



**ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM
GENERAL PERMIT FACT SHEET - FINAL**

Permit Number: AKG572000

**Small Publicly Owned Treatment Works (POTW) and other Small
Treatment Works Providing Secondary Treatment of Domestic
Wastewater and Discharging to Surface Water**

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

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[Alaska Online Public Notice System](#)

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Proposed reissuance of an Alaska Pollutant Discharge Elimination System (APDES) permit to

**Small Publicly Owned Treatment Works (POTW) and other Small Treatment Works
Providing Secondary Treatment of Domestic Wastewater and Discharging to Surface Water**

For wastewater discharges from

Statewide small POTW's and other small treatment works

The Alaska Department of Environmental Conservation (the Department or DEC) proposes to reissue Alaska Pollutant Discharge Elimination System (APDES) general permit to small POTWs and other small privately-owned treatment works providing secondary treatment of domestic wastewater discharging to waters of the United States (U.S.) in the State of Alaska. The general permit places conditions on the discharge of pollutants from authorized facilities to waters of the U.S. 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 authorized facilities and outlines best management practices to which the facility must adhere.

This fact sheet explains the nature of potential discharges from small domestic wastewater facilities 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

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 15 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
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800

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

See <http://www.dec.state.ak.us/commish/InformalReviews.htm> 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:

Office of the Commissioner
Alaska Department of Environmental Conservation
Mail: PO Box 111800
Juneau AK, 99811-1800
In Person: 410 Willoughby Street

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, 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 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 610 University Avenue Fairbanks, AK 99709 (907) 451-2183
Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 410 Willoughby Avenue, Suite 310 Juneau, AK 99801 (907) 465-5180	

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1.0 INTRODUCTION

1.1 Basis for Issuance of a General Permit

Section 301(a) of the Clean Water Act (CWA) and Title 18 Alaska Administrative Code (AAC) 83.015 provides that the discharge of pollutants is unlawful except in accordance with an Alaska Pollutant Discharge Elimination System (APDES) permit. Although such permits can be issued to individual dischargers, Alaska Department of Environmental Conservation (DEC or Department) regulations at 18 AAC 83.205 authorizes to issue an APDES general permit written to cover one or more categories or subcategories of discharges when a number of point sources:

- are located within the same geographic area and warrant similar pollution control measures;
- are involved in the same or substantially similar types of operations;
- discharge the same types of wastes;
- require the same effluent limits or operating conditions;
- require the same or similar monitoring requirements; and
- in the opinion of the Department, are more appropriately controlled under a general permit than under individual permits.

A violation of a condition contained in a general permit constitutes a violation of the CWA and subjects the owner or operator of the permitted discharge to the penalties specified in Section 309 of the CWA. Regulations at 18 AAC 83.210(a) allows a general permit to be administered according to the individual permit regulations found in 18 AAC 83.115 and 18 AAC 83.120, so the general permit may be administratively extended past the expiration date if the general permit expires prior to a new general permit being reissued provided the permittee submits a timely and complete application for a new permit prior to the expiration of the current permit.

1.2 Permit Issuance History

In 2004, the Environmental Protection Agency (EPA) identified approximately 100 small publicly owned treatment works (POTWs) and privately-owned treatment works in Alaska as candidates for general permit coverage. These were smaller facilities discharging less than 1.0 million gallons per day (mgd), treating predominately domestic wastewater to secondary treatment or equivalent to secondary treatment standards, and discharging to waters of the United States (U.S.) in the State of Alaska. The types of operations at these facilities, the wastewater discharged, operating conditions, effluent limits, and monitoring requirements were all similar in nature. Therefore, EPA determined that a general permit was the appropriate National Pollutant Discharge Elimination System (NPDES) permit mechanism for these dischargers.

Alaska Water Quality Standards (WQS), which are codified in 18 AAC 70, contain separate water quality criteria for fresh and marine water. Upon further evaluation by EPA, EPA concluded that two general permits were necessary to address the low-volume domestic discharges; one for facilities that discharged to freshwater (Permit Number AKG570000) and one for facilities that discharged to marine water (Permit Number AKG571000). Because the Alaska WQS contain water quality criteria (which serve as the basis for water quality-based permit limitations) that are different for freshwater

and marine dischargers, EPA opted for two general permits in order to clarify the requirements. Both general permits became effective July 21, 2004, and expired July 21, 2009.

