Fact Sheet

The U.S. Environmental Protection Agency (EPA)

Proposes to Reissue a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA) to:

City of Wrangell

Wastewater Treatment Plant

Public Comment Start Date: October 25, 2022

Public Comment Expiration Date: December 9, 2022

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EPA PROPOSES TO REISSUE THE NPDES PERMIT

EPA proposes to reissue the NPDES permit for the facility referenced above. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility.

This Fact Sheet includes:

- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limitations and other conditions for the facility
- a map and description of the discharge location
- technical material supporting the conditions in the permit

STATE CERTIFICATION

EPA is requesting that the State of Alaska Department of Environmental Conservation (ADEC) certify the permit for this facility pursuant to Section 401 of the Clean Water Act (CWA or Act). Under CWA Section 401(a)(1), EPA Region 10 may not issue a permit until ADEC has granted or denied certification under 40 CFR 124.55 or waived its right to certify.

Questions regarding ADEC's intent to certify the permit should be directed to:

Alaska Department of Environmental Conservation
Attn: James Rypkema, Program Manager, Stormwater and Wetlands
P.O. Box 111800
Juneau, Alaska 99811
907-334-2288
james.rypkema@alaska.gov

CLEAN WATER ACT SECTION 401(a)(2) REVIEW

Section 401(a)(2) of the CWA requires that, upon receipt of an application and state certification pursuant to Section 401(a)(1) of the CWA, EPA as the permitting authority, shall notify a neighboring state or tribe with Treatment as a State (TAS) when EPA determines that the discharge may affect the quality of the neighboring state/tribe's waters. 33 USC 1341(a)(2). No neighboring states or tribes will be impacted by the discharge from this facility.

PUBLIC COMMENT

We request that all comments on EPA's draft permits or requests for a public hearing be submitted via email to Jamey Stoddard (stoddard.jamey@epa.gov). If you are unable to submit comments via email, please call 206.553.6110.

Persons wishing to comment on or request a public hearing for the draft permit for this facility may do so in writing by the expiration date of the public comment period. A request for a public hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. All comments and requests for public hearings must be in writing and should be submitted to the EPA as described in the Public Comments section of the attached Public Notice.

After the Public Notice expires, and all comments on the draft permit and tentative 301(h) decision have been considered, EPA Region 10 will make a final decision regarding 301(h) eligibility and permit issuance. If no substantive comments are received, the tentative conditions in the draft permit will become final, the tentative 301(h) decision will be finalized, and the permit will become effective upon issuance. If substantive comments are received, EPA will address the comments prior to taking final action on the 301(h) decision and permit. The permit will become effective no less than 30 days after the issuance date, unless an appeal is submitted to the Environmental Appeals Board within 30 days pursuant to 40 CFR 124.19.

DOCUMENTS ARE AVAILABLE FOR REVIEW

The draft permit, this FS, the 301(h) Tentative Decision document (301(h) TD), and the Public Notice can also be found by visiting the Region 10 website at https://www.epa.gov/npdes-permits/about-region-10s-npdes-permit-program.

The draft Administrative Record for this action contains any documents listed in the References section. The Administrative Record or documents from it are available electronically upon request by contacting Jamey Stoddard.

For technical questions regarding the draft permit, this Fact Sheet, or the 301(h) TD, contact Jamey Stoddard at 206.553.6110 or stoddard.jamey@epa.gov. Services can be made available to persons with disabilities by contacting Audrey Washington at (206) 553-0523.

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Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
Act	Clean Water Act
AML	Average Monthly Limit
ASR	Alternative State Requirement
AWL	Average Weekly Limit
BE	Biological Evaluation
BOD_5	Biochemical oxygen demand, five-day
°C	Degrees Celsius
C BOD_5	Carbonaceous Biochemical Oxygen Demand
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
EA	Environmental Assessment
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
HUC	Hydrologic Unit Code
ICIS	Integrated Compliance Information System
LA	Load Allocation
lbs/day	Pounds per day
LTA	Long Term Average
LTCP	Long Term Control Plan
mg/L	Milligrams per liter
mL	Milliliters
ML	Minimum Level
µg/L	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
MLLW	Mean Lower Low Water
MPN	Most Probable Number

N	Nitrogen
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
POTW	Publicly owned treatment works
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
RWC	Receiving Water Concentration
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
s.u.	Standard Units
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
UV	Ultraviolet
WD	Water Division
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

I. BACKGROUND INFORMATION

A. General Information

This fact sheet provides information on the draft NPDES permit for the following entity:

General Facility Information

NPDES Permit #:	AK0021466
Applicant:	City of Wrangell Wastewater Treatment Plant
Type of Ownership	Publicly Owned Treatment Works
Physical Address:	Mile 1.7, Zimovia Highway Wrangell, Alaska, 99929
Mailing Address:	P.O. Box 531 Wrangell, Alaska, 99929
Facility Contact:	Brian Christian Lead Wastewater Treatment Operator wrgwwtp@aptalaska.net (907)-874-3458
Facility Location:	Lat: 56.453090, Long: -132.380137
Receiving Water	Zimovia Straight
Facility Outfall	Lat: 56.453298 Long: -132.391262 (midpoint of diffuser)

B. Modification of Secondary Treatment Requirements

The City of Wrangell (the City, the applicant, Wrangell, or the permittee) has requested a modification, under Section 301(h) of the CWA, 33 USC 1311(h), of the secondary treatment requirements contained in Section 301(b)(1)(B) of the CWA, 33 USC 1311(b)(1)(B), to discharge wastewater receiving less than-secondary treatment from the Wrangell wastewater treatment plant (WWTP) into Zimovia Straight. The effluent quality attainable by secondary treatment is defined in regulations at 40 CFR Part 133 in terms of BOD_5, TSS, and pH. The City has requested a 301(h) modification of the secondary treatment requirements for BOD_5 and TSS, but not pH.

Upon review of the application materials and available data the EPA has tentatively determined that the Wrangell WWTP meets the nine statutory requirements of Section 301(h) of the CWA and the implementing regulations at 40 CFR Part 125, Subpart G, and is proposing to reissue a 301(h)-modified NPDES permit to the facility. EPA has prepared a Tentative Decision document (301(h) TD), which presents the findings and conclusions of the Region as to whether the applicant's proposed

discharge complies with the criteria set forth in Section 301(h) of the Act, as implemented by regulations at 40 CFR § 125, Subpart G.

C. Permit History

EPA approved the City of Wrangell's first request for modification of secondary treatment requirements and issued its first CWA Section 301(h)-modified NPDES permit on October 6, 1983. The most recent NPDES permit was issued on December 4, 2001, became effective on January 7, 2002, and expired on January 8, 2007 (hereinafter, the 2002 permit). A timely and complete NPDES application for permit reissuance was submitted by the permittee on April 25, 2006. Pursuant to 40 CFR 122.6, the permit has been administratively continued and remains fully effective and enforceable.

D. Tribal Consultation

EPA consults on a government-to-government basis with federally recognized tribal governments when EPA actions and decisions may affect tribal interests. Meaningful tribal consultation is an integral component of the federal government's general trust relationship with federally recognized tribes. The federal government recognizes the right of each tribe to self-government, with sovereign powers over their members and their territory. Executive Order 13175 (November 2000) entitled "Consultation and Coordination with Indian Tribal Governments" requires federal agencies to have an accountable process to assure meaningful and timely input by tribal officials in the development of regulatory policies on matters that have tribal implications and to strengthen the government-to-government relationship with Indian tribes. In May 2011, EPA issued the "EPA Policy on Consultation and Coordination with Indian Tribes" which established national guidelines and institutional controls for consultation.

The Wrangell WWTP is located within the territory of the Wrangell Cooperative Association (WCA), a federally recognized tribe. EPA notified the WCA of its work on this draft permit via electronic mail in August 2020, January 2021, and held an informational webinar for WCA and other tribes on April 14 and April 25, 2022. On October 14, 2022, EPA invited the WCA to participate in government-to-government consultation on the draft 301(h) and permitting decisions.

II. Facility Information

A. Treatment Plant Description

1. Service Area

The City of Wrangell owns and operates the WWTP located in Wrangell, Alaska. The collection system has no combined sewers. The facility serves a resident population of approximately 2,100 people. There are no major industries discharging to the facility.

2. Treatment Process

The peak design flow of the facility is 3 million gallons per day (mgd) and the average daily design flow is 0.6 mgd. The actual flows from the facility range from 0.21 to 0.56

mgd (average monthly flow). The treatment process consists of a mechanical screen, a 3.5 mgd aeration basin with six day detention, and a 1.2 mgd sedimentation basin with two day detention. Because the design flow is 0.6 mgd, the facility is considered a minor facility. A schematic of the wastewater treatment process and a map showing the location of the treatment facility and discharge are included in Appendix A of the 301(h) TD.

B. Outfall Description

Effluent is discharged approximately 1500 feet from shore at mean lower low water (MLLW) through a 12-inch high density polyethylene pipe terminating in a 240 foot diffuser with sixteen three inch horizontal ports spaced sixteen feet apart. Figures of the outfall can be found in Appendix A of the 301(h) TD.

C. Effluent Characterization

To characterize the effluent, EPA evaluated discharge monitoring report (DMR) data between 2016 and 2021 and the results of a 2006 priority pollutant scan. The effluent quality is summarized in Table 1. Additional data are provided in Appendix A of this fact sheet and Appendix C of the 301(h) TD.

Table 1. Effluent Characterization

Parameter	Minimum	Maximum	Average
Biochemical Oxygen Demand[1]	8.4 mg/L	100 mg/L	18.4 mg/L
TSS[1]	4 mg/L	48 mg/L	13.6 mg/L
Fecal Coliform[1]	72 CFU	60,000 CFU	14,892.7 CFU
Ammonia Nitrogen[1]	4.4 mg/L	28 mg/L	13.1 mg/L
Dissolved Oxygen[1]	2.7 mg/L	10.6 mg/L	6.5 mg/L[2]
pH[1]	6.5	7.8	7.3[2]
Temperature[1]	2.2 C	18.6 C	10.22 C
Copper[3]	43 µg/L	51.2 µg/L	46.4 µg/L
Nickel[3]	3.3 µg/L	3.7 µg/L	3.5 µg/L
Silver[3]	1.62 µg/L	1.62 µg/L	1.62 µg/L
Lead[3]	1.15 µg/L	1.39 µg/L	1.31 µg/L
Zinc[3]	18 µg/L	37.8 µg/L	27.0 µg/L

[1]DMR Data 2016-2021

[2]Average of maximum and minimum reported values

[3]Metals data from three priority pollutant scans (March 21, March 28, April 5, 2006).

D. Compliance History

A summary of effluent violations from 2016-2022 is provided in Table 3. Overall, the facility has a good compliance record. The facility failed to meet the required 30 percent removal for BOD_5 in November 2019, and had several instances of record keeping and reporting violations. More recently the facility exceeded its monthly flow limitation in January 2022.

Additional compliance information for this facility, including compliance with other environmental statutes, is available on Enforcement and Compliance History Online (ECHO). The ECHO web address for this facility is: https://echo.epa.gov/detailed-facility-report?fid=110064637898#history110064637898

Table 2. Summary of Effluent Violations 2016-2022

Parameter	Limit Type	Units	Number of Instances	Number of Violations
BOD_5	Monthly Minimum Removal	%	1	1
Flow	Month Average	mgd	1	1
Information accessed in ECHO on February 28, 2022.				

