Fact Sheet

The U.S. Environmental Protection Agency (EPA)

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

City of Ketchikan

Charcoal Point Wastewater Treatment Plant

Public Comment Start Date: April 15, 2025

Public Comment Expiration Date: May 30, 2025

Technical Contact (USEPA, NPDES Permit): Jamey Stoddard
(206) 553-6110
800-424-4372, ext. 6110 (within Alaska, Idaho, Oregon, and Washington)
stoddard.jamey@epa.gov

Technical Contact (ADEC, Certification): Marie Klingman
(907) 451-2101
marie.klingman@alaska.gov

EPA Proposes to Reissue The NPDES Permit

The 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. 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

ADEC Issues Notice of Application for and Proposes to Issue the Clean Water Act 401 Certification

In accordance with Section 401 of the Clean Water Act (CWA), any applicant for a federal license or permit to conduct an activity that might result in a discharge into navigable waters must apply for and obtain certification from the Alaska Department of Environmental Conservation (ADEC) that the discharge will comply with the CWA, the Alaska Water Quality Standards, and other applicable water-quality related State laws. On April 15, 2025, the EPA requested final Clean Water Act (CWA) 401 certification from ADEC during the public comment period.

ADEC is accepting comment on the draft CWA 401 certification in Appendix G. The public notice for the notice of application and draft Clean Water Act 401 Certification can also be found by visiting the Region 10 website at: https://www.epa.gov/npdes-permits/about-region-10s-npdes-permit-program.

For technical questions regarding the draft 401 certification, contact Marie Klingman at (907) 451-2101 or marie.klingman@alaska.gov.

To comment upon or request a public hearing on the notice of application or the proposed CWA 401 certification, submit comments electronically to Marie Klingman at marie.klingman@alaska.gov on or before the public notice expiration date listed above.

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), the EPA as the permitting authority, shall notify a neighboring State or Tribe with Treatment as a State (TAS) when the EPA determines that the discharge may affect the quality of the neighboring State/tribe's waters (33 U.S.C. 1341(a)(2)). As stated above, ADEC is the certifying authority and is accepting comment regarding ADEC's intent to certify this permit. After the EPA receives final certification from ADEC, the EPA will determine whether the discharge may affect the quality of a neighboring jurisdiction's waters (33 U.S.C. 1341(a)(2)).

Public Comment

The EPA requests that all comments on the EPA's draft permit and tentative 301(h) decision or requests for a public hearing be submitted via email to Jamey Stoddard (stoddard.jamey@epa.gov). If you are unable to submit comments via email, please call 206-553-6110.

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

After the Public Notice expires, and all comments on the draft permit and tentative 301(h) decision have been considered, the EPA 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, the 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) TDD), 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 Jamey Stoddard.

For technical questions regarding the draft permit, this Fact Sheet, or the 301(h) TDD, contact Jamey Stoddard at (206) 553-6110 or stoddard.jamey@epa.gov. Services can be made available to persons with disabilities by contacting Audrey Washington at (206) 553-0523.

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Acronyms

1Q10	1 day, 10-year low flow
7Q10	7-day, 10-year low flow
301(h) TSD	1994 Amended Section 301(h) Technical Support Document
30B3	Biologically based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
ADEC	Alaska Department of Environmental Conservation
AML	Average Monthly Limit
AWL	Average Weekly Limit
BE	Biological Evaluation
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
$CBOD_5$	Carbonaceous Biochemical Oxygen Demand
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved oxygen
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
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
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration

NPDES	National Pollutant Discharge Elimination System
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
TDD	301(h) Tentative 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 National Pollutant Discharge Elimination System (NPDES) permit for the following entity:

Table 1. General Facility Information	
NPDES Permit #:	AK0021440
Applicant:	City of Ketchikan
Type of Ownership	Publicly Owned Treatment Works
Physical Address:	3921 Tongass Avenue Ketchikan, AK 99901
Mailing Address:	334 Front Street P.O. Box 7300 Ketchikan, AK 99901
Facility Contact:	Seth Brakke Public Works Director sethbrakke@ketchikan.gov 907-228-4738
Facility Location:	Lat/Long: 55°21'25.0"N, 131°41'47.4"W Decimal Degrees: 55.356944, -131.696500
Receiving Water	Tongass Narrows, Southeast Alaska
Facility Outfall:	Lat/Long: 55°21'21.8"N, 131°42'09.8"W* Decimal Degrees: 55.356056, -131.702722*
*approximate center point of diffuser	

B. MODIFICATION OF SECONDARY TREATMENT REQUIREMENTS

The City of Ketchikan (Ketchikan, the applicant, or the permittee) has requested a modification under Section 301(h) of the Clean Water Act (CWA) of the secondary treatment requirements contained in Section 301(b)(1)(B) to discharge wastewater receiving less than secondary treatment from the Charcoal Point Wastewater Treatment Plant (hereafter, Ketchikan WWTP). 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. Ketchikan

has requested a 301(h) modification of the secondary treatment requirements for BOD_5, TSS, but not for pH.

Upon review of the application materials and available data, the EPA has tentatively determined that the Ketchikan 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. The EPA has prepared a tentative decision (301(h) TDD) which presents the findings and conclusions of the EPA 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

Ketchikan received its first 301(h)-modified NPDES permit on August 13, 1984. The 1984 permit was administratively continued on August 13, 1989, and was renewed on January 29, 2001. Ketchikan submitted a timely and complete application for renewal of their 301(h)-modified NPDES permit on July 12, 2005. Pursuant to 40 CFR 122.6, the 2001 permit has been administratively continued and remains fully effective and enforceable.

D. TRIBAL CONSULTATION

The EPA consults on a government-to-government basis with federally recognized tribal governments when the 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, the EPA issued the "EPA Policy on Consultation and Coordination with Indian Tribes" which established national guidelines and institutional controls for consultation.

The Ketchikan WWTP is located within the traditional and historical territory of the Ketchikan Indian Community, a federally recognized tribe. The EPA notified the Ketchikan Indian Community of its work on this draft permit in August 2020 and January 2021. The EPA also held an informational webinar for the Ketchikan Indian Community and other tribes on April 14 and 18, 2022. The EPA shared the preliminary draft permit, draft fact sheet, and draft 301(h) TDD with the Ketchikan Indian Community on February 13, 2025. The EPA will invite the Ketchikan Indian Community

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

II. FACILITY INFORMATION

A. TREATMENT PLANT DESCRIPTION

Service Area

The City of Ketchikan owns and operates the Ketchikan WWTP located in Ketchikan, Alaska. The facility serves a resident population of approximately 8,200 people. The treatment plant also accepts approximately 5,000 gallons per month of septage from the Gateway Borough. There are no industrial users discharging to the treatment plant.

Treatment Process

The collection system is a separate sanitary sewer system; there are no combined sewer overflows. The treatment plant provides primary treatment. Raw sewage enters the treatment works and is piped to three 25-inch diameter by 72-inch-long rotary screens with 0.04-inch openings, where larger solids and grit are removed. Sewage is then piped to four primary sedimentation tanks with an effective area of 5,000 ft^2 where settleable solids are removed. At times, chlorine is dosed into the influent at the head of the treatment plant for operational purposes.

Treated effluent flows over the primary clarifier weirs and into the effluent channel that connects to the outfall pipe. The sludge from the primary sedimentation tanks (and septage received from the Gateway Borough) is aerated and dewatered using a belt filter press after stabilization with hydrated lime (CaOH). The sludge is then composted at the Deer Mountain landfill where it is used as cover. The design flows of the facility are presented below:

Average Wet Weather Design Flow: 4.0 million gallons per day (mgd).

Maximum Daily Design Flow: 7.2 mgd

Peak Hour Design Flow: 8.7 mgd

Actual Annual Average Monthly Flow (2019-2023): 1.79 – 1.97 mgd

Actual Average Monthly Flow Range (2019-2023) 1.48 – 2.76 mgd

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) TDD**.**

B. OUTFALL DESCRIPTION

The outfall consists of a 609 foot-long buried onshore pipe (339 foot-long 24-inch ductile iron (DI) pipe and 270 foot-long 24-inch (nominal) high-density polyethylene (HDPE) pipe) from the WWTP to the shoreline, connected to a 716 foot-long buried

24-inch (nominal) HDPE pipe from the shoreline connection to the toe of channel slope, and then connected to a 200 foot-long (61 m) diffuser pipe section. The diffuser pipe section consists of 6 ports at 40 foot spacing: five 6" ports along the pipe spring-line with discharge ports on alternating sides and one 12" terminal diffuser port oriented in-line with the diffuser pipe. The HDPE and DI pipe sections are anchored by concrete block anchors. The end of the outfall diffuser is located at approximately 55 21'21.51" N, 131 42'11.69" W (55.356094, -131.702829) at a depth of ~105 feet at MLLW (32 meters).

C. EFFLUENT CHARACTERIZATION

To characterize the effluent, the EPA evaluated discharge monitoring report (DMR) data from April 2019 through February 2024 and priority pollutant scans conducted in 2002 and 2005. Data from the priority pollutant scans conducted in 2002 and 2005 are not representative of the current discharge and the concentration of many pollutants is currently uncertain due to the age of the data. Monitoring requirements for priority and other pollutants are included in the draft permit. The effluent quality is summarized in Table 2 using discharge monitoring report data from 2019 – 2024. The ammonia data is from 2002 and is not representative of the current discharge. Data are provided in Appendix A of this fact sheet and Appendix C of the 301(h) TDD.

Table 2. Effluent Characterization

Parameter	Minimum	Maximum	Average
Flow (monthly avg), mgd	1.48	2.76	1.87
Flow (max daily), mgd	1.85	5.67	3.08
BOD (monthly avg[1]), mg/L	53	119	88
BOD (monthly avg[1]), lbs/day	863	1872	1331
BOD (monthly avg[1]), % removal	27	54	42
TSS (monthly avg[1]), mg/L	28	59	42.5
TSS (monthly avg[1]), lbs/day	365	1090	660
TSS (monthly avg[1]), % removal	58	80	70
Fecal coliform (max daily/weekly geo[1]), #/100 mL	1500	1,460,000	530,000
Fecal coliform (monthly geo mean[2]), #/100 mL	10	860,000	250,000
Dissolved oxygen (monthly min[3]), mg/L	1.02	10.8	6.5
pH (min[1]), standard units	6.76	7.21	6.99
pH (max[1]), standard units	7.07	7.92	7.39
Temperature (monthly max[3]), °C	8.2	19.8	13.5
Ammonia, mg/L[4]	-	1.9	1.23
Ammonia, lbs/day[4]	-	63.38	41.03

Copper[3], µg/L	9.6	54.2	29.6
Copper[3], lbs/day	0.11	4.16	0.51
Zinc[3], µg/L	1	95	34.1
Zinc[3], lbs/day	.001	2.19	0.52
Total Residual Chlorine[5], µg/L	0.0	100	6.5
Total Residual Chlorine[5], lbs/day	0.0	3.34	0.054
[1] Weekly samples [2] Monthly geometric mean of weekly samples [3] Monthly samples [4] Data from 2002 [5] Weekday samples, April 2019 - Dec 2023			

D. COMPLIANCE HISTORY

The facility had one reported instance of effluent limit violations between March 2019 and February 2024 – a violation of the monthly minimum percent removal limit for BOD in April 2019. 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=110039716144.

The EPA conducted an on-site compliance inspection of the facility in July 2019. The inspection encompassed the wastewater treatment process, records review, operation and maintenance, and the collection system. The inspection did not note any areas of concern.

III. RECEIVING WATER

In drafting permit conditions, the 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) TDD 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 the Tongass Narrows in Ketchikan, located in southeast Alaska. The Tongass Narrows connects to Behm Canal and Clarence Straight to the northwest, and Revillagigedo Channel to the southeast. For a detailed description of the receiving waters please refer to Section 6 of the 301(h) TDD.

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, Tongass Narrows, has not been reclassified, nor does it have site-specific water quality criteria that apply to it. Therefore, Tongass Narrows is 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 the Tongass Narrows is summarized in Table 3 below, and in Section 6 of the 301(h) TDD. The Ketchikan WWTP collected water quality data in the Tongass Narrows in accordance with 2001 permit requirements for the following parameters: temperature, pH, dissolved oxygen, turbidity, salinity, fecal coliform, ammonia, copper, and zinc.

The Aquatic Restoration and Research Institute (ARRI) has been conducting annual water quality surveys for the Alaska Department of Environmental Conservation (ADEC) in the Tongass Narrows and other Alaskan shipping channels since 2020. Parameters assessed include temperature, salinity, pH, dissolved oxygen, fecal coliform, enterococcus, ammonia, copper, nickel, and zinc. The water quality data from the ARRI surveys and permittee data are summarized below in Table 3 and Appendix A.

Table 3. Receiving Water Quality Data			
Parameter	**Units**	**Percentile**	**Value**
Temperature[1]	°C	95th	10.8[1]
pH[1]	Standard units	5th – 95th	7.5 – 8.0
Dissolved Oxygen[1]	mg/L	Minimum	5.1
Turbidity[1]	NTU	Maximum	8.7
Salinity[1]	ppt	5th – 95th	29 – 48.5
Fecal Coliform[2]	CFU/100 mL	95th (geo mean)	27
Ammonia (N)[1,3,4]	mg/L	Maximum	0.69
Copper, Total Recoverable[4]	µg/L	Maximum	0.19
Zinc, Total Recoverable[4]	µg/L	Maximum	0.

Source:

1. Data collected by permittee 2001 – 2005. All values represent samples collected the approximate depth of the outfall.
2. Data collected by permittee 2017 – 2019
3. Receiving water sampling for ammonia was required during the 1st, 3rd, and 4th year of the prior permit term.
4. ARRI, 2022. Water Quality Measures in Alaska's Ports and Shipping Lanes, 2021 Annual Report

1. General Characteristics

The Tongass Narrows includes the body of water lying between Revillagigedo Channel and Guard Island in Clarence Strait, Alaska. The channel has a northwest by southeast orientation and is classified as a saline estuary. For a detailed description of the Tongass Narrows please refer to Section 6 of the 301(h) TDD.

2. Water Quality Limited Waters

The State of Alaska's 2022 Final Integrated Report on the condition of Alaska's waters identifies several areas within Tongass Narrows that are impaired. The list of impaired waters is in Table 4 below:

Table 4. Impaired Waters				
Waterbody	**Impairment Category**	**Designated Use(s) Impaired**	**Parameters**	**Location**
Ward Cove	4A	Aquatic life	Dissolved oxygen; residues	~3 miles northwest of WWTP discharge
Refuge Cove Beach	5	Harvesting for consumption of raw mollusks or other raw aquatic life; seafood processing;	Fecal coliform	~4 miles northwest of WWTP discharge
Sunset Beach	5	Harvesting for consumption of raw mollusks or other raw aquatic life; contact recreation; seafood processing	Fecal coliform; Enterococcus	~4.5 miles northwest of WWTP discharge
Shull Beach	5	Harvesting for consumption of raw mollusks or other raw aquatic life; contact recreation; seafood processing	Fecal coliform; enterococcus	~6.75 miles northwest of WWTP discharge
South Point Higgins Beach	5	Harvesting for consumption of raw mollusks or other raw aquatic life; seafood processing	Fecal coliform	~8 miles northwest of WWTP discharge
Thomas Basin Harbor	5	Harvesting for consumption of raw mollusks or other raw aquatic life; contact recreation; seafood processing	Fecal coliform; enterococcus	~2.5 miles southeast of WWTP discharge
Seaport Beach	5	Harvesting for consumption of raw mollusks or other raw aquatic life; contact	Fecal coliform; enterococcus	~5.2 miles southeast of WWTP discharge

		recreation; seafood processing		
Rotary Park Beach	5	Harvesting for consumption of raw mollusks or other raw aquatic life; aquaculture; seafood processing	Fecal coliform	~5.8 miles southeast of WWTP discharge
Rotary Park Pool	5	Harvesting for consumption of raw mollusks or other raw aquatic life; contact recreation; seafood processing	Fecal coliform; enterococcus	~5.9 miles southeast of WWTP discharge
Mountain Point Surprise Beach	5	Harvesting for consumption of raw mollusks or other raw aquatic life; contact recreation; aquaculture; industrial; seafood processing	Fecal coliform; enterococcus	~7.4 miles southeast of WWTP discharge
Mountain Point Cultural Food Beach	5	Harvesting for consumption of raw mollusks or other raw aquatic life; contact recreation; seafood processing	Fecal coliform; enterococcus	~7.7 miles southeast of WWTP discharge

Local on-site treatment systems such as septic tanks and other decentralized wastewater systems along the coast of the Tongass Narrows are believed to be the probable sources contributing to bacteria impairments to the northwest and southeast. The dissolved oxygen (DO) and residues listing in Ward Cove has been attributed to industrial point source discharges from historic fish processing, a pulp mill, a log transfer facility and a log storage facility.

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**
TBELs		
BOD_5	More stringent limits	The 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.
TSS	More stringent limits	The 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]	New average weekly limit	40 CFR 122.45(d)(2) requires effluent limitations for continuous discharges from POTWs be expressed as average weekly and average monthly discharge limitations, unless impracticable. The 2001 permit contained an average monthly effluent limit for BOD_5. The draft permit proposes to implement an average weekly limit.
TSS[1]	New average weekly limit	40 CFR 122.45(d)(2) requires effluent limitations for continuous discharges from POTWs be expressed as average weekly and average monthly discharge limitations, unless impracticable. The 2001 permit contained an average monthly effluent limit for BOD_5. The draft permit proposes to implement an average weekly limit.
WQBELs		
Total Copper	More stringent limits	Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to

		meet WQS. Copper limits were developed using the dilution factors provided by ADEC in their draft 401 certification.
Total Zinc	More stringent limits	Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet WQS. Zinc limits were developed using the dilution factors provided by ADEC in their draft 401 certification.
Enterococcus	New effluent limits	Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet WQS. CWA 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 zone of initial dilution (ZID). When the 2001 permit was issued, no WQS was in effect for enterococcus. In 2017, the EPA approved Alaska's WQS for enterococcus. The EPA has determined the modified discharge has reasonable potential to cause or contribute to an excursion above the WQS for enterococcus. The draft permit contains a WQBEL for enterococcus developed using the chronic mixing zone.
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. CWA 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 ZID. The draft permit contains fecal coliform limits that the ADEC has included as a condition of their draft 401 certification. These limits will ensure Alaska's most protective WQS are met at the boundary of the chronic mixing zone.
Dissolved Oxygen	New limits	The 2001 permit incorrectly omitted limits for DO. New limits have been included in the draft permit and are based upon Alaska WQS for estuarine receiving waters.
[(1)] Concentration/mass-loading limits only; compliance with 30% removal is still determined on monthly averaging basis.		