In October 2008, the Department received approval from EPA to administer the NPDES Program in the State of Alaska. Rather than reissuing AKG570000 and AKG571000 as EPA had first issued them in 2004, the Department determined that it would be more effective to restructure the general permits according to specific wastewater operations. The Department originally identified four different operations for development into separate general permits: mechanical treatment plants, lagoons, facilities that discharge to tundra wetlands, and common collectors.

In September 2012, the Department reissued general permits AKG570000 and AKG571000 as one general permit, AKG572000, for mechanical treatment plants. AKG572000 authorized discharges from facilities that primarily use a mechanical means to treat domestic wastewater and discharge to surface water. AKG572000 excluded wastewater treatment lagoons, common collectors, and facilities that discharge to land or dry tundra. Facilities previously authorized to discharge under either AKG570000 or AKG571000 that do not qualify for coverage under AKG572000 were administratively extended under the expired general permits. Since the issuance of AKG572000, DEC also issued a general permit for wastewater treatment lagoons, AKG573000. Types of facilities and discharges not covered by AKG572000 are listed in Section 1.3 of the permit.

AKG572000 became effective November 1, 2012 and expired on October 31, 2017. It was then reissued on August 14, 2017, and became effective on October 1, 2017, with an expiration date of September 30, 2022. The Department may administratively extend this permit and subsequent authorizations until the reissuance is complete and in effect.

1.3 Description of Wastewater Treatment Facility Operations

The operations at wastewater treatment facilities (WWTF) that will be covered under the reissued 2022 AKG572000 General Permit generally include preliminary processes (e.g., pumping, screening, and grit removal), primary settling treatment in large primary clarifiers or sedimentation tanks to remove settleable suspended solids, and biological secondary treatment processes. The secondary treatment step is often achieved by an activated sludge system in which wastewater is continuously fed into an aerated tank where it is mixed with an active mass of microorganisms (i.e., activated sludge) capable of aerobically degrading organic matter. After a specific treatment time, the mixed liquor passes into a secondary clarifier where the sludge settles under quiescent conditions and a clarified effluent is produced for discharge. Most facilities provide some level of disinfection either via chlorination or ultra-violet radiation prior to discharge.

Identified pollutants of concern include the conventional domestic wastewater pollutants pH, five day biological oxygen demand (BOD₅), total suspended solids (TSS), dissolved oxygen (DO), and fecal coliform (FC) bacteria. Total residual chlorine (TRC) is also a pollutant of concern where chlorine is used for disinfection of wastewater to treat pathogens. The general permit includes numeric or narrative effluent limitations addressing each of these pollutants of concern. The general permit additionally contains monitoring and reporting requirements for escherichia coli (E. coli) and enterococci bacteria.

Advanced technologies used increasingly in Alaska include membrane bioreactors (MBR). MBRs combine the use of biological processes and membrane technology to provide a high standard of

wastewater treatment. Instead of the secondary clarifier used in the activated sludge process, flow in the MBR system passes through a microporous membrane while solids and large bacteria remain in the treatment system for biological degradation. MBRs can operate at longer solids detention times, thereby not only enhancing the treatment of organic matter, but producing less waste biosolids (or sludge).

The waste biosolids generated by the treatment processes is generally thickened and processed for ultimate disposal. Dewatered biosolids in Alaska are generally either co-incinerated, placed in the municipal solid waste landfill, or land applied. However, biosolids handling and disposal are regulated under separate federal regulations and therefore are not addressed by the general permit.

2.0 PERMIT COVERAGE

2.1 Facilities and Discharges Covered by the Permit

Coverage under the general permit is limited to WWTFs that treat primarily domestic wastewater to secondary treatment standards, have actual and design flow of less than 1.0 mgd, and that discharge through a discrete conveyance (i.e., outfall line, drainage ditch, channel) directly to or within 100 feet of fresh or marine surface water.

