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City of Toledo

Drinking Water Protection Plan

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Abbreviations and Acronyms

AWWA	American Water Works Association
BLM	Bureau of Land Management
CREP	Conservation Reserve Enhancement Program
DEQ	Department of Environmental Quality
DOGAMI	Department of Geology and Mineral Industries
DWPP	Drinking Water Protection Plan
DWSPF	Drinking Water Source Protection Fund
EMO	Emergency Management Organization
EQIP	Environmental Quality Incentives Program
FA	Functional Annex
FEMA	Federal Emergency Management Agency
FERNS	Forest Activity Electronic Reporting and Notification System
ICS	Incident Command System
NIMS	National Incident Management System
NRCS	Natural Resources Conservation Service
NTU	Nephelometric Turbidity Unit
NWQI	National Water Quality Initiative
OAT	Oregon Agricultural Trust
ODA	Oregon Department of Agriculture
ODF	Oregon Department of Forestry
ODOT	Oregon Department of Transportation
OHA	Oregon Health Authority
OWEB	Oregon Watershed Enhancement Board
PLLW	People for Lincoln Land and Waters
SWA	Source Water Assessment
SWCD	Soil and Water Conservation District
USFS	United States Forest Service
WMCP	Water Management and Conservation Plan

SECTION 1: Introduction

1.1 Background and Goals

Water quality standards are in place to ensure that communities have access to clean and safe drinking water sources. Protecting drinking water sources from potential contaminant sources helps reduce water treatment costs and safeguards public health. The 1996 amendments to the federal Safe Drinking Water Act established new requirements and allocated resources to the Oregon Department of Environmental Quality (DEQ) and Oregon Health Authority (OHA) to provide communities with drinking water protection assistance. In Oregon, local jurisdictions can voluntarily develop Drinking Water Protection Plans (DWPPs) outlining management strategies to protect their water sources. The approval process for these plans is administered by DEQ for surface water and OHA for groundwater sources. This DWPP provides a framework for the City of Toledo (City) to address risks to its drinking water sources while meeting the requirements for state approval.

The primary goal of this DWPP is to protect the City's drinking water sources by identifying current and potential sources of contamination in the source water areas and presenting strategies for eliminating or minimizing those risks. The DWPP includes a detailed implementation plan to carry out the selected strategies and a contingency plan describing actions to be taken if a current water source becomes unavailable.

1.2 City of Toledo Source Water Areas

Established in 1866, the City of Toledo is located on the Yaquina River approximately 7 miles inland from the Pacific Ocean. The City's population was 3,650 according to the 2022 population estimate from Portland State University's Population Research Center. In addition to providing water service within city limits, the City's water system serves 71 residential and 6 commercial connections outside city limits and provides wholesale water to Seal Rock Water District and Wright Creek Water District.

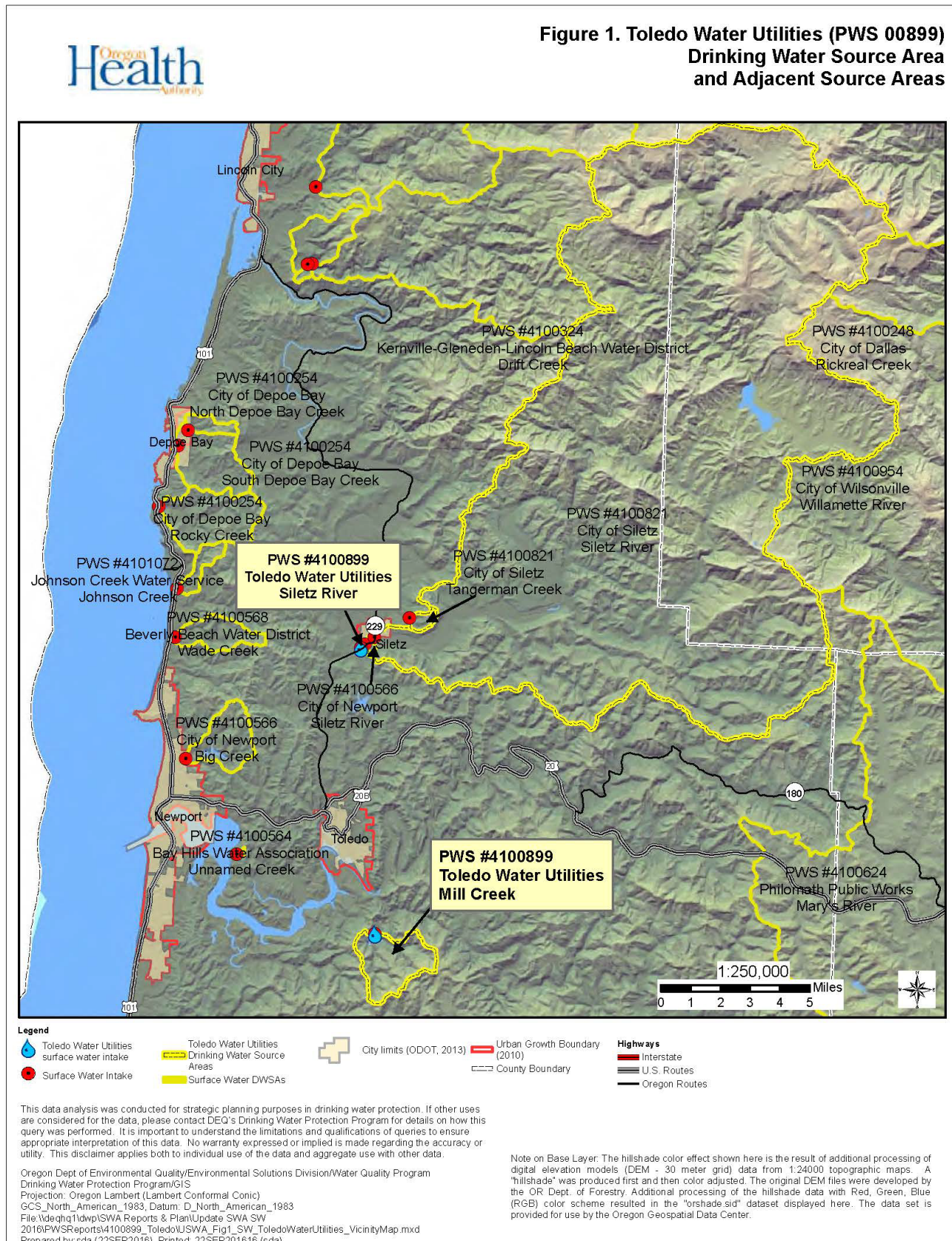
Toledo's water supply sources are the Mill Creek watershed and the Siletz River. Mill Creek is a tributary of the Yaquina River. Water from Mill Creek is primarily used in winter and spring when there is high turbidity in the Siletz River, and water from the Siletz River is used in summer and fall when streamflows in Mill Creek are low and algal blooms often occur in Mill Creek Reservoir. Both the Mill Creek and Siletz River drinking water source areas lie entirely outside of the City of Toledo.

The City's water supply from the Mill Creek watershed includes natural flow from Mill Creek and an unnamed branch of Mill Creek and released stored water from the City-owned Mill Creek Reservoir, all of which are diverted at the Mill Creek Reservoir intake. The drinking water source area within the Mill Creek watershed encompasses 4.15 square miles and is primarily forested. The lower Mill Creek watershed is owned by the City, and the upper watershed includes US Forest Service land and private industrial forestland. The entire watershed is in Lincoln County.

The City's Siletz River intake is located at approximately River Mile 40 near the City of Siletz. The Cities of Newport and Siletz have public water system intakes on the Siletz River upstream of Toledo's intake. The Siletz River drinking water source area is much larger than the Mill Creek watershed, covering about 204 square miles. Approximately 75 percent of the watershed is private industrial forestland, with additional agricultural lands, rural residential development, tribal lands, Bureau of Land Management lands, State Forest, and other state-owned lands. The drinking water source area within the Siletz River watershed is located in Lincoln County and Polk County. **Exhibit 1-1** presents a map of the City's drinking water source areas, and **Exhibit 1-2** presents a table summarizing key features of the City's water rights. More detailed

information on the City's water rights can be found in the City's 2017 Water Management and Conservation Plan.

Exhibit 1-1. Map of Drinking Water Source Areas



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Exhibit 1-2. Water Rights Held by the City of Toledo

Source	Application	Permit	Certificate	Priority Date	Type of Use	Authorized Rate or Volume	Comments
Mill Creek	S-1197	S-709	905	1/14/1911	Domestic Use	5.0 cfs	
Mill Creek	S-6531	S-4085	9040	5/5/1919	Domestic Supply	10.0 cfs	
Unnamed branch of Mill Creek	S-9958	S-7191	9047	12/22/1924	Municipal	0.75 cfs	
Mill Creek	S-9959	S-7192	9048	12/22/1924	Municipal	0.75 cfs	
Mill Creek	R-33458	R-5132	42193	11/9/1959	Municipal	250.0 AF	
Mill Creek Reservoir	S-33459	S-33124	42194	11/9/1959	Municipal	250.0 AF	
Siletz River	S-16771	S-12553	93488	2/12/1937	Municipal	1.75 cfs	
Siletz River	S-9834	S-9370	93489	10/24/1929	Municipal, including manufacturing and domestic	1.34 cfs	
Siletz River	S-9834	S-9370		10/24/1929	Municipal, including manufacturing and domestic	2.66 cfs	Use of the permit currently limited to 1.65 cfs. ¹
Siletz River	S-58445	S-44083		3/23/1979	Municipal	4.0 cfs	Use of the permit currently limited to 0.0 cfs. ¹

cfs = cubic feet per second

AF = acre-feet

¹ Access to additional water under the permit is granted by the Oregon Water Resources Department in a final order approving the City's Water Management and Conservation Plan.

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1.3 Drinking Water Protection Plan Development

1.3.1 Source Water Assessment

In 2002, DEQ developed a Source Water Assessment (SWA) for the City of Toledo's drinking water source areas to fulfill one of the new requirements of the amended Safe Drinking Water Act. The SWA includes a delineation of the source area supplying the water system, identification of areas that may be more susceptible to contamination, and an inventory of potential contaminant sources. An updated SWA was provided by DEQ in 2016. The updated SWA includes the map of drinking water source areas reprinted above along with maps showing soil erosion potential, areas prone to landslides, local land uses and ownership, and potential anthropogenic sources of pollution. The SWA provided a robust foundation for the risk assessment described further in Section 2.

1.3.2 Plan Development Process

The City of Toledo was awarded a grant from OHA in 2021 to develop a DWPP, and plan development began with a kickoff meeting in January 2022. A team of local stakeholders and technical experts was convened, representing local residents and organizations, the Confederated Tribes of the Siletz Indians, forestry, agriculture, government agencies (local, state, and federal), and conservation groups. DWPP development was facilitated by the City's selected consultant, GSI Water Solutions, Inc. and included multiple opportunities and methods for public engagement. The Toledo City Council reviewed and approved the DWPP on [placeholder date] and submitted the Final Draft DWPP to DEQ for approval on [placeholder date]. **Exhibit 1-3** lists the DWPP Team members and their affiliations.

Exhibit 1-3. Drinking Water Protection Plan Team Members

Name	Affiliation
Betty Kamikawa	City of Toledo
Judy Richter	City of Toledo
Bill Zuspan	City of Toledo
Tyler Clouse	Lincoln Soil and Water Conservation District
Jeff DeRoss	Hancock
Matthew Fiorito	Weyerhaeuser
Alan Fujishin	Gibson Farms
Mike Broili	MidCoast Watershed Council
Mike Kennedy	Confederated Tribes of the Siletz Indians
Maria Daugherty	American Aquifers
Clare Paul	City of Newport
Kaety Jacobson	Lincoln County
Debbie Scacco	Port of Toledo
Matt Thomas	Oregon Department of Forestry
Amy Bleekman	Oregon Health Authority
John Spangler	Oregon Department of Fish and Wildlife
Christine Clapp	Oregon Department of Fish and Wildlife
Cheryl Hummon	Oregon Department of Agriculture
Olivia Jasper	Oregon Department of Agriculture
Nikki Hendricks	Oregon Water Resources Department
Jacqueline Fern	Oregon Department of Environmental Quality
Laura Johnson	Oregon Department of Environmental Quality
Douglass Fitting	Bureau of Land Management
Kacey Largent	US Forest Service

1.3.3 Public Outreach and Engagement

Public engagement was an integral part of the process and included in-person and virtual meetings as well as opportunities to provide input on risks and proposed strategies and review draft planning documents. Feedback from the DWPP Team and the community was an important source of local knowledge to verify and refine the inventory of potential contaminant sources and to tailor protection strategies to suit local conditions and preferences. In June 2022, a public meeting was held with in-person and remote options to discuss potential contaminant sources identified in the SWA and by the DWPP Team, to evaluate the priority rankings of those risks by likelihood of occurrence and severity of the threat to drinking water quality, and to solicit local knowledge of any contaminant risks not previously identified. A second public meeting was held in March 2023 focused on the proposed strategies for drinking water source area protection, implementation plans, and the contingency plan for the use of other water sources. Meeting recordings were available online for at least one week after each meeting for those unable to attend. Comments were provided during the meetings and via phone and email. The draft DWPP was made available for public comment, and feedback was incorporated into the final plan. Public meetings were advertised through articles in the City newsletter, on the City's website, messages in water bills, flyers posted around the community, and through DWPP Team communication with stakeholders in the sectors they represented. Appendix A contains examples of public outreach materials.

