



State of Oregon  
Department of  
Environmental  
Quality

# National Pollutant Discharge Elimination System Permit Fact Sheet City of Garibaldi

**Final: October 10, 2024**

<b>Permittee</b>	City of Garibaldi Garibaldi Wastewater Treatment Plant 206 South 7 <sup>th</sup> Street Garibaldi, OR 97118
<b>Existing Permit Information</b>	File Number: 32087 Permit Number: 102609 EPA Reference Number: OR0020362 Category: Domestic Class: Minor Expiration Date: 9/30/2024
<b>Permittee Contact</b>	Nicholas Theoharis Public Works Lead 503-457-3075 P.O. Box 708 Garibaldi, OR 97118
<b>Receiving Water Information</b>	Receiving stream/NHD name: Tillamook Bay NHD Reach Code & % along reach: 17100203011280, 29.31% along reach USGS 12-digit HUC: 171002030800 OWRD Administrative Basin: North Coast ODEQ LLID & River Mile: 1239230455475, RM 0.59 Assessment Unit ID: OR_EB_1710020308_01_100298
<b>Proposed Action</b>	Permit Renewal Application Number: 948142 Date Application Received: 3/15/2024
<b>Permit Writer</b>	Olivia Stoken 971-867-1077 Date Prepared: 8/27/2024

# NPDES Permit Fact Sheet City of Garibaldi

## Table of Contents

<b>1. Introduction</b>	<b>4</b>
<b>2. Facility Description</b>	<b>4</b>
2.1 Wastewater Facility	4
2.2 Stormwater	8
2.3 Industrial Pretreatment	8
2.4 Wastewater Classification	8
<b>3. Schedule A: Effluent Limit Development</b>	<b>8</b>
3.1 Existing Effluent Limits	8
3.2 Technology-Based Effluent Limit Development	9
3.3 Water Quality-Based Effluent Limit Development	12
3.4 Antibacksliding	26
3.5 Antidegradation	26
3.6 Whole Effluent Toxicity	26
3.7 Groundwater	26
<b>4. Schedule A: Other Limitations</b>	<b>26</b>
4.1 Mixing Zone	26
4.2 Biosolids	27
<b>5. Schedule B: Monitoring and Reporting Requirements</b>	<b>27</b>
<b>6. Schedule C: Compliance Schedule</b>	<b>28</b>
<b>7. Schedule D: Special Conditions</b>	<b>28</b>
7.1 Inflow and Infiltration	28
7.2 Emergency Response and Public Notification Plan	28
7.3 Exempt Wastewater Reuse at the Treatment System	28
7.4 Biosolids Management Plan	28
7.5 Wastewater Solids Transfers	29
7.6 Hauled Waste Control Plan	29
7.7 Hauled Waste Annual Report	29
7.8 Operator Certification	29
7.9 Industrial User Survey	29
7.10 Outfall Inspection	29
<b>8. Schedule F: NPDES General Conditions</b>	<b>30</b>
<b>Appendix A: pH AU Memo</b>	<b>31</b>
<b>Appendix B: Temperature AU Memo</b>	<b>32</b>

<b>Appendix C: Temperature RPA.....</b>	<b>33</b>
<b>Appendix D: Thermal Plume RPA.....</b>	<b>34</b>
<b>Appendix E: Fecal Coliform Bacteria Limit Derivation .....</b>	<b>35</b>

## List of Tables

Table 2-1: List of Outfalls.....	8
Table 3-1: Existing Effluent Limits .....	9
Table 3-2: Comparison of TBELs for Federal Secondary Treatment Standards and Oregon Basin-Specific Design Criteria.....	10
Table 3-3: Design Flows and Concentrations Limits .....	11
Table 3-4: BOD <sub>5</sub> and TSS Technology Based Effluent Limits .....	11
Table 3-5: 303(d) and TMDL Parameters .....	12
Table 3-6: Applicable WLAs.....	13
Table 3-7: Domestic Toxic Pollutants of Concern .....	14
Table 3-8: Pollutants of Concern .....	15
Table 3-9: Dilutions for Outfall 001 .....	16
Table 3-10: pH Reasonable Potential Analysis .....	17
Table 3-11: Temperature Criteria Information .....	18
Table 3-12: Temperature Criterion Effluent Limits.....	18
Table 3-13: Thermal Plume Effluent Limit .....	20
Table 3-14: Proposed Enterococcus Limits .....	20
Table 3-15: Proposed Fecal Coliform Limits .....	21
Table 3-16: Proposed Chlorine Limits.....	22
Table 3-17: Ammonia Analysis Information - Summer .....	24
Table 3-18: Ammonia Analysis Information - Winter .....	25

## List of Figures

Figure 2-1: Facility Location .....	6
Figure 2-2: Line Drawing of Wastewater Treatment.....	7
Figure 3-1: Fecal Coliform Monitoring Data vs Proposed Limits.....	21
Figure 3-2: Chlorine Monitoring Data vs Proposed Limits .....	23

# NPDES Permit Renewal Fact Sheet

## City of Garibaldi

### 1. Introduction

As required by Oregon Administrative Rule 340-045-0035, this fact sheet describes the basis and methodology used in developing the permit. The permit is divided into several sections:

- Schedule A – Waste discharge limitations
- Schedule B – Minimum monitoring and report requirements
- Schedule C – Compliance conditions and schedules
- Schedule D – Special conditions
- Schedule E – Pretreatment conditions
- Schedule F – General conditions

Below is a summary of the major changes to the permit:

#### Schedule A:

- More stringent final total residual chlorine effluent limits have been added in Table A1.
- The total residual chlorine limits from the previous permit have been retained as interim limits in Table A1.

#### Schedule B:

- Influent and effluent monitoring requirements in Tables B2 and B3 have been updated to meet current monitoring matrix requirements, except BOD<sub>5</sub> and TSS which have been updated based on a monitoring reduction request analysis.
- Receiving water body monitoring in Tillamook Bay has been added in Table B4.

#### Schedule C:

- A compliance schedule for total residual chlorine has been added in Table C1.

#### Schedule D:

- Special conditions added to proposed permit include 7.7 Hauled Waste Annual Report and 7.10 Outfall Inspection. Special conditions removed from the previous permit include 8. Spill/Emergency Response Plan.

## 2. Facility Description

### 2.1 Wastewater Facility

The Garibaldi wastewater treatment plant (WWTP), originally built in the 1940's and 50's, consisted of an Imhoff tank with sludge drying beds. In 1972, the WWTP was upgraded to a complete mix activated sludge plant to provide secondary treatment. The most recent upgrades to the facility occurred in 2004. The current treatment system includes a headworks with a mechanical screen and grit removal chamber, two sequencing batch reactors (SBRs), two

chlorine contact chambers, and a chemical feed system that supplies sodium hypochlorite for disinfection, sodium bisulfate for dechlorination, and ammonia as necessary to maintain chlorine residual. The facility design average dry weather flow is 0.36 million gallons per day (mgd) and the design average wet weather flow is 0.55 mgd. The peak dry weather flow design capacity is 0.88 mgd.

Wastewater from the collection system is measured with an influent flow meter located on the ground floor of the treatment plant building. From here, wastewater is piped to the upper deck of the treatment plant and sampled. Wastewater is then mixed with the water from the treatment plant's drain and recycled wastewater from Pump Station #2. A mechanical fine screen (with a backup manual bar screen) follows prior to routing of wastewater to a grit removal chamber. A splitter box then divides flow between two SBR tanks where secondary (biological) treatment occurs. The SBR process is a time-based process consisting of an aeration phase, settling phase, and decant phase. The facility SBRs are different from conventional SBRs in that they have continuous inflow of wastewater into the treatment basins during all phases of the cycle. The air to the SBRs is supplied to one reactor at a time by one of two available blowers (one blower supplies the air while the other is on standby). During the settling phase, aeration is stopped to allow the solids to settle to the bottom of the basin. The decanter (normally operated at 4-hour intervals) draws off the clear layer of treated wastewater that forms near the surface during the settling phase. To guide pacing of chemical feeds, the flow rate of decanted wastewater is then measured via a meter at the north end of the SBR tanks. Sodium hypochlorite is fed to wastewater prior to a flash mixer located at the chlorine contact chambers and an emergency chlorine injection point is located upstream of the mixer. Following the chlorine contact chambers, the effluent is dechlorinated using sodium bisulfate.

The treated effluent is then sampled and discharged to Tillamook Bay via Outfall 001 located adjacent to Lumberman's Dock approximately 0.5 miles from the mouth of the bay. The outfall, which extends approximately 61 feet into Tillamook Bay at an approximate depth of 8 feet below the water, consists of a 12-inch diameter pipe and a 2-port diffuser with 10-inch Tideflex valves.

Each of the SBRs has its own submersible waste activated sludge pump. Sludge produced in the SBR process is pumped to four aerobic digester tanks for aerobic digestion. Liquid from the aerobic digestion process is pumped back to the treatment plant's headworks through Pump Station #2. Aerobically digested sludge that meets Class B biosolids requirements is pumped directly from the aerobic digester tanks for loading and subsequent land application.