There are 95 WWTFs that were authorized to discharge under AKG572000 that are eligible for coverage under the reissued general permit. The facilities, listed in Appendix D of the permit, use processes similar to the description of operations described in Fact Sheet Section 1.3. DEC will review the notice of intents (NOIs) submitted from the previously authorized WWTFs for continued authorization to discharge and will amend, as necessary, any existing authorization to reflect current operations and general permit requirements.

2.2 Automatic Coverage

18 AAC 83.210(h) provides that the Department may notify a discharger that their discharge is covered by a general permit even if the discharger has not submitted a NOI seeking coverage. A discharger so notified may request an individual permit under 18 AAC 83.215(b).

2.3 Applying for Coverage

The Department anticipates that there are additional facilities that should obtain coverage under the general permit. The procedure for obtaining authorization to discharge under the general permit is as follows:

- 2.3.1 The eligible facility submits a completed NOI to the Department at least 30 days prior to the expected start of discharge. See General Permit Section 1.4 for specific notification requirements.
- 2.3.2 The Department reviews the NOI for completeness.

- 2.3.3 If the NOI is considered complete and the facility is considered eligible for coverage under the general permit, the Department sends the permittee a written notice of authorization. Authorization to discharge under the general permit does not begin until the permittee receives a written notice of authorization, including a permit number, from the Department. If the Department determines that the NOI is incomplete, the Department will request additional information be submitted. If the Department determines that the facility is not eligible for coverage under the general permit, authorization will be denied and, if appropriate, the applicant will be directed to submit an application for an individual permit.

Pursuant to 18 AAC 83.215(a), DEC may require any permittee applying for, or covered by a general permit, to apply for and obtain an individual permit. In addition, any interested person may petition the Department to take this action. The Department may consider the issuance of an individual permit when: the discharger is not in compliance with conditions of the general permit; a change has occurred in the availability or demonstrated technology or practices; effluent limitations guidelines are promulgated for point sources covered by the general APDES permit; a water quality management plan is approved; circumstances have changed so that the discharger is no longer appropriately controlled under the general permit; the Department determines that the discharge is significant; or, a total maximum daily load has been completed for the impaired receiving water.

APDES regulations at 18 AAC 83.215(b) allow any owner or operator authorized by a general permit to request to be excluded from the coverage of the general permit by applying for an individual permit. The responsible party shall submit an individual permit application (Form 2A and Form 2M if requesting a mixing zone) with reasons supporting the request to the Department no later than 90 days after the publication of the general permit. The request shall be processed under the provisions of 18 AAC 83.115 and 18 AAC 83.120. The Department will grant the request by issuing an individual permit if the reasons cited by the responsible party are adequate to support the request.

Pursuant to 18 AAC 83.215(d), a permittee who already has authorization to discharge under an individual permit may request general permit coverage. If the Department approves coverage under a general permit, the individual permit is revoked.

3.0 COMPLIANCE HISTORY

There is a current total of 95 WWTFs authorized to discharge under AKG572000. Throughout this permit cycle, there were a total of 22 authorizations terminated due to facility closures and/or system changes and an additional 23 WWTFs added that received authorizations to discharge. These were predominantly new facilities without any prior coverage. In order to evaluate the compliance of WWTFs currently authorized under AKG572000, DEC reviewed the DMR data submitted by facilities through the NetDMR E-reporting system, violation reports generated from the Integrated Compliance Information System (ICIS) as well as completed inspections count reports.

Of the 95 currently authorized, there were approximately 70 inspections conducted over the course of this last permit cycle that included both on and offsite inspections, which resulted in the issuance of both informal and formal enforcement actions due to varying degrees of non-compliance.

As was done in the last reissuance, DEC chose to review FC bacteria and TRC maximum daily limit (MDL) violations to determine compliance with the general permit effluent limits, as these pollutants have the highest potential to endanger public health or the environment.

The FC effluent limits in the authorizations range from 40 FC/100 milliliter (mL) to 1,200 FC/100 mL with a majority of them having 800 FC/100 mL as the MDL. DEC's review of the DMR data from November 2017 through May 2022 revealed that 38 of the WWTFs exceeded their FC MDL at least once during this permit cycle, and at least 31 of these WWTFs exceeded more than once. Monitoring results varied from 270 FC/100 mL to greater than 2,000,000 and results that were too numerous to count. 38 of the 98 WWTFs have TRC limits and 12 of the 38 exceeded the TRC MDL of 1.0 milligrams per liter (mg/L) at least once. Results ranged from 1.24 mg/L to 6.8 mg/L.

