ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT FACT SHEET – PRELIMINARY DRAFT

Permit Number: AK0022497

City of Palmer Wastewater Treatment Facility

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

Public Comment Period Start Date: DRAFT
Public Comment Period Expiration Date: DRAFT
Alaska Online Public Notice System

Technical Contact: James Gomez DeMolina
Alaska Department of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
555 Cordova St.
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Proposed issuance of an Alaska Pollutant Discharge Elimination System (APDES) permit to

CITY OF PALMER

For wastewater discharges from

City of Palmer Wastewater Treatment Facility
1802 S. Brooks Rd.
Palmer, AK 99645

The Alaska Department of Environmental Conservation (the Department or DEC) proposes to reissue an APDES individual permit (permit) to the City of Palmer. The permit authorizes and sets conditions on the discharge of pollutants from this facility to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility and outlines best management practices to which the facility must adhere.

This fact sheet explains the nature of potential discharges from the City of Palmer Wastewater Treatment Facility (Palmer WWTF) and the development of the permit including:

- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limitations and other conditions
- technical material supporting the conditions in the permit
- proposed monitoring requirements in the permit

Public Comment

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.

Commenters are requested to submit a concise statement on the permit condition(s) and the relevant facts upon which the comments are based. Commenters are encouraged to cite specific permit requirements or conditions in their submittals.

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. The Department will hold a public hearing whenever the Department finds, on the basis of requests, a significant degree of public interest in a draft permit. The Department may also hold a public hearing if a hearing might clarify one or more issues involved in a permit decision or for other good reason, in the Department's discretion. A public hearing will be held at the closest practicable location to the site of the operation. If the Department holds a public hearing, the Director will appoint a designee to preside at the hearing. The public may also submit written testimony in lieu of or in addition to providing oral testimony at the hearing. A hearing will be tape recorded. If there is sufficient public interest in a hearing, the comment period will be extended to allow time to public notice the hearing. Details about the time and location of the hearing will be provided in a separate notice.

All comments and requests for public hearings must be in writing and should be submitted to the Department at the technical contact address, fax, or email identified above (see also the public comments section of the attached public notice). Mailed comments and requests must be postmarked on or before the expiration date of the public comment period.

After the close of the public comment period and after a public hearing, if applicable, the Department will review the comments received on the draft permit. The Department will respond to the comments received in a Response to Comments document that will be made available to the public. If no substantive comments are received, the tentative conditions in the draft permit will become the proposed final permit.

The proposed final permit will be made publicly available for a five-day applicant review. The applicant may waive this review period. After the close of the proposed final permit review period, the Department will make a final decision regarding permit issuance. A final permit will become effective 30 days after the Department's decision, in accordance with the state's appeals process at 18 Alaska Administrative Code (AAC) 15.185.

The Department will transmit the final permit, fact sheet (amended as appropriate), and the Response to Comments to anyone who provided comments during the public comment period or who requested to be notified of the Department's final decision.

Appeals Process

The Department has both an informal review process and a formal administrative appeal process for final APDES permit decisions. An informal review request must be delivered within 20 days after receiving the Department's decision to the Director of the Division of Water at the following address:

Director, Division of Water
Alaska Department of Environmental Conservation
555 Cordova Street
Anchorage AK, 99501

Interested persons can review 18 AAC 15.185 for the procedures and substantive requirements regarding a request for an informal Department review.

See https://dec.alaska.gov/commish/review-guidance/informal-reviews for information regarding informal reviews of Department decisions.

An adjudicatory hearing request must be delivered to the Commissioner of the Department within 30 days of the permit decision or a decision issued under the informal review process. An adjudicatory hearing will be conducted by an administrative law judge in the Office of Administrative Hearings within the Department of Administration. A written request for an adjudicatory hearing shall be delivered to the Commissioner at the following address:

Commissioner
Alaska Department of Environmental Conservation
Mail: P.O. Box 11180
Juneau, AK 99811
In Person: 555 Cordova Street
Anchorage, AK 99501

Interested persons can review 18 AAC 15.200 for the procedures and substantive requirements regarding a request for an adjudicatory hearing. See https://dec.alaska.gov/commish/review-guidance/adjudicatory-hearing-guidance for information regarding appeals of Department decisions.

Documents are Available

The permit, fact sheet, application, and related documents can be obtained by visiting or contacting DEC between 8:00 a.m. and 4:30 p.m. Monday through Friday at the addresses below. The permit, fact sheet, application, and other information are located on the Department's Wastewater Discharge Authorization Program website: https://dec.alaska.gov/water/wastewater/.

Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 555 Cordova Street Anchorage, AK 99501 (907) 269-6285	Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program **Mail**: P.O. Box 111800 **In Person**: 410 Willoughby Avenue, Suite 303 Juneau, AK 99811-1800 (907) 465-5180

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

1.1 Applicant

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

Permittee:	City of Palmer
Facility:	City of Palmer Wastewater Treatment Facility
APDES Permit Number:	AK0022497
Facility Location:	1802 S. Brooks Rd. Palmer, Alaska 99645
Mailing Address:	1326 S. Bonanza St. Palmer, Alaska 99645
Facility Contact:	Mr. Matthew Midgett

The map in Part 2.1, Figure 1 shows the location of the treatment plant and the location of the outfall.

1.2 Authority

Section 301(a) of the Clean Water Act (CWA) and 18 AAC 83.015 provide that the discharge of pollutants to water of the U.S. is unlawful except in accordance with an APDES permit. The individual permit reissuance is being developed per 18 AAC 83. A violation of a condition contained in the Permit constitutes a violation of the CWA and subjects the permittee of the Palmer WWTF with the permitted discharge to the penalties specified in Alaska Statutes (AS) 46.03.760 and AS 46.03.761.

1.3 Permit History

The Environmental Protection Agency (EPA) issued the City of Palmer their first National Pollutant Discharge Elimination System (NPDES) permit for the Palm under the APDES Program. Under the Administrative Procedures Act and state regulations at 18 AAC 83.155(c), an APDES permit may be administratively extended (i.e., continues in force and effect) provided that the permittee submits a timely and complete application prior to the expiration of the current permit. A timely and complete application for a new permit was submitted by Palmer in July 2011. Accordingly, DEC notified the applicant that the permit was administratively continued in September 2011. Additionally, the applicant submitted revised and/or updated applications in November 2011, on May 30th, 2023, and again on July 29th, 2023.

2.0 BACKGROUND

2.1 Facility Information

The City of Palmer owns, operates and maintains the Palmer WWTF, a publicly owned treatment works (POTW) in Palmer, Alaska. The Palmer WWTF collects and treats domestic wastewater from the community of Palmer with an approximate population of 6,100. The collection system is not combined with a storm water sewer system. The Palmer WWTF has undergone major facility changes since last permit issuance in 2006. The current state of the Palmer WWTF is comprised of three lagoons, a sludge drying field, three Moving Bed Biofilm Reactors (MBBR) tanks, and a set of buildings containing the headworks, the clarifier systems and ultraviolet (UV) radiation disinfection chamber. There are no anticipated major modifications planned for the upcoming permit cycle, however the Palmer WWTF anticipates altering lagoon and headworks functionality in conjunction with the relatively new MBBR system.

Table 1 reflects the current conditions and performance of the facility. The data was derived from discharge monitoring reports (DMR) submitted to DEC from November of 2023 through July of 2024. This time period was determined by the Department to be representative of the effluent quality after the MBBR and secondary clarifiers began normal operation.

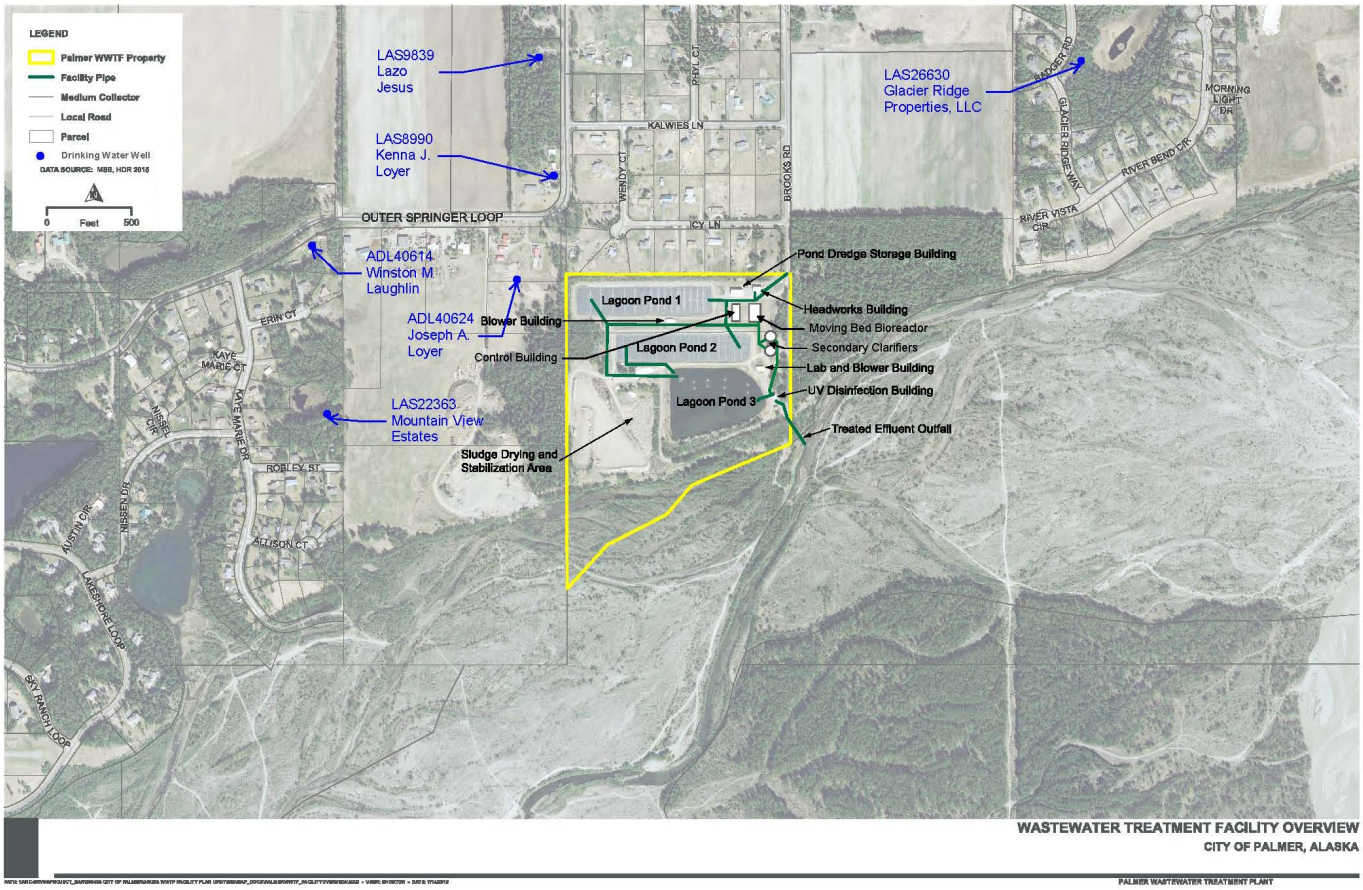
Table 1: Average Plant Performance November 2023 - July 2024