Biosolids are currently land applied as a beneficial soil amendment on four farm fields in Tillamook County (approximately 52 acres). About 13 dry tons/year of biosolids are land applied across these fields at agronomic rates to grow pasture grasses.



**Figure 2-1: Facility Location**

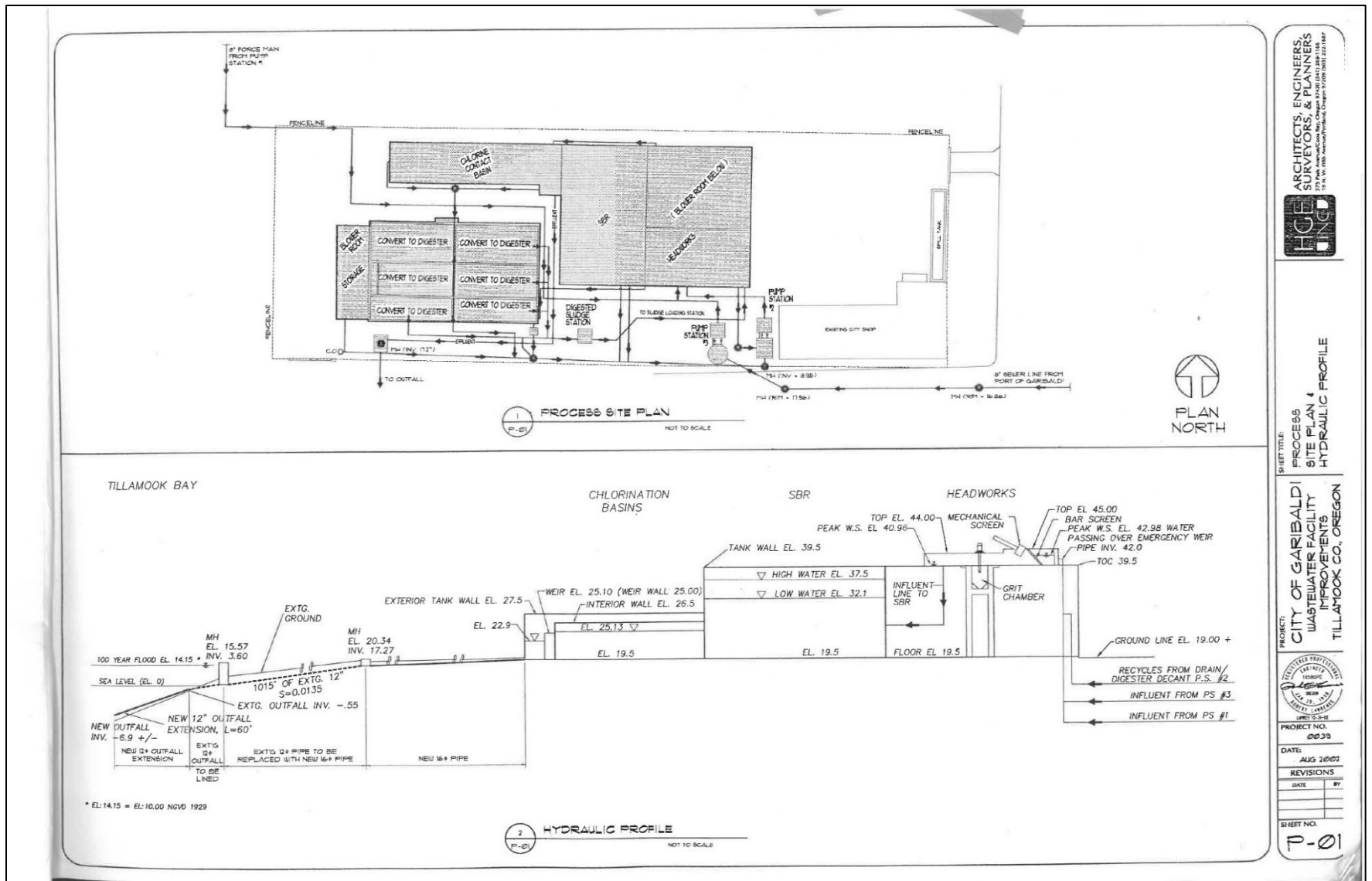


Figure 2-2: Line Drawing of Wastewater Treatment

**Table 2-1: List of Outfalls**

<b>Outfall Number</b>	<b>Type of Waste</b>	<b>Lat/Long</b>
001	Domestic wastewater	45.553967, -123.916345 (WGS 84)

## **2.2 Stormwater**

Stormwater is not addressed in this permit. A 1200-Z Industrial Stormwater permit not required for facilities with a design flow of less than 1 MGD.

## **2.3 Industrial Pretreatment**

The permittee does not have a DEQ-approved industrial pretreatment program. Based on current information, no industrial pretreatment program is needed. Schedule D of the proposed permit requires the permittee to perform an industrial user survey.

## **2.4 Wastewater Classification**

OAR 340-049 requires all permitted municipal wastewater collection and treatment facilities receive a classification based on the size and complexity of the systems. DEQ evaluated the classifications for the treatment and collection system, which are publicly available at: <https://www.deq.state.or.us/wq/opcert/Docs/OpcertReport.pdf>.

# **3. Schedule A: Effluent Limit Development**

Effluent limits serve as the primary mechanism in NPDES permits for controlling discharges of pollutants to receiving waters. Effluent limitations can be based on either the technology available to control the pollutants or limits that are protecting the water quality standards for the receiving water. DEQ refers to these two types of permit limits as technology-based effluent limitations (TBELs) and water quality-based effluent limits (WQBELs) respectively. When a TBEL is not restrictive enough to protect the receiving stream, DEQ must include a WQBEL in the permit.

## **3.1 Existing Effluent Limits**

The table below shows the limits contained in the existing permit.

**Table 3-1: Existing Effluent Limits**

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
BOD <sub>5</sub> (May 1 - October 31)	mg/L	20	30	-
	lb/day	60	90	120
	% removal	85	-	-
TSS (May 1 - October 31)	mg/L	20	30	-
	lb/day	60	90	120
	% removal	85	-	-
BOD <sub>5</sub> (November 1 - April 30)	mg/L	30	45	-
	lb/day	90	140	180
	% removal	85	-	-
TSS (November 1 - April 30)	mg/L	30	45	-
	lb/day	90	140	180
	% removal	85	-	-
Chlorine, Total Residual	mg/L	0.06	-	0.26
pH	SU	Instantaneous limit between a daily minimum of 6.0 and a daily maximum of 9.0		
Fecal Coliform Bacteria	#/100 mL	Must not exceed a monthly geometric mean of 42. No more than 10% of samples may exceed 129.		
Enterococcus Bacteria	#/100 mL	Monthly geometric mean must not exceed 35. No more than 10% of samples may exceed 130.		

### 3.2 Technology-Based Effluent Limit Development

40 CFR 122.44(a)(1) requires publicly owned treatment works (POTW) to meet technology-based effluent limits, for five-day biochemical oxygen demand (BOD<sub>5</sub>), total suspended solids (TSS) and pH (i.e., federal secondary treatment standards). Substitution of 5-day carbonaceous oxygen demand (CBOD<sub>5</sub>) for BOD<sub>5</sub> is allowed. The numeric standards for these pollutants are contained in 40 CFR 133.102. In addition, DEQ has developed minimum design criteria for BOD<sub>5</sub> and TSS that apply to specific watershed basins in Oregon. These are listed in the basin-specific criteria sections under OAR 340-041-0101 to 0350. During the summer low flow months as defined by OAR, these design criteria are more stringent than the federal secondary treatment standards. The basin-specific criteria are not effluent limits but are implemented as design criteria for new or expanded wastewater treatment plants. The table below shows a comparison of the federal secondary treatment standards and the basin-specific design criteria for the North Coast basin.

**Table 3-2: Comparison of TBELs for Federal Secondary Treatment Standards and Oregon Basin-Specific Design Criteria**

Parameter	Federal Secondary Treatment Standards		North Coast Basin-Specific Design Criteria (OAR 340-041-0235)
	30-Day Average	7-Day Average	Monthly Average
BOD <sub>5</sub> (mg/L)	30	45	Low Stream Flow (approximately April 1 - October 31): Monthly average effluent concentrations of 20 mg/L – BOD and TSS  High Stream Flow (approximately November 1 -April 30): Minimum of secondary treatment or equivalent control
TSS (mg/L)	30	45	
pH (S.U.)	6.0 – 9.0. (instantaneous)		Not applicable
BOD <sub>5</sub> and TSS % Removal	85%	Not applicable	Not applicable

The limits for BOD<sub>5</sub> and TSS shown in the table above are concentration-based limits. Mass-based limits are required in addition to the concentration-based limits per OAR 340-041-0061(9). For any new facility or any facility that has expanded its dry weather treatment capacity after June 30, 1992, OAR 340-041-0061(9)(b) requires that the mass load limits be calculated based on the proposed treatment facility capabilities and the highest and best practicable treatment to minimize the discharge of pollutants. The permittee’s facility has been engineered to achieve BOD<sub>5</sub> and TSS monthly average concentrations of 20 mg/L during the dry weather season and 30 mg/L during the wet weather season. For this permit, DEQ uses the average dry weather design flow to calculate the mass load limits as shown below for the dry and wet weather seasons.

$$\text{Monthly Avg Mass Load} = \text{Design Flow}^* \times \text{Monthly Concentration Limit} \times \text{Unit Conversion factor}$$

$$\text{Weekly Average Mass Load} = 1.5 \times \text{Monthly Average Mass Load Limit}$$

$$\text{Daily Maximum Mass Load} = 2 \times \text{Monthly Average Mass Load Limit}$$

\* Design flow is the design average dry weather flow (DADWF)

The following table lists the effluent flows and concentration limits used for the calculations.