EPA conducted an inspection of the facility in August 2017. The inspection encompassed the wastewater treatment process, records review, operation and maintenance, and the collection system. Upon review of administrative files, EPA found that the facility submitted two DMRs late, which is a violation of Part II.C of the Permit. Another area of concern was the proper maintenance of the facility related to sludge removal from the sedimentation basin. At the time of inspection, sludge had not been removed from the sedimentation basin since it was installed in 2002. The inspection recommended sludge be removed from the sedimentation basin to ensure continued and proper operation of the WWTP and compliance with permit conditions.

III. Receiving Water

In drafting permit conditions, EPA must analyze the effect of the facility's discharge on the receiving water. The details of that analysis are provided in the 301(h) TD and in the Water Quality-Based Effluent Limits (WQBEL) section of this FS. This section summarizes characteristics of the receiving water that impact that analysis.

The facility discharges to Zimovia Straight in the saline estuarine waters south of the Stikine River, near the City of Wrangell, Alaska. For a detailed description of the receiving waters please refer to section 6 of the 301(h) TD.

A. Water Quality Standards (WQS)

CWA Section 301(b)(1)(C) requires the development of limitations in permits necessary to meet WQS. 40 CFR 122.4(d) requires that the conditions in NPDES permits ensure compliance with the WQS of all affected states. A state's WQS are composed of use classifications, numeric and/or narrative water quality criteria and an anti-degradation policy. The use classification system designates the beneficial uses that each water body is expected to achieve, such as drinking water supply, contact recreation, and aquatic life. The numeric and narrative water quality criteria are the criteria deemed necessary to support the beneficial use classification of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

Waterbodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230 as listed under 18 AAC 70.230(e). Some waterbodies in Alaska can also have site-specific water quality criterion per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b). The receiving water for this discharge, Zimovia Straight, has not been reclassified, nor have site-specific water quality criteria been established. Therefore, Zimovia Straight must be protected for all marine use classes as per 18 AAC 70.020(a)(2) and 18 AAC 70.050. The designated use classes for marine water include (A) water supply (aquaculture, seafood processing, and industrial), (B) water recreation (contact and secondary), (C) growth and propagation of fish, shellfish, other aquatic life, and wildlife, and (D) harvesting for consumption of raw mollusks or other raw aquatic life.

B. Receiving Water Quality

The water quality of Zimovia Straight is summarized below and in Part 6 of the 301(h) TD. Additional receiving water quality data statistics are provided in Appendix A of this fact sheet.

Table 3. Receiving Water Quality Data

Parameter	Units	Percentile	Value
Temperature[1]	°C	95th	13.65
pH[1]	Standard units	5th – 95th	6.0 – 8.0
Ammonia[1]	mg/L	90th	0.214
Dissolved Oxygen[1]	mg/L	Minimum	4.68
Turbidity[1]	NTU	Average	12.8
Salinity [1]	ppt	5th – 95th	3.1 – 28.6
Fecal Coliform[1]	CFU	Max Geometric Mean	15.1
Copper[2]	µg/L	Maximum	1.05

1. General Characteristics

Zimovia Straight is a large saline estuary in southeast Alaska. The estuary has a net northwest seaward exchange with the Gulf of Alaska and is largely characterized by the influence of the Stikine River to the north. The Stikine River is a large river that discharges substantial quantities of sediment and freshwater to Zimovia Straight.

2. Water Quality Limited Waters

There are no water quality impairments identified in Zimovia Straight on the State of Alaska's 2020 Integrated Report (ADEC, 2020).

IV. Effluent Limitations and Monitoring Requirements

The draft permit includes several changes to the effluent limitations and are summarized below.

The effluent limits and monitoring requirements in the 2002 Permit and draft 2022 permit are shown below in Tables 5 and 6, respectively.

Table 4. Changes in Effluent Limits

Parameter	Effluent Limit Change	Basis
Flow	Maximum daily flow limit was reduced from 3.6 to 3.0 mgd.	The applicant provided updated information and facility figures indicating a peak design flow of 3 mgd.
BOD_5[1]	Maximum daily limit changing to average weekly limit	40 CFR 122.45(d)(2) requires effluent limitations for continuous discharges from POTWs be expressed as average weekly and average monthly discharge limitations, unless impracticable. An average weekly limitation for BOD_5 is more appropriate for a 301(h)-modified facility than a maximum daily limitation because compliance with primary treatment is demonstrated based on monthly average monitoring results 40 CFR 125.60(b). Compliance monitoring for BOD_5 in both the 2002 and draft permits is less frequent than 1/week, so an average weekly limit is as protective as a maximum daily limit and does not trigger anti-backsliding.
TSS[1]	Maximum daily limit changing to average weekly limit	40 CFR 122.45(d)(2) requires effluent limitations for continuous discharges from POTWs be expressed as average weekly and average monthly discharge limitations, unless impracticable. An average weekly limitation for TSS is more appropriate for a 301(h)-

		modified facility than a maximum daily limitation because the facility determines that the effluent it discharges has received primary or equivalent treatment based on the monthly average results of monitoring. 40 CFR 125.60(b). Compliance monitoring for TSS in both the 2002 and draft permits is less than 1/week, so an average weekly limit is as protective as a maximum daily limit and does not trigger anti-backsliding.
Fecal Coliform	More stringent maximum daily and average monthly limits	Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet WQS. Section 301(h)(9) of the CWA and 40 CFR 125.62 require 301(h)-modified discharges to meet state WQS and federal CWA Section 304(a) criteria at the boundary of the zone of initial dilution (ZID). The draft permit contains WQBELs for fecal coliform that will ensure Alaska's most protective WQS are met at the boundary of the ZID.
Enterococcus	New WQBELs	Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet WQS. Section 301(h)(9) and 40 CFR 125.62 require 301(h)-modified discharges to meet all applicable state WQS and federal CWA Section 304(a) criteria at the boundary of the ZID. When the 2002 permit was issued, no WQS for was in effect for enterococcus. In 2017, EPA approved Alaska's WQS for enterococcus. EPA has determined the modified discharge has reasonable potential to cause or contribute to a violation of the WQS for enterococcus and the draft permit contains a WQBEL for enterococcus developed using the dilution achieved at the ZID boundary.
Total Residual Chlorine	New average monthly limit	Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet WQS. Section 301(h)(9) of the CWA and 40 CFR 125.62 require 301(h)-modified discharges to meet all applicable state WQS and federal CWA Section 304(a) criteria at the boundary of the ZID. EPA has determined the modified discharge has reasonable potential to cause or contribute to a violation of the WQS for TRC. EPA calculated a WQBEL and determined that it was more stringent than TBELs; however, the calculated maximum daily limit was less stringent than the current maximum daily limit in the 2002 permit. The draft

		permit retains the maximum daily limit from the 2002 permit and includes a new average monthly WQBEL for chlorine.
Total Ammonia (as N)	New WQBELs	Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet WQS. Section 301(h)(9) of the CWA and 40 CFR 125.62 require 301(h)-modified discharges to meet all applicable state WQS and federal CWA Section 304(a) criteria at the boundary of the ZID. EPA has determined the modified discharge has reasonable potential to cause or contribute to a violation of the WQS for total ammonia. EPA calculated WQBELs for total ammonia and they are included in this permit.
[1] Concentration/mass-loading limits only; compliance with 30% removal is still determined on monthly averaging basis.		

Table 5. Existing 2002 Permit - Effluent Limitations and Monitoring Requirements

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly Limit	Average Weekly Limit	Max Daily Limit	Sample Location	Sample Frequency	Sample Type
Parameters with Effluent Limits and Monitoring Requirements							
Flow	mgd	0.6	-	3.6	effluent	continuous	recorder
BOD_5[1]	mg/L	120	-	200	influent/ effluent	1/month	24-hour composite
	lbs/day	601	-	1001			
TSS[1]	mg/L	140		200	influent/ effluent	1/month	24-hour composite
	lbs/day	701	-	1001			
Fecal Coliform	colonies /100mL	1×10^6	-	1.5×10^6	effluent	1/month	grab
Total Residual Chlorine[2]	mg/L	-	-	0.1	effluent	1/month	grab
Dissolved Oxygen	mg/L	2.0 — 17.0			effluent	1/week	grab
pH	s.u.	6.5 — 8.5			effluent	1/week	grab

Parameters with Monitoring Requirements Only					
Total Ammonia, as N	mg/L	-	effluent	1/quarter	24-hr composite
Temperature	°C	-	effluent	1/week	grab

[1] The average monthly percent removal shall be greater than or equal to 30%
[2] This limit only applies when chlorine is used in the treatment process

Table 6. Draft 2022 Permit - Effluent Limitations and Monitoring Requirements

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type
Parameters with Effluent Limits and Monitoring Requirements							
Total Flow	mgd	0.6		3.0	Influent and Effluent	Continuous	Recorded
BOD_5	mg/L	120	200	---	Influent and Effluent	2/month	24-hour composite
	lbs/day	601	1001	---			Calculation[1]
BOD_5 Percent Removal	%	≥30	---	---	Influent and Effluent	1/month	Calculation[2]
TSS	mg/L	30	45	---	Influent and Effluent	2/month	24-hour composite
	lbs/day	150	225	---			Calculation[1]
TSS Percent Removal	%	≥30	---	---	Influent and Effluent	1/month	Calculation[2]
pH	std. units	Between 6.5 – 8.5			Effluent	1/week	Grab or Meter
Dissolved Oxygen	mg/L	Between 2.0 – 17.0			Effluent	1/week	Grab or Meter
Fecal Coliform[3] (Interim Limit)	#/100 ml[4]	48,300[5,6]		58,660[7,8]	Effluent	2/month[9]	Grab

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type
Fecal Coliform[3,8] (Final Limit)	#/100 ml[4]	1,568[6,10]		4,816[8,10]	Effluent	2/month[9]	Grab
Enterococcus[3] Final Limit	#/100 ml	3,920[6,10,11]	---	14,560[8,10,12]	Effluent	2/month[9]	Grab
Total Residual[13,14] Chlorine	µg/L	73	---	100	Effluent	1/week	Grab
	lbs/day	0.37	---	0.5			Calculation[1]
Total Ammonia (as N)	µg/L	25		51	Effluent	1/week	24-hour composite
	lbs/day	0.13		0.26			Calculation[1]
Parameters with Monitoring Requirements Only							
Copper	µg/L	Report	---		Effluent	1/month	Grab
	lbs/day	Report	---		Effluent	1/month	Calculation[1]
Silver	µg/L	Report	---		Effluent	1/quarter	Grab
	lbs/day	Report	---		Effluent	1/quarter	Calculation[1]
Temperature	°C	Report	---	---	Effluent	1/week	Grab
Permit Application Effluent Testing Data[15]	---				Effluent	1/year	---
Toxic Pollutant Scan[16]	---				Effluent	See Permit Part I.C	Grab

Notes

[1] Loading (in lbs/day) is calculated by multiplying the concentration (in mg/L) by the corresponding flow (in mgd) for the day of sampling and a conversion factor of 8.34. For more information on calculating, averaging, and reporting loads and concentrations see the *NPDES Self-Monitoring System User Guide* (EPA 833-B-85-100, March 1985).

