



State of Oregon
Department of
Environmental
Quality

**National Pollutant Discharge Elimination System
Permit Fact Sheet
USDA/US Forest Service – Columbia River Gorge
National Scenic Area**

Final: May 2, 2024

Permittee	USDA/US Forest Service – Columbia River Gorge National Scenic Area Multnomah Falls Lodge STP 53000 E. Historic Columbia River Highway Bridal Veil, OR 97010
Existing Permit Information	File Number: 109329 Permit Number: 101507 EPA Reference Number: OR0040410 Category: Domestic Class: Minor Expiration Date: 11/30/2023
Permittee Contact	Dennis Ervin Plant Operator 541-993-2374 6412 Cherry Heights Road The Dalles, OR 97058
Receiving Water Information	Receiving stream/NHD name: Columbia River NHD Reach Code & % along reach: 17080001000228 – 26.85% USGS 12-digit HUC: 170800010803 OWRD Administrative Basin: Sandy ODEQ LLID & River Mile: 1240483462464 & 135.9 Assessment Unit ID: OR_SR_1708000108_88_100672
Proposed Action	Permit Renewal Application Number: 948274 Date Application Received: 06/26/2023
Permit Writer	Helen Sanders 541-241-0152 Date Prepared: 3/25/2024

NPDES Permit Fact Sheet

USDA/US Forest Service – Columbia River Gorge National Scenic Area

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NPDES Permit Renewal Fact Sheet

USDA/US Forest Service – Columbia River Gorge

National Scenic Area

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 – Not applicable
- Schedule D – Special conditions
- Schedule E – Not applicable
- Schedule F – General conditions

A summary of the major changes to the permit are listed below:

- The thermal load limit in Schedule A will change from 0.45 million kcals/day to 59.7 million kcals/day as a monthly average.
- The influent BOD₅ and TSS concentrations will no longer be assumed as 200 mg/L for calculation of the percent removal efficiency. Instead, the percent removal efficiency will be reduced to 75%. See 40 CFR 133.103
- Influent and effluent monitoring requirements for TSS in Schedule B will increase from monthly to 2/month.
- Influent and effluent monitoring requirements for pH in Schedule B will increase from 2/week to 3/week.
- Effluent monitoring requirements for temperature in Schedule B will increase from 2/week to 3/week.
- Effluent monitoring requirements for thermal load in Schedule B will increase from weekly to 3/week.
- UV intensity and UV transmittance will be added as a continuous monitoring requirement in Schedule B.
- Ammonia, Oil and Grease, TKN, and nitrate plus nitrite are no longer included in the effluent monitoring requirements.

2. Facility Description

2.1 Wastewater Facility

The Multnomah Falls Lodge sewage treatment facility serves the Historic Multnomah Falls Lodge in Northeast Oregon and discharges into the Columbia River. The lodge houses a U.S. Forest Service interpretive center, gift shop, snack bar, espresso cart, restaurant, bar, and public

restrooms. There is an average of 2.5 million people per year that visit this facility. The wastewater system is located at 53000 E Historic Columbia River Highway, Bridal Veil, OR 97010.

The secondary wastewater treatment facility was originally placed into operation in 2000. The plant was built in response to failing drainfields at the ODOT parking area in the I-84 median. Upon construction of the treatment plant, the drainfield piping was abandoned except for a portion which was utilized to transport wastewater to the treatment plant. The drainfield outfall pipe was intercepted and used as a carrier pipe for a new smaller outfall pipe. The outfall was lengthened and deepened creating a deeper, more distant discharge point in the Columbia River.

The collection system consists of piping from the bathrooms and kitchens of the lodge to a 39,400-gallon septic tank and pump compartment located near the lodge. The collection system is not considered a separate system from the treatment plant and no additional certification is required to operate it. Once filled, the septic tank overflow fills the pump compartment until the pumps are engaged, sending effluent to the treatment plant. The treatment plant discharges intermittently, only when the septic tank pumps are active. Activated sludge is the major treatment process. The treatment plant itself is a “doughnut” type, wastewater aeration and digestion in an outer ring, with secondary clarification in the center. Disinfection is accomplished using ultra-violet (UV) light. The plant has not been expanded.

The design peak flow for the facility is 0.03 MGD. Treated wastewater is discharged to the Columbia River at about river mile 132.32. At this location the Columbia River is nearly 1 mile wide. The only outfall (Outfall 001) is at approximately latitude 45.5804, longitude -122.1168. It is about 700 feet from the treatment plant, in water 25 feet in depth and about 135 feet offshore. The discharge flows by gravity to the outfall. Discharge rates vary depending on the septic tank effluent pumps, which cycle with the usage of facilities at Multnomah Falls Lodge.

