2022

Biological Assessment for the Reissuance of the NPDES Permit for Washington Beef, LLC.

U.S. ENVIRONMENTAL PROTECTION AGENCY

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1 Introduction

Washington Beef LLC owns and operates the Toppenish Plant located in Toppenish, WA, on the Yakama Nation (YN) Reservation. The Toppenish Plant is a complex slaughterhouse, which includes a live animal holding area, rendering, meat processing, hide brining, blood drying, and boxed meat warehousing and shipping.

The Endangered Species Act (ESA) requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries) if the federal agency's actions could beneficially or adversely affect any threatened and endangered species or their critical habitat. In this case, the federal agency is the Environmental Protection Agency (EPA), and the discretionary action is the reissuance of the NPDES permit. The action evaluated in this Biological Evaluation (BE) could affect species under the jurisdiction of both the USFWS and NOAA Fisheries. This BE identifies the endangered, threatened, and proposed species and critical habitat in the project area and assesses potential effects to these species that may result from the discharge authorized in the draft Toppenish Plant NPDES permit.

The following major discussions are provided in this evaluation using the best scientific and commercial data available:

Part 2 identifies the listed species in the action area.

The proposed action is described in Part 3.

The action area (including the relevance of the environmental baseline to the species' status) is described in part 4.

Part 5 further describes the species and their biological requirements and habitat, abundance trends, and status.

Part 6 provides the effects analyses of the proposed action on the listed species.

2 List of Species

According to the USFWS Species List (project code 2022-0040156) and the NOAA Protected Resources App, the following federally listed species are near the discharge:

- Mammals
  - Gray Wolf (*Canis lupus*), endangered
- Birds
  - Yellow-billed Cuckoo (*Coccyzus americanus*), threatened
- Fishes
  - Bull Trout (*Salvelinus confluentus*), threatened
  - Steelhead (*Oncorhynchus mykiss*), Middle Columbia River DPS, Naches River population, threatened

There is no designated critical habitat for any species in the action area.

3 Description of Action

This part describes the permit action proposed by EPA. The discussion includes a general overview of the proposed action, a discussion on the permit status, a description of the industrial process, a description of the outfalls, and a discussion of the proposed interim and final effluent limits in the permit.

3.1 Overview of Permit Action

Section 301(a) of the Clean Water Act (CWA) prohibits the discharge of pollutants except in compliance with CWA Section 402, among other sections. Section 402 authorizes the issuance of NPDES permits for direct dischargers (i.e., existing or new industrial facilities that discharge process wastewaters from any point source into receiving waters) (https://www.epa.gov/npdes). The NPDES permit is developed to control the discharge using effluent limitations guidelines (ELGs) and water quality-based effluent limitations (WQBELs).

EPA establishes ELGs to require a minimum level of process control and treatment for industrial point sources. They are based on the demonstrated performance of model process and treatment technologies that are within the economic means of an industrial category (https://www.epa.gov/eg). Although ELGs are based on the performance of model process and treatment technologies, EPA does not mandate the use of specific technologies; therefore, dischargers are free to use any available control technique to meet the limitations.

In general, receiving waters have ambient water quality standards that are established by the states or EPA to maintain and protect designated uses of the receiving water (e.g., aquatic life, public water supply, primary contact recreation) (https://www.epa.gov/wqs-tech). The facility is located near the City of Toppenish and discharges to tribal waters on the YN Reservation. The YN applied for the status of Treatment as a State (TAS) in 1994 from EPA for purposes of the CWA, and the current permit used YN WQS as a basis for permit limits. However, to date, EPA has not acted on the TAS submission nor does the Tribe have EPA-approved WQS. If the YN is granted TAS, and when it has WQS approved by EPA, those tribal WQS will be used to determine effluent limitations in the permit. In the meantime, the Washington WQS were used as reference for setting permit limits and to protect downstream uses in the Yakima River, which is part of the waters of the State of Washington. The Yakima River is about 10.2 stream miles downstream of the discharges via Wanity Slough and Marion Drain.

The most stringent applicable water quality criteria for the pollutants of concern for the Toppenish Plant permit are listed in Table 1.

Table 1: Water Quality Criteria for Pollutants of Concern

Pollutant	Designated Use	Criteria		Citation (WAC 173-201A)
Ammonia	Salmonid spawning, rearing, and migration	002 May – Sep.	Acute: 4.465 mg/L	240
			Chronic: 0.669 mg/L	
		002 Oct. – April	Acute: 10.14 mg/L	
			Chronic: 1.872 mg/L	
		008 May – Sep.	Acute: 13.09 mg/L	
			Chronic: 1.293 mg/L	
		008 Oct. – April	Acute: 4.552 mg/L	
			Chronic: 0.485 mg/L	

Pollutant	Designated Use	Criteria	Citation (WAC 173-201A)
Chlorine (total residual)	Salmonid spawning, rearing, and migration	Acute: 19 µg/L Chronic: 11 µg/L	240
Dissolved Oxygen (DO)	Salmonid spawning, rearing, and migration	EPA-approved: 8.0 mg/L (1-day minimum) State-adopted: 10 mg/L or 90% saturation (1-day minimum)	200(1)(d)
E. coli	Primary contact recreation	*E. coli* organism levels within an averaging period must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10 percent of all samples (or any single sample when less than 10 sample points exist) obtained within the averaging period exceeding 320 CFU or MPN per 100 mL. (i) A minimum of three samples is required to calculate a geometric mean for comparison to the geometric mean criteria. Sample collection dates shall be well distributed throughout the averaging period so as not to mask noncompliance periods. (A) Effluent bacteria samples: When averaging effluent bacteria sample values for comparison to the geometric mean criteria, or for determining permit compliance, the averaging period shall be 30 days or less.	200(2)(b)
Nitrate+nitrite	Domestic water supply	10 mg/L	260(2)(a), interpreted using EPA 440/5-86-001
pH	Salmonid spawning, rearing, and migration	pH shall be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 unit.	200(1)(g)
Solids, total dissolved	Agricultural water supply and domestic water supply	500 mg/L	260(2)(a), interpreted using EPA 440/5-86-001 and EPA secondary drinking water standards
Temperature	Spawning/rearing	Temperature shall not exceed a 1-DMax of 21.0°C due to human activities. When natural conditions exceed a 1-DMax of 21.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time, exceed $t = 34/(T + 9)$.	Table 602: WRIA 37 – Lower Yakima

Pollutant	Designated Use	Criteria	Citation (WAC 173-201A)
Total nitrogen and total phosphorus (Wanity Slough)	Aesthetics	Total nitrogen: 857 µg/L Total phosphorus: 102 µg/L	260(2)(b), interpreted using reference site data. See Appendix E to the fact sheet.
Turbidity	Salmonid spawning, rearing, and migration	Turbidity shall not exceed: • 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU.	200(1)(e)
Whole effluent toxicity	Salmonid spawning, rearing, and migration	Chronic: 1.0 TUc	260(2)(a), interpreted using EPA/505/2-90-001

The application of the ELGs may result in pollutant discharges that exceed the water quality standards applicable to the receiving waters. In such cases, the CWA and federal regulations require the development of more stringent WQBELs for the pollutant to ensure that the water quality standards are met (Clean Water Act Section 301(b)(1)(C), 40 CFR 122.44(d)). Additionally, pollutant parameters not limited in the ELGs may result in the development of WQBELs. EPA develops WQBELs in accordance with EPA guidance (USEPA, 1991).

EPA is proposing to reissue an NPDES permit to Washington Beef, LLC for their facility in Toppenish, Washington. The ESA regulations require the action agency to evaluate all interdependent actions (actions having no independent utility apart from the proposed action) and interrelated actions (actions that are part of a larger action and depend on the larger action for their justification). The federal regulations at 50 CFR section 402.02 define an action as all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. This is an existing facility that EPA is proposing to reauthorize a permitted discharge. EPA has also issued an air permit to this facility, however, EPA determined that the issuance of the air permit had no effect on threatened or endangered species. Therefore, EPA believes that there are no interdependent or interrelated actions to this action.

A copy of the draft NPDES permit is included in Appendix A of this BE. The draft NPDES permit authorizes the discharge from existing Outfall 002 to Wanity Slough and from Outfall 008 to subject to effluent limitations, monitoring requirements, and other conditions specified in the permit. The draft permit will be finalized following completion of this consultation.

3.2 Permit Reissuance Status

The most recent NPDES permit for the Toppenish Plant was issued on December 12, 2009, became effective on February 1, 2010, and expired on January 31, 2015. An NPDES application for permit issuance was submitted by the permittee on July 16, 2014. EPA determined that the application was timely and complete. Therefore, pursuant to 40 CFR 122.6, the permit has been administratively continued and remains fully effective and enforceable. The draft permit included in Appendix A will be issued upon concurrence with the Services on this Biological Evaluation.

3.3 Industrial Process

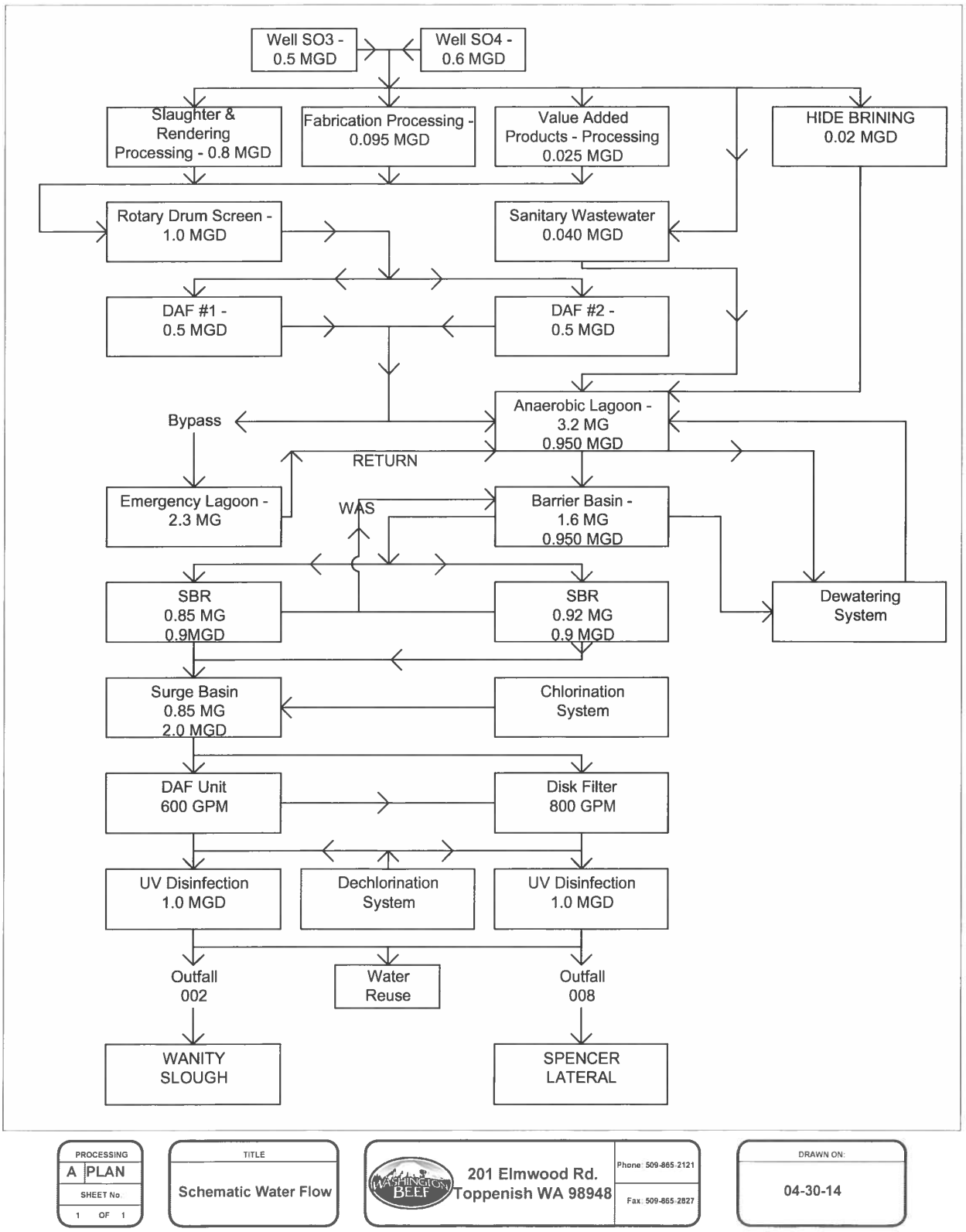
This section provides an overview of the industrial process conducted at the plant, and treatment of wastewater.