Table 6. presents the existing effluent limits and monitoring requirements in the 2001 Permit. Table 7. 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
Flow	mgd	--	--	--	Influent	Continuous	Recorder
BOD_5	mg/L	146	--	--	Influent and Effluent	1/week	24-hour composite
	lbs/day	7,400	--	--			Calculation
BOD_5, % removal	%	Minimum 30% removal			Influent and Effluent	1/month	Calculation
Total Suspended Solids (TSS)	mg/L	129	--	--	Influent and Effluent	1/week	24-hour composite
	lbs/day	7,746	--	--			Calculation
TSS, % removal	%	Minimum 30% removal			Influent and Effluent	1/month	Calculation
Fecal Coliform Bacteria	colonies/100 mL	1.0x10^6	1.25x10^6	1.5x10^6	Effluent	1/week	Grab
Total Copper	µg/L	157	--	290	Effluent		
	lbs/day	9.43	--	17.4	Effluent		
Total Zinc	µg/L	4,682	--	9,384	Effluent		
	lbs/day	281	--	563	Effluent		
Total Ammonia	mg/L	--	--	--	Effluent	1/month	24-hour composite
pH	s.u.	6.5 – 8.5			Effluent	1/week	Grab
Dissolved oxygen	mg/L	--	--	--	Effluent	1/month	Grab

Temperature	°C	--	--	--	Effluent	1/month	Grab
Chronic Whole Effluent Toxicity	TU_C	--	--	--	Effluent	2/permit term	24-hour composite

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
BOD_5	mg/L	143	190	--	Influent and Effluent	1/week	24-hour composite
	lbs/day	4,770	6,338	--			Calculation[1]
BOD_5, % removal	%	Minimum 30% removal			Influent and Effluent	1/month	Calculation[2]
Total Suspended Solids (TSS)	mg/L	49	65	--	Influent and Effluent	1/week	24-hour composite
	lbs/day	1,635	2,168	--			Calculation[1]
TSS, % removal	%	Minimum 30% removal			Influent and Effluent	1/month	Calculation[2]
Enterococcus (Interim Limit)	#/100 mL	Report	--	Report	Effluent	1/week[3]	Grab
Enterococcus[4] (Final Limit)	#/100 mL	690[5] (geomean)	--	2,561[6] (instant. max)	Effluent	1/week[3]	Grab
Fecal Coliform[7] (Interim Limit)	# FC/100 mL	810,000[5] (geomean)	1,150,000[5] (geomean)	1,200,000[6] (instant. max)	Effluent	1/week[3]	Grab
Fecal Coliform[4] (Final Limit)	# FC/100 mL	200[5]	400[5]	800[6]	Effluent	1/week[3]	Grab

Copper, total recoverable	µg/L	39	--	62[6]	Effluent	1/month	24-hour composite
	lbs/day	1.29	--	2.07			Calculation[1]
Zinc, total recoverable	µg/L	552	--	1107[6]	Effluent	1/month	24-hour composite
	lbs/day	18.4	--	36.9			Calculation[1]
pH	s.u.	Between 6.5 – 8.5			Effluent	1/week	Grab
Dissolved Oxygen	mg/L	Between 5.0 – 17.0			Effluent	1/week	Grab
Monitoring Only							
Flow	mgd	Report	--	Report	Effluent	Continuous	Recorded
Temperature	°C	Report	--	Report	Effluent	1/week	Grab
Total Residual Chlorine	µg/L	Report		Report	Effluent	1/week[8]	Grab
	lbs/day	Report		Report			Calculation[1]
Total Ammonia (as N)	mg/L	Report	--	Report	Effluent	1/month	24-hour composite
	lbs/day	Report	--	Report			Calculation[1]
Arsenic	µg/L	Report	--	Report		Quarterly	24-hour composite
	lbs/day	Report		Report		Quarterly	Calculation
Lead	µg/L	Report	--	Report		Quarterly	24-hour composite
	lbs/day	Report		Report		Quarterly	Calculation
Mercury	µg/L	Report	--	Report		Quarterly	24-hour composite
	lbs/day	Report		Report		Quarterly	Calculation
Nickel	µg/L	Report	--	Report		Quarterly	24-hour composite
	lbs/day	Report		Report		Quarterly	Calculation
Selenium	µg/L	Report	--	Report		Quarterly	24-hour composite

	lbs/day	Report		Report		Quarterly	Calculation
Silver	µg/L	Report	--	Report		Quarterly	24-hour composite
	lbs/day	Report		Report		Quarterly	Calculation
Whole Effluent Toxicity (WET)[9]	TU_c	See Permit Part I.C.			Effluent	2/year[10]	24-hour composite
Per-and Polyfluoroalkyl Substances (PFAS)[11]	ng/L	Report	--	Report	Influent, Effluent	2/year[12]	24-hour composite
	mg/kg dry weight	--	--	Report	Sludge	2/year[12]	Grab
Permit Application Effluent Testing Data[13]	---				Effluent	1/year	---
Additional Effluent Testing – Chemical Analysis and Source Identification[14]	---				Effluent	1/year	Grab

(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 at approximately the same time.
(3) Between May and September of each year, fecal coliform and enterococcus sampling shall coincide with receiving water sampling in Permit Part I.D.
(4) Final fecal coliform and enterococcus limits. See Permit Part II.C. for compliance schedule information.
(5) If more than one bacteria sample is collected within the reporting period, the average result must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of "n" quantities is the "nth" root of the product of the quantities. For example, the geometric mean of 100, 200, and 300 is (100 X 200 X 300)1/3 = 181.7.
(6) Reporting is required within 24 hours of a maximum daily limit or instantaneous maximum limit violation. See Permit Parts I.B.3 and III.G.
(7) See part IV.A.3 of the Fact Sheet for information on the interim fecal coliform limits.

(8) Monitoring for total residual chlorine is only required when chlorine is used in the treatment process.
(9) Chronic WET testing – See Permit Part I.C.
(10) Toxicity testing must be conducted two times per year, except as provided in Permit Parts I.C.
(11) See Permit Part I.B.9 and I.B.10
(12) Monitoring for PFAS chemicals is required twice a year. One of the samples should occur between May through August, and the other between September through April, with at least two months between samples.
(13) Permit Application Effluent Testing Data – See NPDES Permit Application Form 2A Table B for the list of pollutants to be included in this testing. The Permittee must use sufficiently sensitive analytical methods in accordance with Permit Part I.B.5.
(14) Additional Effluent Testing – Chemical Analysis and Source Identification: See NPDES Permit Application Form 2A Table C, and Permit Part II.D., Table6, for the list of pollutants to be included in this testing. The pollutants listed in Permit Part II.D., Table 6, must be reported in Table D of NPDES Permit Application Form 2A. The Permittee must use sufficiently sensitive analytical methods in accordance with Permit Part I.B.5.

A. BASIS FOR EFFLUENT LIMITS

In general, the CWA requires that the effluent limits for a particular pollutant be the more stringent of either technology-based effluent limits (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. The EPA identifies pollutants of concern for the discharge based on those which:

- Have a TBEL
- Have an assigned wasteload allocation (WLA) from a Total Maximum Daily Load (TMDL)
- Had an effluent limit in the previous permit
- Are present in the effluent based on 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, ammonia, temperature, and DO.

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

- BOD_5
- TSS

- pH
- Bacteria (fecal coliform, enterococcus)
- Ammonia
- Chlorine
- DO
- Temperature
- Copper
- Zinc
- Whole effluent toxicity
- Other Toxics (arsenic, lead, mercury, nickel, selenium, silver)
- PFAS

2. Technology-Based Effluent Limits (TBELs)

a. Federal Primary Treatment Effluent Limits

The CWA requires publicly owned treatment works (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. The 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 averaging 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.b for more information on concentration and mass limits.

The EPA has tentatively determined that the Ketchikan 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 monthly removal limits for TSS and BOD_5. For additional information on 301(h) please refer to the 301(h) TDD.

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]

The EPA assessed influent and effluent data (2019-2024) 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 includes 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 2019 and 2024 was 42%. Influent BOD_5 concentrations are higher during the summer months as shown in the facility DMR data.

Average Monthly Limit (AML): The EPA used the 95th percentile of influent data from 2019 to 2024 and an assumed 30% removal to calculate an AML of 143 mg/L. The new limit is only slightly more stringent than the current AML in the 2001 permit (146 mg/L). Based on the BOD_5 monitoring data, EPA expects the facility to be able to consistently meet this limit.

[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): 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. The 2001 permit contained an average monthly effluent limit for BOD_5 but no average weekly limit. As required by the regulations, the draft permit includes an average weekly limit for BOD_5. The EPA used the multiplier from Table 5-3 of the Amended Technical Support Document for Water Quality-Based Toxics Control (1991 TSD) and the calculated AML to calculate an AWL of 190 mg/L. The EPA is proposing to include the calculated limits in the draft permit. The 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:

Average Monthly Limit = 143 mg/L × 4.0 mgd × 8.34 = 4,770 lbs/day

Average Weekly Limit = 190 mg/L × 4.0 mgd × 8.34 = 6,338 lbs/day

Table 9. Inputs for Calculation of BOD_5 Limits	
95th Percentile of Influent Data (mg/L)	205
Final Effluent After 30% Removal (mg/L)	143
CV of Effluent Data	0.2
Samples per month	4
TSD[1] Multiplier (99th/95th)	1.33
[1] Technical Support Document for Water Quality-Based Toxics Control. 1991.	

TSS

DMR data indicates the discharge is consistently achieving greater TSS removal than the federal primary treatment standard of 30%. Average percent removal between 2019 and 2024 was 70%. As discussed below, the EPA proposes to establish TSS concentration limits that reflect facility performance.

Average Monthly Limit (AML): Using effluent data from 2019 to 2024, the EPA conducted a statistical analysis to calculate an average monthly TSS limitation based on facility performance. The performance-based AML is 49 mg/L. This is more stringent than the current AML of 129 mg/L and reflects the level of performance the facility has demonstrated it can consistently achieve. The draft permit contains an AML of 49 mg/L.

Average Weekly Limit (AWL): 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. The 2001 permit contained an average monthly effluent limit for TSS but no average weekly limits. As required by the regulations, the draft permit includes an average weekly limit for TSS. Using effluent data from 2019 to 2024, the EPA conducted a statistical analysis to calculate an AWL for TSS based on facility performance. The performance-based AWL is 65 mg/L, which reflects facility performance for TSS.

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

Average Monthly Limit = 49 mg/L × 4.0 mgd × 8.34 = 1,635 lbs/day

Average Weekly Limit = 65 mg/L × 4.0 mgd × 8.34 = 2,168 lbs/day

pH

The TBEL for pH at 40 CFR 133.102 is between 6.0 and 9.0 standard units (s.u.). The Alaska WQS for pH is more stringent than the TBEL. As discussed below, the draft permit includes WQBELs for pH.

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 WLA for the discharge in an approved TMDL. 40 CFR 122.44. There are no approved TMDLs that specify WLAs for this discharge; therefore, all WQBELs are calculated directly from the applicable WQS.

Alaska's WQS can be found at 18 AAC 70 (ADEC 2023) and the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* (ADEC 2022). 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 the EPA's reasonable potential analysis.

b. Reasonable Potential Analysis and Need for WQBELs

The EPA used Alaska WQS and the processes described in the 1994 *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, the 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, the EPA has established the spatial dimensions of the ZID to include the entire water column within a horizontal distance equal to the discharge depth at mean lower low water (32 m) from any point along the diffuser.

Using these values, the ZID for the applicant's outfall was calculated to be a rectangle 64 meters (210 ft) long by 125 meters (410 ft) wide centered over the diffuser, with length and width being roughly parallel and perpendicular to shore, respectively.

The ZID dimension calculations are as follows:

Length (parallel to shore): 32 m + 32 m = 64 m (210 ft)
Width (perpendicular to shore): 32 m + 61 m + 32 m = 125 m (410 ft)

The CORMIX mixing zone model predicts a dilution of 52:1 at the edge of the ZID under critical, worst-case discharge and receiving water conditions. For a complete description of the inputs to the mixing analysis used for determining the ZID, please refer to Section 7 of the 301(h) TDD.

18 AAC 70.240 provides Alaska's mixing zone policy for point source discharges. In their draft 401 certification ADEC proposes to authorize mixing zones within the spatial boundaries of the ZID. The dilution factors associated with the ZID and mixing zones are summarized below. For additional

information on the mixing zones ADEC proposes to authorize, please refer to the draft 401 certification in Appendices G and H.

Table 10. Mixing Zones	
Criteria Type	**Dilution Factor**
Acute Aquatic Life	11.8
Chronic Aquatic Life	19.7
EPA 301(h) ZID	52

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

As discussed in Part IV.A.1. Pollutants of Concern, the pollutants of concern in the discharge are BOD_5, DO, TSS, pH, temperature, fecal coliform, enterococci bacteria, chlorine, copper, zinc, ammonia, WET, PFAS, 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) TDD. The relevant WQS are shown below. Since Tongass Narrows is designated for all uses, the listed designated use in Table 11 is the one with the most protective criteria.

Table 11. Applicable Water Quality Standards			
Pollutant	**Designated Use**	**Marine Criteria**	**Basis**
Ammonia	Aquatic life	Temperature, pH, and salinity dependent 12,400 µg/L (acute) 1,800 µg/L (chronic)	Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (ADEC 2022)
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 2022)
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 2022)
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 MPN/100mL (chronic)	18 AAC 70.020(b)(14)(D)
pH	Aquaculture	6.5—8.5 s.u.	18 AAC 70.020(b)(18)(A)(i)
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))
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 2022)
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,	1.0 TU_C	18 AAC 70.030

	Other Aquatic Life, and Wildlife		
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 2022)
	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 applicable WQBELs for specific parameters are summarized below, in alphabetical order. The parameters included are chlorine, copper, dissolved oxygen/BOD_5, enterococcus, fecal coliform, pH, residues, temperature, TSS/turbidity, and zinc. Reasonable potential calculations are provided in Appendix C.

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* (AK Toxics Manual) includes tables to determine acute and chronic criteria based upon these parameters (ADEC, 2022).

The EPA calculated the 95th percentile of temperature (10.8 ^{o}C), salinity (29.55 g/kg), and pH (8.04 s.u.) using data collected by the permittee at the bottom depths of the receiving water between 2001 and 2005. The 95th percentile data was used as input values in the Tables in Appendices F and G of the AK Toxics Manual (ADEC, 2022) to determine the acute criteria of 12,400 µg/L and chronic criteria of 1,800 µg/L for ammonia.

A maximum ammonia concentration of 1.9 mg/L was reported in the permit application submitted in 2005. Using the maximum concentration, a default CV of 0.6 for the 25 samples, and the chronic dilution factor, a reasonable potential calculation showed that the Ketchikan WWTP discharge does not have reasonable potential to cause or contribute to an excursion above the water quality standard for ammonia. See Appendix E for the EPA's reasonable potential analysis. As such, the draft permit does not contain ammonia limits but requires monthly monitoring.

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The Ketchikan WWTP currently provides incomplete disinfection of its effluent intermittently, but will need to provide consistent, increased disinfection of its effluent to achieve the final bacteria limits in the draft permit. To achieve disinfection, the Ketchikan WWTP will likely need to use either ultraviolet or chlorination.

The EPA calculated reasonable potential for chlorine using effluent data provided by the facility between April 2019 and December 2023, Alaska WQS, and the mixing zones ADEC has proposed. Based upon the calculations presented in Appendix C, the Ketchikan WWTP discharge does not have reasonable potential to cause or contribute to an excursion above the water quality criterion for chlorine and no WQBELs have been included in the draft permit. Monitoring for chlorine will be required when used.

Copper

The 2001 permit includes average monthly and maximum daily effluent limits for total copper of 157 µg/L (9.43 lbs/day) and 290 µg/L (17.4 lbs/day), respectively. In preliminary discussions, ADEC has indicated it will authorize acute and chronic dilution factors of 11.8:1 and 19.7:1, respectively, for total copper.

Based on the DMR data (2019-2024), Alaska WQS, and the mixing zones ADEC has proposed, the Ketchikan WWTP discharge has reasonable potential to cause or contribute to an excursion above the copper water quality criterion for the protection of aquatic life. 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 an excursion above Alaska's WQS for copper, the EPA calculated the following WQBELs for copper:

Average monthly limit: 39 µg/L (1.29 lbs/day)

Maximum daily limit: 62 µg/L (2.07 lbs/day).

These limits are more stringent than the limits in the 2001 permit. Monthly effluent copper concentrations between 2019 and 2024 ranged from a minimum of 9.6 µg/L to maximum of 54 µg/L, with an average of 29.6 µg/L. Based on this data, the EPA believes the facility will be able to meet the proposed limits. The draft permit maintains the monthly monitoring requirement from the 2001 permit. See Appendix C for reasonable potential calculations for copper.

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 excursions above 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 worst-case DO depletion of 0.2mg/L at the boundary of the ZID at the bottom of the receiving water, with a final BOD_5 concentration of 5.0 mg/L after initial mixing. 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) TDD.

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

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. The EPA approved Alaska's WQS for enterococcus in 2017. The WQS at 18 AAC 70.020(b)(14)(B)(i) 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 December 2001.

40 CFR 122.44(d)(1) requires the 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 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, the EPA has determined there is reasonable potential for the discharge to cause or contribute to an excursion above Alaska WQS for enterococcus. The 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 explained in the fecal coliform section.

Monthly geometric mean limit = 35 CFU/100 mL x 19.7 = 689.5 CFU/100 mL
Instantaneous maximum limit = 130 CFU/100 mL x 19.7 = 2,561 CFU/100 mL

These WQBELs will be protective of Alaska WQS for enterococci at the boundary of the chronic mixing zone. The Ketchikan WWTP does not currently have the disinfection technology necessary to meet the WQBELs in the draft permit. In the draft 401 certification ADEC has included a five-year schedule of compliance for Ketchikan to meet the final bacteria limits in the permit. No interim limits are being proposed. Section V.C. of this Fact Sheet describes the compliance schedule for enterococcus.

Fecal Coliform

Alaska's most restrictive marine criterion for fecal coliform bacteria is 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 Tongass Narrows 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 values in that data set are equal. Otherwise, the geometric mean is always less than the arithmetic mean. 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.