In terms of compliance with monitoring and reporting according to the frequencies established in the general permit for each class type, compliance varied from some facilities that did not report any results during discharge periods to other facilities that were consistent with monitoring according to the terms of their authorizations. The Department was also made aware of both staff shortages and intermittent mail and service disruptions due to the pandemic at various facility locations.

It is beyond the scope and intent of this section to provide specific details on each WWTF's compliance history. For facility-specific discharge monitoring results, see EPA's Enforcement and Compliance History Online (ECHO) database at <https://echo.epa.gov/>.

4.0 EFFLUENT LIMITS

4.1 Basis for Permit 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 meet standards reflecting levels of technological capability, comply with 18 AAC 70 Water Quality Standards (WQS) and 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 technology-based effluent limits (TBEL) or water quality-based effluent limits (WQBEL). TBELs are set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the WQS of a waterbody are met and may be more stringent than TBELs. A discussion of the basis for the effluent limits contained in AKG572000 follows.

4.2 Technology-Based Effluent Limits

5-Day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, and Total Residual Chlorine (TRC)

In establishing permit limits, DEC first determines if there are applicable TBELs. 18 AAC 83.430 requires that, if applicable, TBELs and standards subject to the provisions of 40 Code of Federal Regulations (CFR) §122.29(d), adopted by reference in 18 AAC 83.010, must be included in an APDES permit. Section 301 of the CWA established a required technology-based performance level,

referred to as “secondary treatment,” that all POTWs were required to meet by July 1, 1977. “Secondary treatment” TBELs are established in 40 CFR §133.102 [adopted by reference at 18 AAC 83.010(e)]. The TBELs apply to all POTWs and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of the pollutants BOD₅, TSS, pH, and TRC.

Per 40 CFR §125.3(c)(2), the Department is also using best professional judgment under Section 402(a)(1) of the CWA to implement case-by-case technology-based secondary treatment requirements for non-POTWs (i.e., privately-owned treatment facilities) authorized to discharge domestic wastewater under this general permit. The secondary treatment requirements found in 40 CFR §133.102 were promulgated specifically for POTWs. While secondary requirements only directly apply to POTWs, the Department is applying secondary treatment standards to the privately-owned treatment facilities covered by this permit as they are identical to POTWs in mechanics and treatment efficacy, and accordingly, (the secondary standards) provide the most meaningful baseline pollutant control guidelines for this sector of privately-owned treatment facilities and discharges.

Monthly, weekly, and percent removal BOD₅ and TSS effluent requirements as well as pH minimum and maximum effluent limits may be found in the federal secondary treatment regulations at 40 CFR §133. Additionally, a MDL of 60 mg/L for BOD₅ and TSS is included in the general permit (as was required in the previous general permits) to meet the conditions of 18 AAC 83.480 (reissued permits) that require effluent limits, standards, or conditions to be at least as stringent as the final effluent limits, standards, or conditions in the previous permit.

The permits in the prior permit cycle(s) incorporated the State Water Quality Standards (WQS) in the *Alaska Water Quality Criteria Manual for Toxic And Other Deleterious Organic and Inorganic Substance* (adopted by reference 18 AAC 70.020(b)) as the Water Quality Based Effluent Limits (WQBEL’s) for TRC per 18 AAC 83.480 (reissued permits).

The initial general permit originally based some authorized TRC effluent limits on a best professional judgement TBEL as follows:

The TRC limit of 0.5 mg/L is not found at 40 CFR §133.102 [adopted by reference at 18 AAC 83.010(e)] nor is it a state regulation; rather it is derived from standard domestic wastewater treatment operating practices. The Water Pollution Control Federation's (WPCF) Chlorination of Wastewater (1976), indicates that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual concentration is maintained after 15 minutes of contact time. The WPCF concluded that a treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/L limit on a monthly average basis.