Parameter	Average Value [a]
Average Daily Flow Rate	0.66 mgd
Maximum Daily Flow Rate	0.86 mgd
5-Day Biochemical Oxygen Demand (BOD_5)	8.61 mg/L
BOD_5	48.03 lbs/day
BOD_5 percent (%) removal	97.09 %
Total Suspended Solids (TSS)	15.97 mg/L
TSS	82.82 lbs/day
TSS % removal	96.03 %
pH Maximum	7.22 S.U.
pH Minimum	6.82 S.U.
Temperature	15.58 °C
Dissolved Oxygen (DO)	6.46 mg/L
Fecal coliform (FC) bacteria	27.35 FC/100mL
Total Ammonia, as Nitrogen (N)	0.65 mg/L
Total Ammonia, as N	3.74 lbs/day

Footnotes:

a. Units: mgd = million gallons per day, mg/L = milligrams per liter, lbs/day = pounds per day, S.U. = standard units, °C = degrees Celsius, FC/100 mL = Fecal Coliform per 100 milliliters.

Figure 1: Palmer WWTF Map and Location of Outfall



2.2 Wastewater Treatment

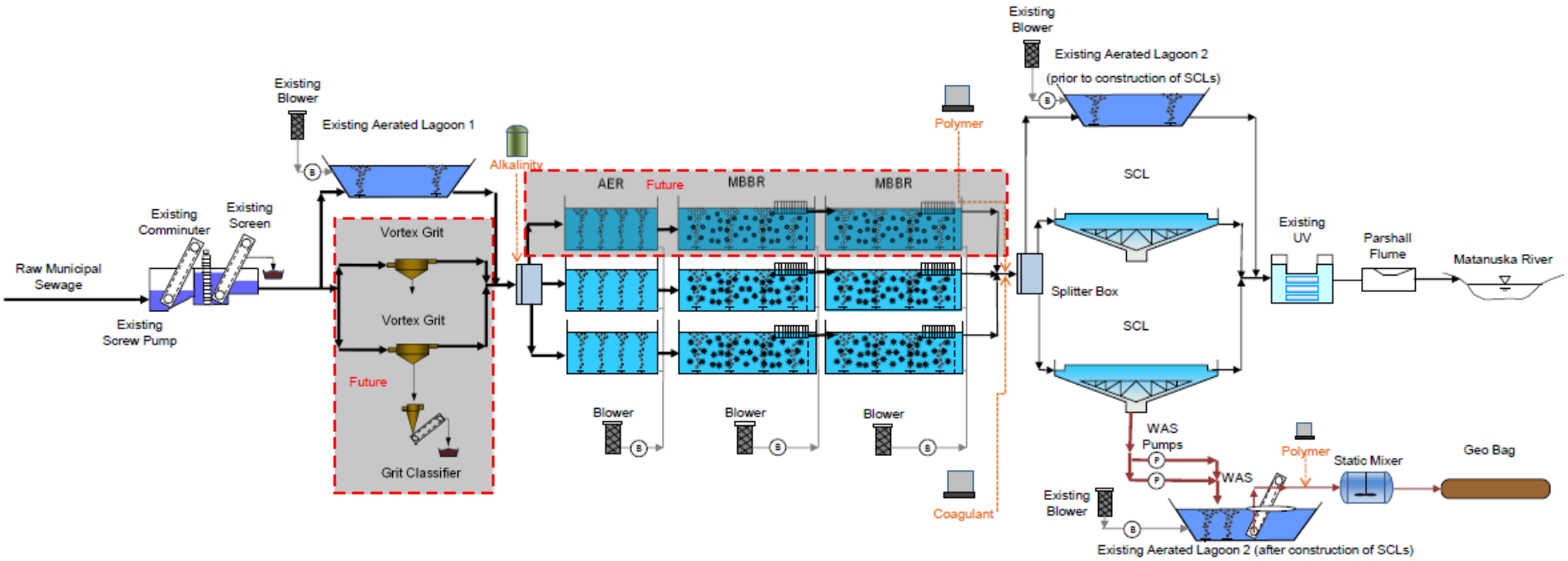
As a POTW, the Palmer WWTF is required to treat their water to secondary treatment standards. The latest DEC verified design flow is 0.95 mgd.

Treatment at the Palmer WWTF consists of primary treatment in the 'headworks building' as seen in Figure 1, followed by an MBBR system utilizing 'lagoon 2' and two secondary clarifiers.

Primary treatment in the headworks is followed by the aeration chambers and MBBR tanks. Solids collected in primary treatment are collected, mixed with lime and sent to the City of Palmer Municipal Landfill. When influent volumes exceed the treatment capacity of the MBBR tanks, the lagoons are used as temporary holding tanks. 'Lagoon 2' is aerated and is part of the intended design for the operation of the MBBR system. Activated sludge can be reintroduced immediately after the headworks to advance biological treatment in the system. Secondary clarifiers were recently constructed and implemented into the system that accept water from the MBBR tanks. The UV system is the last treatment before the outfall pipe and point of discharge. The sampling location for effluent samples immediately follows the UV chamber. When dredging occurs, sludge is mixed with lime and set to dry in a berm area onsite, adjacent to 'lagoon 3'.

Figure 2 is the flow diagram of the proposed design plans submitted by the permittee in an email correspondence on April 17, 2024 pertaining to the development of this permit and has not received final approval to operate with DEC.

Figure 2: Flow Diagram of the Design Plans for the Palmer WWTF



2.3 Pollutants of Concern

Pollutants of concern known to be present in the effluent of the Palmer WWTF consist of domestic wastewater conventional pollutants regulated in the technology-based effluent limits (TBELs) via the secondary treatment standards, including BOD_5, TSS, and pH. Additional domestic wastewater pollutant parameters known to be in the discharge are temperature, DO, FC bacteria, and ammonia. Facilities that discharge to fresh water are required to monitor *Escherichia coli* (*E. coli*) bacteria, in addition to FC bacteria. More information about *E. coli* can be found in Fact Sheet Section A.4.2.5 and Appendix A.

Following major facility changes, variable pollutant levels, a lack of supportive data, and pollutants associated with POTWs, the Department determined Whole Effluent Toxicity (WET) to be a pollutant of concern as required under 18 AAC 83.335(b)(3)(A). More information about WET requirements can be found in Fact Sheet Section 3.4.

Copper, lead, and nickel were determined to be potential pollutants of concern based upon the limited expanded effluent monitoring results seen in Supplement A of the application submitted to DEC on June 6, 2022.

Table 2 contains the maximum exceedances recorded of those parameters which were submitted to the Department from November of 2023 through July of 2024. As stated in section 2.1 of this fact sheet, this period is representative of the effluent quality after the MBBR and secondary clarifiers' normal operation.

Table 2: Pollutants Observed in Effluent above Water Quality Criteria November 2023 – July 2024

Parameter	Units	Maximum Observed Concentration	Date Observed	Water Quality Criteria or Permit Limit
FC Bacteria	FC/100mL	241	February 2024	In a 30-day period, the geometric mean may not exceed 20 FC/100 ml, and not more than 10% of the samples may exceed 40 FC/100 ml.
TSS	mg/L	53.3	July 2024	Secondary treatment standards average weekly limit: 45

2.4 Compliance History

Consent Decree:

The EPA and DEC entered a Consent Decree with the City of Palmer to resolve numeric effluent limit violations under the CWA in December 2016. The consent decree required supplemental treatment activities and process requirements including two new secondary clarifiers and an MBBR system to be constructed and operated by August 2020. When it was determined that construction and operation of the clarifiers would not be completed by the deadline, the City of Palmer requested and received an extension to the deadline granted by the EPA and DEC in The First Material Modification to Consent Decree filed May 14th, 2021.

The extension, with a deadline of July 1st, 2022, provided time to determine if effluent limits could be met without the secondary clarifier system. The clarifiers were substantially completed on October 31st, 2022. Changes to the treatment of wastewater, the Palmer WWTF, and the administration of the consent decree are ongoing as of May 1st, 2024. Table 3 contains a summary the inspection history from 2019 to 2024.

Table 3: Inspection Summary January 2019 - November 2024

Date	Activity	Summary
February 5, 2019	Routine ADEC inspection	No new violations that were not already addressed in the Consent Decree or reported to NetDMR.