Biosolids accumulations from the Multnomah Falls Lodge treatment system are regularly pumped out and transported to a Speedy Septic facility in The Dalles for further treatment and beneficial use as biosolids. The permittee reports the volume of materials removed from the septic tank and the digester tank on the monthly monitoring report and in an annual report. The facility does not store sewage sludge outside of the treatment system and does not land apply biosolids, nor intends to do so during the permit period. The permittee does not currently operate a recycled water program and does not intend to do so during the term of this permit.

There was a modification approved by DEQ on Feb. 4, 2022 for improvements to the existing system. These improvements included modification of the force main discharging into the aeration basin to improve RAS mixing with the influent.

Figure 2-1: Multnomah Falls Lodge WWTP Location and Outfall

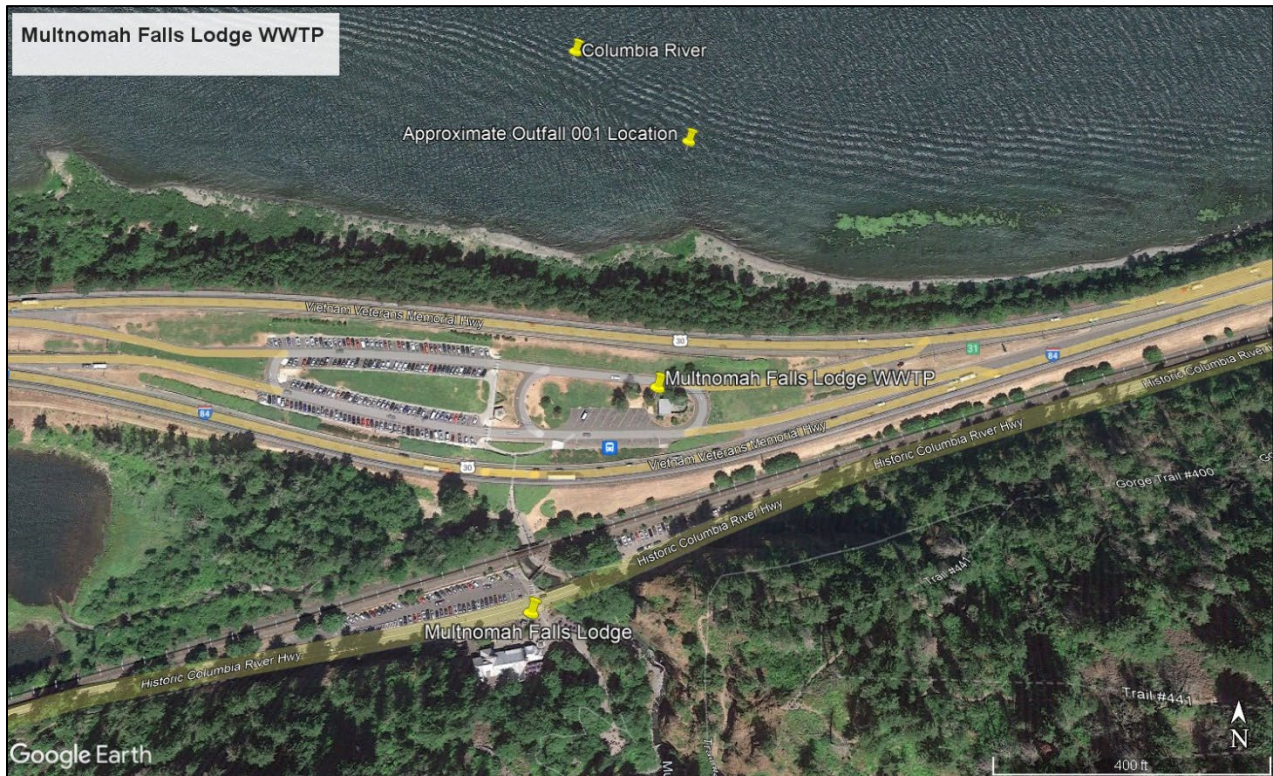


Figure 2-2: Multnomah Falls Lodge WWTP Schematic

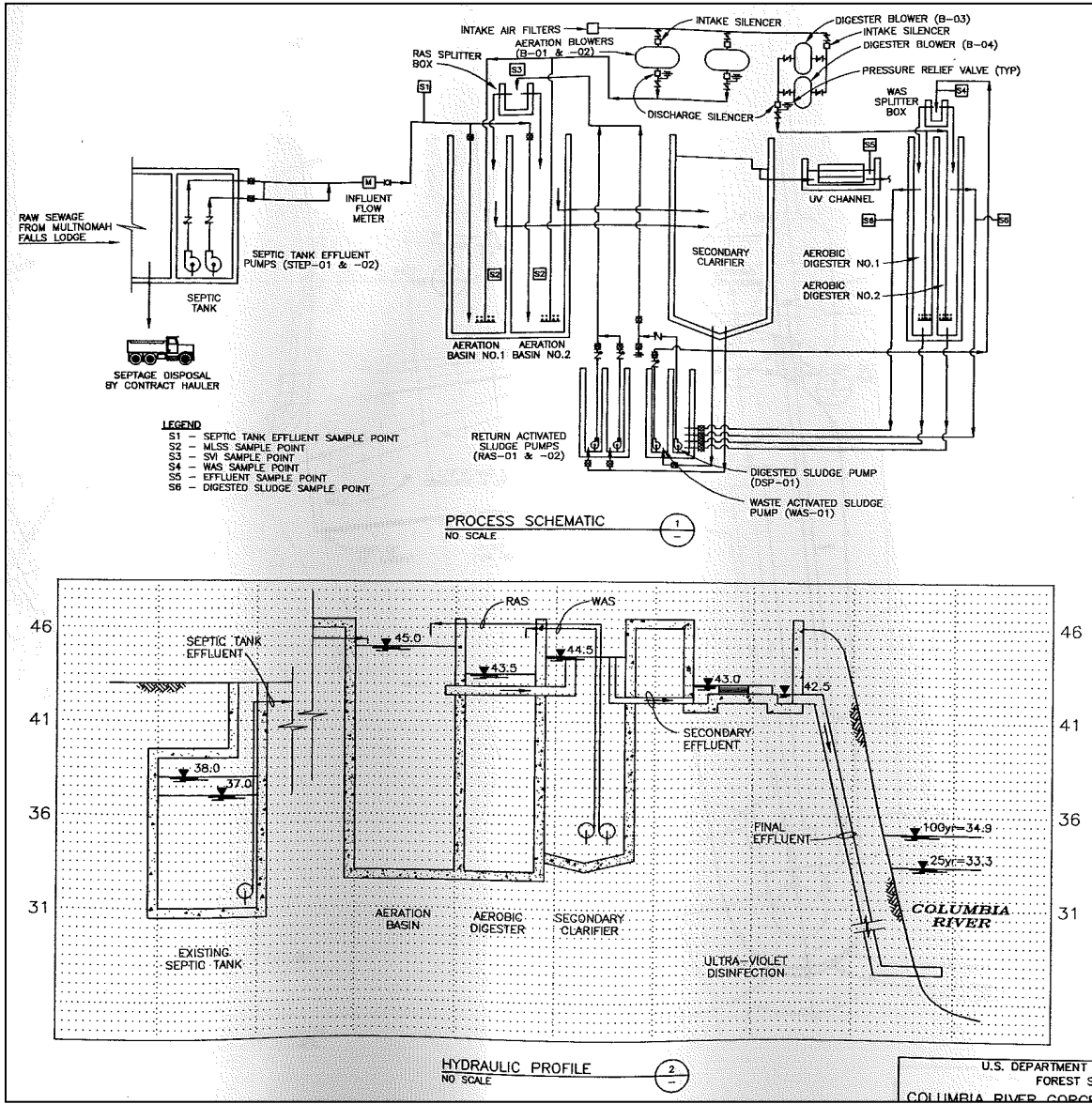


Table 2-1: List of Outfalls

Outfall Number	Type of Waste	Lat/Long	Design Flow ¹ (mgd)	Existing Flow ² (mgd)
001	Treated Wastewater	45.5804, -122.1168	0.03 MGD	0.01 MGD

1. Design Flow = design average dry weather flow
 2. Existing Flow = existing average monthly dry weather flow

2.2 Compliance History