The EPA derived WQBELs for fecal coliform by multiplying the dilution factor of 19.7:1 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 19.7 = 276 CFU/100 mL

Instantaneous maximum limit = 43 MPN/100 mL x 19.7 = 847 MPN/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 Table 12, below, as a condition of their final 401 certification of the reissued permit. Since these limits are more stringent than the WQBELs developed above, the 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 the 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 the EPA has calculated. The EPA is accepting comment on the calculated WQBELs of 266 CFU/100mL (Average Monthly) and 816 MPN/100 mL (Instantaneous Max) that will be imposed if ADEC does not include the fecal coliform limits as indicated in its 401 certification.

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 monthly average, average weekly, and maximum daily fecal coliform limits of 1,000,0000 FC/100mL, 1,250,000, and 1,500,000 FC/100mL, respectively. The Ketchikan WWTP does not currently have the technology necessary to meet the more stringent WQBELs for fecal coliform in the draft permit. The 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. The 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 maximum daily, average weekly, and average monthly interim limits were derived by taking the maximum of weekly geometric mean values, and the 95th percentile of weekly and monthly geometric mean values, respectively.

The proposed interim fecal coliform limits are:

Average monthly limit: 810,000 FC/100 mL

Average weekly limit: 1,150,000 FC/100 mL

Maximum daily limit: 1,200,000 FC/100 mL.

Section V.C. of this Fact Sheet describes the compliance schedule for fecal coliform.

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 occurring range. Mixing zones are generally not granted for pH, therefore the most stringent water quality criterion must be met before the effluent is discharged to the receiving water.

Effluent pH data were compared to the water quality criteria. Between 2019-2024, effluent pH ranged from 6.8 to 7.9 s.u. The draft permit retains the current pH limits of 6.5 to 8.5 s.u.

Residues

The Alaska WQS for residues require that surface waters of the State be free from floating solids, visible foam, or oily wastes 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. The EPA reviewed surface water and DMR data between 2019 and 2024 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 (mid-depth) during receiving water monitoring from 2001 to 2005 was 13.1 °C, and the maximum recorded effluent temperature between 2019 and 2024 was 19.8°C. The EPA conducted a mass balance analysis using these values and calculated a final receiving water temperature of 11.4°C at the edge of the chronic mixing zone.

$$Cd = \frac{^{0}Ce + [\ Cu\ (\ Sa - 1\ )\ ]}{Sa} \quad \text{where}$$

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

Ce = Maximum projected effluent temperature, (19.8 °C)

Cu = Background receiving water temperature, °C (13.1 °C)

Sa = dilution factor (19)

Cd = 13.4°C

The temperature of the receiving water at the edge of the chronic mixing zone is 0.3°C greater than the ambient ocean temperature.

Based upon the above analysis, the proposed discharge is expected to comply with Alaska WQS for temperature at the boundary of the chronic mixing zone. Therefore, the permit does not contain a temperature effluent limit.

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 the Tongass Narrows 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%.

NTU Monitoring Data

The applicant provided 84 readings for turbidity in the receiving water at surface, mid, and bottom depths (bottom depth is 100 - 130 feet) between 2001 and 2005. Turbidity results were not provided in 2003 – the permittee

reported that the readings were not reliable. Average receiving water turbidity values adjacent to the ZID were 5.8, 5.1, and 5.2 NTU for surface, mid, and bottom depths respectively. Values at reference sites were 5.2, 5.1, and 5.1 NTU for surface, mid, and bottom depths respectively. The maximum observed value was a surface measurement of 15.8 NTU on April 10, 2001; however, this is believed to be a sampling or reporting error due to its isolated nature and large deviation from the average surface measurements (5.56 NTU). The next highest observed value is 6.8 NTU at both the surface and mid depth. Historically, ambient turbidity values at the ZID boundary are below 25 NTUs, and within 1.0 NTU of reference sites. The facility's TSS discharge is not expected to cause an excursion above Alaska's water quality criteria for turbidity.

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 (65 mg/L)

S_a = initial dilution (52:1)

Solving the above equation using the maximum allowable TSS concentration results in a 1.25 mg/L increase in suspended solids after initial dilution.

Secchi Disc Data

The 2001 permit did not require the collection of Secchi disc data within the receiving water. Since Secchi disc depth is part of Alaska's WQS for turbidity, the draft permit includes monitoring for Secchi disc depth in the receiving water monitoring requirements.

Summary

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

Zinc

The 2001 permit includes average monthly and maximum daily effluent limits for total zinc of 4,682 µg/L (281 lbs/day) and 9,384 µg/L (563 lbs/day), respectively. In preliminary discussions, ADEC has indicated it will authorize acute and chronic dilution factors of 11.8:1 and 19.7:1, respectively, for total zinc.

Based on the DMR data (2019-2024), Alaska WQS, and the mixing zones ADEC has proposed, the Ketchikan WWTP discharge has reasonable potential to cause or contribute to an excursion above the zinc water quality criterion for the protection of aquatic life. The facility does not have reasonable potential to exceed the human health criterion for total zinc.

Since there is reasonable potential to cause or contribute to an excursion above Alaska's WQS for total zinc, the EPA calculated the following WQBELs: an average monthly limit of 552 µg/L (18.4 lbs/day) and a maximum daily limit of 1107 µg/L (36.9 lbs/day). These limits are more stringent than the limits in the 2001 permit.

Sixty (60) monthly samples were taken between 2019 and 2024, effluent concentrations of total zinc ranged from a minimum of 1.0 µg/L to maximum of 95 µg/L, with an average of 34.1 µg/L. Based on this data, the EPA believes the facility will be able to meet the proposed limits. The draft permit maintains the monthly monitoring requirement from the 2001 permit. See Appendix C for reasonable potential calculations for zinc.

Other Pollutants of Concern

Several other pollutants were detected in the 2002 and 2005 priority pollutant scans at levels above the detection limit – including arsenic, lead, mercury, nickel, selenium, and silver. The available data from 2002 and 2005 is no longer representative of the current discharge and was not used in evaluating reasonable potential. Quarterly monitoring for arsenic, lead, mercury, nickel, selenium, and silver is required in the draft permit.

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 if the revision is consistent with the State's antidegradation policy. The EPA is not proposing any WQBELs with limits that are less stringent than the current permit; therefore an antibacksliding analysis is not necessary.

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 the 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 the 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
Ammonia	Increased effluent monitoring frequency from once per month for the 1st year of the permit to once per month while the permit remains in effect.	The prior permit required ammonia sampling for one year. The amount of ammonia currently being discharges from the facility is uncertain. The EPA is increasing the effluent monitoring requirement to provide adequate and representative data for evaluating compliance with Alaska WQS during permit renewal.
Arsenic	New effluent monitoring, quarterly	Arsenic was detected in priority pollutant results submitted with the permit

		application in 2005. Quarterly monitoring will provide data for evaluating compliance with Alaska WQS during permit renewal.
Biological Monitoring – Total Volatile Solids (TVS) Analysis	The 2001 permit requirement to sample and analyze sediment for total volatile solids has been removed from the draft permit.	See Section 8.G.3. of the 301(h) TDD.
Biological Monitoring – Benthic Survey	Observations of sunflower sea star must be included in the benthic survey in Permit Part I.E.	Section 7 of the Endangered Species Act (ESA). See Section VI.A. of this Fact Sheet.
Chemical Analysis and Source Identification	New effluent monitoring for 301(h) parameters, twice every five years.	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 Table 6 in Permit Part I.B.8, 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.
Chlorine	New effluent monitoring requirement, once per week when chlorine is used in the treatment process	Chlorine is a pollutant of concern at the Ketchikan WWTP and is used intermittently at the facility. Weekly monitoring will provide data for evaluating compliance with Alaska WQS during permit renewal.
Dissolved Oxygen	Increased monitoring frequency from once per month during the 1st, 3rd, and 4th year of the permit, to once per	The draft permit contains new DO limits. The increased monitoring frequency will support the new limits and provide data for evaluating compliance with Alaska WQS during permit renewal.

	week while the permit remains in effect.	
Enterococcus	New effluent monitoring requirement,	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. Weekly is necessary to ensure compliance with the limit and protection of Alaska WQS.
Lead	New effluent monitoring requirement, twice per year	Lead was detected in priority pollutant results submitted with the permit application in 2005. Quarterly monitoring will provide data for evaluating compliance with Alaska WQS.
Mercury	New effluent monitoring requirement, quarterly	Mercury was detected in priority pollutant results submitted with the permit application in 2005. Quarterly monitoring will provide data for evaluating compliance with Alaska WQS.
Nickel	New effluent monitoring requirement, twice per year	Nickel was detected in priority pollutant results submitted with the permit application in 2005. Quarterly monitoring will provide data for evaluating compliance with Alaska WQS.
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 of this Fact Sheet.
Receiving Water Monitoring – Reporting	The permittee must provide a copy of the receiving water monitoring report to the National Marine Fisheries Service	Section 7 of the ESA. See Section VI.A of this Fact Sheet.
Receiving Water Monitoring – Bacteria	Receiving water monitoring for bacteria can be discontinued after certain conditions are met	See Section IV.B.2 of this fact sheet.

Receiving Water Monitoring – Secchi Disk Depth	New requirement to include secchi disk depth as part of the receiving water monitoring requirements.	The 2001 permit did not require the collection of Secchi disc data within the receiving water. Since Secchi disc depth is part of Alaska's WQS for turbidity, the draft permit includes monitoring for Secchi disc depth in the receiving water monitoring requirements.
Selenium	New effluent monitoring requirement, twice per year	Selenium was detected in priority pollutant results submitted with the permit application in 2005. Quarterly monitoring will provide data for evaluating compliance with Alaska WQS.
Silver	New effluent monitoring requirement, twice per year	Silver was detected in priority pollutant results submitted with the permit application in 2005. Quarterly monitoring will provide data for evaluating compliance with Alaska WQS.
Temperature	Increase in effluent monitoring frequency from once per month to once per week.	40 CFR 122.41(j) and 122.48(b) requires effluent monitoring at a frequency sufficient to yield data which are representative of the discharge. More frequent temperature monitoring will provide more representative data to evaluate compliance with Alaska WQS during permit renewal.
Whole Effluent Toxicity (WET)	Increase in monitoring from twice per permit term to twice per year.	40 CFR 122.41(j) and 122.48(b) requires effluent monitoring at a frequency sufficient to yield data which are representative of the discharge. More frequent WET monitoring will provide representative data to evaluate compliance with Alaska WQS during permit renewal.
[1] Concentration/mass-loading limits only; compliance with 30% removal is still determined on monthly averaging basis.		

b. PFAS Monitoring

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 (EPA, 2019, 2022a).

The draft permit requires 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 (EPA, 1991).

The draft permit also requires that the permittee inventory the industrial users (IUs) of the treatment works, to identify IUs of the POTW that may discharge 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 (EPA, 2022b, 2024). The 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 any IUs identified as potential PFAS sources at least once during the following calendar year. These requirements are in addition to the pretreatment program requirements set forth in Part II.D.2 of the permit.

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. The EPA is authorized to require this monitoring and reporting by CWA section 308(a). The permit conditions reflect the 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 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.

The 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 locations around the boundary of the ZID. These additional sampling points will provide more complete information on dilution at the boundary of the ZID. In addition, receiving water monitoring for bacteria can be discontinued if the permittee achieves 12 consecutive months of compliance with the final bacteria limits and the following summer's receiving water sampling results demonstrate full compliance with Alaska's WQS for bacteria at all ZID Boundary (Permit Part I.D.2.b.) and Nearshore Sites (Permit Part I.D.2.d.).

The EPA has determined that once the facility is able to consistently achieve compliance with the final fecal coliform and enterococcus limits in the permit and has demonstrated ongoing compliance with Alaska WQS at the boundary of the ZID, continued sampling for bacteria in the receiving water is no longer warranted to satisfy the requirements of 40 CFR 125.62(a). By achieving compliance with the final fecal coliform and enterococcus limits the EPA expects that the facility will be able to meet Alaska's WQS for fecal coliform and enterococcus at the edge of the ZID after initial mixing. See Permit Part I.D.9. and I.D.10.

A detailed description of the receiving water monitoring program and sampling locations can be found in Section 8.G.2 of the 301(h) TDD and draft Permit Part I.D. A map of the sampling locations can be found in Appendix A of the draft permit. A summary is provided in Table 14. below.

Table 14. Draft Permit - Receiving Water Monitoring Requirements					
Parameter	**Units**	**Sample Type**	**Sample Depth**	**Frequency**	**Location**
Temperature	°C	Grab	Surface, every 5m to bottom	Annually (August or September)	ZID Station[1], ZID Boundary[2], Reference Sites[3]
Salinity	Ppt	Grab	Surface, every 5m to bottom	Annually (August or September)	ZID Station[1], ZID Boundary[2], Reference Sites[3]
Dissolved Oxygen	Mg/L	Grab	Surface, every 5m to bottom	Annually (August or September)	ZID Station[1], ZID Boundary[2], Reference Sites[3]
pH	Standard units	Grab	Surface, every 5m to bottom	Annually (August or September)	ZID Station[1], ZID Boundary[2], Reference Sites[3]
Oil and Grease[4]	Visual	Visual	Surface	Annually (August or September)	ZID Station[1], ZID Boundary[2]
Secchi Disk Depth	Feet	Visual	Per Method	Annually (August or September)	ZID Station[1], ZID Boundary[2], Reference Sites[3]
Turbidity	NTU	Grab	Surface, every 5m to bottom	Annually (August or September)	ZID Station[1], ZID Boundary[2], Reference Sites[3]
Fecal Coliform	#/100 mL	Grab	Surface (or just below)	Monthly[4,5] (May to August)	ZID Station[1], ZID Boundary[2], Reference Sites[3], Additional Sites[6]
Enterococcus	#/100mL	Grab	Surface (or just below)	Monthly[4] (May to August)	ZID Station[1], ZID Boundary[2], Reference Sites[3], Additional Sites[6]
Biological Monitoring for Benthic Infauna and Sediment Analysis	Per method	Grab	Per method	Once every 5 years[7]	ZID Station[1], ZID Boundary[2], Reference Sites[3]

(1) See Permit Part I.D.2.a.

(2) See Permit Part I.D.2.b.

(3) See Permit Part I.D.2.c.

(4) Observations must include the date, time, and whether there is presence of floating solids, visible foam or visible oily wastes which produce a sheen on the surface of the receiving water.

(5) Monitoring is required once a month in May, June, July, and August. Fecal Coliform and enterococcus sampling shall coincide with effluent sampling in Permit Part I.D.

(6) Receiving water monitoring for fecal coliform can be discontinued if the permittee achieves 12 consecutive months of compliance with the final fecal coliform limits. In the event of any violation of the final fecal coliform limits, the permittee must restart the receiving water monitoring for fecal coliform until 12 consecutive months of compliance is achieved.

(7) See Permit Part I.D.2.d.

(8) 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

The 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 using standardized testing protocols and surrogate species. 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. TUa = 100/LC50; the lethal concentration, 50 Percent (LC50) is the toxic or effluent concentration that would cause death in 50 percent of the test organisms over a specified period of time. TUc = 100/NOEC for the survival endpoint and $100/IC_{25}$ for non-quantal endpoints such as growth. The No Observed Effect Concentration (NOEC) is the highest concentration of toxicant to which organisms are exposed in a short-term chronic test that causes no observable adverse effects on the test organisms. The Inhibition Concentration, 25%, (IC_{25}) is a point estimate of the toxic or effluent concentration that would cause a 25-percent reduction in a non-lethal biological measurement. 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 ADEC 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 Ketchikan WWTP conducted WET tests in 2001 and 2005 pursuant to the terms of the 2001 permit. No toxicity was observed at the highest concentrations tested. With few data points collected many 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 19.7 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

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 within the ZID, at a reference location, and within 5 m beyond the ZID boundary.

The 2001 Permit required one biological monitoring survey consisting of a benthic survey and a sediment analysis for TVS, both of which were completed in 2005. The results of the survey do not indicate that the Ketchikan discharge is causing significant changes in the benthic community structure or TVS concentrations in the sediment.

To continue to monitor the effect of the discharge on the surrounding benthic community, the biological monitoring program from the 2001 permit is being largely retained in the draft permit, with the exception of TVS sampling, which is being removed. For additional information on the removal of TVS sampling from the biological monitoring program in the draft permit please refer to Section 8.G.3 of the 301(h) TDD.

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. The EPA has authority under the CWA to issue separate sludge-only permits for the purposes of regulating biosolids. The 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 C, and Permit Part I.B.8 – Table 6, 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.

Pursuant to 40 CFR 125.66(b), unless required by the State of Alaska, the requirements of Permit Parts II.D.1.a. and II.D.1.b. shall not apply if the Permittee certifies that there are no known or suspected sources of toxic pollutants or pesticides and documents the certification with an industrial user survey as described by 40 CFR 403.8(f)(2).

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 or pesticides to develop and implement an approved pretreatment program in accordance with 40 CFR Part 403. Pursuant to 40 CFR 125.66(c)(2), this requirement does not apply to applicants that certify they have no known or suspected industrial sources of toxic pollutants or pesticides. The City of Ketchikan has certified that there are no known or suspected industrial sources of toxic pollutants or pesticides in their discharge.

3. Non-Industrial Source Control Program

The 301(h) regulations at 40 CFR 125.66(d) require applicants 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 an 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 and maintained 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 facility 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 2019-2024, effective until the end of the compliance schedule when final limits for fecal coliform become effective.
- Monitoring and final limits for enterococcus; final limits become effective at the end of the compliance schedule.
- A compliance schedule that allows five years for the facility to comply with the new final effluent limits and includes interim milestones as set forth in Permit Part II.C.

ADEC authorizes compliance schedules in its 401 certification. The draft 401 certification includes a five-year compliance schedule for enterococcus and fecal coliform which has been incorporated into the draft permit. The 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 Ketchikan 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 the EPA and the ADEC upon request.

E. OPERATION AND MAINTENANCE PLAN

The permit requires the Ketchikan 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 the 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 the EPA of an SSO within 24 hours of the time the permittee becomes aware of the overflow. (See 40 CFR 122.41(l)(6))

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

Third Party Notice – The permit requires that the permittee establish a process to notify specified third parties of SSOs that may endanger health due to a likelihood of human exposure; or unanticipated bypass and upset that exceeds any effluent limitation in the permit or that may endanger health due to a likelihood of human exposure. The permittee is required to develop, in consultation with appropriate authorities at the local, county, tribal and/or state level, a plan that describes how, under various overflow (and unanticipated bypass and upset) scenarios, the public, as well as other entities, would be notified of overflows that may endanger health. The

plan should identify all overflows that would be reported and to whom, and the specific information that would be reported. The plan should include a description of lines of communication and the identities of responsible officials. (See 40 CFR 122.41(l)(6)).