1.4 Organization of the Plan

The remainder of this plan is organized into the following sections:

- **Section 2:** Risk Assessment
- **Section 3:** Strategies to Address Risks
- **Section 4:** Implementation Plan
- **Section 5:** Contingency Plan
- **Section 6:** Future Water Sources

SECTION 2: Risk Assessment

2.1 Introduction to Risk Assessment

DEQ initially prepared a SWA for the City's public water system, Toledo Water Utilities, in 2002. This SWA included a delineation of the watersheds contributing to the City's drinking water sources, identification of sensitive areas, an inventory of potential contaminant sources, and a susceptibility analysis. Sensitive areas include a 1000-foot buffer around water bodies, areas with high soil erosion potential, highly permeable soils where potential contaminants would infiltrate more rapidly, and areas with high runoff potential where contaminants and sediments could be more easily transported to water bodies. The susceptibility analysis integrated the contaminant inventory with the mapping of sensitive areas to assess the potential for pollution within the watershed to reach the water system intake. DEQ developed an updated SWA for the City in 2016 that includes additional mapping of sensitive areas, an updated potential contaminant source inventory, and a variety of resources for developing programs to support source water protection. Appendix B contains the 2016 updated SWA.

The Toledo DWPP Team used updated SWA as a starting point to evaluate identified sites and land uses listed as potential sources of contamination. The Team then supplemented this list with additional risks identified through their expertise and local knowledge. After identifying a spectrum of potential risks, the Team conducted a prioritization process. First, every risk was assigned two ratings, each on a scale of 1-5, describing the likelihood of occurrence and the consequence or severity of impact if it does occur. Using the prioritization matrix in Exhibit 2-1, risks were classified into high, medium, or low priority. Information sources for the ratings included a DEQ-provided guidance document on water quality impacts from specific contaminant sources as well as the Team's expertise and knowledge of local conditions, such as common agricultural and forestry practices in the area. Next, the City held a public meeting with in-person and virtual options in June 2022 to present the risks identified and prioritized and to expand and refine the risk assessment and prioritization with public input.

Exhibit 2-1. Risk Prioritization Matrix

Likelihood	Consequence				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Severe (5)
Almost certain (5)	Medium	Medium	High	High	High
Likely (4)	Low	Medium	Medium	High	High
Possible (3)	Low	Medium	Medium	Medium	High
Unlikely (2)	Low	Low	Medium	Medium	Medium
Very unlikely (1)	Low	Low	Low	Low	Medium

The final risk assessment incorporating DWPP Team expertise and public feedback is shown below. Risks are divided into 8 general categories with associated subcategories:

- Biological and Geological Processes
 - Drought and low streamflows
 - Earthquakes
 - Wildfire

- Severe storms
- Insect and fungal outbreaks
- Aquatic invasive species
- Grazing wild animals
- Highly erodible soils
- Forestry
 - Clearcuts
 - Non-clearcut logging and thinning
 - Chemical applications
 - Prescribed fire
 - Riparian impacts
- Transportation
 - Roads and stream crossings
- Municipal
 - Aging infrastructure
 - Vandalism, sabotage, and cybersecurity concerns
 - Land application of treated wastewater
 - Stormwater
- Agriculture
 - Grazing domestic animals
 - Pesticides and fertilizers
 - Irrigated crops
 - Riparian impacts
- Residential
 - Rural development and property management
 - Septic system
- Industrial
 - Wood and pulp mills
 - Mines and quarries
- Recreation
 - Motorized boats

Sections 2.2 through 2.5 describe the risks identified that are applicable to both of the City’s drinking water sources, Mill Creek and the Siletz River. Each risk is presented with its ranked risk level (high, medium, low) followed by its likelihood (1-5) and consequence (1-5), with 1 being the lowest and 5 being the highest likelihood or consequence. Section 2.6 describes additional risks identified solely within the Siletz River watershed. Section 2.7 outlines the process for identifying and addressing new risks that may arise within the source watersheds due to new activities or changes in intensity or spatial patterns of existing activities.

2.2 Biological and Geological Processes

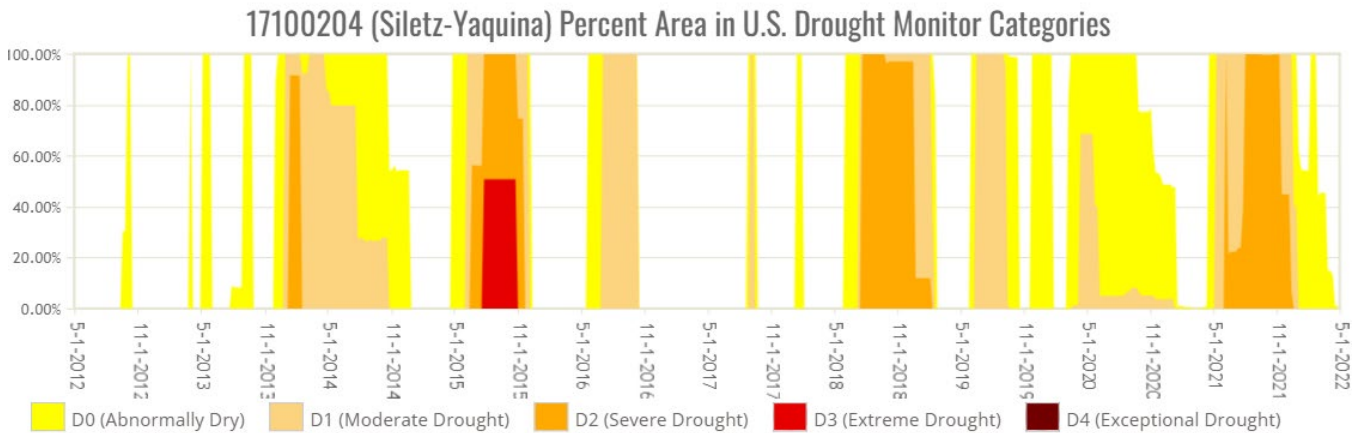
Water quality can be affected by natural and anthropogenic processes and activities. Consideration of the effects of biological and geological processes that may occur within the source watersheds helps with disaster preparedness and increases the resilience of the public drinking water system.

2.2.1 Drought and Low Flows (high: 5, 5)

Low flows exacerbate water quality problems associated with high stream temperatures, concentration of pollutants, low dissolved oxygen, algae growth, and high bacteria counts. The Siletz River is listed under the Clean Water Act 303(d) list as water quality limited for dissolved oxygen, high summer temperature,

turbidity, and flow modification. Mill Creek is also listed as water quality limited for temperature. While lower streamflows in the summer are not unusual, droughts can intensify water quality impacts and extend them throughout the year. As shown in Exhibit 2-2 below, the Siletz-Yaquina basin containing both of the City's source watersheds have experienced moderate to extreme drought conditions multiple times over the past 10 years. Climate change projections in the Pacific Northwest include reduced summer rainfall and increased climatic variability and extremes, including longer and more intense droughts.

Exhibit 2-2. Drought Conditions 2012-2022



Low streamflows coinciding with high demand may present challenges for drinking water supply. Fish and other aquatic life are affected by the water quantity and quality concerns raised by low streamflows, and water supply could potentially be further limited if required to protect streamflows for fish. Under the prior appropriation system, “junior” (newer) water rights may be curtailed or regulated off if “senior” (older) water right holders’ needs are not met. Mill Creek has an instream water right (Certificate 73142) downstream of the City's intake on Mill Creek Reservoir. The City's water rights on Mill Creek are senior to the instream water right, so it is not at risk of curtailment of the Mill Creek water supply. There are two instream water rights on the reach of the Siletz River where the City's intake is located (Certificates 67712 and 67713). The City holds four water rights for the use of water from the Siletz River, three of which are senior to the instream water rights. The fourth water right is junior to the instream water rights and would not be available when streamflows are less than the flows protected by the instream rights, which often occurs in August, September, and October. The City's junior water right and one of the City's three senior water rights also contain “fish persistence” conditions requiring reductions in the use of water when target streamflows to protect listed fish species are not met.

2.2.2 Earthquakes (high: 5, 3)

The magnitude, timing, and location of an earthquake would all affect the potential level of damage to water system infrastructure. Infrastructure that may be impacted includes water intakes, transmission and distribution pipelines, storage structures, and water treatment facilities.

2.2.3 Wildfire (medium: 5, 2)

Immediate impacts of wildfire could include damage to water system infrastructure and contamination of drinking water sources with ash and toxic substances released from burning buildings, appliances, vehicles, plastics, and stored hazardous materials. Firefighting chemicals also have the potential to contaminate drinking water sources. Wildfires could remove vegetation and damage soils, which could cause medium- to long-term impacts, such as increased runoff and erosion in the watershed, high turbidity in water sources,

and decreased water infiltration and soil moisture retention. These effects could be mitigated or amplified depending on the location of the fire and associated landscape characteristics, such as steep slopes, soil erosion potential, and proximity to water bodies. Climate change is likely to increase the risk of wildfire in the future.

2.2.4 Severe Storms (high: 3, 5)

Heavy precipitation events that result in rapid runoff or flooding can cause erosion, increasing sedimentation and stream turbidity. This risk may be amplified by land-use practices, such as timber harvest, or by landscape characteristics, such as previously burned areas. Ice storms and windstorms can cause loss of trees and riparian vegetation, damage water infrastructure, and lead to widespread power outages affecting water treatment and distribution. Climate change in the Pacific Northwest region is projected to increase the likelihood of precipitation extremes, including the magnitude of severe storm events during the winter.

While severe storms could occur in both source watersheds, the Siletz River source area contains previously mapped landslide deposits as well as having 34 percent of its tributary stream miles in areas with highly erodible soils. The Siletz River is already more prone to high turbidity events, leading the City to switch to the Mill Creek water source during the winter and spring.

2.2.5 Insect and Fungal Outbreaks (low: 1, 1)

Although insect outbreaks and fungal infection of trees are not currently common in the area, climate change could affect the probability and severity of these events. Outbreaks of bark beetles in forested areas of other basins have led to widespread loss of trees, increasing the risk of erosion and contributing to wildfire risk through fuel loading. The emerald ash borer has not yet been found in Lincoln County but has recently been detected in Oregon and could have a significant impact on ash trees in riparian areas.

2.2.6 Aquatic Invasive Species (low: 3, 1)

Aquatic invasive organisms, such as mollusks, can become established on water intakes, diversion screens, pumps, and in pipelines, which can clog and damage municipal water infrastructure.

2.2.7 Grazing Wild Animals (low: 1, 1)

Grazing wild animals typically present a lower risk than concentrated grazing domestic animals. Nonetheless, very high populations of grazing wild animals or those whose movement is restricted by habitat fragmentation could potentially overgraze or contribute excessive nutrient loading to drinking water source areas through their wastes.

2.3 Forestry

The City's drinking water source watersheds contain substantial forested areas. Within the Mill Creek watershed, 63 percent of the land area is part of the Siuslaw National Forest owned and managed by the US Forest Service, and 23 percent of the land area is under private industrial forest ownership. In the Siletz River watershed, 75 percent of the land is private industrial forest, 5 percent is state forest, and 10 percent is owned by the Bureau of Land Management.

2.3.1 Clearcuts (Siletz River—high: 3, 5; Mill Creek—medium: 3, 3)

Certain forestry practices, such as clearcutting, may increase erosion in the watershed, leading to higher stream turbidity from sedimentation. This risk may be increased if clearcuts are situated in areas with highly erodible soil types. Increased runoff may reduce infiltration of precipitation into groundwater, contributing to

lower streamflows at certain times of year. Modern forestry practices are less likely to cause water quality and aquatic habitat impacts compared to historical practices. Nonetheless, even updated regulatory requirements do not explicitly address drinking water as a beneficial use, so sedimentation and streamflow effects from timber harvest may still pose risks to the City's drinking water sources.

2.3.2 Non-Clearcut Logging and Thinning (Siletz River—medium: 2, 5; Mill Creek—medium: 2, 3)

Non-clearcut timber harvest practices can result in erosion and impact water quality, though these impacts are generally less than those resulting from clearcut timber harvest practices. Although Oregon's Forest Practices Act did not previously require forested riparian buffers for small non-fish-bearing streams, the Oregon Department of Forestry is currently developing new rules to implement the Private Forest Accord that will include recommended changes to the Forest Practices Act. Wider stream buffers are anticipated to be required for large landowners by July 2023. In 2024, additional new rules will go into effect, such as new design standards for forest roads, additional protections for non-fish-bearing streams, and increased retention of trees on steep slopes. While these changes are anticipated to improve water quality and better protect salmonid habitat, development of the Private Forest Accord did not specifically include consideration of drinking water as a beneficial use. Therefore, these requirements and other modern forestry practices are expected to result in fewer water quality impacts compared with historical practices but would not entirely eliminate risks to the City's water sources.