The Toppenish Plant is a complex slaughterhouse, which includes a live animal holding area, rendering, meat processing, hide brining, blood drying, and boxed meat warehousing and shipping.

3.3.1 Wastewater Treatment Process

Figure 1 shows a schematic of the industrial process and water balance information. The headworks of the treatment process includes a rotary drum screen and two primary dissolved air flotation (DAF) units. This portion of the treatment process receives wastewater from the facility's slaughtering, rendering, fabrication processing, and value-added products processing operations. Wastewater treated by the two primary DAFs is combined with sanitary wastewater and wastewater from the hide brining process and flows to the anaerobic basin and then to the barrier basin. Following the barrier basin, the wastewater is subjected to aerobic treatment in two sequencing batch reactors, which provide BOD removal, nitrification, and denitrification of the wastewater. Following the sequencing batch reactors, wastewater flows to an aerated surge basin, then to a tertiary dissolved air flotation unit, ultraviolet disinfection (with chlorine disinfection as a backup) and then to discharge through Outfalls 002 or 008.

Some treated wastewater is re-used internally. The fact sheet dated September 30, 2009 stated that the facility had the capability to land-apply its effluent, but Washington Beef is not currently doing so.



PROCESSING	TITLE		DRAWN ON:
A PLAN SHEET No. 1 OF 1	Schematic Water Flow	201 Elmwood Rd. Toppenish WA 98948 Phone: 509-865-2121 Fax: 509-865-2827	04-30-14

Figure 1: Water Balance and Wastewater Treatment Process

3.4 Outfall Description

Outfall 002 discharges to Wanity Slough, downstream of Fort Road and upstream of U.S. Highway 97 (near the intersection with Larue Road).

Outfall 008 discharges to Spencer Lateral just west of U.S. Highway 97 between Fort Road and East Elm Street (State Route 22).

The approximate locations of the outfalls are shown in Figure 2.

Figure 2: Aerial Imagery with Approximate Outfall Locations

3.4.1 Wastewater Characterization

To characterize the effluent, EPA evaluated the facility's application form, discharge monitoring report (DMR) data, and additional data provided by Washington Beef. The effluent quality is summarized in Table 2. Effluent data for both outfalls are combined because there are no differences in the wastewater sources or treatment process for wastewater discharged through either outfall. Data are provided in Appendix B to the fact sheet.

Table 2: Effluent Characterization

Parameter	Units	Minimum	Average	Maximum	Standard Deviation	Source
Alkalinity	mg/L as $CaCO_3$	120	152	184	22	3
Ammonia, total as N	mg/L	0.07	0.33	8.18	0.63	1
Ammonia, total as N	lb/day	0.19	1.89	51.8	3.93	1
Dissolved Oxygen	mg/L	6.80	7.35	9.30	0.46	1
E. coli (monthly geometric mean)	#/100 ml	1	19.1	108	21.3	2
Flow (monthly average)	mgd	0.084	0.684	0.916	0.093	2
Nitrate-Nitrite as N	mg/L	5.40	44.2	126	23.4	1
Oil and grease (daily maximum)	mg/L	1.40	2.70	9.10	1.30	2
Oil and grease (daily maximum)	lb/day	1.60	15.9	39.5	7.59	2
Oil and grease (monthly average)	mg/L	1.40	1.78	3.30	0.41	2
Oil and grease (monthly average)	lb/day	1.00	9.97	20.4	2.92	2
pH	s.u.	6.5	—	8.42	—	2
Salinity[a]	mg/L	2000	2290	2700	172	3
Temperature (May – September)	°C	23.1	29.3	36.0	1.7	1
Temperature (April 1 – 15)	°C	22.9	28.0	31.0	1.6	2
Temperature (Winter)	°C	—	22.4	25.8	—	4
Total Nitrogen	mg/L	8.91	60.8	141	28.7	1
Total Nitrogen	lb/day	44.6	339	981	164	1
TSS (daily maximum)	mg/L	4.70	28.0	77.1	17.6	2
TSS (daily maximum)	lb/day	11.0	167	564	113	2
TSS (monthly average)	mg/L	2.20	12.3	36.0	6.84	2
TSS (monthly average)	lb/day	4.00	71.9	217	42.4	2
Turbidity	NTU	1.11	5.73	29.4	3.59	1
Whole Effluent Toxicity	TUc	1.0	4.6	16	5.3	3

Sources:
1. Data from permittee 2017 – 2022
2. Discharge monitoring report data 2010 – 2022
3. Whole effluent toxicity test reports March 2012 – June 2014
4. NPDES permit application (July 2014)

Notes:
a. For most purposes, the terms total dissolved salt content and salinity are equivalent (EPA, 1986).

3.5 Permit Limits

NPDES permits include both technology-based (ELGs) and water quality-based permit limits. Technology-based limits are based on section 301(b)(1)(A) and 301(b)(2) of the CWA and are designed to assure that all industries throughout the country install a baseline level of treatment for their wastewaters. Water quality-based limitations are based on section 301(b)(1)(C) of the CWA and are intended to ensure that effluent from facilities do not adversely affect the designated uses of the water bodies into which they discharge. The implementing regulations at 40 CFR 122.44(d) require that permits contain limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality."

Section 301(b)(2) of the Clean Water Act requires technology-based controls on effluents. This section of the Clean Water Act requires that, by March 31, 1989, all permits contain effluent limitations which: (1) control toxic pollutants and nonconventional pollutants using the "best available technology economically achievable" (BAT), and (2) represent "best conventional pollutant control technology" (BCT) for conventional pollutants (i.e., BOD5, TSS, and pH). In no case may BCT or BAT be less stringent than "best practicable control technology currently available" (BPT), which is a minimum level of control required by section 301(b)(1)(A) the Clean Water Act.

ELGs for the meat and poultry products point source category were last updated on September 8, 2004 (69 FR 54475).

The draft NPDES (2022) permit for the Toppenish Plant includes technology-based effluent limits for the following parameters:

- Total ammonia as N (maximum daily limit for outfall 002 October – April).
- Total nitrogen (outfall 008 year-round and outfall 002 November-March).
- Total suspended solids (TSS)

In addition to the ELGs, EPA evaluated the discharge to determine compliance with Section 301(b)(1)(C) of the Clean Water Act. To determine whether water quality based-limits are needed, EPA follows guidance in its Technical Support Document for Water Quality-based Toxics Control (TSD) (USEPA, 1991). EPA evaluated the discharges to determine if they have the reasonable potential to cause or contribute to excursions above water quality criteria established to protect the designated uses of the receiving water. Effluent limits were developed for those pollutants where there was a reasonable potential to cause or contribute to such exceedances (40 CFR 122.44(d)(1)(i)-(iii)). Parameters for which water quality-based effluent limitations are specified in the draft permit are:

- Parameters with ELGs but with more-stringent technology-based limits in the permit:
    - Biochemical oxygen demand, five-day (BOD_5)
    - *E. Coli*
    - Oil and grease
    - pH
    - Total ammonia as N (except the maximum daily limit for outfall 002 for October – April).
    - Total nitrogen (outfall 002 April – October)
- Parameters not addressed by the ELGs:
    - Dissolved oxygen (DO)
    - Nitrate + nitrite (outfall 008)
    - Temperature (outfall 002 June – August)
    - Total phosphorus (outfall 002 April – October)
    - Total residual chlorine (TRC)
    - Turbidity
    - Whole effluent toxicity (WET)

Effluent limits are not needed for those parameters that did not exhibit reasonable potential to cause or contribute to excursions above water quality standards. Monitoring was included in the draft permit for pollutants of concern for which there was not enough data to determine the need for effluent limits. A description of the reasonable potential evaluation for the draft permit is included in Appendix B. The BE

evaluates the potential for chemical and physical characteristics of the effluent to affect listed species. The parameters evaluated in the BE were those that were identified as pollutants of concern in the 2022 fact sheet. These are:

- BOD_5
- DO
- TSS
- *E. coli* bacteria
- TRC
- pH
- Temperature
- Nitrogen compounds:
    - Total Nitrogen
    - Ammonia
    - Nitrate-Nitrite
- Total Phosphorus
- Oil and grease
- Turbidity
- Whole effluent toxicity (WET)

In developing WQBELs, EPA converts the criteria into limitations using the procedures in the TSD (USEPA, 1991). Factors that influence the development of effluent limits include effluent flow, receiving water critical low flows, effluent variability, and water quality upstream of the discharge. Reasonable worst-case estimates of each of these factors were used to develop the effluent limits to ensure that they are protective of the aquatic organisms using the water quality criteria under critical conditions as a measure of the protectiveness. Each of these factors is discussed in detail in Appendix B.

The receiving water body's ability to dilute effluent is also factored into the development of effluent limitations (40 CFR 122.44(d)(1)(ii)). Available dilution increases with distance downstream of the discharge point. The availability of dilution is termed a mixing zone. Under the Washington water quality standards, mixing zones may be authorized for discharges to meet water quality standards. Mixing zones are areas or volumes of receiving water where wastewater mixes with the receiving water and where water quality standards may be exceeded. Additional discussion of the mixing zones is provided in Section VII.A. Mixing zones were used to calculate the proposed effluent limits for the following parameters. Note that no mixing zone is authorized for outfall 008 from October – April, because there is no flow in Spencer Lateral upstream from the discharge during the non-irrigation season.

- Nitrate + nitrite (outfall 008 May - September)
- Temperature
- Total ammonia as N
- Total nitrogen (outfall 002 April – October)
- Total phosphorus (outfall 002 April – October)
- Total residual chlorine
- Whole effluent toxicity (WET)

The effluent limits are expressed in terms of concentration (e.g., mg/L) or in terms of mass (e.g., lb/day) to ensure that the discharge to the receiving water complies with water quality standards and effluent guidelines. Mass-based limits are particularly important for control of bioconcentratable pollutants because concentration-based limits will not adequately control discharges of these pollutants if the effluent concentrations are below detection levels. However, mass-based limits alone may not assure attainment of water quality standards in waters with low dilution (i.e., less than 100-fold dilution). Therefore, in general, limits are expressed in both mass and concentration, except for limits that cannot be properly expressed as mass (e.g., *E. coli*, temperature, and pH).

The federal regulations at 40 CFR section 122.45(d) requires effluent limitations for continuous discharges to be expressed as maximum daily and average monthly limitations for all dischargers other than publicly owned treatment works. The NPDES regulations at 40 CFR section 122.2 defines the maximum daily discharge as the highest allowable daily discharge and the average monthly discharge limitation as the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. The regulation also defines daily discharge as the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for the purposes of sampling. For pollutants with limitations expressed in units of mass (e.g., lb/day), the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants expressed in other units of measurement (e.g., mg/L), the daily discharge is calculated as the average measurement of the pollutant over the day.

The current (2009) and draft 2022 permit effluent limits for outfalls 002 and 008 are provided in Table 3, Table 4, Table 5, and Table 6.