An AML of 0.5 mg/L for TRC was applied as a TBEL in the previous issuance of AKG572000 for facilities with authorized TRC mixing zones. (See Fact Sheet Section 6.0 for a discussion on mixing zones.) AKG572000 also contained a TRC MDL of 1.0 mg/L. Consistent with the conditions of 18 AAC 83.480 (reissued permits) that require effluent limits, standards, or conditions to be at least as stringent as the final effluent limits, standards, or conditions in the previous permit, and in the absence of new information the TRC limits that were applied as TBELs in the previous permit are being retained as TRC TBELs in this permit. For permittees that have gone through treatment upgrades in any way that include implementing dechlorination, then the water quality standards Water Quality Based Effluent Limits in Tables 2-5 may apply.

TBELs for this general permit are presented in Table 1.

Table 1: Technology-Based Effluent Limits

Parameter	Average Monthly Limit (mg/L)	Average Weekly Limit (mg/L)	Maximum Daily Limit (mg/L)	Percent Removal (%)	Basis for Limit
BOD ₅	30	45	60	85	18 AAC 83.010(e)
TSS	30	45	60	85	18 AAC 83.010(e)
pH	within the range of 6.0 - 9.0 standard units (s.u.)				18 AAC 83.010(e)
TRC	0.5	---	1.0	---	18 AAC 83.480

4.3 Water Quality-Based Effluent Limits

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 18 AAC 70 WQS. APDES regulations 18 AAC 83.435(a)(1) require that permits include WQBELs that “achieve water quality standard established under CWA §303, including State narrative criteria for water quality.” The WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy (see Fact Sheet Section 8.0 for a discussion on antidegradation). The use classification system designates the 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 use classification of each waterbody. The antidegradation policy ensures that the existing uses and necessary water quality are maintained.

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 may also have site-specific water quality criteria per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b).

AKG572000 authorizes discharges of secondary treated domestic wastewater to both fresh and marine waterbodies. The designated uses for freshwater are water supply for drinking, culinary, and food processing, agriculture, aquaculture, and industrial; contact and secondary recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife. The designated uses for marine water are water supply for aquaculture, seafood processing, and industrial; contact and secondary recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life. Numeric WQS criteria for freshwater uses and marine uses can be different and are noted below.

4.3.1 Total Residual Chlorine

Alaska WQS for toxic and other deleterious organic and inorganic substances for freshwater uses are codified in 18 AAC 70.020(b)(11) and for marine water uses in 18 AAC 70.020(b)(23). TRC criteria provide protection for aquatic life. For freshwater the WQS requires that TRC may not exceed either an acute concentration of 0.019 mg/L or a chronic concentration of 0.011 mg/L. For marine water

the WQS requires that TRC may not exceed either an acute concentration of 0.013 mg/L or a chronic concentration of 0.0075 mg/L.

4.3.2 Fecal Coliform Bacteria

Alaska WQS at 18 AAC 70.020(b)(2)(A) provides protection for freshwater designated for drinking, culinary, and food processing water supply. The WQS requires 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. WQS at 18 AAC 70.020(b)(14)(D) provides protection for marine water designated for harvesting for consumption of raw mollusks or other raw aquatic life. The WQS require that in a 30-day period, the geometric mean of samples may not exceed 14 FC/100 mL, and not more than 10 percent of the total samples may exceed 43 most probable number (MPN)/100 mL in a five-tube decimal dilution test.

4.3.3 Dissolved Oxygen

Alaska WQS at 18 AAC 70.020(b)(3) states that surface dissolved oxygen (DO) for freshwater uses to include the growth and propagation of fish, shellfish, other aquatic life, and wildlife must be greater than 7 mg/L and in no case may DO be greater than 17 mg/L. WQS at 18 AAC 70.020(b)(15)(C) states that surface DO for marine water uses to include the growth and propagation of fish, shellfish, other aquatic life, and wildlife must be greater than 6 mg/L and that in no case may DO be greater than 17 mg/L.

4.3.4 pH

Alaska WQS for pH at 18 AAC 70.020(b)(6) for freshwater uses and 18 AAC 70.020(b)(18)(C) for marine uses provides protection for the growth and propagation of fish, shellfish, other aquatic life, and wildlife. The WQS for both freshwater and marine water pH may not be less than 6.5 s.u. or greater than 8.5 s.u.