2.3.3 Chemical Applications (low: 1, 2)

Pesticides, such as insecticides, fungicides, and herbicides, may be applied during reforestation. Over-application, improper handling, or aerial spraying could lead to contamination of drinking water sources. The application method and timing can raise risks or mitigate them. For example, the risk may be higher when applying pesticides before precipitation events or at times of year when breakdown by soil microorganisms is slower. Landscape conditions such as steep slopes and areas with limited vegetation also affect the level of risk. In the City's drinking water source watersheds, chemical applications are usually less frequent, reducing the risk. Herbicide application on most silviculture sites in the area is typically conducted 0-3 times over about 40 years.

2.3.4 Prescribed Fire (low: 1, 3)

Localized burning of slash piles is more common in this region than prescribed broadcast burns. Slash pile burning must be properly managed to prevent erosion, runoff, and sedimentation of streams.

2.3.5 Riparian Impacts (medium: 2, 3)

Timber harvest practices that reduce streamside vegetation or change the riparian species mix can increase the potential for erosion of streambanks. Loss of streamside shading elevates stream temperatures and reduces dissolved oxygen, increasing the risk of algae growth and higher bacteria counts. As part of the Private Forest Accord, SB 1501 has increased riparian buffer zones based on stream classifications and has added protections for non-fish-bearing streams.

2.4 Transportation

Road building, maintenance, and usage may increase erosion and stream turbidity. Community road networks, highways, and forest roads share some elements of risk while being differentiated in other ways. Attention to proper siting and construction techniques can reduce these risks.

2.4.1 Roads and Stream Crossings (medium: 4, 3)

Vehicle usage along roads and highways in the source watersheds is accompanied by the risk of leaks or spills of petroleum products or any potentially hazardous materials being transported. This is a particular concern at stream crossings, where a spill could quickly enter water bodies. Roadside vegetation management may include the use of herbicides. Vegetation removal and soil disturbance for the construction of new roads, including forest access roads, may lead to the erosion and sedimentation risks mentioned above. The risk of sedimentation is increased by undersized and failing culverts, inadequately maintained roads, and road density exceeding two miles of road per square miles of watershed. High road densities occur throughout the Siletz River source watershed.

Wet weather haul by loaded logging trucks at stream crossings on native surface and gravel roads can be a chronic source of increased sediment delivery and turbidity. Inadequate gravel depth, lack of road surface drainage and maintenance, and connectivity to inside ditches can all exacerbate this risk. Appropriate construction and maintenance practices can reduce these risks, and unused forest roads may need to be decommissioned to prevent erosion and other impacts.

2.5 Municipal

Well-planned municipal property management practices can protect infrastructure, streams, and ecosystems. In the Siletz River watershed, the City owns the parcels of land surrounding the water intake near the City of Siletz. The City owns 14 percent of the Mill Creek watershed, including the lower watershed area and Mill Creek Reservoir.

2.5.1 Aging Infrastructure (medium: 3, 4)

Aging municipal infrastructure increases the chances of failures that could impact the drinking water supply. Portions of the City's Mill Creek water system infrastructure were built in the 1960s and are now past their expected design life. The City has projects underway and plans to upgrade the Mill Creek water system infrastructure, including replacement of the Mill Creek raw water line. Most of the Siletz River water system infrastructure has been replaced or upgraded more recently. The Toledo Water Treatment Plant was constructed in 1976 and is generally in good condition. Some components of the water treatment system have been replaced or upgraded over the years, and others are past their design life and may need repairs or eventual replacement. For example, the concrete clearwell was built in 1938 and shows signs of cracks and minor leakage.

2.5.2 Vandalism, Sabotage, and Cybersecurity Concerns (medium: 5, 1)

Vandalism or sabotage of water system infrastructure, such as pipelines or the water treatment plant, could impact the drinking water supply. Cybersecurity has become an increasingly important concern for municipal water suppliers.

2.6 Additional Risks in the Siletz River Watershed

As described previously, the Siletz River watershed is much larger than the Mill Creek watershed, and it contains a more varied mixture of development and land uses. Certain risks were identified by the SWA and the DWPP Team as being a greater concern in this watershed.

2.6.1 Biological and Geological Processes

2.6.1.1 Highly Erodible Soils (high: 3, 5)

Erosion potential of soils is quantified in the original 2002 SWA and the updated 2016 SWA. Soil erosion potential is a combination of the effects of steep slopes and natural soil characteristics that increase the likelihood of soil particle movement caused by rainfall and runoff. Highly erodible soils are more sensitive to ground-disturbing activities, such as road construction, property development, and some timber harvest practices. Large areas of the upper Siletz River watershed contain tributary stream channels in areas with high erosion potential, and therefore, generally contribute to turbidity in the river. There are also some highly erodible soils around small tributaries near the City's intake, which pose a higher risk of sudden turbidity spikes that can challenge the water treatment infrastructure. Riparian vegetation can mitigate the risk of precipitation and wind transporting sediment into the stream, and the Lincoln Soil and Water Conservation District (SWCD) is working on an updated Streamside Vegetation Assessment that would provide more insight into areas of higher and lower risk. The updated assessment is anticipated to be completed by April 2023.

2.6.2 Agricultural Practices

About 2 percent of the source area in the Siletz River watershed is used for agriculture and falls within the Mid Coast Agricultural Water Quality Management Plan area. The only agricultural activities in the Mill Creek watershed are located downstream of Mill Creek Reservoir and the City's water intake, so they are outside the drinking water source area.

2.6.2.1 Grazing Domestic Animals (medium: 2, 4)

Grazing livestock may contribute to erosion of streambanks and sedimentation of streams by reducing riparian vegetation. Source water contamination may also occur from improper storage and management of animal wastes.

2.6.2.2 Pesticides and Fertilizers (low: 1, 3)

Over-application or improper storage and handling of agricultural chemicals, such as pesticides and fertilizers, could lead to contamination of drinking water sources. Application setbacks and applicator licenses are required for more hazardous chemicals.

2.6.2.3 Irrigated Crops (low: 2, 1)

Excessive irrigation can create runoff and transport of agricultural chemicals and sediment to drinking water sources. Non-irrigated crops are more common in the Siletz River watershed, reducing the probability of contamination.

2.6.2.4 Riparian Impacts (low: 2, 2)

Agricultural practices that reduce streamside vegetation may cause erosion of streambanks and other issues associated with lack of shading and high water temperatures. Oregon Department of Agriculture regulations generally require riparian vegetation buffers where feasible (with some exemptions), but required buffers may not always be in place or sufficient to protect water quality without additional voluntary measures.

2.6.3 Municipal

Additional risks in the Siletz River watershed were identified related to the land application of treated wastewater and management of stormwater in urbanized areas.

2.6.3.1 Land Application of Treated Wastewater (high: 5, 3)

Land application of biosolids from treated wastewater has been conducted in some agricultural areas in the Siletz River watershed for several years. In 2018, community concerns about potential water quality impacts in the Siletz River led to testing of shallow sediments for selected chemicals commonly found in biosolids. No contaminants were detected at that time; however, questions remain regarding the potential need for water quality monitoring for other emerging pollutants of concern.

2.6.3.2 Stormwater (medium: 2, 3)

Stormwater from developed areas may transport pollutants to the City's drinking water. Potential contaminants include pesticides, herbicides, fertilizers, and other landscaping chemicals; grease, oil, antifreeze, and heavy metals from cars; and debris such as trash and pet waste. Large portions of the watershed are undeveloped and unlikely to contribute contaminated stormwater. The City's water intake itself is located south of the City of Siletz in closer proximity to developed areas where stormwater may flow into the river.

2.6.4 Residential

Similar to stormwater impacts from urbanized areas, rural residential development can also potentially contribute contaminants to source areas in a more dispersed manner.

2.6.4.1 Rural Development and Property Management (high: 4, 4)

New construction and associated vegetation removal may cause erosion, increasing stream turbidity. In particular, removal of riparian vegetation can result in streambank erosion with the related water quality impacts discussed previously. Removal or modification of beaver habitat could affect water storage and release that influence summer streamflows, depending on the site location.

Property management practices for new and existing rural development may also affect water sources. Overuse and improper storage or disposal of household and landscaping chemicals may allow contaminants to enter stormwater runoff. Domestic animals, such as chickens and horses, require proper waste management to avoid impacting water quality. Installation of impervious surfaces, such as rooftops, patios, and driveways, can increase runoff of contaminants.

2.6.4.2 Septic Systems (low: 1, 4)

Rural residential development typically relies on septic systems for sanitation. Good siting, proper installation, and conscientious maintenance are needed to prevent leaks and impacts to drinking water. This risk is usually of greater concern to water systems relying on groundwater sources and is a lower risk for surface water systems. The cumulative effects of multiple septic systems closer to the Siletz River could increase the potential for contamination.

2.6.5 Industrial Practices

Although the watershed is not highly industrialized, there are a few industrial land uses that may require careful management to avoid potential water quality impacts.

2.6.5.1 Wood and Pulp Mills (medium: 3, 2)

The 2016 SWA identifies one wood and pulp processing mill in the Siletz River source area upstream of the City's water intake. More recent data from the DWPP Team and local research indicate that this facility now operates as a timber salvage and roofing shingle production operation. While proper handling of chemicals can be a major concern for traditional wood and pulp mills, the current operation of this facility may be a lower risk to water quality.

2.6.5.2 Mines and Quarries (low: 2, 1)

Mill Creek Pit was listed as an active basalt mine in the 2016 SWA, and several other mining operations in the area were listed as closed. Due to the historical prevalence of timber processing activities, there are multiple streams named Mill Creek in the area. The Mill Creek south of Toledo that serves as the City's water source in the winter and spring is a tributary to the Yaquina River, and it is not the same as the Mill Creek near the mining operation, which is a tributary to the Siletz River. Mill Creek Pit is located about 200 feet north of the North Fork of Mill Creek, northeast of Logsden. The site was previously owned by Plum Creek Timberlands, and a 2010 letter to the Oregon Department of Geology and Mineral Industries (DOGAMI) stated the intention to use materials extracted from the quarry solely for forest land management purposes on lands owned by Plum Creek. The land is currently owned by Weyerhaeuser.

Spills, leaks, and leachate from mining operations may introduce chemicals and waste products into source waters. Ground disturbance can also cause erosion and increase turbidity in nearby streams if measures are not taken to protect water quality. One of Mill Creek Pit's permit conditions requires the operator to prevent turbid water from the site from entering nearby water bodies. Aerial images available from DOGAMI show that 0.7 acres of previously mined lands had been reclaimed and revegetated by 2014. Aerial imagery from 2021 shows some mined areas and a wide vegetated buffer between the mine and Mill Creek.

2.6.6 Recreation

The Siletz River and its watershed are used for many outdoor recreational activities, such as boating, hiking, fishing, camping, and birdwatching.

2.6.6.1 Motorized Boats (low: 2, 1)

Motorized boats are allowed on most reaches of the Siletz River. There are two boat launches upstream of the City's water intake in the drinking water source area. Water quality may be affected by chipping paint and leaks or spills of gasoline and oil from boats.

2.7 Identifying and Addressing New Risks

The City will consider new information and emerging risks as they arise. At a minimum, the City will review the risks presented in the DWPP annually and determine whether to adjust implementation of source protection strategies or seek additional information about potential new risks. DEQ reviews Drinking Water Protection Plans approximately every 5 years to evaluate progress toward water source protection and recertify the plan. At this time, the City will determine whether any new potential sources of contamination need to be assessed and whether any changes to management strategies are needed to address changing conditions. Any updates to the SWA provided by DEQ or OHA will also be incorporated into future plan updates and recertification.

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SECTION 3: Strategies to Address Risks

3.1 Introduction to Strategies

The DWPP Team identified strategies to address each of the risks identified in Section 2. Strategies were developed using local knowledge and technical expertise from the DWPP Team, examples of successful drinking water protection efforts by other water providers, and strategy guidance documents developed by DEQ and other agencies. Each risk may be addressed by multiple strategies. The major categories of strategies identified are:

- Public Education and Outreach
- Technical Assistance
- Critical Area Protection
- Municipal Policies and Infrastructure Management
- Pollution Prevention Programs
- Monitoring Programs
- Watershed Restoration

Exhibit 3-1 shows how each of the identified strategies addresses one or more risks in the two drinking water source watersheds. The remainder of Section 3 describes the strategies.

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Exhibit 3-1. Overview of Risks Addressed by Strategy

Risk Category	Specific Risks	Public Education and Outreach	Technical Assistance	Critical Area Protection	Municipal Policies and Infrastructure Management	Pollution Prevention Programs	Monitoring Programs	Watershed Restoration
Biological and Geological Processes	Highly erodible soils		•	•			•	•
	Earthquakes	•			•		•	•
	Drought and low flows	•	•		•			
	Wildfire	•	•		•		•	•
	Severe storms		•		•		•	•
	Insects and fungal infections	•	•				•	•
	Grazing wild animals							•
	Aquatic invasive species	•			•			•
Agriculture	Grazing domestic animals	•	•					
	Chemical applications	•	•			•		
	Irrigated crops	•	•					
	Riparian impacts	•	•					•
Forestry	Clearcuts		•	•			•	•
	Non-clearcut logging		•	•			•	•
	Chemical applications	•	•			•	•	
	Prescribed fire	•	•					
	Riparian impacts	•	•	•				•
Transportation	Roads		•		•	•	•	
Municipal	Stormwater	•	•	•	•	•		•
	Land application	•	•				•	
	Aging infrastructure				•			
	Vandalism and sabotage				•			
Residential	Rural development	•	•		•	•		•
	Septic systems	•	•					
Industrial	Wood and pulp mills	•						
	Mines and quarries	•	•				•	•
Recreation	Motorized boats	•				•	•	

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3.2 Public Education and Outreach

Public education and outreach strategies aim to raise awareness of water quality issues and engage the public in preventing contamination of water sources. Outreach topics will be tailored based on location and audience. Both of the drinking water source watersheds lie outside City jurisdiction, making partnerships with other organizations and agencies in the watersheds a critical aspect of these strategies for outreach to the general public, including residents, agricultural producers, and forestry operations. Partnering with existing programs that recognize watershed-friendly business practices incentivize businesses to take actions that support healthy watersheds and water sources. Within city limits, outreach focused on water conservation can help reduce pressure on water resources.