**Table 3-3: Design Flows and Concentrations Limits**

Season	Design Flow (mgd)	Monthly TSS Concentration Limit (mg/L)	Monthly BOD <sub>5</sub> Concentration Limit (mg/L)
Dry Weather	0.36	20	20
Wet Weather	0.36	30	30
Design flow comments: Design average dry weather flow (DADWF)			

Dry Weather Mass Load Calculations:

Monthly Average:  $0.36 \text{ mgd} \times 20 \text{ mg/L} \times 8.34 = 60 \text{ lbs/day}$  (two significant figures)

Weekly Average:  $60 \text{ lbs/day monthly average} \times 1.5 = 90 \text{ lbs/day}$

Daily Maximum:  $60 \text{ lbs/day monthly average} \times 2 = 120 \text{ lbs/day}$

Wet Weather Mass Load Calculations:

Monthly Average:  $0.36 \text{ mgd} \times 30 \text{ mg/L} \times 8.34 = 90 \text{ lbs/day}$  (two significant figures)

Weekly Average:  $90 \text{ lbs/day monthly average} \times 1.5 = 135 \text{ lbs/day}$  becomes  $140 \text{ lbs/day}$  when rounded to two significant figures

Daily Maximum:  $90 \text{ lbs/day monthly average} \times 2 = 180 \text{ lbs/day}$

The proposed BOD<sub>5</sub> and TSS limits are listed in the following table.

**Table 3-4: BOD<sub>5</sub> and TSS Technology Based Effluent Limits**

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
BOD <sub>5</sub> (May 1 – Oct. 31)	mg/L	20	30	-
	lbs/day	60	90	120
	% removal	85	85	-
TSS (May 1 – Oct 31)	mg/L	20	30	-
	lbs/day	60	90	120
	% removal	85	85	-
BOD <sub>5</sub> (Nov. 1 – April 30)	mg/L	30	45	-
	lbs/day	90	140	180
	% removal	85	85	-

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
TSS (Nov. 1 – April 30)	mg/L	30	45	-
	lbs/day	90	140	180
	% removal	85	85	-

### 3.3 Water Quality-Based Effluent Limit Development

40 CFR 122.44(d) requires that permits include limitations more stringent than technology-based requirements where necessary to meet water quality standards. Water quality-based effluent limits may be in the form of a wasteload allocation required as part of a Total Maximum Daily Load (TMDL). They may also be required if a site-specific analysis indicates the discharge has the reasonable potential to cause or contribute to an exceedance of a water quality criterion. DEQ establishes effluent limits for pollutants that have a reasonable potential to exceed a criterion. The analyses are discussed below.

#### 3.3.1 Designated Beneficial Uses

NPDES permits issued by DEQ must protect the following designated beneficial uses of Tillamook Bay. These uses are listed in OAR-340-041-0230 for the North Coast.

- Industrial water supply
- Fish and aquatic life (including salmonid rearing and migration)
- Wildlife and hunting
- Fishing
- Boating
- Water contact recreation
- Aesthetic quality
- Commercial navigation and transportation

#### 3.3.2 303(d) Listed Parameters and Total Maximum Daily Loads

The following table lists the parameters that are on the 2022 303(d) list (Category 5) within the discharge's water body. The table also lists any parameters with a TMDL wasteload allocation assigned to the facility (Category 4).

**Table 3-5: 303(d) and TMDL Parameters**

Water Quality Limited Parameters (Category 5)	
AU ID:	OR_EB_1710020308_01_100298
AU Name:	Tillamook Bay
AU Status:	Impaired
Year Listed	2002
Year Last Assessed	2022
303d Parameters (Category 5)	pH*, Enterococci, Arsenic – Inorganic

<b>TMDL Parameters (Category 4)</b>
E. Coli, Fecal Coliform, Temperature**

\*Assessment Unit ID OR\_EB\_1710020308\_01\_100298 – Tillamook Bay was incorrectly listed as impaired for pH in the 2022 Integrated Report. DEQ will be pursuing delisting for this AU for pH in the 2024 Integrated Report cycle with a delisting reason of “Applicable WQS attained; original basis for listing was incorrect”. The 2022 pH 303(d) listing will not apply to NPDES permit renewals for facilities that discharge into this AU. See Appendix A for more information.

\*\*Assessment Unit ID OR\_EB\_1710020308\_01\_100298 – Tillamook Bay was incorrectly listed as impaired for temperature in the 2018/2020 and 2022 Integrated Reports. DEQ will be pursuing delisting for this AU for temperature in the 2024 Integrated Report cycle with a delisting reason of “Applicable WQS attained; original basis for listing was incorrect”. The 2022 temperature 303(d) listing will not apply to NPDES permit renewals for facilities that discharge into this AU. See Appendix B for more information.

DEQ has not developed TMDLs for enterococci or arsenic in Tillamook Bay. The enterococci and arsenic listings are addressed in sections 3.3.9 and 3.3.10, respectively.

### 3.3.3 TMDL Wasteload Allocations

DEQ issued a TMDL for the Tillamook Bay Watershed in 2001. Primary parameters of concern in the 2001 TMDL were temperature and bacteria. WLAs from this TMDL that are applicable to the permittees are listed in the following table.

**Table 3-6: Applicable WLAs**

<b>Parameter</b>	<b>WLA</b>	<b>Time Period</b>
Bacteria (Fecal Coliform)	Must not exceed a monthly geometric mean of 42 organisms per 100 mL. No more than 10 percent of the samples may exceed 129 organisms per 100 mL.	Year round

The fecal coliform WLA is discussed in section 3.3.9. Tillamook Bay was not water quality limited for temperature in 2001, so a WLA was not developed for Garibaldi WWTP.

### 3.3.4 Ocean Discharge Findings

Federal rules (40 CFR §125.120 – 40 CFR §125.124) require that a discharge into territorial seas that is to be permitted under the NPDES program be evaluated as to whether the discharge will cause unreasonable degradation of the marine environment. Goals 6 and 19 of Oregon’s Statewide Planning Goals and Guidelines and Oregon’s Territorial Seas Plan require that the State’s marine resources be conserved. DEQ believes that the intent of these criteria is to reduce or prevent the discharge of those persistent pollutants that bio-accumulate in the marine food chain. Pollutants found in sewage that are amenable to treatment by typical wastewater treatment facilities include Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), pH, bacteria, nutrients, and potentially toxic substances, such as chlorine, which is used for disinfection of pathogenic organisms. BOD, TSS, and pH are not discrete substances that can accumulate in living organisms. BOD is a measure of the oxygen used by microorganisms when

they break down organic matter. TSS is a measure of organic and inorganic solid materials that are suspended in the water column, and pH is a measure of the amount of hydrogen ions in solution.

Residual chlorine in treated wastewater, if any, immediately reacts with bromide naturally present in seawater to produce other oxidants that are toxic to living organisms. These other oxidants are referred to as chlorine produced oxidants. Chlorine, which is still present in the reaction products, is too reactive to be bioavailable from soil, water, or other environmental media and too reactive to bio-accumulate in the food chain. Bacteria do not bio-accumulate in other living organisms. Nutrients, (e.g., nitrogen and phosphorus), can have deleterious effects on the marine environment by stimulating algal blooms. These algal blooms have the potential to cause turbidity problems and fluctuations in dissolved oxygen and pH. However, nutrients do not bio-accumulate in the tissues of living organisms and do not bio-magnify in the trophic levels of marine food chains.

DEQ has concluded that the discharge from Garibaldi wastewater treatment plant will not cause unreasonable degradation of the marine environment.

### 3.3.5 Pollutants of Concern

To ensure that a permit is protecting water quality, DEQ must identify pollutants of concern. These are pollutants that are expected to be present in the effluent at concentrations that could adversely impact water quality. DEQ uses the following information to identify pollutants of concern:

- Effluent monitoring data.
- Knowledge about the permittee’s processes.
- Knowledge about the receiving stream water quality.
- Pollutants identified by applicable federal effluent limitation guidelines.

Based on EPA’s NPDES permit application requirements, toxic pollutants of concern for domestic facilities are listed in the following table.

**Table 3-7: Domestic Toxic Pollutants of Concern**

Flow Rate	Pollutants
< 0.1 mgd	Total Residual Chlorine
≥ 0.1 mgd and < 1.0 mgd	Total Residual Chlorine, Total Ammonia Nitrogen
≥ 1.0 mgd	Total Residual Chlorine, Total Ammonia Nitrogen, Metals, Volatile Organic Compounds, Acid Extractable Compounds, Base Neutral Compounds

DEQ identified the following pollutants of concern for this facility listed in the following table.