[2] Percent Removal. The monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month using the following equation: (average monthly influent concentration – average monthly effluent concentration) ÷ average monthly influent concentration x 100. Influent and effluent samples must be taken over approximately the same time period.

[3] Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation. See Permit Parts I.B.5 and III.G.

[4] A five-tube decimal dilution test is required. See 18 AAC 70.020(b)(14)(D).

[5] Interim average monthly limit based on the 95th percentile of fecal coliform data between 2016-2021. See Permit Part II.C for compliance schedule information.

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Sample Location	Sample Frequency	Sample Type

[6] If more than one bacteria sample is collected within the reporting period, the average result must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of "n" quantities is the "nth" root of the product of the quantities. For example, the geometric mean of 100, 200, and 300 is (100 X 200 X 300)1/3 = 181.7.

[7] Interim maximum daily limit based on the 99th percentile of fecal coliform data between 2016-2021. See Permit Part II.C for compliance schedule information.

[8] When only one sample is collected, the effluent limit cannot be exceeded. If ten or more samples are collected during the monthly reporting period, not more than 10% of the samples may exceed the effluent limit

[9] Fecal coliform and enterococcus sampling shall coincide with receiving water sampling in Permit Part I.C.

[10] Final fecal coliform and enterococcus limits. See Permit Part II.C for compliance schedule information.

[11] In a 30-day period, the geometric mean of samples may not exceed 3920 enterococci CFU/100 ml.

[12] No more than 10% of the samples may exceed a statistical threshold value (STV) of 14560 enterococci CFU/100 ml

[13] Monitoring for total residual chlorine is only required when chlorine is used in the treatment process for disinfection

[14] Effluent limits for total residual chlorine are not quantifiable using EPA-approved analytical methods. The Permittee will be in compliance with the effluent limits for chlorine provided the total residual chlorine levels are below the compliance evaluation level of 0.10 mg/L.

[15] Effluent Testing Data - See NPDES Permit Application Form 2A, Table B for the list of pollutants to be included in this testing. The Permittee must use sufficiently sensitive analytical methods in accordance with Permit Part I.B.7.

[16] See Permit Part I.C.

A. Basis for Effluent Limits

In general, the CWA requires effluent limits for a particular pollutant be the more stringent of either technology-based effluent limits (TBELs) or water quality-based effluent limits (WQBELs). TBELs are set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the WQS applicable to a waterbody are being met and may be more stringent than TBELs.

1. Pollutants of Concern

Pollutants of concern are those that either have TBELs or may need WQBELs. EPA identifies pollutants of concern for the discharge based on those which:

- Have a TBEL
- Have an assigned wasteload allocation (WLA) from a Total Daily Maximum Load (TMDL)
- Had an effluent limit in the previous permit
- Are present in the effluent monitoring
- Are expected to be in the discharge based on the nature of the discharge

The wastewater treatment process at the Wrangell WWTP includes both primary treatment (screening, sedimentation) and secondary treatment technology (aeration basin). Pollutants expected in the discharge from a facility with this type of treatment, include but are not limited to: five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), fecal coliform and enterococcus bacteria, total residual chlorine (TRC), pH, ammonia, temperature, and dissolved oxygen (DO).

Based on this analysis, pollutants of concern are as follows:

- BOD_5
- DO
- TSS
- Fecal coliform bacteria
- Enterococcus bacteria
- TRC
- pH
- Ammonia
- Copper

Copper was detected in the effluent during priority pollutant scans conducted on March 21, March 28, and April 5, 2006 and has been identified as a potential pollutant of concern. For additional information see the part on copper found on page 32 of this fact sheet.

2. Technology-Based Effluent Limits (TBELs)

Federal Primary Treatment Effluent Limits

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," which POTWs were required to meet by July 1, 1977. EPA has developed and promulgated "secondary treatment" effluent limitations, which are found at 40 CFR 133.102. These TBELs identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD_5, TSS, and pH.

Secondary Treatment Standards

Parameter	30-day average	7-day average
BOD_5	30 mg/L	45 mg/L (or 40 mg/L $CBOD_5$)
TSS	30 mg/L	45 mg/L
BOD_5 and TSS removal	not less than 85%	- -
pH	within the limits of 6.0–9.0	

Section 301(h) of the Act provides for a waiver from secondary treatment if the permittee meets several specific criteria, including a requirement to achieve primary treatment. Primary treatment is defined in Section 301(h) of the Act as 30 percent removal of BOD_5 and TSS from the influent. The current permit requires 30% removal of BOD_5 and TSS on a monthly basis and the applicant has requested to maintain these limits.

Unlike secondary treatment standards, which require POTWs to meet monthly average and weekly average concentration limits for BOD_5 and TSS, primary treatment does not include concentration-based treatment standards for BOD_5 and TSS.

Concentration-based limitations, and by extension mass-based limits, are established case-by-case using state WQS and the level of treatment performance the facility is consistently able to achieve. See Part IV.A.2.a for more information on concentration and mass limits.

EPA has tentatively determined that the City of Wrangell WWTP qualifies for a continuation of their waiver from secondary treatment under Section 301(h) of the CWA.

The draft permit maintains the 30% minimum percent removal limits for TSS and BOD_5 on a monthly basis. The City did not request a 301(h)-modification for pH.

Concentration and Mass-Based Limits

40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, except under certain conditions. 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass-based limits are expressed in pounds per day and are calculated as follows:

Mass-based limit (lbs/day) = concentration-based limit (mg/L) × design flow (mgd) × 8.34[1]

As discussed above, concentration limits for 301(h)-modified facilities are established case-by-case using state WQS and data on historical facility performance.

In the 2002 permit monthly average and maximum daily concentration-based limits for TSS and BOD_5 were specified by ADEC in their November 21, 2001, final Certificate of Reasonable Assurance issued pursuant to Section 401 of the CWA.

For this draft permit, EPA assessed influent and effluent data (2016-2021) for TSS and BOD_5 to establish concentration-based limits reflective of facility performance. If a resulting performance-based limit was less stringent than the limit in the 2002 permit, the limit from the 2002 permit was retained in order to satisfy anti-backsliding provisions of the CWA. The resulting concentration-based limits were then used to establish mass-based limits using the equation above.

The draft permit is replacing the maximum daily limits for TSS and BOD_5 with average weekly limits. 40 CFR 122.45(d)(2) requires average weekly and average monthly discharge limitations for POTWs. Further, an average weekly limit is more appropriate for TSS and BOD_5 for the Wrangell WWTP because these parameters are limited on a monthly averaging basis under the 301(h) program.

BOD_5

Average Monthly Limit (AML): EPA used the 95th percentile of influent data from 2016 to 2021 and an assumed 30% removal to calculate an average monthly limit of 129

[1] 8.34 is a conversion factor with units (lb ×L)/(mg × gallon×10^6). See Exhibit 5-7 in the NPDES Permit Writers Manual available publicly online.

mg/L. This is less stringent than the current average monthly limitation of 120 mg/L. EPA has retained the existing average monthly limit of 120 mg/L in this permit.

Average Weekly Limit (AWL): EPA used the multiplier from Table 5-3 of the 1991 *Amended Technical Support Document for Water Quality-based Toxics Control* (1991 TSD) and the existing average monthly limit of 120 mg/L to calculate an average weekly limit of 208 mg/L. This is less stringent than the current maximum daily limit of 200 mg/L. EPA is retaining the current maximum daily limit of 200 mg/L as the AWL.

Table 7. Inputs for Calculation of BOD_5 Limit

95th Percentile of Influent Data (mg/L)	185.50
Final Effluent After 30% Removal (mg/L)	129.85
CV of Effluent Data	0.64
Samples per month	2
1991 TSD Multiplier (99th/95th)	1.73
Average Monthly Limit (mg/L)	**120**
Average Weekly Limit (mg/L)	**200**
Average Monthly Limit (lbs/day)	**601**
Average Weekly Limit (lbs/day)	**1001**

Using these concentration limits in the equation above, the mass-based limits for BOD_5 are as follows:

Average Monthly Limit = 120 mg/L × 0.6 mgd × 8.34 = 600.5 lbs/day

Average Weekly Limit = 200 mg/L × 0.6 mgd × 8.34 = 1000.8 lbs/day

TSS

DMR data indicates the discharge is achieving far greater TSS removal than the federal primary treatment standard of 30%. Average percent removal between 2016 and 2021 was 78.9%. These data are reflective of the long detention times being provided by the aeration basin and sedimentation basin, a combination of technology typically associated with secondary treatment facilities. EPA established TSS concentration limits more reflective of the treatment technology in use and historical performance of the facility.

Average Monthly Limit (AML): Using effluent data from 2016 to 2021, EPA conducted a statistical analysis to calculate an average monthly TSS limit based on facility performance. The performance-based AML was 22.4 mg/L, a level of treatment more stringent than the 30-day federal secondary treatment standard of 30 mg/L. The draft permit contains an AML for TSS of 30 mg/L, a level of performance the facility can consistently achieve using available technology.

Average Weekly Limit (AWL): Using effluent data from 2016 to 2021, EPA conducted a statistical analysis to calculate an AWL for TSS based on facility performance. The

performance-based AWL was 35.3 mg/L, a level of treatment that is more stringent than the 7-day federal secondary treatment standard of 45 mg/L. The draft permit contains an AWL for TSS of 45 mg/L, a level of performance the facility has demonstrated it can consistently achieve using available technology.

Using these concentration-based limits from the equation above, the mass-based limits for TSS are as follows:

Average Monthly Limit = 30 mg/L × 0.6 mgd × 8.34 = 150.1 lbs/day

Average Weekly Limit = 45 mg/L × 0.6 mgd × 8.34 = 225.2 lbs/day

3. Water Quality-Based Effluent Limits (WQBELs)

Statutory and Regulatory Basis

For 301(h)-modified dischargers, water quality-based effluent limits must consider the following four separate regulatory provisions which overlap to some extent.

Section 301(b)(1)(C) of the CWA requires the development of limits in permits necessary to meet all applicable WQS. Discharges to state or tribal waters must also comply with conditions imposed by the state or tribe as part of those entities' certification of NPDES permits under Section 401 of the CWA. 40 CFR 122.44(d)(1), which implements Section 301(b)(1)(C) of the CWA, requires that permits include limits for all pollutants or parameters that 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 or tribal WQS, including narrative criteria for water quality. Effluent limits must also meet the applicable water quality requirements of affected states other than the state in which the discharge originates, which may include downstream states. 40 CFR 122.4(d), 122.44(d)(4), see also Section 401(a)(2) of the CWA. These requirements are applicable to all NPDES permits.

Section 301(h)(9) of the CWA and its implementing regulations at 40 CFR 125.62(a), require 301(h)-modified discharges to meet all applicable state WQS and water quality criteria established under Section 304(a)(1) of the CWA after initial mixing in the waters surrounding or adjacent to the discharge point. These requirements are specific to 301(h)-modified dischargers.

Section 301(h)(1) of the CWA and its implementing regulations at 40 CFR 125.61, require that there must be a WQS applicable to each pollutant for which the 301(h) modification is requested (i.e., BOD_5 and TSS, or surrogates) and the applicant must demonstrate the proposed modified discharge will comply with these standards after initial mixing. These requirements are specific to 301(h)-modified dischargers.