Table 3: 2009 Permit Effluent Limits and Monitoring Requirements for Outfall 002

Parameter	Units	Effluent Limitations				Monitoring Requirements	
		Average Monthly	Maximum Daily	Minimum Daily	Range	Sample Frequency	Sample Type
Outfall Flow	mgd	—	—	—	—	Daily	Recording
Biochemical Oxygen Demand (BOD_5)	mg/l	30	45	—	—	3/week	24-hour composite
	lbs/day	400.3	600.5	—	—		
Total Suspended Solids (TSS)	mg/l	39	78	—	—	3/week	24-hour composite
	lbs/day	520	1040	—	—		
Oil and Grease	mg/L	10	15	—	—	2/week	grab
	lbs/day	133.4	200.2	—	—		
E. coli Bacteria[1]	# / 100ml	100	see note 2	—	—	3/week	Grab
pH	s.u.	—	—	—	6.5-8.5	3/week	Grab
Dissolved Oxygen[3]	mg/l	—	—	6.8	—	3/week	Grab
Total Nitrogen	mg/L	134	194	—	—	3/week	24-hour composite
	lbs/day	1788	2587.5	—	—		
Total Ammonia as N [3,4]	mg/L	2.9	11.2	—	—	3/week	24-hour composite
	lbs/day	38.7	149.5	—	—		
Turbidity[3]	NTU	12.4	50.3	—	—	3/week	Grab
Total Residual Chlorine[5]	µg/L	9.5	19.0	—	—	Daily	Grab
Temperature	°C	—	—	—	—	Daily	Grab

Parameter	Units	Effluent Limitations				Monitoring Requirements	
		Average Monthly	Maximum Daily	Minimum Daily	Range	Sample Frequency	Sample Type
April 15 – September 30 each year							
Whole Effluent Toxicity (WET) – Chronic[6]	TU c	—	—	—	—	Quarterly	24-hour composite

1. The average monthly limit for *E. coli* is expressed as a geometric mean.
2. No more than 10% of all samples collected for the month shall exceed 200 colonies/100 ml.
3. See Part I.A.5 for compliance schedule for turbidity and dissolved oxygen, and the average monthly limit for ammonia.
4. Reporting is required within 24-hours if the maximum daily limit is violated.
5. EPA test methods can accurately measure total residual chlorine to 20 µg/L, therefore the permittee will be considered in compliance with the permit limits as long as the sample result is less than 20 µg/L. Chorine only needs to be monitored when the chlorination/dechlorination unit is being used by the facility.
6. Quarterly testing shall start two years from the effective date of the permit, and continue until 10 valid samples are collected. One test shall occur in each of the following quarters: January – March; April – June; July –September; and October - December. See Part I. B. for additional information.

Table 4: 2009 Permit Effluent Limits and Monitoring Requirements for Outfall 008

Parameter	Units	Effluent Limitations				Monitoring Requirements	
		Average Monthly	Maximum Daily	Minimum Daily	Range	Sample Frequency	Sample Type
Outfall Flow	mgd	—	—	—	—	Daily	Recording
Biochemical Oxygen Demand (BOD_5)	mg/l	30	45	—	—	3/week	24-hour composite
	lbs/day	400.3	600.5	—	—		
Total Suspended Solids (TSS)	mg/l	39	78	—	—	3/week	24-hour composite
	lbs/day	520	1040	—	—		
Oil and Grease	mg/L	10	15	—	—	2/week	Grab
	lbs/day	133.4	200.2	—	—		
E. coli Bacteria[1]	# / 100ml	100	see note 2	—	—	3/week	Grab
pH	s.u.	—	—	—	6.5-8.5	3/week	Grab
Dissolved Oxygen[3]	mg/l	—	—	6.8	—	3/week	Grab
Total Nitrogen	mg/L	134	194	—	—	3/week	24-hour composite
	lbs/day	1788	2587.5	—	—		
Total Ammonia as N[3, 4]	mg/L	2.3	9.1	—	—	3/week	24-hour composite
	lbs/day	30.7	121.4	—	—		
Total Residual Chlorine[5]	µg/L	9.0	18.0	—	—	Daily	Grab
Turbidity[3]	NTU	12.4	44.2	—	—	3/week	Grab
Temperature April 15 – September 30 each year	°C	—	—	—	—	Daily	Grab
Whole Effluent Toxicity (WET) – Chronic[6]	TU c	—	—	—	—	Quarterly	24-hour composite

1. The average monthly limit for *E. coli* is expressed as a geometric mean.
2. No more than 10% of all samples collected for the month shall exceed 200 colonies/100 ml.
3. See Part I.A.5 for compliance schedule for turbidity and dissolved oxygen, and the average monthly limit for ammonia.
4. Reporting is required within 24-hours if the maximum daily limit is violated.
5. EPA test methods can accurately measure total residual chlorine to 20 µg/L, therefore the permittee will be considered in compliance with its effluent limits as long as the sample result is less than 20 µg/L. Chorine only needs to be monitored when the chlorination/dechlorination unit is being used by the facility.

Parameter	Units	Effluent Limitations				Monitoring Requirements	
		Average Monthly	Maximum Daily	Minimum Daily	Range	Sample Frequency	Sample Type
6. Quarterly testing shall start two years from the effective date of the permit, and continue until 10 valid samples are collected. One test shall occur in each of the following quarters: January – March; April – June; July –September; and October - December. See Part I. B. for additional information.							

Table 5: 2022 Draft Permit Effluent Limits and Monitoring Requirements for Outfall 002

Parameter	Units	Effluent Limitations				Monitoring Requirements	
		Average Monthly	Maximum Daily	Minimum Daily	Range	Sample Frequency	Sample Type
Outfall Flow	mgd	—	—	—	—	Daily	Recording
Biochemical Oxygen Demand (BOD_5)	mg/l	30	45	—	—	1/week	24-hour composite
	lbs/day	400.3	600.5	—	—		
Total Suspended Solids (TSS)	mg/l	42.8	85.7	—	—	1/week	24-hour composite
	lbs/day	572	1143	—	—		
Oil and Grease	mg/L	10	15	—	—	1/month	Grab
	lbs/day	133.4	200.2	—	—		
E. coli Bacteria	# / 100ml	100	Note 1	—	—	3/week	Grab
pH	s.u.	—	—	—	6.5-8.5	3/week	Grab
Dissolved Oxygen	mg/l	—	—	6.8	—	3/week	grab
	% of saturation			90			
Total Nitrogen (April 1 – October 31, final)	mg/L	3.80	9.05	—	—	3/week	24-hour composite
	lbs/day	24.3	57.8	—	—		
Total Nitrogen (April 1 – October 31, interim)	mg/L	134	194	—	—	3/week	24-hour composite
	lbs/day	1788	2587.5	—	—		
Total Nitrogen (November 1 – March 31)	mg/L	134	194	—	—	3/week	24-hour composite
	lbs/day	1788	2587.5	—	—		
Total Phosphorus (April 1 – October 31, final)	mg/L	0.547	1.30	—	—	3/week	24-hour composite
	lbs/day	3.54	8.32	—	—		
Total Phosphorus (November 1– March 31)	mg/L	Report	Report	—	—	1/month	24-hour composite
Total Ammonia as N (May 1– September 30)	mg/L	1.27	5.16	—	—	3/week	24-hour composite
	lbs/day	9.70	39.4	—	—		
Total Ammonia as N (October 1– April 30)	mg/L	2.90	8.0	—	—	3/week	24-hour composite
	lbs/day	22.1	89.8	—	—		
Nitrate + Nitrite	mg/L	Report	Report	—	—	3/week	24-hour composite
Total Residual Chlorine	µg/L	9.5	19.0	—	—	Daily	Grab
	lbs/day	0.13	0.25	—	—		
Turbidity	NTU	12.4	50.3	—	—	1/week	Grab
Floating solids, visible foam, oily wastes	—	See permit Part I.B.2.				1/week	Visual
Chloride	mg/L	—	Report	—	—	Quarterly	24-hour composite
Sulfate	mg/L	—	Report	—	—	Quarterly	24-hour composite
Temperature (June 1 – 30)	°C	—	31.2	—	—	Continuous	Recording

Parameter	Units	Effluent Limitations				Monitoring Requirements	
		Average Monthly	Maximum Daily	Minimum Daily	Range	Sample Frequency	Sample Type
Temperature (July 1 – 31)	°C	—	23.6	—	—	Continuous	Recording
Temperature (August 1 – 31)	°C	—	23.6	—	—	Continuous	Recording
Temperature (September 1 – May 31)	°C	—	Report	—	—	Continuous	Recording
Whole Effluent Toxicity (WET) – Chronic (final)	TU c	5.3	10.0	—	—	Quarterly	24-hour composite
Whole Effluent Toxicity (WET) – Chronic (interim)	TU c	13.4	25.9	—	—	Quarterly	24-hour composite
Notes: 1. No more than 10 percent of all samples obtained within the month shall exceed 320 CFU or MPN per 100 mL.							

Table 6: 2022 Draft Permit Effluent Limits and Monitoring Requirements for Outfall 008

Parameter	Units	Effluent Limitations				Monitoring Requirements	
		Average Monthly	Maximum Daily	Minimum Daily	Range	Sample Frequency	Sample Type
Outfall Flow	mgd	—	—	—	—	Daily	Recording
Biochemical Oxygen Demand (BOD_5)	mg/l	30	45	—	—	1/week	24-hour composite
	lbs/day	400.3	600.5	—	—		
Total Suspended Solids (TSS)	mg/l	42.8	85.7	—	—	1/week	24-hour composite
	lbs/day	572	1143	—	—		
Total Dissolved Solids (TDS) (May – September, final)	mg/l	1742	1995	—	—	3/week	24-hour composite
	lbs/day	13308	15240	—	—		
Total Dissolved Solids (TDS) (October – April, final)	mg/l	500	558	—	—	3/week	24-hour composite
	lbs/day	3820	4263	—	—		
Total Dissolved Solids (TDS) (interim)	mg/l	2371	2714	—	—	3/week	24-hour composite
	lbs/day	18113	20733	—	—		
Oil and Grease	mg/L	10	15	—	—	2/week	Grab
	lbs/day	133.4	200.2	—	—		
E. coli Bacteria	# / 100ml	100		—	—	3/week	Grab
pH	s.u.	—	—	—	6.5-8.5	3/week	Grab
Dissolved Oxygen	mg/l	—	—	6.8	—	3/week	Grab
	% of saturation	—	—	90	—		
Total Nitrogen	mg/L	134	194	—	—	3/week	24-hour composite
	lbs/day	1788	2587.5	—	—		
Total Phosphorus	mg/L	Report	Report	—	—	1/month	24-hour composite
Total Ammonia as N (May – September)	mg/L	3.21	7.65	—	—	3/week	24-hour composite
	lbs/day	24.5	58.4	—	—		
Total Ammonia as N (October – April)	mg/L	0.211	0.855	—	—	3/week	24-hour composite
	lbs/day	1.61	6.53	—	—		
Nitrate + Nitrite (May – September, final)	mg/L	40.4	89.4	—	—	3/week	24-hour composite
	lbs/day	309	682	—	—		
Nitrate + Nitrite (October – April, final)	mg/L	10.0	22.1	—	—	3/week	24-hour composite
	lbs/day	76.4	169	—	—		

Parameter	Units	Effluent Limitations				Monitoring Requirements	
		Average Monthly	Maximum Daily	Minimum Daily	Range	Sample Frequency	Sample Type
Nitrate + Nitrite (interim)	mg/L	59	154	—	—	3/week	24-hour composite
	lbs/day	451	1176	—	—		
Total Residual Chlorine	µg/L	9.0	18.0	—	—	Daily	Grab
	lbs/day	0.12	0.24	—	—		
Turbidity	NTU	12.4	44.2	—	—	1/week	Grab
Floating solids, visible foam, oily wastes	—	See permit Part I.B.2.				1/week	Visual
Chloride	mg/L	—	Report	—	—	Quarterly	24-hour composite
Sulfate	mg/L	—	Report	—	—	Quarterly	24-hour composite
Temperature	°C	Report	Report	—	—	Continuous	Recording
Whole Effluent Toxicity (WET) – Chronic (May – September, final)	TU_c	3.8	7.2	—	—	2/season	24-hour composite
WET – Chronic (October – April, final)	TU_c	1.0	1.8	—	—	2/season	24-hour composite
Whole Effluent Toxicity (WET) – Chronic (interim)	TU_c	13.4	25.9	—	—	Quarterly	24-hour composite
Notes: 1. No more than 10 percent of all samples obtained within the month shall exceed 320 CFU or MPN per 100 mL.							

4 Description of Action Area

This part describes the action area for the permit action proposed by EPA. The discussion includes a definition of the action area, a description of the terrain and climate in the action area, and a description of the receiving water condition in the action area.

4.1 Definition of Action Area

The ESA implementing regulations define action area as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR section 402.02). Indirect effects are defined as those effects that are caused by or will result from the proposed action and are later in time but are still reasonably certain to occur (50 CFR section 402.02). Neither the ESA regulations nor guidance (USFWS & NMFS, 1998) provides a definition of direct effects; however, correspondence from USFWS (2000) defines "direct effects" under the ESA consultation process as direct or immediate effects of the proposed action on the species or its habitat.

