutant Discharge Elimination System (NPDES) permit requirements. The City does not discharge between May 1 and October 31 to the Pudding River. When discharge to the Pudding River is not allowed, the City's WWTP treated effluent is seasonally and selectively irrigated to a small 6 acre poplar plantation located next to the WWTP. The City is currently looking at ways to expand this small poplar plantation.

The NPDES permit is a federal permit required by the Clean Water Act and DEQ has been delegated authority to issue NPDES permits by USEPA. As permits are renewed through DEQ, the permit requirements will be revised to ensure that all 303(d) related issues and TMDL allocations are addressed in the permit (DEQ, 2008). As such, the City will continue to comply with their NPDES permit requirements.

Background and Implementation Plan Goals

Summary of TMDL Requirements

Total Maximum Daily Loads (TMDLs) are limits on pollution intended to bring rivers, lakes and streams into compliance with water quality standards designed to protect human health, aquatic life, and other beneficial uses of water. Development of TMDLs is required by the federal Clean Water Act of 1972, and the Oregon Department of Environmental Quality (DEQ) is the state agency authorized by federal and state law and regulation to develop these pollution limits (DEQ, 2008).

Section 303(d) of the federal Clean Water Act requires states to periodically list waterbodies that do not meet water quality standards ("303(d) list"). As part of the Molalla-Pudding Subbasin TMDL. DEQ completed 30 TMDLs and proposed delisting 3 impaired stream reaches (Zollner Creek arsenic and manganese and Pudding River manganese listings.

A TMDL determines how much pollution can be added to the waterbody without exceeding water quality standards. The TMDL identifies where pollution comes from within the basin, calculates pollution loads that will meet water quality standards and divides or "allocates" the pollution loads among different sources (DEQ Bacteria Fact Sheet, 2008). TMDLs have been developed for most of the types of pollution causing impairment of beneficial uses in the Molalla-Pudding Subbasin. The amount of a given pollutant (e.g., heat, fecal bacteria, nitrate) that a waterbody may receive without violating a water quality standard is called the Loading Capacity, which is allocated to various uses. The amount that current pollution exceeds the loading capacity is termed the Excess Load. The allocations for point source discharges (e.g., wastewater treatment plants) are termed "waste load allocations," and allocations for non-point sources of pollutants (e.g., urban, agricultural, or forest runoff) are called "load allocations." The sum of all allocations, plus a margin of safety for uncertainty, and a reserve capacity for future needs, is the TMDL (DEQ, 2008).

For the Willamette Basin and most subbasins, TMDLs for temperature, bacteria and mercury were established in September 2006. The Molalla-Pudding Subbasin was not included at that time for staffing reasons and because DEQ had already completed Pudding River TMDLs for dissolved oxygen, forms of oxygen demand, total suspended solids, and ammonia-nitrogen in 1993. DEQ completed the final TMDL for the Molalla-Pudding Subbasin in December 2008.

As part of the Molalla-Pudding Subbasin TMDL, DEQ developed a Water Quality Management Plan (WQMP) to describe the overall framework for implementing the TMDL. The WQMP includes a description of activities, programs, legal authorities and other measures for which DEQ and other Designated Management Agencies (DMAs) have regulatory responsibility. Due to the close proximity to Mill Creek and the Pudding River, the City of Aurora was named by DEQ as a DMA in that it has legal authority over a sector or source contributing pollutants within the City's limits, and in that it operates a wastewater treatment plant with a permit to discharge treated effluent into the Pudding River.

A second round of implementation process is due to DEQ by September 3, 2022. This second round is specifically designed to address mercury in the Willamette Basin. As a designated management agency identified in *DEQ's Revised Mercury Total Maximum Daily Load Water Quality Management Plan,* the City of Aurora is required under OAR 340-42-0080(4) and the WQMP, to prepare and

submit by September 3, 2022, a nonpoint source TMDL implementation plan for DEQ approval that incorporates implementation requirements based on several criteria: https://www.oregon.gov/deq/wq/Documents/willHgtmdlwqmpF.pdf.

The City of Aurora was notified of this requirement on March 3, 2021. The WQMP was issued as an order on November 22, 2019 as part of the *DEQ Final Revised Willamette Basin Mercury Total Maximum Daily Load. Information can be accessed at:* https://www.oregon.gov/deq/wq/tmdls/Pages/willhgtmdlac2018.aspx.

As per ***DEQ Revised Mercury TMDL WQMP*** Section 13.3.1, the City of Aurora's plan is due November 30. 2022 to align with existing reporting requirements.

The TMDL mercury allocations specified in EPA's 2021 TMDL (https://www.epa.gov/sites/default/files/2021-02/documents/tmdl-willamette-mercury-final-02-04-2021.pdf) are effective for designated management agencies and responsible persons named in DEQ's Mercury TMDL WQMP. Summarized below:

The Willamette Basin TMDLs have basin-wide reduction targets for bacteria, mercury and temperature. Reductions in bacteria are needed to protect contact recreation (swimming, fishing, boating, etc.). Reductions in mercury are needed to eliminate fish consumption advisories. And a reduction in temperature is needed to protect fish spawning and rearing.