September 27, 2021	EPA inspection	Effluent limit violations reflected repeated periods of effluent limit exceedance violations for BOD, FC, ammonia – nitrogen (NH3 – N), total suspended solids (TSS), pH, and flow. Floating solids were also recorded appearing in the receiving waterbody directly downstream from Outfall 001A.
August 7, 2023	Routine ADEC inspection	This inspection listed violations in 20 areas of enforceable action. These violations included: numeric effluent limits; QAP development and maintenance; failure to construct clarifiers; failure to perform water analysis; failure to properly conduct, submit, and/or maintain various records, Consent Decree documents, noncompliance notifications, reports, a signatory authority delegation, calculations, and record weekly effluent pollutant loading for BOD, TSS and ammonia; failure to monitor effluent, failure to post outfall signage; and failure to conduct plan review.

DEC reviewed DMRs submitted by the Palmer WWTF from January 1, 2019, to July 31, 2024. The DMR review identified 98 effluent exceedances for ammonia, BOD_5, FC bacteria, flow, pH, and TSS. Table 4 is inclusive of the exceedances reported in Table 2.

No citizen complaints were lodged against the Palmer WWTF. Table 4 lists the exceedances reported by the permittee from January 2019 through March 2024.

Table 4: Effluent Limit Exceedances for Outfall 001A January 2019 – July 2024

Parameter	Units [a]	Basis	Permit Limit	Number of Exceedances	Maximum Reported Value	Date of Maximum Reported Value
Ammonia, as N	lbs/day	Average Monthly Limit	13.5	6	85.9	July 2022
Ammonia, as N	lbs/day	Maximum Daily Limit	28.5	7	157.7	August 2022
Ammonia, as N	mg/L	Average Monthly Limit	8.7	10	24.95	August 2022
Ammonia, as N	mg/L	Maximum Daily Limit	18.5	9	34	December 2022
BOD_5	mg/L	Weekly Average	45	1	55	August 2020
FC Bacteria	FC/100mL	Average Monthly Limit	100	10	422	October 2023
FC Bacteria	FC/100mL	Maximum Daily Limit	200	20	3300	February 2024
Flow	mgd	Maximum Daily Limit	0.95	1	0.973	April 2021
pH	S.U.	Maximum	8.5	1	9.2	May 2021
pH	S.U.	Minimum	6.5	3	6.48	September 2023
TSS	lbs/day	Maximum Daily Limit	475	2	1112.6	June 2023
TSS	lbs/day	Weekly Average	357	2	605.9	June 2023

TSS	mg/L	Average Monthly Limit	30	6	51	June 2023
TSS	mg/L	Maximum Daily Limit	60	6	153	June 2023
TSS	mg/L	Weekly Average	45	12	153	June 2023
TSS Percent (%) Removal	%	Minimum	85	3	84	August 2021

Footnotes:

a. Units: mgd = million gallons per day, mg/L = milligrams per liter, lbs/day = pounds per day, FC/100 mL = fecal coliform per 100 milliliters, S.U.= standard units.

Of the exceedances in Table 4, only three were recorded between November 2023 and July 2024; the period after the MBBR and secondary clarifiers began normal operation and before the date in which DMRs were reviewed for permit development. Three FC bacteria exceedances and one TSS exceedance. Refer to Table 2 for maximum values during the period of normal operation.

3.0 EFFLUENT LIMITS AND MONITORING REQUIREMENTS

3.1 Basis for Permit Effluent Limits

Per 18 AAC 83.015, the Department prohibits the discharge of pollutants to waters of the U.S. unless the permittee has first obtained a permit issued by the APDES Program that meet the purposes of AS 46.03 and is in accordance with the CWA Section 402. Per these statutory and regulatory provisions, the Permit includes effluent limits that require the discharger to (1) meet standards reflecting levels of technological capability, (2) comply with 18 AAC 70 –WQS, and (3) comply with other state requirements that may be more stringent.

The CWA requires that the limits for a particular pollutant be the more stringent of either TBELs or WQBELs. TBELs are set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the water quality standards of a waterbody are met. WQBELs may be more stringent than TBELs.

The permit contains a combination of both TBELs and WQBELs. The Department first determines if TBELs are required to be incorporated into the permit. TBELs for POTWs, which apply to the City of Palmer WWTF, are derived from the secondary treatment standards found in Title 40 Code of Federal Regulations (40 CFR) §133.102 and 40 CFR §133.105, adopted by reference at 18 AAC 83.010(e). The following section summarizes the proposed effluent limits. A more expansive technical and legal basis for the proposed effluent limits is provided in Appendix A Basis for Effluent Limitations.

3.2 Basis for Effluent and Receiving Water Monitoring

In accordance with AS 46.03.110(d), the Department may specify in a permit the terms and conditions under which waste material may be disposed. Monitoring in a permit is required to determine compliance with effluent limits. Monitoring may also be required to gather effluent and receiving water data to determine if additional effluent limits are required and/or to monitor effluent impact on the receiving waterbody quality.

The permit also requires the permittee to perform the additional effluent monitoring required by the APDES application Form 2A for POTWs so that this data will be available when the permittee applies to reissue the APDES permit. The permittee is responsible for conducting the monitoring and submitting the results with the application for renewal of the APDES permit. The permittee should consult and review Form 2A upon permit issuance to ensure that the required monitoring in the application will be completed prior to submitting a request

for permit renewal. A copy of Form 2A can be found at https://dec.alaska.gov/water/wastewater/permit-entry/domestic-and-municipal/.

3.3 Effluent Limits and Monitoring Requirements

The permit contains a combination of both TBELs and WQBELs. The following summarizes the proposed effluent limits. A more expansive technical and legal basis for the proposed effluent limits is provided in Appendix A Basis for Effluent Limitations. The permit contains new or revised effluent limitations for DO, FC bacteria, E. coli, WET, and ammonia. Data will be used to conduct future reasonable potential analysis to determine if discharges of these parameters might cause an exceedance of the WQS in the receiving waterbody.

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 Palmer WWTF's performance. The permittee has the option of taking more frequent samples than required under the permit. These additional samples must be used for averaging (for pollutants results reported on a monthly or weekly average) if they are conducted using the Department-approved test methods (found in 18 AAC 70 and 40 CFR Part 136, adopted by reference in 18 AAC 83.010).

For all effluent monitoring, the permittee must use a sufficiently sensitive EPA-approved test method that quantifies the pollutants to a level lower than applicable limits or water quality standards or use the most sensitive test method available, per 40 CFR §136, adopted by reference in 18 AAC 83.010(f).

The permit requires influent and effluent monitoring at Outfall 001A. The permit carries forward the monitoring requirements and effluent limits for flow from the previous permit. Table 5 contains Outfall 001A effluent limits and monitoring requirements. Table 6 contains effluent limits and monitoring requirement changes from the last permit issuance. Further information outlining the details of the effluent limits and monitoring requirements for Outfall 001A can be found in Appendix A.

Table 5: Outfall 001A Effluent Limits and Monitoring Requirements

Parameter	Effluent Limits					Monitoring Requirements		
	Units [a]	Daily Minimum	Monthly Average	Weekly Average	Daily Maximum	Sample Location	Sample Frequency	Sample Type
Total Discharge Flow	mgd	N/A	Report	N/A	0.95	Effluent	Continuous	Recorded
BOD_5	mg/L	N/A	30	45	60	Influent and Effluent [c]	1/Week	24-hour Composite [d]
	lbs/day [b]		238	357	475			Calculated
TSS	mg/L	N/A	30	45	60	Influent and Effluent	1/Week	24-hour Composite
	lbs/day		238	357	475			Calculated
BOD_5 & TSS Minimum Percent (%) Removal	%	N/A	85 [e]	N/A	N/A	Influent and Effluent	1/Month	Calculated
pH	SU	6.5	N/A	N/A	8.5	Effluent	5/Week	Grab
Temperature	° C	N/A	N/A	N/A	Report	Effluent	5/Week	Grab
DO	mg/L	7	N/A	N/A	17	Effluent	1/Month	Grab
FC Bacteria	FC/ 100 mL	N/A	20 [f]	N/A	40 [g]	Effluent	1/Week	Grab

E. coli	cfu/ 100 mL	N/A	126 [f]	N/A	410 [g]	Effluent	1/Month [h]	Grab
Total Ammonia, as Nitrogen	mg/L	N/A	2.69	4.03	6.41	Effluent	1/Month	24-hour Composite
	lbs/day	N/A	21	32	51			
Copper, total recoverable	µg/L	N/A	N/A	N/A	Report	Effluent	2/Year [i]	24-hour Composite
Lead, total recoverable	µg/L	N/A	N/A	N/A	Report	Effluent	2/Year [i]	24-hour Composite
Nickel, total recoverable	µg/L	N/A	N/A	N/A	Report	Effluent	2/Year [i]	24-hour Composite
WET	TU_c	N/A	N/A	N/A	1.0	Effluent	2/Year [i]	24-hour Composite

Footnotes:

a. Units: mgd = million gallons per day, mg/L = milligrams per liter, lbs/day = pounds per day, SU= standard units, °C= degrees Celsius, FC/100 mL = Fecal Coliform per 100 milliliters, cfu/100 mL = colony forming units per 100 milliliters, µg/L = micrograms per liter, TU_c = toxic unit chronic.

b. lbs/day = concentration (mg/L) x flow (mgd) x 8.34 (conversion factor)

c. Limits apply to effluent. Report average monthly influent concentration. Influent and effluent composite samples shall be collected during the same 24-hour period.

d. See Appendix C for definition.

e. Minimum % Removal = [(monthly average influent concentration in mg/L – monthly average effluent concentration in mg/L) / (monthly average influent concentration in mg/L)] x 100. The monthly average percent removal must be calculated using the arithmetic mean of the influent value and the arithmetic mean of the effluent value for that month.

f. If more than one bacteria sample [FC, E. coli] 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 $(100 \text{ X } 200 \text{ X } 300)^{1/3} = 181.7$.

g. If less than ten samples are collected within a 30-day period, the effluent limit cannot be exceeded. If ten or more samples are collected within a 30-day period, not more than 10% of the samples may exceed the effluent limit.

h. One sample shall be collected each month, May through September, on the same day as a fecal coliform bacteria sample is collected.

i. One sample shall be collected per season; Summer season: May 1st-September 30th, Winter season: October 1st-April 30th.

