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:

Haines Borough

Haines Borough Wastewater Treatment Plant

Public Comment Start Date: May 4, 2023

Public Comment Expiration Date: June 19, 2023

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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 (FS) 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

CLEAN WATER ACT § 401 CERTIFICATION

EPA is requesting final Clean Water Act (CWA) 401 certification from the State of Alaska Department of Environmental Conservation (ADEC).

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

Alaska Department of Environmental Conservation
Attn: Gene McCabe, Program Manager, Wastewater Discharge Authorization Program
P.O. Box 111800
Juneau, Alaska 99811
907-269-7580
gene.mccabe@alaska.gov

CLEAN WATER ACT § 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), 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 U.S.C. 1341(a)(2)). There are no neighboring states or tribes with TAS within 300 miles of the facility. Therefore, EPA has determined that no neighboring states or tribes with TAS will be impacted by the discharge from this facility.

PUBLIC COMMENT

EPA requests that all comments on EPA's draft permit and tentative 301(h) decision or requests for a public hearing be submitted via email to Abigail Conner (conner.abigail@epa.gov). If you are unable to submit comments via email, please call 206-553-6358.

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 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 Fact Sheet, 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 draft Administrative Record or documents from it are available electronically upon request by contacting Abigail Conner.

For technical questions regarding the draft permit, this Fact Sheet, or the 301(h) TD, contact Abigail Conner at (206) 553-6358 or conner.abigail@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.
AML	Average Monthly Limit
ASR	Alternative State Requirement
AWL	Average Weekly Limit
BE	Biological Evaluation
BOD_5	Biochemical oxygen demand, five-day
BOD_{5u}	Biochemical oxygen demand, ultimate
BMP	Best Management Practices
°C	Degrees Celsius
$CBOD_5$	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
FR	Federal Register
gpd	Gallons per day
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
O&M	Operations and maintenance
NTU	Nephelometric Turbidity Unit
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
TD	301(h) Technical Decision Document
TMDL	Total Maximum Daily Load
TRC	Total Residual Chlorine
TRE/TIE	Toxicity Reduction and Identification Evaluation
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
TU_a	Toxic Units, Acute
TU_c	Toxic Units, Chronic
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UV	Ultraviolet
WD	Water Division
WET	Whole Effluent Toxicity
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:

Table 1. General Facility Information

NPDES Permit #:	AK0021385
Applicant:	Haines Borough Haines Borough Wastewater Treatment Plant
Type of Ownership	Publicly Owned Treatment Works
Physical Address:	229 W Fair Dr. Haines, AK 99827
Mailing Address:	P.O. Box 1049 Haines, AK 99827
Facility Contact:	Dennis Durr Water-Wastewater Department Supervisor ddurr@haines.ak.us 907-766-6452
Facility Location:	Latitude: 59.23447°N, Longitude: -135.465215°W
Receiving Water	Portage Cove
Facility Outfall	Latitude: 59.23710°N, Longitude: -135.431138°W (midpoint of diffuser)

B. MODIFICATION OF SECONDARY TREATMENT REQUIREMENTS

Haines Borough (Haines, the applicant, or the permittee) has requested a modification, under Section 301(h) of the CWA of the secondary treatment requirements contained in Section 301(b)(1)(B) of the CWA to discharge wastewater receiving less than secondary treatment from the Haines Borough Wastewater Treatment Plant (WWTP) into Portage Cove. The effluent quality attainable by secondary treatment is defined in the regulations at 40 CFR Part 133 in terms of biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH. Haines 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, EPA has tentatively determined that the Haines 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 (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 CWA, as implemented by regulations at 40 CFR Part 125, Subpart G.

C. PERMIT HISTORY

The most recent NPDES permit for the Haines WWTP was issued on November 20, 2001, became effective on December 24, 2001, and expired on December 26, 2006 (hereafter referred to as the 2001 permit). The 2001 permit is a 301(h)-modified NPDES permit and includes a modification of secondary treatment requirements, as approved by EPA. A timely and complete NPDES application for permit issuance was submitted by the permittee on July 13, 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 Haines WWTP is located within the traditional and historical territory of the Chilkoot Indian Association, a federally recognized tribe. EPA notified the Chilkoot Indian Association of its work on this draft permit in August 2020 and January 2021. EPA also held an informational webinar for the Chilkoot Indian Association and other tribes on April 14 and 18, 2022. EPA shared the preliminary draft permit, draft fact sheet, and draft 301(h) TD with the Chilkoot Indian Association on February 17, 2023. EPA will invite the Chilkoot Indian Association to participate in formal government-to-government consultation on the draft 301(h) TD and permitting decisions during the public notice period.

In addition, the Chilkat Indian Village, a federally recognized tribe, is located 22 miles north of Haines. EPA notified the Chilkat Indian Village of its work on this draft permit in April 2023. EPA shared the preliminary draft permit, draft fact sheet, and draft 301(h) TD with the Chilkat Indian Village on April 28, 2023. EPA will invite the Chilkat

Indian Village to participate in formal government-to-government consultation on the draft 301(h) TD and permitting decisions during the public notice period.

II. FACILITY INFORMATION

A. TREATMENT PLANT DESCRIPTION

Service Area

Haines Borough owns and operates the WWTP located in Haines, Alaska. The collection system has no combined sewers. The facility serves a resident population of approximately 1,800 people. There are two small industrial users, a distillery, and a brewery, with a maximum combined discharge to the Haines collection system of less than 10,000 gallons per day (gpd).

Treatment Process

The max monthly design flow of the facility is 1.9 million gallons per day (mgd). The reported actual flows from the facility range from 0.16 mgd to 0.66 mgd (average monthly flow). The facility provides primary treatment to all wastewater prior to discharge. The treatment process consists of two primary screens, a grit chamber where a polymer is added, then a clarifier. Because the design flow is greater than 1 mgd, the facility is considered a major 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

The facility outfall is a 16-inch pipe which extends 558 meters from shore at approximately 24.4 meters (80 feet) below mean lower low water (MLLW). The pipe ends in a three-port diffuser. One of the three ports on the diffuser was capped in 1986 and is no longer used. The diffuser is 9.1 m (30 feet) in length and the diameter of each port is 7.6 cm.

C. EFFLUENT CHARACTERIZATION

To characterize the effluent, EPA evaluated discharge monitoring report (DMR) data from 2016 through 2021 and the results of a 2006 priority pollutant scan. The effluent quality is summarized in Table 2. Data are provided in Appendix A of this fact sheet and Appendix C of the 301(h) TD.

Table 2. Effluent Characterization

Parameter	Minimum	Maximum
BOD (monthly avg), mg/L BOD (monthly avg), lbs/day	7.3 16	245 345
BOD (daily max), mg/L BOD (daily max), lbs/day	7.3 23	245 610
BOD (monthly avg % removal), %	25	93
TSS (monthly avg), mg/L	22	121

TSS (monthly avg), lbs/day	40	180
TSS (daily max), mg/L TSS (daily max), lbs/day	32 74	244 813
TSS (monthly avg % removal), %	31	90
Fecal coliform (monthly avg), #/100 mL Fecal coliform (daily max), #/100 mL	14,100 10,000	980,000 1,430,000
Copper, total recoverable (monthly avg), µg/L Copper, total recoverable (daily max), µg/L	0 0	30 30
Flow (max daily), mgd Flow (monthly avg), mgd	0.21 0.16	1.65 0.66
Dissolved oxygen (daily min), mg/L Dissolved oxygen (daily max), mg/L	2.1 2.2	11.2 16.5
pH (min), standard units pH (max), standard units	6.5 7.0	7.4 8.0
Temperature (monthly avg), ^{o}C	5.6	15.8
Parameter	**Avg Daily**	**Max Daily**
Chloroform[2], µg/L	0.26	2
Toluene[2], µg/L	0.39	0.79
Phenol[2], µg/L	2.9	5.9
Di-n-butyl phthalate[2], µg/L	1.6	3.1
1,4-dichlorobenzene[2], µg/L	0.46	9.1
Naphthalene[2], µg/L	1.4	2.7
Bis (2-ethylhexyl phthalate)[2], µg/L	0.75	1.5
Antimony[2], µg/L	0.11	0.22
Arsenic[2], µg/L	0.27	0.545
Chromium[2], µg/L	0.36	0.711
Lead[2], µg/L	0.323	0.646
Nickel[2], µg/L	1.76	2.23
Selenium[2], µg/L	1.31	2.62
Silver[2], µg/L	0.414	0.827
Zinc[2], µg/L	27.4	28.4

Source:

1. Discharge monthly reports (DMR) from 9/30/2016 - 9/30/2021
2. Priority Pollutant Scan, 2006, 2 samples collected for each pollutant

D. COMPLIANCE HISTORY

A summary of effluent violations from 2016 to 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 May 2018, August 2019, and January 2022, the daily maximum concentration for fecal coliform in July 2021, and the TSS daily maximum concentration in July 2018, August 2019, and September 2019. The exceedances of

BOD_5 in May 2018 and BOD_5 and TSS in August 2019 were due to sampling error after equipment replacements. The exceedance of TSS in September 2019 was due to operator error. In each instance, Haines corrected the problem before the next reporting date.

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=110000761453.

Table 3 Summary of Effluent Violations

Parameter	Limit Type	Units	Number of Instances
BOD_5	% Removal	%	3
TSS	Daily Maximum	mg/L	3
Fecal Coliform	Daily Maximum	#/100ml	1
Information accessed in ECHO on May 26, 2022.			

EPA conducted an inspection of the facility on July 10, 2017. The inspection encompassed the wastewater treatment process, records review, operation and maintenance, and the collection system. The inspection noted several areas of concern at the facility, including the locations of surface water monitoring, the procedure for determining effluent flow, the timing of composite samples, the records of time of day of monitoring, flows used to calculate loadings, missing Quality Assurance Plan (QAP) requirements for copper monitoring, calibration records, and maintenance of the effluent sampling tube.

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 Fact Sheet. This section summarizes characteristics of the receiving water that impact that analysis.

This facility discharges to Portage Cove in Haines Borough, AK. Portage Cove is located on the western shoreline of the eastern branch of Chilkoot Inlet on the northern end of Lynn Canal. For a detailed description of the receiving waters please refer to Section 6 of the 301(h) TD.

A. WATER QUALITY STANDARDS (WQS)

Section 301(b)(1)(C) of the CWA 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 Alaska Administrative Code (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, Portage Cove, has not been reclassified, nor have site-specific water quality criteria been established. Therefore, Portage Cove 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 Portage Cove is summarized in Table 4, below, and in Section 6 of the 301(h) TD. The Haines WWTP collected water quality data in Portage Cove in accordance with 2001 permit requirements for the following parameters: temperature, pH, dissolved oxygen, turbidity, and salinity.

From April through August 2021, the Aquatic Restoration and Research Institute (ARRI) conducted a survey for the Alaska Department of Environmental Conservation (ADEC) on water quality data in the vicinity of the Haines WWTP for temperature, salinity, pH, fecal coliform, enterococcus, ammonia, copper, nickel, and zinc. Cruise ships were not operating in 2021. However, the 2021 values for temperature, salinity, pH, and dissolved oxygen are similar to data collected by ARRI in 2020, when cruise ships were actively operating in the area (ARRI, 2022). Therefore, the 2021 ARRI data are believed to be representative of Portage Cove conditions. The water quality data in Portage Cove from the 2021 ARRI report and the permittee are summarized below in Table 4 and Appendix A.