The regulations implementing the NPDES program at 40 CFR Part 122 require the permitting authority to make these evaluations using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that WQS are met and must be consistent with any available WLA for the discharge in an

approved TMDL. If there are no approved TMDLs that specify WLA for this discharge; all of the WQBELs are calculated directly from the applicable WQS.

Alaska's WQS can be found at 18 AAC 70 (ADEC 2020) and the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* (ADEC 2008). As discussed in Part III.A of this FS, Alaska's WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy. The use classification system identifies the designated uses that each waterbody is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the state to support the designated use classification of each waterbody and are the values used in EPA's reasonable potential analysis.

Reasonable Potential Analysis and Need for WQBELs

EPA used Alaska WQS and the processes described in the *Amended Section 301(h) Technical Support Document* (301(h) TSD) and the 1991 TSD to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an excursion above any state WQS for a given pollutant, EPA compares the maximum projected receiving water concentration to the WQS for that pollutant. If the projected receiving water concentration exceeds the WQS, there is reasonable potential, and a WQBEL must be included in the permit. 40 CFR 125.62(a)(1)(iv) requires this evaluation be based upon conditions reflecting periods of maximum stratification and during other periods when discharge characteristics, water quality, biological seasons, or oceanographic conditions indicate more critical situations may exist. Such periods are commonly referred to as critical conditions.

In some cases, a dilution allowance or mixing zone is permitted within a receiving water. A mixing zone is a limited area or volume of water where initial dilution of a discharge takes place and within which certain WQS may be exceeded (EPA 2014). Under the 301(h) program, this mixing area is referred to as the zone of initial dilution, or ZID, and is defined at 40 CFR 125.58(dd) as, "*the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports, provided that the ZID may not be larger than allowed by mixing zone restrictions in applicable water quality standards."* While the acute and chronic criteria may be exceeded within the ZID, the use and size of the ZID must be limited such that the waterbody as a whole will not be impaired, all designated uses are maintained, and acutely toxic conditions are prevented. As discussed above, Section 301(h)(9) of the CWA and 40 CFR 125.62(a) require 301(h)-modified discharges to meet the water quality criteria established under Section 304(a)(1) of the CWA after initial mixing at the edge of the ZID, unless states have adopted more stringent criterion, in which case those must be met. Consistent with the recommendations in the 301(h) TSD for setting spatial boundaries for the ZID, EPA has established the spatial dimensions of the ZID to include the entire water column within 100 feet of any point of the 240-foot diffuser. This is the same ZID spatial boundary as the 2002 permit.

18 AAC 70.240 provides Alaska's mixing zone policy for point source discharges. In ADEC comments to EPA on the preliminary draft permit, ADEC proposes to authorize mixing zones within the spatial boundaries of the ZID. The proposed mixing zones and their associated dilution factors are summarized below. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 0.6 mgd.

Table 8. Mixing zones

Criteria Type	Dilution Factor
Acute Aquatic Life	3.9
Chronic Aquatic Life (except ammonia)	29
Chronic Aquatic Life (ammonia)	29
Human Health Noncarcinogen	N/A
Human Health Carcinogen	N/A

The reasonable potential analysis and WQBEL calculations were based on the dilution factors shown above. If ADEC revises the allowable mixing zone in its final 401 Certification of this permit, the reasonable potential analysis and WQBEL calculations will be revised accordingly.

As discussed in Part IV.A. Pollutants of Concern, the pollutants of concern in the discharge are BOD_5, DO, TSS, pH, temperature, fecal coliform, enterococci bacteria, ammonia, and copper. Each parameter is summarized in Part IV.A, and the equations used to conduct the reasonable potential analysis and calculate the WQBELs are provided in Appendix B: Reasonable Potential and WQBEL Formulae, and Part 8.C of the 301(h) TD. The relevant WQS are shown below. Since Zimovia Straight is designated for all uses, the listed use is the one with the most protective criteria.

Table 9. Alaska Water Quality Standards

Pollutant	Designated Use	Criteria	Basis
DO	Aquaculture	≥5 mg/L, ≤17 mg/L	18 AAC 70.020(b)(15)(A)(i)
Turbidity	Aquaculture Aquatic life	25 NTU (aquaculture) May not reduce the depth of the compensation point for photosynthetic activity by more than 10%. May not reduce the maximum secchi disk depth by more than 10%. (aquatic life)	18 AAC 70.020(b)(24)(A)(i) 18 AAC 70.020(b)(24)(C)
pH	Aquaculture	6.5—8.5 s.u.	18 AAC 70.020(b)(18)(A)(i)
Fecal coliform	Harvesting for consumption of raw mollusks or other raw aquatic life	14 CFU/100mL (acute) 43 CFU/100mL (chronic)	18 AAC 70.020(b)(14)(D)
Enterococcus	Primary contact recreation	35 CFU/100mL (acute) 130 CFU/100mL (chronic)	18 AAC 70.020(b)(14)(b)(i)
Total residual chlorine	Aquatic life	13 µg/L (acute) 7.5 µg/L (chronic)	*Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* (ADEC 2008)
Copper	Aquatic life	4.8 µg/L (acute) 3.1 µg/L (chronic)	*Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* (ADEC 2008)
Ammonia	Aquatic life	7.7 mg/L (acute) 1.2 mg/L (chronic)	*Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* (ADEC 2008)
Silver	Aquatic life	1.9 µg/L (acute)	*Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* (ADEC 2008)

Reasonable Potential and WQBELs

The reasonable potential and WQBEL for specific parameters are summarized below. The calculations for ammonia, TRC, and copper are provided in Appendix C, and the calculations for DO and TSS are provided in Appendix B of the 301(h) TD.

Ammonia

Marine ammonia criteria are based on a formula which relies on the pH, temperature, and salinity of the receiving water, because the fraction of ammonia present as the toxic, un-ionized form increases with increasing pH and temperature and decreases with increasing salinity. Therefore, the criteria become more stringent as pH and temperature increase, and less stringent as salinity increases. Appendices F and G of the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* provides tables for determining the applicable acute and chronic criteria based upon these parameters.

A salinity of 10 mg/L was selected given the estuarine nature of the receiving water and several ambient salinity measurements below 10 ppt. The 95th percentile of temperature (13.65°C, rounded to 15°C) and pH data (8.0 s.u.) collected near the outfall at the trapping depth of the effluent plume was used. The acute and chronic criterion are 7,700 and 1,200 µg/L, respectively. See Appendix A for Alaska's ammonia criteria.

A reasonable potential calculation showed that the discharge has the reasonable potential to cause or contribute to an excursion of the water quality standard for ammonia. WQBELs for total ammonia have been calculated and included in the permit. See Appendices B and C for formula and reasonable potential and effluent limit calculations, respectively, for ammonia.

pH

The Alaska WQS for the protection of aquatic life requires that ambient pH may not be less than 6.5 or greater than 8.5, and may not vary more than 0.2 pH unit outside of the naturally occurring range. Mixing zones are generally not granted for pH, therefore the most stringent water quality criterion must be met before the effluent is discharged to the receiving water. Effluent pH data were compared to the water quality criteria. Between 2016 and 2021, effluent pH ranged from 6.5 to 7.8. The applicant has not requested a CWA Section 301(h)-modification for pH. The draft permit retains the current pH limits of 6.5-8.5 s.u.

Dissolved Oxygen (DO) and BOD_5

Natural decomposition of organic material in wastewater effluent impacts DO in the receiving water at distances far outside of the regulated mixing zone. The BOD_5 of an effluent sample indicates the amount of biodegradable material in the wastewater and estimates the magnitude of oxygen consumption the wastewater will generate in the receiving water.

Alaska does not have WQS for BOD_5 and instead uses DO. The standard applicable to marine waters provides that for estuarine water the concentration of DO shall not be

less than 5.0 mg/L except where natural conditions cause this value to be depressed, and in no case can DO exceed 17.0 mg/L.

The reasonable potential to cause or contribute to violations of the DO criteria of 5.0 mg/L at the edge of the ZID can be evaluated using equation B-5 in the 301(h) TSD, which calculates the DO depletion caused by the BOD_5 of the effluent. These equations were used to calculate the DO concentration (DOf) at the completion of initial dilution, using worst-case effluent and receiving water conditions as required by 40 CFR 125.62(a)(1)(iv) and the 301(h) TSD. This process was repeated for bottom, mid, and surface depths based on receiving water data. To assess the potential for far field impacts to DO the final BOD_5 concentration after initial mixing was determined using the simplified procedures described in Appendix B of the 301(h) TSD.

The analysis indicates the effluent BOD_5 will result in a DO depletion of less than 0.1% at the completion of initial mixing, with a final BOD_5 concentration of 1.3 mg/L after initial mixing. These results indicate that both near field and far field DO impacts are negligible.

Bottom ambient DO measurements at both reference and outfall locations were slightly below the 5.0 mg/L standard. Because reference site measurements were lower than the outfall location and are outside of the influence of the discharge, these measurements are believed to be the result of natural conditions.

For a complete analysis of DO please refer to Appendix B of the 301(h) TD.

Based on the above analyses and that presented in the 301(h) TD, the discharge will not cause or contribute to a violation of Alaska WQS for DO. The permit retains the DO limits from the 2002 permit.

Total Suspended Solids and Turbidity

Alaska does not have WQS for TSS but uses turbidity. Alaska WQS applicable to the estuarine waters of Zimovia Straight provide that turbidity shall not exceed 25 nephelometric turbidity units (NTU) and shall not reduce the depth of the compensation point for photosynthetic activity by more than 10%. In addition, the turbidity shall not reduce the maximum Secchi disc depth by more than 10%. The permittee collected ambient receiving water data for turbidity and Secchi depth as part of the last permit cycle. A summary of the ambient turbidity and Secchi data collected by the permittee at outfall and reference sites between 2016 and 2021 is presented in Part 8.B of the 301(h) TD.

As discussed in the 301(h) TD, the estuarine receiving waters of Zimovia Straight are heavily influenced by the significant freshwater and sediment inputs from the Stikine River. This large riverine input results in a highly variable and dynamic receiving water with large fluctuations and variations in suspended solids concentrations and salinity depending on timing and local conditions. This variability can be observed in the ambient turbidity and secchi data.

Secchi Monitoring Data

The applicant collected ambient Secchi data in the receiving water between 2016 and 2021. The data collected at reference and outfall sites is presented in Table 3 of the 301(h) TD. The data appears to indicate the outfall sites have an average Secchi depth >10% less than the reference sites. However, like the highly variable NTU readings discussed below, EPA does not believe this data is representative of the impact of the discharge, but rather the significant sediment load contributed by the nearby Stikine River. Further, recent dilution modeling indicates the effluent plume becomes trapped approximately 24 meters below the surface, well below the Secchi depths reported at any site. This strongly indicates that any difference in Secchi depths observed between sites is the result of local ambient conditions and the results should be interpreted with caution.

NTU Monitoring Data

The applicant collected ambient NTU data within the receiving water between 2016 and 2021. The ambient NTU data is highly variable depending on the time, location, and depth of the sample. This is consistent with the very significant and variable sediment loading from the nearby Stikine River.

When averaged, none of the NTU measurements at surface, mid-depth, or bottom exceed the Alaska WQS of 25 NTU. However, the maximum reported and 95th percentile values collected at the surface at both the outfall and reference sites exceeded the 25 NTU criterion. Similar to the Secchi data, these measurements are believed to be a result of sediment traveling south from the nearby Stikine River, not the result of the permitted discharge. All mid-depth and bottom NTU measurements collected at the outfall locations were below the standard.