Exhibit 3-2 shows the focus areas for each risk to be addressed through public education and outreach.

Exhibit 3-2. Public Education and Outreach Focus Areas

Risk Addressed	Source Watersheds Affected	Outreach within Source Watersheds		Outreach within City
		General Public	Businesses	
Earthquakes	Siletz R., Mill Creek			•
Drought and low flows	Siletz R., Mill Creek	•		•
Wildfire	Siletz R., Mill Creek	•		•
Insect and fungal infections	Siletz R., Mill Creek	•		
Aquatic invasive species	Siletz R., Mill Creek	•		
Grazing domestic animals	Siletz R.		•	
Irrigated crops	Siletz R.		•	
Chemical applications (agriculture and forestry)	Siletz R., Mill Creek		•	
Riparian impacts (agriculture and forestry)	Siletz R., Mill Creek		•	
Prescribed burns	Siletz R., Mill Creek		•	
Stormwater	Siletz R.	•		
Land application	Siletz R.	•		
Rural development	Siletz R.	•		
Septic systems	Siletz R.	•		
Wood and pulp mills	Siletz R.		•	
Mines and quarries	Siletz R.		•	
Motorized boats	Siletz R.	•		

3.2.1 Outreach in the Source Watersheds

Outreach in the drinking water source watersheds will focus on pollution prevention and watershed stewardship. The City will explore opportunities to partner with and provide outreach to upstream communities, such as the City of Siletz. Potential topics include: low impact development protocols, disconnecting stormwater systems from wastewater systems, land application, rural development and land management, and car wash best practices to prevent runoff and pollution. During droughts, the City will promote water conservation and awareness of drinking water sources. The City will support natural disaster preparedness education that assists the public in preparing for the impacts of events, such as earthquakes and wildfires, particularly in the context of potential impacts to drinking water sources.

In partnership with Lincoln SWCD, the City will support outreach promoting irrigation efficiency and conservation upgrades for agricultural producers to prevent runoff that could affect water sources.

Education focused on safe management of chemicals used in agriculture and forestry will help ensure that potential contaminants do not reach drinking water sources. The City will provide referrals to DEQ, Lincoln SWCD, and Oregon State University Extension technical assistance programs for protecting water quality.

In the event of aquatic invasive species introduction, insect outbreaks, or fungal infections occurring in the watershed, the City will seek to promote awareness and encourage the public to track and report the spread through resources such as the Oregon Invasive Species Online Hotline (<https://oregoninvasiveshotline.org/>). Efforts to prevent the spread of aquatic invasive species may also benefit from partnerships with the Port of Toledo and Lincoln County Parks, which manages boat launches on the Siletz River.

3.2.1.1 Business Recognition and Outreach

Business recognition programs incentivize businesses to take action to protect the watershed through principles such as low impact development and integrated pest management. Promoting existing programs is likely to be more straightforward and cost-effective than developing a new program. For example, the Salmon Safe certification program protects rivers, watersheds, and water quality through an accreditation process for farmers, developers, and land managers. Similarly, the Newport Chapter of Surfrider Foundation operates the Ocean Friendly Gardens program, which uses environmentally-friendly landscaping methods to prevent water pollution. The City will promote business recognition programs that align well with its drinking water protection efforts.

3.2.2 Outreach within the City

Within its own jurisdiction, the City has multiple opportunities to interact with residents, businesses, and visitors. The City will provide water conservation education related to droughts and low flows, including projected impacts of climate change on water resources. The goals of this outreach are to prevent water waste, reduce pressure on the water sources, and guard against future shortages. The City will seek to increase awareness of Toledo's water sources and what is being done to protect them, including best practices for pollution prevention. Potential outreach methods include mailers, flyers, newsletter articles, and billing messages. Specialized outreach may be needed to address natural disasters, such as personal disaster preparedness planning, how to receive disaster alerts, and how to find out if there is a boil water order.

3.3 Technical Assistance

Technical assistance may be provided directly by the City or through referrals to entities, such as the MidCoast Watersheds Council, Lincoln SWCD, DEQ, and OSU Extension. Technical assistance will focus on actions to protect water quality.

3.3.1 Sediment Management

Sediment management technical assistance includes techniques for preventing erosion and sediment transport to drinking water source streams. This may include best practices for construction, road maintenance, forestry, agriculture, rural residential land management, and industry. Areas with highly erodible soils, as mapped in the 2002 SWA, and riparian stream buffers will be prioritized. Specialized assistance may be needed following wildfires or severe storms. The City will implement best practices for sediment management in its own public works and construction projects and will provide referrals to appropriate agencies and organizations as needed to provide technical assistance for sediment management.

Proper road maintenance, such as appropriate grading, bridge and culvert work, and roadside vegetation management, can help prevent or minimize delivery of sediment to adjacent waterways. The City will explore potential collaboration with the Oregon Department of Transportation's culvert inspection program for Highway 229 and Highway 410 in the Siletz River watershed. The City will also support and promote technical assistance where available, particularly for activities like wet weather haul during forestry operations. For example, the Bureau of Land Management develops site-specific drainage plans for timber sales to prevent sedimentation and turbidity during wet weather haul at stream crossings.

3.3.2 Nutrient and Chemical Management

The City will provide information and referrals to technical assistance related to prevention of pollution from nutrients and chemicals, such as fertilizers, pet waste, herbicides, pesticides, and oil and grease from vehicles. This may include best practices for agriculture, forestry, home and garden, and roadside vegetation management. Specialized assistance may be provided following wildfires or severe storms. Oregon Department of Agriculture (ODA) regulations are in place to protect water quality, and the Siletz River watershed is a focus area for voluntary pollution prevention practices for agriculture through Lincoln SWCD. The Natural Resources Conservation Service (NRCS) offers manure management technical assistance. Communications and outreach may also focus on understanding the potential impacts of land application of treated wastewater. The City will communicate with the Oregon Department of Forestry (ODF) to understand relevant Forest Management Plans and aerial or other chemical application buffers in drinking water source watersheds. If an insect or fungal outbreak occurs, the City may review existing regulations and promote management strategies that avoid the potential for chemicals to enter waterways.

3.3.3 Septic Systems

The City will provide information and promote the availability of programs designed to financially assist rural residents with septic system repair and replacement, such as those available through Lincoln County and DEQ. Financial assistance may include grants or loans. Programs may also include property owner education about septic system usage, maintenance, and actions to be taken in the event of septic system failure.

3.4 Critical Area Protection

Areas within the drinking water source watersheds are considered "critical areas" when a potential contaminant source or land use, if present in that area, would have a greater likelihood of impacting water quality or water supply. These areas include land with highly erodible soils, steep slopes, riparian lands around the Siletz River and Mill Creek and their tributaries, areas prone to landslides, and areas with high runoff potential due to slow soil infiltration rates. The 2002 SWA prepared by DEQ identifies and maps these sensitive areas. Critical area protection strategies are designed to protect drinking water sources by preventing activities that could pose a threat to water quality.

3.4.1 Land Acquisition and Conservation Easements

The City will explore land acquisition and conservation easement opportunities. Acquiring land or development rights would provide the City with more management authority over activities outside its jurisdiction in critical areas within the source watersheds. Implementing this strategy could require a partnership with a conservation organization or land trust. The City could also assist landowners in critical areas in obtaining conservation easements or deed restrictions for their properties, which could be used to limit activities that would negatively impact the water sources. For example, this strategy could be used to prevent or carefully manage activities, such as timber harvest or rural residential development. The City currently owns nearly 400 acres in the lower Mill Creek watershed and manages it according to the Toledo Mill Creek Forest Stewardship Plan (Forest Stewardship Plan) prepared by Trout Mountain Forestry in 2011.

The Forest Stewardship Plan recommends developing a plan update in 2022, which would provide an opportunity for the City to review management actions to-date and ensure that drinking water protection goals continue to be supported by thoughtful forest management. An update of the plan would also allow the City to incorporate changes to the Forest Practices Act enacted through the Private Forest Accord in 2022, which affect stream buffers, road construction, harvest on steep slopes, and other forestry activities.

3.5 Municipal Policies and Infrastructure Management

Municipal policies provide a foundation to guide decision making and investment, presenting a valuable opportunity to make sustainable water management part of Toledo's way of life. Policies may be formally adopted through an ordinance or City Council resolution, or they may be internal directives guiding the operation of City departments. Through municipal policies, the City can set priorities, establish standards and goals, and create accountability through enforcement provisions. Strategies in this category address risks related to biological and geological processes, transportation, stormwater, and infrastructure.

3.5.1 Water Conservation

Demand management helps to reduce pressure on water resources, particularly during the summer when demand is typically highest, streamflows are lowest, and water quality issues may arise. Water conservation is also critical in the event of supply disruptions or prolonged droughts. In addition to the water conservation outreach described in Section 3.2.2, the City will consider adopting development ordinances that would increase the water efficiency of new homes and businesses and their associated landscaping. For example, ordinances could require that indoor plumbing fixtures meet or exceed specific efficiency standards, or specify that water-wise landscaping and water-efficient irrigation technologies be used. The City will also explore opportunities to conserve water used in City parks and facilities.

3.5.2 Infrastructure Management

Maintenance and improvements to City water infrastructure will increase reliability and protect water quality. The City will conduct regular maintenance and targeted upgrades in coordination with the City's Water Master Plan and applicable capital improvement plans. Specialized projects may be needed to prepare for or recover from wildfires, severe storms, or similar disaster conditions. Earthquake preparedness measures may include installation of check valves on tanks, protection of pipes, and securing backup electrical systems or generators. The City recently installed a back-up electric generator for the Siletz River water intake system, which will allow water to continue to be pumped from the river during power outages. Resilient water infrastructure management also includes efforts to improve cybersecurity and prevent or respond to potential vandalism or sabotage. In addition to City-owned water system infrastructure, the City may implement policies to support good road maintenance practices that help prevent stormwater pollution, erosion, and sedimentation.

3.6 Pollution Prevention Programs

Pollution prevention programs focus on avoiding contamination of drinking water source areas by promoting safe disposal of chemicals and hazardous wastes. These strategies build on the technical assistance and educational programs described above to include proactive hazardous waste collection activities and coordination of spill response plans to respond to accidental releases of chemicals that may affect drinking water sources.

3.6.1 Hazardous Waste Collection

Hazardous waste collection events offer opportunities for residents and businesses to safely dispose of potentially hazardous chemicals that they no longer need. The City will investigate options for setting up permanent drop-off locations or sponsoring one-day events for collecting household and business hazardous waste. Examples of materials that may be accepted include paint, motor oil, batteries, antifreeze, expired medications, and chemicals used in landscaping, agriculture, and forestry. Special events may be held specifically targeting businesses that may have larger quantities of agricultural or forestry chemicals (pesticides, fertilizers, etc.) requiring safe disposal. The City will communicate with Lincoln County and DEQ about collaboration and funding sources for sponsoring hazardous waste collection events and ongoing collection programs. Lincoln County holds annual household hazardous waste collection events. The City will also explore partnerships with the Port of Toledo and Lincoln County Parks boat launch areas for collection of boating-related hazardous waste, such as fuels, solvents, varnishes, bottom paints, antifreeze, and oil. The Oregon State Marine Board has approved the Port of Toledo as a Certified Clean Marina for its efforts to reduce water pollution through public outreach and implementation of best practices in its shipyard services. Boating-related hazardous waste collection events could be developed as a natural extension of the Port's existing programs.

3.6.2 Spill Response Plans

The purpose of this strategy is to coordinate spill response plans with other municipalities whose drinking water intakes may also be affected by large upstream spills of gasoline or other hazardous chemicals, primarily in the Siletz River watershed. This has been identified as a higher risk where roads cross the river and its tributaries, since a spill in these locations could more quickly reach the water source. The Cities of Siletz and Newport also have intakes on the Siletz River and could be affected by a spill, so having specific spill response procedures in place would allow for quicker response and targeted notifications to all potentially affected municipalities.