Record Keeping – The permittee is required to keep records of SSOs. The permittee must retain the reports submitted to the 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 the 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. 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 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.

Pursuant to ESA Section 7, on August 30, 2024, the EPA requested concurrence from the NMFS that renewal of the 301(h)-modified NPDES permit to the Ketchikan WWTP is not likely to adversely affect the following threatened, endangered, or candidate species or their designated critical habitats:

- Western Distinct Population Segment (Western DPS or WDPS) Steller sea lions
- Mexico DPS humpback whales

o Sunflower sea star

On October 15, 2024, the NMFS concurred with EPA's determination that renewal of AK0021440 is not likely to adversely affect any ESA-listed species or designated critical habits under their jurisdiction. The NMFS provided the following mitigation measures and conservation recommendations, which have been incorporated into the draft permit as specified:

General Mitigation Measures

1. The project proponent will provide NMFS with annual water temperature and water quality reports from each of the six POTWs in Southeast Alaska (email information to akr.prd.records@noaa.gov).

[See Permit Part I.D.8.b]

2. The project proponent will provide NMFS a report of sunflower sea star sighting and density data collected during benthic surveys around each outfall and reference site once during the 5-year permit period. This report also will include the date, water depth of each survey, and water quality.

[See Permit Part I.E.5 and I.E.6.]

Sunflower Sea Star Advisory Conservation Recommendations

3. If it appears that a sunflower sea star has sea star wasting syndrome or if any dead sunflower sea stars are observed, pictures of the individuals will be taken and infected individuals will be counted. The infected sunflower sea stars will not be touched or relocated. These and all sunflower sea star survey findings will be reported to NMFS, including latitude/longitude and transect line, at akr.prd.records@noaa.gov.

[See Permit Part I.E.5.]

No ESA-listed species or designated critical habitat under the jurisdiction of USFWS were identified.

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 the 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.

The EPA has prepared an EFH assessment which analyzes the impacts of the discharge on EFH and has concluded the permit will not adversely affect EFH.

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.

The EPA had preliminary discussions with ADEC regarding its CWA Section 401 certification during development of the draft permit. On February 13, 2025, EPA sent ADEC a pre-filing certification meeting request. A prefiling meeting was held between the EPA and ADEC on March 6, 2025, and a draft certification was provided on March 10, 2025. The EPA will request final 401 certification from ADEC with the public notice of this draft permit. The 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

ADEC. 2023. *18 AAC 70, Water Quality Standards, As Amended Through November 13, 2022.* Approved by the EPA in 2023. https://www.epa.gov/wqs-tech/water-quality-standards-regulations-alaska.

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ADEC. 2020. In*tegrated Water Quality Monitoring and Assessment Report*.

Aquatic Restoration and Research Institute, 2022. *Water Quality Measures in Alaska's Ports and Shipping Lanes: 2021 Annual Report*. Prepared for ADEC. January 2022.

EPA. 1985. *NPDES Self-Monitoring System User Guide*. US Environmental Protection Agency, Office of Water, EPA-833-B-85-100.

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

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EPA, 2022b. *Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs.* US Environmental Protection Agency, Office of Water, December 5, 2022. Available at:

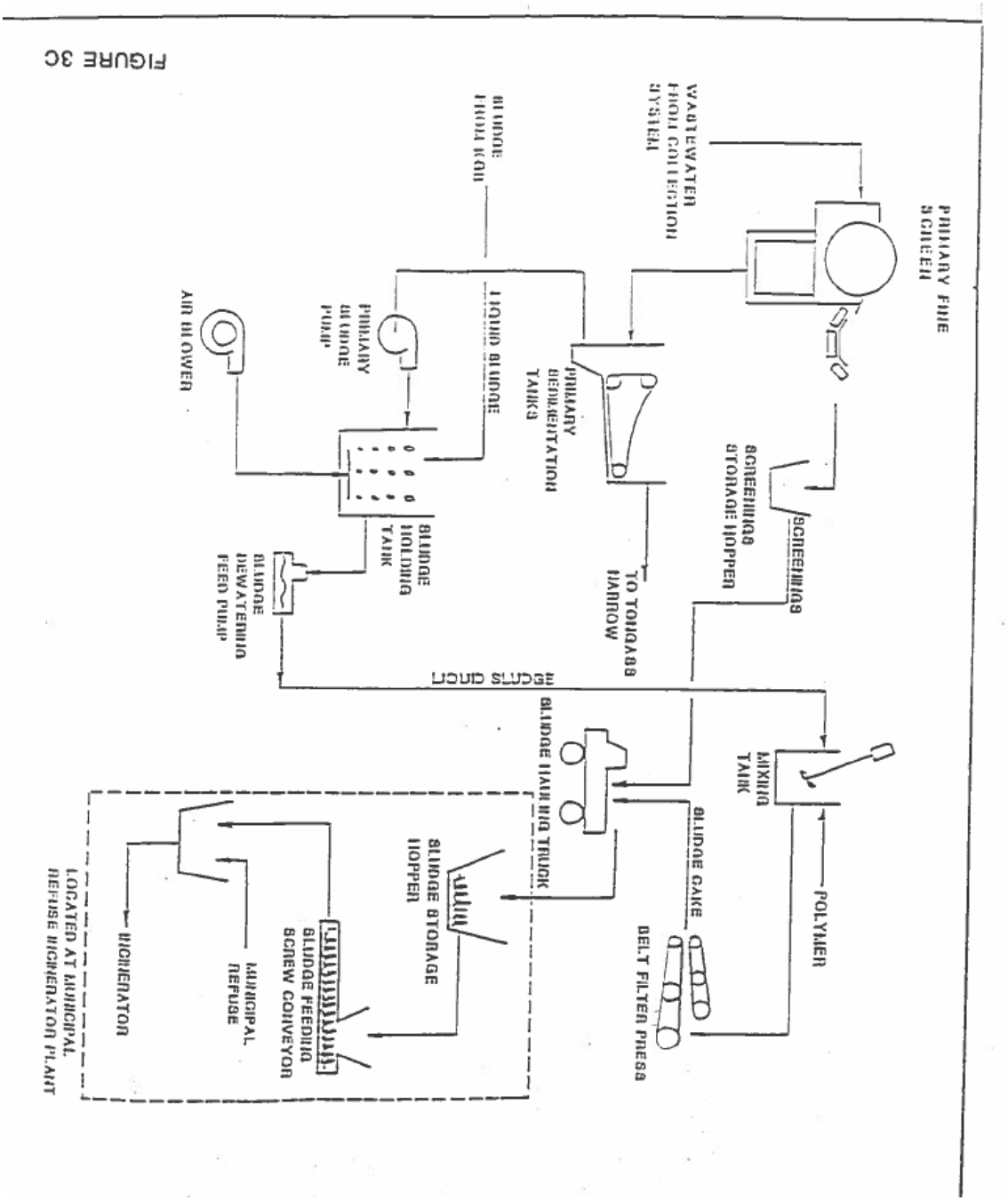
https://www.epa.gov/system/files/documents/2022-12/NPDES_PFAS_State%20Memo_December_2022.pdf.

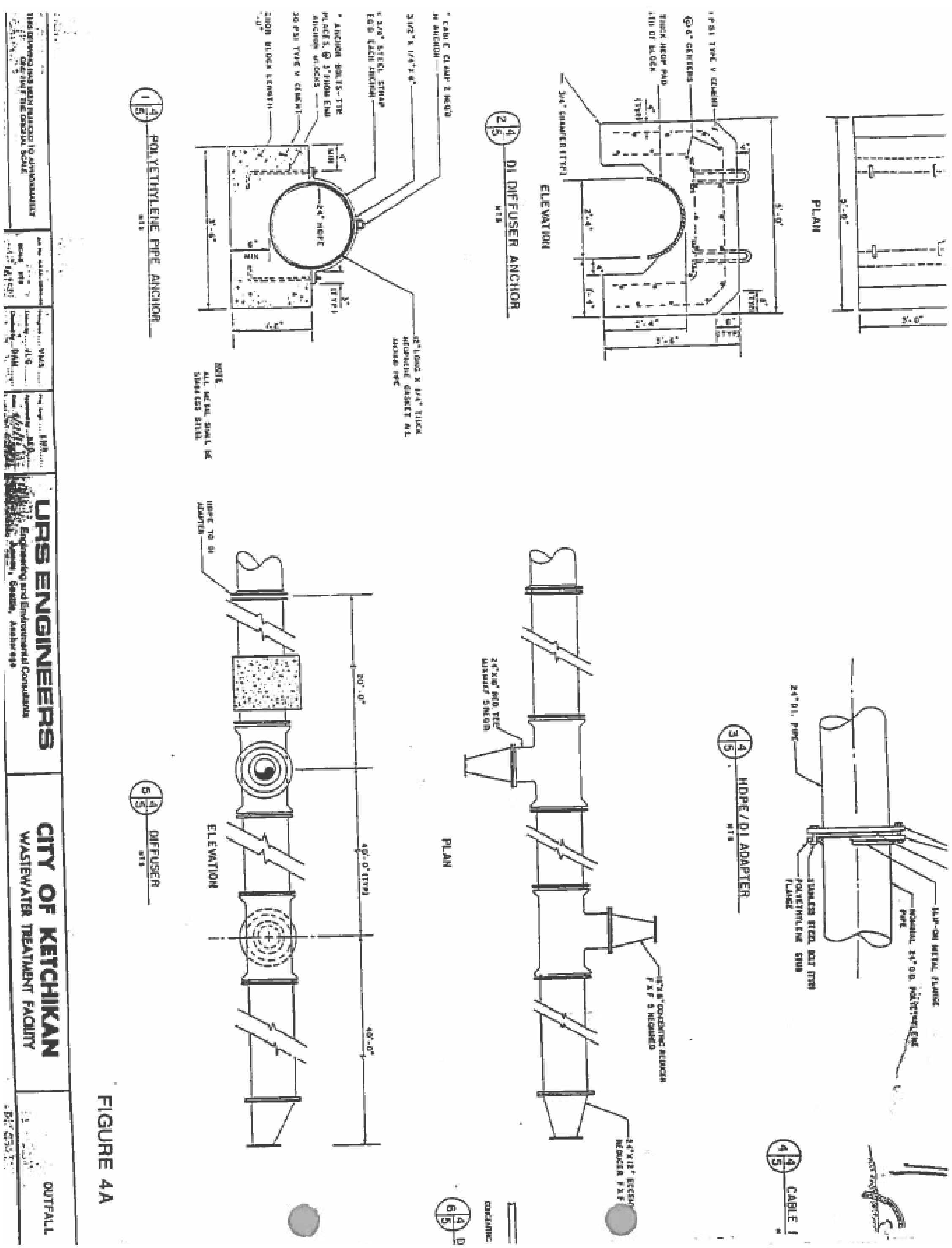
EPA, 2024. A spreadsheet listing industries that may discharge PFAS, including Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS) codes, and a spreadsheet listing Superfund sites with PFAS detections, are available on EPA's website at: https://echo.epa.gov/tools/data-downloads/national-pfas-datasets#about.

Executive Order 13175, 2000. Consultation and Coordination with Indian Tribal Government, November 2000.

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

Appendix A. Facility Maps and Schematics





POLYETHYLENE PIPE ANCHOR
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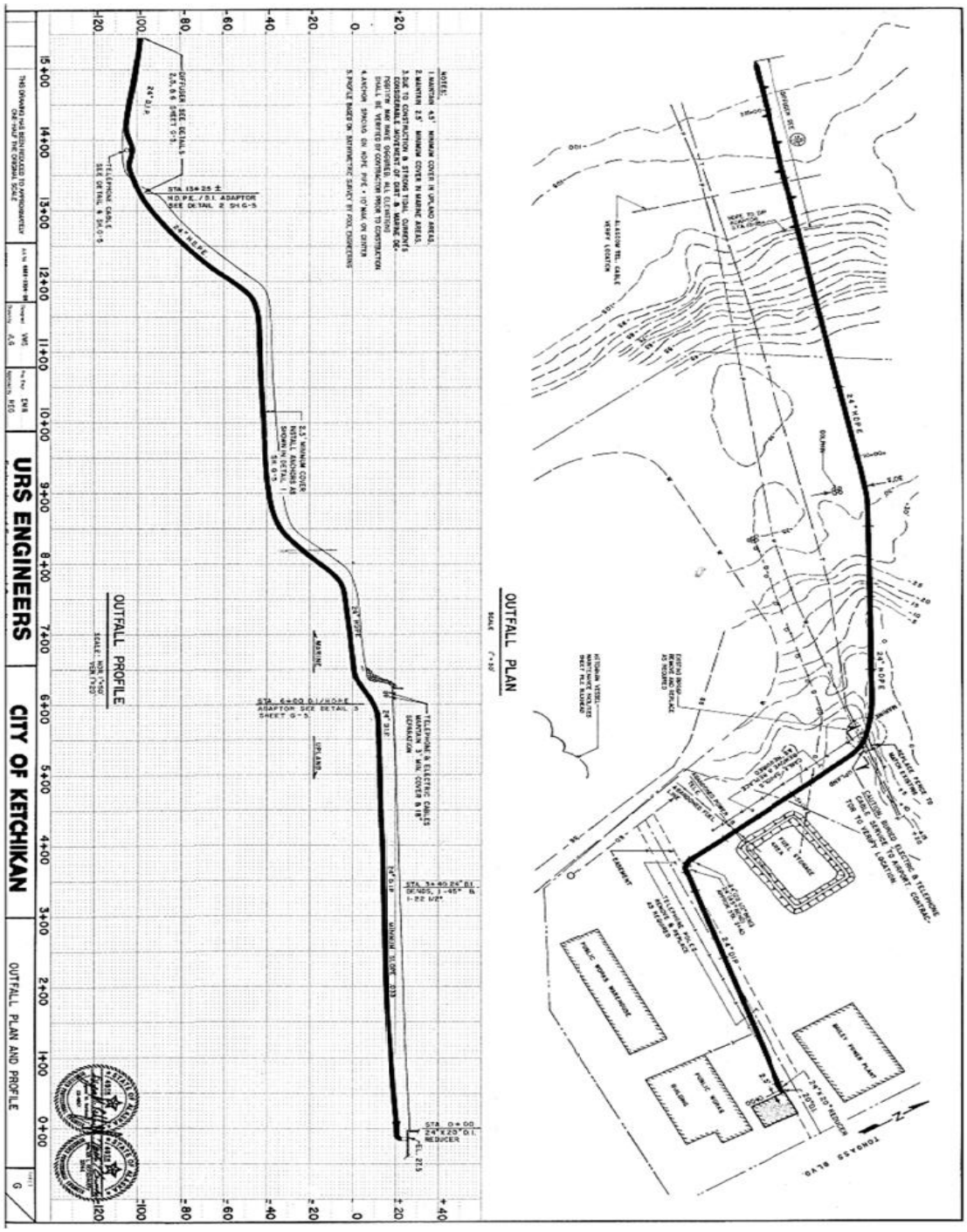
CITY OF KETCHIKAN
WASTEWATER TREATMENT FACILITY
OUTFALL
FIGURE 4A


OUTFALL PLAN
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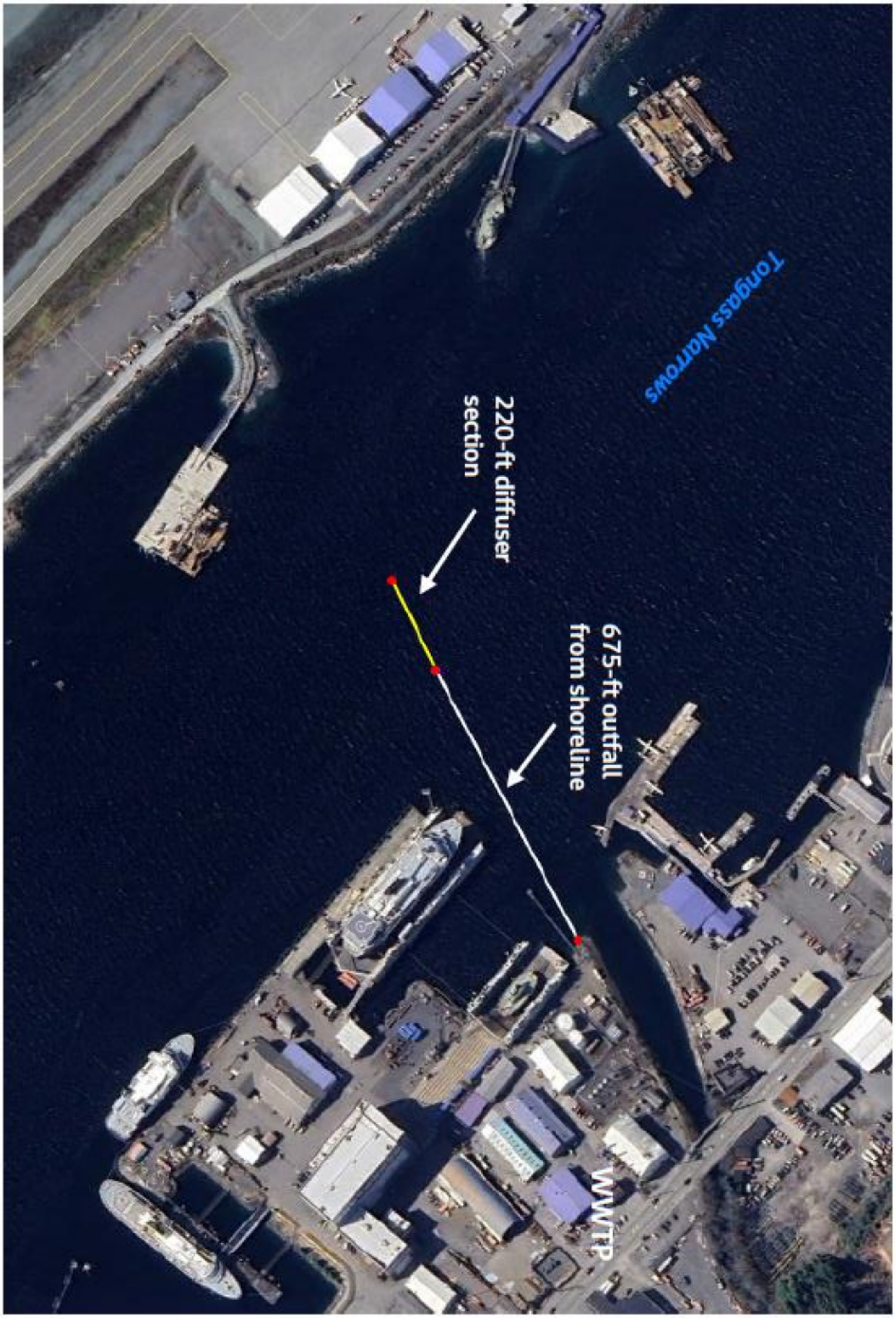
CITY OF KETCHIKAN
OUTFALL PLAN AND PROFILE