The change in suspended solids in the water column is indirectly related to turbidity measurements. The increase in receiving water suspended solids concentration following initial dilution can be calculated from formula B-32 in the 301(h) TSD:

$SS = SS_e/S_a$ where,
SS = change in suspended solids concentration following initial dilution
SS_e = effluent suspended solids concentration (45 mg/L)
S_a = initial dilution (112:1)

Solving the above equation using the maximum allowable TSS concentration results in a 0.40 mg/L increase in suspended solids after initial dilution, or 0.8%. The 301(h) TSD states that a TSS increase of less than 10% after initial dilution is not expected to have a substantial impact on water quality.

Based on the above analyses and that presented in Appendix B the 301(h) TD, the discharge will not cause or contribute to a violation of Alaska WQS for turbidity.

Temperature

Alaska's most stringent WQS for water temperature provides that the discharge may not cause the weekly average temperature to increase more than 1°C. The maximum

rate of change may not exceed 0.5°C per hour. Normal daily temperature cycles may not be altered in amplitude or frequency. EPA reviewed surface water and DMR data between 2016 and 2021 to assess whether the modifieded discharge will comply with Alaska WQS for temperature.

The maximum ocean temperature recorded at the trapping depth of the discharge during receiving water monitoring from 2016 to 2021 was 13.7°C, and the maximum recorded effluent temperature between 2016 and 2021 was 18.6°C. EPA conducted a mass balance analysis using these values and calculated a final receiving water temperature of 13.69 after initial dilution.

$$Cd = \frac{Ce + [\, Cu\, (\, Sa - 1\,)\,]}{Sa} \quad \text{where}$$

Cd = Resultant temperature at edge of mixing zone, °C

Ce = Maximum projected effluent temperature, (18.6 °C)

Cu = Background receiving water temperature, °C (13.7 °C)

Sa = dilution factor (112)

Cd = 13.7 °C

The temperature of the receiving water after initial dilution is effectively the same as the ambient ocean temperature.

Based upon the above analysis, the proposed discharge is expected to comply with Alaska WQS for temperature after initial mixing at the edge of the ZID.

Residues

The Alaska WQS require that surface waters of the State be free from floating, suspended or submerged matter of any kind in concentrations impairing designated beneficial uses. The draft permit contains a narrative limitation prohibiting the discharge of such materials.

Fecal Coliform

Alaska's most restrictive marine criterion for fecal coliform bacteria concentrations are in areas protected for the harvesting and use of raw mollusks and other aquatic life. The criterion specifies that the geometric mean of samples shall not exceed 14 fecal coliform/100 mL, and that not more than 10 percent of the samples shall exceed 43 most probable number (MPN)/100 mL for a five-tube decimal dilution test. MPN is the statistic that represents the number of individuals most likely present in a given sample, based on test data. Because Zimovia Straight is protected for raw aquatic life consumption this standard must be met at the edge of the ZID.

40 CFR 122.45(d)(2) requires effluent limitations for continuous discharges from POTWs be expressed as average weekly and average monthly limitations, unless impracticable. Additionally, the terms "average weekly discharge limitation" and "average monthly discharge limitation" are defined in 40 CFR 122.2 as being arithmetic (as opposed to geometric) averages. It is impracticable to properly implement a 30-day geometric mean criterion in a permit using monthly and weekly arithmetic average limits. The geometric mean of a given data set is equal to the arithmetic mean of that data set if and only if all of the values in that data set are equal. Otherwise, the geometric mean is always less than the arithmetic mean. In order to ensure that the effluent limits are "derived from and comply with" the geometric mean water quality criterion, as required by 40 CFR 122.44(d)(1)(vii)(A), it is necessary to express the effluent limits as a monthly geometric mean and an instantaneous maximum limit.

Because fecal coliform concentrations must be met at the edge of the ZID, EPA derived WQBELs for fecal coliform by multiplying the dilution factor of 112 achieved at the edge of the ZID by the criteria. The WQBEL calculations are shown below:

(acute) 14 CFU/100 mL x 112 = 1568 CFU/100 mL

(chronic) 43 CFU/100 mL x 112 = 4816 CFU/100 mL

The draft permit proposes a monthly average limit of 1568 CFU/100 mL and a maximum daily limit of 4816 CFU/100 mL. The Wrangell WWTP does not currently have the technology necessary to meet the WQBEL for fecal coliform in the draft permit. Therefore, ADEC has proposed in its draft 401 Certification to authorize a five-year schedule of compliance for the facility to meet the final fecal coliform limits in the draft permit. EPA has included the terms of the compliance schedule in the draft permit.

The proposed permit includes interim performance-based limits that apply until the end of the compliance schedule, derived by taking the 95th and 99th percentile of fecal coliform data. The proposed interim fecal coliform limit is an average monthly limit of 48,300 CFU/100 mL and a maximum daily limit of 58,660 CFU/100 mL. See Appendix B for water quality data.

Part V.A. of this FS describes the compliance schedule for fecal coliform. The WQBELs developed for fecal coliform will be protective of Alaska WQS after initial mixing at the edge of the ZID and will satisfy the requirements of Section 301(h)(9) of the CWA and 40 CFR 125.63(a).

Enterococcus

Enterococci bacteria are indicator organisms of harmful pathogens recommended by the EPA to protect primary contact recreation for marine waters. The EPA Beaches Environmental Assessment and Coastal Health Act (BEACH Act) requires states and territories with coastal recreation waters to adopt enterococci bacteria criteria into their WQS. EPA approved Alaska's WQS for enterococcus in 2017. The WQS at 18 AAC

70.020(b)(14)(B) for contact recreation specifies that the enterococci bacteria concentration shall not exceed 35 enterococci CFU/100mL, and not more than an 10% of the samples may exceed a concentration of 130 enterococci CFU/100mL.

The 2002 permit does not contain effluent limitation for enterococcus bacteria because there was no applicable enterococcus standard in effect when the permit was issued in December 2001.

40 CFR 122.44(d)(1) requires EPA to account for existing controls on discharges when determining whether a discharge has the reasonable potential to cause or contribute to an excursion of state WQS. The WWTP does not currently disinfect its effluent, resulting in the high bacterial loads observed in the available fecal coliform data. The 2002 permit did not require enterococcus monitoring, but it reasons that the high fecal coliform loads observed are also indicative of high loads of other pathogens commonly found in WWTP effluents, including enterococcus. With the available fecal coliform data and lack of disinfection capacity at the facility, EPA has determined there is reasonable potential for the discharge to cause or contribute to a violation of Alaska WQS for enterococcus. EPA calculated WQBELs using the same procedure used for fecal coliform.

Maximum Daily Limit = 112 x 130 = 14,560 CFU/100mL

Average Monthly Limit = 112 x 34 = 3,920 CFU/100mL

The WWTP does not currently have the disinfection technology necessary to meet these limits. Therefore, ADEC has proposed in its draft 401 Certification to authorize a five-year schedule of compliance for Wrangell to meet the final enterococcus limits in the draft permit. EPA has included the terms of the compliance schedule in the draft permit. Because this is a new effluent limit no interim limits are being proposed.

The WQBELs developed for enterococcus will be protective of Alaska WQS after initial mixing at the edge of the ZID and will satisfy the requirements of 301(h)(9) and 40 CFR 125.63(a).

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The Wrangell WWTP does not currently provide consistent disinfection of its effluent but will need to in order to achieve the final bacteria limits in the draft permit. To achieve disinfection Wrangell will likely use either UV or chlorination. As a result chlorine was identified as a pollutant of concern and WQBELs have been developed.

Alaska WQS establish an acute criterion of 13 µg/L, and a chronic criterion of 7.5 µg/L for the protection of aquatic life (ADEC 2008). EPA past practice on wastewater chlorination suggests 0.5 mg/L of chlorine residual to ensure adequate disinfection, with 1.5 multiplier for maximum dosage. This resulted in an assumed effluent concentration of 0.75 mg/L. Using this concentration, a reasonable potential calculation showed that the discharge from the facility would have the reasonable potential to cause or contribute to a violation of the water quality criteria for chlorine.

WQBELs were calculated and determined to be more stringent than technology-based limits. However, the calculated maximum daily limit (146 µg/L) was less stringent than the current maximum daily limit in the 2002 permit (100 µg/L) . The draft permit retains the maximum daily limit from the 2002 permit and includes a new average monthly WQBEL for chlorine. See Appendix C for the reasonable potential analysis and WQBEL calculation.

Copper

Copper was detected in the effluent during priority pollutant scans conducted on March 21, March 28, and April 5, 2006. Since there are only three data samples, collected over 15 years ago, the concentration of copper in the current discharge is uncertain. This is reflected in the large reasonable potential multiplying factor of 5.6 used in the reasonable potential analysis (Table 3-1, 1991 TSD). If more effluent data were available for copper the reasonable potential multiplying factor would be smaller, and this may result in a finding that the discharge does not have the reasonable potential to cause or contribute to excursions above WQS. Because of the uncertainty in the effluent concentration of copper, EPA is proposing monthly copper monitoring in this permit.

Silver

Silver was detected in the effluent during a priority pollutant scan conducted on March 21, 2006. Two additional priority pollutant scans on March 28 and April 5, 2006, did not detect silver in the discharge. Since there is only one sample, collected over 15 years ago, the concentration of silver in the current discharge is uncertain. This is reflected as the large reasonable potential multiplying factor of 13.2 used in the reasonable potential analysis (Table 3-1, 1991 TSD). If more effluent data were available for silver, the reasonable potential multiplying factor would be smaller, and this may result in a finding that the discharge does not have the reasonable potential to cause or contribute to excursions above WQS. Because of the uncertainty in the effluent concentration of silver, EPA is proposing quarterly silver monitoring in this permit

Antibacksliding

Section 402(o) of the CWA and 40 CFR 122.44(l) generally prohibit the renewal, reissuance, or modification of an existing NPDES permit that contains effluent limits, permit conditions, or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding) but provides limited exceptions. For explanation of the antibacksliding exceptions refer to Chapter 7 of the Permit Writers Manual *Final Effluent Limitations and Anti-backsliding*.

There are no effluent limits, permit conditions, or standards in the draft permit that are less stringent than the 2002 permit. Therefore, there is no backsliding in the permit.

B. Monitoring Requirements

Section 308 of the CWA and 40 CFR 122.44(l) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality.

The draft permit also requires the permittee to perform effluent monitoring required by the NPDES Form 2A application, so that these data will be available when the permittee applies for a renewal of its NPDES permit.

The draft permit also requires the permittee to perform effluent monitoring required by Tables A, B, and C of the NPDES Form 2A application, so that these data will be available when the permittee applies for a renewal of its NPDES permit and EPA can assess compliance with Section 301(h) of the CWA.

The permittee is responsible for conducting the monitoring and for reporting results on DMRs or on the application for renewal, as appropriate, to EPA.

1. Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples must be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR Part 136) or as specified in the permit.