A Warning Letter (WL-8837) was issued on Nov. 21, 2023 for an exceedance of *E. coli* in April 2023. DEQ conducted an inspection on Dec. 5, 2023 and found no permit violations.

2.3 Stormwater

Stormwater is not addressed in this permit. General NPDES permits for stormwater are not required for facilities with a design flow of less than 1 MGD.

2.4 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.

2.5 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 show the limits contained in the existing permit.

Table 3-1: Existing Effluent Limits

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
Effluent Flow (May 1 to Oct 31)	MGD	0.03 MGD		
BOD5 (July 1 – January 31)	mg/L	20	30	
	lb/day	5	8	10
	% removal	85	-	-

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
TSS (July 1 – January 31)	mg/L	20	30	
	lb/day	5	8	10
	% removal	75	-	-
BOD ₅ (February 1 – June 30)	mg/L	30	45	
	lb/day	8	11	15
	% removal	85	-	-
TSS (February 1 – June 30)	mg/L	30	45	
	lb/day	8	11	15
	% removal	75	-	-
pH	SU	Instantaneous limit between a daily minimum of 6.0 and a daily maximum of 8.5		
<i>E. coli</i>	#/100 mL	Must not exceed a monthly geometric mean of 126, no single sample may exceed 406		
Excess Thermal Load Limit (ETLL) (May 1 to Oct. 31)	million kcal/day (Mkcal/day)	ETLL = 0.45 as a 7-day rolling average		
Note: Due to preliminary treatment that occurs within the septic tanks, the influent BOD ₅ and TSS concentrations are assumed to be 200 mg/L for calculation of the percent removal efficiency.				