4.3.5 Escherichia coli (E.coli) and Enterococci Bacteria

E. coli and enterococci bacteria are indicator organisms of harmful pathogens recommended by EPA as the best indicator of health risk in water used for recreation. They are also a better indicator of acute gastrointestinal illness arising from swimming-associated activities than FC bacteria.

In 1986 EPA published Ambient Water Quality Criteria for Bacteria that contained recommended bacteria water quality criteria for primary contact recreational users. The Beaches Environmental Assessment and Coastal Health Act of 2000 requires states and territories with coastal recreation waters to adopt bacteria criteria into their WQS that are at least as protective as EPA's 1986 published bacteria criteria by April 10, 2004. Alaska did not adopt the enterococci bacteria into the WQS by the April 10, 2004 deadline, therefore EPA promulgated the 1986 bacteria criteria for Alaskan coastal recreational waters in 2004. Accordingly, monitoring for enterococci bacteria was required for all facilities authorized to discharge under the previous permit.

In 2012 EPA issued updated recreational water quality criteria (RWQC) bacteria recommendations to protect human health in all coastal and non-coastal waters designated for primary contact recreation use. Primary contact recreation includes swimming, bathing, surfing, water skiing, tubing, play by children, and similar water contact activities where a high degree of bodily contact with water, immersion, and ingestion are likely. EPA's RWQC contains two sets of water quality criteria values for enterococci and E. coli bacteria. States can choose an estimated illness rate of either 32

illnesses per 1,000 people, or 36 illnesses per 1,000 people. Either set of criteria recommendations protect primary contact recreation. The criteria are described by both a 30-day geometric mean and statistical threshold value (STV) whereby the STV approximates the 90th percentile of the water quality distribution and is intended to be a value that should not be exceeded by more than 10 percent of the samples taken in the same 30-day period.

In January 2017, DEC adopted EPA's recommended RWCQ at the 36 illnesses per 1,000 people risk level and revised 18 AAC 70.020(b)(2)(B)(i) to adopt *E. coli* as the recommended freshwater WQ criteria for contact recreation and 18 AAC 70.020(b)(14)(B)(i) to adopt enterococci as the recommended contact recreation WQ criteria for marine waters. (See 4.3.5.1 and 4.3.5.2, below). EPA approved DEC's revised bacteria water quality criteria on May 15, 2017. Monitoring is required May through September when primary contact recreation in which full immersion and ingestion of water is more likely to occur.

4.3.5.1 Escherichia coli

Alaska WQS at 18 AAC 70.020(b)(2)(B)(i) provides protection for freshwater contact recreation. The WQS requires that in a 30-day period, the geometric mean shall not exceed 126 colony forming units (cfu)/100 mL. In the same 30-day period, not more than one sample, or more than 10 percent of the samples if there are more than 10 samples, may exceed a STV of 410 cfu/100 mL.

4.3.5.2 Enterococci Bacteria

Alaska WQS at 18 AAC 70.020(b)(14)(B)(i) provides protection for marine water contact recreation. The WQS requires that in a 30-day period, the geometric mean shall not exceed 35 cfu/100 mL. In the same 30-day period, not more than one sample, or more than 10 percent of the samples if there are more than 10 samples, may exceed a STV of 130 cfu/100 mL.

Table 2 lists the applicable water criteria as WQBELs for TRC, FC, Enterococci Bacteria, *E. coli*, DO and pH.