Monitoring Changes from the Previous Permit

The draft permit proposes the following monitoring changes from the 2002 permit:

Table 10. Monitoring Changes in Permit

Parameter	Monitoring Change	Basis
BOD_5[1]	Increase in influent and effluent monitoring frequency from once per month to twice per month.	The prior permit required weekly monitoring for the first year of the permit followed by monthly monitoring. In November 2019, the permittee was unable to achieve 30% removal of TSS. For concentration and loading limits, monitoring twice per month is more appropriate and representative of the discharge than monthly monitoring.
TSS[1]	Same as BOD_5	Same as BOD_5
Fecal Coliform	Increase in effluent monitoring frequency from once per month to twice per month.	The draft permit contains new, more stringent, fecal coliform limits which the permittee will be working to achieve in accordance with the compliance schedule outlined in Part II.C of the

		draft permit. Monitoring twice per month is more appropriate and representative than monthly monitoring and is required to ensure compliance with the fecal coliform limits and protection of Alaska WQS.
Ammonia	Increase in effluent monitoring from once per quarter to once per week.	The draft permit contains new WQBELs for total ammonia. Weekly monitoring is necessary to ensure compliance with the limit and protection of Alaska WQS.
Enterococcus	New effluent monitoring requirement, twice per month.	The draft permit contains a new effluent limit for enterococcus that the permittee will be working to achieve in accordance with the compliance schedule outlined in Part II.C of the draft permit. Monitoring twice per month is necessary to ensure compliance with the limit and protection of Alaska WQS.
Copper	New effluent monitoring requirement, once per month.	The concentration of copper in the effluent is uncertain. Monitoring once per month will provide sufficient data to characterize the effluent for copper for the next permit.
Silver	New effluent monitoring requirement, once per month.	The concentration of silver in the effluent is uncertain. Monitoring once per month will provide sufficient data to characterize the effluent for silver for the next permit.
Total Residual Chlorine	Increase in effluent monitoring from monthly to twice per month when chlorine is used in the treatment process.	The draft permit contains a new WQBEL for chlorine. Monitoring twice per month when chlorine is used in the treatment process is necessary to ensure compliance with the limit and protection of Alaska WQS.
[1] Concentration/mass-loading limits only; compliance with 30% removal is still determined on monthly averaging basis.		

Under 40 CFR 125.66, facilities operating under 301(h)-modified permits are required to conduct a chemical analysis of their discharge for all toxics substances and pesticides identified in 40 CFR 401.15 and conduct an analysis of possible source for any parameters detected. The draft permit requires the permittee to conduct this analysis and submit the results with their permit renewal application.

2. Receiving Water Monitoring

In general, receiving water monitoring may be required for pollutants of concern to assess the assimilative capacity of the receiving water for the pollutant. In addition, receiving water monitoring may be required for pollutants for which the water quality criteria are dependent and to collect data for TMDL development if the facility discharges to an impaired water body. Pursuant to Section 301(h)(3) of the CWA and 40 CFR 125.63(c), facilities operating under 301(h)-modified permits are required to establish and implement a water quality monitoring program to provide adequate data for evaluating compliance with WQS or federal water quality criteria and measure the presence of toxic pollutants that have been identified or reasonably may be expected to be present in the discharge.

EPA is retaining most of the receiving water monitoring program from the 2002 permit in the new draft permit. Changes to the receiving water monitoring program include the addition of enterococcus to the suite of parameters analyzed and the removal of sampling at the edge of the 1600-meter mixing zone (Stations 6 and 7). Sampling at the edge of the 1600-meter mixing zone is no longer required because the 1600-meter mixing zone is not being reauthorized by ADEC and the point of compliance for all parameters is the edge of the ZID.

A detailed description of the receiving water monitoring program in the draft permit can be found in Part 8.G.2 of the 301(h) TD, Part I.D.1 of the draft permit, and the Table below.

Table 11. RECEIVING WATER MONITORING REQUIREMENTS

Parameter	Units	Sample Type	Sample Depth	Frequency	Location
Temperature	°C	Grab	S, M, B	Annually (August or September)	See Permit Part I.C.2.a, b
Salinity	g/kg	Grab	S, M, B	Annually (August or September)	See Permit Part I.C.2.a, b
Dissolved Oxygen	mg/L	Grab	S, M, B	Annually (August or September)	See Permit Part I.C.2.a, b
pH	standard units	Grab	S, M, B	Annually (August or September)	See Permit Part I.C.2.a, b

Parameter	Units	Sample Type	Sample Depth	Frequency	Location
Secchi Disk Depth	feet	Visual	Per method	Annually (August or September)	See Permit Part I.C.2.a, b
Turbidity	NTU	Grab	S, M, B	Annually (August or September)	See Permit Part I.C.2.a, b
Fecal Coliform	#/100 ml	Grab	S (or just below)	Monthly[1] (May through August)	See Permit Part I.C.2.a, b, c
Enterococcus	#/100 ml	Grab	S (or just below)	Monthly[1] (May through August)	See Permit Part I.C.2.a, b, c
Ammonia	mg/L	Grab	S (or just below)	Annually (August or September)	See Permit Part I.C.2.a, b

Notes:

[1] Fecal coliform and enterococcus sampling shall coincide with effluent sampling in Permit Part I.B.

S=Surface, M=Mid-depth, B=Bottom

3. Biological Monitoring

Facilities operating under 301(h)-modified NPDES permits are required by 40 CFR 125.63(b) to have a biological monitoring program in place that provides adequate data to evaluate the impact of the discharge on marine biota.

EPA is retaining most of the biological monitoring program from the 2002 permit in the new draft permit in Permit Part I.D. Changes to the biological monitoring program include:

- increasing the total number of sampling locations from five to seven by the addition of two more ZID boundary sites;
- increasing the number of benthic samples per site from one to two;

For a full description of the biological monitoring program please refer to Permit Part I.D.

4. Electronic Submission of Discharge Monitoring Reports

The draft permit requires that the permittee submit DMR data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application.

Further information about NetDMR, including upcoming trainings and contacts, is provided on the following website: https://netdmr.epa.gov. The permittee may use NetDMR after requesting and receiving permission from EPA Region 10.

Permit Part III.B.3 requires that the Permittee submit a copy of the DMR to ADEC. Currently, the permittee may submit a copy to ADEC in one of three ways: 1) a paper copy may be mailed; 2) The email address for ADEC may be added to the electronic submittal through NetDMR; or 3) The permittee may provide ADEC viewing rights through NetDMR.

C. Sludge (Biosolids) Requirements

EPA Region 10 separates wastewater and sludge permitting. EPA has authority under the CWA to issue separate sludge-only permits for the purposes of regulating biosolids. EPA may issue a sludge-only permit to each facility at a later date, as appropriate.

Until future issuance of a sludge-only permit, sludge management and disposal activities at each facility continue to be subject to the national sewage sludge standards at 40 CFR Part 503 and any requirements of the State's biosolids program. The Part 503 regulations are self-implementing, which means that facilities must comply with them whether or not a permit has been issued.

V. Other Permit Conditions

A. Toxics Control Program

1. Chemical Analysis and Source Identification

The 301(h) regulations at 40 CFR 125.66(a) require applicants to submit at the time of application an analysis of their effluent for the toxic substances and pesticides identified in 40 CFR 401.15 and, pursuant to 40 CFR 125.66(b), provide an analysis of the known or suspected sources of any detected parameters. The draft permit includes these requirements in Part II.D.1.

2. Industrial Waste Management

The 301(h) regulations at 40 CFR 125.66(b) require applicants with known or suspected sources of industrial sources of toxic pollutants to develop and implement an approved pretreatment program in accordance with 40 CFR Part 403. This provision does not apply to applicants that certify they have no known or suspected industrial sources of toxics in their discharge. The City has certified that it has no known or suspected industrial sources of toxics in their discharge. The draft permit requires the facility to maintain and submit a list of any industrial users at the time of permit

renewal application, or a new certification stating there are no known or suspected industrial sources of toxics pollutants in their discharge.

3. Non-industrial Source Control Program

The 301(h) regulations at 40 CFR 125.66 require the permittee to implement a public education program designed to minimize the entrance of nonindustrial toxic pollutants and pesticides into its POTW. The draft permit requires the permittee to develop and implement a public education and outreach program designed to minimize the introduction of nonindustrial sources of toxics into the treatment plant.

B. Interim Beach Advisory

The permit requires a beach advisory sign be placed on the nearshore area around the outfall advising against bathing or the consumption of raw shellfish from the area. The sign must remain in place until the final WQBELs for fecal coliform and enterococcus are achieved.

C. Compliance Schedules

Compliance schedules are authorized by federal NPDES regulations at 40 CFR 122.47 and Alaska WQS at 18 AAC 70.910. Compliance schedules allow a discharger to phase in, over time, compliance with WQBELs when limitations are in the permit for the first time.

The draft permit proposes a compliance schedule for fecal coliform, enterococcus, and chlorine, because the discharge cannot immediately comply with the new effluent limits on the effective date of the permit. The draft permit proposes the following:

1. Interim performance-based limits for fecal coliform, based on fecal coliform effluent data from 2016-2022, effective until the end of the compliance schedule when final limits for fecal coliform become effective

2. Monitoring for enterococcus and final limits for enterococcus, which become effective at the end of the compliance schedule

ADEC authorizes compliance schedules in its 401 Certification. EPA will amend the compliance schedule, if needed, after receiving final 401 Certification for ADEC. For more information on the details of the compliance schedule refer to the 401 Certification and Part II.C of the draft permit.

D. Quality Assurance Plan

The Wrangell WWTP is required to update the Quality Assurance Plan (QAP) within 180 days of the effective date of the permit. The QAP must consist of standard operating procedures the permittee must follow for collecting, handling, storing, and shipping samples, laboratory analysis, and data reporting. The plan must be retained on site and made available to EPA and the ADEC upon request.

E. Operation and Maintenance Plan

The permit requires the Wrangell WWTP to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance is essential to meeting discharge limits, monitoring requirements, and all other permit requirements at all times. The permittee is required to develop and implement an operation and maintenance plan for their facility within 180 days of the effective date of the permit. The plan must be retained on site and made available to EPA and ADEC upon request.

F. Sanitary Sewer Overflows and Proper Operation and Maintenance of the Collection System

Sanitary Sewer Overflows (SSOs) are not authorized under this permit. The permit contains language to address SSO reporting and public notice and operation and maintenance of the collection system. The permit requires that the permittee identify SSO occurrences and their causes. In addition, the permit establishes reporting, record keeping and third party notification of SSOs. Finally, the permit requires proper operation and maintenance of the collection system.

The following specific permit conditions apply:

Immediate Reporting – The permittee is required to notify EPA of an SSO within 24 hours of the time the permittee becomes aware of the overflow. (See 40 CFR 122.41(l)(6)).

Written Reports – The permittee is required to provide EPA a written report within five days of the time it became aware of any overflow that is subject to the immediate reporting provision. (See 40 CFR 122.41(l)(6)(i)).

Third Party Notice – The permit requires that the permittee establish a process to notify specified third parties of SSOs that may endanger health due to a likelihood of human exposure; or unanticipated bypass and upset that exceeds any effluent limitation in the permit or that may endanger health due to a likelihood of human exposure. The permittee is required to develop, in consultation with appropriate authorities at the local, county, tribal and/or state level, a plan that describes how, under various overflow (and unanticipated bypass and upset) scenarios, the public, as well as other entities, would be notified of overflows that may endanger health. The plan should identify all overflows that would be reported and to whom, and the specific information that would be reported. The plan should include a description of lines of communication and the identities of responsible officials. (See 40 CFR 122.41(l)(6)).