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 (BOD₅), total suspended solids (TSS) and pH (i.e., federal secondary treatment standards). Substitution of 5-day carbonaceous oxygen demand (CBOD₅) for BOD₅ is allowed. The numeric standards for these pollutants are contained in 40 CFR 133.102. In addition, DEQ has developed minimum design criteria for BOD₅ 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 Columbia basin.

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

Parameter	Federal Secondary Treatment Standards		Columbia Basin-Specific Design Criteria (OAR 340-041-0104)
	30-Day Average	7-Day Average	Monthly Average
BOD ₅ (mg/L)	30	45	20 mg/L during July 1 st to January 31 st .
TSS (mg/L)	30	45	20 mg/L during July 1 st to January 31 st .
pH (S.U.)	6.0 – 9.0. (instantaneous)		7.0 - 8.5
BOD ₅ and TSS % Removal	85%		Not specified

Adjustments to Percent Removal Requirements

Federal regulations (40 CFR 133.103(d)) include special considerations for less concentrated influent wastewater from separate sewers. The rule allows substitution of either a lower percent removal requirement or a mass loading limit for the percent removal requirements provided that the permittee satisfactorily demonstrates that:

- The treatment works is consistently meeting, or will consistently meet, its permit effluent concentration limits, but its percent removal requirements cannot be met due to less concentrated influent wastewater;
- To meet the percent removal requirements, the treatment works would have to achieve significantly more stringent limits (defined as at least 5 mg/l more stringent than the otherwise applicable concentration-based limits) than would otherwise be required by the concentration-based standards; and,
- The less concentrated influent wastewater is not the result of excessive infiltration and inflow (I/I).

DEQ has determined the facility meets all three conditions above since there is primary treatment via the septic tank prior to the flow entering the wastewater treatment facility. Therefore, DEQ is proposing BOD₅ and TSS percent removal limits of 75%. The removal limit was calculated based on average monthly influent and effluent data from 2019 - Sept. 2023. The percent removal for each month was calculated from the reported monthly average influent and effluent. This shows the actual performance of the facility over the last five years. The lowest percent removal during that time period was 76%. The following calculation was used to determine the BOD₅ and TSS percent removal limit of 75%:

$$\text{Percent Removal} = \frac{\text{Monthly Avg Influent Concentration} - \text{Monthly Avg Effluent Concentration}}{\text{Monthly Avg Influent Concentration}} \times 100$$

The new percent removal limit is replacing the previous permit removal limit to be consistent with federal regulation (40 CFR 133.103(d)), which specifically applies to an adjustment of the % removal efficiency, but not the influent concentration. The primary treatment from the septic tank results in a dilute influent entering the wastewater treatment facility. The new percent removal limits are effectively equivalent to the existing limits and are not considered a relaxation of limits. Therefore, an anti-backsliding analysis (CWA 402(o)) is not required.

The limits for BOD₅ 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 BOD₅ and TSS monthly average concentrations of 20 mg/L during the dry weather season and 30 mg/L during the wet weather season. DEQ uses the maximum monthly 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 maximum monthly dry weather flow (DMMDWF) or design maximum monthly wet weather flow (DMMWWF)

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 ₅ Concentration Limit (mg/L)
Dry Weather	0.03 MGD	20 mg/L	20 mg/L
Wet Weather	0.03 MGD	30 mg/L	30 mg/L
Design flow comments: Design flow limits based upon average dry weather design flow (0.03 MGD).			

Dry Weather BOD and TSS Mass Load Calculations:

Monthly Average: $0.03 \text{ [design flow] mgd} \times 20 \text{ [concentration] mg/L} \times 8.34 = 5.0 \text{ lbs/day}$
(Two significant figures)

Weekly Average: $5.0 \text{ lbs/day monthly average} \times 1.5 = 7.5 \text{ lbs/day}$

Daily Maximum: $5.0 \text{ lbs/day monthly average} \times 2 = 10 \text{ lbs/day}$

The proposed BOD₅ and TSS limits are listed in the following table.

Table 3-4: BOD₅ and TSS Technology Based Effluent Limits

Parameter	Units	Average Monthly	Average Weekly	Daily Maximum
BOD ₅ (Dry Weather: July 1 – January 31)	mg/L	20	30	NA
	lbs/day	5.0	7.5	10
	% removal	75	NA	NA
TSS (Dry Weather: July 1 – January 31)	mg/L	20	30	NA
	lbs/day	5.0	7.5	10
	% removal	75	NA	NA
BOD ₅ (Wet Weather: November 1 – April 30)	mg/L	30	45	NA
	lbs/day	7.5	11	15
	% removal	75	NA	NA
TSS (Wet Weather: November 1 – April 30)	mg/L	30	45	NA
	lbs/day	7.5	11	15
	% removal	75	NA	NA

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 the Columbia River. These uses are listed in OAR-340-041-0101 for Columbia Basin.