Each pollutant has its own reduction strategy listed in its respective TMDL document. Those allocated percentage reductions are listed below for bacteria and mercury. Temperature focuses on protection and restoration of shade canopy to improve temperatures for fish.

Bacteria Reduction

Subbasin/Waterbody	Season	Land Use	Overall % Reduction
Molalla-Pudding 2008	Summer Fall-Winter-Spring	Urban	Summer 75-87% Fall-Winter-Spring 70-92%

Mercury Reduction North Santiam-17090005

Category	The EPA 2019 allocated reduction (required)
Non-Permitted Urban Stormwater	75%

Information above is an excerpt from Appendix C from U.S. EPA Total Maximum Daily Load (TMDL) for Mercury in the Willamette Basin, Oregon Total Maximum Daily Load (TMDL) for Mercury in the Willamette Basin, Oregon - February 4, 2021 (epa.gov)

The Oregon Administrative Rule (OAR 340-042-0080) that addresses TMDLs requires local governments and other agencies to develop TMDL Implementation Plans. According to the OARs, TMDL Implementation Plans must include the following five elements:

Identify the management strategies the City will use to achieve load allocations and reduce pollutant loading;
Provide a timeline for implementing management strategies and a schedule for completing measurable milestones;
Provide for performance monitoring with a plan for periodic review and revision of the
implementation plan;
Provide evidence of compliance with applicable statewide land use requirements; and Provide any other analyses or information as specified in the Water Quality Management Plan.

DMAs are to develop and submit TMDL Implementation Plans to the DEQ within 18 months after the release of the final TMDLs. As such, the City of Aurora is required to develop this TMDL Implementation Plan for review and approval by DEQ.

Molalla-Pudding Subbasin Overview

The Molalla-Pudding Subbasin TMDL states that the subbasin is located in the north-eastern portion of the middle Willamette Basin. The Molalla River flows into the Willamette River between river miles 35 and 36. The Pudding River flows into the Molalla River at approximately 0.7 miles upstream of the Molalla River's confluence with the Willamette River. The Molalla River (including the Pudding River watershed) drains approximately 878 square miles (561,920 acres) of which the Pudding River drains approximately 530 square miles (339,200 acres). Figure 1 below illustrates the location of the Molalla-Pudding Subbasin within the Willamette Basin.

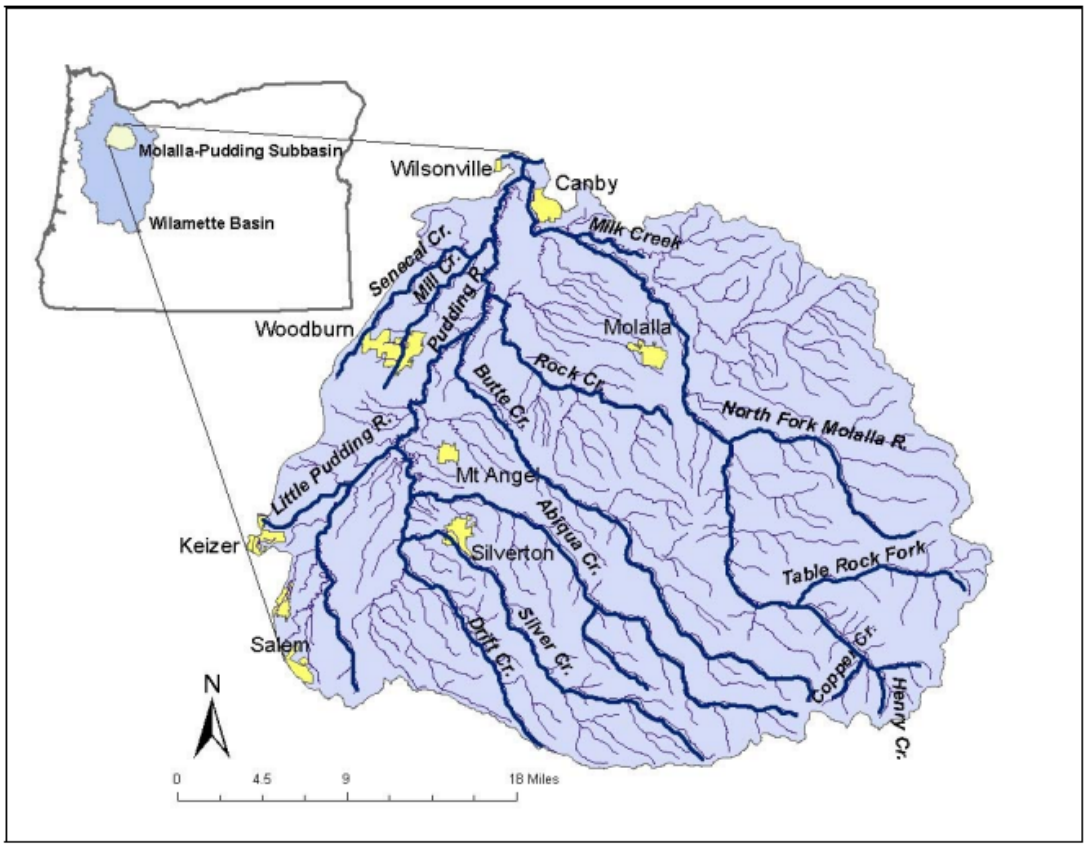

Figure 2 - Location of Molalla-Pudding Subbasin in Willamette Basin (2008 Chapt. 1)