Record Keeping – The permittee is required to keep records of SSOs. The permittee must retain the reports submitted to EPA and other appropriate reports that could include work orders associated with investigation of system problems related to a SSO, that describes the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the SSO. (See 40 CFR 122.41(j)).

Proper Operation and Maintenance – The permit requires proper operation and maintenance of the collection system. (See 40 CFR 122.41(d) and (e)). SSOs may be indicative of improper operation and maintenance of the collection system. The permittee may consider the development and implementation of a capacity, management, operation and maintenance (CMOM) program.

The permittee may refer to the Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (EPA 305-B-05-002). This guide identifies some of the criteria used by EPA inspectors to evaluate a collection system's management, operation and maintenance program activities. Owners/operators can review their own systems against the checklist (Chapter 3) to reduce the occurrence of sewer overflows and improve or maintain compliance.

G. Environmental Justice

As part of the permit development process, EPA Region 10 conducted a screening analysis to determine whether this permit action could affect overburdened communities. "Overburdened" communities can include minority, low-income, tribal, and indigenous populations or communities that potentially experience disproportionate environmental harms and risks. EPA used a nationally consistent geospatial tool that contains demographic and environmental data for the United States at the Census block group level. This tool is used to identify permits for which enhanced outreach may be warranted.

The Wrangell WWTP is not located within or near a Census block group that is potentially overburdened. The draft permit does not include any additional conditions to address environmental justice.

Regardless of whether a facility is located near a potentially overburdened community, EPA encourages permittees to review (and to consider adopting, where appropriate) Promising Practices for Permit Applicants Seeking EPA-Issued Permits: Ways To Engage Neighboring Communities (see https://www.federalregister.gov/d/2013-10945). Examples of promising practices include: thinking ahead about community's characteristics and the effects of the permit on the community, engaging the right community leaders, providing progress or status reports, inviting members of the community for tours of the facility, providing informational materials translated into different languages, setting up a hotline for community members to voice concerns or request information, follow up, etc.

For more information, please visit https://www.epa.gov/environmentaljustice and Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*.

H. Standard Permit Provisions

Permit Parts III., IV. and V. contain standard regulatory language that must be included in all NPDES permits. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

VI. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. EPA has prepared a biological evaluation and determined the discharge has the potential to affect the endangered western distinct population segment of Steller sea lion and the threatened Mexico distinct population segment of Humpback whale. Pursuant to Section 7 of the ESA, EPA will be consulting with NOAA Fisheries prior to taking final action on the permit.

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH).

The EFH regulations define an adverse effect as any impact that reduces quality and/or quantity of EFH and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

EPA will prepare an EFH assessment to assess the impacts of the discharge on EFH. If the EFH assessment concludes there will be adverse impacts EPA will consult with the NMFS prior to final permit action.

C. CWA Section 401 State Certification

Section 401 of the CWA requires the state in which the discharge originates to certify that the discharge complies with the appropriate sections of the CWA, as well as any appropriate requirements of state law. See 33 USC 1341(d). As a result of the certification, the state may require more stringent permit conditions or additional monitoring requirements to ensure that the permit complies with WQS, or treatment standards established pursuant to any state law or regulation.

EPA held preliminary discussions with ADEC regarding its CWA Section 401 Certification during development of the draft permit. One June 2, 2022 EPA sent ADEC

a pre-filing certification meeting request. EPA is now sending a final request for CWA Section 401 Certification to ADEC.

D. Antidegradation

ADEC will conduct an antidegradation analysis of the discharge following its antidegradation policy and implementation methods outlined in 18 AAC 70.015 and 18 AAC 70.016, respectively. The antidegradation review will be included in the CWA Section 401 Certification for this permit. Questions regarding the CWA Section 401 Certification or antidegradation review can be submitted to ADEC as set forth above (see State Certification on Page 1 of this Fact Sheet).

E. Permit Expiration

The permit will expire five years from the effective date.

VII. REFERENCES

ADEC. 2003. 18 AAC 70, Water Quality Standards, As Amended Through June 26, 2003. Approved by the EPA in 2004. https://www.epa.gov/wqs-tech/water-quality-standards-regulations-alaska.

ADEC. 2008. Alaska Water Quality Criteria Manual for Toxic and other Deleterious Organic and Inorganic Substances.

ADEC. 2020. Integrated Water Quality Monitoring and Assessment Report.

USEPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency, Office of Water, EPA/505/2-90-001.https://www3.epa.gov/npdes/pubs/owm0264.pdf

USEPA. 1994. Amended Section 301(h) Technical Support Document. EPA-842-B-94-007.Water Pollution Control Federation. Subcommittee on Chlorination of Wastewater. *Chlorination of Wastewater.* Water Pollution Control Federation. Washington, D.C. 1976.

EPA. 2010. *NPDES Permit Writers' Manual.* Environmental Protection Agency, Office of Wastewater Management, EPA-833-K-10-001. September 2010. https://www3.epa.gov/npdes/pubs/pwm_2010.pdf

EPA, 2007. *EPA Model Pretreatment Ordinance*, Office of Wastewatr Management/Permits Division, January 2007.

EPA, 2011. *Introduction to the National Pretreatment Program*, Office of Wastewater Management, EPA 833-B-11-011, June 2011.

EPA. 2014. Water Quality Standards Handbook Chapter 5: General Policies. Environmental Protection Agency. Office of Water. EPA 820-B-14-004. September 2014. https://www.epa.gov/sites/production/files/2014-09/documents/handbook-chapter5.pdf

VIII. APPENDIX A: WATER QUALITY DATA

A. Treatment Plant Effluent Data (2016-2021)

Parameter	BOD5, 20 deg. C (mg/L)	BOD5, 20 deg. C (mg/L)		BOD5 20 deg. C (lbs/day)		BOD5 (% removal)
Statistical Basis	INFLUENT	DAILY MAX	MO AVG	DAILY MX	MO AVG	Min % Removal
Average	92.53	18.42	18.42	44.75	44.75	77.56
Maximum	240.00	100.00	100.00	296.70	296.70	94.17
Minimum	32.00	8.40	8.40	17.35	17.35	28.50
Count	68.00	68.00	68.00	68.00	68.00	68.00
Std Dev	46.71	11.75	11.75	34.53	34.53	10.56
CV	0.50	0.64	0.64	0.77	0.77	0.14
99th Percentile	226.60	56.45	56.45	165.57	165.57	91.83
95th Percentile	185.50	33.55	33.55	77.34	77.34	89.69
5th Percentile	37.45	9.89	9.89	22.60	22.60	60.33

Parameter	TSS (mg/L)	TSS (mg/L)		TSS (lbs/day)		TSS (% removal)
Statistical Basis	INFLUENT	DAILY MX	MO AVG	DAILY MX	MO AVG	Min % Removal
Average	86.84	13.85	13.85	34.27	34.27	78.89
Maximum	280.00	48.00	48.00	99.17	99.17	96.70
Minimum	27.00	4.00	4.00	6.16	6.16	42.00
Count	68.00	68.00	68.00	68.00	68.00	68.00
Std Dev	48.56	6.43	6.43	16.78	16.78	12.02
CV	0.56	0.46	0.46	0.49	0.49	0.15
99th Percentile	239.80	35.27	35.27	81.89	81.89	96.10
95th Percentile	185.50	24.10	24.10	62.92	62.92	95.60
5th Percentile	32.90	4.84	4.84	12.03	12.03	59.04

Parameter	Fecal coliform, MPN, 44.5 C (#/100mL)		Flow (mgd)		Nitrogen, ammonia total [as N]	D.O. (mg/L)	
Statistical Basis	DAILY MX	MO GEO	DAILY MAX	MO AVG	DAILY MX	MAX	MIN
Average	14892.68	14892.68	0.69	0.35	13.07	7.95	5.00
Maximum	60000.00	60000.00	1.88	0.56	28.00	10.62	7.43
Minimum	72.00	72.00	0.26	0.21	4.40	5.21	2.67
Count	68.00	68.00	68.00	68.00	23.00	68.00	68.00
Std Dev	14639.29	14639.29	0.31	0.07	6.10	1.29	0.97
CV	0.98	0.98	0.45	0.20	0.47	0.16	0.19
99th Percentile	58660.00	58660.00	1.88	0.52	27.12	10.59	7.32
95th Percentile	48300.00	48300.00	1.31	0.46	27.20	10.22	7.10
5th Percentile	394.00	394.00	0.34	0.24	4.48	5.81	3.60

Parameter	pH (S.U.)		Temp (C)
Statistical Basis	MAX	MIN	MO AVG
Average	7.56	7.09	10.22
Maximum	7.79	7.49	18.63
Minimum	6.95	6.50	2.17
Count	68.00	68.00	68.00
Std Dev	0.15	0.23	5.15
CV	0.02	0.03	0.50
99th Percentile	7.78	7.46	18.48
95th Percentile	7.75	7.40	17.96
5th Percentile	7.23	6.51	3.09

B. Receiving Water Data (2016-2021)

Parameter	Units	Percentile	Value	Source
Temperature	°C	95th	13.65	1
pH	Standard units	5th – 95th	6.0 – 8.0	1
Ammonia	mg/L	90th	0.214	1
Dissolved Oxygen	mg/L	Minimum	4.68	1
Turbidity	NTU	Average	12.8	1
Salinity	ppt	5th – 95th	3.1 – 28.6	1
Fecal Coliform	CFU	Max Geometric Mean	15.1	1
Copper	µg/L	Maximum	1.05	2

Source:
1) Data collected by permittee 2016-2021
2) Water Quality Measures in Alaska's Ports and Shipping Lanes, 2020 Annual Report

C. Alaska WQS Tables for Ammonia

Acute Ammonia Criteria, Marine

Total Ammonia in mg-N/L at 10 g/kg Salinity								
pH	Temperature							
	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
7.0	222.4	157.3	107.9	75.8	51.1	36.2	23.9	17.3
7.2	144.1	99.6	68.4	47.8	32.9	22.2	15.6	10.7
7.4	90.6	63.4	42.8	28.8	20.6	14.0	9.9	6.8
7.6	56.8	39.5	27.2	18.9	13.2	9.1	6.3	4.6
7.8	36.2	25.5	17.3	12.4	8.2	5.8	4.1	2.9
8.0	22.2	15.6	10.7	7.7	5.3	3.8	2.6	1.9
8.2	14.8	9.9	7.0	4.8	3.5	2.4	1.7	1.2
8.4	9.1	6.5	4.4	3.0	2.2	1.6	1.2	0.8
8.6	6.0	4.1	2.9	2.1	1.5	1.1	0.8	0.6
8.8	3.8	2.7	1.9	1.4	1.0	0.8	0.6	0.5
9.0	2.4	1.7	1.2	0.9	0.7	0.6	0.4	0.4

Chronic Ammonia Criteria, Marine

Total Ammonia in mg-N/L at 10 g/kg Salinity								
pH	Temperature							
	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
7.0	33.8	23.9	16.5	11.5	7.7	5.4	3.6	2.6
7.2	21.4	14.8	9.9	7.2	4.9	3.4	2.3	1.6
7.4	14.0	9.9	6.4	4.4	3.0	2.1	1.5	1.0
7.6	8.2	5.9	4.1	2.8	2.0	1.4	1.0	0.7
7.8	5.4	3.9	2.6	1.8	1.2	0.9	0.6	0.4
8.0	3.4	2.4	1.6	1.2	0.8	0.6	0.4	0.3
8.2	2.2	1.5	1.1	0.7	0.5	0.4	0.3	0.2
8.4	1.4	1.0	0.7	0.5	0.3	0.2	0.2	0.1
8.6	0.9	0.6	0.4	0.3	0.2	0.2	0.1	0.1
8.8	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.1
9.0	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1

IX. APPENDIX B: REASONABLE POTENTIAL AND WQBEL FORMULAE

A. Reasonable Potential Analysis

EPA uses the process described in the 1991 TSD to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a WQBEL must be included in the permit.