Table 6: Effluent and Monitoring Changes from Prior Permit

Parameter	Units [a]	Monthly Average		Weekly Average		Daily Maximum		Monitoring Frequency	
		2007	2024	2007	2024	2007	2024	2007	2024
Flow	mgd	0.95	Unchanged	---	---	Report	Unchanged	Continuous	Unchanged
BOD_5	mg/L	Concentration limits unchanged.						1/ Week	Unchanged
	lbs/day	258	238	357	Unchanged	475	Unchanged		
TSS	mg/L	Concentration limits unchanged.						1/ Week	Unchanged
	lbs/day	258	238	357	Unchanged	475	Unchanged		
BOD_5 & TSS Minimum % Removal	%	Percent Removal minimum unchanged.						1/ Month	Unchanged
pH	S.U.	6.5 minimum and 8.5 maximum are unchanged.						5/Week	Unchanged
Temperature	º C	---	---	---	---	Report	Unchanged	5/Week	Unchanged
DO	mg/L	2.0 daily minimum	7.0 daily minimum	---	---	---	17	1/Month	Unchanged
FC Bacteria (July-August)	FC/ 100 mL	20	Unchanged	---	---	40	Unchanged	1/Week	Unchanged
FC Bacteria (September-June)	FC/ 100 mL	100	20	---	---	200	40	1/Week	Unchanged
E. coli	cfu/ 100 mL	---	126	---	---	---	410	---	1/Month
Total Ammonia, as Nitrogen	mg/L	1.7	2.69	---	4.03	18.5	6.41	1/ Week	1/Month
	lbs/day	13.5	21	---	32	28.5	51		
Copper, total recoverable	µg/L	---	---	---	---	---	---	---	2/Year
Lead, total recoverable	µg/L	---	---	---	---	---	---	---	2/Year[b]
Nickel, total recoverable	µg/L	---	---	---	---	---	---	---	2/Year[b]
WET	TU_c	---	---	---	---	---	1.0	3/5 Years	2/Year[b]
Total Residual Chlorine (TRC)	µg/L	1.7	---	---	---	3.4	---	2/Week	---
	lbs/day	0.013	---	---	---	0.027	---		

Footnotes:

a. Units: mgd = million gallons per day, mg/L = milligrams per liter, lbs/day = pounds per day, S.U.= standard units, °C= degrees Celsius, µg/L = micrograms per liter, TU_c = toxic unit chronic.

b. One sample shall be collected per season; Summer season: May 1st-September 30th, Winter season: October 1st-April 30th.

Total discharge flow remains unchanged as 0.95 mgd was the last DEC approved flow for the Palmer WWTF. BOD_5 and TSS monthly average mass limits in lbs/day were updated. All other TSS, pH and BOD_5 limits are maintained due to secondary treatment standards for POTWs. DO minimum was updated to reflect the water quality standards for fresh water. Monitoring frequency of DO was increased due to DMR data from the Palmer WWTF between 2019 and 2024 reflecting effluent that has potential to exceed the water quality criteria.

The seasonal limits for ammonia and FC bacteria in the previous permit have been consolidated into year-round limits. 18 AAC 70 Water Quality Standards protect all waters of the state for all uses. For ammonia, the effluent limits were recalculated using pH and temperature data from the ambient receiving waterbody monitoring collected from July 2023 through March 2024. More details about the development of the ammonia limit can be found in Appendix A of this fact sheet in section A.3.

The Department and the applicant identified the effluent as having the potential to exceed a temperature of 13°C (see §18 AAC 70.020(b)(10)(C))(see Appendix-A A.4.2) where spawning is occurring. The Department therefore determined that the temperature of the effluent and receiving water be monitored and reported in conjunction with the temperature study detailed in permit section 1.6.

TRC is no longer a monitored parameter, the chlorination and dechlorination water treatment process was replaced by the UV disinfection system. Copper, lead, and nickel were added as monitored parameters due to results of the limited expanded effluent monitoring.

3.4 Whole Effluent Toxicity Monitoring

Alaska WQS at 18 AAC 70.030 requires that an effluent discharged to a waterbody may not impart chronic toxicity to aquatic organisms, expressed as 1.0 TU_c at the point of discharge in the absence of a 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.

WET tests are laboratory tests that measure total toxic effect of an effluent on living organisms. WET tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. WET testing is included in the permit to demonstrate any potential toxicity resulting from the Palmer WWTF discharge. The two different durations of toxicity tests are acute and chronic. Acute toxicity tests measure survival over a 96-hour exposure. Chronic toxicity tests measure reductions in survival, growth, and reproduction over a 7-day exposure.

WET testing will occur twice annually, once per season. The summer season is between May 1st and September 30th. The winter season is between October 1st and April 30th.

The permit allows for WET testing frequency to be reduced to annual testing. The permittee may request a reduction in WET testing frequency after four consecutive WET monitoring results meeting permit toxicity limits. DEC will review the submitted request and WET monitoring results. WET testing frequency may only be reduced upon DEC approval.

The previous permit required that the Palmer WWTF conduct three chronic toxicity tests per permit period on the test organisms *Ceriodaphnia dubia* (water flea) and *Pimephales promelas* (fathead minnow).

The WET testing results submitted in the Palmer WWTF's 2021 Form 2A were conducted in the years 2008, 2009, and 2010. The Palmer WWTF suspended testing following 2010 and, as of May 2024, WET testing has not resumed. Due to the age of the WET testing results and the changes to the water treatment process, the results from the application were not accepted as representative of current effluent quality at the Palmer WWTF. WET testing will resume following the effective date of the permit.

Effluent monitoring for WET is required in the permit in order to provide ongoing assessment of the toxicity of the Palmer WWTF wastewater discharge and ensure compliance with 18 AAC 70.030.

Previous permits for the Palmer WWTF did not contain chronic toxicity effluent limits for this discharge. The test dilution series and the TU_c trigger in this permit is 100% 50%, 25%, 12.5%, 6.25%, and 0% (control). The permit requires accelerated WET testing if the toxicity is greater than 1.0 TU_c in any test. If the toxicity exceeds the permit trigger, six biweekly WET tests (every two weeks over a 12-week period) are required. If the Palmer WWTF demonstrates corrective actions have been implemented, only one accelerated test is required. If toxicity is greater than 1.0 TU_c in any of the accelerated tests, the Palmer WWTF must initiate a Toxicity Reduction Evaluation (TRE). A TRE is required so that specific cause of the toxicity can be identified and mitigated (see Permit Section 1.4.10 for further details).

3.5 Receiving Waterbody Limits and Monitoring

The Unnamed Stream is protected for the following uses per 18 AAC 70.020(a)(1)(A) – (C): water supply for drinking, culinary, and food processing; agriculture, including irrigation and stock watering; aquaculture; industrial activities; water recreation, both contact and secondary recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife.

The City of Palmer monitored the Unnamed Stream for pH and temperature from July 5, 2023, through March 29, 2024.

The permit establishes a receiving waterbody station in the Unnamed Stream at a location outside the influence of the Palmer WWTF's discharge at Outfall 001A to monitor ambient conditions as specified in Table 7. The monitoring station must be approved by DEC per Section 1.5.2.2 of the permit. Monitoring must start within 60 days of the effective date of the permit.

To the extent practicable, receiving waterbody sample collection must occur on the same day as the corresponding effluent sample collection, and all receiving waterbody monitoring must be performed on the same day.

Table 7: Receiving Waterbody Monitoring Requirements

Parameter	Units [a]	Sample Frequency	Sample Type
pH	SU	2/Year [b]	Grab
Temperature	° C	2/Year [b]	Grab
Hardness as $CaCO_3$	mg/L	2/Year [b]	Grab
Total Ammonia, as N	mg/L	2/Year [b]	Grab

Footnotes:

a. Units: SU= standard units, °C= degrees Celsius, mg/L = milligrams per liter.

b. One sample shall be collected per period; May 1-July 31 and August 1 – October 31.

As stated in permit section 1.5.6, sample location, sampling date, analyses performed, results of analyses, and the relevant quality assurance/quality control information will be submitted to DEC as an attachment to the DMR for the month in which sampling occurred.

3.6 Temperature Study

A temperature study shall be conducted to address temperature as a pollutant of concern. The Department reviewed information provided in the permit application which identified the concern for temperature exceedances. No form or intended means for temperature treatment of effluent for temperature was stated in the application. Based on the data submitted with the DMRs from February 2019 through June 2024, and the additional effluent temperature data submitted with the receiving water monitoring from July 2023 through March 2024, Palmer WWTF has exceeded the water quality standard of temperature of 13°C.

The temperature study shall be conducted within the permit cycle and shall be due with the application for permit reissuance. The plan for the study is due to DEC's permitting Department 180 days of the permit

effective date. The study plan must include all elements of a Quality Assurance Project Plan (QAPP) as outlined in Permit Section 2.1. Written approval from DEC is required prior to commencement of the temperature study.

One year after the effective date of the final permit and annually thereafter, the permittee shall submit an annual progress report with a summary of the progress made towards completing the temperature study.