- Public and private domestic water supply
- Industrial water supply
- Irrigation and livestock watering
- Fish and aquatic life (including salmonid migration)
- Wildlife and hunting
- Fishing and Boating
- Water contact recreation

- Aesthetic quality
- Hydro power
- 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 stream reach. 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_SR_1708000108_88_100672
AU Name:	Columbia River
AU Status:	Impaired
Year Listed	1998
Year Last Assessed	2022
303d Parameters (Category 5)	Temperature- year round, Total Dissolved gas, DDE 4,4'- Human Health Toxics, Dioxin (2,3,7,8-TCDD)- Human Health Toxics, Polycyclic Aromatic Hydrocarbons (PAHs)- Human Health Toxics, Polychlorinated Biphenyls (PCBs)- Human Health Toxics
TMDL Parameters (Category 4)	
Temperature	

3.3.3 TMDL Wasteload Allocations

DEQ issued a TMDL for the Columbia and Lower Snake Rivers Basin. WLAs from this TMDL that are applicable to the permittees are listed in the following table.

Table 3-6: Applicable WLAs

Parameter	WLA	Time Period
Temperature	59.7 million kcal/day	June – Sept.

As part of this renewal, some of these permit limits are being modified. The Excess Thermal Load limit in the current permit will be replaced by a TMDL temperature WLA. The basis for developing the new limits is described in detail in Section 3.3.7.

3.3.4 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.

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

Table 3-7: Pollutants of Concern

Pollutant	How was pollutant identified?
pH	Effluent Monitoring
Temperature	Effluent Monitoring
<i>E. coli</i>	Effluent Monitoring

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.

3.3.5 Regulatory Mixing Zone

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

The regulatory mixing zone is that portion of the Columbia River within 50 feet of the discharge pipe. The zone of initial dilution is that portion of the Columbia River with 5 feet of the discharge pipe.

The dilution factors at the edge of the zone of initial dilution and mixing zone are shown in Table 3-8. These dilutions are based on a 2023 mixing zone study analysis conducted by DEQ. DEQ based its analysis on a 2012 mixing zone study submitted by Multnomah Falls. The original study was based on ambient data collected in September 2012. CORMIX was used at that time to simulate the discharge using effluent flow data and estimate dilutions at the edge of the ZID and mixing zone. DEQ updated this modeling analysis using current effluent flow data from 2019-2023. CORMIX v12.0 was used in the analysis. This updated analysis is documented in a December 2023 mixing Zone memo which is part of the administrative record.

Table 3-8: Mixing Zone Dilutions

Dilution Summary – Year-round						
Water Quality Standard	Stream Flow (cfs)		Effluent Flow (mgd)		Dilution Factor	Location
	Statistic	Flow	Statistic	Flow		
Aquatic Life, Acute	1Q10	72,100	<input type="checkbox"/> ADWDF x PF <input checked="" type="checkbox"/> Max Daily Avg <input type="checkbox"/> Other	0.019	7.5	ZID
Aquatic Life, Chronic	7Q10	79,300	<input type="checkbox"/> ADWDF <input checked="" type="checkbox"/> Max Monthly Avg <input type="checkbox"/> Other	0.013	73	MZ
Human Health, Non-Carcinogen	30Q5	91,400	<input type="checkbox"/> ADWDF <input checked="" type="checkbox"/> Max Monthly Avg <input type="checkbox"/> Other	0.013	73	MZ
Human Health, Carcinogen	Harmonic Mean	NA	<input type="checkbox"/> Annual Avg Design <input type="checkbox"/> Annual Avg <input type="checkbox"/> Other	NA	NA	MZ
ADWDF = Average dry weather design flow PF = Peaking factor (1.5)						
Comments:						

3.3.6 pH

The pH criterion for this basin is 7.0 – 8.5 per OAR 340-041-0104. The previous permit pH limits were 6.0 to 8.5. DEQ determined there is no reasonable potential for the discharge to exceed the pH criterion at the edge of the mixing zone based on the current limits. The proposed limits are a lower limit of 6.0, which is a TBEL and an upper limit of 8.5, which is a WQBEL. The following provides a summary of the data used for the analysis.