The Molalla-Pudding Subbasin is located within Clackamas and Marion Counties, and includes the cities of Woodburn, Mt. Angel, Silverton, Canby, Molalla, Hubbard, Gervais, Aurora, Brooks, Barlow, Colton and Scotts Mills and portions of Salem, Keizer, Donald, and Wilsonville. Most land in the

Molalla-Pudding Subbasin is privately owned, with approximately 53 percent of the land used for forestry, 40 percent for agriculture, and the remaining seven percent is urban, residential, and industrial (DEQ, 2008).The U.S. Bureau of Land Management (BLM) administers the largest portion of public land in the subbasin. The U.S. Forest Service manages comparatively little land in the far eastern and southeastern portions of the subbasin. The largest portion of state-managed land is Silver Falls State Park, located in the south central portion of the subbasin. Figure 2 below illustrates the general land use in the Molalla-Pudding Subbasin.

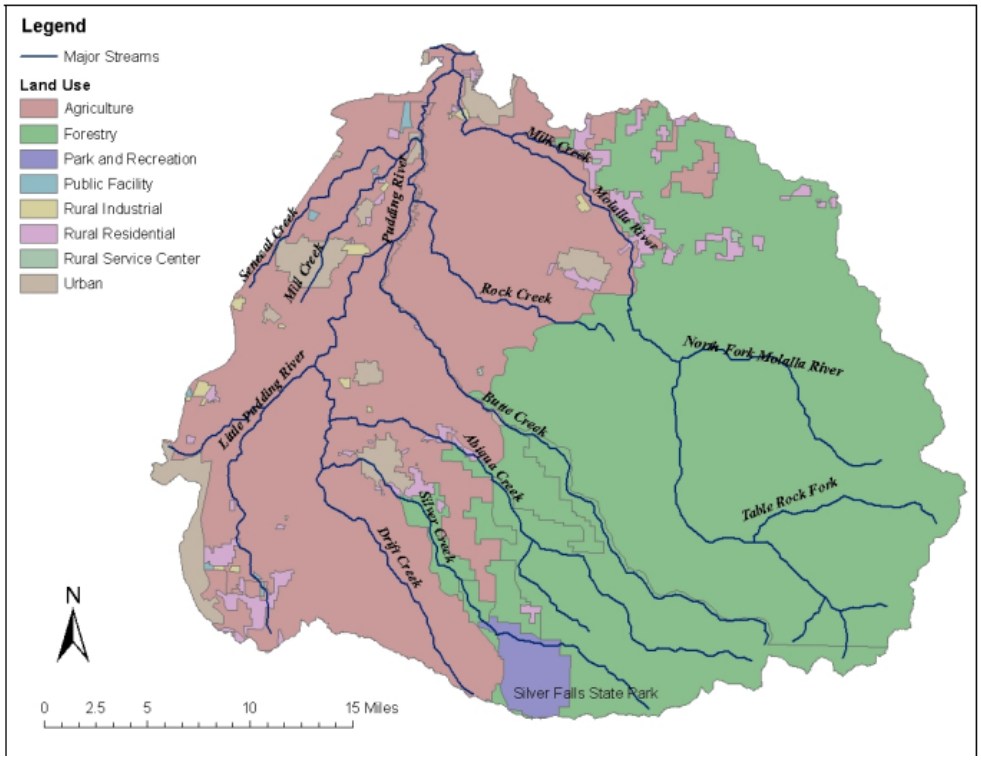

Figure 3 General Land Use in the Molalla-Pudding Subbasin (2008 chapt.1)

The topography, surficial geology, stream channel characteristics, and land use are distinct between the Molalla River and Pudding River portions of the subbasin. The subbasin's various watersheds include:

Molalla River tributaries

- Milk Creek
- North Fork Molalla
- Table Rock Fork

Pudding River *(City's receiving waterbody)* tributaries

- Mill Creek (NRM 8)
- Rock Creek (NRM 14)
- Butte Creek (NRM 18)
- Little Pudding River (NRM 34)
- Abiqua Creek (NRM 43)
- Silver Creek (NRM 46)
- Drift Creek (NRM 48)