Tongass Narrows
220-ft diffuser section
675-ft outfall from shoreline
WWTP

Appendix B. Treatment Plant Effluent Data

Parameter	Flow (mgd)		BOD5, 20 deg. C (mg/L)	BOD5, 20 deg. C (mg/L)	BOD5 20 deg. C (lbs/day)	BOD5 (% removal)
Statistical Basis	DAILY MAX	MONTHLY AVE	INFLUENT (MO. AVE)	EFFLUENT (MO. AVE)	EFFLUENT (MO. AVE)	Min % Removal
4/30/2019	3.11	1.67	135	98	1405	27
5/31/2019	1.85	1.48	205	105	1249	48
6/30/2019	3.29	1.74	245	115	1524	50
7/31/2019	2.20	1.67	211	109	1620	47
8/31/2019	3.40	1.83	202	119	1872	40
9/30/2019	3.39	1.83	192	110	1486	43
10/31/2019	3.32	1.90	127	75	1081	37
11/30/2019	3.63	2.06	153	75	1314	48
12/31/2019	2.85	1.91	119	76	1155	36
1/31/2020	3.14	1.93	122	83	1367	33
2/29/2020	3.16	1.86	108	61	1017	43
3/31/2020	2.87	1.62	148	102	1369	31
4/30/2020	2.34	1.50	156	86	1051	40
5/31/2020	2.15	1.53	187	101	1275	46
6/30/2020	3.18	1.78	172	93	1559	46
7/31/2020	2.78	1.77	170	88	1150	45
8/31/2020	3.49	2.16	134	71	1191	46
9/30/2020	2.91	1.71	185	109	1430	40
10/31/2020	3.18	1.53	205	110	1326	44
11/30/2020	5.67	2.11	119	77	1272	35
12/31/2020	3.57	2.07	131	63	1086	49
1/31/2021	2.94	1.77	133	85	1387	35
2/28/2021	2.79	2.16	135	77	1261	43
3/31/2021	2.82	1.71	131	77	1163	39
4/30/2021	3.94	1.53	133	79	1361	37
5/31/2021	2.80	2.11	174	90	1231	48
6/30/2021	2.43	2.07	161	89	1341	43
7/31/2021	2.19	1.72	196	94	1312	52
8/31/2021	3.86	1.80	173	93	1265	45
9/30/2021	4.92	2.09	139	80	1644	42
10/31/2021	2.76	2.76	151	89	1505	41
11/30/2021	3.56	2.02	127	75	1363	41
12/31/2021	2.80	1.94	126	74	1189	41
1/31/2022	4.92	2.31	148	92	1607	36
2/28/2022	4.23	1.98	128	80	1410	37
3/31/2022	2.76	1.79	161	86	1222	44
4/30/2022	2.25	1.61	178	105	1238	41
5/31/2022	2.52	1.62	180	101	1232	44
6/30/2022	2.41	2.41	166	90	1358	44
7/31/2022	2.98	1.98	184	93	1367	46
8/31/2022	3.28	2.06	182	90	1381	50
9/30/2022	3.58	2.11	141	80	1277	41
10/31/2022	3.45	2.08	122	53	863	53
11/30/2022	2.94	1.84	131	83	1390	36
12/31/2022	2.92	1.86	132	77	1138	41
1/31/2023	3.39	1.94	122	75	1364	37
2/28/2023	3.17	1.94	112	74	1193	34
3/31/2023	2.15	1.52	145	86	1153	41
4/30/2023	2.66	1.66	163	88	1400	44
5/31/2023	2.26	1.66	203	92	1279	54
6/30/2023	2.35	1.86	199	100	1650	50
7/31/2023	2.31	1.94	199	95	1507	52
8/31/2023	2.96	1.85	180	101	1497	43
9/30/2023	3.22	2.01	140	89	1545	36
10/31/2023	4.10	1.85	197	95	1229	50
11/30/2023	3.56	1.97	143	83	1617	41
12/31/2023	2.94		123	82	1196	33
1/31/2024	3.00		151	89	1413	40
2/29/2024	2.24		166	90	1228	42
Average	3.08	1.88	157.64	88.08	1331.78	42.22
Maximum	5.67	2.76	245.00	119.00	1872.00	54.00
Minimum	1.85	1.48	108.00	53.00	863.00	27.00
Count	59.00	56.00	59.00	59.00	59.00	59.00
Std Dev	0.72	0.24	31.05	13.37	181.27	5.49
CV	0.23	0.13	0.20	0.15	0.14	0.13
99th Percntile	5.23	2.57	225.28	116.68	1743.24	53.42
95th Percentile	4.92	2.33	205.00	110.00	1644.00	52.00
5th Percentile	2.15	1.52	119.00	63.00	1051.00	33.00

Parameter	TSS (mg/L)	TSS (mg/L)	TSS (lbs/day)	TSS (% removal)	Fecal coliform, MPN, 44.5 C (# x 10^6/100mL)	Fecal coliform, MPN, 44.5 C (# x 10^6/100mL)	Fecal coliform, MPN, 44.5 C (# x 10^6/100mL)
Statistical Basis	INFLUENT (MO. AVE)	EFFLUENT (MO. AVE)	EFFLUENT (MO. AVE)	Min % Removal	DAILY MAX	WEEKLY GEO	MO. GEO
30/2019	115	39	558	67	1.04	1.04	0.342
31/2019	210	48	694	72	0.95	0.95	0.705
30/2019	212	47	625	75	0.835	0.835	0.584
31/2019	243	52	785	76	1.15	1.15	0.672
31/2019	181	53	781	70	0.825	0.825	0.573
30/2019	175	57	764	67	1.18	1.14	0.709
/31/2019	134	47	669	62	0.865	0.865	0.484
/30/2019	157	39	707	72	0.56	0.56	0.252
/31/2019	115	39	600	65	0.26	0.26	0.16
31/2020	130	47	809	64	0.33	0.33	0.12
29/2020	97	34	554	65	0.37	0.37	0.14
31/2020	139	34	782	58	0.13	0.13	0.084
30/2020	164	41	522	69	0.3	0.3	0.0441
31/2020	181	50	630	72	0.57	0.57	0.232
30/2020	166	48	810	71	0.855	0.855	0.394
31/2020	185	48	624	73	0.955	0.955	0.806
31/2020	130	36	605	69	0.74	0.74	0.508
30/2020	204	58	766	71	0.56	0.56	0.16
/31/2020	228	59	718	72	0.63	0.63	0.192
/30/2020	134	44	738	67	0.053	0.053	0.0079
/31/2020	160	38	651	73	0.039	0.039	0.0166
31/2021	146	44	757	67	0.0125	0.0125	0.0024
28/2021	127	39	629	70	0.0074	0.0074	0.00028
31/2021	130	39	578	70	0.0024	0.0024	0.000172
30/2021	129	42	766	63	0.008	0.008	0.000298
31/2021	158	41	602	74	0.0016	0.0016	0.00001
30/2021	166	57	848	64	0.28	0.28	0.0594
31/2021	184	52	732	71	0.353	0.353	0.11
31/2021	150	52	704	65	0.67	0.067	0.344
30/2021	133	52	1090	61	0.49	0.49	0.214
/31/2021	178	55	962	67	0.38	0.38	0.0243
/30/2021	122	42	776	67	0.087	0.087	0.0293
/31/2021	111	31	509	71	0.0015	0.0015	0.0000278
31/2022	129	32	561	71	0.168	0.168	0.042
28/2022	121	34	679	72	0.037	0.037	0.021
31/2022	165	39	556	74	0.099	0.099	0.029
30/2022	164	42	494	74	0.37	0.37	0.057
31/2022	169	51	631	70	0.57	0.57	0.185
30/2022	142	41	622	68	0.625	0.625	0.0484
31/2022	202	49	741	72	0.54	0.54	0.289
31/2022	169	43	688	74	1.2	1.2	0.573
30/2022	126	43	695	64	0.59	0.59	0.443
/31/2022	116	28	465	73	0.42	0.42	0.371
/30/2022	115	36	614	68	0.26	0.26	0.0888
/31/2022	127	33	488	73	0.131	0.131	0.00998
31/2023	143	33	605	72	0.425	0.425	0.141
28/2023	114	35	577	65	0.31	0.31	0.139
31/2023	173	43	572	75	0.31	0.31	0.139
30/2023	179	46	733	72	0.52	0.52	0.412
31/2023	200	42	575	79	1.19	1.1	0.346
30/2023	214	47	777	77	0.46	0.46	0.387
31/2023	224	43	681	80	1.12	1.12	0.858
31/2023	168	40	599	76	1.3	1.04	0.823
30/2023	117	33	610	72	0.95	0.95	0.243
/31/2023	188	28	364	80	1.46	1.16	0.418
/30/2023	118	31	570	73	0.875	0.875	0.146
/31/2023	109	36	536	66	0.95	0.95	0.123
31/2024	154	35	578	75	0.51	0.51	0.154
29/2024	181	42	563	74	0.39	0.39	0.116
verage	156.29	42.53	659.64	70.32	0.53	0.51	0.25
aximum	243.00	59.00	1090.00	80.00	1.46	1.20	0.86
inimum	97.00	28.00	364.00	58.00	0.0015	0.0015	0.00001
Count	59.00	59.00	59.00	59.00	59.00	59.00	59.00
td Dev	34.62	7.88	122.73	4.69	0.39	0.37	0.24
CV	0.22	0.19	0.19	0.07	0.73	0.73	0.98
Percntile	234.30	58.42	1015.76	80.00	1.37	1.18	0.84
Percentile	224.00	57.00	848.00	79.00	1.20	1.15	0.81
Percentile	111.00	31.00	488.00	62.00	0.00	0.00	0.00

Parameter	D.O. (mg/L)	pH (S.U.)		Copper (µg/L) total recoverable	Copper (lbs/day) total recoverable	Zinc (µg/L) total recoverable	Zinc (lbs/day) total recoverable	Temp (C)
Statistical Basis	MONTHLY MIN	MAX	MIN	DAILY MAX/ MONTHLY AVE	DAILY MAX/ MONTHLY AVE	DAILY MAX/ MONTHLY AVE	DAILY MAX/ MONTHLY AVE	MO MAX
				29.2		39.7		
4/30/2019	7.26	7.58	7.16	37	0.44			12.5
5/31/2019	3.08	7.38	6.99	51.4	0.57	38	0.42	15
6/30/2019	1.58	7.29	6.9	25.9	0.31	28.4	0.34	17
7/31/2019	2.83	7.59	6.77	30	0.47	44.9	0.7	18.8
8/31/2019	2.27	7.3	7	33.5	0.46	37	0.51	19.4
9/30/2019	3.97	7.25	6.99	50.2	0.57	1	0.01	19.4
10/31/2019	7.08	7.42	7.06	32.7	0.4	37.9	0.47	16.5
11/30/2019	5.47	7.58	7.11	37.9	0.85	25.1	0.56	13.6
12/31/2019	9.5	7.44	7.12	44.7	0.53	28	0.33	11
1/31/2020	7.32	7.51	7.16	36	0.41	18.9	0.21	9.6
2/29/2020	10.51	7.4	7.21	40.9	0.53	40.7	0.53	9.4
3/31/2020	9.12	7.7	7.04	48.9	0.93	42.7	0.81	10.2
4/30/2020	7.75	7.56	7.18	37.1	0.45	25.8	0.31	11.4
5/31/2020	6.45	7.37	6.97	46.7	0.68	38.5	0.56	13.6
6/30/2020	4.21	7.42	6.92	44.9	0.74	41	0.68	14.9
7/31/2020	4.18	7.15	6.87	35.8	0.46	48	0.62	17
8/31/2020	4.48	7.13	6.94	40.1	0.59	23.9	0.035	16.5
9/30/2020	5.92	7.1	6.77	32.9	0.45	41.9	0.57	16.4
10/31/2020	4.42	7.35	6.89	37	0.47	41	0.52	14.7
11/30/2020	7.94	7.2	6.98	33.7	0.46			11.7
12/31/2020	9.1	7.36	7.04	25.7	0.53	85.8	1.76	10.5
1/31/2021	9.63	7.45	7.1	20	0.27	1	0.001	9.5
2/28/2021	8.68	7.45	7.11	24.5	0.39	21.3	0.34	8.6
3/31/2021	10.78	7.85	7.09	33.1	0.47	17.2	0.25	11.2
4/30/2021	9.8	7.43	7.17		4.16	27.7	0.43	11
5/31/2021	8.74	7.45	7.18	24.2	0.29	18	0.22	12.2
6/30/2021	6.51	7.21	6.76	40	0.81	34.8	0.71	16.2
7/31/2021	2.94	7.28	6.83	36.2	0.51	44.1	0.63	17.5
8/31/2021	2.24	7.19	6.82	54.2	0.93	45	0.078	17.6
9/30/2021	3.61	7.24	6.91	34.5	0.63	53.3	0.98	16.6
10/31/2021	6.1	7.26	7	29.1	0.67	95	2.19	13.4
11/30/2021	8.23	7.22	7.02	24.4	0.51	12.5	0.26	12
12/31/2021	9.07	7.33	6.92	16.9	0.28	14.1	0.24	9.8
1/31/2022	9.81	7.46	6.95	23.9	0.39	21.7	0.36	8.2
2/28/2022	10.07	7.41	6.89	17.2	0.61	26.8	0.95	9.1
3/31/2022	8.45	7.63	6.99	40.1	0.56	1	0.01	9.6
4/30/2022	8.18	7.92	7.13	24.3	0.29	48	0.57	11
5/31/2022	5.59	7.37	7.17	25.2	0.27	38.5	0.42	14.2
6/30/2022	6.1	7.32	7.04	9.6	0.11			15.9
7/31/2022	3.25	7.38	6.98	21.4	0.3	43.6	0.62	17.7
8/31/2022	2.6	7.58	6.85	14.3	0.2			19.8
9/30/2022	4.28	7.35	6.94	33.2	0.49	56	0.83	18
10/31/2022	6.17	7.26	7	15.2	0.22	12.2	0.18	15.5
11/30/2022	7.76	7.62	7.18	20.2	0.3	39.5	0.58	12
12/31/2022	9.65	7.36	7.14	16.8	0.28	24.4	0.41	9.3
1/31/2023	7.45	7.26	7	20.9	0.3	34.8	0.5	9.6
2/28/2023	9.75	7.37	6.97	23.8	0.63	25.1	0.66	9.5
3/31/2023	9.39	7.4	7.14	21.4	0.25	31.8	0.38	9.5
4/30/2023	7.95	7.34	7.02	33.8	0.75	34.7	0.77	10.5
5/31/2023	1.02	7.59	7.05	22.1	0.28	48.2	0.61	13.8
6/30/2023	4.05	7.15	6.91	16.8	0.3	33	0.59	15.2
7/31/2023	2.81	7.07	6.78	10.6	0.16	18.7	0.28	18.5
8/31/2023	2.79	7.14	6.84	27.1	0.39	61.9	0.88	19.3
9/30/2023	4.69	7.18	6.77	19.3	0.28	51.8	0.76	17.9
10/31/2023	5.96	7.19	6.96	28.1	0.37	37.8	0.5	14.8
11/30/2023	7.52	7.14	6.99	15.4	0.21	31.7	0.43	12.2
12/31/2023	9.03	7.7	6.98	20.4	0.27	26.5	0.35	11.5
1/31/2024	8.88	7.22	6.97	31	0.42	41.9	0.56	11.5
2/29/2024	8.59	7.87	7.02	22.9	0.43	11	0.21	9.9
Average	6.48	7.39	6.99	29.57	0.51	34.06	0.52	13.54
Maximum	10.78	7.92	7.21	54.20	4.16	95.00	2.19	19.80
Minimum	1.02	7.07	6.76	9.60	0.11	1.0000	0.0010	8.20
Count	59.00	59.00	59.00	58.00	59.00	55.00	55.00	59.00
Std Dev	2.70	0.19	0.12	10.75	0.52	17.71	0.37	3.45
CV	0.42	0.03	0.02	0.36	1.02	0.52	0.71	0.25
99th Percntile	10.62	7.89	7.19	52.60	2.29	90.03	1.96	19.57
95th Percentile	10.07	7.85	7.18	50.26	0.93	66.68	1.14	19.40
5th Percentile	2.24	7.13	6.77	14.12	0.20	1.00	0.01	9.10

Chlorine Effluent Data (2019-2023)	
N=	1183
MAX (ug/L)	100
MIN	0
AVE	4.489796
95th	50
STDEV	0.017488
CV	0.002687

Appendix C. Receiving Water Data

Table 15. Receiving Water Data Collected by Permittee, 2001-2005							
AREA OF SAMPLE	DATE	TEMP	DO mg/l	SALINITY ppt	pH	DEPTH Meters	TURBIDITY NTU
WQA1	10-Apr-01	6.38	9.22	33.14	7.62	0.9	6.4
WQA1	10-Apr-01	6.33	9.21	33.35	7.88	20	6.8
WQA1	10-Apr-01	6.32	9.01	33.44	7.85	41	6.4
WQA2	10-Apr-01	6.73	9.27	33.05	8.01	0.9	5.4
WQA2	10-Apr-01	6.39	8.87	33.25	7.99	23.2	5.9
WQA2	10-Apr-01	6.32	8.51	33.39	7.98	45.7	6.5
WQA3	10-Apr-01	6.43	9.54	33.15	7.96	1.1	5.4
WQA3	10-Apr-01	6.38	9.02	33.27	7.97	19.7	5.9
WQA3	10-Apr-01	6.35	9.04	33.46	7.97	38.1	8.7
WQA4	10-Apr-01	6.58	9.09	33.15	7.96	3.6	15.8
WQA4	10-Apr-01	6.33	8.82	33.34	7.97	17.1	6.3
WQA4	10-Apr-01	6.34	8.95	33.41	7.97	35.6	6.4
WQA1	23-Oct-01	8.92	8.5	36.8	7.74	Bottom	5.4
WQA1	23-Oct-01	9.85	7.4	39.45	7.74	Mid-Depth	5.5
WQA1	23-Oct-01	9.66	6.67	40.84	7.69	Surface	5.7
WQA2	23-Oct-01	8.99	7.88	36.84	7.78	Bottom	4.8
WQA2	23-Oct-01	9.74	7.23	39.79	7.77	Mid-Depth	5
WQA2	23-Oct-01	9.74	7.18	40.14	7.76	Surface	5.3
WQA3	23-Oct-01	9.01	8.25	36.94	7.76	Bottom	4.7
WQA3	23-Oct-01	9.82	7.32	39.71	7.76	Mid-Depth	5.6