Since the proposed action is the re-issuance of the NPDES permit, the direct effects are those that would cause toxicity to a listed species from individual and combined pollutant concentrations within the mixing zone. The presence of parameters regulated by the draft permit could potentially be present at a concentration that could cause toxicity to a listed species at different distances downstream from the discharge, depending upon the effluent limit, available dilution from the receiving water, and the physical and chemical characteristics of the parameter. Section 6 provides the analysis of the potential direct effects from the action that define the action area (the area within which each individual parameter may have an effect) and Section 6.1.10 discusses the potential combined direct effects from the action that define the action area due to combined effects of parameters within the whole effluent.

The area where direct effects may occur commences at the point of discharge. The action area downstream for a specific parameter depends on the physical and chemical properties that cause it to degrade or dilute as it travels downstream. A parameter that is highly volatile or readily biodegradable in a river may be present over a relatively small downstream area at a concentration that could potentially cause toxicity, because several mechanisms effectively remove the parameter from the river. On the other hand, a parameter that is persistent in the environment and is not readily biodegraded in a river system might be present over a longer downstream distance at a concentration that could potentially cause toxicity, because removal mechanisms are less effective in eliminating this parameter from the receiving water.

Indirect effects for the proposed action are those that would cause an effect to a listed species or habitat from individual and/or combined pollutant concentrations within the waterbody at a later time. These effects would result from delayed exposure (e.g., uptake of deposited effluent constituents from sediment resuspension, consumption of prey species, and habitat modification (e.g., deposited effluent constituents on the riverbed, decrease in photosynthesis). Any of these indirect effects could occur as long as there is influence on water column and sediment quality from the Toppenish Plant discharge. Therefore, the indirect action area extends to the point downstream where an indirect adverse effect could occur (e.g., where the concentration of a parameter in the water column or sediment resulting from the effluent discharge is high enough to cause an adverse effect to threatened and endangered fish species).

From the analysis conducted in this BE, the action area extends from outfall 002 on Wanity Slough to the mouth of Marion Drain at its confluence with the Yakima River. EPA believes that, beyond this point, dilution and decay of the discharged pollutants will result in water quality that is indistinguishable from background. See Figure 3.

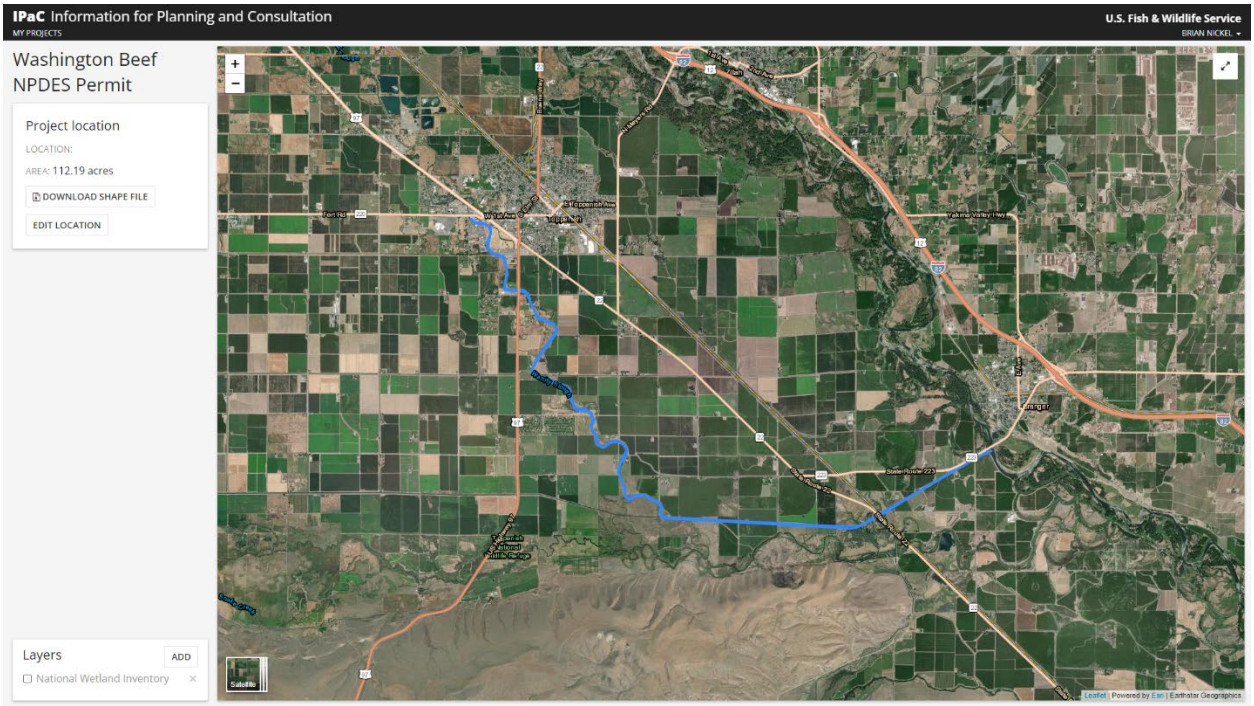


Figure 3: Action Area

4.2 Climate

The Yakima area has a cold desert climate (Köppen BWk) with most precipitation falling in the winter months. Total annual precipitation only about 8 inches, due to the rain shadow from the cascade mountains. Monthly normal temperatures and precipitation are shown in Figure 4.

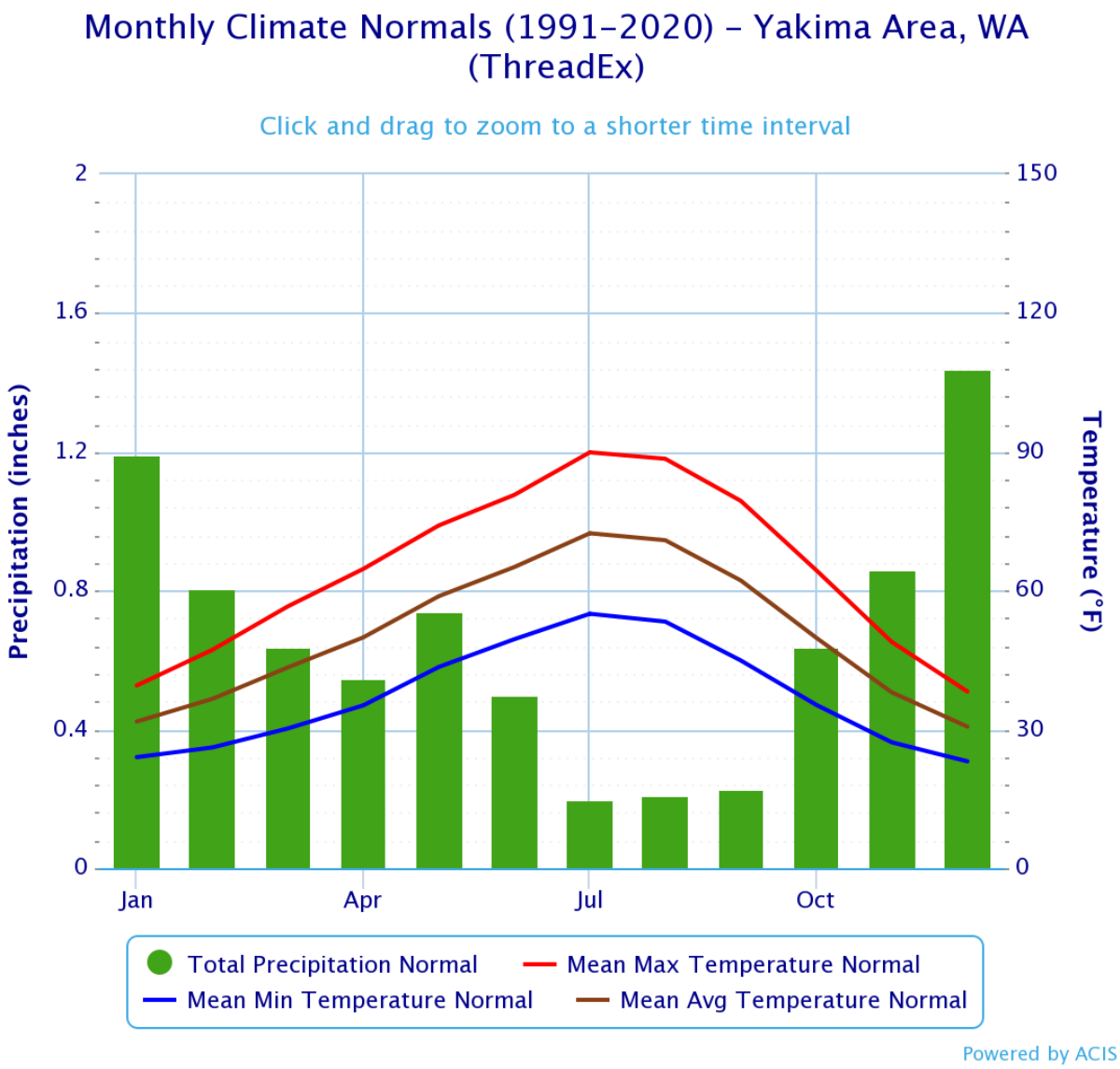


Figure 4: Monthly Normal Temperature and Precipitation for the Yakima Area (NOAA National Weather Service)

4.3 Receiving Water

This facility discharges to Wanity Slough through Outfall 002 and to Spencer Lateral through Outfall 008 near the City of Toppenish, WA. Both Wanity Slough and Spencer Lateral are waters of the United States because they are tributaries to an interstate waterbody (the Columbia River), via the Yakima River.[1]

[1] https://www.epa.gov/wotus/current-implementation-waters-united-states

In the Yakima River basin, water storage and delivery systems have significantly changed the natural hydrology, resulting in stream flows that are out of phase with native salmonids' life history requirements (NOAA, 2009).

4.3.1 Physical Description of Receiving Water

4.3.1.1 Wanity Slough

Wanity Slough is a tributary to Marion Drain, which is a tributary to the Yakima River, which is a tributary to the Columbia River. Wanity Slough is 20 miles long and conveys irrigation water from drains west of the slough to canals and laterals east of the slough. During the non-irrigation season, the headgate of Wanity Slough (on the Yakima River just upstream from the Sunnyside diversion dam) is opened to maintain flow in the upper portion of the slough (USBR, 1998).

According to *Habitat Limiting Factors: Yakima River Watershed: Water Resource Inventory Areas 37 – 39 Final Report* (Haring, 2001)*:*

> *"Wanity Slough is a historic side-channel of the Yakima that has been modified for irrigation…. Wanity Slough historically flowed into the lower portion of Toppenish Creek, but is currently intercepted by Marion Drain, eliminating the historic connection with Toppenish Creek…. Toppenish Creek water is diverted into the upper end of Marion Drain (at the junction of Marion and Harrah drains), resulting in false attraction of adult salmonids into Marion Drain, and possibly also into Wanity and Harrah drains.*
>
> *It is believed that the number of salmonids that spawn and rear in Wanity Slough is currently quite small, although potential fall chinook and coho production may be significant (CBSP 1990). Marion Drain and Wanity Slough support fall chinook, summer steelhead, and coho.*

According to the Washington Department of Fish and Wildlife's SalmonScape mapping tool (http://apps.wdfw.wa.gov/salmonscape/), rainbow trout are also present in Wanity Slough in addition to fall chinook, summer steelhead, and coho.

SalmonScape provides no information on fish presence in Spencer Lateral. However, SalmonScape does show that summer steelhead and rainbow trout are present in Subdrain 35, downstream from Spencer Lateral.

EPA located 72 measurements of stream flow in Wanity Slough in the USGS National Water Information System (NWIS) (https://waterdata.usgs.gov/) and the EPA Legacy STORET[2] databases, collected between 1974 and 1989. From these measurements, EPA calculated and estimated the flow statistics in Table 7.

Table 7: Flow Statistics for Wanity Slough

Flow Statistics	Annual Flows (cfs)
1-day 10-year low flow (1Q10)	15 (estimated)
7-day, 10-year low flow (7Q10)	25 (estimated)
30-day, 5-year low flow (30Q5)	28 (estimated)
Harmonic Mean	57

[2] https://www3.epa.gov/storet/legacy/

Flow Statistics	Annual Flows (cfs)
Source: Legacy STORET station YAV131 (operated by U.S. Bureau of Reclamation, 1974 – 1981, n = 68) and USGS NWIS stations 12505480 and 12505482 (1986 – 1989, n = 4)	

4.3.1.2 Spencer Lateral

Although Spencer Lateral is an irrigation conveyance, field reconnaissance by an EPA inspector on May 26, 2009 demonstrated Spencer Lateral is a tributary to Wanity Slough via a piped connection. Field reconnaissance by an EPA inspector on July 6, 2005 demonstrated that, during the irrigation season, water in Spencer Lateral that is not used for irrigation drains to the Yakima River via Subdrain 35.