Molalla-Pudding Subbasin TMDL Parameters and Water Quality Assessment

As part of the Willamette Basin TMDLs, DEQ identified temperature, bacteria, and mercury as the three key pollutants of concern. For the Molalla-Pudding Subbasin, DEQ has identified a total of nine pollutants as water quality concerns, including temperature, bacteria, nitrate, DDT, chlordane, dieldrin, iron, manganese, and arsenic. TMDLs apply to the Pudding mainstem and tributaries. Being situated just south of the confluence of Mill Creek with the Pudding River at approximately river mile (RM) 8, the City of Aurora is responsible for water quality impacts within the city limits (approximately 2 river miles) to both Mill Creek and the Pudding River. As such, the following table excerpt from the Molalla-Pudding Subbasin TMDL identifies the that apply to the Pudding River and tributaries:

Table 1 Pudding River in the Molalla-Pudding Subbasin (excerpt) TMDLs

Water Body	Listed River Mile	Parameter	Season - Criteria	Assessment Vear	Action
Pudding River	Oto 35.4	DDT	Year Around	1998	TMDL Completed
Pudding River	Oto 35.4	Dieldrin	Year Around	Previously Unlisted	TMDL Completed
Pudding River[1]	Oto 35.4	*E. Coli*	Fall/Winter/Spring	2004	TMDL Completed
Pudding River	Oto 35.4	Iron	Year Around	2004	TMDL Completed
Pudding River	Oto 35.4	Manganese	Year Around	2004	Recommended for Delisting
Pudding River	Oto 35.4	Temperature	Year Around (Nonspawning) Salmon and trout rearing and migration: 18.0 °C.	2004	TMDL Completed

'A 1998 listing for Pudding River (River Mile Oto 35.4) for fecal coliform in fall/winter/spring is not included in Table because the 2004-06 listing for E. coli applies to the same reach and season.

Following are brief summaries of the Molalla-Pudding Subbasin TMDL parameters, but more in- depth information on these parameters and the processes used to develop the TMDLs can be found in Chapters 2 through 6 of the Molalla-Pudding Subbasin TMDL. The summaries below include basic information about the characteristics of the parameter, the potential sources of each pollutant, and a brief list of potential strategies to address each parameter.

Temperature TMDL

The temperature concern is that the Willamette River and its tributaries, which includes the Pudding River, is too warm, which poses a threat to cold water fish species. The temperature TMDL is based on what salmonid fish need to live and reproduce. Salmonids are a family of fish that include salmon and trout. The most critical period for temperature is during periods of low flow and high temperatures, generally during the summer and early fall. Removal or disturbance of streamside vegetation is the primary activity that negatively impacts water temperature due to the loss of shade cover, but water temperature is also affected by erosion, loss of channel complexity, low flows, and heated discharges from industrial or municipal operations.

Salmonids may die at water temperatures above the mid-to-upper 70s°F. The water quality temperature standard is set below this lethal range to protect the fish from conditions that may lead to death. Effects of warmer water include an increased incidence of disease, an inability to spawn, reduced growth rates and survival of eggs and juveniles, increased competition for limited habitat and food, reduced ability to compete with other species that are better adapted to higher temperatures and other adverse effects.

For point sources of heat such as wastewater treatment plants, waste load allocations have been developed that will allow increasing the temperature of the receiving stream no more than 0.2°C above the applicable criterion. Point sources will continue to be regulated through the existing National Pollution Discharge Elimination System (NPDES) permit methods

For non-point sources, such as lack of stream-side shade-producing vegetation, the load allocation is based on the development of natural vegetation in the area adjacent to the stream, known as the riparian zone. Natural vegetation species and heights are determined by considering climate, soils, slope, elevation and historic vegetation. DEQ terms this condition "system potential vegetation." When point sources achieve their waste load targets, and the stream reaches system potential vegetation, temperature in the system will either achieve the numeric criteria or will be near the natural temperature for the system. DEQ uses computer modeling to estimate the natural temperature for the system (DEQ Molalla-Pudding Subbasin Fact Sheet, 2008).

The major implication of the temperature TMDLs is the protection and restoration of stream-side vegetation. Examples of options to address temperature concerns include mechanisms such as:

- Develop brochures and/or other literature that explains why property owners should preserve natural stream-side vegetation;
- Institute a riparian ordinance that prohibits the removal of native stream-side

vegetation;

- Actively restore riparian areas on public land and help private property owners restore
- riparian areas on private land.
- Acquire critical stream-side property and implement projects to demonstrate potential riparian management techniques that can be used; Become involved in a water quality trading program;

Bacteria TMDL

The mainstem Willamette River is water quality limited for bacteria during the high flows of the fall- winter-spring months, but is generally in compliance during summer low flows when there is the least amount of runoff. However, in the Molalla-Pudding subbasin, violations of the bacteria criteria occur throughout the year and under all observed flow conditions.

High bacterial levels can affect the health of citizens who recreate in the Molalla-Pudding Subbasin. Bacteria comes from a variety of sources including failing septic systems, discharges of untreated or poorly treated sewage resulting from sewer malfunctions or overflows, and stormwater runoff that carries feces from pets, domesticated animals or wildlife from urban, residential, and agricultural lands. The main sources of bacterial contamination appear to be non-point sources (e.g., urban, agricultural, or forest runoff).