Table 3-9: pH Reasonable Potential Analysis

INPUT	Lower pH Criteria	Upper pH Criteria
1. DILUTION AT MZ BOUNDARY (7Q10)	73.0	73.0
2. UPSTREAM CHARACTERISTICS		
Temperature (deg C):	22.0	9.8
pH:	7.6	8.5
Alkalinity (mg CaCO3/L):	46.8	46.8
3. EFFLUENT CHARACTERISTICS		
Temperature (deg C):	22.7	8.5
pH (S.U.) - Enter existing lower and upper limit	6.0	8.5
Alkalinity (mg CaCO3/L):	134.6	134.6
4. APPLICABLE PH CRITERIA		
pH at Mixing Zone Boundary:	7.2	8.5
Is there Reasonable Potential?	No	No
Proposed Effluent Limits	6.0	8.5
Effluent data source: ICIS summary statistic Data 2019-2023.		
Ambient data source: AWQM Ambient Data 2013 stations 12042-ORDEQ, 34161-ORDEQ, 34191-ORDEQ, 35562-ORDEQ, 34516-ORDEQ, 35559-ORDEQ, 39340-ORDEQ, 35264-ORDEQ for pH and temperature. Alkalinity data collected by permittee upstream of outfall (2019-2023).		

3.3.7 Temperature

3.3.7.1 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 3-10: Temperature Criteria Information

Applicable Temperature Criterion	Migration Corridor 20°C (OAR 340-041-0028(4)(d))
Applicable dates: Year-round	
Salmon/Steelhead Spawning 13°C? OAR 340-041-0028(4)(a)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Applicable dates:	
WQ-limited?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
TMDL wasteload allocation assigned?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Applicable dates: June- September	
TMDL based on natural conditions criterion?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Cold water summer protection criterion applies?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Cold water spawning protection applies?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Comments:	

As with all pollutants in the permittee’s discharge, the effluent temperature must be low enough to ensure compliance with applicable water quality criteria. The water quality criteria pertaining to temperature in Oregon are primarily based on the most sensitive aquatic species and life stages present in the water body. The most sensitive species are usually salmonids, though pacific eulachon (smelt), which are also present in this section of the Columbia River, have different critical life-stage periods and temperature needs. A temperature discussion related to eulachon follows the salmonid discussion below.

Multnomah Falls Lodge discharges to a segment of the Columbia River which serves as a migration corridor for salmonids (OAR 340-041-0101, Table 101B). OAR 340-041-0028(4)(d) states that the 7-day average maximum temperature of a stream identified as a salmonid migration corridor may not exceed 20 °C (68°F).¹ This segment of the Columbia River is listed as being water quality limited for temperature (year-round). A temperature TMDL for the Columbia River, which addresses this listing, was completed by the EPA on May 10, 2022. This TMDL includes a wasteload allocation, applicable from June through September, in the form of a thermal load from treatment plant. This thermal load is 59.7 million kcal/day as a monthly average. The allocation applies from June through September, with no limitation required under the TMDL for the remainder of the year.

Cold Water Refugia

OAR 340-041-0028(4)(d) requires that water bodies subject to the salmonid migration criterion of 20 °C must also have cold water refugia that are sufficiently distributed so as to allow salmon and steelhead migration without significant adverse effects from higher water temperatures

¹ According to Oregon Department of Fish and Wildlife’s online fish habitat distribution maps, existing uses of the stream include salmonid rearing in the channel areas near Outfall 001. The salmonid migration corridor use includes consideration that some downstream juvenile salmonid rearing occurs along with the migration use and the associated criterion (20°C) is considered protective of this use.

elsewhere in the water body. The diffuser of the facility's outfall is approximately 135 feet offshore and 25 feet below the water surface, with no nearby cold water tributary stream. This location and the surrounding mixing zone area are not expected to contain cold water refugia. As a result, it is unlikely that the facility's effluent with its minimal flow would have an impact on any cold water refugia.

Eulachon Analysis

Pacific eulachon, a species listed as threatened under the Endangered Species Act, are known to migrate and spawn in the Columbia River and its tributaries. While there are no specific temperature criteria within Oregon's water quality rules for the protection of eulachon, DEQ must ensure that thermal mixing zones are as small as feasible and adverse effects to eulachon are minimized.

DEQ has previously performed detailed analyses related to eulachon for two other NPDES facilities on the Columbia River: GP Wauna Paper Mill and the City of Portland's Columbia Blvd. wastewater treatment plant. The results of these studies indicated that the discharges were unlikely to have any detrimental impact on eulachon (see the permit fact sheets for each of these facilities for detailed information). Since this facility has a relatively new outfall², and with the receiving stream characteristics and effluent temperatures similar to the Columbia Blvd. facility's (but with much lower effluent flow than that facility), DEQ has concluded that the Multnomah Falls Lodge discharge will be very unlikely to have any detrimental impact on eulachon due to the thermal nature of its discharge.

Temperature Criterion Effluent Limits

Based upon the analysis presented above, the proposed permit will not require a limit for temperature to meet the requirements of OAR 340-041-0053 (thermal plumes). However, with the issuance of the EPA TMDL, a wasteload allocation for the facility applies to the discharge. This allocation is addressed in the proposed permit by including an effluent limit of 59.7 million kcal/day (monthly average) for the June – September period.