WQA3	23-Oct-01	9.69	6.97	40.65	7.73	Surface	5.4
WQA4	23-Oct-01	8.92	8.01	36.8	7.77	Bottom	5
WQA4	23-Oct-01	9.34	7.49	37.6	7.77	Mid-Depth	5.1
WQA4	23-Oct-01	9.71	7.09	40.4	7.74	Surface	5.4
WQA1	31-Oct-03	10.26	7.19	30.59	7.61	32	NR
WQA1	31-Oct-03	10.17	7.56	29.42	7.63	16	NR
WQA1	31-Oct-03	8.62	8.37	24.95	7.62	3	NR
WQA2	31-Oct-03	10.29	6.37	29.55	7.61	31	NR
WQA2	31-Oct-03	10.86	6.9	28.52	7.67	15.5	NR
WQA2	31-Oct-03	11.55	8.18	25.45	7.79	3	NR
WQA3	31-Oct-03	10.21	7.24	29.98	7.66	41	NR
WQA3	31-Oct-03	10.11	7.37	29.26	7.67	20.5	NR
WQA3	31-Oct-03	8.7	8.23	25.12	7.66	3	NR
WQA4	31-Oct-03	10.23	7.24	30.28	7.67	37	NR
WQA4	31-Oct-03	10.18	7.28	29.92	7.68	19	NR
WQA4	31-Oct-03	8.8	8.15	24.7	7.68	3	NR
WQA1	9-Oct-03	10.03	5.9	30.02	7.56	32	NR
WQA1	9-Oct-03	10.92	7.12	28.21	7.66	16	NR
WQA1	9-Oct-03	11.47	7.97	25.81	7.76	3	NR
WQA2	9-Oct-03	10.29	6.37	29.55	7.61	31	NR
WQA2	9-Oct-03	10.86	6.9	28.52	7.67	15.5	NR
WQA2	9-Oct-03	11.55	8.18	25.45	7.79	3	NR
WQA3	9-Oct-03	10.28	6.3	29.63	7.56	41	NR
WQA3	9-Oct-03	10.44	6.47	29.31	7.58	20.5	NR

WQA3	9-Oct-03	11.51	7.97	25.56	7.73	3	NR
WQA4	9-Oct-03	10.57	6.66	29.07	7.54	37	NR
WQA4	9-Oct-03	11.4	7.9	26.24	7.66	19	NR
WQA4	9-Oct-03	11.53	8.05	25.65	7.7	3	NR
WQA1	7-Aug-03	7.58	5.07	32.47	7.44	32	NR
WQA1	7-Aug-03	8.9	5.42	31.6	7.52	16	NR
WQA1	7-Aug-03	14.66	8.52	27.65	7.95	3.05	NR
WQA2	7-Aug-03	8.58	5.26	31.84	7.5	31	NR
WQA2	7-Aug-03	9.22	5.59	31.42	7.54	15.5	NR
WQA2	7-Aug-03	15.36	8.88	27.22	8.01	3.05	NR
WQA3	7-Aug-03	8.46	5.27	31.92	7.49	41	NR
WQA3	7-Aug-03	11.14	6.48	30.1	7.68	20.5	NR
WQA3	7-Aug-03	14.5	8.6	27.68	7.94	3.05	NR
WQA4	7-Aug-03	8.16	5.24	32.07	7.43	37.5	NR
WQA4	7-Aug-03	10.74	6.22	30.35	7.62	19	NR
WQA4	7-Aug-03	14.87	8.49	27.37	7.93	3.05	NR
WQA1	10-Jul-03	8.38	6.51	31.67	7.64	32	NR
WQA1	10-Jul-03	11.45	8.21	29.35	7.92	16	NR
WQA1	10-Jul-03	13.53	8.77	27.13	8.05	3.05	NR
WQA2	10-Jul-03	9.07	6.82	31.2	7.73	31	NR
WQA2	10-Jul-03	10.23	7.56	30.31	7.83	15.5	NR
WQA2	10-Jul-03	13.49	8.77	27.1	8.06	3.05	NR
WQA3	10-Jul-03	9.89	7.37	30.58	7.78	41	NR
WQA3	10-Jul-03	13.11	8.46	27.58	8.00	20.5	NR

WQA3	10-Jul-03	13.79	8.87	26.92	8.05	3.05	NR
WQA4	10-Jul-03	9.67	7.19	30.75	7.72	37.5	NR
WQA4	10-Jul-03	11.16	7.86	29.52	7.83	19	NR
WQA4	10-Jul-03	13.8	8.76	26.81	8.03	3.05	NR
WQA1	19-Jun-03	9.97	8.02	30.64	7.89	Bottom	NR
WQA1	19-Jun-03	9.98	8.03	30.54	7.89	Mid-Depth	NR
WQA1	19-Jun-03	11.23	8.44	28.23	7.99	Surface	NR
WQA2	19-Jun-03	9.96	7.94	30.5	7.89	Bottom	NR
WQA2	19-Jun-03	10.14	7.95	30.15	7.9	Mid-Depth	NR
WQA2	19-Jun-03	11.64	8.79	26.92	8.04	Surface	NR
WQA3	19-Jun-03	9.96	8.05	30.54	7.86	Bottom	NR
WQA3	19-Jun-03	10.37	8.13	29.84	7.88	Mid-Depth	NR
WQA3	19-Jun-03	11.59	8.95	27.66	8.01	Surface	NR
WQA4	19-Jun-03	9.99	8.02	30.52	7.88	Bottom	NR
WQA4	19-Jun-03	10.3	7.98	29.87	7.89	Mid-Depth	NR
WQA4	19-Jun-03	11.55	8.94	27.67	8.02	Surface	NR
WQA1	15-May-03	8.12	9.55	31.05	7.95	Bottom	NR
WQA1	15-May-03	8.25	9.68	30.95	7.97	Mid-Depth	NR
WQA1	15-May-03	8.33	9.96	30.83	7.99	Surface	NR
WQA2	15-May-03	8.16	9.28	31.14	7.87	Bottom	NR
WQA2	15-May-03	8.22	9.66	31.04	7.89	Mid-Depth	NR

WQA2	15-May-03	8.18	9.52	31.07	7.92	Surface	NR
WQA3	15-May-03	8.18	9.48	31.09	7.94	Bottom	NR
WQA3	15-May-03	8.36	9.77	30.9	7.98	Mid-Depth	NR
WQA3	15-May-03	8.61	10.14	30.57	8.03	Surface	NR
WQA4	15-May-03	8.2	9.45	31.06	7.93	Bottom	NR
WQA4	15-May-03	8.44	9.87	30.79	7.98	Mid-Depth	NR
WQA4	15-May-03	8.63	10.1	30.55	8.01	Surface	NR
WQA1	17-Apr-03	6.87	9.35	31.47	7.79	Bottom	NR
WQA1	17-Apr-03	6.91	9.42	31.36	7.8	Mid-Depth	NR
WQA1	17-Apr-03	7.01	9.54	31.14	7.82	Surface	NR
WQA2	17-Apr-03	6.89	8.98	31.53	7.72	Bottom	NR
WQA2	17-Apr-03	6.91	9.35	31.27	7.75	Mid-Depth	NR
WQA2	17-Apr-03	7.07	9.65	31.06	7.79	Surface	NR
WQA3	17-Apr-03	6.86	9.12	31.55	7.77	Bottom	NR
WQA3	17-Apr-03	6.87	9.16	31.43	7.78	Mid-Depth	NR
WQA3	17-Apr-03	7.01	9.79	30.94	7.85	Surface	NR
WQA4	17-Apr-03	6.88	9.16	31.37	7.76	Bottom	NR
WQA4	17-Apr-03	6.9	9.32	31.26	7.78	Mid-Depth	NR
WQA4	17-Apr-03	7.01	9.82	31.05	7.82	Surface	NR
WQA1	27-Mar-03	6.36	7.36	48.52	7.72	37.79	NR

WQA1	27-Mar-03	6.32	7.43	48.17	7.72	18.9	NR
WQA1	27-Mar-03	6.35	7.75	45.61	7.72	3.05	NR
WQA2	27-Mar-03	6.36	7.23	48.3	7.68	41.76	NR
WQA2	27-Mar-03	6.37	7.58	47.14	7.68	21.33	NR
WQA2	27-Mar-03	6.38	7.9	44.83	7.7	3.05	NR
WQA3	27-Mar-03	6.35	7.41	48.43	7.71	32	NR
WQA3	27-Mar-03	6.36	7.5	47.88	7.7	15.85	NR
WQA3	27-Mar-03	6.34	7.85	44.95	7.72	3.05	NR
WQA4	27-Mar-03	6.35	7.45	48.41	7.71	30.48	NR
WQA4	27-Mar-03	6.36	7.52	47.73	7.7	15.24	NR
WQA4	27-Mar-03	6.35	7.87	45.02	7.71	3.05	NR
WQA1	31-Mar-04	6.33	8.64	31.98	7.78	39.08	3.8
WQA1	31-Mar-04	6.31	8.77	31.81	7.79	19.73	3.9
WQA1	31-Mar-04	6.34	9.25	30.39	7.81	0.69	3.8
WQA2	31-Mar-04	6.32	8.81	31.81	7.73	38.05	3.9
WQA2	31-Mar-04	6.31	9.04	31.35	7.75	18.37	4

WQA2	31-Mar-04	6.3	9.56	29.25	7.78	1.1	3.9
WQA3	31-Mar-04	6.32	8.67	31.9	7.77	30.36	3.9
WQA3	31-Mar-04	6.3	8.9	31.76	7.78	17.15	4
WQA3	31-Mar-04	6.3	9.16	30.79	7.79	0.78	3.9
WQA4	31-Mar-04	6.33	8.52	31.9	7.75	26.95	3.7
WQA4	31-Mar-04	6.3	8.87	31.71	7.76	13.04	3.9
WQA4	31-Mar-04	6.19	9.52	29.08	7.8	0.93	4
WQA1	29-Apr-04	6.65	8.06	32.61	7.66	31.7	6.5
WQA1	29-Apr-04	6.81	8.73	32.26	7.74	18.1	6.4
WQA1	29-Apr-04	8.44	10.91	29.02	8.07	0.82	6.7
WQA2	29-Apr-04	6.67	8.58	32.55	7.74	43.3	6.7
WQA2	29-Apr-04	7.2	9.07	31.93	7.87	18.2	6.6
WQA2	29-Apr-04	8.11	10.67	30.08	8.07	0.67	6.7
WQA3	29-Apr-04	6.64	8.24	32.69	7.7	32.7	6.3
WQA3	29-Apr-04	6.91	8.94	32.11	7.81	14.4	6.6
WQA3	29-Apr-04	8.42	11.09	29.3	8.1	0.67	6.7
WQA4	29-Apr-04	6.63	8.19	32.65	7.71	31.9	6.6
WQA4	29-Apr-04	7.11	9.23	31.77	7.88	15.6	6.6
WQA4	29-Apr-04	8.42	10.88	29.38	8.1	0.85	6.8
WQA1	15-Oct-04	10.83	7.44	30.16	7.83	43.4	3.1

WQA1	15-Oct-04	10.89	7.46	29.16	7.84	21.8	3.2
WQA1	15-Oct-04	11.08	8	26.09	7.78	1.4	3.9
WQA2	15-Oct-04	10.83	7.4	29.77	7.87	49.5	2.9
WQA2	15-Oct-04	10.94	7.79	27.59	7.89	25	3.2
WQA2	15-Oct-04	11.15	8.23	25.6	7.91	0.5	3.5
WQA3	15-Oct-04	10.8	7.23	30.34	7.84	36.9	2.9
WQA3	15-Oct-04	10.95	7.71	27.87	7.87	18.2	3.3
WQA3	15-Oct-04	11.12	8.13	25.82	7.89	1.3	3.4
WQA4	15-Oct-04	10.86	7.43	29.24	7.86	35.9	3
WQA4	15-Oct-04	10.97	7.89	26.9	7.88	16.7	2.9
WQA4	15-Oct-04	11.11	8.12	25.9	7.9	2.4	3.4
WQA1	17-Mar-05	6.30	8.94	32.43	7.79	34.0	4.50
WQA1	17-Mar-05	6.29	9.11	32.27	7.79	17.7	4.50
WQA1	17-Mar-05	5.94	10.93	29.81	8.01	1.0	5.20
WQA2	17-Mar-05	6.28	8.91	32.40	7.87	42.7	4.70
WQA2	17-Mar-05	6.28	8.81	31.97	7.87	20.9	4.50
WQA2	17-Mar-05	5.91	10.99	29.56	8.09	1.0	5.20
WQA3	17-Mar-05	6.29	9.05	32.47	7.85	32.1	4.50
WQA3	17-Mar-05	6.27	9.03	32.15	7.85	16.1	4.60

WQA3	17-Mar-05	6.00	10.63	30.05	8.04	0.9	5.10	
WQA4	17-Mar-05	6.28	9.01	32.34	7.86	30.0	4.60	
WQA4	17-Mar-05	6.28	8.81	31.97	7.86	14.8	4.40	
WQA4	17-Mar-05	5.95	10.73	29.83	8.07	1.0	5.00	
WQA1	21-Apr-05	6.87	9.44	32.35	7.76	40.0	6.02	
WQA1	21-Apr-05	6.91	9.49	32.16	7.79	20.1	5.97	
WQA1	21-Apr-05	7.38	10.03	30.38	7.85	0.9	5.93	
WQA2	21-Apr-05	6.83	9.27	32.22	7.85	42.6	5.97	
WQA2	21-Apr-05	6.87	9.36	32.00	7.85	22.3	5.72	
WQA2	21-Apr-05	7.44	10.01	29.98	7.94	1.2	5.97	
WQA3	21-Apr-05	6.90	9.46	32.20	7.81	36.3	6.02	
WQA3	21-Apr-05	6.93	9.53	31.97	7.82	18.9	5.97	
WQA3	21-Apr-05	7.40	10.05	30.15	7.90	0.8	5.93	
WQA4	21-Apr-05	6.87	9.42	32.22	7.83	29.0	6.02	
WQA4	21-Apr-05	6.89	9.52	31.91	7.84	14.7	5.97	
WQA4	21-Apr-05	7.45	10.00	30.07	7.92	0.6	5.97	
n		180	180	180	180	132	84	
MAX		15.36	11.09	45.61	8.10	37.00	15.80	Surface
		13.11	9.87	48.17	8.00	25.00	6.80	Mid
		10.86	9.55	48.52	7.98	49.50	8.70	Bottom
MIN		5.91	6.66	24.70	7.54	0.50	3.40	Surface
		6.27	5.42	26.24	7.52	13.04	2.90	Mid
		6.28	5.07	29.07	7.43	26.95	2.90	Bottom
AVE		9.19	9.01	30.62	7.88	2.74	5.56	Surface
		8.53	8.22	32.37	7.80	18.12	5.08	Mid
		8.89	7.53	32.09	7.74	36.27	5.96	Bottom

Table 16. Receiving Water Data Collected by the Permittee, Ammonia

Date	Ammonia-N mg/l
4/17/2003	0.42
5/15/2003	0.42
6/17/2003	0.69
7/10/2003	0.41
8/7/2003	ND
10/9/2003	0.41

Table 17. Ketchikan Sampling Results from 2021 ARRI Report

Site	PE01	PE02	PE03	PE04	PE05	PE06	Avg	Max
Ammonia-N (mg/L)	0.05	0.04	0.05	0.04	0.04	0.04	0.04	0.05
Cu, Total (ug/L)	0.41	0.38	0.38	0.40	0.40	0.46	0.41	0.46
Cu, Dissolved (ug/L)	0.45	0.45	0.37	0.36	0.36	0.49	0.41	0.49
Ni, Total (ug/L)	0.40	0.37	0.38	0.38	0.37	0.42	0.39	0.42
Ni, Dissolved (ug/L)	0.37	0.38	0.36	0.36	0.35	0.49	0.39	0.49
Zn, Total (ug/L)	0.83	0.37	0.40	0.39	0.42	1.04	0.58	1.04
Zn, Dissolved (ug/L)	1.59	0.63	0.46	0.42	0.40	2.09	0.93	2.09

Temperature (C)						
Depth (m)	**PE01**	**PE02**	**PE03**	**PE04**	**PE05**	**PE06**
1m	10.3	10.9	10.9	10.7	10.4	11.1
2n	10.2	10.7	10.5	10.4	10.3	10.2
3m	10.1	10.5	10.4	10.3	10.2	10.1
4m	10.1	10.6	10.4	10.3	10.2	10.2
Average	**10.2**	**10.7**	**10.6**	**10.4**	**10.3**	**10.4**

Salinity (ppt)						
Depth	**PE01**	**PE02**	**PE03**	**PE04**	**PE05**	**PE06**
1m	25.8	24.1	24.8	25	26.3	22.4
2n	26.1	25.3	26.3	26.3	26.4	25.4
3m	26.2	25.9	26.3	26.5	26.2	26.2
4m	26.3	25.7	26.3	26.5	26.6	26.1
Average	**26.1**	**25.3**	**25.9**	**26.1**	**26.4**	**25.0**

pH (s.u.)						
Depth (m)	**PE01**	**PE02**	**PE03**	**PE04**	**PE05**	**PE06**
1m	8.03	8.09	8.13	8.04	8.06	8.42
2n	8.06	8.10	8.10	8.05	8.07	8.16
3m	8.06	8.10	8.10	8.06	8.08	8.34
4m	7.98	8.12	8.09	8.15	8.36	8.31
Average	**8.03**	**8.10**	**8.11**	**8.08**	**8.14**	**8.31**

Dissolved Oxygen (mg/L)						
Depth (m)	**PE01**	**PE02**	**PE03**	**PE04**	**PE05**	**PE06**
1m	9.72	9.89	9.84	9.74	9.74	10.20
2n	9.80	9.98	9.90	9.77	26.40	10.15
3m	9.80	9.97	9.91	9.83	9.85	10.10
4m	9.79	9.77	9.94	9.84	9.88	10.23
Average	**9.78**	**9.90**	**9.90**	**9.80**	**13.97**	**10.17**

Appendix D. Reasonable Potential and WQBEL Formulae

The 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, the 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, the 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) the EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for each pollutant parameter has been calculated, the reasonable potential multiplier (RPM) used to derive the maximum projected effluent concentration (Ce) can be calculated using the following equations:

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

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

where,

p_n = the percentile represented by the highest reported concentration

n = the number of samples

confidence level = 99% = 0.99

and

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

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:

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

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, the 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 12. The criteria translator (CT) is equal to the conversion factor, because site-specific translators are not available for this discharge.