The City can focus on urban issues to ensure that the quality of water does not degrade due to current land use, population growth, and land use changes. Strategy options the City can use to address bacteria in the urban area include:

- Preventing erosion and controlling sediment from new construction Detaining and treating stormwater prior to discharge into waterways Keeping stormwater conveyance channels clear of organic matter Controlling animal waste
- Maintaining and restoring riparian buffers Encouraging better site design to decrease runoff Preventing non-stormwater and illegal discharges
- Developing stewardship and educational programs to prevent pollution Street sweeping

DEQ provides many sources of information regarding what individuals can do to prevent bacteria pollution. Several are listed below:

- Maintain your septic system, including the drain field. Follow manufacturer instructions regarding pumping and maintenance service. This prevents the discharge of raw sewage into storm drains and nearby rivers following heavy rainfall.
- Pet owners should pick up pet droppings. Storm water runoff can wash pet droppings directly into surface waters or bacteria can be carried to rivers and lakes through the storm sewer systems.
- Avoid feeding geese, ducks and other birds. Bird feces can be a significant contributor to bacteria levels. High bird populations can compound the problem.
- Diaper-aged children should be outfitted with appropriate swimwear. Many swimsuits are now made with specially-designed diapers built in. As well, rubber pants and
- diapers made for swimming will help keep fecal matter contained until diapers can be changed.
- Fence horses and cows away from streams and provide alternative watering devices.
- Boaters with on-board lavatories should make sure that their sanitary systems are discharged into a holding tank or sanitary sewer and not directly into the water.

Mercury TMDL

The Willamette Basin in general, has high concentrations of Mercury. The primary way that humans are exposed to mercury is through the consumption of fish or seafood containing elevated levels of mercury. These high mercury levels in the Willamette Basin have resulted in fish consumption advisories. To protect public health, especially that of pregnant women and young children, the Department of Human Services (DHS) has issued advisories recommending that people limit the amount of fish they consume from certain waterways. Mercury is a potent toxin that can cause damage to the brain and nervous system. Small children and the developing fetus are most sensitive to mercury's toxic effects.

Mercury is a naturally occurring element found in soils throughout the Willamette Basin. Mercury is also found in trees and fossil fuels such as coal, natural gas, diesel and heating oil. The mercury present in these fuels is released into the atmosphere upon combustion. This mercury can be transported great distances and can later be deposited on the land where storm water runoff can carry it into rivers and lakes.

DEQ's preliminary analysis indicates that the majority of the mercury in the Willamette River comes from non-point sources such as the erosion of native soils containing mercury and the runoff of atmospherically-deposited mercury from urban, agricultural and forested landscapes. Mercury is also discharged at low levels by some industrial facilities and domestic wastewater treatment facilities. These sources contribute a relatively minor amount of mercury to waters of the Willamette Basin.

Many of the management strategies that address temperature and bacteria also address mercury. Potential strategies include:

- Working with dentist offices to properly dispose of mercury wastes
  Establishing a stormwater plan with water quality protection components Stormwater detention and treatment prior to discharge into waterways Establishing an erosion prevention and sediment control program Regular street sweeping and stormwater system maintenance
  Limiting land disturbance whenever possible

- DEQ also provides many sources of information regarding what individuals can do to reduce mercury pollution. Several are listed below: Exchange mercury-containing thermometer for a digital thermometer. DEQ sponsors a number of household hazardous waste collection events statewide that include mercury thermometer collection and exchange.
- Recycle fluorescent light tubes, compact fluorescent light bulbs and other mercury- containing products by taking them to a household hazardous waste collection event or facility.
- Check to see if your vehicle has mercury-containing convenience light switches. Replace them with non-mercury switches.
- Replace your mercury-containing thermostat with an energy-efficient digital thermostat. Quickly clean up any spilled mercury following DEQ guidelines.

Nitrate TMDL

Nitrate is not listed on the 303(d) listing for the Pudding River; however, nitrate concentrations in Zollner Creek (a tributary to the Pudding River, which enters at river mile 29.6} exceeds the human- health based standard for drinking water. Nitrate is a naturally occurring compound of nitrogen and oxygen. Nitrogen occurs in the air, living organisms and their waste. Some sources of nitrates are from agricultural runoff and ground water contaminated with nitrates from fertilizer application. Applying more nitrate fertilizer to the soil than a crop can use will build up high levels of nitrate.

Other sources of nitrates are from septic systems, animal waste, and other natural sources. Excess nitrate in waterbodies can be responsible for eutrophication (e.g. excessive algal productivity), but nitrate is also addressed through criteria based on toxic effects. Nitrate levels above 10 mg/l may represent a serious health concern for infants and pregnant or nursing women.

Pesticides TMDL

DDT, dieldrin, and chlordane were used for urban and agricultural insect control until 1972, 1970, and 1988, respectively. All three chemicals persist in the environment because they degrade slowly and are fat soluble, so may bioaccumulate in aquatic organisms. The banned pesticide DDT is on the 303{d) list as a pollutant in the Pudding River. The banned pesticides dieldrin and chlordane are listed as pollutants in Zollner Creek.