The City will communicate with Lincoln County about integrating hazardous spill response planning into the County's existing Emergency Operations Plan. Currently, the County's plan calls for coordination with local fire departments and notification of the National Response Center in the event of an oil or chemical spill. The Toledo Fire Department maintains emergency plans and procedures to provide hazardous materials incident support and can request assistance from the Oregon State Fire Marshal Regional Hazardous Materials Team. Integrated spill response plans would enable any entity that learns of a spill to communicate important information quickly to others, including the Cities of Toledo, Newport, and Siletz; Lincoln County; the Oregon Department of Transportation; and others as needed. This would enable drinking water providers to assess the potential threat to their systems and determine whether there is a need to temporarily suspend operation of an intake, switch to an alternate water source, or use stored water to meet demands until the water source is once again safe.

3.7 Monitoring Programs

Monitoring programs can be designed to assess current threat levels and to track changes in an area over time. Water quality monitoring is needed to detect and address any potential degradation of water quality in the drinking water sources. In addition, the City may decide to monitor for potential insect and fungal outbreaks in the watersheds as needed.

3.7.1 Water Quality Monitoring

The City conducts routine drinking water quality monitoring at the water treatment plant in compliance with all state and federal requirements. Water quality monitoring in the source watersheds and tributaries would

help the City understand potential upstream sources of pollution and determine whether any action is needed to prevent contamination.

Because of the seasonal water quality issues in the City's water sources, each one is used at a particular time of year. Due to low streamflows in Mill Creek and shallow water in Mill Creek Reservoir above the intake, this water source frequently experiences algae blooms in the summer, causing taste and odor issues. Therefore, Mill Creek is used primarily during the winter and spring months. The Mill Creek watershed is much smaller than the Siletz River watershed, and no areas of highly erodible soils have been mapped in the area. The City's 2017 Water Master Plan reports that turbidity at the intake on Mill Creek rarely exceeds 1.0 NTU (Nephelometric Turbidity Unit, a common unit of measurement for turbidity) even during the winter. While extensive monitoring in the Mill Creek watershed may not be needed at this time, the City may consider targeted monitoring after specific events, such as logging or chemical applications in the watershed.

The Siletz River watershed covers a substantial area under multiple jurisdictions and a wide variety of land uses. The City is limited to using the Siletz River water source during the summer and fall months because winter storms greatly increase turbidity in the river. Heavy loads of silt and sand damage the pump bearings at the intake and increase the difficulty of water treatment. The City will explore potential partnerships with other Siletz River water users, such as the Cities of Newport and Siletz, for creating an early-warning system of turbidity monitoring in areas of the watershed with highly erodible soils that could cause issues further downstream. Turbidity monitoring could be conducted on a routine basis or could include targeted sampling following events, such as wildfires, earthquakes, or severe storms. In addition to turbidity monitoring, the City will also investigate the need for water quality monitoring before and after activities, such as logging, mining, roadside vegetation management, land application, and chemical applications in agricultural and forestry operations.

3.7.2 Insect and Fungal Outbreak Monitoring

Regional outbreaks of certain types of insects or fungal infections could lead to widespread tree mortality in the drinking water source areas. In the event of a reported outbreak, the City will provide public information about detecting the pest species and will publicize reporting systems to monitor the spread of the insect or fungus, such as the Oregon Invasive Species Online Hotline. As needed, the City will implement monitoring and determine other actions that may be needed to control the spread within the drinking water source areas.

3.8 Watershed Restoration

Healthy source watersheds are better able to produce clean water for communities, the environment, agriculture, and other uses. Activities and projects that restore and enhance watershed health can protect water quality, reduce sedimentation and turbidity in streams, and help maintain higher streamflows longer into the summer when surrounding lands are better able to retain soil moisture and contribute to baseflows. Watershed restoration strategies may be used to address risks related to highly erodible soils, agriculture, forestry, mining, and municipal stormwater, along with specialized projects to recover following natural disasters. Restoration activities can be planned for portions of the Mill Creek watershed owned by the City, and the City can support or promote voluntary restoration of the Siletz River watershed upstream of the intake. Restoration can also be combined with Critical Area Protection strategies.

3.8.1 Restoration Projects

Specific activities may include invasive species removal, revegetation with native plants, planting or maintenance of riparian buffers, erosion control and slope stabilization, and installation of large woody

debris in streams. Strategic fencing can be used to manage potential impacts from grazing wild and domestic animals in the source watersheds while also maintaining habitat connectivity. Decommissioned forest access roads can be assessed to identify locations where revegetation and drainage improvement techniques may be needed to protect water quality. On-the-ground habitat restoration and enhancement projects can be linked with targeted outreach about invasive species management for rural development, forestry, mining, and other sectors as needed. As feasible, the City will support and collaborate with local entities engaged in watershed restoration, such as the MidCoast Watershed Council, Lincoln SWCD, and the Alsea Stewardship Group for projects on forest lands near the Siuslaw National Forest.

Special projects may need to be developed following events such as earthquakes, wildfires, severe storms, or insect and fungal outbreaks. Monitoring activities recommended above can be used to determine the need for specific projects. Restoring floodplains and beaver habitat can improve streamflows and help make the watersheds more resilient to drought, extreme high and low flows, and climate change. Restoration following wildfires or severe storms may be focused on stabilizing soils, accelerating revegetation, and reducing erosion risks.

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SECTION 4: Implementation Plan

The implementation plan section of the DWPP describes the activities that the City plans to undertake as part of its strategies to address risks to the drinking water supply source areas. The implementation plan includes activities over the next six years, but some activities may require longer planning timeframes or are intended to be ongoing. Potential funding sources are also described in this section, since implementation of many activities will be contingent on funding and staff availability. The City plans to continue engaging the DWPP Team and building partnerships during implementation. The implementation plan will be reviewed periodically to assess progress and determine if new actions are needed to address any changes in risk levels or watershed conditions.

The implementation plan is divided into three phases based on the complexity and readiness of the activities to proceed. Activities listed in Phase 1 include actions that can be implemented immediately along with data collection activities to fill data gaps and inform future activities. Phase 2 includes actions that require additional preparation, such as developing partnerships. Activities with longer lead times or more substantial funding needs are included in Phase 3. Specific activities to implement each strategy listed in Section 3 are described by phase below.

4.1 Phase 1: Immediate Activities and Data Gathering

4.1.1 Public Education and Outreach

4.1.1.1 Outreach in the Source Watersheds

To address risks in the source watersheds, the City will continue to learn about current forestry and agricultural practices in order to develop outreach about the DWPP and how specific risks can be minimized or eliminated. The City will seek information about existing outreach programs in the City of Siletz that may be relevant, such as water conservation or pollution prevention programming that would benefit the Siletz River as a shared water source. Additional research may be done to better understand any existing low impact development programs and projects in the City of Siletz or other upstream communities. During this phase, the City will begin promoting existing programs that support public education and watershed protection, such as Lincoln SWCD programs and the Ocean-Friendly Gardens program. Topics could include riparian vegetation, sediment and chemical management, or irrigation efficiency, among others.

4.1.1.2 Outreach within the City

Additional outreach efforts within the City of Toledo will focus on promoting water conservation through participation in the Mid-Coast Water Conservation Consortium (Mid-Coast Water) and creating educational materials about the DWPP, risks and strategies, and how residents and businesses can help protect drinking water supplies.

4.1.2 Technical Assistance

During Phase 1, the City will focus on gathering information about current technical assistance programs, such as those offered by Lincoln SWCD, ODA, ODF, ODOT, BLM, NRCS, and USFS. Specifically, the City will learn about programs for sediment management and nutrient and chemical management, including septic system assistance programs.

4.1.3 Critical Area Protection

Assessing and prioritizing critical areas in the source watersheds is a necessary precursor to any protection activities. The City will use data from the SWA, the 303(d) list, and other sources as needed to prioritize potential locations that may need additional protection to ensure healthy watersheds and water quality. Areas for protection could include those with highly erodible soils, steep slopes near water sources, areas prone to landslides, and stream buffers. The City will coordinate with Lincoln SWCD and other local agencies to learn about current land management practices and whether they are already providing sufficient protection of identified critical areas. As needed, the City will begin communicating with landowners and land managers about best practices and existing conservation programs, such as the Conservation Reserve Enhancement Program (CREP) for agricultural and ranching landowners.

4.1.4 Municipal Policies and Infrastructure Management

The City will strive to enhance water conservation and protection policies. By participating in Mid-Coast Water, the City will seek to promote water conservation and share best practices with other water providers in the region. As a Mid-Coast Water member, the City has access to water conservation outreach materials and water conservation items to offer customers, such as faucet aerators, water-efficient showerheads, shower timers, and toilet leak detection dye tablets. The City will begin assessing opportunities for water conservation at City-owned facilities and parks to better protect the water supply.

In coordination with the City's Water Master Plan and its Water Management and Conservation Plan, the City will start assessing water system infrastructure needs for disaster preparedness and achieving reductions in water loss. The City will also communicate with Lincoln County and ODOT to determine if there are current evaluations of roads in the source watersheds that may contribute to stormwater pollution or sediment. Infrastructure management activities during Phase 1 will be aligned with projects in the City's annual budget, such as replacement of the Mill Creek raw water line.

4.1.5 Pollution Prevention Programs

The City will begin coordinating with DEQ and Lincoln County Solid Waste District to set up collection sites or sponsor regular drop-off events for household hazardous waste. To facilitate proper disposal of agricultural chemicals, the City will connect with ODA, DEQ, and the Lincoln County Farm Bureau to investigate hosting collection events and to learn about opportunities with the Pesticide Stewardship Partnership. Additional data gathering during Phase 1 will focus on learning about existing spill response plans that may have been developed by the City of Siletz, City of Newport, Lincoln County, and ODOT.

4.1.6 Monitoring Programs

During Phase 1, the City will learn about existing water quality monitoring programs, such as those being implemented by Surfrider, DEQ, Lincoln SWCD, the MidCoast Watershed Council, and other municipalities in the area. Next, the City will determine the most important water quality parameters to monitor regarding its drinking water sources and will assess whether these are already sufficiently monitored by other entities or if new programs may be needed. In particular, new monitoring programs may be desirable to understand changes in water quality before and after clearcuts or other large-scale timber harvest activities, chemical applications, land application of treated wastewater, landslides, wildfires, severe storms, or earthquakes. The City will also learn about any "watch list" insects, fungi, or aquatic invasive species that may become a threat in the area.

4.1.7 Watershed Restoration

The City will gather information about existing restoration efforts that are ongoing or planned in the source watersheds and will then determine if there are priority areas where the City can support restoration. During Phase 1, the City will begin proactively exploring funding options for restoration of these key areas. The City will maintain a list of potential funding sources, including post-disaster recovery funds that could be used to protect water quality.

4.2 Phase 2: Develop Partnerships and Continue Implementation

Actions included in Phase 2 include continued data gathering and implementation of Phase 1 actions as well as development of partnerships for more complex projects.

4.2.1 Public Education and Outreach

4.2.1.1 Outreach in the Source Watersheds

During Phase 2, the City will develop partnerships with entities, such as Lincoln SWCD and the City of Siletz, to co-develop outreach materials targeting specific drinking water risks, such as agriculture and municipal stormwater. The City will maintain regular communications with forest managers to understand upcoming activities, such as timber harvest and chemical applications, and will subscribe to ODF's Forest Activity Electronic Reporting and Notification System (FERNS) to receive timely information about planned forest operations. Targeted outreach materials will be developed for forest managers describing the City's DWPP and strategies related to forestry and expressing interest in regular communications and collaboration. The City will explore partnering or promoting the Salmon Safe certification for businesses in the Siletz River watershed.

4.2.1.2 Outreach within the City

The City will continue its efforts to educate water customers about water conservation and the true value of tap water, and may begin to include targeted outreach in mailers or billing messages based on current needs and the observed impact of previous efforts. Website content will be developed or updated to describe the DWPP and actions that residents can take. A pub talk style public outreach series will be developed to make water-related topics accessible to a range of audiences and promote best practices for conservation and pollution prevention.

4.2.2 Technical Assistance

The City will continue to promote existing technical assistance programs and resources describing best practices for sediment, nutrient, and chemical management. During Phase 2, the City will work to develop and strengthen partnerships with other agencies and organizations working in these areas so it can provide seamless referrals to the appropriate resources.

4.2.3 Critical Area Protection

Based on the results of the critical area assessments undertaken during Phase 1, the City will determine whether to begin developing partnerships with organizations and land trusts, such as the McKenzie River Trust, Oregon Coast Community Forestry Association, and the Greenbelt Land Trust. Partnerships will be targeted toward potential acquisition or conservation easements for identified critical areas.

4.2.4 Municipal Policies and Infrastructure Management

During Phase 2, the City will research and evaluate the adoption of water conservation ordinances as a way to reduce water demand and prevent water waste. Ordinances may target indoor water use, such as by requiring water-efficient plumbing fixtures in new development, or outdoor water use, such as by requiring or encouraging planting of low water use, drought-tolerant species.

Depending on funding and staffing availability, the City will begin implementing water conservation activities and upgrades at City-owned parks and facilities that were identified during Phase 1. The City will continue water system infrastructure maintenance and upgrades to improve disaster preparedness and to decrease water loss from the system. The City will consider cybersecurity training and system assessments that may be available through the American Water Works Association or the Environmental Protection Agency. The City will support any road maintenance programs and practices that were determined during Phase 1 to prevent pollution and sediment transport to the drinking water sources.