**Table 3-8: Pollutants of Concern**

Pollutant	How was pollutant identified?
pH	Effluent Monitoring
Temperature	Effluent Monitoring
Fecal Coliform	Effluent Monitoring
Enterococcus	Effluent Monitoring
Total Residual Chlorine	Effluent Monitoring
Total Ammonia Nitrogen	Application Requirement

The sections below discuss the analyses that were conducted for the pollutants of concern to determine if water quality based effluent limits are needed to meet water quality standards.

### 3.3.6 Regulatory Mixing Zone

The proposed permit contains a mixing zone as allowed per OAR 340-041-0053. The regulatory mixing zone from the existing permit is described as:

*The allowable mixing zone is that portion of Tillamook Bay within a 300-foot radius of the point of discharge. The zone of immediate dilution (ZID) is that portion of the allowable mixing zone within a 30-foot radius of the point of discharge.*

The proposed permit contains an updated regulatory mixing zone description which is described as follows. The description was updated to redefine the extent of the RMZ so that it did not extend onto land, and restricted the size so that the mixing zone did not overlap with the nearby heavily used crabbing dock.

*The Regulatory Mixing Zone (RMZ) is that portion of Tillamook Bay 50 feet to the east and west of the diffuser and 30 feet to the north and south, centered on the diffuser mid-point. The Zone of Immediate Dilution (ZID) is a 5-foot radius from the diffuser mid-point.*

The dilution factors at the edge of the Regulatory Mixing Zone and Zone of Initial Dilution are shown in Table 3-9. A mixing zone memo documenting the development of these dilution values is in a May 21, 2024 Mixing Zone Memo which is part of the administrative record. For this memo, CORMIX 12.0.1.0 was used to model the path of the effluent plume at its discharge point in Tillamook Bay. Sensitive resources in the area including recreational shellfishing, commercial shellfishing, and salmonid habitat were mapped. A heavily used public crabbing dock lies 120 feet to the east of the outfall. The ZID and the RMZ were redefined so that the RMZ did not extend onto land and also so that recreational crabbers would not be fishing inside the RMZ boundary.

The outfall is located at 45.553967, -123.916345 (WGS84). The outfall coordinates were measured in 2009 by DEQ staff and confirmed by the operator of the facility at the time of this memo. The coordinates are for the center of the two diffusers. The outfall is a 12-inch pipe with two 10-inch Series 35 Duckbill Valves pointing east and west (opposing) and parallel to the expected current. At the time of design, the outfall was expected to be under 9 feet of water. At the date of the last outfall inspection in 2021, the outfall was at a depth of 1.5 feet at Mean Low Low Water (MLLW). Due to increases in facility flow and decreases in ambient depth, the available dilution in the ZID and RMZ decreased compared with the last permit renewal.

**Table 3-9: Dilutions for Outfall 001**

<b>Dilution Summary – Outfall 001 – Year-Round</b>						
<b>Water Quality Standard</b>	<b>Ambient Velocity (ft/s)</b>		<b>Effluent Flow (mgd)</b>		<b>Dilution Factor</b>	<b>Location</b>
	<b>Statistic</b>	<b>Velocity</b>	<b>Statistic</b>	<b>Flow</b>		
Aquatic Life, Acute	10 <sup>th</sup> percentile	0.8 m/s	<input type="checkbox"/> ADWDF x PF <input checked="" type="checkbox"/> Max Daily Avg <input type="checkbox"/> Other	1.624	1.92	ZID (5 ft)
Aquatic Life, Chronic	50 <sup>th</sup> percentile	1.39 m/s	<input type="checkbox"/> ADWDF <input checked="" type="checkbox"/> Max Monthly Avg <input type="checkbox"/> Other	0.65	32.3	RMZ (50 ft)
Human Health, Non-Carcinogen	50 <sup>th</sup> percentile	1.39 m/s	<input type="checkbox"/> ADWDF <input checked="" type="checkbox"/> Max Monthly Avg <input type="checkbox"/> Other	0.65	37.7	RMZ (50 ft)
Human Health, Carcinogen	50 <sup>th</sup> percentile	1.39 m/s	<input type="checkbox"/> Annual Avg Design <input checked="" type="checkbox"/> Annual Avg <input type="checkbox"/> Other	0.29	48.8	RMZ (50 ft)
<i>ADWDF = Average dry weather design flow</i> <i>PF = Peaking factor (1.5)</i>						
<b>Comments:</b> Outfall depth at Mean Low Low Water (MLLW) is 1.5 feet. Outfall depth at Mean Low Water (MLW) = 3.8 feet. ZID of 5 feet = 1.524 meters, RMZ of 50 feet = 15.24 meters.						

### 3.3.7 pH

The pH criterion for this basin is 6.5 – 8.5 per OAR 340-041-0235. DEQ determined there is no reasonable potential for the discharge to exceed the pH criterion at the edge of the mixing zone. The existing pH limits of 6.0 – 9.0 will be retained and are TBELs. The following provides a summary of the data used for the analysis.

**Table 3-10: pH Reasonable Potential Analysis**

<b>Input</b>	<b>Lower pH Criteria</b>	<b>Upper pH Criteria</b>
1. Discharge area characteristics		
a) Dilution at mixing zone boundary	32.3	32.3
b) Depth of discharge (m)	0.5	0.5
2. Upstream characteristics		
a) Temperature (°C)	15.0	9.1
b) pH	7.8	8.2
c) Alkalinity (mg CaCO <sub>3</sub> /L)	43.6	43.6
d) Salinity (psu)	32.6	32.6
3. Effluent characteristics		
a) Temperature (°C)	20.0	11.0
b) pH (S.U.)	6.0	9.0
c) Alkalinity (mg CaCO <sub>3</sub> /L)	69.6	69.6
d) Salinity (psu)	0.1	0.1
4. Applicable pH criteria		
<b>pH at mixing zone boundary</b>	<b>7.2</b>	<b>8.2</b>
<b>Is there reasonable potential?</b>	<b>No</b>	<b>No</b>
<b>Proposed effluent limits</b>	<b>6.0</b>	<b>9.0</b>
<b>Effluent data source:</b> DMRs - 11/2019-4/2024 A default effluent salinity value was used.		
<b>Ambient data source:</b> AWQMS: 5/18/2015 - 10/5/2021 from ORDEQ stations 13308, 38598 and 40793, EPA Garibaldi Station, and EPA National Aquatic Resources Survey Stations 10187 and 10205. Ambient salinity is the average salinity from stations and dates above.		

### 3.3.8 Temperature

#### 3.3.8.1 Temperature Criteria OAR 340-041-0028

The following table summarizes the temperature criteria that apply at the discharge location along with whether the receiving stream is water quality-limited for temperature and whether a TMDL wasteload allocation has been assigned. Using this information, DEQ performed several analyses to determine if effluent limits were needed to comply with the temperature criteria.

**Table 3-11: Temperature Criteria Information**

<b>Applicable Temperature Criterion</b>	Oceans & Bays (340-041-0028(7))
Applicable dates: Year-round	
<b>Salmon/Steelhead Spawning 13 °C?</b> OAR 340-041-0028(4)(a)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Applicable dates: NA	
<b>WQ-limited?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>TMDL wasteload allocation assigned?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Applicable dates: NA	
TMDL based on natural conditions criterion?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Cold water summer protection criterion applies?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Cold water spawning protection applies?</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Comments:	

DEQ conducted a temperature reasonable potential analysis (RPA) to determine if the effluent discharge has the reasonable potential to warm Tillamook Bay at the edge of the mixing zone by more than 0.3 °C above the natural condition. The effluent temperature value used in this analysis is 22 °C. This value was taken from the facility’s DMRs for the period from November 2019 to April 2024 and represents the maximum 7-day average of the daily maximum. The ambient temperature used in this analysis is 13 °C. This value was taken from monitoring stations close to Garibaldi’s outfall in ORDEQ’s Ambient Water Quality Monitoring System for the period from May 2015 to July 2020 and represents the average 7-day average of the daily maximum.

The result of this RPA indicates that there is no potential for the facility’s discharge to exceed the temperature standard. Based on these analyses, no temperature limit associated with the applicable temperature criteria is included in the proposed permit (Appendix C). Final effluent limits are listed in the following table.

**Table 3-12: Temperature Criterion Effluent Limits**

<b>Effluent limit needed?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>TMDL WLA Limit:</b> NA
Applicable time period: Dates <input checked="" type="checkbox"/> NA
<b>Temperature Criterion Limit:</b> NA
Applicable time period: Dates <input checked="" type="checkbox"/> NA
Comments: NA

### 3.3.8.2 Thermal Plume OAR 340-041-0053(2)(d)

In addition to compliance with the temperature criteria, OAR 340-041-0053(2)(d) contains thermal plume limitation provisions designed to prevent or minimize adverse effects to salmonids that may result from thermal plumes. The discharge was evaluated for compliance with these provisions as follows:

- OAR 340-041-0053(2)(d)(A): Impairment of an active salmonid spawning area where spawning redds are located or likely to be located. This adverse effect is prevented or minimized by limiting potential fish exposure to temperatures of 13°C or more for salmon and steelhead, and 9°C or more for bull trout.