The temperature study final report is due no later than 180 days prior to the expiration date of the permit with an application for reissuance. At minimum, the final report shall include all monitoring and additional data collected for the study, a summary as to how the permittee has met criteria listed in the 18 AAC 70 Alaska Water Quality Standards for temperature, or, if temperature water quality standards have not been met, an implementation plan to meet regulatory standards in the next permit cycle.

4.0 RECEIVING WATERBODY

4.1 Description of Receiving Waterbody

The application listed the Matanuska River as the receiving waterbody; however, DEC reviewed both the geographic location of the receiving water and the path of its drainage and determined the receiving water to be a distinct tributary to the Matanuska River. Due to the size of the stream, its length before meeting the Matanuska River, the stream's isolated water quality, and the Palmer WWTF's reasonable potential to impact the stream, DEC made the determination to distinguish the Unnamed Stream from the Matanuska River.

The Unnamed Stream is an Alaska Department of Fish and Game (ADF&G) documented stream used by anadromous fish denoted as 247-50-10220-2033-3020-4020 in the Anadromous Waters Catalog. The Unnamed Stream is a braid to the Matanuska River, running parallel to it for several miles depending on water level. The Unnamed Stream is approximately 5.95 miles in length under normal conditions. At the point where WWTF effluent meets the Unnamed Stream, it is 27.50 feet wide and 0.42 feet deep. These clear-watered side channels are the preferred locales for spawning salmon. The City of Palmer is the closest settlement to the receiving water.

4.2 Outfall Description

The Palmer WWTF continually discharges secondary-treated domestic wastewater into the Unnamed Stream via Outfall 001A at a single discharge unit located at: latitude: 61.559722°, longitude: -149.110000°. The treated wastewater is discharged subsurface. The effluent subsequently percolates up through the adjacent rock and sediment and gravity feeds to the receiving water.

4.3 Water Quality Standards

Section 301(b)(1)(C) of the CWA required the development of limits in permits necessary to meet water quality standards by July 1, 1977. Per 18 AAC 83.435, APDES permits must include conditions to ensure compliance with WQS. Additionally, regulations in 18 AAC 70 require that the conditions in permits ensure compliance with the WQS. The State's WQS are composed of waterbody use classifications, numeric and/or narrative water quality criteria, and an Antidegradation Policy. The 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. The antidegradation policy ensures that the existing uses and the level of water quality necessary to protect the uses are maintained and protected.

Waterbodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230 as listed under 18 AAC 70.230(e). Some waterbodies in Alaska can also have site-specific water quality criterion per 18 AAC 70.235, such as those listed under18 AAC 70.236(b). The previous receiving waterbody, the Matanuska River, was impaired for residue (debris). The receiving waterbody for this discharge, the Unnamed Stream, has not been reclassified, nor have site-specific water quality criteria been established.

Therefore, existing uses and designated uses are the same and Unnamed Stream must be protected for all freshwater use classes listed in 18 AAC 70.020(a)(1). These fresh water designated uses consist of the following: water supply for drinking, culinary, and food processing; water supply for agriculture, including irrigation and stock watering; water supply for aquaculture and industry; contact and secondary recreation, and growth and propagation of fish, shellfish, other aquatic life, and wildlife.

5.0 ANTIBACKSLIDING

18 AAC 83.480 requires that "interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit, unless the circumstances on which the previous permit was based have materially and substantially changed since the permit was issued, and the change in circumstances would cause for permit modification or revocation and reissuance under 18 AAC 83.135." 18 AAC 83.480(c) also states that a permit may not be reissued "to contain an effluent limitation that is less stringent than required by effluent guidelines in effect at the time the permit is renewed or reissued."

Effluent limitations may be relaxed as allowed under 18 AAC 83.480, CWA §402(o) and CWA §303(d)(4). 18 AAC 83.480(b) allows relaxed limitations in renewed, reissued, or modified permits when there have been material and substantial alterations or additions to the permitted facility that justify the relaxation or if the Department determines that technical mistakes were made.

The effluent limitations in this permit reissuance are consistent with 18 AAC 83.480. DEC considers the ammonia limit change seen in Appendix A Table A-1 as information conducive with the application of 18 AAC 83.480(b)(2), which states that information other than revised regulations, guidance, or test methods that would have justified the application of a less stringent effluent limitation is now available but was not available at the time of permit issuance, or the Department determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under 33 U.S.C. 1342(a)(1)(b). For the purposes of developing a WQBEL for ammonia, the receiving waterbody monitoring that was conducted between July of 2023 and March 2024 was recognized as new information not available at the time of permit issuance. The ammonia limit was developed using the approved methods referenced in Appendix A Table A-1.

6.0 ANTIDEGRADATION

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 waterbody's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. The State's Antidegradation policy is found in the 18 AAC 70 Water Quality Standards (WQS) regulations at 18 AAC 70.015. The Department's approach to implementing the antidegradation policy is found in 18 AAC 70.016: *Antidegradation implementation methods for discharges authorized under the federal Clean Water Act*. Both the antidegradation policy and the implementation methods are consistent with 40 CFR 131.12 and approved by EPA. This section analyzes and provides rationale for the Department's decisions in the permit issuance with respect to the antidegradation policy and implementation methods.

Using the policy and corresponding implementation methods, the Department determines a Tier 1 or Tier 2 classification and protection level on a parameter-by-parameter basis. A Tier 3 protection level applies to a designated water. At this time, no Tier 3 waters have been designated in Alaska.

18 AAC 70.015(a)(1) states that the existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected (Tier 1 protection level). The receiving water, Unnamed Stream, is not currently categorized in the most recent integrated report.

Antidegradation analysis conservatively assumes that the Tier 2 protection level applies to all other parameters, consistent with 18 AAC 70.016(c)(1).

18 AAC 70.015(a)(2) states that if the quality of water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, quality must be maintained and protected, unless the Department authorizes a reduction in water quality (Tier 2 protection level).

The Department may allow a reduction of water quality only after the specific analysis and requirements under 18 AAC 70.016(b)(5)(A-C), 18 AAC 70.016(c)(7)(A-F), and 18 AAC 70.016(d) are met. The Department's findings are as follows:

> ***18 AAC 70.016(b)(5)***
>
> ***(A)*** *existing uses and the water quality necessary for protection of existing uses have been identified based on available evidence, including water quality and use related data, information submitted by the applicant, and water quality and use related data and information received during public comment;*
>
> ***(B)*** *existing uses will be maintained and protected; and*
>
> ***(C)*** *the discharge will not cause water quality to be lowered further where the department finds that the parameter already exceeds applicable criteria in 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b).*

The water quality criteria, upon which the permit effluent limits are based, serve the specific purpose of protecting the existing and designated uses of the receiving water. Per 18 AAC 70.020 and 18 AAC 70.050, all fresh waterbodies are protected for all uses; therefore, the most stringent water quality criteria found in 18 AAC 70.020 and in the DEC Toxics manual apply and were evaluated. This will ensure existing uses and the water quality necessary for protection of existing uses of the receiving waterbody are fully maintained and protected.

The permit places limits and conditions on the discharge of pollutants. The limits and conditions are established after comparing TBELs and WQBELs and applying the more restrictive of these limits. The WQ criteria, upon which the permit effluent limits are based, serve the specific purpose of protecting the existing and designated uses of the receiving water. WQBELs are set equal to the most stringent water quality criteria available for any of the protected water use classes.

Conventional pollutants of concern in domestic wastewater are BOD_5, TSS, and pH. Additional domestic wastewater pollutants are: temperature, DO, TSS, ammonia, FC bacteria, and WET. Other pollutants of concern in the Palmer WWTF effluent are lead, copper, and ammonia. The permit includes numeric effluent limits or continued monitoring addressing each of these pollutants of concern. The permit requires facilities to implement an Operation and Maintenance (O&M) Plan to minimize the production of waste and the discharge of pollutants to waters of the U.S. to ensure that domestic wastewater facilities provide for the protection or attainment of existing and designated uses. The Matanuska has a Tier 1 total maximum daily load (TMDL) for residue (debris), but this does not apply to the permit because the Matanuska River is not being considered as the receiving waterbody and residue is not a pollutant of concern. As described in Sections 4.1 and 4.3, the receiving waterbody for this discharge, the Unnamed Stream, is not listed as impaired and is protected for all uses. The Department concludes the terms and conditions of the permit will be adequate to fully protect and maintain the existing uses of the water and that the findings under 18 AAC 70.016(b)(5) are met.

18 AAC 70.016(c)(7)(A –F) *if, after review of available evidence, the department finds that the proposed discharge will lower water quality in the receiving water, the department will not authorize a discharge unless the department finds that*

> ***18 AAC 70.016(c)(7)(A)*** *the reduction of water quality meets the applicable criteria of 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b), unless allowed under 18 AAC 70.200, 18 AAC 70.210, or 18 AAC 70.240;*

As previously stated, Section 1.2.2 of the permit requires that the discharge shall not cause or contribute to a violation of the WQS at 18 AAC 70. WQBELs are set equal to the most stringent water quality criteria available under 18 AAC 70.020(b) for any of the protected water use classes. Because of the nature of the permitted

discharges, other pollutants are not expected to be present in the discharges at levels that would cause, have the reasonable potential to cause, or contribute to an exceedance of any Alaska WQS.

The effluent end-of-pipe limits and monitoring requirements in the permit (see Table 6 and 7) protect water quality criteria, and therefore, will not violate the water quality criteria found at 18 AAC 70.020. The Alaska WQS (and associated TMDL, wasteload allocations, and margin of safety) upon which the permit effluent limits are based, serve the specific purposes of protecting the existing and designated uses.