To demonstrate compliance with the thermal load limit, the daily thermal load discharged is calculated by multiplying the daily effluent flow by the average daily effluent temperature and a standard conversion factor. The daily thermal loads are averaged for the month and must be equal to or less than 59.7 million kcal/day.

The follow formula is to be used to calculate the thermal loading of the effluent:

$$TL_e = T_e \times Q_e \times c$$

Where,

TL_e = Daily Thermal Load (million kcal/day)

T_e = Daily average effluent temperature (°C).

Q_e = Effluent Flow (million gallon per day (MGD))

c = Conversion factor = 3.78

² The outfall has a multi-port diffuser and the mixing zone has been sized to be as small as feasible.

The daily thermal load values are then averaged over the month to give the monthly thermal load discharged.

Final effluent limits are listed in the following table.

Table 3-11: Temperature Criterion Effluent Limits

Effluent limit needed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
TMDL WLA Limit: 59.7 million kcal/day
Applicable time period: June-September <input type="checkbox"/> NA
Temperature Criterion Limit: N/A

3.3.7.2 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.

Multnomah Falls Lodge: Spawning is not a designated beneficial use in the segment of the river; therefore, this is not applicable.

- 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.

Multnomah Falls Lodge: Maximum effluent temperature for the permittee is 27.5 °C, which is well below the criterion of concern for this rule.

- 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.

Multnomah Falls Lodge: An analysis related to thermal shock, included in Appendix A, indicates that when both the effluent and upstream receiving water temperatures are at their maximum measured values, the plume's temperature at 5% of the receiving stream's cross-sectional area will not be above 25 °C. Based on this analysis, 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.

Multnomah Falls Lodge: The maximum recorded receiving water upstream of the discharge location is 20.3 °C (7-day average of the daily maximum) and the maximum effluent temperature is 27.5 °C (7-day average of the daily maximum). An analysis related to migration blockage, included in Appendix A, indicates that when the effluent plume reaches 25% of the receiving stream'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 3-12: Thermal Plume Effluent Limit

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

3.3.8 Bacteria

OAR 340-041-0009(6)(b) requires discharges of bacteria into freshwaters meet a monthly geometric mean of 126 *E. coli* per 100 mL, with no single sample exceeding 406 *E. coli* per 100 mL. If a single sample exceeds 406 *E. coli* per 100 mL, then the permittee may take five consecutive re-samples. If the geometric mean of the five re-samples is less than or equal to 126, a violation is not triggered. The re-sampling must be taken at four-hour intervals beginning within 28 hours after the original sample was taken. The following table includes the proposed permit limits and apply year-round.

Table 3-13: Proposed *E. coli* Limits

<i>E. coli</i> (#/100 ml)	Geometric Mean	Maximum
Existing Limit	126	406
Proposed Limit	126	406

The *E. coli* limit is met through UV disinfection. Because the discharge is intermittent, DEQ developed a site-specific UV dose calculation. Dose (in mJ/cm²) is equal to the UV intensity (in mWatts/cm²), multiplied by the duration of exposure (in seconds). UV intensity is provided by the disinfection unit. To obtain the duration of exposure, the volume of the UV chamber must be divided by the flow rate. The UV chamber is a rectangular channel, 66.75 inches long, 12 inches wide, with a typical depth of 6 inches. Thus, its volume is 2.78 ft³. To be consistent with typical measurement units, the UV chamber volume is measured in cubic feet, and the flow rate in MGD. These units must be converted to cubic centimeters and seconds:

$$1 \text{ ft}^3 = 28,317 \text{ cm}^3$$

$$1 \text{ MGD} = 43,801 \text{ cm}^3/\text{s}$$

Thus, the equation to obtain the duration is:

$$\text{Duration} = [\text{Volume} * (28,317 \text{ cm}^3/\text{ft}^3)] / [\text{Flow} * (43,801 \text{ cm}^3/\text{s})]$$

Where,

Duration = Duration of exposure (seconds)
Volume = Volume of UV chamber (2.78 ft³), and
Flow = Discharge flow rate (MGD).

Combining the conversion factors, this simplifies to:

$$\text{Duration} = 1.8 / \text{Flow}$$

Therefore,

$$\text{Dose} = 1.8 * \text{Intensity} / \text{Flow}$$

Where,

Intensity = Intensity provided by the UV unit (mWatts/cm²)
Flow = Discharge flow rate (MGD).

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). Compliance with the antibacksliding provisions related to the thermal load limit and the BOD₅ and TSS percent reduction limits are discussed below. The other proposed limits are the same or more stringent than those in the existing permit, so the antibacksliding provisions are satisfied for those limits.