The only flow information EPA could locate for Spencer Lateral was in *Habitat Limiting Factors: Yakima River Watershed: Water Resource Inventory Areas 37 – 39 Final Report* (Haring, 2001), which stated that Spencer Lateral withdraws 41 CFS from Wanity Slough.

4.3.2 Cumulative Effects

Cumulative effects are defined at 50 CFR section 402.02 as those effects of future State or private activities, not involving federal activities, which are reasonably certain to occur within the action area of the Federal action subject to consultation. Since the action area is within the confines of Wanity Slough and Marion Drain, cumulative effects would be those that affect those waterbodies.

Ecology and the U.S. Bureau of Reclamation have prepared the Yakima River Basin Integrated Water Resource Management Plan, which identifies a comprehensive approach to water resources and ecosystem restoration improvements in the Yakima River basin. The seven elements of the integrated plan are: reservoir fish passage, structural and operational changes to existing facilities, surface water storage, groundwater storage, habitat/watershed protection and enhancement, enhanced water conservation, and market reallocation (https://yakimabasinintegratedplan.org/).

Since the action area is within the Yakama reservation, the State of Washington does not have the authority to implement federal environmental laws within the action area. There are, however, other federal NPDES permits discharging near the action area. Although these are not considered cumulative effects because they are federal actions, these are discussed in Section 4.4.

EPA searched the EPA's and the Washington Department of Ecology's websites for active cleanup sites near the action area. There were no active cleanup sites near the action area with known surface water contamination.

4.3.3 Receiving Water Quality Data

The water quality for the receiving waters is summarized in Table 8 and Table 9. All available water quality data for Spencer Lateral (Table 9) were provided by the permittee.

Table 8: Receiving Water data for Wanity Slough

Parameter	Units	Minimum	Average	Maximum	Standard Deviation	Count	Source
Alkalinity, upstream	mg/L as $CaCO_3$	56	—	97	—	2	3
Ammonia, upstream	mg/L	0.01	0.08	0.35	0.05	41	1,2
BOD_5, upstream	mg/L	2	2.2	5.3	0.74	36	1

Parameter	Units	Minimum	Average	Maximum	Standard Deviation	Count	Source
Alkalinity, upstream	mg/L as $CaCO_3$	56	—	97	—	2	3
Dissolved oxygen, May – Sep., AM, downstream	mg/L	6.09	8.15	10.95	1.11	65	1
Dissolved oxygen, May – Sep., AM, upstream	mg/L	5.4	8.0	11.0	1.2	65	1
Dissolved oxygen, May – Sep., PM, downstream	mg/L	5.70	8.68	12.40	1.47	61	1
Dissolved oxygen, May – Sep., PM, upstream	mg/L	5.6	8.6	11.3	1.3	62	1
Dissolved oxygen, October – April, AM, downstream	mg/L	4.99	7.94	11.40	1.54	91	1
Dissolved oxygen, October – April, AM, upstream	mg/L	4.6	7.9	11.8	1.4	91	1
Dissolved oxygen, October – April, PM, downstream	mg/L	4.95	8.64	11.10	1.17	89	1
Dissolved oxygen, October – April, PM, upstream	mg/L	5.2	8.5	11.5	1.2	89	1
E. coli, upstream[a]	#/100 ml	1	53.1 (median)	>200.5	149 (IQR)	155	1
Nitrate + Nitrite, upstream	mg/L	0.144	0.310	0.440	0.129	6	2
pH, downstream, May – September	s.u.	7.08	8.04	11.5	1.05	41	2
pH, downstream, October – April	s.u.	6.40	7.70	10.2	0.90	26	2
pH, upstream, May – September	s.u.	5.62	6.73	8.12	0.51	71	1,2
pH, upstream, October – April	s.u.	5.20	6.96	7.67	0.51	87	1
Temperature, April, upstream	°C	10.1	14.0	18.9	2.3	42	1
Temperature, May – Sep., downstream	°C	11.0	18.4	23.4	2.2	489	1,2
Temperature, May – Sep., upstream	°C	12.0	18.3	23.1	2.1	451	1,2
Temperature, October - April., downstream	°C	1.3	12.5	20.9	3.0	74	1,2
Total dissolved solids, upstream	mg/L	85	—	141	—	2	3
Total Nitrogen, upstream	mg/L	0.510	0.613	0.690	0.076	4	2
Total Phosphorus, upstream	µg/L	47	65	85	13	6	2
Total suspended solids, downstream	mg/L	3	18.3	188	27.5	103	2
Total suspended solids, upstream	mg/L	0.8	8.7	29	11.3	8	2
Turbidity, upstream	NTU	0.81	3.76	15.4	3.00	37	1,2

Sources:
1. Data from permittee
2. Water quality portal
3. USGS NWIS Station #12505470

Notes:
a. 28 of 155 *E. coli* results were reported as "greater than" values. Thus, an accurate average and standard deviation cannot be calculated. The median value has been reported instead the average, and the interquartile range has been reported instead of the standard deviation.

Table 9: Receiving Water Quality Data for Spencer Lateral (Irrigation Season)

Parameter	Units	Minimum	Average	Maximum	Standard Deviation	Count
Ammonia, upstream	mg/L	0.07	0.13	0.79	0.17	18
Turbidity, upstream	NTU	1.54	8.64	46.1	10.7	19
BOD_5, upstream	mg/L	2.0	2.0	2.9	0.74	19
pH, upstream	s.u.	5.57	6.99	10.09	0.67	78
Temperature, May – Sep., upstream	°C	12.0	18.9	26.5	2.5	445
Temperature, April., upstream	°C	9.3	14.0	19.0	2.4	38
Dissolved oxygen, October and April, AM, upstream	mg/L	7.00	8.55	9.90	0.81	13
Dissolved oxygen, October and April, PM, upstream	mg/L	7.80	9.25	11.28	1.10	12
Dissolved oxygen, May – Sep., AM, upstream	mg/L	5.20	8.24	10.70	1.18	65
Dissolved oxygen, May – Sep., PM, upstream	mg/L	6.40	9.03	11.65	1.12	64
E. coli, upstream[1]	#/100 ml	4.2	109.1 (median)	490	99.3 (IQR)	77

Notes:
1. 10 of 77 *E. coli* results were reported as "greater than" values. Thus, an accurate average and standard deviation cannot be calculated. The median value has been reported instead the average, and the interquartile range (IQR) is reported instead of the standard deviation. The true maximum may be greater than 490 organisms per 100 ml.

4.4 Other Nearby NPDES Permits

A search of EPA's Enforcement and Compliance History Online (ECHO) database (https://echo.epa.gov/) on October 6, 2022 located four other NPDES permits within the same 12-digit HUC (170300030403, Wanity Slough-Marion Drain) as the action area (Table 10).

EPA's construction general permit, which covers the Toppenish Sewer Phase 3 Improvements, prohibits take of ESA-listed species.[3] Threatened and endangered species protection is addressed by Appendix E to the EPA's multi-sector general permit for industrial stormwater (MSGP), which covers Silgan Containers Mfg. Corp.[4]

EPA determined that the two individual permits for the Wapato WWTP and the Legends Casino, had no effect on any threatened or endangered species.

Table 10: Other NPDES Permitted Discharges near the Action Area (HUC 170300030403)

Name	Permit Number	Permit Components	Permit Effective Date	Permit Expiration Date	Receiving Water
Silgan Containers Mfg. Corp.	WAR05I300	Industrial Stormwater	05/14/2021	02/28/2026	Unnamed waterbody
Toppenish Sewer Phase 3 Improvements	WAR10I027	Construction Stormwater	11/24/2021	02/15/2022	Canal

[3] https://www.epa.gov/npdes/construction-general-permit-threatened-and-endangered-species
[4] https://www.epa.gov/npdes/stormwater-discharges-industrial-activities-threatened-and-endangered-species

Name	Permit Number	Permit Components	Permit Effective Date	Permit Expiration Date	Receiving Water
Wapato WWTP	WA0050229	Biosolids, publicly owned treatment works	11/01/2011	10/31/2016	Yakima River via Drainage Ditch #2
Yakama Nation's Legends Casino WWTP	WA0026743	Publicly owned treatment works	11/01/2013	10/31/2018	Wanity Slough, Wapato Irrigation Project Drain No. 4

5 Species Descriptions

5.1 Bull Trout

The Columbia River bull trout DPS was listed as threatened on June 10, 1998 (63 FR 31647). The coterminous US population of bull trout was listed as threatened on November 1, 1999 (64 FR 58910).

5.1.1 Distribution

Bull trout generally occur in the Klamath River Basin of south-central Oregon; the Jarbidge River in Nevada; the Willamette River Basin in Oregon; Pacific Coast drainages of Washington, including Puget Sound; major rivers within the Columbia River Basin in Idaho, Oregon, Washington, and Montana; and the St. Mary-Belly River, east of the Continental Divide in northwestern Montana (Bond, 1992; Brewin, Brewin, & Monita, 1997; Cavender, 1978; Leary & Allendorf, 1997)

5.1.2 Critical Habitat

Critical habitat for bull trout was designated on October 18, 2010 (75 FR 63897). The receiving waters for this permit are not designated critical habitat for bull trout.

5.1.3 Life History

Bull trout exhibit both resident and migratory life history strategies. Both resident and migratory forms may be found together, and either form may produce offspring exhibiting either resident or migratory behavior (Bruce E. Rieman & McIntyre, 1993). Resident bull trout complete their entire life cycle in or near tributary streams where they spawn and rear. Migratory bull trout spawn in tributary streams where juvenile fish rear for one to four years before migrating to a lake, river (Fraley & Shepard, 1989; F. Goetz, 1989), or saltwater (Cavender, 1978; McPhail & Baxter, 1996; WDFW, 2004). Bull trout reach sexual maturity in four to seven years and may live longer than 12 years. They are iteroparous, meaning that they may spawn more than once in a lifetime. Bull trout typically spawn from August through November during periods of increasing flows and decreasing water temperatures. Spawning areas are often associated with cold-water springs, groundwater infiltration, and the coldest streams in a given watershed (Baxter, Taylor, Devlin, Hagen, & McPhail, 1997; Pratt, 1992; Bruce E. Rieman, Lee, & Thurow, 1997; Bruce E. Rieman & McIntyre, 1993). Fry normally emerge from early April through May, depending on water temperatures and increasing stream flows (Howell & Buchanan, 1992; Pratt, 1992). Bull trout are primarily found in colder streams (below 15°C; 59°F) (Fraley & Shepard, 1989; Pratt, 1992; Bruce E. Rieman & McIntyre, 1993), though they may be found in warmer waters that have access to colder refuges.

Bull trout have more specific habitat requirements than most other salmonids (Bruce E. Rieman & McIntyre, 1993). Habitat components that influence bull trout distribution and abundance include water temperature (as described above), availability of cover, channel form and stability, valley form, spawning and rearing substrate, and migratory corridors (Fraley & Shepard, 1989; F. Goetz, 1989; Howell & Buchanan, 1992; Pratt, 1992; Rich, 1996; Bruce E. Rieman & McIntyre, 1993, 1995; Sedell & Everest, 1991; Watson & Hillman, 1997). All life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, boulders, and pools (Fraley & Shepard, 1989; F. Goetz, 1989; Hoelscher & Bjornn, 1989; Pratt, 1992; Rich, 1996; Sedell & Everest, 1991; Sexauer & James, 1997; Thomas, 1992; Watson & Hillman, 1997). Early life stages of bull trout, specifically the developing embryo, require the highest inter-gravel dissolved oxygen levels, and are the most sensitive life stage to reduced oxygen levels. The oxygen demand of embryos depends on temperature and stage of development, with the greatest dissolved oxygen required just prior to hatching.

Bull trout are opportunistic feeders, with food habits primarily a function of size and life-history strategy. Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macrozooplankton, and small fish (Boag, 1987; Donald & Alger, 1993; F. Goetz, 1989). Bull trout may also feed heavily on fish eggs of other salmon (Lowery & Beauchamp, 2015). Subadult and adult migratory bull trout feed on various fish species (Brown, 1994; Donald & Alger, 1993; Fraley & Shepard, 1989; Leathe & Graham, 1982). In marine nearshore areas of western Washington, bull trout feed on Pacific herring, Pacific sand lance, and surf smelt (F. A. Goetz et al., 2004). Bull trout of sizes greater than fry have been found to eat fish up to half their length (Beauchamp & Van Tassell, 2001).