Table 4. Receiving Water Quality Data

Parameter	Units	Percentile	Value
Temperature[1]	°C	95th	12.5
pH[1]	Standard units	5th – 95th	7.5 - 8.5
Dissolved Oxygen[1]	mg/L	Minimum	5.2
Turbidity[1]	NTU	Average	2.9
Salinity[1]	ppt	5th – 95th	4.5 - 32
Fecal Coliform[2]	CFU/100 mL	Max Geometric Mean	8
Enterococcus[2]	MPN/100 mL	Maximum	96
Ammonia[2]	mg/L	Maximum	0.021
Copper[2]	µg/L	Maximum	0.39
Nickel[2]	µg/L	Maximum	0.35
Zinc[2]	µg/L	Maximum	0.38

Source:

1. Data collected by permittee 2003 - 2005
2. ARRI, 2022. Water Quality Measures in Alaska's Ports and Shipping Lanes, 2021 Annual Report

1. General Characteristics

Portage Cove is located within the saline estuary of Chilkoot Inlet in southeast Alaska. The circulation pattern within Chilkoot Inlet is characterized by a two-layer flow system typical of estuaries or fjords. The surface layer flows seaward and is driven by freshwater inflow, and the bottom layer moves landward. There is a net transport of water out of the inlet due to freshwater runoff.

2. Water Quality Limited Waters

There are no water quality impairments identified in Portage Cove on the State of Alaska's 2022 Integrated Report (ADEC, 2022).

IV. EFFLUENT LIMITATIONS AND MONITORING

The draft permit includes several changes to the effluent limitations. The changes are summarized in Table 5 below:

Table 5. Summary of Proposed Changes to Effluent Limits

Parameter	Effluent Limit Change	Basis
BOD_5	Less stringent limits	EPA is proposing less stringent effluent limits that reflect facility performance. The less stringent limits meet an exception to the prohibition on backsliding as described in Section IV.A.2.b.
TSS	More stringent limits	EPA is proposing more stringent effluent limits that reflect facility performance. The proposed limits are at the level of performance which the facility can consistently achieve.
BOD_5[1]	Removing maximum daily limit/including average weekly limit	The regulations at 40 CFR 122.45(d)(2) require effluent limitations for continuous discharges from POTWs be expressed as average weekly and average monthly discharge limitations, unless impracticable. The 2001 permit contained average monthly and maximum daily effluent limits for BOD_5. The draft permit proposes to remove the maximum daily effluent limit and implement an average weekly limit. The inclusion of a maximum daily limit instead of an average weekly limit meets an exception to the prohibition on backsliding as described in Section IV.A.2.b.
TSS[1]	Removing maximum daily limit/including average weekly limit	The regulations at 40 CFR 122.45(d)(2) require effluent limitations for continuous discharges from POTWs be expressed as average weekly and average monthly discharge limitations, unless impracticable. The 2001 permit contained average monthly and maximum daily effluent limits for TSS. The draft permit proposes to remove the maximum daily effluent limit and implement an average weekly limit. The change in limits meets an exception to prohibition on backsliding as described in Section IV.A.2.b.

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) discharges to meet state WQS and federal CWA 304(a) criteria at the boundary of the zone of initial dilution (ZID). The draft permit contains fecal coliform limits that EPA anticipates the state of Alaska will include as a condition of the 401 certification. These limits will ensure Alaska's most protective WQS are met at the boundary of the chronic mixing zone.
Enterococcus	New effluent limits	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 water quality standards and federal CWA Section 304(a) criteria at the boundary of the ZID. When the 2001 permit was issued, no WQS 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 WQBELs for enterococcus developed using the dilution achieved at the boundary of the chronic mixing zone.
Copper	More stringent effluent limits	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 water quality standards and federal CWA Section 304(a) criteria at the boundary of the ZID and at the boundary of the acute and chronic mixing zones. EPA has determined the discharge has reasonable potential to cause or contribute to an exceedance of the WQS for copper and is including the calculated limits so the facility meets WQS.

Chlorine	Removal of effluent limits	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 water quality standards and federal CWA Section 304(a) criteria at the boundary of the ZID. EPA has determined the discharge does not have reasonable potential to cause or contribute to an exceedance of the WQS for chlorine and removal of the limit is allowed under the antibacksliding policy as described in Section IV.A.3.d.
1. Concentration/mass-loading limits only; compliance with 30% removal is still determined on monthly averaging basis.		

Table 6 below presents the existing effluent limits and monitoring requirements in the 2001 Permit. Table 7 below presents the effluent limits and monitoring requirements proposed in the draft permit.

Table 6. Existing 2001 Permit - Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly Limit	Average Weekly Limit	Max Daily Limit	Sample Location	Sample Frequency	Sample Type
Total Flow	MGD	1.9	--	2.9	Influent or Effluent	Continuous	Recorded
BOD_5, May 1 – Sept. 30	mg/L	260	--	300	Influent and Effluent	1/month	24-hour composite
	lbs/day	4100	--	4800			
BOD_5, Oct. 1 – April 30	mg/L	140	--	200	Influent and Effluent	1/month	24-hour composite
	lbs/day	2200	--	3200			
BOD_5,% removal	%	Minimum 30% removal			Influent and Effluent	--	Calculation

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly Limit	Average Weekly Limit	Max Daily Limit	Sample Location	Sample Frequency	Sample Type
Total Suspended Solids (TSS)	mg/L	140	--	200	Influent and Effluent	1/week	24-hour composite
	lbs/day	2200	--	3200			
TSS, % removal	%	Minimum 30% removal			Influent and Effluent	--	Calculation
Total Residual Chlorine[5]	µg/L	--	--	110	Effluent	1/week	Grab
Fecal Coliform	# FC/100 mL	1.0×10^6	--	1.5×10^6	Effluent	1/month	Grab
Copper, Total Recoverable	µg/L	78	--	156	Effluent	1/quarter	24-hour composite
pH	s.u.	Between 6.5 s.u.– 8.5 s.u.			Effluent	1/week	Grab
Dissolved Oxygen	mg/L	Between 2.0 mg/L – 17 mg/L			Effluent	1/week	Grab
Temperature	°C	--			Effluent	1/week	Grab
Toxic Pollutants and Pesticides[1]	--	--			Effluent	2/permit term[2]	24-hour composite
Whole Effluent Toxicity (WET)[3], TU_c	TU_c	--			Effluent	1/permit term[4]	24-hour composite

1. "Toxic Pollutants" are defined as the 126 priority pollutants in 40 CFR 401.15. "Pesticides" are defined at 40 CFR 125.58(p).
2. The permittee shall conduct analyses of the effluent for toxic pollutants and pesticides during the first and fourth year of the permit term. Monitoring during the first year shall be conducted during the dry season in the month of July. Monitoring during the fourth year shall be conducted during the wet season in the month of January. Samples shall be 24-hour composite samples. Sampling and analysis shall be conducted according to methods approved in 40 CFR Part 136.
3. See Part 1.C. of 2001 Permit.
4. Whole Effluent Toxicity monitoring shall be conducted in the first year of the permit term.
5. Chlorine monitoring and the effluent limits are only effective if the facility adds a chlorination process to the facility as a method of disinfection.

Table 7. Draft Permit - Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations			Monitoring Requirements		
		Average Monthly Limit	Average Weekly Limit	Max Daily Limit	Sample Location	Sample Frequency	Sample Type
Total Flow	MGD	1.9	--	2.9	Influent and Effluent	Continuous	Recorded
BOD_5, May 1 – September 30	mg/L	278	417	--	Influent and Effluent	1/month	24-hour composite
	lbs/day	4401	6602	--			Calculation[1]
BOD_5, Oct 1 – April 30	mg/L	164	266	--	Influent and Effluent	1/month	24-hour composite
	lbs/day	2596	4210	--			Calculation[1]
BOD_5, % removal	%	Minimum 30% removal			Influent and Effluent	1/month	Calculation[2]
Total Suspended Solids (TSS)	mg/L	90	190	--	Influent and Effluent	1/week	24-hour composite
	lbs/day	1426	3010	--			Calculation[1]
TSS, % removal	%	Minimum 30% removal			Influent and Effluent	1/month	Calculation[2]
Fecal Coliform[3] (Interim Limit)	# FC/100 mL	977,000[4,5] (geomean)	--	1,141,000[6,7] (instant. max)	Effluent	2/month[8]	Grab
Fecal Coliform[3] (Final Limit)	# FC/100 mL	200[5,9]	400	800[7,9]	Effluent	2/month[8]	Grab
Enterero-coccus[3] Final Limit	#/100 mL	665[5,9,10] (geomean)	--	2470[7,9,11] (instant. max)	Effluent	2/month[8]	Grab
pH	s.u.	Between 6.5 – 8.5			Effluent	1/week	Grab
Dissolved Oxygen	mg/L	Between 2.0 – 17.0			Effluent	1/week	Grab

Copper	µg/L	21		64	Effluent	1/month	Grab
	lbs/day	0.33		1.01			Calculation[1]
Temperature	°C	--	Report	Report	Effluent	Continuous	Meter
Ammonia	µg/L	--			Effluent	1/quarter	Grab
Per-and Polyfluoroalkyl Substances (PFAS)	ng/L	Report	--	Report	Influent and effluent	2/year[10]	24-hour composite
	mg/kg dry weight	--	--	Report	Sludge	2/year[10]	Grab
Whole Effluent Toxicity (WET)[11], TU_c	See Permit Part I.C.				Effluent	2/year[12]	24-hour composite
Toxic Pollutant Scan[13]	--				Effluent	Twice every 5 years[14]	24-hour composite

[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 Paragraph I.B.0 and Part III.G of this permit.

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

[5] If more than one bacteria sample {FC, Enterococci} 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.

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

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

[9] Final fecal coliform and enterococcus limits. See Section II.C of the permit for compliance schedule information.

[10]Monitoring for PFAS chemicals is required for 2 years (8 quarters), beginning at the start of the first complete quarter in the third year of the permit term.

[11]Chronic WET testing – See Permit Part I.C

[12]See monitoring described in Permit Parts I.C.

[13]Toxic Pollutant Scan- See NPDES Permit Application Form 2A, Table B, Table C, and Permit Part II.D.1. 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.

[14]Testing must occur twice every five years, once during the wet weather season and once during the dry weather season. See Permit Part II.D.

A. BASIS FOR EFFLUENT LIMITS

In general, the CWA requires that the effluent limits for a particular pollutant be the more stringent of either TBELs or 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 TMDL
- Had an effluent limit in the previous permit
- Are present in the effluent monitoring. Monitoring data are reported in the application and DMR and any special studies
- Are expected to be in the discharge based on the nature of the discharge

The wastewater treatment process for this facility includes primary treatment. Pollutants expected in the discharge from a facility with this type of treatment, include but are not limited to: BOD_5, TSS, fecal coliform and enterococcus bacteria, pH, temperature, and dissolved oxygen (DO).