Based on the water quality standards, the lack of WET results since 2010, and the subsequent changes to the facility, there are WET requirements imposed by the permit. The permittee must conduct WET tests two times per year to determine if the effluent is creating toxicity in the receiving water beyond the terminus of the Outfall. If WET tests reveal that the discharge could have toxicity beyond the terminus, the permittee shall perform accelerated testing and identify the source of the toxicity. The permittee must notify DEC of the exceedance in writing within two weeks of receipt of test results. WET results from this permit issuance will be used when the permittee applies for reissuance of the permit to ensure the applicable criteria of 18 AAC 70.030 are met.

Site-specific criteria as allowed by 18 AAC 70.235 have not been established for the Unnamed Stream, as listed in 18 AAC 70.236(b), and are therefore not applicable. The permit does not authorize short term variance or zones of deposit under 18 AAC 70.200 or 18 AAC 70.210; therefore does not apply.

The Department has determined the reduction of water quality meets the applicable criteria of 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b), and that the finding is met.

18 AAC 70.016(c)(7)(B) *each requirement under (b)(5) of this section for a discharge to a Tier 1 water is met;*

See 18 AAC 70.016(b)(5) analysis and findings above.

18 AAC 70.016(c)(7)(C) *point source and state-regulated nonpoint source discharges to the receiving water will meet requirements under 18 AAC 70.015(a)(2)(D); to make this finding the department will (i) identify point sources and state-regulated nonpoint sources that discharge to, or otherwise impact, the receiving water;* and *(ii) consider whether there are outstanding noncompliance issues with point source permits or required state-regulated nonpoint source best management practices, consider whether receiving water quality has improved or degraded over time, and, if necessary and appropriate, take actions that will achieve the requirements of 18 AAC 70.015(a)(2)(D); and (iii) coordinate with other state or federal agencies as necessary to comply with (i) and (ii) of this subparagraph;*

The requirements under 18 AAC 70.015(a)(2)(D) state:

(D) all wastes and other substances discharged will be treated and controlled to achieve

(i) for new and existing point sources, the highest statutory and regulatory requirements; and

(ii) for nonpoint sources, all cost-effective and reasonable best management practices;

The highest statutory and regulatory requirements are defined at 18 AAC 70.015(d):

(d) For purposes of (a) of this section, the highest statutory and regulatory requirements are

(1) any federal technology-based effluent limitation identified in 40 C.F.R. 122.29 and 125.3, revised as of July 1, 2017 and adopted by reference;

(2) any minimum treatment standards identified in 18 AAC 72.050;

(3) any treatment requirements imposed under another state law that is more stringent than a requirement of this chapter; and

(4) any water quality-based effluent limitations established in accordance with 33 U.S.C. 1311(b)(1)(C) (Clean Water Act, sec. 301(b)(1)(C)).

The first part of the definition includes all federal technology-based effluent limit guidelines (ELGs) including "For POTWs, effluent limitations based upon…Secondary Treatment" at 40 CFR § 125.3(a)(1) defined at 40 CFR § 133.102, adopted by reference at 18 AAC 83.010(e). The ELGs set standards of performance for existing and new sources and are incorporated in the permit.

The second part of the definition references the minimum treatment standards for domestic wastewater discharges found at 18 AAC 72.050. The conditions of this permit require the permittee to meet or exceed the minimum treatment standards described in 18 AAC 72.050. Wastewater operations at the Palmer WWTF often exceed minimal percent removal and concentration-based secondary treatment requirements for POTWs at 40 CFR § 133.102 and 18 AAC 72.050. The facility includes, primary treatment, MBBR, secondary clarifiers, and UV disinfection, which are designed to achieve the highest statutory and regulatory requirements. The Department finds that this requirement is met.

The third part of the definition refers to treatment requirements imposed under another state law that are more stringent than 18 AAC 70. Other regulations beyond 18 AAC 70 that apply to this permitting action include 18 AAC 15 and 18 AAC 72. Neither the regulations in 18 AAC 15 and 18 AAC 72 nor another state law that the Department is aware of impose more stringent requirements than those found in 18 AAC 70.

The fourth part of the definition refers to WQBELS. WQBELs are designed to ensure that the WQS of a waterbody are met and may be more stringent than TBELs. Section 301(b)(1)(C) of the CWA requires the development of limits in permits necessary to meet WQS by July 1, 1977. WQBELs included in APDES permits are derived from EPA-approved 18 AAC 70 WQS. APDES regulation 18 AAC 83.435(a)(1) requires that permits include WQBELs that can "achieve water quality standard established under CWA §303, including state narrative criteria for water quality." The permit requires compliance with the 18 AAC 70 WQS, including effluent limits for ammonia, bacteria, pH, DO and monitoring for other applicable WQS pollutants.

DEC reviewed the available information and determined that there are no point sources or non-point sources to the receiving water.

After review of the methods of treatment and control and the applicable statutory and regulatory requirements, including 18 AAC 70, 18 AAC 72, and 18 AAC 83, the Department finds that the discharge authorized under this general permit meets the highest applicable statutory and regulatory requirements; therefore, 18 AAC 70.016(c)(7)(C) finding is met.

18 AAC 70.016(c)(7)(D)(i-ii) *the alternatives analysis provided under (4)(C-F) of this subsection demonstrates that*

- *(i) a lowering of water quality under 18 AAC 70.015(a)(2)(A) is necessary; when one or more practicable alternatives that would prevent or lessen the degradation associated with the proposed discharge are identified, the department will select one of the alternatives for implementation; and*
- *(ii) the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the department to be the most effective and practicable.*

The City of Palmer did not submit a revised antidegradation analysis in the required Antidegradation Form 2G that included an alternatives analysis to address ammonia with regards to (4)(C-F) of this subsection. However,

(i) The alternative for which ammonia is addressed was the MBBR mentioned in Application Form 2G. The installation, stated to have occurred in 2018, has resulted in lower concentrations and loads that typically meet WQS.

The Department has determined that discharge under the limitations and requirements of the permit is identified as the only practicable alternative; therefore 18 AAC 70.016(c)(7)(D)(i) finding is met.

(ii) The methods of prevention, control, and treatment the Department finds to be most effective and reasonable are currently in use at the facility and include meeting federal (40 CFR 133) and state (18 AAC 72.050) requirements. The Palmer WWTF utilizes a variety of measures to prevent, control and treat the pollution that may be generated as a result of the facility's wastewater treatment

operations, as described in Fact Sheet Part 2.2. The facility Operation and Maintenance Plan (OMP) establishes standard operational procedures and regular maintenance schedules for the prevention, control, and treatment of all wastes and other substances discharged from the facility. The OMP that prevents or minimizes the release of pollutants into Unnamed Stream includes minimum components such as preventative maintenance, spill prevention, water conservation, and public information and education. Section 2.6 of the permit requires that pollutants removed during treatment, such as screenings and grit, be disposed of in accordance with Alaska Solid Waste Management Regulations at 18 AAC 60.

The Department has determined that the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the Department to be the most effective and practicable; therefore 18 AAC 70.016(c)(7)(D)(ii) finding is met.

18 AAC 70.016(c)(7)*(E) except if not required under (4)(F) of this subsection, the social or economic importance analysis provided under (4)(G) and (5) of this subsection demonstrates that a lowering of water quality accommodates important social or economic development under 18 AAC 70.015(a)(2)(A);*

The community of Palmer has been discharging wastewater from the community of Palmer to the Unnamed Stream under the NPDES Program since 1976 and under the APDES program since 2008. The facility currently serves an estimated population of 13,200. The Palmer WWTF treats and disposes of sewage from residential and commercial connections reducing the risk to public health, according to the Palmer's application form 2A. The Department has found that the facility routinely produces effluent quality exceeding the secondary treatment requirement of 40 CFR Part 133, adopted by reference at 18 AAC 83.010. The facility's continued operation is important to the public health and the regional economy, as well as the overall economic and social development of the State of Alaska.

The Department has determined that the operation of the Palmer WWTF and the discharges authorized by the permit demonstrate that a lowering of water quality accommodates important social or economic development; therefore, 18 AAC 70.016(c)(7)(E) finding is met.

18 AAC 70.016(c)(7)(F) *18 AAC 70.015 and this section have been applied consistent with 33 U.S.C. 1326 (Clean Water Act, sec. 316) with regard to potential thermal discharge impairments.*

Discharges authorized under the permit are not associated with a potential thermal discharge impairment; therefore, the finding is not applicable.

7.0 OTHER PERMIT CONDITIONS

7.1 Quality Assurance Project Plan

The permittee is required to develop procedures to ensure that the monitoring data submitted are accurate, and to explain data anomalies if they occur. The permittee is required to update, implement, and/or maintain the QAPP. The QAPP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples; laboratory analysis; precision and accuracy requirements; data reporting, including method detection/reporting limits; and quality assurance/quality control criteria. The permittee is required to amend the QAPP whenever any procedure addressed by the QAPP is modified. The plan shall be retained on site and made available to the Department upon request.

7.2 Operation and Maintenance Plan

The permit requires the permittee to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance are essential to meeting discharge limitations, monitoring requirements, and all other permit requirements at all times. The permittee is required to review and update the OMP that was required under the previous permit within 180 days of the effective date of the final permit to

ensure that it includes appropriate best management practices and pollution prevention measures. The plan shall be retained on site and made available to the Department upon request.

7.3 Industrial User Survey

18 AAC 83.340 requires POTWs to identify and locate all Significant Industrial Users (SIUs) that discharge process wastewaters and associated pollutants to their wastewater treatment system. General and specific pretreatment prohibitions at 40 CFR 403.5, adopted by reference at 18 AAC 83.010(g)(2), contain prohibitions that apply to each industrial user introducing pollutants into a POTW, whether or not the industrial user is subject to other National Pretreatment Standards, or any national, State, or local Pretreatment Requirements. Therefore, in order to assess whether an industry or business has the potential to violate any general or specific pretreatment prohibition, and to determine if a pretreatment program should be developed and/or if pretreatment requirements should be included in the City of Palmer WWTF wastewater discharge permit, the permittee is required to submit with their permit reissuance application: Form 2A, a list of those industries or businesses that discharge and/or have the potential to discharge non-domestic wastewater to the City of Palmer WWTF's collection system. DEC may request further information on specific industries or business to assist in this evaluation.