The source of these banned pesticides to streams is primarily sediment transported by erosion and runoff from agricultural land use. Urban stormwater has not been discounted as a source, but the greater percentage of land use in the Molalla Pudding Subbasin is agricultural (DEQ, 2008}. DEQ's analysis found DDT to be related to in-stream sediment and that sources of DDT to the Pudding River were likely sediment from Zollner Creek and the Little Pudding River. Dieldrin is less strongly related to sediment but may also decrease as runoff and stream bank erosion to Zollner Creek is reduced.

Metals TMDL

Iron, manganese, and arsenic are elements that occur naturally in volcanic rocks, associated soils, and alluvial sediments of volcanic origin. These element concentrations in groundwater and surface water are often related because arsenic can adsorb on or coprecipitate with iron and manganese and adsorb onto clay mineral surfaces under oxidizing conditions.

DEQ placed Zollner Creek on the 1998 303{d) list for exceedances of the iron, manganese, and
arsenic criteria and placed the Pudding River from the mouth to river mile 35.4 on the 2004/2006 303{d) list for iron and manganese exceedances. However, DEQ recently proposed delisting Zollner Creek for arsenic and manganese and the Pudding River for manganese listings based on evidence they are present in surface water at natural concentrations, given the rocks and soils derived from volcanic materials in the subbasin.

Iron is also naturally occurring, but DEQ's analysis found that high iron concentrations were associated with rain, higher stream flows, and potentially, bank erosion. As such, DEQ has set iron reduction targets for non-point sources. The strategies to limit

sediment entry into streams that will reduce iron contamination are the same strategies likely to reduce temperatures, bacteria, and pesticides.

Point Source (WWTP) TMDL Impact Summary

Discharge from the Wastewater Treatment Plant (WWTP) facility currently meets the requirements of the NPDES permit. The WWTP does not discharge between June 1 and September 30 when a wasteload allocation for excess thermal load would apply to the Pudding River and its tributaries. The wasteload allocation for bacteria will be metby the effluent limits for *E. coli* bacteria in the facility's permit. The City will need to collect iron data to evaluate the treatment plant's potential to cause or contribute to iron criteria exceedances in the Pudding River (DEQ, 2008).

Inventory of Existing Water Quality Management Activities

Existing Policies, Programs, and Practices – Legal Authorities

There are currently many water quality management activities underway within the City of Aurora. The City Municipal Code currently includes requirements to protect the natural environment and scenic features of the City along with landscaping standards. In addition, the City has many codes, master plans, and programs in place that are related to water quality. Table 2 below displays an inventory of these water quality related measures and documents already in place.

Table 2 - Inventory of Existing Water Quality Management Programs, Activities, and Policies

Existing Policies, Programs, and Practices	Existing Master Plans/Documents
• Protection of Natural Features • Landscaping Standards • Environmental Performance Standards • Erosion Control requirements for new development	• Comprehensive Plan • Municipal Code • Parks Master Plan • Water System Master Plan • Water Management and Conservation Plan • Source Water Assessment

In addition to the master plans/documents listed in the table above, the City developed a stormwater master plan in Jun 2021, which provides much needed stormwater planning and guidance. The stormwater master plan will include specifics on stormwater quality consideration and priorities to ensure that future stormwater system expansions and upgrades are designed and constructed to properly detain, treat, and convey stormwater. The stormwater master plan will also include figures and maps that will aid decision-making about where to focus water quality protection activities.

An analysis of the various existing water quality management activities, programs, and policies indicates that the City should focus their efforts on strengthening mechanisms designed to protect and restore important riparian areas, provide for animal waste management, and develop education/training strategies to better promote water quality within the City.

The TMDL WQMP (Chapter 14) and DEQ 2019 Revised Mercury TMDL WQMP outlines additional plan requirements. The additional plan requirements and a discussion on how they are incorporated into this plan follows:

Stormwater Control Measures

The DEQ Revised 2019 Revised Mercury TMDL Water Quality Management Plan and the 2006 Willamette Basin TMDL states that cities less than 10,000 in population should consider the six stormwater control measures similar to those required by the National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System (NPDES - MS4). The control measures are designed to reduce stormwater pollutants from contaminating receiving waters. The six control measures are:

1. Public Education and Outreach
2. Public Participation/Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post-Construction Runoff Control
6. Pollution Prevention/Good Housekeeping

The City intends to incorporate these stormwater management strategies as appropriate within the City's various policies, programs, and practices.

Public Participation/Involvement

The plan will be presented to the City Council for approval. Once approved, future changes to the plan will also be presented to the City Council for review and approval. The City Council will review and approve annual and 5-year reports prior to submitting them to DEQ.
Documents relating to the TMDL Implementation Plan can be found on the City's website at: Public Works | Aurora Oregon https://www.ci.aurora.or.us/publicworks

TMDL Implementation Plan documents will include: This Plan w/matrix, and the most current report submitted to DEQ.