1. Mass Balance

For discharges to flowing water bodies, the maximum projected receiving water concentration is determined using the following mass balance equation:

$$C_d Q_d = C_e Q_e + C_u Q_u \qquad \textit{Equation 1}$$

where,

C_d	=	Receiving water concentration downstream of the effluent discharge (that is, the concentration at the edge of the mixing zone)
C_e	=	Maximum projected effluent concentration
C_u	=	95th percentile measured receiving water upstream concentration
Q_d	=	Receiving water flow rate downstream of the effluent discharge = Q_e+Q_u
Q_e	=	Effluent flow rate (set equal to the design flow of the WWTP)
Q_u	=	Receiving water low flow rate upstream of the discharge (1Q10, 7Q10 or 30B3)

When the mass balance equation is solved for C_d, it becomes:

$$C_d = \frac{C_e \times Q_e + C_u \times Q_u}{Q_e + Q_u} \qquad \textit{Equation 2}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with 100% of the receiving stream.

If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

$$C_d = \frac{C_e \times Q_e + C_u \times (Q_u \times \%MZ)}{Q_e + (Q_u \times \%MZ)} \qquad \textit{Equation 3}$$

Where:

% MZ = the percentage of the receiving water flow available for mixing.

If a mixing zone is not allowed, dilution is not considered when projecting the receiving water concentration and,

$$C_d = C_e \qquad \textit{Equation 4}$$

A dilution factor (D) can be introduced to describe the allowable mixing. Where the dilution factor is expressed as:

$$D = \frac{Q_e + Q_u \times \%MZ}{Q_e} \qquad \textit{Equation 5}$$

After the dilution factor simplification, the mass balance equation becomes:

$$C_d = \frac{C_e - C_u}{D} + C_u \qquad \textit{Equation 6}$$

If the criterion is expressed as dissolved metal, the effluent concentrations are measured in total recoverable metal and must be converted to dissolved metal as follows:

$$C_d = \frac{CF \times C_e - C_u}{D} + C_u \qquad \textit{Equation 7}$$

Where C_e is expressed as total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is a conversion factor used to convert between dissolved and total recoverable metal.

The above equations for C_d are the forms of the mass balance equation which were used to determine reasonable potential and calculate WLAs.

2. Maximum Projected Effluent Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, the 1991 TSD recommends using the maximum projected effluent concentration (Ce) in the mass balance calculation (see equation 3, page C-5). To determine the maximum projected effluent concentration (Ce) EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for each pollutant parameter has been calculated, the reasonable potential multiplier (RPM) used to derive the maximum projected effluent concentration (Ce) can be calculated using the following equations:

First, the percentile represented by the highest reported concentration is calculated.

$$p_n = (1 - \text{confidence level})^{1/n} \qquad \textit{Equation 8}$$

where,

p_n = the percentile represented by the highest reported concentration

n = the number of samples

confidence level = 99% = 0.99

and

$$RPM = \frac{C_{99}}{C_{P_n}} = \frac{e^{Z_{99} \times \sigma - 0.5 \times \sigma^2}}{e^{Z_{P_n} \times \sigma - 0.5 \times \sigma^2}}$$ *Equation 9*

Where,

σ^2 = $\ln(CV^2 + 1)$

Z_{99} = 2.326 (z-score for the 99th percentile)

Z_{Pn} = z-score for the P_n percentile (inverse of the normal cumul distribution function at a given percentile)

CV = coefficient of variation (standard deviation ÷ mean)

The maximum projected effluent concentration is determined by simply multiplying the maximum reported effluent concentration by the RPM:

$$C_e = (RPM)(MRC)$$ *Equation 10*

where MRC = Maximum Reported Concentration.

3. Maximum Projected Effluent Concentration at the Edge of the Mixing Zone

   Once the maximum projected effluent concentration is calculated, the maximum projected effluent concentration at the edge of the acute and chronic mixing zones is calculated using the mass balance equations presented previously.

4. Reasonable Potential

   The discharge has reasonable potential to cause or contribute to an exceedance of water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the most stringent criterion for that pollutant.

B. WQBEL Calculations

1. Calculate the Wasteload Allocations (WLAs)

   WLAs are calculated using the same mass balance equations used to calculate the concentration of the pollutant at the edge of the mixing zone in the reasonable potential analysis. To calculate the WLAs, C_d is set equal to the acute or chronic criterion and the equation is solved for C_e. The calculated C_e is the acute or chronic WLA. Equation 6 is rearranged to solve for the WLA, becoming:

$$C_e = WLA = D \times (C_d - C_u) + C_u$$ *Equation 11*

Alaska's water quality criteria for some metals are expressed as the dissolved fraction, but the Federal regulation at 40 CFR 122.45(c) requires that effluent limits be expressed as total recoverable metal. Therefore, EPA must calculate a WLA in total recoverable metal that will be protective of the dissolved criterion. This is accomplished by dividing the WLA expressed as dissolved by the criteria translator, as shown in equation 12. The criteria translator (CT) is equal to the conversion factor, because site-specific translators are not available for this discharge.

$$C_e = WLA = \frac{D \times (C_d - C_u) + C_u}{CT} \qquad \textit{Equation 12}$$

The next step is to compute the "long term average" concentrations which will be protective of the WLAs. This is done using the following equations from the 1991 TSD:

$$LTA_a = WLA_a \times e^{(0.5\sigma^2 - z\,\sigma)} \qquad \textit{Equation 13}$$

$$LTA_c = WLA_c \times e^{(0.5\sigma_4^2 - z\sigma_4)} \qquad \textit{Equation 14}$$

where,

σ^2 = $\ln(CV^2 + 1)$

Z_{99} = 2.326 (z-score for the 99th percentile probability basis)

CV = coefficient of variation (standard deviation ÷ mean)

σ_4^2 = $\ln(CV^2/4 + 1)$

For ammonia, because the chronic criterion is based on a 30-day averaging period, the Chronic Long Term Average (LTAc) is calculated as follows:

$$LTA_c = WLA_c \times e^{(0.5\sigma_{30}^2 - z\sigma_{30})} \qquad \textit{Equation 15}$$

where,

σ_{30}^2 = $\ln(CV^2/30 + 1)$

The LTAs are compared and the more stringent is used to develop the daily maximum and monthly average permit limits as shown below.

2. Derive the maximum daily and average monthly effluent limits

Using the 1991 TSD equations, the MDL and AML effluent limits are calculated as follows:

$$\mathrm{MDL} = \mathrm{LTA} \times e^{(z_m\sigma - 0.5\sigma^2)} \qquad \textit{Equation 16}$$

$$\mathrm{AML} = \mathrm{LTA} \times e^{(z_a\sigma_n - 0.5\sigma_n^2} \qquad \textit{Equation 17}$$

where σ, and σ^2 are defined as they are for the LTA equations above, and,

σ_n^2	=	$\ln(CV^2/n + 1$
z_a	=	1.645 (z-score for the 95th percentile probability basis)
z_m	=	2.326 (z-score for the 99th percentile probability basis)
n	=	number of sampling events required per month. With the exception of ammonia, if the AML is based on the LTA_c, i.e., $LTA_{minimum} = LTA_c$), the value of ''n'' should is set at a minimum of 4. For ammonia, In the case of ammonia, if the AML is based on the LTA_c, i.e., $LTA_{minimum} = LTA_c$), the value of ''n'' should is set at a minimum of 30.

X. APPENDIX C: REASONABLE POTENTIAL AND WQBEL CALCULATIONS

Pollutant			AMMONIA, Criteria as Total NH3	CHLORINE (Total Residual)	Copper
Effluent Data	# of Samples (n)		23	4	3
	Coeff of Variation (Cv)		0.47	0.6	0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile)		28,000	750	51.2
	Calculated 50th percentile Effluent Conc. (when n>10)				
Mixing Zone Used	Aquatic Life – Acute		11.2	11.2	11.2
	Aquatic Life – Chronic		112	112	112
	Ammonia		112		
	Human Health - Non-Carcinogen				
	Human Health – carcinogen				
Receiving Water Data	90th Percentile Conc., µg/L		0.214	0	1.05
	Geo Mean, µg/L				
Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	7,700	13	4.8
		Chronic	1,200	7.5	3.1
	Human Health Water and Organism, µg/L		-	-	
	Human Health, Organism Only, µg/L		-	-	
	Metal Criteria Translator, decimal	Acute	-	-	0.83
		Chronic	-	-	0.83
	Carcinogen?		N	N	N
Aquatic Life Reasonable Potential					
Σ	$\sigma^2=\ln(CV^2+1)$		0.447	0.555	0.555
P_n	$=(1\text{-confidence level})^{1/n}$	99%	0.819	0.316	0.215
1991 TSD Multiplier	$=\exp(2.3262\sigma-0.5\sigma^2)/\exp(\text{invnorm}(P_N)\sigma-0.5\sigma^2)$	99%	1.9	4.7	5.6
Max. conc.(ug/L) at edge of…		Acute	4709	317.1	22.28
		Chronic	471	31.7	3.17

Reasonable Potential? Limit Required?			NO	YES	Uncertain
Aquatic Life Limit Calculation					
n = # samples assumed to calculate AML			-	4	4
# of Compliance Samples Expected per month			-	4	4
LTA Coeff. Var. (CV), decimal	default = 0.6 or calculate from data		-	0.6	0.6
Permit Limit Coeff. Var. (CV), decimal			-	0.6	0.6
Waste Load Allocations ug/L	$C_d=(C_r x MZ_a)-C_{sa} x(MZ_a-1)$	Acute	-	145.6	43.1
	$C_d=(C_r x MZ_c)-C_{sc}*(MZ_c-1)$	Chronic	-	840.0	230.7
Long Term Averages ug/L	WLAc x $\exp(0.5\sigma^2-2.326\sigma)$	Acute	-	46.7	13.8
	WLAa x $\exp(0.5\sigma^2-2.326\sigma)$; ammonia n=30	Chronic	-	443.0	121.6
Limiting LTA, ug/L	used as basis for limits calculation		-	46.7	13.8
Metal Translator or 1?			-	-	0.83
Average Monthly Limit (AML), ug/L		95%	-	73	26
Maximum Daily Limit (MDL), ug/L		99%	-	146	52
Average Monthly Limit (AML), mg/L			-	0.073	0.026
Maximum Daily Limit (MDL), mg/L			-	0.146	0.052
Average Monthly Limit (AML), lb/day			-	0.4	0.1
Maximum Daily Limit (MDL), lb/day			-	0.7	0.3