Table 2: Water Quality Based Effluent Limits

Parameter	Units	Water	Chronic	Acute	Basis for Limit
TRC ^a	mg/L	fresh	0.011	0.019	18 AAC 70.020(b)(11)
		marine	0.0075	0.013	18 AAC 70.020(b)(23)
FC	FC/100 mL	fresh	20 ^b	40	18 AAC 70.020(b)(2)
		marine	14 ^c	43	18 AAC 70.020(b)(14)
Enterococci Bacteria	cfu/100 mL	marine	35	130 ^d	18 AAC 70.020(b)(14)(B)(i)
E. coli	cfu/100 mL	fresh	126	410 ^e	18 AAC 70.020(b)(2)(B)(i)
DO	mg/L	fresh	may not be less than 7 or greater than 17		18 AAC 70.020(b)(3)
		marine	may not be less than 6 or greater than 17		18 AAC 70.020(b)(15)
pH	s.u.	fresh	may not be less than 6.5 or greater than 8.5		18 AAC 70.020(b)(6)
		marine	may not be less than 6.5 or greater than 8.5		18 AAC 70.020(b)(18)
Footnotes: a. TRC effluent limits are only applicable if chlorine is used as a disinfectant. b. Not more than one sample, or if more than ten FC bacteria samples are collected during the monthly reporting period, not more than 10% of the samples may exceed 40 FC/100 mL. c. Not more than one sample, or if more than ten FC bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed 43 MPN/100 mL for a five-tube dilution test. d. Not more than one sample, or if more than ten enterococci bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed a STV of 130 cfu/100 mL. e. Not more than one sample, or if more than ten E. coli bacteria samples are collected during the reporting period, not more than 10% of the samples may exceed a STV of 410 cfu/100 mL.					

4.4 Flow

Flow will be based on the hydraulic design capacity of the WWTF (flow rate as gallons per day) and shall be determined by a professional engineer. The systems must comply the regulatory requirements of 18 AAC 83 and 18 AAC 72, as updated. A flow limit based on the design capacity ensures that the WWTF operates within its capabilities to receive and properly treat sustained average flow quantities and specific pollutants.

4.5 Mass-Based Limits

The general permit contains place holders for mass-based limits for BOD₅ and TSS. State 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 WWTF. Expressing limitations in terms of concentration as well as mass encourages the proper operation of a WWTF at all times.

Because mass-based limits are derived from the facility's design flow, they must be calculated for each facility and, therefore, mass-based limits will be assigned during the authorization process. The mass-based limits are expressed in pounds per day (lbs/day) and are calculated as follows:

$$\text{Mass based limit} \left(\frac{\text{lbs}}{\text{day}} \right) = \text{concentration limit} \left(\frac{\text{mg}}{\text{L}} \right) \times \text{design flow (mgd)} \times 8.34 \frac{\text{lbs}}{\text{gal}}$$

4.6 Effluent Limits Summary

The more stringent of the technology or WQBELs are included as permit limits. See Tables 3, 4, and 5, below.

5.0 MONITORING REQUIREMENTS

5.1 Basis for Influent, Effluent and Receiving Waterbody Monitoring

In accordance with Alaska Statutes (AS) 46.03.101(d) and 18 AAC 83.430, the Department may specify in a permit the terms and conditions under which waste material may be disposed.

Monitoring in permits is required to determine compliance with effluent limits. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limits are required and/or to monitor effluent impact on receiving waterbody quality. Monitoring may be required in individual authorizations for site specific evaluations related to, but not limited to: protection of WQS, evaluation of receiving waterbody impairments, threatened or endangered species, verification of mixing zone sizes, or application requirements.

In addition to the pollutants that are listed in Section 4, above as having permit limits that require monitoring to track compliance, Sections 5.3 and 5.4 below, contains monitoring requirements for ammonia and the receiving waterbody that DEC determined necessary to implement in the last permit and is carrying forward into this one.

Receiving waterbody monitoring may be required in APDES permits in order to evaluate if the effluent is causing or contributing to an in-stream excursion of water quality criteria. Given the nature and size of the discharges authorized under the general permit, the permit allows DEC to require receiving waterbody monitoring under specific situations.

Permittees will be notified of any additional monitoring such as shoreline bacteria monitoring when mixing zones have the potential to touch the shoreline when issued authorization to discharge under the general permit.

5.2 Monitoring Frequencies

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 and compliance. Permittees have the option of taking more frequent samples than are required under the general permit. These samples must be used for averaging if they are conducted using the

Department-approved test methods (generally found in 18 AAC 70 and 40 CFR §136 [adopted by reference in 18 AAC 83.010]).

Facilities covered under the general permit are expected to range in size from a few hundred gallons per day (gpd) discharge up to 1 mgd. Given this wide range in discharge volume, the general permit requires monitoring frequencies that are dependent on the design flow of the facility. See Tables 3, 4, and 5, below.