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

- BOD_5
- DO
- TSS
- pH
- Temperature
- Chlorine
- Bacteria (fecal coliform, enterococcus)
- Copper
- Ammonia
- Other Toxics (antimony, arsenic, benzidine, bis (2-ethylhexyl) phthalate, chloroform, chromium, di-n-butyl phthalate, 1,4 dichloro benzene, lead, naphthalene, nickel, phenol, selenium, silver, toluene, zinc)

2. Technology-Based Effluent Limits (TBELs)

a. 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 in 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.

Table 8. 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 CWA 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 CWA as 30 percent removal of BOD_5 and TSS from the influent. The current permit requires 30 percent 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, the primary treatment standards do not include concentration-based TBELs for BOD_5 and TSS. Instead, concentration-based limitations, and by extension mass-based limits, are established on a case-by-case basis using state WQS and the level of treatment performance the facility is consistently able to achieve. See Section IV.A.2.a for more information on concentration and mass limits.

EPA has tentatively determined that the Haines WWTP qualifies for a continuation of their waiver from secondary treatment under Section 301(h) of the CWA. Therefore, the draft permit maintains the 30 percent minimum removal limits for TSS and BOD_5 on a monthly basis. Haines did not request a 301(h)-modification for pH.

b. 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 limit (mg/L) × design flow (mgd) × 8.34.[1]

In the 2001 permit, monthly average and maximum daily concentration-based limits for TSS and BOD_5 were specified by ADEC in their June 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 BOD_5 and TSS to establish concentration-based limits reflective of facility performance.

Instead of including maximum daily limits for BOD_5 and TSS, the draft permit imposes average weekly limits. This is consistent with 40 CFR 122.45(d)(2) which requires average weekly and average monthly discharge limitations for POTWs.

BOD_5

DMR data indicates the discharge is consistently achieving greater BOD_5 removal than the federal primary treatment standard of 30%. Average percent removal between 2016 and 2021 was 49%. The 2001 permit includes seasonal limits for BOD_5, based on the requirements in ADEC's 401 certification of the 2001 permit which cited greater loading during the summer months. The draft permit continues to have seasonal limits. Influent BOD concentrations are higher during the summer months as shown in the facility DMR data between 2016-2021.

Average Monthly Limit (AML): EPA used the 95th percentile of influent data from 2016 to 2021 and an assumed 30% removal to calculate an AML of 278 mg/L (May 1 – Sept 30) and 164 mg/L (Oct 1 – April 30). This is less stringent than the current AMLs in the 2001 permit. EPA is proposing to include the calculated limits in the draft permit.

[1] 8.34 is a conversion factor with units (lb x L)(mg x gallon x 10^6). See Exhibit 5-7 in the NPDES Permit Writer's Manual.

Average Weekly Limit (AWL): EPA used the multiplier from Table 5-3 of the Amended Technical Support Document for Water Quality-Based Toxics Control and the calculated AMLs to calculate AWLs of 417 mg/L (May 1 – Sept 30) and 266 mg/L (Oct 1 – Apr 30). EPA is proposing to include the calculated limits in the draft permit. EPA is removing the maximum daily limits that were in the 2001 permit. *See* Antibacksliding discussion, below.

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

BOD_5 (May - September)

Average Monthly Limit = 277.76 mg/L × 1.9 mgd × 8.34 = 4,401 lbs/day

Average Weekly Limit = 416.64 mg/L × 1.9 mgd × 8.34 = 6,602 lbs/day

BOD_5 (October - April)

Average Monthly Limit = 163.8 mg/L × 1.9 mgd × 8.34 = 2,596 lbs/day

Average Weekly Limit = 265.68 mg/L × 1.9 mgd × 8.34 = 4,210 lbs/day

Table 9. Inputs for Calculation of BOD Limits

Parameter	May 1 – Sept 30	Oct 1 – April 30
95th Percentile of Influent Data (mg/L)	397	233
Final Effluent After 30% Removal (mg/L)	277.76	163.8
CV of Effluent Data	0.4	0.5
Samples per month	2	2
TSD Multiplier (99th/95th)	1.50	1.622

TSS

DMR data indicates the discharge is consistently achieving greater TSS removal than the federal primary treatment standard of 30%. Average percent removal between 2016 and 2021 was 65%. As discussed below, EPA proposes to establish TSS concentration limits that reflect facility performance.

Average Monthly Limit (AML): Using effluent data from 2016 to 2021, EPA conducted a statistical analysis to calculate an average monthly TSS limitation based on facility performance. The performance-based AML was 90 mg/L. This is more stringent than the current AML of 140 mg/L and reflects facility performance for TSS. The draft permit contains an AML of 90 mg/L which is the level of performance that the facility can consistently achieve.

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 190 mg/L, which reflects facility performance for TSS. The 2001 permit included maximum daily limit (MDL) of 200 mg/L. The draft permit contains an AWL of 190 mg/L which is the level of performance that the facility can consistently achieve.

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

Average Monthly Limit = 90 mg/L × 1.9 mgd × 8.34 = 1,426 lbs/day

Average Weekly Limit = 190 mg/L × 1.9 mgd × 8.34 = 3,010 lbs/day

Antibacksliding: TBELs

CWA section 402(o) 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 also provides limited exceptions to antibacksliding. For explanation of the antibacksliding exceptions refer to Chapter 7 of the Permit Writers Manual *Final Effluent Limitations and Anti-backsliding*.

EPA is proposing to remove the maximum daily BOD_5 and TSS limits and establish average monthly and average weekly limits pursuant to 40 CFR 122.45(d)(2). 40 CFR 122.45(d)(2) requires that effluent limitations for continuous discharges from POTWs be expressed as average weekly and average monthly discharge limitations, unless impracticable.

40 CFR 122.44(l)(1) states that a permit can be made less stringent if "the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification…under §122.62." Here, EPA is removing the maximum daily limits for BOD_5 and TSS. Since EPA is including both average monthly and average weekly limits, maximum daily limits are no longer necessary, and the permit is as stringent as it was previously. However, even assuming that removal of the maximum daily limits results in less stringent effluent limits, EPA can remove the limits. One of the causes for modification is to allow for the correction of technical mistakes.

40 CFR 122.62(a)(15). The 2001 BOD_5 average weekly and maximum daily effluent limits were specified in ADEC's 401 certification; it is unknown what assumptions these limits were based on, and EPA is unable to determine how these limits were calculated. During preliminary discussions, ADEC has indicated they will not include maximum daily limits in their 401 certification. If this changes upon receipt of their final certification, EPA will include the effluent limits in the final permit. Therefore, EPA is correcting this technical mistake and an exception to antibacksliding applies.

3. Water Quality-Based Effluent Limits (WQBELs)

a. Statutory and Regulatory Basis

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 the CWA 401 certification of the permit. See 33 U.S.C. 1341. 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) and 122.44(d)(4), see also 33 U.S.C. 1341(a)(2). These requirements are applicable to all NPDES permits.

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

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 as well as 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. See 33 U.S.C. 1311(h)(9).

Section 301(h)(1) of the CWA, and its implementing regulations at 40 CFR 125.61, require that there must be a water quality standard 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. 33 U.S.C. 1311(h)(1).

In addition, effluent limits must be stringent enough to ensure that WQS are met and must be consistent with any available wasteload allocation (WLA) for the discharge in an approved total maximum daily load (TMDL). 40 CFR 122.44. There are no approved TMDLs that specify WLAs for this discharge; therefore, 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 Section III.A of this Fact Sheet, 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.

b. 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 *Technical Support Document for Water Quality-based Toxics Control* 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 water quality criteria 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 a rectangle 209 feet (63.7m) long (perpendicular to shore) and 180 feet (54.9m) wide, centered on the 30-foot diffuser. This is the same ZID spatial boundary as the 2001 permit.

The ZID for the applicant's outfall was calculated using a discharge depth of 80 ft (24.4m) below MLLW, a mean tide level of 8.7 ft (2.65 m), and a port height above sea bottom of 0.7 ft (0.2m). Using the diffuser length of 30 ft (9.1m), and a diameter of 16 in (1.33 ft; 0.41m), the ZID was calculated to be a rectangle of 209 ft (63.7m) long (perpendicular to shore) and 180 ft (54.9m) wide, centered on the diffuser and perpendicular to the shoreline.

The ZID dimension calculations are as follows:

Width (units in feet) = 1.33 + 2 x (80 + 8.7 + 0.7) = 180 ft
Length (units in feet) = 30 + 2 x (80 + 8.7 + 0.7) = 209 ft

18 AAC 70.240 provides Alaska's mixing zone policy for point source discharges. In preliminary discussions with EPA, ADEC proposes to authorize mixing zones within the spatial boundaries of the ZID. The mixing zones and their associated dilution factors that EPA has used in the draft permit are summarized below. All dilution factors are calculated with the effluent flow rate set equal to the design flow of 1.9 mgd.

Table 10. Mixing Zones for Haines WWTP

Criteria Type	Dilution Factor
Acute Aquatic Life	11*
Chronic Aquatic Life	19*
*EPA anticipates that the condition will be contained in ADEC's CWA Section 401 Certification.	

The reasonable potential analysis and WQBEL calculations were based on the dilution factors shown in Table 10 above. If ADEC revises the allowable mixing zone in its 401 certification of this permit, the reasonable potential analysis and WQBEL calculations will be revised accordingly.

As discussed in Part I.A.1. Pollutants of Concern, the pollutants of concern in the discharge are BOD_5, DO, TSS, pH, temperature, fecal coliform, enterococci bacteria, chlorine, copper, and other toxics and metals as listed

above. Each parameter is summarized in Part IV.A. Basis for Effluent Limits, 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 Section 8.C of the 301(h) TD. The relevant WQS are shown below. Since Portage Cove is designated for all uses, the listed use is the one with the most protective criteria.

Table 11. Applicable Water Quality Standards

Pollutant	Designated Use	Marine Criteria	Basis
Antimony	Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife	4300 µg/L (human health; organisms only)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2008)
Arsenic, dissolved	Aquatic life	69 µg/L (acute) 36 µg/L (chronic)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2008)
Benzidine	Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife	0.0054 µg/L (human health, organisms only)	National Toxics Rule, 40 CFR 131.36
Bis (2-ethylhexyl) phthalate	Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife	59 µg/L (human; organisms only)	National Toxics Rule, 40 CFR 131.36
Chloroform	Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife	4700 µg/L (human health; organisms only)	National Toxics Rule, 40 CFR 131.36
Chromium VI, Dissolved	Aquatic life	1,100 µg/L (acute) 50 µg/L (chronic)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2008)
Copper, Dissolved	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)
Deleterious organic and inorganic substances	Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Narrative Criteria	18 AAC 70.020(b)(23)(C)
Di-n-butyl phthalate	Aquatic life	12,000 µg/L (human health; organisms only)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2008)
1,4 dichlorobenzene	Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife	2,600 µg/L (human health; organisms only)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2008)
DO	Aquaculture	≥5 mg/L, ≤17 mg/L	18 AAC 70.020(b)(15)(A)(i)
Enterococcus	Primary contact recreation	35 CFU/100mL (acute) 130 CFU/100mL (chronic)	18 AAC 70.020(b)(14)(b)(i)
Fecal coliform	Harvesting for consumption of raw mollusks or other raw aquatic life	14 CFU/100mL (acute) 43 CRU/100mL (chronic)	18 AAC 70.020(b)(14)(D)
Lead, Dissolved	Aquatic life	210 µg/L (acute) 8.1 µg/L (chronic)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2008)
Nickel, Dissolved	Aquatic life	74 µg/L (acute) 8.2 µg/L (chronic)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2008)
	Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife	4,600 µg/L (human health; organisms only)	
pH	Aquaculture	6.5—8.5 s.u.	18 AAC 70.020(b)(18)(A)(i)