7.4 Electronic Discharge Monitoring Report

The permittee must submit DMR data electronically through NetDMR per Phase I of the E-Reporting Rule (40 CFR 127) upon the effective date of the permit. Authorized persons may access permit information by logging into the NetDMR Portal (https://Consent Decreexnodengn.epa.gov/oeca-netdmr-web/action/login). DMRs submitted in compliance with the E-Reporting Rule are not required to be submitted as described in permit APPENDIX A – Standard Conditions unless requested or approved by the Department. Any DMR data required by the Permit that cannot be reported in a NetDMR field (e.g. mixing zone receiving water data, etc.), shall be included as an attachment to the NetDMR submittal. DEC has established an e-Reporting Information website at https://dec.alaska.gov/water/compliance/electronic-reporting-rule that contains general information about this new reporting format.

Phase II of the E-Reporting rule will integrate electronic reporting for all other reports required by the Permit (e.g., Annual Reports and Certifications) and implementation is expected to occur during the term of the permit. Permittees should monitor DEC's E-Reporting Information website (https://dec.alaska.gov/water/compliance/electronic-reporting-rule) for updates on Phase II of the E-Reporting Rule and will be notified when they must begin submitting all other reports electronically. Until such time, other reports required by the Permit may be submitted in accordance with permit APPENDIX A – Standard Conditions.

7.5 Standard Conditions

Appendix A of the permit contains standard regulatory language that must be included in all APDES permits. These requirements are based on the regulations and cannot be challenged in the context of an individual APDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

8.0 OTHER LEGAL REQUIREMENTS

8.1 Endangered Species Act

The National Marine Fisheries Service (NMFS) is responsible for administration of the Endangered Species Act (ESA) for listed cetaceans, seals, sea lions, sea turtles, anadromous fish, marine fish, marine plants, and corals. All other species (including polar bears, walruses, and sea otters) are administered by the United States Fish & Wildlife Service (USFWS).

Per Section 7 of the ESA, federal agencies are required to consult with the National Oceanic and Atmospheric Administration (NOAA), NMFS, and the USFWS if their actions could beneficially or adversely affect any threatened or endangered species. As a state agency, DEC is not required to consult under Section 7 with these federal agencies regarding wastewater discharge permitting actions. However, this does not absolve DEC from complying with Section 9 and 10 of the ESA. DEC voluntarily contacted the agencies to notify them of the proposed permit issuance and to obtain listings of threatened and endangered species near the discharge.

DEC contacted the USFWS and the NMFS on June 6, 2024, and requested them to identify any threatened or endangered species under their jurisdiction in the vicinity of the Palmer WWTF outfall. NOAA responded in the same day and informed DEC that additional relevant parties were forwarded the notice. There was no further correspondence.

This fact sheet and the permit will be submitted to the agencies for review during the public notice period and any comments received from these agencies will be considered prior to issuance of the permit.

8.2 Essential Fish Habitat

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

As a state agency, DEC is not required to consult with NOAA on EFH; however, DEC voluntarily contacts agencies to notify them of the proposed permit issuance and to obtain listings of EFH in the area. NMFS has concluded that since the Matanuska River Basin is a freshwater system, the ADF&G "Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes" and associated Atlas are the appropriate documents for determining EFH in freshwater in Alaska. The ADF&G *"Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes"* lists the Unnamed Stream in the catalog (AWC# 247-50-10220-2033-3020-4020) as important for sockeye, coho, and chum salmon for the purposes with documented observations of spawning, and rearing.

Additionally, in accordance with state regulations at 18 AAC 70.240, no mixing zone is authorized for the discharge from the Palmer WWTF.

This fact sheet and the permit will be submitted to the agencies for review during the public notice period and any comments received from these agencies will be considered prior to issuance of the permit.

8.3 Sludge (Biosolids) Requirements

Sludge means any solid, semi-solid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. State and federal requirements regulate the management and disposal of sewage sludge (biosolids). The permittee must consult both state and federal regulations to ensure proper management of the biosolids and compliance with applicable requirements.

8.3.1 State Requirements

The Department separates wastewater and biosolids permitting. The permittee should contact the Department's Solid Waste Program for information regarding state regulations for biosolids. The permittee can access the Department's Solid Waste Program web page for more information and who to contact.

8.3.2 Federal Requirements

EPA is the permitting authority for the federal sewage sludge regulations at 40 CFR Part 503. Biosolids management and disposal activities are subject to the federal requirements in Part 503. The Part 503 regulations are self-implementing, meaning a permittee must comply with the regulations even if no federal biosolids permit has been issued for the Palmer WWTF.

A POTW is required to apply for an EPA biosolids permit. The permittee should ensure that a biosolids permit application has been submitted to EPA. In addition, the permittee is required to submit a biosolids permit application to EPA for the use or disposal of sewage sludge at least 180 days before this APDES permit expires in accordance with 40 CFR §§122.21(c)(2) and 122.21(q) [see also 18 AAC 83.110(c) and 18 AAC 83.310, respectively]. The application form is NPDES Form 2S and can be found on EPA's website, www.epa.gov, under NPDES forms. A completed NPDES Form 2S should be submitted to:

U.S. Environmental Protection Agency
Region 10, NPDES Permits Unit OWW-130
Attention: Biosolids Contact
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

The EPA Region 10 telephone number is 1-800-424-4372. Information about EPA's biosolids program and CWA Part 503 is available at www.epa.gov and either search for 'biosolids' or go to the EPA Region 10 website link and search for 'NPDES Permits'.

8.4 Permit Expiration

The permit will expire five years from the effective date of the permit.

9.0 References

Alaska Department of Environmental Conservation. 18 AAC 72 Wastewater Disposal, as amended through April 26, 2024.

Alaska Department of Environmental Conservation. 18 AAC 83 Alaska Pollutant Discharge Elimination System Program, as amended through April 26, 2024.

Alaska Department of Environmental Conservation. 18 AAC 70 Water Quality Standards, as amended through November 13, 2022.

Alaska Department of Environmental Conservation, "Alaska's Final 2014-16 Integrated Water Quality Monitoring and Assessment Report," April 12, 2019.

Alaska Department of Environmental Conservation, "Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances," as amended through December 12, 2008.

Alaska Department of Environmental Conservation, "Alaska Pollutant Discharge Elimination System permits reasonable potential analysis and effluent limits development guide."

USEPA, "EPA Regions 8, 9 and 10 Toxicity Training Tool," January 2010, pdf files located at: http://www.epa.gov/region8/water/wet/ToxTrainingTool10Jan2010.pdf

USEPA, "Technical Support Document for Water Quality-based Toxics Control," EPA/505/2-90-001, USEPA Office of Water, Washington, DC, March 1991.

USEPA, "Water Quality Standards Handbook: Second Edition," EPA-823-B-94-005a, USEPA, Washington, DC, August 1994.

APPENDIX A. BASIS FOR EFFLUENT LIMITATIONS

A.1 Statutory and Regulatory Basis

18 Alaska Administrative Code (AAC) 70.010 prohibits conduct that causes or contributes to a violation of the water quality standards (WQS). 18 AAC 15.090 requires that permits include terms and conditions to ensure criteria are met, including operating, monitoring, and reporting requirements.

The regulations require the permitting authority to make this evaluation using procedures that account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving waterbody. The limits must be stringent enough to ensure that WQS are met and must be consistent with any available wasteload allocation. The Clean Water Act (CWA) requires a Publicly Owned Treatment Works (POTWs) to meet effluent limits based on available wastewater treatment technology, specifically, secondary treatment effluent limit standards found at Title 40 Code of Federal Regulations (CFR) 133, adopted by reference at 18 AAC 83.010(e). The Alaska Department of Environmental Conservation (Department or DEC) may find, by analyzing the effect of an effluent discharge on the receiving waterbody, that secondary treatment effluent limits are not sufficiently stringent to meet Alaska WQS. In such cases, the Department is required to develop more stringent water quality-based effluent limits (WQBELs), which are designed to ensure that the WQS of the receiving waterbody are met.

Secondary treatment effluent limits for POTWs do not limit every pollutant that may be present in the effluent. Limits have only been developed for five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH. Effluent from a POTW may contain other pollutants, such as bacteria, ammonia, or metals, depending on the type of treatment system used and the quality of the influent to the POTW. When technology based effluent limits (TBELs) do not exist for a pollutant expected to be present in the effluent, the Department must determine if the pollutant may cause or contribute to an exceedance of a water-quality criterion for the waterbody. If a pollutant causes or contributes to an exceedance of a water-quality criterion, a WQBEL for the pollutant must be established in the permit.

If DEC does not authorize a mixing zone, water quality criteria are applied at the end of the pipe, and TBELs are selected for those parameters that are solely technology based. A mixing zone is not authorized for the City of Palmer WWTF discharge; therefore, water quality criteria apply at the end of the pipe.

Table A-1 summarizes the basis for effluent limits contained in the permit. Further details for each effluent limit follow in this section.