Tillamook Bay is not designated as salmonid spawning habitat; therefore, the spawning area requirement is met.

- OAR 340-041-0053(2)(d)(B): Acute impairment or instantaneous lethality is prevented or minimized by limiting potential fish exposure to temperatures of 32°C or more to less than 2 seconds.

The maximum daily effluent temperature recorded between November 2019 and April 2024 was 22 °C, below the criterion of 32 °C. Therefore, the discharge is not expected to cause acute impairment to salmonid species.

- OAR 340-041-0053(2)(d)(C): Thermal shock caused by a sudden increase in water temperature is prevented or minimized by limiting potential fish exposure to temperatures of 25°C or more to less than 5% of the cross-section of 100% of the 7Q10 flow of the water body.

The maximum daily effluent temperature recorded between November 2019 and April 2024 was 22 °C. Since the maximum effluent temperature is below 25 °C, thermal shock caused by the discharge is prevented or minimized.

- OAR 340-041-0053(2)(d)(D): Unless ambient temperature is 21°C or greater, migration blockage is prevented or minimized by limiting potential fish exposure to temperatures of 21°C or more to less than 25% of the cross-section of 100% of the 7Q10 flow of the water body.

An analysis related to migration blockage, included in Appendix D, indicates that when the effluent plume reaches 25% of the receiving water body's cross-sectional area, the plume's temperature will not be above 21.0°C, and migration blockage caused by the discharge is therefore prevented or minimized.

**Table 3-13: Thermal Plume Effluent Limit**

<b>Effluent limit needed?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Calculated limit:</b> NA
<b>Applicable timeframe:</b> NA
Comments: NA

**3.3.9 Bacteria**

Enterococcus

OAR 340-041-0009(6)(a) requires discharges of bacteria into coastal waters meet a monthly geometric mean of 35 enterococcus organisms per 100 mL, with no more than 10 percent of samples exceeding 130 enterococcus organisms per 100 mL. The following table includes the proposed permit limits and apply year-round.

**Table 3-14: Proposed Enterococcus Limits**

<b>Enterococcus (#/100 ml)</b>	<b>Geometric Mean</b>	<b>No more than 10% exceed</b>
Existing Limit	35	140
Proposed Limit	35	130

Fecal Coliform

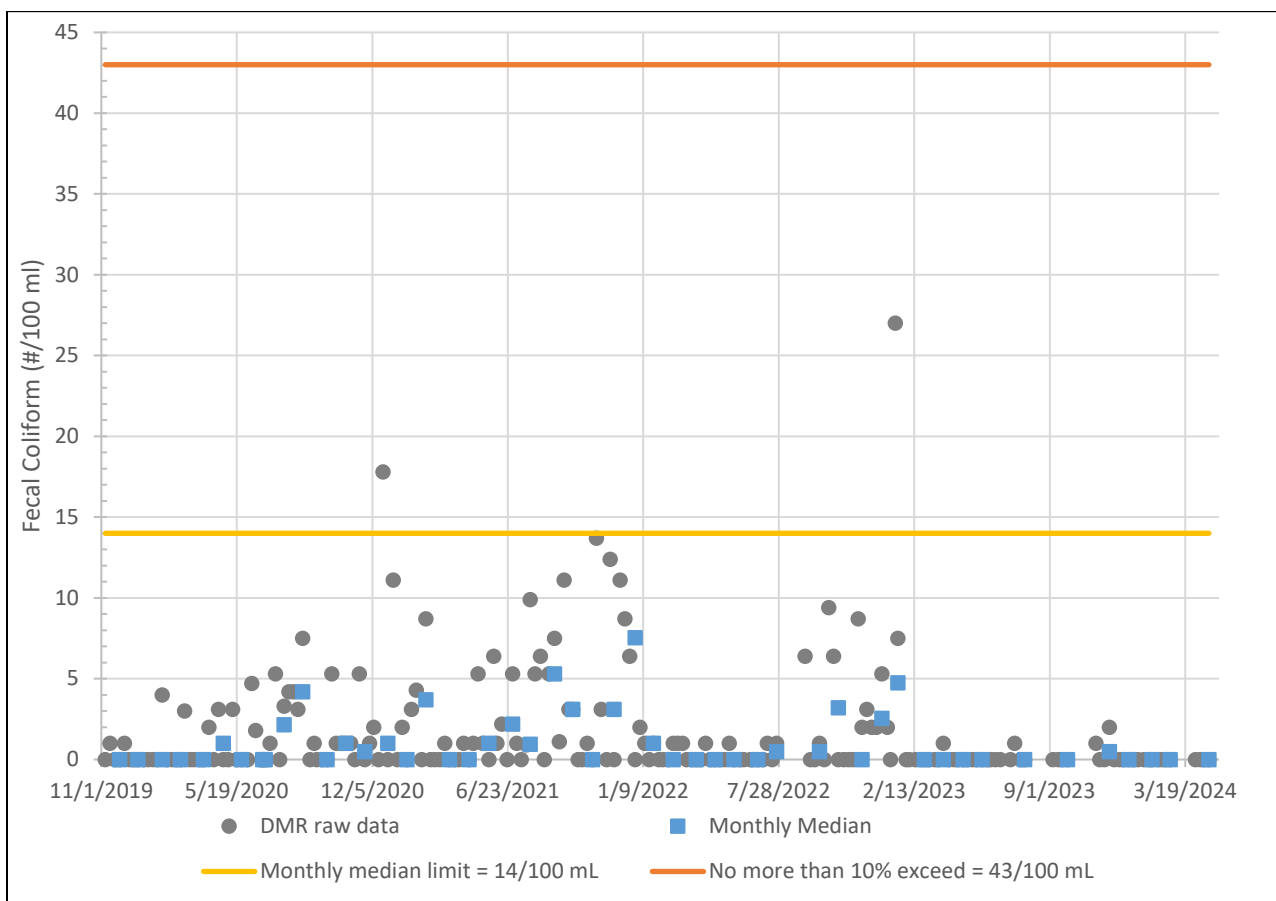
The current permit contains limits for fecal coliform based on the 2001 TMDL. This TMDL addressed the fecal coliform water quality standard that was in place at the time of TMDL development. The fecal coliform standard has since been updated, and now includes a figure (OAR 340-041-0230, Figure 230E) that delineates locations in Tillamook Bay shellfish harvesting where coastal contact recreation and shellfish harvesting are designated beneficial uses. The locations for the shellfish harvesting use differ from those considered under the TMDL. Because of this difference, the TMDL wasteload allocation cannot be solely relied on to ensure compliance with the fecal coliform criteria at the designated shellfish harvesting location.

DEQ conducted a new analysis and determined that more stringent fecal coliform limits are required to ensure compliance with the fecal coliform water quality criteria (see Appendix E). The limits for fecal coliform are year-round and are included in the table below. The statistics used for limit compliance have changed to align with the applicable rule.

**Table 3-15: Proposed Fecal Coliform Limits**

Discharge Period	Fecal Coliform (#/100 ml)	
	Monthly Median	Not More than 10% of the Samples May Exceed
May 1 – October 31	14	43
November 1 – April 30	14	43

Fecal coliform discharge monitoring data between November 2019 and April 2024 were compared against proposed limits in the figure below.



**Figure 3-1: Fecal Coliform Monitoring Data vs Proposed Limits**

From November 2019 to April 2024, the maximum daily fecal coliform concentration was 27 cells/100 mL, while the maximum median monthly concentration was 7.6 cells/100 mL. Therefore, the permittee is expected to be able to meet the limits upon issuance.

### 3.3.10 Toxic Pollutants

DEQ typically performs the reasonable potential analysis for toxics according to EPA guidance provided in the Technical Support Document for Water Quality-Based Toxics Control (TSD) (Office of Water Enforcement and Permits, U.S. EPA, March 1991). The factors incorporated into this analysis include:

1. Effluent concentrations and variability
2. Water quality criteria for aquatic life and human health
3. Receiving water concentrations
4. Receiving water dilution (if applicable)

DEQ performs these analyses using spreadsheets that incorporate EPA’s statistical methodology. The following sections describe the analyses for various toxic pollutants below.