4.2.5 Pollution Prevention Programs

Partnerships will be developed with the Port of Toledo and/or Lincoln County Parks for collection of boating-related hazardous waste. Public service announcements or other outreach may be developed in conjunction with waste collection, and signage may be developed for posting at boat ramps. For agricultural or forestry chemicals, the City will consider implementing drop-off events through the Pesticide Stewardship Partnership or similar one-day events. Using the information collected during Phase 1 regarding existing spill response plans, the City will coordinate with other entities to update its own spill response plan as needed. The City will keep an updated list of contact information so that the appropriate parties can be notified quickly in the event of a spill that could threaten drinking water sources.

4.2.6 Monitoring Programs

Monitoring programs will be developed as needed during Phase 2 based on the results of the evaluations conducted during Phase 1 and the potential to build on existing monitoring programs. Parameters to monitor will be selected, appropriate monitoring locations will be chosen, protocols and schedules will be developed, and responsible parties will be identified to conduct the monitoring. The City will explore relevant partnerships to secure funding for water quality monitoring, such as programs funded by OHA. Water quality monitoring results will be shared with the Public Works Department to ensure that any risks to the drinking water supply can be addressed quickly. Should any insect or fungal outbreaks occur, the City will maintain communications with agencies monitoring or responding to the outbreak. The City will also promote existing reporting hotlines for outbreaks and invasive species, such as the Oregon Invasive Species Online Hotline.

4.2.7 Watershed Restoration

The City will develop a list of existing projects that would contribute to drinking water source area protection and will maintain communications with potential partner organizations regarding these projects. To the extent possible, the City will also assist with pursuing funding for these projects and provide in-kind or monetary support for project implementation. Specific activities will depend on the location of restoration and enhancement projects and their relationship to the drinking water sources. Priority areas are likely to include those with highly erodible soils, riparian corridors, areas where wild animals appear to be concentrated or overgrazing, and lands affected by mining or forestry activities.

4.3 Phase 3: Long-Term Implementation

Phase 3 will include continued implementation of activities described in earlier phases, with some additional actions that require more preparation as described below.

4.3.1 Public Education and Outreach

4.3.1.1 Outreach in the Source Watersheds

During Phase 3, the City will communicate with Lincoln County and upstream communities in the Siletz River watershed to promote low impact development.

4.3.2 Critical Area Protection

As needed, the City will begin pursuing funding for conservation easements or land acquisition of critical areas in collaboration with the partners discussed in Phase 2. This may include the Drinking Water Source Protection Fund through the Oregon Health Authority, the Oregon Agricultural Trust for agricultural lands, and the Oregon Watershed Enhancement Board. The City will develop or co-develop management plans for areas to be acquired.

4.3.3 Municipal Policies and Infrastructure Management

As needed, the City will seek funding to implement more substantial water conservation efforts, such as upgrades at City facilities and parks. This could include replacement of older, inefficient plumbing fixtures or irrigation systems. Should any disasters occur during the implementation period, specialized recovery projects may be needed to rebuild or repair water infrastructure.

4.3.4 Pollution Prevention Programs

The City will develop a schedule for regularly implementing pollution prevention programs and will maintain a list of related contacts and outreach materials to facilitate ongoing implementation efforts.

4.3.5 Monitoring Programs

During Phase 3, the City will implement any water quality monitoring programs developed during Phase 2. In the event of insect or fungal outbreaks or detection of aquatic invasive species, the City will coordinate with response agencies to promote management methods with lower contamination risk to water sources, such as non-chemical treatments where possible.

4.3.6 Watershed Restoration

In addition to longer-term support of prioritized restoration and habitat enhancement efforts, specialized projects to recover from disasters will be implemented as needed.

4.4 Overview of Timeline and Entities Involved

In general, the City anticipates that Phase 1 activities will occur during the first year of implementing the DWPP. There will likely be some overlap with Phase 2, anticipated to occur during the first 3 years of implementation, depending on the development of partnerships and availability of funding and staff resources. Long-term implementation activities under Phase 3 are expected to be undertaken within 4-6 years of adoption of the DWPP.

Exhibit 4-1 presents a summary of the implementation plan timeline by phase, strategy (see Section 3 for additional details), and risks addressed (see Section 2 for additional details). Exhibit 4-2 lists responsible parties and potential partner organizations.

Exhibit 4-1. Implementation Plan Summary by Phase

Strategy	Phase 1 Activities	Phase 2 Activities	Phase 3 Activities	Risks Addressed
Public education and outreach				
Source watersheds	<ul style="list-style-type: none">Learn about existing City of Siletz outreachContinue to learn about current forestry practices and develop outreach about DWPPContinue to learn about current agriculture practices and develop outreach about DWPPLearn about existing programs for low impact development in upstream communitiesPromote existing Lincoln SWCD programsExplore promoting Ocean-Friendly Gardens	<ul style="list-style-type: none">Co-develop outreach materials with Lincoln SWCD as appropriateCo-develop additional outreach with City of Siletz as neededRegular communications with forestry companiesExplore promoting Salmon Safe certification	<ul style="list-style-type: none">Work with the County and upstream communities to promote low impact development	<ul style="list-style-type: none">Drought and low flowsBiological and geological processesForestry practicesAgricultural practicesMunicipal stormwaterRural residential practicesSeptic systemsRecreation
Within City	<ul style="list-style-type: none">Promote water conservation through Mid-Coast WaterCreate outreach about DWPP	<ul style="list-style-type: none">Targeted outreach in mailers or billing messages as neededPublic outreach series (pub talk style)		<ul style="list-style-type: none">Drought and low flowsBiological and geological processes
Technical assistance				
Sediment management	<ul style="list-style-type: none">Learn about current TA programs (Lincoln SWCD, ODA, ODF, BLM, USFS, NRCS)Learn about ODOT culvert programSign up for ODF FERNs notifications. Review and comment (as needed) on proposed forestry management actionsDevelop an action plan that assesses the highest risk areas and prioritizes best management practices for targeted outreach	<ul style="list-style-type: none">Promote existing programs and best practicesPartnerships with existing entitiesIdentify funding sources for sediment prevention and mitigation		<ul style="list-style-type: none">Highly erodible soilsDrought and low flowsBiological and geological processesTransportationForestry practicesAgricultural practicesMunicipal stormwaterRural residential practicesIndustrial practices
Nutrient and chemical management	<ul style="list-style-type: none">Learn about current TA programs (Lincoln SWCD, ODA, NRCS, ODF, BLM, USFS)Develop an action plan that assesses the highest risk areas and prioritizes best management practices for targeted outreach	<ul style="list-style-type: none">Promote existing programs and best practicesPartnerships with existing entities		<ul style="list-style-type: none">Highly erodible soilsDrought and low flowsBiological and geological processesTransportationForestry practicesAgricultural practicesMunicipal stormwaterRural residential practicesSeptic systems
Septic system assistance	<ul style="list-style-type: none">Septic system assistance program referrals	<ul style="list-style-type: none">Partnerships with existing entitiesConsider financial incentives for landowners to inspect and maintain septic systems		<ul style="list-style-type: none">Rural residential practicesSeptic systems

Critical area protection				
Critical area protection	<ul style="list-style-type: none">Assess and prioritize critical areas in source watersheds, including 303(d) listLearn about current land management (coordinate with Lincoln SWCD)Communicate with landowners about best practices and existing conservation programs (e.g., CREP, Lincoln SWCD)	<ul style="list-style-type: none">Develop partnerships with land trusts if needed (McKenzie River Trust, Oregon Coast Community Forestry Association, Greenbelt Land Trust)	<ul style="list-style-type: none">Seek funding for conservation easements/acquisition (DWSPF implementation, OWEB, OAT for agricultural) if neededDevelop management plans for areas to be acquired	<ul style="list-style-type: none">Highly erodible soilsForestry practicesAgricultural practicesMunicipal stormwaterRural residential practices
Municipal policies and infrastructure management				
Water conservation	<ul style="list-style-type: none">Continue participating in Mid-Coast WaterAssess water conservation opportunities at city facilities and parks	<ul style="list-style-type: none">Consider water conservation ordinancesImplement water conservation at city facilities and parks	<ul style="list-style-type: none">As needed, seek funding for more substantial water conservation opportunities, such as at city facilities and parks	<ul style="list-style-type: none">Drought and low flowsAgricultural practicesRural residential practices
Infrastructure management	<ul style="list-style-type: none">Assess water system infrastructure needs for disaster preparedness and water loss (coordinate with Water Master Plan)Learn about County or ODOT assessments of roads that may contribute to stormwater pollution or sediment	<ul style="list-style-type: none">Maintenance and upgrades to improve disaster preparedness and decrease water lossConsider cybersecurity training and system assessment (AWWA, EPA)Support road maintenance practices that prevent pollution and sediment transport	<ul style="list-style-type: none">As needed, specialized projects to recover from disasters	<ul style="list-style-type: none">Drought and low flowsBiological and geological processesTransportationMunicipal stormwaterAging infrastructureVandalism
Pollution prevention programs				
Hazardous waste collection	<ul style="list-style-type: none">Set up drop sites or sponsor drop-off events for household hazardous waste (coordinate with DEQ, Lincoln County Solid Waste District)Connect with ODA/DEQ about Pesticide Stewardship Partnership, Lincoln County Farm Bureau – host collection events or sites	<ul style="list-style-type: none">Partner with Port and/or Lincoln County Parks for boating-related hazardous waste collection – PSA/signage at boat rampsConsider implementing drop-off events with Pesticide Stewardship Partnership or similar 1-day events	<ul style="list-style-type: none">Develop a schedule for regularly implementing pollution prevention programsMaintain list of contacts and outreach materials for future events	<ul style="list-style-type: none">Forestry practicesAgricultural practicesMunicipal stormwaterRural residential practicesRecreation
Spill response plans	<ul style="list-style-type: none">Learn about existing spill response plans (City of Siletz, City of Newport, Lincoln County, ODOT)	<ul style="list-style-type: none">Coordinate response plans and keep contact info updated		<ul style="list-style-type: none">Forestry practicesAgricultural practicesTransportation
Monitoring programs				
Water quality monitoring	<ul style="list-style-type: none">Learn about existing water quality monitoring programs (Surfrider, DEQ, City, Lincoln SWCD, Mid-Coast Watershed Council)Determine most important parameters to monitor (see 303(d) list)	<ul style="list-style-type: none">Develop additional monitoring plans as neededPotential partnership on funding for water quality monitoring (OHA)	<ul style="list-style-type: none">Implement monitoring plans	<ul style="list-style-type: none">Biological and geological processesForestry practicesTransportation
Insect/fungal/aquatic invasive monitoring	<ul style="list-style-type: none">Learn about any “watch list” species that may become a threat in the area	<ul style="list-style-type: none">Communicate with agencies monitoring any outbreaksPromote reporting hotline in the event of outbreaks	<ul style="list-style-type: none">As needed, promote management methods with lower contamination risk to water sources	<ul style="list-style-type: none">Biological and geological processes

Watershed restoration				
Restoration projects	<ul style="list-style-type: none">▪ Learn about existing restoration efforts▪ Determine priority areas to support restoration▪ Explore funding options proactively for restoration, including post-disaster funding	<ul style="list-style-type: none">▪ Ongoing communication and tracking of restoration work▪ In-kind or other support of prioritized restoration	<ul style="list-style-type: none">▪ As needed, specialized projects following disasters	<ul style="list-style-type: none">▪ Highly erodible soils▪ Drought and low flows▪ Biological and geological processes▪ Transportation▪ Forestry practices▪ Agricultural practices▪ Municipal stormwater▪ Rural residential practices▪ Industrial practices

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Exhibit 4-2. Responsible Parties and Potential Partnerships

Category	Potential Partners
Public Education and Outreach	
Source Watersheds	City of Siletz, Lincoln SWCD, Surfrider, Salmon Safe, Lincoln County, People for Lincoln Land and Waters (PLLW)
Within City	Mid-Coast Water
Technical Assistance	
Sediment Management	Lincoln SWCD, ODA, ODF, BLM, USFS, ODOT (culvert program), DEQ
Nutrient and Chemical Management	Lincoln SWCD, ODA, NRCS, ODF, BLM, USFS, DEQ
Septic System Assistance	DEQ, Lincoln County, ODA
Critical Area Protection	
Acquisition and Conservation Easements	Lincoln SWCD, McKenzie River Trust, Greenbelt Land Trust, Oregon Coast Community Forest Association, OWEB
Municipal Policies and Infrastructure Management	
Water Conservation	Mid-Coast Water
Infrastructure Management	ODOT, County (roads), AWWA (cybersecurity), industry
Pollution Prevention Programs	
Hazardous Waste Collection	DEQ and ODA (Pesticide Stewardship Partnership), Lincoln County Solid Waste District, Lincoln County Farm Bureau, Port of Toledo, Lincoln County Parks (boat launches), industry
Spill Response Plans	City of Siletz, City of Newport, Lincoln County, ODOT, industry
Monitoring	
Water Quality Monitoring	DEQ, Lincoln SWCD, MidCoast Watershed Council, Surfrider, OHA
Insect, Fungus, and Aquatic Invasive Species Monitoring	ODFW, ODA, ODF
Watershed Restoration	
Restoration Projects	MidCoast Watershed Council, Lincoln SWCD, ODFW, industry

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4.5 Potential Funding Sources

The following is a list of potential funding sources for supporting implementation of the DWPP. The City's SWA also contains a list of funding sources.