5.1.4 Current Stressors and Threats

Throughout their range, bull trout are threatened by the combined effects of habitat degradation, fragmentation, and alterations associated with dewatering, road construction and maintenance, mining, grazing, the blockage of migratory corridors by dams or other diversion structures, entrainment in diversion channels, and introduced non-native species (64 FR 58910). Although all salmonids are likely to be affected by climate change, bull trout are especially vulnerable given that spawning and rearing are constrained by their location in upper watersheds and the requirement for cold water temperatures (Battin et al., 2007; Bruce E Rieman et al., 2007). Additional threats to bull trout include industrial development and urbanization, timber harvest, and poaching or bycatch.

The iteroparous reproductive strategy of bull trout has important repercussions for the management of this species. Bull trout require passage both upstream and downstream for both spawning and foraging, and passage must be allowed for multiple spawning migrations. However, most fish ladders were designed specifically for anadromous, semelparous salmonids (spawning once before death). Therefore, fish passage facilities (e.g., fish ladders) at barriers to migration may be a factor in isolating bull trout populations because they do not provide downstream passage for adults and subadults. Additionally, in some core areas, bull trout that migrate to marine waters must pass both upstream and downstream through areas with net fisheries at river mouths. This can increase the likelihood of mortality during spawning and foraging migrations.

Climate change is likely to play an increasingly important role in determining the abundance of ESA-listed species and the conservation value of designated critical habitats in the Pacific Northwest. Average regional temperatures are likely to increase by 3°F to 10°F over the next century (Karl, Melillo, Peterson, & Hassol, 2009). Overall, about one-third of the current cold-water habitat in the Pacific

Northwest is likely to exceed water temperature thresholds for bull trout by the end of this century (Karl et al., 2009). Significant reductions in both total snowpack and low-elevation snowpack in the Pacific Northwest are predicted over the next 50 years (Mote & Salathé, 2010), which will shrink the extent of the snowmelt-dominated habitat available to salmonids and cause warmer temperatures after snowmelt has run off (Karl et al., 2009). As the snow pack diminishes and seasonal hydrology shifts to more frequent and severe early large storms, stream flow timing and increased peak river flows may limit salmonid survival (Mantua, Tohver, & Hamlet, 2010). Similarly, marine conditions adverse to salmonids may be more likely under a warming climate (Zabel, Scheuerell, McClure, & Williams, 2006).

5.2 Mid-Columbia River Steelhead

The Middle Columbia River steelhead DPS was listed as threatened on March 25, 1999 (64 FR 14517). The threatened status was reaffirmed on June 28, 2005 (70 FR 37160) and updated on April 14, 2014 (FR 79 20802).

5.2.1 Distribution

The Middle Columbia River steelhead DPS includes all naturally spawned anadromous O. mykiss populations below impassable barriers in streams from above the Wind River in Washington and the Hood River in Oregon, upstream to, and including, the Yakima River in Washington but excluding O. mykiss from the Snake River Basin. Seven artificial propagation programs are also included in the DPS.

There are 17 extant populations (and three historically extirpated populations) in the Middle Columbia River steelhead DPS(ICTRT, 2003, 2005). The populations are further classified into four major population groups: John Day River (five extant populations), Umatilla/Walla Walla Rivers (three extant and one extirpated populations), Yakima River (four extant populations), and the Eastern Cascades group (five extant and two extirpated populations).

5.2.2 Critical Habitat

Critical habitat for the Middle Columbia River steelhead DPS was designated for Oregon and Washington in 2005 (70 FR 52630). The receiving waters for this permit are not designated critical habitat for Middle Columbia River steelhead.

5.2.3 Life History

Middle Columbia River steelhead trout follow a summer-run pattern (consistent with other inland steelhead), and they mature in streams for up to one year before spawning (DOI, 2011). Spawning migration starts in mid-May, and fish pass over Bonneville Dam in July and August (DOI, 2011). Fry emerge from gravel between May and June, and juvenile Middle Columbia River steelhead tend to smolt after two years in freshwater streams, after which they spend one to three years in the ocean before returning to freshwater (DOI, 2011). Middle Columbia River steelhead co-occur with non-anadromous rainbow trout, and they may not be reproductively isolated (Carmichael, 2006).

5.2.4 Current Stressors and Threats

Limiting factors for Middle Columbia River steelhead trout include adverse impacts from hydropower operations (i.e., modified hydrograph, increase in lentic conditions/ decrease in riverine conditions, passage barriers, altered temperatures and dissolved oxygen, and invasive species), riparian habitat degradation, decreased large wood recruitment, altered floodplain connectivity and function, altered

channel structure and complexity, reduced stream flows, and hatchery-related impacts (i.e., reduced genetic diversity) (NMFS, 2011).

Habitat quality in tributary streams in the Middle Columbia River range from excellent in wilderness and roadless areas to poor in areas subject to relatively heavy agricultural and urban development (NOAA, 2009; Wissmar et al., 1994). Critical habitat throughout much of the Middle Columbia River has been degraded by intense agriculture, alteration of stream morphology (i.e., channel modifications and diking), riparian vegetation removal, wetland draining and conversion, livestock grazing, dredging, road construction and maintenance, logging, mining, and urbanization. Reduced summer stream flows, impaired water quality, and reduction of habitat complexity are common problems for critical habitat in developed areas.

Many stream reaches designated as critical habitat in the Middle Columbia River are over-allocated under state water law, resulting in greater extraction of water than existing streamflow conditions can support. Withdrawal of water, particularly during low-flow periods that commonly overlap with agricultural withdrawals, often results in increased summer stream temperatures. Withdrawal can also block fish migration, strand fish, and alter sediment transport (Spence, Lomnicky, Hughes, & Novitzki, 1996). Reduced tributary stream flow has been identified as a major limiting factor for all listed salmon and steelhead species in this area (NMFS, 2016; UCSRB, 2007).

5.3 Yellow-Billed Cuckoo

5.3.1 General Information

The following information is taken from the proposed rule for threatened status for the western distinct population segment of the yellow-billed cuckoo (78 FR 61621)

The yellow-billed cuckoo (*Coccyzus americanus*) is a member of the avian family *Cuculidae* and is a Neotropical migrant bird that winters in South America and breeds in North America. Yellow-billed cuckoos spend the winter in South America, east of the Andes, primarily south of the Amazon Basin in southern Brazil, Paraguay, Uruguay, eastern Bolivia, and northern Argentina (AOU, 1998; Ehrlich, Dobkin, & Wheye, 1992; Johnson, 2008). The breeding range of the entire species formerly included most of North America from southeastern and western Canada (southern Ontario and Quebec and southwestern British Columbia) to the Greater Antilles and northern Mexico (AOU, 1983, 1998; Wetmore et al., 1957).

Adult yellow-billed cuckoos have moderate to heavy bills, somewhat elongated bodies, and a narrow yellow ring of colored bare skin around the eye. The plumage is loose and grayish-brown above and white below, with reddish primary flight feathers. The tail feathers are boldly patterned with black and white below. They are a medium-sized bird about 12 inches (in) (30 centimeters (cm)) in length, and about 2 ounces (oz) (60 grams (g)) in weight. The species has a slender, long-tailed profile, with a stout and slightly down-curved bill, which is blue-black with yellow on the basal half of the lower mandible. The legs are short and bluish-gray. Yellow-billed cuckoos have a zygodactyl foot, in which two toes point forwards and two toes point backwards. Juveniles resemble adults, except the tail patterning is less distinct and the lower bill has little or no yellow. Males and females differ slightly; the males have a slightly smaller body size, smaller bill, and the white portions of the tail tend to form distinct oval spots. In females the white spots are less distinct and tend to be connected (Hughes, 2015).

Typically a secretive and hard-to-detect bird, mated yellow-billed cuckoos have a distinctive "kowlp" call, which is a loud, nonmusical series of notes that slows down and slurs toward the end. Unmated yellow-billed cuckoos advertise for a mate using a series of soft "cooing" notes. Both members of a pair use the "knocker" call, a series of soft notes given as a contact or warning call near the nest (Hughes, 2015).

Little information exists on lifespan for yellow-billed cuckoos, which is a result of the scarcity of banded yellow-billed cuckoos and a very low recovery rate (0.4 percent) (Hughes, 2015). The longest known lifespan of a banded yellow-billed cuckoo is 5 years (USGS, 2021).

5.3.2 Critical Habitat

Critical habitat for yellow-billed cuckoo was designated on April 21, 2021 (86 FR 20798). No critical habitat was designated in Washington.

5.3.3 Diet

The yellow-billed cuckoo's diet consists of insects, frogs, lizards, small wild fruits, and seeds. Caterpillars are a primary prey species.[5]

5.4 Gray Wolf

5.4.1 General Information

The following information is taken from the final rule delisting the gray wolf from the endangered species list (85 FR 69778). This rule was vacated by a court order on February 10, 2022.

Gray wolves are the largest wild members of the canid (dog) family and have a broad circumpolar range. Adults range in weight from 18 to 80 kilograms (40 to 175 pounds), depending on sex and geographic locale. Gray wolves are highly territorial, social animals that live and hunt in packs. They are well adapted to traveling fast and far in search of food, and to catching and eating large mammals. In North America, they are primarily predators of medium to large mammals, including deer, elk, and other species, and are efficient at shifting their diet to take advantage of available food resources (USFWS, 2020).

Gray wolves are a highly adaptable species. They can successfully occupy a wide range of habitats provided adequate prey exists and human-caused mortality is sufficiently regulated. Scientific models generally depict high-quality suitable habitat as areas with sufficient prey where human-caused mortality is relatively low due to limited human access, or high amounts of escape cover, or relatively low risk of wolf-livestock conflicts (USFWS, 2020).

5.4.2 Distribution

Gray wolves in the lower 48 United States today exist primarily as two large metapopulations: One spread across northern Minnesota, Michigan, and Wisconsin, and the other consisting of the recovered and delisted Northern Rocky Mountains DPS wolf population that is biologically connected to a small number of colonizing wolves in western Washington, western Oregon, northern California, and, most likely, Colorado (USFWS, 2020) (figure 2).

[5] https://ecos.fws.gov/ecp/species/3911#lifeHistory

Gray wolves in the Western United States are distributed across the Northern Rocky Mountains DPS and into western Oregon, western Washington, northern California, and most recently in northwest Colorado (USFWS, 2020). The Western United States metapopulation consisted of more than 1,900 gray wolves in 2015 (at least 1,880 in the Northern Rocky Mountains DPS and at least 26 outside the Northern Rocky Mountains DPS boundary), the final year of a combined northern Rocky Mountain wolf annual report (USFWS, 2020) (Appendix 2). The most recent year-end minimum counts indicate at least 310 gray wolves occur in the States of Oregon, Washington, and California (USFWS, 2020) (Appendix 2).

5.4.3 Critical Habitat

There is designated critical habitat for gray wolf in Michigan and Minnesota (43 FR 9607). There is no critical habitat for gray wolf in Washington.

6 Effects of the Permit on Listed Species

The primary actions that are evaluated in this BE are the effluent limitations that, if applied, have the potential to influence levels of the pollutants of concern. See section 3.5.

The description of effects of the discharge permit is limited to the effects on the Middle Columbia River steelhead resulting from discharges from outfall 002.

There is no evidence that bull trout or Middle Columbia River steelhead are present in Spencer Lateral, which is the receiving water for outfall 008. No fish are present in Spencer Lateral during the non-irrigation season when the lateral is dry. Discharges from outfall 008 may affect water quality in downstream waters in which Middle Columbia River Steelhead are present (e.g., Wanity Slough, Subdrain 35, and the Yakima River). However, the effects on waters downstream from Spencer Lateral from discharge to outfall 008 would be no greater than the effects from discharges from outfall 002, where steelhead could be directly exposed to the discharge, which are analyzed below. Therefore, the effects analysis does not specifically address discharges from outfall 008.

EPA has determined that bull trout are not in the action area. The closest populations are in the Yakima River downstream from the action area and in Ahtanum Creek to the north of the action area. Therefore, bull trout is assigned a **no effect** determination and will not be addressed further in this BE.