As discussed in section 3.3.7 above, the thermal load effluent limit has been changed to meet the wasteload allocated to Multnomah Falls Lodge in the 2022 Columbia and Lower Snake Rivers Basin TMDL. Although antibacksliding provisions generally do not allow relaxation of effluent limits in renewal permits, section 303(d)(4)(A) of the Clean Water Act allows relaxation when the receiving water is not in attainment for the limiting or related pollutant, the effluent limit is based on a TMDL wasteload allocation (WLA), and it can be shown that relaxation is consistent with antidegradation requirements. As noted above, the receiving water is water quality limited and the new limit is based on a TMDL WLA. It also complies with the antidegradation requirement since TMDL WLA ensures the temperature increase is an insignificant increase according to the Oregon's antidegradation rule, OAR 340-041-0004(3)(c). Therefore, the new thermal load limit based on the TMDL wasteload allocation is allowed and is included in the proposed permit.

The percent removal efficiency limits for BOD₅ and TSS have been reduced from 85% to 75% and the previous permit's provision that influent concentrations are assumed as 200 mg/L has been removed. These changes were made to ensure the proposed permit is consistent with Federal regulations (40 CFR 133.103(d)). As noted in Section 3.2, above, these new effluent limits are considered to be effectively equivalent to the existing limits and are therefore not considered a relaxation of limits that would be subject to an anti-backsliding analysis.

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 discharge loadings as the existing permit, with the exception of the temperature (thermal load) limits as discussed in Section 3.3.7, above. Under Oregon's Antidegradation Rule, discharges with insignificant temperature increases are not considered degradation (OAR 340-041-0004(3)(c)). Specifically, the rule states that insignificant temperature increases authorized under OAR 340-041-0028(11) and (12) are not considered a reduction in water quality. Section 3.3.7 of this report provides an analysis of the temperature impacts of this discharge and determines appropriate effluent limits to ensure the discharge will result in temperature increases at or below those authorized under OAR 340-041-0028(11) and (12). Based on OAR 340-041-0004 and the Section 3.3.7 of this report, the discharge from the facility does not have the potential to reduce water quality as it pertains to temperature.

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.

WET tests are used to determine the percentage of effluent that produces an adverse effect on a group of test organisms. The measured effect may be fertilization, growth, reproduction, or survival. EPA's methodology includes both an acute test and a chronic test. An acute WET test is considered to show toxicity if adverse effects occur at effluent concentrations less than what is found at the edge of the zone of immediate dilution (ZID). A chronic WET test is considered to show toxicity if adverse effects occur at effluent concentration less than what is known to occur at the edge of the mixing zone.

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 Chlorine Usage

Schedule A of the permit prohibits the permittee from using chlorine or chlorine compounds for effluent disinfection purposes.

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 stream. 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.

Receiving stream monitoring is required in the permit to determine accurate representation of stream ambient conditions during the permit's monitoring period. This stretch of the Columbia River is only sporadically monitored and may not provide a representative data set for the next renewal period's RPA.

6. Schedule C: Compliance Schedule

The permittee is expected to meet all effluent limits once the permit becomes effective and therefore a compliance schedule is not needed.

7. Schedule D: Special Conditions

The proposed permit contains the following special conditions. The conditions include the following:

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

7.3 Wastewater Solids Annual Report

This condition requires the permittee to submit a Wastewater Solids Annual Report each year documenting removal of wastewater solids from the facility during the previous calendar year.

7.4 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.

7.5 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.

7.6 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: Thermal Plume RPAs

OAR 340-041-0053(2)(d)(C): Thermal Shock	
25 deg C at 5% of the stream cross section	
Enter data into white cells below:	Data Metric/Source
7Q10 = 79300 cfs	2023 MZ Memo
Ambient Temperature = 20.3 °C	Max 7 DADM from 2019-2023 DMRs
Effluent Flow = 0.03 mgd	2023 MZ Memo
Max Daily Effluent Temperature = 27.5 °C	Max 7 Day effluent temp. from 2019-2023 DMRs
5% of 7Q10 = 3965.0 cfs	
5% dilution = 85435	dilution = $(Qr \cdot 0.05) / Qe + 1$
Temperature at 5% cross section = 20.3 °C	No Reasonable Potential

OAR 340-041-0053(2)(d)(D): Migration Blockage	
21 deg C at 25% of the stream cross section	
Enter data into white cells below:	Data Metric/Source
7Q10 = 79300 cfs	2023 MZ Memo
Ambient Temperature = 20.3 °C	Max 7 DADM from 2019-2023 DMRs
Effluent Flow = 0.03 mgd	2023 MZ Memo
Max 7dAM Effluent Temperature = 27.5 °C	Max 7 Day effluent temp. from 2019-2023 DMRs
25% of 7Q10 = 19825.0 cfs	
25% dilution = 427172	dilution = $(Qr \cdot 0.25) / Qe + 1$
Temperature at 25% cross section = 20.3 °C	No Reasonable Potential
ΔT at 25% Stream Flow = 0.0 °C	