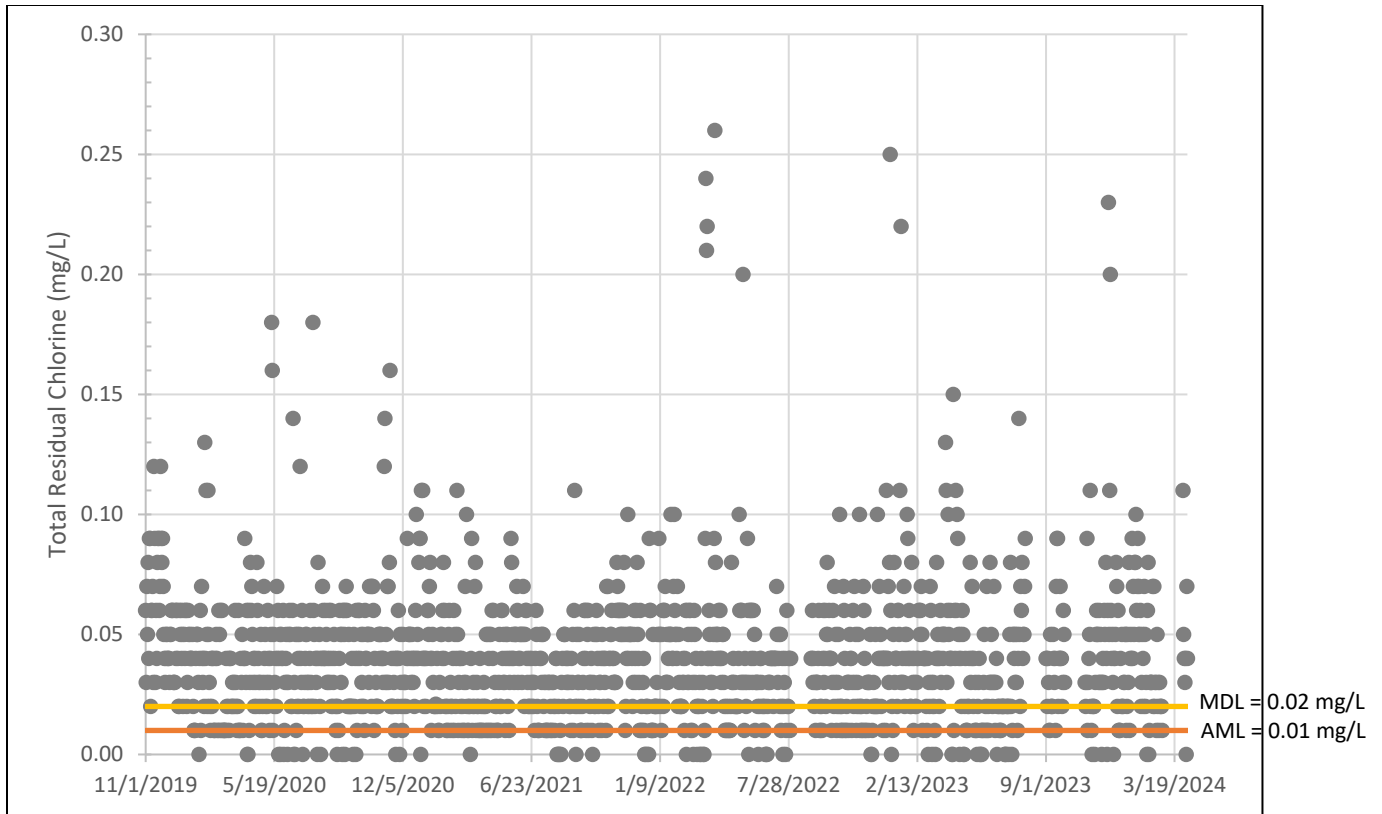
#### 3.3.10.1 Total Residual Chlorine

The existing permit contains chlorine limits. New chlorine limits were calculated based on updated information. The newly calculated limits are more stringent than the existing limits, so the new limits are being proposed. Proposed limits are listed in the following table.

**Table 3-16: Proposed Chlorine Limits**

	<b>Chronic (mg/L)</b>	<b>Acute (mg/L)</b>
<b>Chlorine Criteria</b>	0.0075	0.013
	<b>Average Monthly Limit (mg/L)</b>	<b>Maximum Daily Limit (mg/L)</b>
<b>Existing Limit</b>	0.06	0.26
Calculated Limit	0.01	0.02
<b>Proposed Limit</b>	<b>0.01</b>	<b>0.02</b>
Effluent data source: Previous maximum daily chlorine limit		
Receiving water data source: Assumed to be zero		

Chlorine discharge monitoring data between November 2019 and April 2024 were compared against proposed limits in the figure below.



**Figure 3-2: Chlorine Monitoring Data vs Proposed Limits**

The proposed limits are outside of the range currently achieved by the facility. A compliance schedule has been added to the proposed permit (see Schedule C of Fact Sheet and Permit). The current limits will be kept as interim limits until the compliance schedule is complete.

**3.3.10.2 Total Ammonia Nitrogen**

DEQ’s ammonia criteria vary with changes in pH and temperature. DEQ performed a reasonable potential analysis that accounts for changes in the effluent and receiving water pH and temperature to determine the appropriate ammonia criteria.

An ammonia reasonable potential analysis was performed for summer (May 1 – October 31) and winter (November 1 – April 30). The results of the analyses show that there was no reasonable potential to exceed water quality at the edge of the ZID or the RMZ. As a result, no effluent limits are included in the proposed permit.

The following table provides a summary of the data used for the ammonia analysis and the results of the analysis.

**Table 3-17: Ammonia Analysis Information - Summer**

	Acute	Chronic	
		4-day	30-day
Dilution	1.92	32.3	37.7
Ammonia Criteria	20.5	0.9	-
<b>Effluent Data Used</b>			
Ammonia (mg/L)	7.0	7.0	
pH (SU)	6.9	6.9	
Temperature (°C)	22.0	22.0	
Alkalinity (mg/L CaCO <sub>3</sub> )	34.5	34.5	
<b>Receiving Water Body Data Used</b>			
Ammonia (mg/L)	0.1	0.1	
pH (SU)	8.2	8.2	
Temperature (°C)	16.1	16.1	
Alkalinity (mg/L CaCO <sub>3</sub> )	108.0	108.0	
<b>Ammonia Limit Needed?</b>	<b>No</b>		
<b>Calculated Limits</b>	<b>AML</b>	<b>MDL</b>	
Ammonia (mg/L)	NA	NA	
<b>Effluent data source</b>			
ICIS DMR statistics: 11/2019 – 4/2024 A default effluent salinity value of 0.1 ppt was used.			
<b>Ambient data source</b>			
AWQMS: 5/18/2015 - 10/5/2021 from ORDEQ stations 13308, 38598 and 40793, EPA Garibaldi Station, and EPA National Aquatic Resources Survey Stations 10187 and 10205. Ambient salinity (32.55 ppt) is the average salinity from stations and dates above.			

**Table 3-18: Ammonia Analysis Information - Winter**

	Acute	Chronic	
		4-day	30-day
Dilution	1.92	32.3	37.7
Ammonia Criteria	67.0	1.7	-
<b>Effluent Data Used</b>			
Ammonia (mg/L)	3.0	3.0	
pH (SU)	6.7	6.7	
Temperature (°C)	17.0	17.0	
Alkalinity (mg/L CaCO3)	36.0	36.0	
<b>Receiving Water Body Data Used</b>			
Ammonia (mg/L)	0.0	0.0	
pH (SU)	8.2	8.2	
Temperature (°C)	11.4	11.4	
Alkalinity (mg/L CaCO3)	55.1	55.1	
<b>Ammonia Limit Needed?</b>	<b>No</b>		
<b>Calculated Limits</b>	<b>AML</b>	<b>MDL</b>	
Ammonia (mg/L)	NA	NA	
<b>Effluent data source</b>			
ICIS DMR statistics: 11/2019 – 4/2024 A default effluent salinity value of 0.1 ppt was used.			
<b>Ambient data source</b>			
AWQMS: 5/18/2015 - 10/5/2021 from ORDEQ stations 13308, 38598 and 40793, EPA Garibaldi Station, and EPA National Aquatic Resources Survey Stations 10187 and 10205. Ambient salinity (32.55 ppt) is the average salinity from stations and dates above.			

**3.3.10.3 Priority Pollutant Toxics**

The City of Garibaldi’s WWTP discharges less than 1 MGD and no priority pollutant toxics are known to be present in the discharge. Therefore, no additional controls or monitoring will be required.

**3.3.10.4 Other Pollutants Associated with Water Quality Impairments**

This assessment unit is listed for Arsenic in Category 5 for not meeting human health criterion for arsenic. Monitoring is required for facilities where the pollutant is known to be present. Arsenic is not known or expected to be present in the facility discharge. Therefore, there is no reasonable potential to cause or contribute to this listing and monitoring for arsenic is not being required in the proposed permit.

### **3.3.10.5 Mercury – Human Health Criterion**

DEQ determined that this facility is not a likely source of mercury. Therefore, no additional controls or monitoring will be required.

## **3.4 Antibacksliding**

The proposed permit complies with the antibacksliding provisions of CWA sections 402(o) and 303(d)(4) and 40 CFR 122.44(l). The proposed limits are the same or more stringent than the existing permit so the antibacksliding provision is satisfied.

## **3.5 Antidegradation**

DEQ must ensure the permit complies with Oregon’s antidegradation policy found in OAR 340-041-0004. This policy is designed to protect water quality by limiting unnecessary degradation from new or increased sources of pollution.

DEQ has performed an antidegradation review for this discharge. The proposed permit contains the same or more stringent discharge loadings as the existing permit. Permit renewals with the same or more stringent discharge loadings as the previous permit are not considered to lower water quality from the existing condition. DEQ is not aware of any information that existing limits are not protecting the receiving stream’s designated beneficial uses. DEQ is also not aware of any existing uses present within the water body that are not currently protected by standards developed to protect the designated uses. Therefore, DEQ has determined that the proposed discharge complies with DEQ’s antidegradation policy. DEQ’s antidegradation worksheet for this permit renewal is available upon request.