Gray wolf and yellow-billed cuckoo are terrestrial species that are not aquatic-dependent. The only exposure pathway of the pollutants in the authorized discharges to these species would be consumption of water from the action area. All fresh surface waters of the State of Washington not named in WAC-173-201A-602 are protected for the designated use of wildlife habitat as well as stock watering, domestic water supply, and aquatic life (salmonid spawning, rearing, and migration) (WAC-173-201A-600). EPA has applied these use designations to the receiving waters. The water quality criteria and water quality-based effluent limits are protective of these uses. Thus, EPA finds that the discharges authorized by this permit will have **no effect** on the yellow-billed cuckoo and gray wolf, and these species are not addressed further in this BE.

6.1 Direct Effects of Pollutants on Middle Columbia Steelhead

EPA has evaluated the discharges likely to result from compliance with the permit limits for this permit. Based on this evaluation, EPA has determined that issuance of this permit is not likely to adversely affect Middle Columbia River steelhead. The discussion below outlines this evaluation for each pollutant.

6.1.1 Dissolved Oxygen (DO)/Biochemical Oxygen Demand

Oxygen depletion is caused by decomposition of organic matter, and nitrification of ammonia, both measured as biochemical oxygen demand (BOD), and by algal respiration. Data from Wanity Slough indicates that the water quality criteria for dissolved oxygen are not consistently met (Table 8).

Dissolved oxygen is a characteristic of a water body that can be affected by several different parameters such as temperature, physical characteristics (stream velocities, percent sediments, etc.), nutrients, sunlight, ammonia, etc. Because any oxygen demanding material or nutrients can negatively affect dissolved oxygen, meeting the criterion without allowing some insignificant decrease in dissolved oxygen would require disallowing any discharge of any pollutant that would affect dissolved oxygen. In this case, EPA believes that this is unnecessarily restrictive and would lead to unnecessary and costly expenditures for the facility.

Therefore, EPA is requiring the facility to control BOD and D.O. levels such that the discharge meets DO criteria at the end-of-pipe and the BOD discharge has a non-measurable effect on dissolved oxygen levels in the water. Washington State defines a measurable change in D.O. as a decrease in D.O. of 0.2 mg/L (see WAC 173-201A-320). The draft permit requires that the effluent DO be at least 90% of saturation (at the effluent temperature) or 6.8 mg/L, whichever is greater.

Because the discharge will have a non-measurable effect on D.O., EPA has determined that the permit limits for D.O. and biochemical oxygen demand will have insignificant and discountable effects and are therefore **not likely to adversely affect** Middle Columbia River steelhead.

6.1.2 Total Suspended Solids/Turbidity

Total suspended solids (TSS) include settleable and suspended sediment and organic solids in a wastewater discharge. As such, TSS provides a surrogate for sediment in the discharge that may have the potential to impact the listed aquatic species. Sediment can impact spawning habitat by physically covering habitat, adding to the nutrient loading in the system, and by creating hypoxic or anoxic conditions.

Significant suspended sediment loads have been associated with the discharge of agricultural return flows to the river during the irrigation season. During the 1995 irrigation season, the combined TSS load from Yakama Reservation drains and tributaries to the Yakima River was 75 tons per day, whereas only 1.5 tons per day came from municipal or industrial sources (Ecology, 1998). The average monthly mass limit for TSS in the draft permit is 572 lb/day, or 0.286 tons per day. The prevalence of suspended sediment from eroded farm soils has long been recognized as a problem in the tributaries and main stem of the Yakima River where furrow and flood irrigation are employed. In the lower basin, high sediment levels have been correlated with high levels of turbidity and high levels of bacteria, which exceed water quality standards during the irrigation season.

There are no numeric water quality criteria for TSS. The TSS limits in the draft permit are based on the ELGs, which are production-normalized, meaning that the loading limit is based in part on the average daily production that can reasonably be expected to prevail during the next term of the permit. The calculation of production-normalized technology-based effluent limits is explained in the U.S. Environmental Protection Agency NPDES Permit Writers' Manual at Section 5.2.2.5 (USEPA, 2010).

Based on the expected production level during the term of the permit the average monthly allowable discharge for is 42.8 mg/L or 572 lbs/day. The average monthly concentration limit for TSS is less than the 56 mg/L TSS target for tributaries to the Yakima River in the Lower Yakima River Suspended Sediment TMDL (Ecology, 1998).

However, numeric water quality criteria for the protection of aquatic life are applicable for turbidity (WAC 173-201A-200(1)(e)). The average monthly turbidity limit in the draft permit is 12.4 NTU. Turbidity limits were carried forward from the prior permit. Washington's water quality criterion for turbidity is 5 NTU over background when the background is 50 NTU or less; or a 10 percent increase in turbidity when the background turbidity is more than 50 NTU. This level is intended to be protective of aquatic life. The maximum background turbidity in Wanity Slough is 15.4 NTU (Table 8), thus the average monthly turbidity limits require effluent turbidity to be less than the maximum observed background turbidity, thus ensuring that the discharge has similar turbidity to the receiving water.

The primary source of sediment loading is from non-point agricultural sources, and the loading attributed to this facility is comparatively small. The effluent limits for TSS will require the effluent TSS concentration to be lower than the target for Yakima River tributaries in the Lower Yakima River Suspended Sediment TMDL. The effluent limits for turbidity will ensure that the effluent turbidity is close to the background turbidity. EPA has therefore determined that the permit limits for TSS and turbidity will have insignificant and discountable effects and are therefore **not likely to adversely affect** Middle Columbia River steelhead.

6.1.3 *E. Coli* Bacteria

E. coli bacteria are indicators of potential human pathogens. There is no information to suggest that bacteria or the pathogens for which they are indicators pose any threat to the Middle Columbia River steelhead, therefore, EPA has determined that the discharges of bacteria will have **no effect** on the Middle Columbia River steelhead.

6.1.4 Total Residual Chlorine

Under normal operation, chlorine is not a pollutant of concern for the Toppenish Plant, because the facility uses ultraviolet disinfection. However, chlorine disinfection is present as a backup to ultraviolet disinfection and the permit includes water quality-based effluent limits for total residual chlorine to ensure protection of water quality if chlorine is used.

The maximum daily limit for total residual chlorine for outfall 002 is identical to the acute water quality criterion of 19 µg/L and the average monthly limit of 9.5 µg/L is less than the chronic water quality criterion of 11 µg/L. Thus, the effluent limits in the draft permit meet water quality criteria for chlorine at the end-of-pipe.

In the *Biological Evaluation of EPA's Proposed Approval Action on the Swinomish Tribe's Water Quality Standards* (USEPA, 2022), EPA found that the Swinomish Tribe's freshwater criteria for total residual chlorine, which are identical to Washington's criteria, are not likely to adversely affect any threatened or endangered species, including steelhead and bull trout.

Because chlorine is used for disinfection only as a backup for ultraviolet disinfection, and because the backup use of chlorine is subject to water quality-based effluent limits that meet water quality criteria that are not likely to adversely affect steelhead, discharges of chlorine from the Toppenish Plant will

have insignificant and discountable effects and are therefore **not likely to adversely** affect Middle Columbia River steelhead.

6.1.5 pH

The pH effluent limits in the draft permit implement the range portion of Washington's pH criteria (6.5 – 8.5 standard units) at the end-of-pipe. The criteria also include a provision limiting human-caused variation to 0.5 standard units. Data from Wanity Slough indicate that the water quality criteria for pH are not consistently met (Table 8).

In the *Biological Evaluation of EPA's Proposed Approval Action on the Swinomish Tribe's Water Quality Standards* (USEPA, 2022), EPA found that the Swinomish Tribe's freshwater criteria for pH were not likely to adversely affect any threatened or endangered species, including steelhead and bull trout. The applicable pH criteria for the Toppenish Plant permit are similar to the Swinomish Tribe's pH criteria. The range portion of the criteria is identical; however, the human-caused variation portion of the criterion is less stringent in the case of this permit (0.5 standard units instead of 0.2 standard units for the Swinomish water quality criteria). The effects analysis in the Swinomish BE was based primarily on the range portion of the criterion.

The draft permit requires the effluent pH to comply with the range portion of the water quality criteria at the end-of-pipe. Because the draft permit requires that the pH of the effluent be within a range that is not likely to adversely affect steelhead, the pH of the Toppenish Plant discharge will have insignificant and discountable effects and is therefore **not likely to adversely affect** Middle Columbia River steelhead.

6.1.6 Temperature

Water temperature is a critical aspect of the freshwater habitat of Pacific Northwest salmon and trout. These fish, including those listed as threatened or endangered under the Endangered Species Act (ESA), need cold water to survive. Human-caused increases in river water temperatures have been identified as a factor in the decline of ESA-listed fish in the Pacific Northwest. State and Tribal temperature water quality standards can play an important role in helping to maintain and restore water temperatures to protect these salmon and trout and aid in their recovery.

The applicable temperature criterion for the Toppenish Plant is a site-specific temperature criterion for Yakima River, because the portion of the Yakima River to which this site-specific criterion is applicable is the first water of the State of Washington that is downstream from the discharges. The site-specific temperature criterion is "Temperature shall not exceed a 1-DMax of 21.0°C due to human activities. When natural conditions exceed a 1-DMax of 21.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time, exceed $t = 34/(T + 9)$" (WAC 173-201A-602). A 1-Dmax temperature is defined as "the highest water temperature reached on any given day" (WAC 173-201A-020).

EPA has determined that the discharge from the Toppenish Plant has the reasonable potential to cause or contribute to excursions above water quality criteria for temperature in Wanity Slough in June, July, and August. The draft permit does not propose a compliance schedule for the new water quality-based effluent limits for temperature; the permittee must comply with the temperature limits immediately on the effective date of the final permit. This is because the permittee can avoid the need to comply with the June – August temperature limits for Outfall 002 by discharging through Outfall 008 (to Spencer

Lateral), which does not have temperature limits, and where threatened and endangered fish are not known to be present. From September – May, the discharge does not have the reasonable potential to cause or contribute to excursions above water quality standards for temperature. From September – May, when no temperature effluent limits apply, observed end-of-pipe temperatures are below 32 °C. The final water quality-based effluent limits for temperature are 31.2 °C in June and 23.6 °C in July and August. Discharge temperatures will therefore not cause lethality to fish within the thermal plume at any time (USEPA, 2003).

The discharge generally does not have the reasonable potential to cause or contribute to excursions above water quality criteria for temperature. The draft permit includes immediately effective water quality-based effluent limits for outfall 002 from June – August when the discharge does have the reasonable potential to excursions above water quality criteria for temperature. Observed or limited discharge temperatures are below 32 °C. Therefore, the discharge of heat from the Toppenish Plant will have insignificant and discountable effects and is therefore **not likely to adversely affect** Middle Columbia River steelhead.

6.1.7 Nitrogen Compounds

There are three nitrogen compounds that are pollutants of concern for the Toppenish Plant: total nitrogen, ammonia, and nitrate-nitrite.

6.1.7.1 Ammonia

Discharges of ammonia may impact receiving waters in three ways: 1) by causing acute or chronic toxicity, 2) by causing dissolved oxygen depression due to nitrogenous BOD, and 3) by adding nitrogen, which may act as a nutrient, to the receiving water.

To evaluate potential for acute or chronic effects on steelhead, EPA developed the effluent limits using the Washington acute and chronic ammonia criteria. The ammonia toxicity is both temperature and pH dependent, and the criteria were implemented using the 95th percentile of the pH and temperature data collected from Wanity Slough. The ammonia concentrations in Wanity Slough, upstream of the facility, are less than the ammonia criteria which would result in acute or chronic effects on fish. Mixing zones of 2.5% of the low flow for acute criteria and 25% of the low flow for chronic criteria were used when determining the effluent limits to ensure that there is remaining assimilative capacity in the stream downstream of the facility, and to ensure that there is a zone of passage for aquatic life.

EPA analyzed the effects of Washington's acute ammonia criterion on Middle Columbia River steelhead in the *Biological Evaluation of Washington's Freshwater Ammonia Acute Water Quality Standard* and found that the acute ammonia criterion is not likely to adversely affect Middle Columbia River steelhead and bull trout (USEPA, 2021). Washington's chronic ammonia criterion is more stringent than the EPA's current recommended criterion.[6] As discussed above, both the acute and chronic criterion are implemented using the 95th percentile pH and temperature of the receiving water, thus ensuring a very low probability of a criterion exceedance.