Phenol	Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife	4,600,000 (human health; organisms only)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2008)
Residues	Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Narrative Criteria	18 AAC 70.020
Sediment	Contact recreation	No measurable increase in concentration of settleable solids above natural conditions, as measured by the volumetric Imhoff cone method.	18 AAC 70.020(21)(B)(i)
Selenium, Dissolved	Aquatic life	290 (acute) 71 (chronic)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2008)
	Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	11,000 µg/L (human health; organisms only)	
Silver, Dissolved	Aquatic life	1.9 µg/L (acute)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2008)
Temperature	Seafood Processing, Aquaculture	May not exceed 15^{o}C and may not cause the weekly average temperature to increase more than 1^{o}C. The maximum rate of change may not exceed 0.5^{o}C per hour. Normal daily temperature cycles may not be altered in amplitude or frequency.	18 AAC 70.020(22)(A)(i))
Toluene	Growth and Propagation of Fish, Shellfish,	200,000 (human health; organisms only)	Alaska Water Quality Criteria Manual for Toxic and Other

	other Aquatic Life and Wildlife		Deleterious Organic and Inorganic Substances (ADEC 2008)
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)
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)
Whole Effluent Toxicity	Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	1.0 TU_C	18 AAC 70.030
Zinc, Dissolved	Aquatic life	90 µg/L (acute) 81 µg/L (chronic)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2008)
	Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife	69,000 µg/L (human health; organisms only)	

c. Reasonable Potential and WQBELs

The reasonable potential and WQBELs for specific parameters are summarized below. The calculations are provided in Appendix C.

pH

The Alaska WQS for the protection of aquatic life require that ambient pH may not be less than 6.5 or greater than 8.5 standard units (s.u.) and may not vary more than 0.2 s.u. outside of the naturally occuring 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 2016-2021, effluent pH ranged from 6.5 to 8.0 s.u. The applicant has not requested a CWA Section 301(h) modification for pH. The draft permit retains the current pH limits of 6.5 to 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 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 at the completion of initial dilution and at the edge of the chronic mixing zone, 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 1.2% at the completion of initial mixing and DO depletion of 7.0% at the edge of the chronic mixing zone, with a final BOD_5 concentration of 4.38 mg/L after initial mixing. At the edge of the chronic mixing zone, the effluent BOD_5 will result in a DO depletion of 7.0%, with a BOD_5 concentration of 23 mg/L at the edge of the chronic mixing zone These results indicate that both near field and far field DO impacts meet Alaska WQS. For a complete analysis of DO please refer to Appendix E of the 301(h) TD.

Based on the above analyses and that presented in the 301(h) TD, the discharge will not contribute to a violation of AK WQS for DO. The permit retains the DO limits from the 2001 permit to ensure the facility continues to meet Alaska WQS.

Total Suspended Solids and Turbidity

Alaska does not have WQS for TSS but uses turbidity as a surrogate. Alaska WQS applicable to the estuarine waters of Portage Cove 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 data at the outfall and reference sites between 2016 and 2021. The data are presented in Part 8.B of the 301(h) TD.

NTU Monitoring Data

The applicant collected ambient NTU data within the receiving water in August 2003, February 2004, and September 2005. The turbidity results from 2003-2005 indicate that turbidity is generally higher at the surface and that Portage Cove has elevated levels of sediment in the summer months due to freshwater and sediment inputs from nearby rivers. None of the NTU measurements within the water column at any of the sampling sites exceed the Alaska WQS of 25 NTU. The maximum reported value across all samples is 8.8 NTU, which meets the 25 NTU criterion. Therefore, the facility's TSS discharge is not expected to violate Alaska's water quality criteria for turbidity.

Secchi Monitoring Data

The applicant collected ambient Secchi data in the receiving water between 2003 and 2005. The data collected at reference and outfall sites is presented in Table 3 of the 301(h) TD.

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 (190 mg/L)

S_a = initial dilution (100:1)

Solving the above equation using the maximum allowable TSS concentration results in a 1.9 mg/L increase in suspended solids after initial dilution, or 1%. The 301(h) guidance 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 of the 301(h) TD, the discharge will not cause or contribute to a violation of AK WQS for turbidity.

Copper

The Alaska WQS for the protection of aquatic life are an acute criterion of 4.8 µg/L and a chronic criterion of 3.1 µg/L for dissolved copper. The 2001 permit includes effluent limits for copper of 78 µg/L (1.236 lbs/day) and a maximum daily limit of 156 µg/L (2.472 lbs/day). In preliminary discussions, ADEC has indicated it will authorize acute and chronic dilution factors of 11:1 and 19:1, respectively, for copper.

Based on the DMR data (2016-2021), Alaska WQS, and the mixing zone ADEC has proposed, the Haines WWTP discharge has reasonable potential to cause or contribute to a violation of the aquatic water quality criterion for copper. The facility does not have reasonable potential to exceed the human health criterion for copper.

Since there is reasonable potential to cause or contribute to a violation of the aquatic WQS for copper, EPA calculated the following WQBELs for copper : an average monthly limit of 21 µg/L (0.33 lbs/day) and a maximum daily limit of 64 µg/L (1.01 lbs/day). These limits are more stringent than the limits in the 2001 permit.

The 95th percentile effluent concentration from 2016-2021 for copper is 30 µg/L. The average copper effluent concentration from 2016-2021 is 8.8 µg/L. The range of copper effluent concentrations from 2015-2021 is a minimum of 0 µg/L and a maximum of 100 µg/L. Based on this data, EPA believes the facility will be able to meet the proposed limits. Therefore, EPA is not proposing a compliance schedule for copper. The draft permit proposes to increase copper effluent monitoring to twice a month to support the effluent limits. See Appendix C for reasonable potential calculations for copper.

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The Haines 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. In addition, Haines did not include the use of chlorine in its permit application and did not provide any indication that chlorine was being used at the facility. Since the Haines WWTP does not use chlorine, EPA has determined that the Haines WWTP does not have reasonable potential to exceed the water quality standard for chlorine and is not including a limit for chlorine in the proposed permit. If the facility begins to use chlorine, it will need to notify EPA pursuant to Part *IV.I* of the permit so that EPA can

determine whether to modify the permit to include chlorine limits. Until that time, the Haines WWTP is not authorized to discharge chlorine.

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 Portage Cove 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.

EPA derived WQBELs for fecal coliform by multiplying the dilution factor of 19:1 achieved at the edge of the chronic mixing zone by the criteria. The WQBEL calculations are shown below:

Monthly geometric mean limit = 14 CFU/100 mL x 19 = 266 CFU/100 mL

Instantaneous maximum limit = 43 CFU/100 mL x 19 = 817 CFU/100 mL

These WQBELs will be protective of Alaska WQS for fecal coliform at the boundary of the chronic mixing zone.

During review of the preliminary draft permit, ADEC indicated that they will require the final fecal coliform limitations in the table below as a condition of their final 401 Certification of the reissued permit. Since these limits are more stringent than the WQBELs developed above, EPA has included these limits in the draft permit. ADEC will accept comment on their proposed limits

during public notice of the 401 certification. If ADEC includes these limits in the final 401 certification, then EPA must include them in the permit pursuant to CWA section 401(d). If ADEC does not include these limits in the final 401 certification of this permit, the fecal coliform effluent limits will be based on the WQBELs that EPA has calculated. EPA is accepting comment on the calculated WQBELs that will be imposed if ADEC does not include the fecal coliform limits as indicated in its 401 certification.

These limits would become effective at the end of the compliance schedule.

Table 12. ADEC Proposed Final Fecal Coliform Limits

Average Monthly (FC/100 mL)	Average Weekly (FC/100 mL)	Maximum Daily (FC/100 mL)
200[1]	400[1]	800
1. 18 AAC 72.990(21)		

The 2001 permit contains effluent limits for fecal coliform of a monthly average limit of 1,000,0000 FC/100mL and a maximum daily limit of 1,500,000 FC/100mL. The Haines WWTP does not currently have the technology necessary to meet the more stringent WQBELs for fecal coliform in the draft permit. EPA expects that ADEC will authorize a five-year compliance schedule for the facility in its 401 Certification 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 draft permit includes interim performance-based limits that apply until the end of the compliance schedule. The interim limits were derived by taking the 95th percentile of fecal coliform effluent data for the facility. The proposed interim fecal coliform limits are an average monthly limit of 977,000 cfu/100 mL and a maximum daily limit of 1,141,000 CFU/100 mL. (See Appendix A for water quality data.)

Section V.C. of this Fact Sheet describes the compliance schedule for fecal coliform. The WQBELs developed for fecal coliform will be protective of Alaska WQS after 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 2001 permit does not contain effluent limitations for enterococcus bacteria because there was no applicable enterococcus standard in effect when the permit was issued in November 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 2001 permit did not require enterococcus monitoring, but high fecal coliform loads such as what was observed during the last permit cycle, are indicative of high concentrations 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 at the edge of the chronic mixing zone. EPA calculated WQBELs using the same procedure used for fecal coliform. The enterococcus limits are expressed in terms of a geometric mean and instantaneous limit for the same reasons as explained above in the fecal coliform section.

Monthly geometric mean limit = 35 CFU/100 mL x 19 = 665 CFU/100 mL
Instantaneous maximum limit = 130 CFU/100 mL x 19 = 2,470 CFU/100 mL

These WQBELs will be protective of Alaska WQS for enterococci at the boundary of the chronic mixing zone. The Haines WWTP does not currently have the disinfection technology necessary to meet these limits. EPA expects that ADEC will authorize a five-year compliance schedule for the Haines WWTP in its 401 Certification 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.

Section V.C. of this Fact Sheet describes the compliance schedule for enterococcus. 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 Section 301(h)(9) of the CWA and 40 CFR 125.63(a).

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.

Temperature

Alaska's WQS for water temperature provides that the discharge may not exceed 15^{o}C for marine uses. In addition, for waters protected for the aquaculture designated use, the discharge may not cause the weekly average temperature to increase more than 1^{o}C. The maximum rate of change may not exceed 0.5^{o}C per hour, and 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 modified discharge will comply with the Alaska WQS for temperature.

The maximum ocean temperature recorded at the trapping depth of the discharge during receiving water monitoring from 2003 to 2005 was 11.2°C, and the maximum recorded effluent temperature between 2016 and 2021 was 15.8°C. EPA conducted a mass balance analysis using these values and calculated a final receiving water temperature of 11.2°C 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, (15.8 °C)

Cu = Background receiving water temperature, °C (11.2 °C)

Sa = dilution factor (100)

Cd = 11.2 °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. Therefore, the permit does not contain a temperature effluent limit.

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 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* includes tables to determine acute and chronic criteria based upon these parameters.

No ammonia effluent data was available since the 2001 permit was issued. Therefore, EPA did not have any samples to evaluate for reasonable potential to exceed the water quality standards for ammonia. Since ammonia is a commonly discharged pollutant by wastewater treatment plants, and the Haines WWTP is a major facility, EPA is requiring quarterly ammonia effluent samples so that reasonable potential for ammonia can be evaluated during the next permit cycle. The proposed permit also requires that the permittee conduct receiving water monitoring of pH, temperature, and salinity, to allow calculation of applicable ammonia criteria for the next permit cycle.