## **3.6 Whole Effluent Toxicity**

DEQ does not require whole effluent toxicity testing (WET) for minor domestic facilities because concentrations of toxics are typically very low and WET testing is not warranted.

## **3.7 Groundwater**

The treatment facility does not have any basins, ponds or lagoons that have the potential to leach into the groundwater. No groundwater monitoring or limits are required.

# **4. Schedule A: Other Limitations**

## **4.1 Mixing Zone**

Schedule A describes the regulatory mixing zone as discussed above in section 3.

## 4.2 Biosolids

The permit holder currently produces Class B biosolids for beneficial land application and this permit allows the facility to continue to produce and land apply biosolids. DEQ previously reviewed and approved a 2019 biosolids management plan and land application plan for the WWTP. During the term of this permit, the permittee must keep its existing biosolids management plan and land application plan up to date as required by OAR 340-050-0031. Any significant changes to these plans will be subject to public review and comment before the plans may be implemented.

For all Class B biosolids to be land applied under this permit, Schedule A of the permit requires the WWTP to apply biosolids according to their Biosolids Management Plan. In addition, Schedule A requires the following:

- The biosolids must be land applied at or below agronomic rates.
- The permittee must have written site authorization for each location from DEQ before land applying and abide by the restrictions for each site.
- Prior to application, the permittee must ensure that biosolids meet one of the pathogen reduction standards under 40 CFR 503.32 and one of the vector attraction reduction standards under 40 CFR 503.33.
- The permittee must not apply biosolids containing pollutants in excess of the ceiling concentrations for the nine metals shown in Schedule A of the permit.

## 5. Schedule B: Monitoring and Reporting Requirements

Schedule B of the permit describes the minimum monitoring and reporting necessary to demonstrate compliance with the proposed effluent limits. In addition, monitoring for other parameters is required to better characterize the effluent quality and the receiving water body. This data will be used during the next permit renewal. Detailed monitoring frequency and reporting requirements are in Schedule B of the proposed permit. The required monitoring, reporting and frequency for many of the parameters are based on DEQ's monitoring and reporting matrix guidelines, permit writer judgment, and to ensure the needed data is available for the next permit renewal.

The permittee requested monitoring reductions for BOD<sub>5</sub>, TSS, enterococcus, and fecal coliform. DEQ reviewed the request using EPA's memo "Interim Guidance for Performance – Based Reductions of NPDES Permit Monitoring Frequencies - April 19, 1996" and found that the permittee was eligible for reductions in BOD<sub>5</sub> and TSS monitoring and adjusted monitoring frequencies accordingly. Due to water quality impairments in the receiving water for bacteria, no reductions in enterococcus or fecal coliform monitoring frequencies were granted.

Receiving water body monitoring added this permit renewal includes total ammonia and alkalinity for use in reasonable potential analyses. Both parameters are not routinely monitored by another agency in Tillamook Bay and most of the ambient data currently available will be over 10 years old during the next permit renewal.

## **6. Schedule C: Compliance Schedule**

The proposed permit contains new effluent limits for total residual chlorine. The facility is unable to meet these limits upon permit issuance. The proposed permit contains a compliance schedule that allows time for the facility to make facility modifications in order to meet the new limits. This compliance schedule lays out a series of milestones which upon completion, will enable the permittee to meet the permit's water quality-based effluent limits (see 40 CFR 122.47 and OAR 340-041-0061(12)).

The limits addressed in the schedule are more restrictive WQBELs than those in the current permit. DEQ has determined that the proposed compliance schedule requires the permittee to meet the final limits as soon as possible. The permittee must provide process optimization and engineering options, as well as progress reports on achieving the final effluent limitations. The permittee must determine and begin to implement by the date described in Schedule C of the permit a solution for achieving final total residual chlorine effluent limits.

## **7. Schedule D: Special Conditions**

The proposed permit contains the following special conditions:

### **7.1 Inflow and Infiltration**

A requirement to submit an updated inflow and infiltration report in order to reduce groundwater and stormwater from entering the collection system;

### **7.2 Emergency Response and Public Notification Plan**

A requirement to develop an emergency and spill response plan or ensure the existing one is current per General Condition B.8 in Schedule F.

### **7.3 Exempt Wastewater Reuse at the Treatment System**

A condition that exempts the permit holder from the recycled water requirements in OAR 340-055, when recycled water is used for landscape irrigation at the treatment facility or for in-plant processes, such as in plant maintenance activities.

### **7.4 Biosolids Management Plan**

A requirement to manage all biosolids in accordance with a DEQ-approved biosolids management plan and land application plan. The biosolids management plan and the land

application plan must meet the requirements in OAR 340-050-0031 and describe where and how the land application of biosolids is managed to protect public health and the environment.

## **7.5 Wastewater Solids Transfers**

A condition that allows the facility to transfer treated or untreated wastewater solids to other in-state or out-of-state facilities that are permitted to accept the wastewater solids.

## **7.6 Hauled Waste Control Plan**

[A condition that allows the acceptance of hauled waste according to a DEQ-approved hauled waste plan. The hauled waste plan ensures waste is not accepted that could negatively impact the treatment capabilities of the facility.

## **7.7 Hauled Waste Annual Report**

A condition requiring submittal of an annual hauled waste report that summarizes hauled waste accepted at the facility during the previous year.

## **7.8 Operator Certification**

The permit holder is required to have a certified operator consistent with the size and type of treatment plant covered by the permit per OAR 340-049-0005. This special condition describes the requirements relating to operator certification.

## **7.9 Industrial User Survey**

This condition requires the permittee to conduct or update an industrial user survey. The purpose of the survey is to identify whether there are any categorical industrial users discharging to the POTW and ensure regulatory oversight of these discharges.

## **7.10 Outfall Inspection**

A condition that requires the permittee to inspect the outfall and submit a report regarding its condition.

## **8. Schedule F: NPDES General Conditions**

Schedule F contains the following general conditions that apply to all NPDES permittees. These conditions are reviewed by EPA on a regular basis.

- Section A. Standard Conditions
- Section B. Operation and Maintenance of Pollution Controls
- Section C. Monitoring and Records
- Section D. Reporting Requirements
- Section E. Definitions

# Appendix A: pH AU Memo



## Memorandum

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**To:** WQ Permit File, 101025 Bay City and 102609 Garibaldi

**From:** Olivia Stoken, NPDES Permit Writer

**Reviewed By:** Aliana Britson, Rob Burkhart, George Cannon, and Lesley Merrick

**Date:** 5/7/2024

**Subject:** pH 303(d) Listing Discrepancy in Tillamook Bay (Assessment Unit OR\_EB\_1710020308\_01\_100298)

Assessment unit (AU) OR\_EB\_1710020308\_01\_100298 located in Tillamook Bay was incorrectly added to the 303(d) list as a Category 5 parameter for pH in the 2022 Integrated Report (IR). During the 2022 IR Call for Data, USEPA submitted dissolved oxygen, pH, and temperature data collected at their Garibaldi monitoring location between January 22, 2018 and July 9, 2020. This submission included around 43,000 results per parameter.

Due to an unknown transcription error, the submitted data indicated an impairment of pH for Tillamook Bay. A re-evaluation of the AU with the corrected data resulted in the assessment unit attaining pH water quality standards. Therefore, DEQ will be pursuing delisting for Assessment Unit ID OR\_EB\_1710020308\_01\_100298 – Tillamook Bay for pH in the 2024 IR cycle with a delisting reason of “Applicable WQS attained; original basis for listing was incorrect”.

Multiple NPDES permittees discharge into this AU, including the City of Bay City (permit # 101025) and the City of Garibaldi (permit # 102609). Since this AU will be delisted for pH in the 2024 IR, the 2022 pH 303(d) listing will not apply to NPDES permit renewals for facilities that discharge into this AU.

# Appendix B: Temperature AU Memo



## Memorandum

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**To:** WQ Permit File, 101025 Bay City and 102609 Garibaldi

**From:** Olivia Stoken, NPDES Permit Writer

**Reviewed By:** Rob Burkhart, Jeff Navarro, Lesley Merrick, and Travis Pritchard

**Date:** 5/29/2024

**Subject:** Temperature 303(d) Listing Discrepancy in Tillamook Bay (Assessment Unit OR\_EB\_1710020308\_01\_100298)

Assessment unit (AU) OR\_EB\_1710020308\_01\_100298 located in Tillamook Bay was incorrectly added to the 303(d) list as a Category 4A parameter for temperature in the 2018/2020 and 2022 Integrated Reports (IR).

During the 2018/2020 IR, the assessment unit methodology underwent substantial changes resulting in two AUs for Tillamook Bay, the Mainstem Lower (OR\_EB\_1710020308\_01\_100298) and the Mainstem Upper (OR\_EB\_1710020308\_01\_107225). The Mainstem Upper AU includes portions of major tributaries to Tillamook Bay, which were assessed and listed for temperature in the early 2000s. The temperature assessment and listing for the Miami River was incorrectly carried into the Mainstem Lower Tillamook Bay AU during the 2018/2020 IR methodology change. Therefore, DEQ will be pursuing delisting for Assessment Unit ID OR\_EB\_1710020308\_01\_100298 – Lower Mainstem Tillamook Bay for temperature in the 2024 IR cycle with a delisting reason of “Applicable WQS attained; original basis for listing was incorrect”.