Mercury BMP implementation to reduce mercury entering streams via erosion of sediments (DEQ 2019 Revised Mercury WQMP Section 13 Table 13-11 and 13-14)

BMPs related to mercury and sediment reduction are included in the matrix. The Table 13-11 requirements being implemented and not implemented are in the Appendix A Matrix

DEQ 2019 WQMP Tables 13-11 and 13-14

Stormwater Measure	Table 13-11 Requirements	Table 13-14 < 5000 population Timeline
1 Pollution Prevention Municipal Operations	DMAs must properly operate and maintain its facilities, using prudent pollutionprevention and good housekeeping to reduce the discharge of mercury-related pollutants, such as sediment, through the stormwater conveyance system to waters of the state. DMAs must ensure that DMA-owned or operated facilities with industrial activity identified in DEQ's 1200-Z Industrial Stormwater General Permit have coverage under this permit. The DMA must also conduct its municipal operation and maintenance activities in a manner that reduces the discharge of pollutants to protectwater quality. DMAs must maintain records for activities to meet the requirements of the Pollution Prevention and Good Housekeeping for Municipal Operations program requirements and include a descriptive summary of their activities in theTMDL Annual Report.	As determined by DEQ based on information provided by DMA
2. Public Education and Outreach	DMAs must conduct an ongoing education and outreach program to inform the public about the impacts of stormwater discharges on waterbodies and the steps that they can take to reduce mercury-related pollutants in stormwater runoff. The education and outreach program must address stormwater issues of significance within the DMA's community. DMAs must track implementation of the public education and outreach requirements. In each corresponding TMDL Annual Report, the DMA must assess their progress toward implementation of the program, including a qualitative evaluation of at least one education and outreach activity corresponding to the reporting timeframe for the associated TMDL Annual Report. The evaluation should be used to inform future stormwater education and outreach efforts to most effectively convey the educational material to the target audiences.	As determined by DEQ based on information provided by DMA
3. Public Involvement and Participation	DMAs must implement a public involvement and participation program that providesopportunities for the public to effectively participate in the development of stormwater control measures. The DMA must comply with their public notice requirements when implementing a public involvement participation process, including	As determined by DEQ based on information

	maintaining and promoting at least one publicly accessible website with information on the city's stormwater control implementation plan, contact information and educational materials.	provided by DMA
4. Illicit Discharge Detection and Elimination	DMAs must implement and enforce a program to detect and eliminate illicit discharges into the stormwater conveyance system. An illicit discharge is any discharge to a stormwater conveyance system that is not composed entirely of stormwater. The DMA must develop and maintain a current map of their stormwater conveyance system. The stormwater conveyance system map and digital inventory must include the location of outfalls and an outfall inventory, conveyance system andstormwater control locations. The DMA must make maps and inventories available toDEQ upon request. When in digital format, the DMA must fully describe mapping standards in the TMDL implementation plan or another city planning document. The IDDE program must prohibit non-stormwater discharges into the stormwater conveyance system through enforcement of an ordinance or other legal mechanism,including appropriate enforcement procedures and actions to ensure compliance. The ordinance or other regulatory mechanism must also define the range of illicit discharges it covers, including those dischargesthat are conditionally allowed, such as groundwater and lawn watering discharges.The IDDE program must also maintain a procedure or system to document all complaints or reports of illicit discharges into and from the stormwater conveyancesystem. *The DMA must track implementation of the IDDE program requirements. In each TMDL Annual Report, the DMA must assess their progress towards implementationof the program.*	As determined by DEQ based on information provided by DMA
5. Constructio n SiteRunoff Control	DMAs must refer project sites to DEQ, or the appropriate DEQ agent, to obtain NPDES 1200-C Construction Stormwater Permit coverage for construction projectsthat disturb one or more acres (or that disturb less than one acre, if it is part of a "common plan of development or sale" disturbing one or more acres). In addition, DMAs must require construction site operators to complete and implement an Erosion and Sediment Control Plan for construction project sites in itsjurisdictional area that result in a minimum land disturbance of 21,780 square feet (one half of an acre) or more, and are not already covered by a 1200-C permit. Through ordinance or other regulatory mechanism, to the extent allowable understate law, the DMA must require erosion controls, sediment controls, and waste materials management controls to be used and maintained at all qualifying construction projects (as described above) from initial clearing through final stabilization to reduce pollutants in stormwater discharges to the stormwater conveyance system from construction sites.	As determined by DEQ based on information provided by DMA