Benzidine

Benzidine is predominately used in the production of dyes, but its carcinogenic properties have decreased its use. The production of benzidine was banned in the US in 1973, and benzidine is no longer imported into the US, although benzidine-based dyes may still be imported[2]. EPA's National Toxics Rule at 40 CFR 131.36 establishes a human health criteria for benzidine, for protection of organisms, that is applicable to Alaska, of 0.0054 µg/L.

The Haines WWTP detected benzidine in two samples submitted with the priority pollutant scans in 2006. However, since benzidine is expected to now be less prevalent in wastewater discharges than in 2006, in March 2022, EPA requested that the facility submit 3 new effluent samples of benzidine. All three samples of benzidine submitted in 2022 resulted in non-detects. EPA used these recent samples to determine that the facility does not have reasonable potential to exceed the water quality standards for benzidine. Therefore, the permit does not contain an effluent limit for benzidine.

Other Pollutants of Concern

EPA also evaluated reasonable potential for other pollutants the facility detected during required monitoring of priority pollutants. These pollutants include lead, nickel, silver, zinc, antimony, arsenic, bis (2-ethylhexyl) phthalate, chloroform, chromium, di-n-butyl phthalate, 1,4 dichloro benzene, naphthalene, phenol, selenium, and toluene. EPA did not find reasonable

[2] USEPA Benzidine IRIS Summary, Accessed at https://iris.epa.gov/ChemicalLanding/&substance_nmbr=135

potential to exceed the water quality criteria for any of these pollutants and effluent limits are therefore not included in the draft permit. Reasonable potential calculations can be found in Appendix C**.**

d. Antibacksliding: WQBELs

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*.

According to the U.S. EPA NPDES Permit Writers' Manual (EPA-833-K-10-001), backsliding is allowed if it is consistent with the provisions of CWA section 303(d)(4) or if one of the exceptions in CWA section 402(o)(2) is met (except for Sections 402(o)(2)(B)(ii) and 402(o)(2)(D)). Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. EPA is proposing to backslide for chlorine limits.

Here, the waterbody is in attainment of WQS, thus supports the waterbody's designated uses. The facility has a chlorine limit in the 2001 permit that applies if the facility uses chlorine. The facility does not provide chlorination of the effluent and does not have reasonable potential to exceed the water quality standard for chlorine. ADEC will conduct an antidegradation analysis during the 401-certification process as described in Fact Sheet Section VI.D. Assuming that ADEC concludes that their antidegradation policy is met, backsliding is allowed.

B. MONITORING REQUIREMENTS

Section 308 of the CWA and 40 CFR 122.44(i) 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 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.

a. Effluent Monitoring Changes from the Previous Permit

The draft permit maintains the effluent monitoring schedule from the 2001 permit except for the following proposed changes:

Table 13. Monitoring Changes in Permit

Parameter	Monitoring Change	Basis
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 Section II.C of the draft permit. Monitoring twice per month is more appropriate and representative than monthly monitoring and required to ensure compliance with the fecal coliform limits 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 Section II.C of the draft permit. Monitoring twice per month is necessary to ensure compliance with the limit and protection of Alaska WQS.
Copper	Increase effluent monitoring from quarterly monitoring to once per month	The prior permit required quarterly monitoring for copper to support the effluent limits. EPA determined the permittee has reasonable potential to exceed the WQS for copper and is

		proposing more stringent copper effluent limits to meet Alaska WQS. EPA is increasing the effluent monitoring requirement to support the more stringent limits.
Ammonia	New effluent monitoring requirement, quarterly	Ammonia is a pollutant of concern at wastewater treatment plants. Quarterly monitoring will provide data for the next permit cycle for evaluating compliance with Alaska WQS.
Whole Effluent Toxicity	Increase in monitoring	Haines is classified as a major facility and requires more frequency toxicity monitoring. Increased monitoring will also help to better characterize WET for the next permit cycle.
Toxic Pollutants Monitoring	Clarified effluent monitoring requirements	The draft permit clarifies the required toxic pollutants to monitor in effluent to comply with CWA regulations.
PFAS	New effluent monitoring requirements	PFAS are widespread and persistent in the environment. The draft permit requires monitoring to determine if the effluent contains PFAS. See Section IV.B.1.b, below.
[1] Concentration/mass-loading limits only; compliance with 30% removal is still determined on monthly averaging basis.		

b. PFAS Monitoring

Per- and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals that have been in use since the 1940s. PFAS are found in a wide array of consumer and industrial products. Due to their widespread use and persistence in the environment, most people in the United States have been exposed to PFAS. Discharges of PFAS above certain levels may cause adverse effects to human health or aquatic life.[3, 4]

Since PFAS chemicals are persistent in the environment and may lead to adverse human health and environmental effects, the draft permit requires

[3] EPA, EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan, EPA 823R18004, February 2019. Available at: https://www.epa.gov/sites/production/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf

[4] EPA, Fact Sheet: Draft 2022 Aquatic Life Ambient Water Quality Criteria for Perfluorooctanoic acid (PFOA) and Perfluorooctane Sulfonic Acid (PFOS). Available at: https://www.epa.gov/system/files/documents/2022-04/pfoa-pfos-draft-factsheet-2022.pdf

that the permittee conduct twice yearly influent, effluent, and sludge sampling for PFAS chemicals. This will result in 10 samples being collected over the 5-year permit term. 10 results are the minimum sample size necessary to calculate the standard deviation and mean of the data with sufficient confidence (USEPA, 1991).

The draft permit also requires that the permittee either submit a certification meeting the requirements of 40 CFR 125.66(a)(2) that there are no industrial users and documents the certification with an industrial user survey as described by 40 CFR 403.8(f)(2) or inventory the industrial users (IUs) of the treatment works, to identify IUs of the POTW that may discharge pollutants, including PFAS chemicals, to the collection system. Industry sectors known or suspected to discharge PFAS include, but are not limited to, organic chemicals, plastics & synthetic fibers (OCPSF); metal finishing; electroplating; electric and electronic components; landfills; pulp, paper & paperboard; leather tanning & finishing; plastics molding & forming; textile mills; paint formulating, and airports.[5, 6] EPA's website has public databases such as Enforcement and Compliance History Online (ECHO) (https://echo.epa.gov/) and Envirofacts (https://enviro.epa.gov/) which may be useful in identifying such industrial users.

If PFAS chemicals are detected in the influent, effluent, or sludge in the first year of sampling, then the permittee must sample the IUs identified as potential PFAS sources at least once during the following calendar year.

The purpose of these monitoring and reporting requirements is to better understand potential discharges of PFAS from this facility and to inform future permitting decisions, including the potential development of water quality-based effluent limits. EPA is authorized to require this monitoring and reporting by CWA section 308(a). The permit conditions reflect EPA's commitments in the PFAS Strategic Roadmap, which directs the Office of Water to leverage NPDES permits to reduce PFAS discharges to waterways "at the source and obtain more comprehensive information through monitoring on the sources of PFAS and quantity of PFAS discharged by these sources."

There is currently no analytical method approved in 40 CFR Part 136 for PFAS. As stated in 40 CFR 122.44(i)(1)(iv)(B), in the case of pollutants or pollutant parameters for which there are no approved methods under 40 CFR Part 136 or methods are not otherwise required under 40 CFR chapter I, subchapter N or O, monitoring shall be conducted according to a test

[5] EPA, "Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs." Available at: https://www.epa.gov/system/files/documents/2022-12/NPDES_PFAS_State%20Memo_December_2022.pdf.

[6] A spreadsheet listing industries that may discharge PFAS, including Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS) codes, and a spreadsheet listing Superfund sites with PFAS detections, are available on EPA's website at: https://echo.epa.gov/tools/data-downloads/national-pfas-datasets#about.

procedure specified in the permit for such pollutants or pollutant parameters. Therefore, the Permit specifies that until there is an analytical method approved in 40 CFR Part 136 for PFAS, monitoring shall be conducted using Draft Method 1633.

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 2001 permit in the draft permit. Changes to the receiving water monitoring program include the addition of enterococcus to the suite of parameters analyzed and the addition of sampling at the center of the ZID, and at the west and east side of the ZID. These additional sampling points will provide more complete information on dilution at the boundary of the ZID.

A detailed description of the receiving water monitoring program in the draft permit can be found in Section 8.G.2 of the 301(h) TD, Part I.D.1 of the draft permit, and Table 12 below. Locations of the receiving water monitoring for each parameter can be found in Permit Part I.D.2.

Table 14. Receiving Water Monitoring Requirements

Parameter	Units	Sample Type	Sample Depth	Frequency	Location
Temperature	°C	Grab	Surface, every 5m to bottom	Annually (July or August)	ZID Station, ZID Boundary, Reference Sites[1]
Salinity	Ppt	Grab	Surface, every 5m to bottom	Annually (July or August)	ZID Station, ZID Boundary, Reference Sites[1]
Dissolved Oxygen	Mg/L	Grab	Surface, every 5m to bottom	Annually (July or August)	ZID Station, ZID Boundary, Reference Sites[1]
pH	Standard units	Grab	Surface, every 5m to bottom	Annually (July or August)	ZID Station, ZID Boundary, Reference Sites[1]
Secchi Disk Depth	Feet	Visual	Surface, every 5m to bottom	Annually (July or August)	ZID Station, ZID Boundary, Reference Sites[1]
Turbidity	NTU	Grab	Surface, every 5m to bottom	Annually (July or August)	ZID Station, ZID Boundary, Reference Sites[1]
Fecal Coliform	#/100 mL	Grab	Surface (or just below)	Monthly[3] (May to September)	ZID Station, ZID Boundary, Reference Sites, Near Shore Sites[2]
Enterococcus	#/100mL	Grab	Surface (or just below)	Monthly[3] (May to September)	ZID Station, ZID Boundary, Reference Sites, Near Shore Sites[2]
Biological Monitoring for Benthic Infauna and Sediment Analysis	Per method	Grab	Per method	Once every 5 years[4]	ZID Station, ZID Boundary, Reference Sites[1]

[1]Monitoring is required at the following: ZID Station, ZID Boundary Sites and Reference Sites as described in Permit Part I.D.2.a,b,c.

[2]Monitoring is required at the following: ZID Station, ZID Boundary Sites and Reference Sites as described in Permit Part I.D.2.a,b,c,d.

[3]Monitoring is required once a month in May, June, July, August, and September. Fecal Coliform and enterococcus sampling shall coincide with effluent sampling in Permit Part I.B.

[4]Biological monitoring shall be conducted in August of the fourth year of the permit and every five years thereafter.

3. Whole Effluent Toxicity (WET) Testing Requirements

EPA and individual States implement three approaches to protect water quality. These approaches include chemical-specific control, toxicity testing control (i.e., whole effluent toxicity testing), and biological criteria/bioassessments (EPA 1991).

WET requirements in NPDES permits protect aquatic life from the aggregate toxic effect of a mixture of pollutants in the effluent. WET tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. The end point and results of WET tests are typically reported in acute and chronic toxic units, TUa and TUc, respectively. The TUa and TUc test results are treated the same as other reported permit parameters and used in the same manner in the TSD calculations for determining reasonable potential and establishing WQBELs for WET.