- Drinking Water Source Protection Fund, Oregon Health Authority
 - Provides grants of approximately \$30,000-\$50,000; grants can be received in two consecutive years, then there must be at least one year before another grant is awarded
 - Provides loans up to \$100,000 per project
 - Funding must be used within two years
 - Emergency grants are available to address threats to drinking water supplies outside of the standard Letter of Interest submission timeline
 - Letters of Interest due from January through March
 - Example projects: land acquisition, incentive-based protection measures, community outreach, riparian restoration, waste collection, and watershed planning
 - <https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/SRF/Pages/spf.aspx>
- Drinking Water Provider Partnership Grants, Numerous partners (Oregon Department of Environmental Quality, USFS, US EPA, BLM, USDA, The Freshwater Trust, GEOS Institute, Wild Earth Guardians, Washington State Department of Health)
 - Provides grants up to \$50,000
 - Project must be in a drinking water source area with a Federal nexus (e.g., USFS and BLM)
 - Funding must be used within 18 months
 - Proposals due in early January
 - Supports projects that restore and protect watersheds that provide drinking water while also benefiting aquatic and riparian ecosystems, including the native fish that inhabit them
 - Example projects: develop native riparian reserves, road sediment analysis and road redesign, riparian planting, weed control, floodplain reconnection
 - <https://geosinstitute.org/initiatives/dwpp/>
- Clean Water State Revolving Fund, Oregon DEQ and US EPA
 - Provides below-market rate loans for planning, design, and construction projects that protect public health, restore natural areas, and promote economic development.
 - Applications reviewed three times a year
 - Example projects: establishing monitoring programs and outreach programs, watershed restoration, loans for septic system upgrades/replacements, land purchase, and nonpoint source control activities
 - <https://www.oregon.gov/deq/wq/cwsrf/pages/default.aspx>
- Oregon 319 Nonpoint Source Implementation Grants, Oregon Department of Environmental Quality
 - Provides grants up to \$30,000 and requires a 40% non-Federal match (i.e., 40% of the total project cost must be covered by non-federal funds and/or in-kind services)
 - Only projects with a DEQ Watershed-Based Plan are eligible (shown in Section B of the application information)
 - Application period closes in April or May
 - Supported activities include technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and monitoring
 - Projects that involve collaborative stakeholder partnerships are encouraged
 - Projects that protect or replace failing infrastructure on USFS or BLM roads or lands are not eligible

- <https://www.oregon.gov/deq/wq/programs/pages/nonpoint-319-grants.aspx>
- Oregon Watershed Enhancement Board
 - Monitoring grants: eligible monitoring projects include status and trend, project effectiveness, landscape effectiveness, and Rapid Bio-Assessment; apply in the fall
 - Restoration: Priorities include altered watershed function affecting water quality, water flow, and fish production capacity; apply in the spring or fall
 - Stakeholder Engagement: Eligible projects increase awareness and understanding in watersheds to support implementation of specific restoration, monitoring, and conservation activities; apply in spring or fall
 - Technical Assistance: apply in spring or fall
 - Land Acquisition Grants: Eligible projects involve purchase of interests in land from willing sellers for maintenance and restoration of watersheds and fish and wildlife habitat; apply in the fall
 - Water Acquisition Grants: Eligible projects involve purchase of an interest in water from a willing seller to increase in streamflow for habitat and species conservation benefits and to improve water quality; apply in fall
 - Small Grants: Provides up to \$15,000 for less complex, on-the-ground restoration projects
 - <https://www.oregon.gov/oeb/grants/Pages/grant-programs.aspx>
- Feasibility Study Grants and Water Project Grants and Loans, Oregon Water Resources Department
 - Water Project Grants and Loans
 - Applications are due in April
 - Supports projects that address instream and out-of-stream water supply needs now and into the future
 - Example projects include: irrigation efficiency projects
 - Feasibility Study Grants
 - Reimburse up to 50% of the costs of studies to evaluate the feasibility of developing water conservation, reuse, and storage projects
 - Applications are due in fall
 - <https://www.oregon.gov/owrd/programs/FundingOpportunities/Pages/default.aspx>
- Various Financial Assistance Programs, USDA Natural Resources Conservation Service
 - Environmental Quality Incentives Program (EQIP): Financial and technical assistance to agricultural and forestry producers to address natural resources concerns and provide environmental benefits, such as water quality improvements, reduce soil erosion and sedimentation, and improved wildlife habitat
 - Conservation Stewardship Program: Encourages farmers, ranchers, and woodland owners to take the conservation a step further by implementing additional conservation activities and enhancements
 - National Water Quality Initiative (NWQI): Provides funding for a detailed watershed assessment and an outreach strategy to address agricultural-related impacts, and following completion, funding to implement projects becomes available through EQIP
 - <https://www.nrcs.usda.gov/wps/portal/nrcs/main/or/programs/>
 - Watershed and Flood Prevention Operations Program: Provides financial and technical assistance for erosion and sediment control, watershed protection, flood prevention, water quality improvements, water management, fish and wildlife habitat enhancement, hydropower sources, and rural, municipal, and industrial water supply; the project must have agricultural benefits
 - <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wfpo/>

- Emergency Watershed Protection Program: Provides technical and financial assistance for communities following natural disasters that impair a watershed. Examples of activities that could be funded include removal of debris from stream channels and culverts, restoration of streambanks, establishing vegetative cover on critically eroding lands, repairing levees, and purchase of floodplain easements
- <https://www.nrcs.usda.gov/programs-initiatives/ewp-emergency-watershed-protection>
- Five Star and Urban Waters Restoration Grant Program, US EPA and National Fish and Wildlife Foundation
 - Provides grants to improve water quality, watershed conditions, and fish and wildlife habitat
 - Projects must incorporate: wetland, riparian, instream, and/or coastal habitat restoration; and education and training activities through community outreach, participation, and/or integration with K-12 environmental curriculum; five or more partners; measurable ecological, educational, and community benefits; and a plan for sustaining the benefits
 - Awards range from \$20,000-\$50,000, and grants span 12 to 18 months with a start date in late summer/early fall; apply in January
 - <https://www.epa.gov/wetlands/5-star-wetland-and-urban-waters-restoration-grants>
- Environmental Education Grants Program, US EPA
 - Supports projects that promote environmental awareness and stewardship and help provide people with skills to protect the environment
 - Applicants must represent at least one of the following types of organizations: local education agency, state education or environmental agency, college or university, non-profit organization, tribal education agency, noncommercial educational broadcasting entity
 - Grant competition closes in January
 - <https://www.epa.gov/education/grants>
- Various Grants, Oregon Office of Emergency Management
 - Emergency Management Performance Grant: makes grants from the Federal government available to state, local, and tribal governments to assist in preparing for all hazards
 - Hazard Mitigation Assistance Grant: Provides funds from the Federal government to assist in hazard mitigation planning, projects, and other activities to reduce vulnerability to hazards
 - Homeland Security Grant Program: Provides funds from the Federal government for planning, organizing, equipment purchasing, training, and exercises for emergencies
 - <https://www.oregon.gov/oem/emresources/Grants/Pages/default.aspx>
- Wildfire Resources, State of Oregon
 - <https://wildfire.oregon.gov/>
- Fire prevention and training funding, multiple agencies (FEMA, USFS, BLM)

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SECTION 5: Contingency Plan

A contingency plan for responding to the loss or substantial reduction of a drinking water source is a required element of a state-approved Drinking Water Protection Plan. Oregon Administrative Rule [OAR 333-061-0057\(5\)](#) specifies that a contingency plan must include the following elements:

1. Inventory/prioritize all threats to the drinking water supply
2. Prioritize water usage
3. Anticipate responses to potential incidents
4. Identify key personnel and develop a notification roster
5. Identify short-term and long-term replacement potable water supplies
6. Identify short-term and long-term conservation measures
7. Provide for plan testing, review, and update
8. Provide for new and ongoing training of appropriate individuals
9. Provide for education of the public
10. Identify logistical and financial resources

These elements are addressed below.

This contingency plan has been developed in coordination with the City of Toledo Emergency Operations Plan (November 2014).

5.1 Threats to the Drinking Water Supply

The City identified numerous threats in its drinking water source areas (see Section 2 of this DWPP and Section 2.1.2 of the City's Emergency Operations Plan [EOP]). Of those identified, the following could cause the potential loss or reduction of a drinking water source:

- Drought
- Wildfire
- Earthquake
- Tsunami
- Severe weather (windstorm, winter storm, flood, landslides/debris flow)
- Water system infrastructure or facility failure (dams)
- Contamination
- Human caused/adversarial threats (sabotage)

In addition to the hazards identified above, hazards that originate in neighboring jurisdictions may create hazard conditions within the City. These hazards include a tsunami on the Oregon coast or a volcanic eruption in the Mt. Hood area. If these occur, the City may be impacted by residents fleeing their cities and seeking shelter in Toledo (See Section 2.1.2.1 in EOP).

5.2 Prioritization of Water Usage

If an emergency results in an insufficient water supply to meet all needs, the City may need to prioritize water use. The prioritization may be as follows:

- Fire protection
- Residential (indoor domestic)
- Schools and commercial
- Parks

- Irrigation (by residential or commercial water customers)

5.3 Responses to Potential Incidents

The City has an all-hazard plan (the EOP) that describes how the City will organize and respond to emergencies and disasters in the community. It is based on, and is compatible with, Federal plans, including Presidential Policy Directive 8 and the National Disaster Recovery Framework; State plans, including the State Emergency Management Plan; Lincoln County plans, including the Lincoln County Multi-jurisdictional Natural Hazard Mitigation Plan; and City of Toledo Plans, including the Toledo Public Works Water System Emergency Operations Plan (See Section 1.5 in EOP).

It contains an Immediate Action Checklist (See page iii in EOP) to initiate the City's response to and support of an emergency incident. It outlines the appropriate City personnel and organizations that can assist with emergency response (local, regional, and State), and details how to declare a state of emergency as needed.

It contains a Basic Plan (See Section 1 in EOP), which provides a framework for emergency operations and information regarding the City's emergency management structure. Incident Annexes that outline the actions to take if a specific type of emergency or disaster occurs are also included in the EOP.

Exhibit 5-1 presents the threats to municipal water supply identified above and the Incident Annex that responds to the threat. Each Incident Annex describes actions to be implemented in response to the incident. Examples of actions include analyzing scope and extent of the incident, communicating with agencies and the public, organizing efforts, documenting information and actions, activating mutual aid agreements, and initiating water curtailment procedures. For the full list of actions, see the Incident Annexes in the Emergency Operations Plan.

Exhibit 5-1. Municipal Water Supply Threats and Corresponding Incident Annex

Threats	Incident Annex
Drought	Drought
Wildfire	Major Fire
Earthquake	Earthquake
Tsunami	Tsunami
Severe Weather (windstorm, winter storm, flood, landslides/debris flow)	Severe weather, Flood
Water system infrastructure or facility failure	Flood, Utility failure
Contamination	Hazardous Materials Incident
Human caused/adversarial threats (sabotage)	Terrorism

The City has a conventional water treatment plant that requires a certified operator. Oregon Health Authority requires the City to have a water treatment plant operations and maintenance manual, which describes protocols for operating and maintaining various components of the water treatment system. This manual is located in the water treatment plant and intended for use by individuals who have some training in operating water treatment plants.

Information about the City's water treatment system and drinking water sampling is available through OHA's Drinking Water Data Online database using the following links:

- System Information: yourwater.oregon.gov/inventory.php?pwsno=00899

- Specific sampling requirements and status:
yourwater.oregon.gov/scheduleschems.php?pwsno=00899
- Entry point detects: yourwater.oregon.gov/unconfirmed.php?pwsno=00899

5.4 Key Personnel and Notification Roster

5.4.1 Key Personnel

The key personnel identified in this Contingency Plan as having a role in addressing emergencies is based on the City's Emergency Operations Plan (Immediate Action Checklist, Section 3.2 Emergency Management Organization, Section 4 Roles and Responsibilities in Functional Annexes 1 through 3: Emergency Services, Human Services, and Infrastructure Services).

Under the City of Toledo's Emergency Management Organization (EMO), the City Manager is considered the Emergency Management Director, unless this role has been otherwise delegated. The City Manager may, depending on the size or type of incident, delegate the authority to lead response and recovery actions to other City staff. Additionally, some authority to act in the event of an emergency may already be delegated by ordinance or by practice. As a result, the organizational structure for the City's emergency management program can vary depending upon the location, size, and impact of the incident.

The EMO for the City is divided into two general groups, organized by function: the Executive Group and Emergency Response Agencies.

5.4.1.1 Executive Group

The Executive Group may include representation from each City Department during an event. The Executive Group is responsible for the activities conducted within its jurisdiction. The members of the group include both elected and appointed executives with legal responsibilities (see Section 3.2.1 in EOP).

Mayor and City Council – During emergencies, the Mayor and City Council are responsible for encouraging citizen involvement and citizen assistance, issuing policy statements as needed to support actions and activities of recovery and response efforts, and providing the political contact needed for visiting State and Federal officials. In the event that declaration of emergency is needed, the Mayor will initiate and terminate the State of Emergency through a declaration ratified by the council (See Section 3.2.1 in EOP).