[6] https://www.epa.gov/wqc/aquatic-life-criteria-ammonia

Because the ammonia effluent limits conservatively implement protective water quality criteria, EPA has determined that the discharge of ammonia from the facility will have insignificant and discountable effects and is therefore **not likely to adversely affect** the Middle Columbia River steelhead.

6.1.7.2 Total Nitrogen and Nitrate-Nitrite

The draft permit includes water quality-based effluent limits for total nitrogen for outfall 002 from April – October and technology-based effluent limits that apply from November – March. EPA determined that the discharge from outfall 002 does not require effluent limits for nitrate-nitrite specifically. The total nitrogen limits will also control nitrate and nitrite as these compounds are components of total nitrogen.

The water quality-based effluent limits for total nitrogen are based on Washington's narrative water quality criterion for aesthetics (WAC 173-201A-260(2)(b)). However, these water quality-based effluent limits may also mitigate the observed exceedances of dissolved oxygen and pH criteria in Wanity Slough (Table 8). Therefore, EPA finds that the discharge of total nitrogen will have insignificant and discountable effects and is therefore **not likely to adversely affect** Middle Columbia River steelhead.

6.1.8 Total Phosphorus

The draft permit includes water quality-based effluent limits for total phosphorus for outfall 002 from April – October. The water quality-based effluent limits for total phosphorus are based on Washington's narrative water quality criterion for aesthetics (WAC 173-201A-260(2)(b)). However, these water quality-based effluent limits may also mitigate the observed exceedances of dissolved oxygen and pH criteria in Wanity Slough (Table 8). Therefore, EPA finds that the discharge of total phosphorus will have insignificant and discountable effects and is therefore **not likely to adversely affect** Middle Columbia River steelhead.

6.1.9 Oil and Grease

Nonpetroleum oils may occur at four levels in the aquatic environment: (a) floating on the surface, (b) emulsified in the water column, (c) solubilized, and (d) settled on the bottom as a sludge. Oils of any kind can cause (a) drowning of water fowl because of loss of buoyancy, exposure because of loss of insulating capacity of feathers, and starvation and vulnerability to predators because of lack of mobility; (b) lethal effects on fish by coating the epithelial surfaces of gills, thus preventing respiration; (c) potential fish kills resulting from biochemical oxygen demand; (d) asphyxiation of benthic life forms when floating masses become engaged with surface debris and settle on the bottom; and (e) adverse aesthetic effects of fouled shorelines and beaches. Oils of animals or vegetables are generally chemically non-toxic to humans and aquatic life. However, floating sheens of such oils can result in deleterious environmental effects as described above. Thus, EPA recommended that surface waters be virtually free from floating nonpetroleum oils of vegetable or animal origin (USEPA, 1986).

The proposed permit contains a narrative condition which states: "There shall be no discharge of floating solids, visible foam, or oily wastes which produce a sheen on the surface of the receiving water." The draft permit also includes numeric effluent limits for oil and grease. The numeric limits are carried forward from the prior permit and are more stringent than the technology-based effluent limits from the effluent limit guidelines.

EPA believes that the numeric and narrative effluent limits for oil and grease will ensure that the water is not negatively impacted from oil and grease, therefore, EPA has determined that the permit limits for

oil and grease will have insignificant and discountable effects and are therefore **not likely to adversely affect** Middle Columbia River steelhead.

6.1.10 Whole Effluent Toxicity

Limits on whole effluent toxicity implement Washington's narrative water quality criterion for toxicity (WAC 173-201A-260(2)(a)) by requiring that the toxicity of the effluent, as measured by EPA-approved biological methods (40 CFR 136.3, Table IA), is less than that which would cause chronic toxicity at the edge of the chronic mixing zone. EPA has interpreted Washington's narrative water quality criterion for toxicity as a value of 1.0 chronic toxic units. A chronic toxic unit is defined as 100 divided by the no observed effect concentration (NOEC) for survival endpoints or 100 divided by the 25% inhibition concentration (IC_{25}) for other endpoints, where the NOEC and IC_{25} are both measured in percent effluent (USEPA, 1991).

EPA has determined that the discharge from outfall 002 has the reasonable potential to cause or contribute to excursions above Washington's narrative water quality criterion for toxicity and therefore the draft permit includes water quality-based effluent limits for whole effluent toxicity. EPA has determined that the permittee cannot comply with the new water quality-based effluent limits for whole effluent toxicity and that a compliance schedule is appropriate for the new water quality-based effluent limits for whole effluent toxicity. During the term of the compliance schedule, performance-based interim effluent limits for WET are proposed in the draft permit.

The final water quality-based effluent limits for WET ensure that chronic toxicity at the edge of the chronic mixing zone will be less than 1.0 TUc under critical conditions. Therefore, the final water quality-based effluent limits for WET will have insignificant and discountable effects and are therefore **not likely to adversely affect** Middle Columbia River steelhead.

Although the performance-based interim limits for WET are less stringent than the final water quality-based effluent limits, it should be noted that the final water quality-based effluent limits are based on critical conditions, which are, by definition, improbable. The probability basis of the performance-based average monthly limit for whole effluent toxicity is 95%, which means there is a 5% probability of effluent toxicity equal to or exceeding the interim average monthly limit of 13.4 TUc. Assuming that the effluent flow is equal to the maximum monthly average flow of 0.916 mgd, the probability of a dilution factor after mixing with 25% of the receiving water flow that is less than or equal to 13.4:1 is 45.2%. This means that the probability of an effluent toxicity at or greater than 13.4 TUc coinciding with a dilution factor of 13.4:1 or less after mixing with 25% of the flow in Wanity Slough is 2.26% (0.05 × 0.42 = 0.0226).

Toxicity will continue to be mitigated as the discharge continues to mix with the receiving water. The probability of a dilution factor of 13.4:1 or less after mixing with 50% of the receiving water flow is 15.5%, thus the probability of an effluent toxicity at or greater than 13.4 TUc coinciding with a dilution factor of 13.4:1 or less after mixing with 50% of the flow in Wanity Slough is 0.78% (0.05 × 0.155 = 0.0078).

Because there is a low probability that the interim WET limits will result in a toxic condition after mixing with actual (as opposed to critical) receiving water flows, the interim WET limits will also have insignificant and discountable effects and are therefore **not likely to adversely affect** Middle Columbia River steelhead.

6.1.11 Total Dissolved Solids

EPA evaluated total dissolved solids to determine whether the discharges from the Toppenish Plant have the reasonable potential to cause or contribute to excursions above water quality standards for water supply uses.

EPA has applied a criterion of 500 mg/L for total dissolved solids to protect agricultural and domestic water supply uses, based on *Quality Criteria for Water 1986* (USEPA, 1986) and the EPA's secondary drinking water standards.[7] EPA determined that the discharge from outfall 002 does not have the reasonable potential to cause or contribute to excursions above this criterion.

Quality Criteria for Water 1986 also addresses effects of dissolved solids on aquatic life. The recommended variation from natural salinity for waters with natural salinity between 0 and 3.5 parts per thousand is 1 part per thousand, or 1,000 mg/L.

Because the discharge of total dissolved solids from the Toppenish Plant does not have the reasonable potential to cause or contribute to excursions above the water supply criterion of 500 mg/L, the discharge will not change the salinity of the ambient water by 1,000 mg/L. Therefore, the discharge of total dissolved solids will have insignificant and discountable effects and is therefore **not likely to adversely affect** Middle Columbia River steelhead.

6.2 Effects on the Environmental Baseline

The environmental baseline for receiving waters would be affected by the direct effects listed in section 6.1.

Biological Oxygen Demand and DO are limited in the discharge from the facility. As discussed in section 6.1.1, the dissolved oxygen and BOD5 at the points of discharge from the facility will not measurably affect the environmental baseline of the receiving water.

The facility discharges total suspended solids/turbidity, thereby very slightly affecting the total suspended solids and turbidity in the receiving streams. However, the load from the facility is far outweighed by sediment load and turbidity from other non-point sources (e.g., agricultural return flows) in the basin (Ecology, 1998). Additionally, as explained in section 6.1.2, the turbidity limits have been established to ensure that the water quality for aquatic life is protected, and the technology-based TSS limits require an effluent TSS concentration lower than the target in the Lower Yakima River Suspended Sediment TMDL. Therefore, EPA has determined that with respect to total suspended solids and turbidity the facility will not significantly affect the environmental baseline in receiving streams.

Under normal operation, the discharge does not discharge total residual chlorine. At times when chlorine is used for disinfection as a backup to ultraviolet disinfection, chlorine concentrations are subject to effluent limits that apply water quality criteria at the end-of-pipe. See section 6.1.4. The infrequent and small discharge of chlorine from the facility will not affect the environmental baseline.

Although excursions of pH criteria have been observed in the receiving water (Table 8), this is not attributable to the discharge authorized in the permit, which requires compliance with the range portion of the pH water quality criterion at the end-of-pipe. See section 6.1.5.

[7] https://www.epa.gov/sdwa/secondary-drinking-water-standards-guidance-nuisance-chemicals

The heat in the discharges slightly increase the temperature near the outfalls. However, to the extent that the discharges have the reasonable potential to cause or contribute to excursions above water quality criteria for temperature, the permit includes water quality-based effluent limits for temperature which ensure compliance with water quality criteria for temperature. See section 6.1.6.

The permit includes effluent limits for ammonia that ensure compliance with water quality criteria for ammonia. The acute ammonia criteria are demonstrated to be protective of Middle Columbia River steelhead and bull trout. EPA has determined that the permit is not likely to adversely affect the environmental baseline with respect to ammonia. See section 6.1.7.1.

The total nitrogen and total phosphorus limits in the permit will require a substantial reduction in the total nitrogen and total loads discharged by the facility, thus improving the environmental baseline. Although these limits are not based on aquatic life criteria, they may mitigate the observed exceedances of DO and pH criteria downstream from the facility (Table 8). See sections 6.1.7.2 and 6.1.8.

The facility also discharges oil and grease in their effluent, thereby increasing the amount of oil and grease in the streams. However, the permit limits the amount of oil and grease that is discharged such that there is no oily sheen visible on the receiving water. As stated in Part 6.1.9, this requirement should ensure that aquatic life is protected. EPA has determined that the discharge of oil and grease will not significantly affect the environmental baseline in the receiving streams.

Although EPA has determined that the toxicity of the effluent has the reasonable potential to cause or contribute to excursions above Washington's narrative water quality criterion for toxicity, there is a low probability of toxic conditions in the receiving water after mixing, even during the term of the compliance schedule for the final water quality-based effluent limits. See section 6.1.10. The interim effluent limits for whole effluent toxicity are performance-based and will therefore maintain the environmental baseline; the final water quality-based effluent limits for whole effluent toxicity require a reduction from historically observed toxicity and will improve the environmental baseline.

The discharge of total dissolved solids from outfall 002 will not increase the salinity of the receiving water to an extent that would cause adverse effects on aquatic life.

6.3 Critical Habitat

The action area does not include critical habitat for any threatened or endangered species. The effects of the pollutants of concern in the discharge, on water quality have been discussed in section 6.1 above.

6.4 Use of Best Scientific and Commercially Available Data

To determine effects of the facility discharges, the best scientific and commercially available data was used to evaluate these effects.

6.5 Effects Determination for Listed Aquatic and Terrestrial Species and Designated Critical Habitat

6.5.1 Salmonids

The Middle Columbia River Bull trout are not in the vicinity of the discharge, therefore there is no effect on the listed Bull trout.

However, the Middle Columbia River steelhead are found in Wanity Slough, therefore it is important to make sure the direct and cumulative effects of the facility do not further endanger the steelhead. As discussed in section 6.1, the discharges of pollutants from the facility are generally not likely to adversely affect Middle Columbia River steelhead, with the discharge of *E. coli* bacteria having no effect on Middle Columbia River steelhead.

The permit may be modified during the life of the permit if new information regarding the discharge effects on listed species becomes available.

7 Essential Fish Habitat

EPA assessed the draft permit for potential adverse effects to essential fish habitat in Appendix F to the fact sheet, which is in turn provided as Appendix B to this BE. EPA determined that the discharge is not likely to adversely affect EFH.

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Appendix A: Draft NPDES Permit

Appendix B: Fact Sheet