Alaska WQS at 18 AAC 70.030 require that an effluent discharged to a waterbody may not impart chronic toxicity to aquatic organisms, expressed as 1.0 chronic toxic unit (TUc), at the point of discharge, or if the Department authorizes a mixing zone in a permit, approval, or certification, at or beyond the mixing zone boundary, based on the minimum effluent dilution achieved in the mixing zone. 18 AAC 83.435 requires that a permit contain limitations on WET when a discharge has reasonable potential to cause or contribute to an exceedance of a WQS.

The Haines WWTP conducted a WET test in 2001 pursuant to the terms of the 2001 permit. The reported TU_c is 3.1. With only one data point collected over 20 years ago, the toxicity of the current discharge is highly uncertain. To characterize the toxicity of the effluent for the protection of Alaska WQS, the permit proposes to increase WET monitoring to two tests per year while the permit remains in effect.

A WET trigger of 19 TUc has been established which, if exceeded, will require the Permittee to implement the toxicity identification evaluation (TIE) and toxicity reduction evaluation (TRE) procedures specified in Part I.C. of the draft permit. If the WET trigger is not exceeded after six (6) consecutive WET tests the Permittee may reduce the frequency of WET testing to annually while the permit remains in effect. At the completion of the TIE/TRE process the Permittee must revert to testing twice per year. To assess and monitor for any seasonal variation in results, biannual testing must be conducted during different seasons and annual testing must be done on a rotating quarterly schedule, so that each annual test is conducted during a different quarter than the previous year's test.

4. Biological Monitoring for Benthic Infauna and Sediment Analyses

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. The draft permit requires biological monitoring, consisting of a benthic survey and sediment analysis for total volatile solids (TVS) within the ZID, at a reference location, and within 5 m beyond the ZID boundary.

The 2001 Permit required one benthic survey and sediment analysis for TVS, completed in 2006. The results of the survey do not indicate that the sewer outfall discharge is causing significant changes in the benthic community structure.

To continue to monitor the effect of the discharge on the surrounding benthic community, the biological monitoring program from the 2001 permit is being retained in the draft permit. The draft permit requires biological monitoring during the fourth year of the permit and every five years thereafter. See Permit Part I.E.

5. 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://npdes-ereporting.epa.gov/net-netdmr.

Permit Part III.B.3 requires that the Permittee submit a copy of the DMR to ADEC. The permittee may submit a copy by adding the email address for to the electronic submittal 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. The draft permit requires monitoring of toxic substances and pesticides as detailed in the NPDES Application Form 2A, Table B, C, and Permit Part I.B.10 which includes those in 40 CFR 401.15. Pursuant to 40 CFR 125.66(b), facilities must also 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 Pretreatment Requirements

The 301(h) regulations at 40 CFR 125.66(c) require applicants with known or suspected 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. Haines has certified they have 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 submit 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(d) 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 continue to 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 draft permit retains the requirement for a beach advisory sign 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 and enterococcus because the discharge cannot immediately comply with the new effluent limits on the effective date of the permit. The draft permit proposes the following:

- Interim performance-based limits for fecal coliform, based on fecal coliform effluent data from 2016-2021, effective until the end of the compliance schedule when final limits for fecal coliform become effective;
- Monitoring for enterococcus and final limits for enterococcus, which become effective at the end of the compliance schedule;
- A compliance schedule that allows 5 years for the facility to comply with the new effluent limits and includes interim milestones as set forth in Permit Part II.C.

ADEC authorizes compliance schedules in its 401 certification. EPA will amend the compliance schedule, if needed, after receiving final 401 certification from 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 Haines 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 Haines 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 CFR122.41(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 CFR122.41(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 Haines 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. PRETREATMENT REQUIREMENTS

Because the Haines WWTP does not have an approved POTW pretreatment program per 40 CFR 403.8, EPA is the Control Authority of industrial users that might introduce pollutants into the Haines WWTP. 40 CFR 125.66(c) provides that an applicant that has known or suspected industrial sources of toxic pollutants shall have an approved pretreatment in accordance with 40 CFR part 403. This requirement does not apply to any applicant which certifies that the applicant is not known or suspected industrial sources of toxic pollutants or pesticides. The permittee provided this certification on

April 8, 2022. Since EPA does not know of or suspect any industrial sources of toxic pollutants, the facility is not required to have an approved pretreatment program.

Permit Part II.D reminds the Permittee that it cannot authorize discharges that may violate the national specific prohibitions of the General Pretreatment Program.

Although not a permit requirement, the Permittee may wish to consider developing the legal authority enforceable in Federal, State or local courts which authorizes or enables the POTW to apply and to enforce the requirement of CWA sections 307 (b) and (c) and 402(b)(8), as described in 40 CFR403.8(f)(1). Where the POTW is a municipality, legal authority is typically through a sewer use ordinance, which is usually part of the city or county code. EPA has a Model Pretreatment Ordinance for use by municipalities operating POTWs that are required to develop pretreatment programs to regulate industrial discharges to their systems (EPA, 2007). The model ordinance should also be useful for communities with POTWs that are not required to implement a pretreatment program in drafting local ordinances to control nondomestic dischargers within their jurisdictions.

I. 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 (ESA) requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and/or 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. Pursuant to Section 7 of the ESA, EPA will consult 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 NOAA Fisheries prior to final permit action.

C. CWA SECTION 401 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 U.S.C. 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 had preliminary discussions with ADEC regarding its CWA Section 401 Certification during development of the draft permit. On February 17, 2023, EPA sent ADEC a pre-filing certification meeting request. EPA will request final 401 certification from ADEC with the public notice of this draft permit. EPA cannot issue the permit until ADEC has granted or waived certification. If ADEC denies certification, EPA cannot issue the permit.

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

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ADEC, 2008. *Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances*. December 2008.

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EPA. 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

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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

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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

Great Lakes Environmental Center, Inc, 2021. *Mixing Zone Dilution Modeling for Six Alaska POTWs.* Prepared for EPA Region 10. August 2021.

Appendix A. Water Quality Data

Appendix A.1. Treatment Plant Effluent Data

Parameter	Flow		BOD, 5 day, 20 deg C (mg/L)	BOD, 5 day, 20 deg C (mg/L)		BOD, 5 day, 20 deg C (lbs/day)		BOD % removal	TSS (mg/L)	TSS (mg/L)		TSS (lbs/day)		TSS % removal
Statistical Base	MX DAY	MO AVE	Influent	MO AVE	MX DAY	MO AVE	MX DAY	MO AVE	Influent	MO AVE	MX DAY	MO AVE	MX DAY	MO AVE
Sep-16	0.720	0.386	133	72	72	231	432	46	81	49	81	157	260	48
Oct-16	0.450	0.229	158	44	44	84	165	72	56	33	56	63	210	75
Nov-16	0.762	0.326	82	48	48	130	305	42	77	41	77	111	489	50
Dec-16	0.618	0.326	60	40	40	109	109	32	32	25	32	68	87	48
Jan-17	1.200	0.456	88	45	45	170	450	45	32	24	32	83	320	66
Feb-17	1.101	0.300	78	52	52	130	477	33	35	31	35	77	321	55
Mar-17	0.408	0.218	140	60	60	109	204	60	35	22	35	40	119	80
Apr-17	0.450	0.255	74	39	39	83	146	48	93	48	93	102	198	53
May-17	0.501	0.219	124	74	74	135	309	41	58	23	58	42	242	63
Jun-17	0.405	0.202	246	132	132	225	445	46	106	83	106	153	566	61
Jul-17	0.447	0.200	280	150	150	250	559	46	124	87	124	145	462	70
Aug-17	0.318	0.199	368	188	188	312	528	49	148	92	148	153	392	61
Sep-17	0.669	0.302	164	67	67	169	374	60	59	48	59	121	329	90
Oct-17	0.450	0.262	226	78	78	170	189	66	118	32	118	70	443	61
Nov-17	0.453	0.192	246	65	65	104	246	73	59	46	59	74	223	77
Dec-17	0.825	0.391	100	64	64	209	440	35	33	24	33	78	227	80
Jan-18	0.486	0.288	140	75	75	180	304	47	46	31	46	74	186	77
Feb-18	0.369	0.184	329	109	109	167	335	67	60	46	60	70	185	84
Mar-18	0.552	0.266	68	47	47	104	216	30	55	43	55	97	187	67
Apr-18	0.424	0.263	113	7.3	7.3	16	23	93	54	31	54	68	167	79
May-18	0.437	0.257	105	80	87	171	313	25	135	82	135	176	260	31
Jun-18	0.258	0.202	181	117	117	197	251	36	79	64	79	108	170	66
Jul-18	0.238	0.182	200	106	106	161	209	47	203	116	203	176	403	64
Aug-18	0.287	0.187	233	111	111	172	266	52	81	70.5	81	172	194	76
Sep-18	0.213	0.167	244	154	154	214	274	37	82	50	82	70	146	85
Oct-18	0.770	0.313	174	95	95	248	610	45	92	55	92	144	591	55
Nov-18	0.670	0.253	111	58	58	122	292	58	55	40	55	84	277	62
Dec-18	0.762	0.342	98	15	15	43	95	84	128	58	128	165	813	34
Jan-19	0.698	0.307	76	51	51	131	297	33	87	35	87	90	506	53
Feb-19	0.435	0.195	124	33.4	33.4	55	121	72	76	45	76	74	276	60
Mar-19	0.952	0.319	52	21.5	21.5	57.2	166	58	52	34.25	52	86	423	79
Apr-19	0.449	0.269	191	128	128	287	479	33	41	37	41	83	153	59
May-19	0.360	0.204	197	74	74	126	222	62	82	58	82	99	174	61
Jun-19	0.266	0.192	305	173	173	277	383	43	106	69	106	110	318	66
Jul-19	0.250	0.184	337	222	222	340	462	34	126	102	126	157	263	71
Aug-19	0.237	0.171	262	192.5	192.5	275	294	27	208	121	208	173	328	39
Sep-19	0.322	0.192	434	245	245	345	345	44	244	119	244	175	350	44
Oct-19	0.610	0.272	145	96.5	96.5	213	213	33	122	69.5	122	148	255	43
Nov-19	0.771	0.376	80	41	45	125	137	40	108	42	108	180	287	42
Dec-19	0.986	0.414	73	36	36	74	74	50	36	23	36	91	92	63
Jan-20	0.789	0.328	67	42	42	118	118	37	76	64	76	160	232	65
Feb-20	0.724	0.401	61	29	29	96	96	53	52	38	52	125	185	73
Mar-20	0.680	0.359	69	47	47	218	218	31	54	44	54	142	159	73
Apr-20	0.507	0.357	125	49	49	120	120	49	59	48	59	129	162	75
May-20	0.390	0.222	232.9	80.1	80.1	148	148	66	172	74.5	172	123	261	81
Jun-20	0.231	0.170	205.7	98.4	98.4	136	136	52	128	65	128	91	178	63
Jul-20	0.275	0.178	404	97	97	123	123	76	104	68	104	96	132	80
Aug-20	0.283	0.211	354	130	130	162	162	63	64	45	64	67	80	76
Sep-20	0.405	0.174	189	89	89	116	116	53	140	115	140	157	207	57
Oct-20	0.413	0.231	213	113	113	175	175	47	108	67	108	110	185	68
Nov-20	0.547	0.234	173	67	67	108	108	61	66	33	66	72	109	70
Dec-20	1.650	0.658	62	42	42	157	157	32	59	34	59	124	165	62
Jan-21	1.070	0.458	100	46	46	171	171	54	35	33	35	131	214	77
Feb-21	0.300	0.236	116	80	80	159	159	31	52	40	52	83	102	66
Mar-21	0.486	0.265	165	110	110	258	258	33	105	52	105	52	173	56
Apr-21	0.486	0.265	165	110	110	257	257	33	105	52	105	122	173	56
May-21	0.449	0.233	274	84	84	138	138	84	67	33	67	61	123	78
Jun-21	0.253	0.220	193	103	103	155	155	47	49	24	49	40	74	73
Jul-21	0.222	0.163	245	165	165	263	263	32	126	102	126	140	162	71
Aug-21	0.286	0.174	149	44	44	58	58	70	156	58	156	96	200	78
Sep-21	0.578	0.250	114	70	70	96	96	41	63	47	63	117	117	59
Average	0.533	0.265	174.9	86.9	87.0	163.9	242.9	48.8	88.3	54.3	88.3	108.9	251.1	64.9
Minimum	0.213	0.163	52.0	7.3	7.3	16.0	23.0	25.0	32.0	22.0	32.0	40.0	74.0	31.0
Maximum	1.650	0.658	434.0	245.0	245.0	345.0	610.0	93.0	244.0	121.0	244.0	180.0	813.0	90.0
Count	59	59	58	58	58	58	58	58	59	59	59	59	59	59
Std Dev	0.281	0.092	94.7	51.1	51.0	74.0	137.0	15.8	46.6	26.2	46.6	39.3	143.3	13.0
CV	0.527	0.346	0.54	0.59	0.59	0.45	0.56	0.32	0.53	0.48	0.53	0.36	0.57	0.2
95th Percentile	1.073	0.418	356.1	188.7	188.7	290.8	486.4	77.2	175.1	115.1	175.1	175.1	512.0	81.3
5th Percentile	0.236	0.171	61.9	27.9	27.9	56.9	91.9	30.9	34.8	23.9	34.8	51.0	91.5	41.7
90th percentile	0.850	0.379	312.2	157.3	157.3	266.6	453.6	70.6	141.6	94.0	141.6	166.4	446.8	80.0
50th percentile	0.450	0.250	164.5	76.5	76.5	158.0	214.5	47.0	77.0	47.0	77.0	102.0	200.0	66.0