Emergency Management Director – The City Manager serves as Emergency Management Director and is responsible for continuity of government, overall direction of City emergency operations, and dissemination of public information. The City Manager has been designated as the City's Emergency Program Director with ultimate authority for direction and control of the City's EMO (See Section 3.2.1.2 in EOP).

Emergency Management Coordinator – The Fire Chief serves as the Emergency Management Coordinator for the City. The EMC has the day-to-day authority and responsibility for overseeing emergency management programs and activities. The EMC works with the EMD and Executive Group to ensure that there are unified objectives with regard to the City's emergency plans and activities. The EMC has authority to activate the EOC See Section 3.2.1.3 in EOP).

City Department Heads – Department and agency heads collaborate with the Executive Group during development of local emergency plans and provide key response resources (See Section 3.2.1.4 in EOP).

5.4.1.2 Emergency Response Agencies

- **Public Safety Answering Point (911 Dispatch)**
 - Toledo Dispatch Center
- **Toledo Fire Department (541) 336-3311**
- **Toledo Police Department (541) 336-5555**
- **Public Works Department (541) 336-2247**
- **Lincoln County Emergency Management (541) 265-4199**
- **OHA – Drinking Water Services (971) 673-0405**
- **DEQ – Drinking Water Program (503) 229-5954**
- **Other Organizations**
 - Organizations such as the Oregon Department of Transportation, the Oregon State Police, local ambulance service, and local hospitals may assign liaisons as points of contact within the City EOC for coordination and communication (from FA 1-6).

5.4.1.3 Tasked Agencies

Functional Annexes (FA) 1 through 3 describe agencies tasked with responding to different types of threats to the community. Section 4 in each FA describes roles and responsibilities, and Section 5 describes the concept of operations.

FA 1. Emergency Services

This annex outlines the basic City emergency services necessary to respond to a disaster (from page FA 1-1).

Primary Agencies	Emergency Management Director/Coordinator Police Department Fire Department Toledo Dispatch Center Local Emergency Medical Service Providers
Supporting Agencies	Public Works Department Lincoln County Emergency Management Lincoln County Sheriff's Office Lincoln County Health and Human Services Department Ambulance Providers: Pacific West Ambulance and Central Coast Ambulance

FA 2. Human Services

This annex addresses emergencies that require evacuation of people and sheltering or care (from FA 2-1).

Primary Agencies	Emergency Management Director/Coordinator American Red Cross
Supporting Agencies	Fire Department Police Department Lincoln County School District Lincoln County Emergency Management Lincoln County Health and Human Services Department County Sheriff's Office (Animal Services) Local Community and Faith Based Organizations

	Lincoln County Animal Shelter (located in Newport)
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FA 3. Infrastructure Services

This annex provides information regarding the coordination of infrastructure, public works, damage assessment, and engineering services during all phases of emergency management (from FA 3-1).

Primary Agencies	Public Works Department
Supporting Agencies	Emergency Management Director/Coordinator Fire Department Police Department Lincoln County Department of Public Works Department Oregon Department of Transportation Local Utilities: <i>Water: City of Toledo</i> <i>Sewer: City of Toledo</i> <i>Electricity: Central Lincoln Public Utility District</i> <i>Gas: Northwest Natural Gas</i> <i>Telephone(s): CenturyLink</i>

Section 3 Situation and Assumptions (FA 3-2) states that the Public Works Department's response operations will include assisting law enforcement and fire services in traffic control and rescue operations and clearing and maintaining critical lifeline routes. Also states that the Public Works Department will generally be assigned or assume the lead agency role in a natural hazards event, such as a flood, windstorm, or earthquake response.

Section 4 Roles and Responsibilities (FA 3-2) describes the activities and responsibilities of the Emergency Management Director and/or Coordinator, Public Works Department, Fire Department, Police Department, and local utilities.

Section 5 Concept of Operations (FA 3-5) describes coordination activities. The City Public Works Department is the lead agency for infrastructure operations and solid waste (debris) management. Public Works will focus on restoring vital lifeline systems to the community, with an emphasis on critical roads. Public Works will also focus on supporting law enforcement, fire, and search and rescue services with evacuation and traffic control capabilities. Other operational priorities include, but are not limited to the following:

- Damage assessment
- Stabilization of damaged public and private structures to facilitate certain rescue and/or protect public's health and safety.
- Repair and restoration of damaged public systems (e.g., water, wastewater, and stormwater systems)
- Coordination with utility restoration operations (power, gas, and telecommunications)
- Prioritization of efforts to restore, repair, and mitigate infrastructure owned by the City and County

Currently, the City's Public Works Department consists of a Public Works Director who manages public works activities and staff, including a water treatment plant operator. The Public Works Department can be

contacted by phone at 541-336-2247 extension 2070, including during nonbusiness hours and in the event of emergencies. A contact list of personnel is also located at [placeholder – will be added].

5.5 Short-term and Long-term Replacement Potable Water Supplies

5.5.1 Short-term Actions

The City has two water sources that are used during different seasons, as described previously. Depending on the time of year when an emergency occurs and the current water quality conditions in the source not being used, the City may be able to temporarily switch to the alternate source if supply is reduced or unavailable. The City's Water Curtailment Plan outlines further proactive measures that the City will take to reduce demand in response to the reduction or loss of water supply. The Water Curtailment Plan is a required component in the City's Water Management Conservation Plan (WMCP). The Water Curtailment Plan consists of four stages of water curtailment to be invoked in the event of a water supply shortage. These stages could be initiated and implemented in progressive steps, or a later stage could be implemented directly. For each stage of water curtailment, it identifies the conditions or events triggering the stage of curtailment and the measures that the City will implement in response.

Stages 1 through 3 describe water use restrictions and/or prohibitions aimed at reducing water demand and conserving water. Stage 4 of water curtailment, the most severe phase, describes how the City will proceed in the event that: maximum daily production of the WTP does not meet daily demand and water storage reservoirs fall to 50 percent of capacity; major damage to the water system occurs due to a natural disaster, fire, or criminal act; failure of a critical part of the water system or facility occurs; and/or major contamination of the water supply occurs, including, for example, a contamination event precluding the use of the Siletz River for a prolonged period of time during the peak demand season (from page 4-4 – 4-5 of WMCP). If the City has a short-term loss of water supply lasting a few hours to a few days, the City will depend on its reservoirs.

5.5.2 Long-term Actions

Depending on the water supply emergency, the City may need to switch between its water sources or construct new infrastructure to supply drinking water. Short-term replacement actions would need to continue until long-term actions restore the City's drinking water supply.

5.6 Short-term and Long-term Conservation Measures

The City's Water Curtailment Plan describes water conservation measures required under the different phases of water curtailment (See Section 4 in WMCP).

Stage 1: Water Supply Shortage Warning

Under Stage 1, the City will ask customers to voluntarily decrease indoor and outdoor water use by 10 percent, as well as to postpone new plantings. Voluntary actions include, but are not limited to: reducing outdoor watering, postponing washing outdoor surfaces, and looking for and fixing any indoor leaks.

Stage 2: Moderate Water Supply Shortage

Under Stage 2, the City will ask customers to take one or more of the following voluntary actions to curtail water use: cease washing vehicles at home, cease washing outdoor surfaces, cease filling swimming pools, cease using water to maintain water features, reduce indoor water use by fixing indoor leaks, reduce non-essential water use in commercial/industrial establishments.

The City may inform customers of the following mandatory action to curtail water use: restrict watering lawns, ornamental/landscaping plants, and vegetable gardens to 3 days per week and only before 9 am or after 9 pm.

Stage 3: Severe Water Supply Shortage

Under Stage 3, voluntary water use reduction actions in Stage 2 will become mandatory and the City will implement additional mandatory water use reductions. The City will require that customers implement one or more of the following mandatory actions to curtail water use: no watering of lawns, but customers may hand irrigate ornamental/landscaping plants and vegetables before 9am or after 9pm; no planting of new lawns; cease washing vehicles at home; cease washing outdoor surfaces; cease filling swimming pools; cease using water to maintain water features, except those supporting fish life; cease non-essential water use in commercial/industrial establishments; cease allowing water to run to waste in any gutter or drain

The City will limit hydrant and water main flushing to emergencies under Stage 3.

Stage 4: Critical Water Supply Shortage

Under Stage 4, the City will require that customers implement one or more of the following mandatory actions: restrict indoor water use to only water uses essential for public health and safety; cease outdoor watering; cease water use in commercial/industrial establishments except for critical functions, such as fire protection.

5.7 Plan Testing, Review, and Update

To stay coordinated with the City's EOP, this Contingency Plan will be reviewed and updated when changes to emergency operations occur, which happens when a new senior elected or appointed official takes office or at a minimum of every five years to comply with State requirements.

5.8 Personnel Training

Personnel training is outlined in Section 6.2 in the City of Toledo's Emergency Operations Plan. This section outlines training essential response staff and supporting personnel to incorporate Incident Command System (ICS)/ National Incident Management System (NIMS) concepts in all facets of an emergency.

The City's Emergency Management Coordinator organizes training for City personnel and encourages them to participate in training sessions hosted by other agencies, organizations, and jurisdictions throughout the region. Current training and operational requirements set forth under NIMS have been adopted and implemented by the City. The Emergency Management Coordinator maintains records and lists of training received by City personnel (See Section 6.2 in EOP).

The City's training program includes conducting exercises annually to test and evaluate the Emergency Operations Plan. The City coordinates with agencies to conduct joint exercises that include a variety of tabletop exercises, drills, functional exercises, and full-scale exercises. The Emergency Management Coordinator will work with other City/County departments and agencies to identify and implement corrective actions and mitigation measures, based on exercises conducted through Emergency Management. Additionally, the Emergency Management Coordinator will conduct a review with exercise participants after each exercise. Reviews and reporting will also be facilitated after an actual disaster, which will include all agencies involved in the emergency response. The review following an actual incident will describe actions taken, identify equipment shortcomings and strengths, and recommend ways to improve operational readiness (See Section 6.4 in EOP).

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5.9 Public Education

The City educates the public about threats, disasters, and what to do when an emergency occurs. The City maintains an active community preparedness program and recognizes that citizen preparedness and education are essential components of the City's overall readiness (See Section 6.5 in EOP). This information is housed in the Emergency Preparedness section of the City's website at <https://www.cityoftoledo.org/community/page/emergency-preparedness-0>. Information provided on the website includes resources for building an emergency preparedness kit, materials for preparing homes for fires, electrical and other related hazards, and materials to help prepare for the Cascadia Earthquake. The City also communicates with water customers via billing messages and other public outreach efforts.

5.10 Logistical and Financial Resources

Funding and maintaining this Contingency Plan along with an EMO are priorities for the City as they ensure the City's ability to respond to and recover from disasters that (Section 6.6 in EMO). In accordance with the Emergency Operations Plan, the Emergency Manager will work with City Council and community stakeholders to:

- Identify funding sources for emergency management programs, personnel, and equipment.
- Ensure that Council is informed of progress toward building emergency response and recovery capabilities and is aware of gaps to be addressed.
- Leverage partnerships with local, regional, and State partners to maximize use of scarce resources.

Resource requests and emergency/disaster declarations must be submitted by the Emergency Management Director to the County Emergency Manager according to provisions outlined under ORS Chapter 401 (See Section 1.9.1 in the EMO). Assistance from the State and Federal Emergency Management Agency (FEMA) may be available to the City (See Section 1.74 and 1.75 in the EMO). The State evaluates resource requests based on the goals and priorities established by the OEM Director. If the capabilities of the State are not sufficient to meet the requirements as determined by the Governor, federal assistance may be requested. FEMA provides resources, coordination, planning, training, and funding to support State and local jurisdictions when requested by the Governor.

In the case of fire emergencies, the City of Toledo Fire Chief and County Fire Defense Board Chief can contact the State Fire Marshall to mobilize and fund resources (See Section 1.9.1 in the EMO).

If an incident in the City requires major redirection of City fiscal resources, the City Council has authority to adjust budgets and funding priorities (See Section 1.9.2 in EMO).

SECTION 6: Future Water Sources

Drinking water protection planning can be used to identify areas that should be protected now so that they will provide high quality drinking water in the future, if the entity preparing the DWPP anticipates developing additional sources of water supply. The City currently has sufficient water rights for use of water from the Siletz River and the Mill Creek watershed, and does not have any plans to seek additional water sources within the planning horizon of this DWPP. Specifically, the City has unused water rights capacity from two existing permits that authorize use of the Siletz River (up to 1.1 cfs under existing Permit S-9370 and up to 4 cfs under existing Permit S-44083), as described in the City's 2017 Water Management and Conservation Plan. In addition, water demand will likely decrease now that Seal Rock Water District has switched to Beaver Creek as its primary water source. However, Seal Rock Water District still relies on water from the City of Toledo as a backup water supply, such as in the event of a major Beaver Creek water infrastructure or water quality issue.

Currently, the need to plan for development of future water sources appears unnecessary. Nevertheless, implementing water conservation remains a critical, ongoing activity to help the City reduce water demand and prolong the City's ability to rely solely on its current water sources.