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

The next step is to compute the "long term average" concentrations which will be protective of the WLAs. This is done using the following equations from the 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 E. Reasonable Potential and WQBEL Calculations

Table 18. Reasonable Potential Analysis for Toxic Pollutants in the Effluent

Pollutants of Concern			AMMONIA, default: cold water,	CHLORINE (Total Residual)	COPPER - SEE Toxic	ZINC
Effluent Data	Number of Samples in Data Set (n)		25	1183	60	60
	Coefficient of Variation (CV) = Std. Dev./Mean (default CV = 0.6)		0.6	2.68	0.36	0.6
	Effluent Concentration, µg/L (Max. or 95th Percentile) - (C_e)		1,900.00	100	54.2	95
	Calculated 50th % Effluent Conc. (when n>10), Human Health Only					
Receiving Water Data	90th Percentile Conc., µg/L - (C_u)				0.468	1.396
	Geometric Mean, µg/L, Human Health Criteria Only					
Applicable Water Quality Criteria	Aquatic Life Criteria, µg/L	Acute	12,400.00	13.	4.8	90.
	Aquatic Life Criteria, µg/L	Chronic	1,800.00	7.5	3.1	81.
	Acute:chronic ratio		6.89	1.73	1.55	1.11
	Human Health Water and Organism, µg/L		–	N/A	N/A	N/A
	Human Health, Organism Only, µg/L		–	60.	–	69,000.
	Metals Criteria Translator, decimal (or default use Conversion Factor)	Acute		–	.83	.946
		Chronic		–	.83	.946
	Carcinogen (Y/N), Human Health Criteria Only		–		N	–
Calculated Dilution Factors (DF) (or enter Modeled DFs)	Aquatic Life - Acute	1Q10	11.8	11.8	11.8	11.8
	Aquatic Life - Chronic	7Q10 or 4B3	19.7	19.7	19.7	19.7
	Aquatic Life - Chronic Ammonia	30B3 or 30Q10/30Q5	19.7	19.7	19.7	19.7
	Human Health - Non-Carcinogen	Harmonic Mean	19.7	19.7	19.7	19.7
	Human Health - Carcinogen	Harmonic Mean	19.7	19.7	19.7	19.7
Aquatic Life Reasonable Potential Analysis						
σ	$\sigma^2=\ln(CV^2+1)$		0.555	1.450	0.349	0.555
P_n	$=(1\text{-confidence level})^{1/n}$, where confidence level =	99%	0.832	0.996	0.926	0.926
Multiplier (TSD p. 57)	$=\exp(z\sigma-0.5\sigma^2)/\exp[\text{normsinv}(P_n)\sigma-0.5\sigma^2]$, where	99%	2.1	1.0	1.4	1.6
Statistically projected critical discharge concentration (C_e)			4051	100.00	73.66	154.66
Predicted max. conc.(ug/L) at Edge-of-Mixing Zone		Acute	343	8.47	5.61	13.68
(note: for metals, concentration as dissolved using conversion factor as translator)		Chronic	206	5.08	3.55	8.75
Reasonable Potential to exceed Aquatic Life Criteria			NO	NO	YES	YES
Aquatic Life Effluent Limit Calculations						
Number of Compliance Samples Expected per month (n)			30	4	4	4
n used to calculate AML (if chronic is limiting then use min=4 or for ammonia min=30)			–	4	4	4
LTA Coeff. Var. (CV), decimal	(Use CV of data set or default = 0.6)		–	–	0.360	0.600
Permit Limit Coeff. Var. (CV), decimal	(Use CV from data set or default = 0.6)		–	–	0.360	0.600
Acute WLA, ug/L	C_d = (Acute Criteria x MZ_a) - C_u x (MZ_a-1)	Acute	–	–	51.6	1,046.9
Chronic WLA, ug/L	C_d = (Chronic Criteria x MZ_c) - C_u x (MZ_c-1)	Chronic	–	–	52.3	1,569.6
Long Term Ave (LTA), ug/L	WLAa x $\exp(0.5\sigma^2-z\sigma)$, Acute	99%	–	–	24.3	336.1
(99th % occurrence prob.)	WLAc x $\exp(0.5\sigma^2-z\sigma)$; ammonia n=30, Chronic	99%	–	–	35.1	827.8
Limiting LTA, ug/L	used as basis for limits calculation		–	–	24.3	336.1
Applicable Metals Criteria Translator (metals limits as total recoverable)				–	0.83	0.95
Average Monthly Limit (AML), ug/L , where % occurrence prob =		95%	–	–	**39**	**552**
Maximum Daily Limit (MDL), ug/L , where % occurrence prob =		99%	–	–	**62**	**1107**
Average Monthly Limit (AML), mg/L			–	–	**0.039**	**0.552**
Maximum Daily Limit (MDL), mg/L			–	–	**0.062**	**1.107**
Average Monthly Limit (AML), lb/day			–	–	**1.291**	**18.4**
Maximum Daily Limit (MDL), lb/day			–	–	**2.073**	**36.9**
Human Health Reasonable Potential Analysis						
σ	$\sigma^2=\ln(CV^2+1)$			1.450	0.349	0.555
P_n	$=(1\text{-confidence level})^{1/n}$ where confidence level =	95%		0.997	0.951	0.951
Multiplier	$=\exp(2.326\sigma-0.5\sigma^2)/\exp[\text{invnorm}(P_N)\sigma-0.5\sigma^2]$, prob. =	50%		0.017	0.561	0.399
Dilution Factor (for Human Health Criteria)				19.7	19.7	19.7
Max Conc. at edge of Chronic Zone, ug/L (C_d)				0.087	1.543	1.923
Reasonable Potential to exceed HH Water & Organism				NO	NO	NO
Reasonable Potential to exceed HH Organism Only				NO	–	NO

Appendix F. TSS Performance-based Limits

	TSS Data (mg/L)/Effluent	Ln()
4/30/2019	**39**	3.664
5/31/2019	**48**	3.871
6/30/2019	**47**	3.850
7/31/2019	**52**	3.951
8/31/2019	**53**	3.970
9/30/2019	**57**	4.043
10/31/2019	**47**	3.850
11/30/2019	**39**	3.664
12/31/2019	**39**	3.664
1/31/2020	**47**	3.850
2/29/2020	**34**	3.526
3/31/2020	**34**	3.526
4/30/2020	**41**	3.714
5/31/2020	**50**	3.912
6/30/2020	**48**	3.871
7/31/2020	**48**	3.871
8/31/2020	**36**	3.584
9/30/2020	**58**	4.060
10/31/2020	**59**	4.078
11/30/2020	**44**	3.784
12/31/2020	**38**	3.638
1/31/2021	**44**	3.784
2/28/2021	**39**	3.664
3/31/2021	**39**	3.664
4/30/2021	**42**	3.738
5/31/2021	**41**	3.714
6/30/2021	**57**	4.043
7/31/2021	**52**	3.951
8/31/2021	**52**	3.951
9/30/2021	**52**	3.951
10/31/2021	**55**	4.007
11/30/2021	**42**	3.738
12/31/2021	**31**	3.434
1/31/2022	**32**	3.466
2/28/2022	**34**	3.526
3/31/2022	**39**	3.664
4/30/2022	**42**	3.738
5/31/2022	**51**	3.932
6/30/2022	**41**	3.714
7/31/2022	**49**	3.892

8/31/2022	**43**	3.761
9/30/2022	**43**	3.761
10/31/2022	**28**	3.332
11/30/2022	**36**	3.584
12/31/2022	**33**	3.497
1/31/2023	**33**	3.497
2/28/2023	**35**	3.555
3/31/2023	**43**	3.761
4/30/2023	**46**	3.829
5/31/2023	**42**	3.738
6/30/2023	**47**	3.850
7/31/2023	**43**	3.761
8/31/2023	**40**	3.689
9/30/2023	**33**	3.497
10/31/2023	**28**	3.332
11/30/2023	**31**	3.434
12/31/2023	**36**	3.584
1/31/2024	**35**	3.555
2/29/2024	**42**	3.738
	Mean	**3.733**
	Variance	**0.035**

Performance-based Effluent Limits

INPUT	
LogNormal Transformed Mean:	3.7333
LogNormal Transformed Variance:	0.0346
Number of Samples per month for compliance monitoring:	4
Autocorrelation factor (n_e) (use 0 if unknown):	0
OUTPUT	
E(X) =	42.5451
V(X) =	63.687
VARn	0.0088
MEANn=	3.7462
VAR(Xn)=	15.922
RESULTS	
Maximum Daily Effluent Limit:	**64.4**
Average Monthly Effluent Limit:	**49.4**
Flow (mgd)	4.0
Loading Limits	
Max Daily (lbs/day)	2150
Avg Monthly (lbs/day)	783

Appendix G. Antidegradation Form (2G) and draft 401 Certification

Antidegradation Form 2G

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION (DEC)
Wastewater Discharge Authorization Program
555 Cordova Street, AK 99501
907-269-6285

Form 2G must be completed by all applicants. The applicant shall submit sufficient information for the department to complete an antidegradation analysis and make findings under 18 AAC 70.016 (b), (c), and (d). DEC may request additional information as necessary.

Antidegradation analysis is tier-specific and the department findings for Tier 1 and Tier 2 are on a parameter-by-parameter basis. Analysis and department findings for Tier 3 water are on a basis of a designated water.

The antidegradation review procedure is based on:

- The level of protection (i.e. Tier 1, 2, or 3) assigned to the pollutants of concern within the receiving water,
- The type of receiving water,
- Existing water quality of the receiving water,
- The necessity of degradation, and
- The social and economic importance of the regulated activity.

All discharges that require a permit under 18 AAC 83 Alaska Pollutant Discharge Elimination System (APDES) or an application for state certification of a federal permit under Section 401 of the Clean Water Act (CWA) are subject to antidegradation regulatory requirements under 18 AAC 70.016. [18 AAC 70.016(a)(1)(A & B)]

Submit completed form to DEC Division of Water to the address above, or via email to either of the following email addresses depending on the type of permit:

- 401 Certification for 404 CWA, or other federal permits: DEC-401Cert@alaska.gov
- APDES Permits: DEC.Water.WQPermit@alaska.gov
- Or, via other means as coordinated with DEC Division of Water.

Section 1- Facility Information [18 AAC 70.016(a)(5)(A – G)]

Facility Name: Charcoal Point Wastewater Treatment Plant **Permit Number**: AK-002144-0

1. Provide a list of Parameters of Concern in the discharge, the respective concentrations, persistence, and potential impacts to the receiving water.
2. Identify which Tier protection level should apply for each Parameter of Concern.

(For multiple parameters or if additional space is needed, attach separate sheet)

Receiving Waterbody or Wetland: Tongass Narrows — Tier 2

Parameter of Concern:	Respective Concentrations:	Tier* Protection Level: *(*Note, complete this entry after completing the rest of the form)*
Copper and Temperature	Copper (54.2 ug/L maximum); Temperature (19.8 deg C maximum)	

Persistence:

Copper is a conservative effluent constituents, but not persistent. Temperature is non-conservative and reduced in waterbody.

Potential Impacts:

Effluent monitoring of total copper yields a maximum of 54.2 ug/L (after one outlier was removed in ProUCL). Dissolved copper in seawater can impact aquatic organisms at high concentrations and AK water quality criteria are 13 ug/L (acute) and 7.5 ug/L (chronic) for dissolved copper. The 6-port diffuser located at >100 feet of water depth in Tongass Narrows provides very rapid dilution into flowing seawater. Copper concentrations inside the diffuser port jet plumes within 1-3 meters from diffuser have the potential to impact fish. Particulate copper discharged binds to organic materials and is not toxic. The discharge plume has a limited area and volume in Tongass Narrow and is trapped below mid-depth in a stratified water column. Discharge plumes cross-sectional area is <0.4% of channel cross-section at 10 meters distance from the diffuser. These discharge plume characteristics will allow fish passage and limit organisms exposures to very low copper concentrations. The maximum effluent temperature of 19.8C is mixed to <0.5C above ambient temperature within 10 meters from the diffuser ports and within ~20 seconds.

If applicable, data is attached on the parameters that may alter the effects of the discharge to the receiving water. ☐ Yes, ☐ No, ☐ N/A

Section 2- Baseline Water Quality Provisions [18 AAC 70.016(a)(6)(A – C)]

If determined necessary and requested by the Department, submit sufficient and credible baseline water quality information for the receiving water which meets the requirements of 18 AAC 70.016(a)(6)(A – C).

Section 3- Tier 1 Protection Level and Analysis [18 AAC 70.016(b)]

1. Does a discharge of any parameter identified in Section 1 occur to a Category 4 [305(b)] or Category 5 [303(d)] waterbody listed in the current approved Alaska's Integrated Water Quality Monitoring and Assessment Report?

See http://dec.alaska.gov/water/water-quality/impaired-waters.aspx for the most recently approved integrated report and category listings.

☐ Yes ☐ No

a. If yes, list parameters from Section 1 that are present in the proposed discharge that will be included in the Tier 1 analysis in the following table.

Receiving Water and Wetlands Information (if additional space is needed, attach separate sheet):

a. Name of waterbodies or wetlands to which you discharge:	**Impaired Waters**					
	b. Is the proposed discharge(s) directly to any segment of a Category 4 or 5 waterbody?		If you answered yes to b, then answer the following three questions (c, d, and e).			
			c. What parameter(s) are causing the Category 4 or 5 water degradation?	**d**. Are the parameter(s) causing the degradation present in the proposed discharge?		**e**. Is the discharge consistent with the assumptions and requirements of applicable EPA approved or established Total Maximum Daily Load (TMDL)?
	Yes	No		Yes	No	Yes	No
	☐	☐		☐	☐	☐	☐
	☐	☐		☐	☐	☐	☐

Section 4- Tier 2 Protection Level and Analysis [18 AAC 70.016(c)]

If not identified as requiring only Tier 1 level of protection, Tier 2 is presumed for all water as the default protection level for all parameters [18 AAC 70.016(c)(1)].

1. Is the application for a *(Check all that apply)*:

☑ New Discharge* ☑ Existing Discharge ☐ Expanded Discharge*

*Note: "new or expanded," with respect to discharges means discharges that are regulated for the first time or discharges that are expanded such that they could result in an increase in permitted parameter load or concentration or other changes in discharge characteristics that could lower water quality or have other adverse environmental impacts.

2. Does a discharge of any parameter identified in Section 1 – Facility Information require Tier 2 analysis as defined under 18 AAC 70.016(c)(2)(A) – (E)?

☑ **Yes**, proceed to **Question 3**

☐ **No**, please **explain below** and proceed to **Section 5**

See attached ADEC 2022 Final Integrated Water Quality Monitoring and Assessment Report -- Map of Assessed Waters for Tongass Narrows. Refer also to Terri Lomax/ADEC.

3. For each parameter requiring a Tier 2 analysis, provide a description per discharge (e.g., parameter specific per outfall) and analysis of a range of practicable alternatives that have the potential to prevent or lessen the degradation associated with the proposed discharge [18 AAC 70.016(c)(4)] (*if additional space is needed, attach separate sheet*). Include:

A. Identification of receiving water quality and accompanying environmental impacts on the receiving water for each of the practicable alternatives;

Two effluent constituents (copper and temperature) require dilution in defined mixing zone regions in Tongass Narrows to reduce water quality impacts. The existing NPDES permit includes effluent total copper limits of 157 ug/L (monthly avg.) and 290 ug/L (maximum day) - compared to the wastewater maximum copper concentration of 54.2 ug/L - so effluent copper is an existing discharge in the Permit. The Ketchikan Public Utilities 2022 Consumer Confidence Report lists a 90% copper concentration of 290 ug/L in the drinking water supply - which matches the maximum daily effluent limit. The only practicable means to reduce effluent copper would be via treatment of the drinking water supply.

The existing NPDES permit includes effluent total zinc limits of 4,682 ug/L (monthly avg.) and 9,384 ug/L (maximum day) - compared to the wastewater maximum zinc value of 95 ug/L - so effluent zinc is an existing discharge in the Permit and the maximum effluent zinc concentration is equal to the acute water quality criteria for zinc.

Effluent temperature is the only "new" discharge constituent, although it was present in past permit renewals it was not addressed. Effluent temperature monitoring data show values range from 6.1 deg. C in winter to a maximum of 19.8 deg. C in summer with an average of 11.6 deg. C. The only practicable alternative to reduce effluent discharge temperature would require mechanical methods such as cooling towers or a counter-current heat exchanger using seawater to reduce effluent temperature to match receiving water temperatures of 8 to 15 deg. C.

B. Evaluation of the cost for each of the practicable alternatives, relative to the degree of water quality degradation;

The only practicable alternative to reduce effluent discharge temperature would require design and construction of mechanical methods such as cooling towers or a counter-current heat exchanger using seawater to reduce effluent temperature to match receiving water temperatures of 8 to 15 deg. C. A cooling tower or heat exchanger would require space, piping, and mechanical and electrical infrastructure to function, as well as significant O&M costs to operate. If the objective of design is reducing effluent discharge temperature to the ambient seawater temperature of ~10 deg. C, then the capital and O&M costs would exceed $0.5 M for a cooling tower and would exceed $0.9 M for a seawater heat exchanger due to additional piping and pumps. In comparison, the existing outfall diffuser functions to reduce a maximum effluent temperature of 19.8C to <0.5C above ambient temperature within 10 meters from the diffuser ports and within ~20 seconds.

C. Identification of a proposed practicable alternative that prevents or lessens water quality degradation while also considering accompanying cross-media environmental impacts. (*If the applicant has selected a non-degrading alternative, the social or economic importance analysis in Question 4 is not required.*

Design and construction of a cooling tower to reduce effluent temperature to match receiving water temperatures of 8 to 15 deg. C is the selected practicable alternative. The installation and operation of a cooling tower would require space, piping, and a pump as well as mechanical and electrical infrastructure to function. Operation of a cooling tower will require routine addition of chlorine solution to control biological growths and maintain functional performance. Periodic addition of anti-corrosion chemicals are also necessary for cooling tower operation. The chlorine solution and anti-corrosion chemicals would be discharged to Tongass Narrows via the WWTP multi-port outfall diffuser.