Parameter	pH (s.u.)		Fecal Coliform (#100/mL)		Copper (ug/L)		Dissolved Oxygen (mg/L)		Temperature (deg C)
Statistical Base	max	min	DAILY MAX	MO GEO	DAILY MAX	MO AVG	MAX	MIN	MO AVG
Sep-16	7.58	6.99	470,000	470,000	3	3	4.04	2.55	13.6
Oct-16	7.72	6.98					6.78	5.23	11.8
Nov-16	7.9	7.1	270,000	243,721			9.9	6.7	9.45
Dec-16	7.8	7.4			4	4	10.7	6.7	7.6
Jan-17	7.96	7.34	270,000	270,000			11.33	8.08	5.85
Feb-17	7.36	6.88					11.47	9.47	5.95
Mar-17	7.9	7	660,000	544,977	2	2	9.3	8.9	5.6
Apr-17	7.9	7.14					9.4	8	6.7
May-17	7.37	7.31	340,000	314,006			8.61	3.77	10.5
Jun-17	7.4	7.2	1,030,000	836,899	3	3	9.1	2.7	11.6
Jul-17	7.38	7.28	1,150,000	976,985			2.93	2.32	12.6
Aug-17	7.39	7.19	600,000	579,655			3.72	2.95	14
Sep-17	7.2	7.1	270,000	270,000	4	4	4.31	2.08	13.9
Oct-17	7.1	7					5.62	2.13	12.4
Nov-17	7.14	7.06	180,000	179,722			5.28	2.31	10.4
Dec-17	7.13	7.02			4	4	9.72	8.05	8.3
Jan-18	7.2	7.3	790,000	540,648			9.3	7.7	7.3
Feb-18	7.32	7.19					9.66	6.94	7.9
Mar-18	7.28	7.04	300,000	256,905	3	3	9.45	7.11	7.5
Apr-18	7.24	7.14					9.32	7.2	7.1
May-18	7.1	7	210,000	177,482			6.6	5.3	8.2
Jun-18	7.22	7.13	530,000	519,903	2	2	3.9	3.51	12.1
Jul-18	7.32	6.89	920,000	830,662			2.2	2.1	14.8
Aug-18	7.45	7.08	1,100,000	932,201			4.62	2.07	14.8
Sep-18	7.33	7.19	210,000	210,000	4	4	3.9	2.9	14
Oct-18	7.52	7.17					9.6	3.68	13.5
Nov-18	7.5	6.7	960,000	924,337			16.5	9.8	11
Dec-18	7.19	7.07			3	3	13.2	8.4	9
Jan-19	7.2	7.1	345,000	321,714			9.17	7.47	8.5
Feb-19	7.32	7.1					14.6	7.8	7.9
Mar-19	7.1	6.8	360,000	344,674	0	0	11.4	7.3	8.15
Apr-19	7.5	6.9					9.6	9.3	8.1
May-19	7.2	6.83	590,000	590,000			6.58	3.98	11.125
Jun-19	7.22	6.74	790,000	519,904	23	23	4.33	4.16	9.175
Jul-19	7.19	6.94	980,000	980,000			4.4	2.45	15.35
Aug-19	7.25	6.78	850,000	819,451			4.62	2.83	15.6
Sep-19	6.97	6.91	610,000	610,000	0	0	6.91	2.12	15.8
Oct-19	7.17	6.85					8.24	4.27	12.92
Nov-19	7.15	6.83	520,000	420,476			10.25	8.33	11.3
Dec-19	7.12	6.56			0	0	12.13	7.64	8.85
Jan-20	7.44	7.02	10,000	14,142			10.02	8.72	8.13
Feb-20	7.37	6.51					10.39	9.43	8.34
Mar-20	7.31	7.11	750,000	739,932	0	0	11.4	9.05	8.95
Apr-20	7.31	7.08					10.9	8.88	7.3
May-20	7.21	7.09	42,000	388,844			9.55	6.52	11.13
Jun-20	7.23	7.02	980,000	980,000	0	0	4.02	3.62	14
Jul-20	7.17	7.02	710,000	604,618			4.1	2.15	14.55
Aug-20	7.22	7.08	760,000	616,441			5.02	2.53	14.4
Sep-20	7.16	7.09	670,000	542,955			8.71	2.96	13.7
Oct-20	7.22	7.11					7.7	3.6	12.15
Nov-20	7.45	7.14	170,000	92,195			8.66	7.23	10.8
Dec-20	7.16	6.98			0	0	13.33	11.18	7
Jan-21	7.15	6.74	360,000	317,490			11.92	10.43	8.1
Feb-21	7.04	6.86					10.64	10.39	9.2
Mar-21	7.14	6.86	500,000	374,166	0	0	11.2	8.51	7.05
Apr-21	7.14	6.86					11.2	8.51	7.05
May-21	7.23	6.98	510,000	468,295			8.68	5.33	7.09
Jun-21	7.39	7.05	810,000	661,362	30	30	7.33	4.31	13
Jul-21	7.34	7.05	1,140,000	900,000			4.4	3.03	14.5
Aug-21	7.28	7	1,430,000	770,324			6.69	2.42	14.52
Sep-21	6.99	6.89	200,000	200,000	0	0	9.25	3.48	13
Average	7.30	7.01	597,000	522,000	4.3	4.3	8.42	5.78	10.49
Minimum	6.97	6.51	10,000	14,142	0	0	2.20	2.07	5.60
Maximum	7.96	7.40	1,430,000	980,000	30.0	30.0	16.50	11.18	15.80
Count	59.00	59.00	40	40	19.0	19.0	59.00	59.00	59.00
Std Dev	0.22	0.18	346,000	273,000	8.1	8.1	3.15	2.82	3.01
CV	0.03	0.03	0.58	0.52	1.87	1.87	0.37	0.49	0.29
95th Percentile	7.90	7.30	1,141,000	977,000	23.7	23.7	13.21	9.86	14.86
5th Percentile	7.09	6.74	164,000	173,000	0	0	3.88	2.12	6.63
90th percentile	7.50	7.19	1,037,000	925,000	7.8	7.8	11.56	9.33	14.53
50th percentile	7.23	7.04	595,000	530,000	2.0	2.0	9.25	6.52	10.40

Appendix A.2. Receiving Water Data

Table 15. Receiving Water Data Collected by Permittee, 2003-2005

Site	Time	Depth (m)	Temp (C)	Salinity (ppt)	DO (mg/L)	pH (s.u.)	Turbidity (NTU)	Secchi Disc (ft)
8/13/2003								
Site 1	9:10am	0	12.50	17	10.4	8.37	5.49	7
	9:10am	5	12.30	19	10.2	8.42	6.38	
	9:10am	10	11.60	23	10.2	8.41	2.45	
	9:10am	15	10.70	26	9.5	8.35	2.32	
	9:10am	20	11.20	22	9.4	8.4	2.4	
	9:10am	25/bottom	10.50	29	9.4	8.28	2.9	
Site 2	9:55am	0	12.00	18	9.9	8.5	7.74	7
	9:55am	5	12.50	19	9.5	8.4	4.36	
	9:55am	10	11.90	21	9.54	8.45	2.64	
	9:55am	15	10.80	26	9.32	8.35	1.88	
	9:55am	20	9.60	29	9.23	8.28	1.24	
	9:55am	25/bottom	9.50	30	9.08	8.26	2.03	
Site 3	10:35am	0	12.10	17	9.54	8.51	8.26	7
	10:35am	5	12.20	19	9.36	8.47	8.26	
	10:35am	10	12.00	20	8.89	8.45	3.59	
	10:35am	15	10.70	25	9.44	8.37	2.31	
	10:35am	20/bottom	10.20	26	9.02	8.34	1.43	
Site 4	10:55am	0	12.40	17	9.6	8.5	6.37	7
	10:55am	5	12.50	19	9.36	8.47	2.43	
	10:55am	10	12.30	20	9.17	8.46	2.3	
	10:55am	15	10.70	25	9.26	8.37	1.83	
	10:55am	20	9.00	30	8.96	8.27	1.71	
	10:55am	25/bottom	8.80	30	8.7	8.26	2.05	
2/25/2004								
Site 1	10:00am	0	4.10	31	8.42	7.57	1.13	27
	10:00am	5	4.00	31.4	10.19	7.8	1.11	
	10:00am	10	3.50	31	10.45	7.7	1.21	
	10:00am	15	4.00	32	9.6	7.7	1.21	
	10:00am	20	4.50	32	10.29	7.6	1.19	
	10:00am	25/bottom	3.70	32	10.36	7.58	1.29	
Site 2	10:20am	0	4.10	32.1	9.4	7.48	1.09	26
	10:20am	5	4.30	32	9.76	7.51	1.11	
	10:20am	10	4.10	32	9.94	7.55	1.45	
	10:20am	15	4.20	32	9.57	7.6	1.4	
	10:20am	20	4.40	32	9.73	7.64	1.06	
	10:20am	25/bottom	3.70	32	10.31	7.67	1.22	