Multiple NPDES permittees discharge into this AU, including the City of Bay City (permit # 101025) and the City of Garibaldi (permit # 102609). Since this AU will be delisted for temperature in the 2024 IR, the 2022 temperature 303(d) listing will not apply to NPDES permit renewals for facilities that discharge into this AU.

# Appendix C: Temperature RPA

Discharge to Natural Lakes (OAR 340-041-0028(6)) and Ocean/Bays (OAR 340-041-0028(7))						
Analysis at Edge of Mixing Zone						
Section 5.7 of the Temperature IMD						
<p>Note: This spreadsheet is generally only appropriate for analyses of effluent from minor domestic facilities. For other facilities, an analysis using paired seasonal ambient and effluent data is more appropriate.</p>						
Facility Name: Garibaldi WWTP	Date: 5/28/2024					
<p>Enter data into white cells below:</p> <p>Mixing Zone Dilution = 32.3</p> <p>Ambient Temperature = 13 °C</p> <p>Effluent Temperature = 22 °C</p> <p>Allowable Increase = 0.3 °C</p> <p>Effluent Flow = 0.975 mgd</p>	<table border="1"> <thead> <tr> <th>Data Metric/Source</th> </tr> </thead> <tbody> <tr> <td>Aquatic life, chronic year round dilution from mixing zone memo</td> </tr> <tr> <td>Average of the 7-day rolling average daily max ambient temperature (2015-2020)</td> </tr> <tr> <td>Max of the 7-day rolling average daily max effluent temperature (2019-2024)</td> </tr> <tr> <td>Max monthly average flow from mixing zone memo x 1.5</td> </tr> </tbody> </table>	Data Metric/Source	Aquatic life, chronic year round dilution from mixing zone memo	Average of the 7-day rolling average daily max ambient temperature (2015-2020)	Max of the 7-day rolling average daily max effluent temperature (2019-2024)	Max monthly average flow from mixing zone memo x 1.5
Data Metric/Source						
Aquatic life, chronic year round dilution from mixing zone memo						
Average of the 7-day rolling average daily max ambient temperature (2015-2020)						
Max of the 7-day rolling average daily max effluent temperature (2019-2024)						
Max monthly average flow from mixing zone memo x 1.5						
<p><b>ΔT at MZ edge= 0.28 °C</b></p> <p><b>Thermal Load Limit = N/A Million Kcals</b></p>	<p><b>No Reasonable Potential</b></p>					
<p>Note: If Reasonable Potential is indicated, use a more refined analysis (e.g. paired temperature analysis) to make the final RP determination.</p>						
<p>Equation used to calculate ΔT at edge of MZ</p> $\Delta T_{mz} = \frac{T_e + (S - 1)T_a}{S} - T_a$ <p>Equation used to calculate thermal load limit</p> $TLL = 3.7854 Q_e S \Delta T_{all} C_p \rho$ <p>Where:</p> <ul style="list-style-type: none"> <li>Q<sub>e</sub> = Effluent Flow in mgd</li> <li>S = Dilution</li> <li>ΔT<sub>all</sub> = Allowable temperature increase at edge of MZ (°C)</li> <li>C<sub>p</sub> = Specific Heat of Water (1 cal/g °C)</li> <li>ρ = Density of Water (1 g/cm<sup>3</sup>)</li> <li>3785.41 = Flow conversion from mgd to m<sup>3</sup>/day</li> </ul>						

# Appendix D: Thermal Plume RPA

Temperature Thermal Plume Limitations within the Mixing Zone Rule (OAR 340-041-0053(2)(d))			
<b>Sections 5.6 and 6.5 of Temperature IMD</b> This rule only applies to receiving streams with salmonid uses. For migration blockage, applies to upstream migration of anadromous salmonids (See associated notes in the "Thermal Plumes Instructions"). This spreadsheet assesses compliance with OAR 340-042-0053(2)(d) subparts C and D. Subparts A and B need to be assessed separately (see Thermal Plumes Instructions). Facility Name: Garibaldi WWTP      Date: 5/28/2024			
<b>OAR 340-041-0053(2)(d)(C): Thermal Shock</b> 25 deg C at 5% of the stream cross section		<b>OAR 340-041-0053(2)(d)(D): Migration Blockage</b> 21 deg C at 25% of the stream cross section	
Enter data into white cells below:		Enter data into white cells below:	
7Q10 = <input type="text" value="0.0"/> cfs	Data Metric/Source	7Q10 = <input type="text" value="66.72"/> cfs	Data Metric/Source
Ambient Temperature = <input type="text" value="#DIV/0!"/> °C		Ambient Temperature = <input type="text" value="13"/> °C	Critical velocity x average depth x distance to nearest bank from mixing zone memo
Effluent Flow = <input type="text" value="#DIV/0!"/> mgd		Effluent Flow = <input type="text" value="0.975"/> mgd	Average of the 7-day rolling average daily max ambient temperature (2015-2020)
Max Daily Effluent Temperature = <input type="text" value="#DIV/0!"/> °C		Max 7dAM Effluent Temperature = <input type="text" value="22"/> °C	Max monthly average flow from mixing zone memo x 1.5
			Max of the 7-day rolling average daily max effluent temperature (2019-2024)
5% of 7Q10 = <input type="text" value="0.0"/> cfs		25% of 7Q10 = <input type="text" value="16.7"/> cfs	
5% dilution = <input type="text" value="#DIV/0!"/> dilution = (Qr*0.05)/Qe + 1		25% dilution = <input type="text" value="12"/> dilution = (Qr*0.25)/Qe + 1	
Temperature at 5% cross section = <input type="text" value="#DIV/0!"/> °C	<input type="text" value="#DIV/0!"/>	Temperature at 25% cross section = <input type="text" value="13.7"/> °C	No Reasonable Potential
		ΔT at 25% Stream Flow = <input type="text" value="0.7"/> °C	
Notes:			

Equation used to calculate ΔT at edge of MZ

$$\Delta T_{mz} = \frac{T_e + (S - 1)T_a}{S} - T_a$$

Equation used to calculate thermal load limit

$$TLL = 3.7854 Q_e S \Delta T_{all} C_p \rho$$

Where:

- Qe = Effluent Flow in mgd
- S = Dilution
- ΔT<sub>all</sub> = Allowable temperature increase at edge of MZ (°C)
- Cp = Specific Heat of Water (1 cal/g °C)
- ρ = Density of Water (1 g/cm<sup>3</sup>)
- 3785.41 = Flow conversion from mgd to m<sup>3</sup>/day

# Appendix E: Fecal Coliform Bacteria Limit Derivation

## Background/General Discussion

The 2001 Tillamook Bay Watershed TMDL included fecal wasteload allocations for Garibaldi. These allocations addressed the beneficial use of shellfish harvesting within the Tillamook Bay, as designated at the time of TMDL development. At that time there was no specific map within DEQ's water quality rules delineating shellfish harvesting areas. The TMDL determined that conductivity in the bay vs conductivity of saltwater allowed for dilution to be considered in the TMDL wasteload allocation development (see Section 3.2.7 of the TMDL and Appendix B). The TMDL also used estimates of instream and overland bacteria decay (or die off) for riverine discharges in the development of allocations.

In 2016, Oregon's bacteria standards were updated to include figures explicitly delineating shellfish harvesting areas. Specifically, OAR 340-041-0230 Figure 230E was included designating shellfish harvesting areas in the Tillamook Bay. This figure indicates that the designated shellfish harvesting area in the bay is much closer to the mouth of the Trask River (and other rivers) than the location considered during TMDL development.

DEQ would typically rely on TMDL allocations to ensure discharges are not causing or contributing to exceedances criteria. However, because of this change in rule, the allocation to the city may not ensure compliance with the fecal criteria. In particular, the 3 to 1 dilution ratio used in the TMDL for allocation development was reconsidered.

## Permit Limit Development

Since OAR 340-041-0230 Figure 230E designates shellfish harvesting as a use within all of Tillamook Bay, the fecal coliform criteria are required to be addressed at this location. These criteria are included in OAR 340-041-009(1)(c) and are a median concentration of 14 organisms per 100 mL and not more than ten percent of the samples may exceed 43 organisms per 100 mL.<sup>1</sup>

As noted above, the TMDL wasteload allocation for Garibaldi was calculated using the dilution value of 3 to 1 that was expected to occur in the Tillamook Bay and was considered under the TMDL. Since the revised rule designates all of the bay to be shellfish harvesting area, this dilution is no longer considered valid for derivation of Garibaldi's fecal coliform limits. Where the TMDL targeted fecal coliform values of 42 (14 multiplied by the dilution of 3) and 129 (43 multiplied by the dilution of 3) within the bay, the new permit limits are based on targeting the criteria (14 and 43) within the bay.

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<sup>1</sup> The TMDL considered the geometric mean and the 90<sup>th</sup> percentile statistics as equivalent to the statistics in the rule.