4. Social or Economic Importance [18 AAC 70.016(c)(5)]

Provide information that demonstrates the accommodation of important social or economic development. The applicant shall complete either a social OR economic importance analysis (or both) identifying each affected community in the area where the receiving water for the proposed discharge is located. *(if additional space is needed, attach separate sheet)*

(A) Social Importance Analysis: *(select one or more areas, and describe below)*	**(B) Economic Importance Analysis**: *(select one or more areas, and describe below)*:
☑ community services provided;	☐ employment, job availability, and salary impacts;
☑ public health or safety improvements;	☑ tax base impacts;
☑ infrastructure improvements;	☐ expanded leases and royalties;
☐ education and training;	☐ commercial activities;
☐ cultural amenities;	☐ access to resources;
☐ recreational opportunities	☐ access to a transportation network

Describe (checked items above or attach as separate document)

The City of Ketchikan provides wastewater collection, pollution prevention, and control and treatment of all wastes and substances entering the sewage collections system under the practices and requirements in the NPDES permit. The WWTP average design flow is 4.0 mgd. The WWTP is essential for community public health and safety - through these services of the City's Public Works. The City provides staff and funding to operate and maintain the WWTP infrastructure to comply with state and federal regulations. The City's population in 2020 was ~8,200. In 2017, the ACS-estimated median annual income for a household in the city was $56,372, and the per capita income for the city was $30,474. Implementation of the design, construction, and operation of a cooling tower at the WWTP to reduce effluent temperatures would be a significant burden to the City's residents and would require an increase in sewer rates and obligation of municipal bonds to fund. At the same time - the City will be required in the NPDES permit to design, construct, and operate disinfection facilities at the WWTP during the next five year permit period.

Section 5- Tier 3 Protection Level and Analysis [18 AAC 70.016(d)]

1. Is the discharge to a designated Tier 3 water? ☐ Yes ☐ No

(Currently, the State of Alaska has not designated any Tier 3 waters).

See http://dec.alaska.gov/water/water-quality/standards/antidegradation.aspx for Tier 3 for further information.)

Section 6. Certification Information

An Alaska Pollutant Discharge Elimination System (APDES) permit application must be signed by an individual with the appropriate authority per 18 AAC 83.385 or for 401 certification of 404 permits or other federal permits per 18 AAC 15.030.

APDES Permits	
Corporate Executive Officer 18 AAC 83.385 (a)(1)(A)	For a corporation, a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation.
Corporate Operations Manager 18 AAC 83.385 (a)(1)(B)	For a corporation, the manager of one or more manufacturing, production, or operating facilities, if (i) the manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations; (ii) the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and (iii) authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
Sole Proprietor or General Partner 18 AAC 83.385 (a)(2)	For a partnership or sole proprietorship, the general partner or the proprietor respectively.
Public Agency, Chief Executive Officer 18 AAC 83.385 (a)(3)(A)	For a municipality, state, or other public agency, the chief executive officer of the agency.
Public Agency, Senior Executive Officer 18 AAC 83.385 (a)(3)(B)	For a municipality, state, or other public agency, a senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.
401 Certifications	
Corporations 18 AAC 15.030(1)	In the case of corporations, by a principal executive officer of at least the level of vice president or his duly authorized representative, if the representative is responsible for the overall management of the project or operation.
Partnerships 18 AAC 15.030(2)	in the case of a partnership, by a general partner
Proprietorship 18 AAC 15.030(3)	in the case of a sole proprietorship, by the proprietor
Public Agency 18 AAC 15.030(4)	in the case of a municipal, state, federal or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Organization:	Name:	Title:
City of Ketchikan	Amanda Robinson	Acting Public Works Director

Phone:	Fax (optional):	Email:
907-228-4732		amandar@city.ketchikan.ak.us

Mailing Address:	Street (PO Box):		
	3920 Tongass Avenue		
	City:	State:	Zip:
	Ketchikan	AK	99901

12/21/2023

Signature/Responsible Official — Date

Section 7. Form 2G Preparer *(Complete if Form 2G was prepared by someone other than the certifier.)*

Organization:	Name:	Title:
Jacobs Engineering Group, Inc.	David Wilson	Senior Environmental Scientist

Phone:	Fax (optional):	Email:
425-985-8762		David.Wilson@jacobs.com

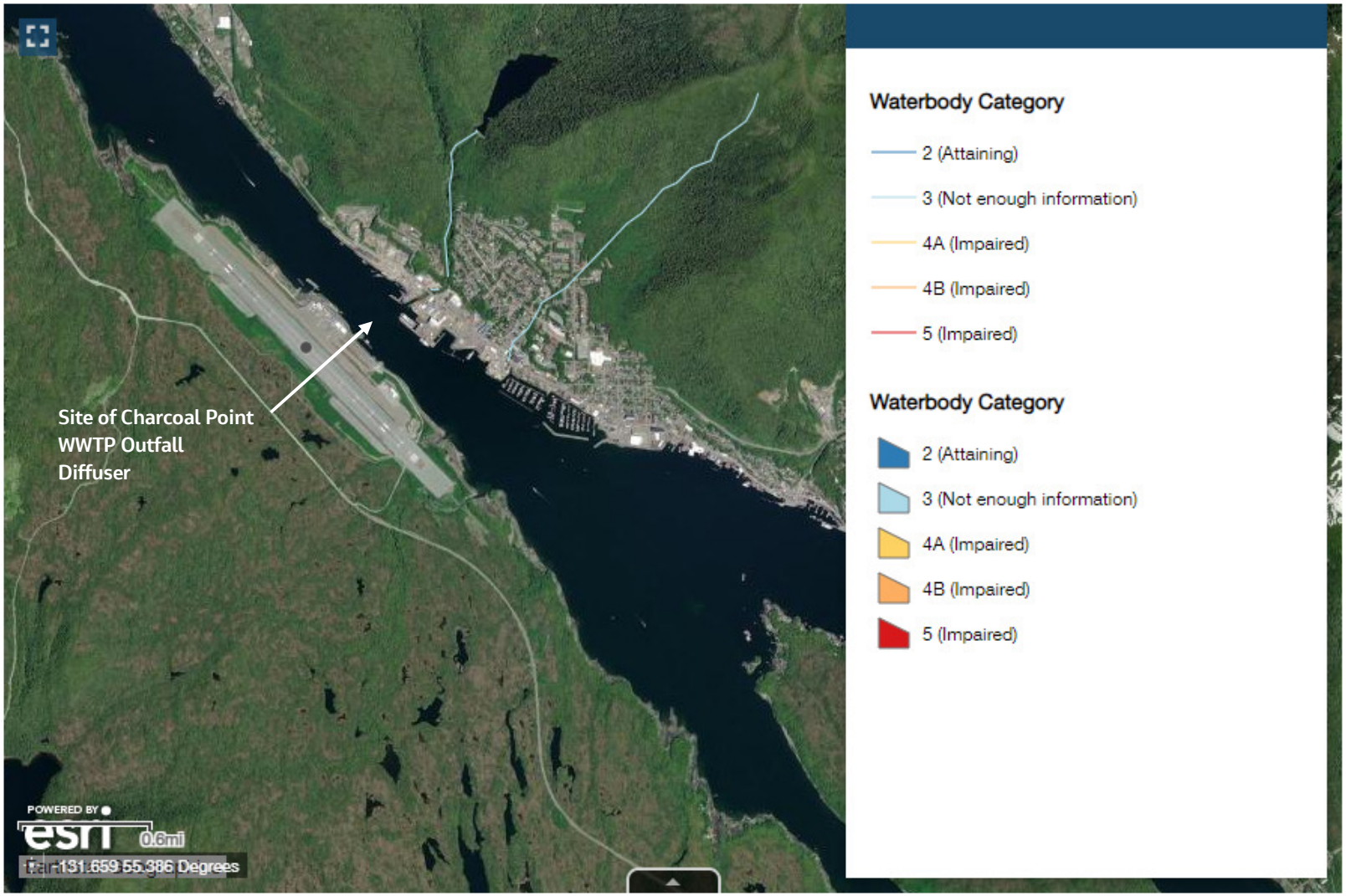
Mailing Address: ☐ Check if same as Certifiers Information	Street (PO Box):		
	1100 112th Ave. NE		
	City:	State:	Zip:
	Bellevue	WA	98004

ATTACHMENT 1 to ADEC Form 2G

Alaska DEC 2022 Final Integrated Water Quality Monitoring and Assessment Report

Map of Assessed Waters for Tongass Narrows and City of Ketchikan

Map shows no impaired waterbodies in vicinity of Ketchikan Charcoal Point WWTP Outfall in Tongass Narrows



STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DRAFT CERTIFICATE OF REASONABLE ASSURANCE

A Certificate of Reasonable Assurance, as required by Section 401 of the Clean Water Act, has been requested by the Environmental Protection Agency (EPA) for the marine water discharge of primary treated domestic wastewater from the City of Ketchikan Charcoal Point Wastewater Treatment Plant (WWTP).

The activity is located at 55º 21' 21.8" north latitude, 131º 42' 09.8" west longitude, near Ketchikan, Alaska with discharges to Tongass Narrows.

Water Quality Certification is required for the activity because the activity will be authorized by an EPA permit identified as National Pollutant Discharge Elimination Permit No. AK0021440 and because a discharge will result from the activity.

Public notice of the application for this certification is made in accordance with 18 Alaska Administrative Code (AAC) 15.180. Public notice of the City of Ketchikan's Antidegradation Form 2G, included as an attachment to this certification, is made in accordance with 18 AAC 70.016. In accordance with 18 AAC 70.016, *Antidegradation implementation methods for discharges authorized under the federal Clean Water Act,* the Alaska Department of Environmental Conservation (DEC or Department) reviewed the City of Ketchikan's Antidegradation Form 2G and determined that the information provided by the City of Ketchikan complies with the requirements of 18 AAC 70.016. DEC will accept comments on these documents during the public notice period.

DEC has completed its review of EPA's Draft National Pollutant Discharge Elimination Permit (NPDES) No. AK0021440 and associated documents and by means of this Draft Certificate of Reasonable Assurance conditionally certifies that there is reasonable assurance that the activity and the resulting proposed modified discharge from the City of Ketchikan Charcoal Point WWTP is compliant with the requirements of Section 401 of the Clean Water Act, 40 Code of Federal Regulations (CFR) 125.61, Alaska Statutes Title 46, and Alaska Water Quality Standards 18 AAC 70 provided that the proposed modified discharge adheres to the stipulations provided below in this certification. Furthermore, as per 40 CFR 125.64(b), the Department has determined that the proposed modified discharge will not result in an additional treatment pollution control or other requirement on any other point or nonpoint sources as Tongass Narrows is not included on DEC's 2024 Integrated Water Quality Monitoring and Assessment Report as an impaired waterbody nor is the subject portion of Tongass Narrows subject to a proposed or approved Total Maximum Daily Load.

A Final Certification of Reasonable Assurance is pending review of any public comments received and is contingent on the inclusion of the following stipulations in NPDES Permit No. AK0021440:

1. In accordance with 18 AAC 70.240, DEC authorizes mixing zones in Tongass Narrows for copper, zinc, dissolved oxygen, enterococcus bacteria, fecal coliform bacteria, temperature, and whole effluent toxicity contained in the discharge from the City of Ketchikan Charcoal Point WWTP. The mixing zones are defined as follows:

   The chronic mixing zone has a dilution of 19.7:1 and is defined as a rectangular area with a length of 28 meters and width of 64 meters centered over the diffuser with the length oriented parallel to the shoreline.

The acute mixing zone has a dilution of 11.8:1 and is defined as a rectangular area with a length of 20 meters and width of 62 meters centered over the diffuser with the length oriented parallel to the shoreline.

Rationale: In accordance with State Regulations 18 AAC 70.240, the department has authority to designate mixing zones in permits or certifications. The designated mixing zones will ensure that the most stringent water quality criteria for copper (acute 5.8 micrograms per liter (µg/L), chronic 3.7 µg/L), zinc (acute 95.1 µg/L, chronic 86.1 µg/L), dissolved oxygen (6.0 milligrams per liter (mg/L) daily minimum (surface for a depth of 1 meter, no less than 4 mg/L at any depth below the surface), 17 mg/L daily maximum, and temperature (15º Celsius) are met at all points outside of the mixing zone.

2. In order for the City of Ketchikan's Charcoal Point WWTP to achieve compliance with the fecal coliform and enterococcus bacteria final effluent limits, DEC requires the establishment of a Compliance Schedule in the permit. Final effluent limits must be met as soon as possible, but no later than 5 years after the effective date of the permit. Interim requirements that will lead to compliance with the final effluent limits with dates for their achievement must be established in the permit. The following interim requirements shall be included in the Compliance Schedule:

   By one year after the effective date of the permit, the permittee shall develop a facility plan that evaluates alternatives to meet the final fecal coliform and enterococcus bacteria effluent limits and select their preferred alternative.

   By two years after the effective date of the permit, the permittee must complete the design of the preferred alternative and request approval to construct from DEC's Engineering Support and Plan Review (ESPR).

   By three years after the effective date of the permit, the permittee must secure funding and select a contractor to construct upgrades.

   By four years after the effective date of the permit, the permittee must commence construction.

   By five years after the effective date of the permit, the permittee must complete construction, complete optimization of facility upgrade operations, and achieve compliance with the final fecal coliform and enterococcus effluent limits. Final approval to operate must be requested from ESPR.

   The permittee must submit progress or compliance reports on interim and final requirements no later than 14 days following the scheduled date of each requirement.

   Rationale:
   In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and all applicable criteria will be met.

   According to 18 AAC 83.560, the Department has authority to specify a schedule of compliance leading to compliance with 33 U.S.C. 1251-1387 (Clean Water Act). Any schedule of compliance must require compliance as soon as possible, but no later than the applicable statutory deadline under 33 U.S.C. 1251-1387 (Clean Water Act). 18 AAC 83.560(b) requires interim requirements and dates for their achievement if the schedule of compliance exceeds one year from the date of permit issuance. Time between interim requirements must not exceed one year. Progress reports must be submitted no later than 14 days following each interim date and the final date of compliance.

According to 18 AAC 72.200, Application for department approval, (a) Except as otherwise provided in 18 AAC 72.035(d) and 18 AAC 72.200(b), a person must submit a plan to the department and obtain approval of that plan before constructing, installing, or modifying any part of a domestic wastewater collection, treatment, storage, or disposal system. To obtain approval, a person shall provide to the department the information required by 18 AAC 72.205. 18 AAC 72.240, states that the department will issue final approval to operate if the information required by 18 AAC 72.235 confirms that (A) the system was constructed as originally approved or (B) the system, or a designated phase of that system, otherwise meets the requirements of AS 46.03 and 18 AAC 72. DEC plan approval requirements will ensure that the most stringent water quality criteria for fecal coliform and enterococcus bacteria are met at all points outside the mixing zone.

3. DEC requires that the permit contain the following final fecal coliform effluent limits:

Monthly Average 200 fecal coliform per 100 mL (FC/100 mL)
Weekly Average 400 FC/100 mL
Daily Maximum 800 FC/100 mL.

Rationale:
In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and all applicable criteria will be met.

18 AAC 72.050(a)(3), Minimum treatment, states that the Department may authorize a person to discharge domestic wastewater into or onto water or land if the discharge to surface water has received secondary treatment and has been disinfected. 18 AAC 72.050(c) states that the Department may allow or require treatment different from the minimum set out in this section as necessary to protect public health, public and private water systems, or the environment. In deciding to evaluate alternative minimum treatment requirements, the Department will consider other permit or plan approval requirements, and the receiving environment.

Under Section 301(h) of the Clean Water Act, EPA determined that the City of Ketchikan Charcoal Point WWTP qualifies for a continuation of their waiver from secondary treatment standards for 5-day biochemical oxygen demand (BOD_5) and total suspended solid (TSS). To qualify, the City of Ketchikan must meet specific criteria including a requirement to achieve primary treatment. Therefore, DEC has determined that the City of Ketchikan may treat to less than the minimum secondary treatment requirement at 18 AAC 72.050(a)(3); however, less than secondary treatment only applies to BOD_5 and TSS and does not include disinfection. Therefore, the discharge of domestic wastewater to surface water must be disinfected

18 AAC 72.990(21) defines disinfect to treat by means of a chemical, physical, or other process such as chlorination, ozonation, application of ultraviolet light, or sterilization, designed to eliminate pathogenic organisms, and producing an effluent with a 30-day 200 FC/100 mL monthly average and a seven-day 400 FC/100 mL average. These limits are required as final fecal coliform limits. A daily maximum final effluent limit of 800 FC/100 mL limit is also required. Establishment of a daily maximum limit will help ensure compliance with water quality criteria. Since these limits are dependent on the use of specific technological processes, DEC applies these final fecal coliform bacteria effluent limits as technology-based limits. These final fecal coliform bacteria effluent limits will ensure that the most stringent water quality criteria for fecal coliform bacteria are met at all points outside the mixing zone.

4. DEC requires that the permit contain the following final enterococcus bacteria limits:

   30-day Geometric Mean 690 colony forming units (CFU)/100 mL
   Daily Maximum 2,561 CFU/100 mL).

   Rationale:
   In accordance with State Regulations 18 AAC 15.090, the Department may attach terms and reporting requirements, and the posting of a performance bond or other surety, that it considers necessary to ensure that conditions to a permit, variance, or approval, including operating, monitoring, inspection, sampling, access to records and all applicable criteria will be met.

   Enterococcus bacteria has reasonable potential to exceed water quality criteria. Effluent limits based on the reasonable potential for enterococcus bacteria to exceed water quality criteria and the dilution required for the effluent to meet enterococcus water quality criteria water quality criteria were therefore developed using the chronic dilution of the driver of the mixing zone (copper, 19.7:1). These final enterococcus bacteria limits will ensure that the most stringent water quality criteria for enterococcus bacteria are met at all points outside the mixing zone. DEC expects that after the implementation of disinfection, the City of Ketchikan Charcoal Point WWTP may achieve compliance with enterococcus water quality criteria (30-day geometric mean 35 CFU/100 mL with not more than 10% of the samples exceeding a statistical threshold value of 130 CFU/100 mL), therefore these final enterococcus bacteria limits may be revised in the next permit reissuance.

DRAFT	DRAFT
Signature	Date
DRAFT	DRAFT
Printed Name	Title