Site 3	11:00am	0	3.60	31	10.1	7.7	1.09	30
	11:00am	5	4.10	32	9.62	7.7	0.98	
	11:00am	10	4.00	32	9.44	7.7	0.98	
	11:00am	15	4.40	32	8.91	7.79	1.09	
	11:00am	20	4.10	32	10.17	7.8	0.83	
	11:00am	25/bottom	4.10	32	9.89	7.8	2.74	
Site 4	11:25am	0	4.10	32	10.46	7.8	1.15	32
	11:25am	5	3.60	32	10.15	7.88	0.93	
	11:25am	10	4.50	32	10.03	7.8	1.05	
	11:25am	15	4.10	32	10.45	7.9	0.75	
	11:25am	20/bottom	3.90	32	9.32	7.9	2.59	
9/1/2005								
Site 1	12:30pm	0	12.70	8	6.45	7.26	8.77	4
	12:30pm	5	12.30	8	6.14	8.27	5.81	
	12:30pm	10	11.50	18	7.23	8.39	7.71	
	12:30pm	15	10.60	17	5.78	8.13	2.76	
	12:30pm	20	9.40	27	5.8	8.14	2.15	
	12:30pm	25	8.40	29	5.57	8.13	1.58	
	12:30pm	30/bottom	7.90	32	5.23	8.13	2.16	
Site 2	1:30pm	0	10.20	4	7.05	8.58	6.98	5
	1:30pm	5	8.06	5	9.5	8.06	2.91	
	1:30pm	10	4.15	18	10.3	8.12	4.15	
	1:30pm	15	8.50	18	10.5	8.13	2.59	
	1:30pm	20/bottom	8.10	29	9.5	8.15	3.03	
Site 3	2:00pm	0	10.90	4	7.05	8.58	5.92	5
	2:00pm	5	10.50	7	11.4	8.4	3.03	
	2:00pm	10	9.60	25	9.4	8.26	3.39	
	2:00pm	15	8.30	28	10.4	8.18	2.83	
	2:00pm	20/bottom	8.10	29	10.44	8.21	3.03	
Site 4	3:00pm	0	11.30	3	6.2	8.56	5.92	5
	3:00pm	5	10.40	5	10.5	8.43	3.57	
	3:00pm	10	9.40	10	9.3	8.26	2.54	
	3:00pm	15	8.60	27	9	8.21	2.54	
	3:00pm	20	8.10	29	8.92	8.23	2.88	
	3:00pm	25/bottom	8.10	29	7.56	8.2	5.07	

Table 16. Port of Haines Sampling Results from 2021 ARRI Report

Site	Ammonia-N (mg/L)	Cu (µg/L)	Ni (µg/L)	Zn (µg/L)
HA01	0.007	0.32	0.34	0.10
HA02	0.007	0.36	0.32	0.10
HA03	0.007	0.33	0.34	0.10
HA04	0.021	0.48	0.35	0.38
HA06	0.009	0.35	0.32	0.10
Average	0.010	0.38	0.33	0.16

Appendix B. Reasonable Potential and WQBEL Formulae

EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA 1991) 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 wasteload allocations.

2. Maximum Projected Effluent Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, EPA's Technical Support Document for Water Quality-based Toxics Controls (TSD, 1991) 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

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

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:

$$C_e = (\text{RPM})(\text{MRC}) \qquad \textit{Equation 10}$$

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)

Wasteload allocations (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 wasteload allocations, 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:

$$C_e = WLA = D \times (C_d - C_u) + C_u \qquad \textit{Equation 11}$$

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 wasteload allocation 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 __. 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 EPA's *Technical Support Document for Water Quality-based Toxics Control* (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 TSD equations, the MDL and AML effluent limits are calculated as follows:

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

$$AML = LTA \times e^{(z_a\sigma_n - 0.5\sigma_n^2)}$$ *Equation 17*

where σ, and σ² 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.

Appendix C. Reasonable Potential and WQBEL Calculations

Table 17. Reasonable Potential Analysis for Toxic Pollutants in the Effluent

Pollutants of Concern			COPPER - SEE Toxic BiOp	LEAD - SEE Toxic BiOp	NICKEL - SEE Toxic BiOp	SILVER	ZINC - SEE Toxic BiOp	ANTIMONY (INORGANIC)	ARSENIC - SEE Toxic BiOp	BENZIDINE	BIS(2-ETHYLHEXYL) PHTHALATE	CHLOROFORM	CHROMIUM(HEX)	DI-n-BUTYL PHTHALATE	1,4 DICHLOROBENZENE	NAPHTHALENE	PHENOL	SELENIUM, Lotic	TOLUENE
Effluent Data	Number of Samples in Data Set (n)		19	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		1.87	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		23.7	0.646	2.23	0.827	28.4	0.22	0.545	0	1.5	2	0.711	3.1	0.91	2.7	5.9	2.62	0.79
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only																		
Receiving Water Data	90th Percentile Conc., µg/L - (C_u)									0									
	Geometric Mean, µg/L, Human Health Criteria Only									0									
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	4.8	210.	74.	1.9	90.	--	69.	--	--	--	1,100.	--	--	--	--	290.	--
	Aquatic Life Criteria, µg/L	Chronic	3.1	8.1	8.2	--	81.	--	36.	--	--	--	50.	--	--	--	--	71.	--
	Acute:chronic ratio		1.55	25.93	9.02	--	1.11	--	1.92	--	--	--	22.00	--	--	--	--	4.08	--
	Human Health Water and Organism, µg/L		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Human Health, Organism Only, µg/L		--	Narrative	4,600.	--	69,000.	4,300.	.14	.00054	5.9	470.	--	12,000.	2,600.	--	4,600,000.	11,000.	200,000.
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute	.83	.951	.99	.85	.946	--	1.	--	--	--	.993	--	--	--	--	.998	--
		Chronic	.83	.951	.99	na	.946	--	1.	--	--	--	.993	--	--	--	--	.998	--
	Carcinogen (Y/N), Human Health Criteria Only		N	N	N	N	N	N	--	Y	Y	Y	N	N	N	N	N	N	N
Percent River Flow Default Value = 0%	Aquatic Life - Acute	1Q10	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Aquatic Life - Chronic	7Q10 or 4B3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		30B3 or 30Q10/30Q5	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Human Health - Non-Carcinogen	Harmonic Mean	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Human Health - Carcinogen	Harmonic Mean	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
	Aquatic Life - Chronic	7Q10 or 4B3	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
	Aquatic Life - Chronic Ammonia	30B3 or 30Q10/30Q5	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
	Human Health - Non-Carcinogen	Harmonic Mean	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
	Human Health - Carcinogen	Harmonic Mean	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Aquatic Life Reasonable Potential Analysis																			
σ	$\sigma^2=\ln(CV^2+1)$		1.226	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555
P_n	$=(1\text{-confidence level})^{1/n}$, where confidence level =	99%	0.785	0.100	0.100	0.100	0.100	0.100	0.100	0.215	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
Multiplier (TSD p. 57)	$=\exp(z\sigma\text{-}0.5\sigma^2)/\exp[\text{normsinv}(P_n)\sigma\text{-}0.5\sigma^2]$, where	95%	2.9	5.1	5.1	5.1	5.1	5.1	5.1	3.9	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Statistically projected critical discharge concentration (C_e)			67.74	3.27	11.30	4.19	143.90	1.11	2.76	0.00	7.60	10.13	3.60	15.71	4.61	13.68	29.89	13.28	4.00
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	5.11	0.28	1.02	0.32	12.38	0.10	0.25	0.00	0.69	0.92	0.33	1.43	0.42	1.24	2.72	1.20	0.36
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	2.96	0.16	0.59	--	7.16	0.06	0.15	0.00	0.40	0.53	0.19	0.83	0.24	0.72	1.57	0.70	0.21
Reasonable Potential to exceed Aquatic Life Criteria			YES	NO	NO	NO	NO	NA	NO	NA	NA	NA	NO	NA	NA	NA	NA	NO	NA
Aquatic Life Effluent Limit Calculations																			
Number of Compliance Samples Expected per month (n)			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LTA Coeff. Var. (CV), decimal	(Use CV of data set or default = 0.6)		1.870	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		1.870	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acute WLA, ug/L	C_d = (Acute Criteria x MZ_a) - C_u x (MZ_a-1)	Acute	52.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chronic WLA, ug/L	C_d = (Chronic Criteria x MZ_c) - C_u x (MZ_c-1)	Chronic	58.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Long Term Ave (LTA), ug/L	WLAa x $\exp(0.5\sigma^2\text{-}z\sigma)$, Acute	99%	6.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
(99th % occurrence prob.)	WLAc x $\exp(0.5\sigma^2\text{-}z\sigma)$; ammonia n=30, Chronic	99%	12.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Limiting LTA, ug/L	used as basis for limits calculation		6.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Applicable Metals Criteria Translator	(metals limits as total recoverable)		0.83	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Average Monthly Limit (AML), ug/L	where % occurrence prob =	95%	**21**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Maximum Daily Limit (MDL), ug/L	where % occurrence prob =	99%	**64**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Average Monthly Limit (AML), mg/L			**0.021**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Maximum Daily Limit (MDL), mg/L			**0.064**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Average Monthly Limit (AML), lb/day			**0.332**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Maximum Daily Limit (MDL), lb/day			**1.008**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Human Health Reasonable Potential Analysis																			
σ	$\sigma^2=\ln(CV^2+1)$		1.226	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555	0.555
P_n	$=(1\text{-confidence level})^{1/n}$ where confidence level =	95%	0.854	0.224	0.224	0.224	0.224	0.224	0.224	0.368	0.224	0.224	0.224	0.224	0.224	0.224	0.224	0.224	0.224
Multiplier	$=\exp(2.326\sigma\text{-}0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma\text{-}0.5\sigma^2]$, prob. =	50%	0.275	1.524	1.524	1.524	1.524	1.524	1.524	1.205	1.524	1.524	1.524	1.524	1.524	1.524	1.524	1.524	1.524
Dilution Factor (for Human Health Criteria)			19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Max Conc. at edge of Chronic Zone, ug/L (C_d)			0.342	0.052	0.179	0.066	2.278	0.018	0.044	--	0.120	0.160	0.057	0.249	0.073	0.217	0.473	0.210	0.063
Reasonable Potential to exceed HH Water & Organism			NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Reasonable Potential to exceed HH Organism Only			--	NO	NO	--	NO	NO	NO	NO	NO	NO	--	NO	NO	--	NO	NO	NO

Appendix C.1. WET Reasonable Potential Analysis

The 2001 permit required the facility to conduct chronic whole effluent toxicity testing once in the summer during the permit term. The results of chronic WET testing in 2001 using the sand dollar (*Dendraster excentricus)* test approach was 3.1 TUc, respectively (see Table 1 below).

Table 18. Whole Effluent Toxicity Test Results

Test Date	Species and Test Type	NOEC (%)	IC25 (%)	TUc	TUa (Tc/10)
10-07-2002	Sand Dollar	32	>68	3.1	0.31