	The DMA must develop, implement and maintain a written escalating enforcementand response procedure for all qualifying construction sites. The procedure must address repeat violations through progressively stricter response, as needed, to achieve compliance. The DMA must track implementation of its construction site runoff program required activities. In each TMDL annual report, the DMA must assess their progress towardimplementing its construction site runoff program's control measures.	
6. Post-Constructio n SiteRunoff for New Developmen t and Redevelopm ent	DMAs must develop, implement, and enforce a program to reduce discharges of pollutants and control post-construction stormwater runoff from new development andredevelopment project sites in its jurisdictional area. Through ordinance or other regulatory mechanism, the DMA must require the following for project sites discharging stormwater to the storm water conveyance system that create or replace 10,890 square feet (one quarter of an acre) or more ofnew impervious surface area: (A)The use of stormwater controls at all qualifying sites. (B) A site-specific stormwater management approach that targets natural surface orpredevelopment hydrological function through the installation and long-termoperation and maintenance of stormwater controls. (C) Long-term operationand maintenance of stormwater controls at project sites that are under the ownership of a private entity. The DMA must target natural surface or predevelopment hydrologic function to retainrainfall on-site and minimize the offsite discharge of precipitation utilizing stormwatercontrols that infiltrate and evaporate stormwater. For projects that are unable to fully retain rainfall/runoff from impervious surfaces on-site, the remainder of the rainfall/runoff from impervious surfaces must be treated prior to discharge with structural stormwater controls. These stormwater structural controls should be designed to remove, at a minimum, 80 percent of the total suspended solids.	As determined by DEQ based on information provided by DMA

Plan Implementation and Reporting Requirements

Management Strategies

The attached Management Strategy Matrix displays the pollutant being addressed, the strategy used to address it, when that strategy will be implemented, and how to measure progress and successful implementation within the next five years (see Appendix A). The strategies that require grants and donations will be pursued when funding and time allows.

The strategies that are related to community projects will occur when and where there is community interest, involvement, and funds. The attached matrix will also serve as a tracking tool for annual reporting to DEQ.

Performance Monitoring

Each strategy in the TMDL Implementation Plan, and specifically itemized on the attached matrix, will be reviewed annually and date entered in the matrix. This offers an efficient means for quickly reviewing program progress.

Plan Review. Revision. and Reporting Requirements

The City of Aurora will track TMDL implementation activities and report to DEQ annually (before December 31, unless otherwise directed by DEQ) on progress and accomplishments by filling in the "status" column of the matrix for each strategy and submitting the updated matrix to DEQ. The City of Aurora will follow the same reporting schedule for the revised mercury TMDL effective Sept 3, 2022(Nov 30 2022 plan due). The City of Aurora will include any delays or challenges the city has had in implementing strategies in annual reports.

The City of Aurora will evaluate this Implementation Plan every five years following submittal. The evaluation will include a review of existing water quality data and other information to evaluate the effectiveness of the Plan relative to the pollution reduction goals. The report will describe what information was used in the evaluation, findings of the evaluation, and the basis for this reasoning. If the evaluation indicates that the Plan is not likely to be adequate to meet the pollution reduction goals, the City will describe how the Plan will be modified or will undertake other efforts to achieve these goals, and also provide a timeline for accomplishing this. In addition, the City of Aurora will review and revise this Implementation Plan as needed following DEQ re-evaluation of the TMDL.

Fiscal Analysis for resources needed to develop, implement and maintain plan

The City plans on funding future updates to this Plan by using existing general fund monies from streets and storm, since the City's storm drain system maintenance is currently financed using these funds. User fees from water and wastewater may also be used when deemed necessary, since the overall objective is to improve water quality.

Evidence of Compliance with Land Use Requirements(Optional)

All of the strategies outlined herein and listed in the attached matrix are consistent with the City of Aurora's land use plans. The City of Aurora will evaluate and maintain consistency with local and statewide land use laws in any future actions related to TMDL implementation.

References

Willamette Basin TMDL. State of Oregon Department of Environmental Quality, 2006.

Molalla-Pudding Subbasin TMDL. State of Oregon Department of Environmental Quality, 2008.

TMDL Implementation Plan Guidance - for State and Local Government Designated Management Agencies. State of Oregon Department of Environmental Quality, 2007.

Molalla-Pudding Subbasin draft TMDLs Fact Sheet. State of Oregon Department of Environmental Quality, 2008.

Reducing Temperature in the Willamette Basin Fact Sheet. State of Oregon Department of Environmental Quality, 2007.

Reducing Bacteria Pollution in the Willamette Basin Fact Sheet. State of Oregon Department of Environmental Quality, 2006.

Reducing Mercury Pollution in the Willamette River Fact Sheet. State of Oregon Department of Environmental Quality, 2007.

Nitrate in Drinking Water Fact Sheet. State of Oregon Department of Environmental Quality, 2002.

City of Creswell Total Maximum Daily Load {TMDL) Implementation Plan. City of Creswell, 2008.

City of Keizer Total Maximum Daily Load (TMDL) Implementation Plan. City of Keizer, 2008.

City of Albany Willamette Basin TMDL Implementation Plan. City of Albany, 2008.

DEQ's Revised Mercury Total Maximum Daily Load Water Quality Management Plan, November 22, 2019. Additional information can be accessed at:
https://www.oregon.gov/deq/wq/tmdls/Pages/willhgtmdlac2018.aspx

The TMDL mercury allocations specified in EPA's 2021 TMDL (https://www.epa.gov/sites/default/files/2021-02/documents/tmdl-willamette-mercury-final-02-04-2021.pdf) are effective for designated management agencies and responsible persons named in DEQ's Mercury TMDL WQMP.