Table A-1- Basis for Effluent Limits

Parameter	Units [a]	EFFLUENT LIMITS				
		Daily Minimum	Monthly Average	Weekly Average	Daily Maximum	Basis for Limit
Total Discharge Flow	mgd	---	---	---	0.95	18 AAC 72.245
BOD_5	mg/L	---	30	45	60	18 AAC 83.010(e) 18 AAC 83.540
	lbs/day	---	238	375	475	
TSS	mg/L	---	30	45	60	18 AAC 83.010(e) 18 AAC 83.540
	lbs/day	---	238	375	475	
BOD_5 & TSS Minimum Percent Removal	%	85				18 AAC 83.010(e)

pH	S.U.	6.5	---	---	8.5	18 AAC 70.020(b)(6)
Dissolved Oxygen (DO)	mg/L	7	---	---	17	18 AAC 70.020(b)(3)
Fecal Coliform (FC) Bacteria	FC/100 mL	---	20	---	40	18 AAC 70.020(b)(2)(A)
Escherichia coli (E. coli)	cfu/100mL	---	126	---	410	18 AAC 70.020(b)(2)(B)
Total Ammonia as Nitrogen	mg/L	---	2.69	4.03	6.41	18 AAC 70.020(b)(11) 18 AAC 83.530 18 AAC 83.540
	lbs/day		21	32	51	
Whole Effluent Toxicity (WET)	TU_c	---	---	---	1.0	18 AAC 70.030

Footnotes:

a. Units: mgd = million gallons per day, mg/L = milligrams per liter, lbs/day = pounds per day, S.U. = standard units, FC/100 mL = Fecal Coliform per 100 milliliters, cfu/100 mL = colony forming units per 100 milliliters, µg/L= micrograms per liter, ºC =degrees Celsius TU_c = toxic unit chronic.

A.2 Secondary Treatment Effluent Limitations

The CWA requires a POTW to meet requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment", that all POTWs were required to meet by July 1, 1977. The secondary treatment standards in 40 CFR §133.102, which the Department has adopted in 18 AAC 83.010(e), are TBELs that apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD_5, TSS, and pH. In addition to the federal secondary treatment regulations in 40 CFR Part 133, the State of Alaska requires maximum daily limitations (MDLs) of 60 milligrams per liter (mg/L) for BOD_5 and TSS in its own secondary treatment regulations [18 AAC 72.990(59)]. The secondary treatment effluent limits are listed in Table A-2.

Table A- 2: Secondary Treatment Effluent Limits

Parameter	Units	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Average Monthly Minimum Removal
BOD_5	mg/L	30	45	60	85%
TSS	mg/L	30	45	60	
pH	Standard Units (SU)	6.0 – 9.0 s.u. at all times			

A.3 Water Quality Based Effluent Limits

WQBELs included in Alaska Pollutant Discharge Elimination System (APDES) permits are derived from WQS. APDES regulation 18 AAC 83.435(a)(2) requires that permits include WQBELs that can achieve WQS

established under CWA Section 303, including state narrative criteria for water quality. The State'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. designated uses are those uses specified in WQS for each waterbody or segment whether or not they are being attained [40 CFR Section 131.3(f)]. Existing uses are those uses actually attained in a waterbody on or after November 28, 1975, whether or not they are included in the WQS [40 CFR Section 131.3].

Waterbodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230 as listed under 18 AAC 70.230(e). Some waterbodies in Alaska can also have site–specific water quality criteria per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b).

The receiving waterbody for the discharge, the Unnamed Stream, has not been reclassified, nor have site-specific water quality criteria been established. Therefore, the Unnamed Stream must be protected for all fresh water designated uses. The WQS at 18 AAC 70.020(a) designates classes of water for beneficial uses of water supply, water recreation, and of growth and propagation of fish, shellfish, other aquatic life, and wildlife.

A.3.1 pH

Alaska WQS at 18 AAC 70.020(b)(6)(A)(iii) (aquaculture) and 18 AAC 70.020(b)(6)(C) (Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife) states that the pH water quality criteria may not be less than 6.5 or greater than 8.5. SU and may not vary more than 0.5 pH unit from natural conditions.

DEC reviewed 32 pH effluent monitoring results of the Palmer WWTF from January 2019 through June 2023. During this period, the average minimum pH value observed was 6.86 SU and the average maximum pH value was 7.24 SU. The previous permit implemented WQBELs for pH that required a minimum of 6.5 SU and a maximum of 8.5 SU, monitored at a frequency of five times per week. The effluent limits and monitoring frequency requirement are carried forward in the present permit.

A.3.2 Dissolved Oxygen

18 AAC 70.020(b)(3)(C) states DO must be greater than 7 mg/l in waters used by anadromous or resident fish. In no case may DO be less than 5 mg/l to a depth of 20 cm in the interstitial waters of gravel used by anadromous or resident fish for spawning (see note 2). For waters not used by anadromous or resident fish, DO must be greater than or equal to 5 mg/l. In no case may DO be greater than 17 mg/l. The concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection.

DEC reviewed DMR data from February 2019 through July 2024. During this period, Palmer WWTF frequently exceeded 7mg/L for the designated use and has indicated higher effluent quality and stable performance following facility upgrades and troubleshooting as of 2024. The Palmer WWTF is not authorized a mixing zone in the receiving waterbody, therefore WQS criteria apply at the end of pipe prior to discharge.

A.3.3 Fecal Coliform (FC) Bacteria

The most stringent WQS is found at §18 AAC 70.020(b)(2)(A)(i) stating that in a 30-day period, the geometric mean may not exceed 20 FC/100 ml, and not more than 10% of the samples may exceed 40 FC/100 ml.

DEC reviewed DMR data from February 2019 through July 2024. Of the 66 results reviewed, 19 exceeded the monthly water quality standard and 25 exceeded the daily water quality standards. Effluent quality standards seem to have improved after November 2023; however, exceedances are still occurring. DEC is applying the WQS of 20 FC/100mL monthly average limit, and 40 FC/100/mL daily maximum as year round

effluent limits because the Palmer WWTF is not authorized a mixing zone in the receiving waterbody. The seasonal limit in the previous permit for the months of September through June are therefore replaced by the more stringent limit.

A.3.4 Escherichia coli (E. coli)

18 AAC 70.020(b)(2)(B)(i) states that for the designated use of contact recreation, in a 30-day period, the geometric mean of samples may not exceed 126 *Escherichia coli (E. coli*) colony forming units (cfu)/100ml, and not more than 10% of the samples may exceed a statistical threshold value (STV) of 410 *E. coli* cfu /100 ml.

In January 2017, DEC adopted EPA's recommended recreational water quality criteria (RWCQ) and revised 18 AAC 70.020(b)(2)(B)(i) to adopt E. coli as the recommended contact recreation WQ criteria for fresh waters. The water quality criteria for E. coli bacteria are a monthly geometric mean of 126 colony forming units (cfu)/100 mL and a statistical threshold value of 410 cfu /100 mL. EPA approved DEC's revised bacteria water quality criteria on May 15, 2017. Effluent monitoring is required on a monthly basis from May through September, to be performed in conjunction with fecal coliform bacteria monitoring, when primary contact recreation in which full immersion and ingestion of water is more likely to occur.

DEC established limits for E. coli as exceedances associated with fecal coliform have been observed.

A.3.5 Total Ammonia as N

Total ammonia is the sum of ionized (NH_4^+) and un-ionized ammonia (NH_3). Temperature, pH, and salinity affect which form NH_4^+ or NH_3, is present. NH_3 is more toxic to aquatic organisms than NH_4^+ and predominates with higher temperature and pH. Biological wastewater treatment processes reduce the amount of total nitrogen in domestic wastewater; however, without advanced treatment, wastewater effluent may still contain elevated levels of ammonia nitrogen. Excess ammonia as nitrogen in the environment can lead to dissolved oxygen depletion, eutrophication, and toxicity to aquatic organisms.

DEC derived ammonia criteria from the Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances (DEC, 2022). DEC used the 85th percentile of the pH (7.93 SU) and temperature (8.57°C) data, as per DEC RPA guidance, from receiving water data collected by the City of Palmer from the Unnamed Stream from July 2023 through March 2024 to establish an acute ammonia water quality criterion of 6.41 mg/L and a chronic ammonia water quality criterion of 2.69 mg/L.

18 AAC 83.530(d) requires effluent limits from a continuously discharging POTW to be stated as average weekly and monthly limits unless impracticable. Secondary treatment standards at 18 AAC 83.605 establishes average weekly limits (AWLs) as being 1.5 times the average monthly limit (AML). Following this precedent, the AWL for ammonia is derived by multiplying ammonia's unrounded AML of 2.69 mg/L by 1.5 to obtain an AWL of 4.03 mg/L.

A.3.6 WET

18 AAC 70.030 An effluent discharged to a water may not impart chronic toxicity to aquatic organisms, expressed as 1.0 chronic toxic unit, at the point of discharge, or if the Department authorizes a mixing zone in a permit, approval, or certification, at or beyond the mixing zone boundary, based on the minimum effluent dilution achieved in the mixing zone. If the Department determines that an effluent has reasonable potential to cause or contribute to exceedance of the whole effluent toxicity limit, the Department will require whole effluent toxicity testing as a condition of a permit, approval, or certification.

A.3.7 Mass-Based Limitations

APDES regulations at 18 AAC 83.540 require that effluent limits be expressed in terms of mass unless they cannot appropriately be expressed by mass, if it is infeasible, or if the limits can be expressed in terms of other units of measurement. In addition, 18 AAC 83.520 requires that effluent limits for a POTW be calculated based on the design flow of the facility in million gallons per day (mgd). The last DEC-approved design flow submitted in a permit application for the Palmer WWTF was 0.95 mgd. The Department used the design flow to calculate loading limits in the permit for BOD_5, TSS, and ammonia. Expressing limitations in terms of concentration as well as mass encourages the proper operation of a facility at all times. The mass-based limits are expressed in pounds per day (lbs/day) and are calculated as follows:

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

Where: 8.34 is a conversion factor with units (lbs x L) / (mg x gallon x 106)

A.3.8 Flow

The Department established the most recent approved design flow rate of 0.95 MGD as the permit's daily maximum flow limit. This design flow is also in mass-based limitations calculations as described in A.3.7.