The monitoring frequencies are divided into three categories:

- Class A WWTFs with a design flow above 250,000 gpd up to 1.0 mgd
- Class B WWTFs with a design flow above 5,000 gpd up to and including 250,000 gpd
- Class C WWTFs with a design flow less than and including 5,000 gpd

5.3 Total Ammonia as Nitrogen

Total ammonia is the sum of ionized (NH_4^+) and un-ionized ammonia (NH_3). Temperature and pH affect which form, NH_4^+ or NH_3 is present. NH_3 , which is more toxic to aquatic organisms than NH_4^+ , predominates at higher pH and temperature levels. 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 nitrogen in the environment can lead to dissolved oxygen depletion, eutrophication, and toxicity to aquatic organisms.

DEC requires that the largest facilities, those that discharged above 0.25 mgd up to 1.0 mgd and that would likely have the largest impact in the environment, monitor for total ammonia as nitrogen. During this permit cycle, there were four facilities with discharges greater than 0.25 mgd with quarterly monitoring requirements. DEC reviewed the DMRs from these facilities from November 2017 through May 2022 and determined that the data was insufficient and is therefore requiring continued ammonia monitoring to be increased to monthly monitoring requirements in this next permit cycle to get a more robust data set. Additionally, the requirement of concurrent monitoring of the receiving waterbody for pH, temperature, and salinity (criteria for ammonia are pH, temperature, and salinity dependent) is carried over. The receiving waterbody data along with the ammonia data is necessary to effectively assess the quality of each facility's discharge relative to its receiving waterbody.

DEC will continue to analyze the monitoring results to determine whether continued monitoring or limits for total ammonia are warranted in the next reissuance of the general permit.

5.4 Receiving Waterbody Monitoring

As described in 5.3, above, ammonia criteria are pH, temperature, and salinity dependent. Therefore, those facilities that are monitoring for ammonia shall also be required to concurrently monitor the receiving waterbody for pH, temperature, and salinity (if the discharge is to marine water) at a location outside of the influence of the discharge.

Tables 3, 4, and 5 below depict effluent limitations and monitoring for facilities authorized to discharge under this general permit. The applicable table is determined by the design flow of the

WWTF. The effluent limits must be met at the end of the treatment process, or for those facilities with modified limits, at the boundary of an authorized mixing zone. If a facility is authorized a mixing zone, the effluent limits in Tables 3, 4 or 5 for which a mixing zone is authorized, are superseded by the corresponding modified effluent limits in the individual authorization to discharge. Appendix D, Table B of the permit lists previously authorized facility mixing zones and corresponding modified effluent limits. DEC will notify the permittee of any modified effluent limits when issued an authorization to discharge under this general permit.

Table 3. Class A: Effluent Limits and Monitoring Requirements for Wastewater Treatment Facilities with a Design Flow above 250,000 – 1,000,000 gallons per day

Parameter	Units ^a	Effluent Limits				Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Minimum Daily	Sample Location	Sample Frequency	Sample Type
Total Discharge Flow	gpd	---	---	---	---	Effluent	1/day (5/week)	Measured
pH	s.u.	---	---	8.5	6.5	Effluent	1/day (5/week)	Grab
				Report	---	Receiving Waterbody ^b	1/quarter ^c	
Total Residual Chlorine (TRC) ^{d,e}	mg/L	0.011 (fresh) 0.0075 (marine)	---	0.019 (fresh) 0.013 (marine)	---	Effluent	1/day (5/week)	Grab
Dissolved Oxygen (DO)	mg/L	---	---	17	7 (fresh) 6 (marine)	Effluent	1/week	Grab
Biochemical Oxygen Demand (BOD ₅)	mg/L	30	45	60	---	Effluent	2/month	24-hour Composite ^g
	lbs/day ^f	---	---	---	---			Calculated
BOD ₅ Percent (%) Removal ^h	%	85	---	---	---	Influent and Effluent ⁱ	2/month	Calculated
Total Suspended Solids (TSS)	mg/L	30	45	60	---	Effluent	2/month	24-hour Composite ^g
	lbs/day ^f	---	---	---	---			Calculated
TSS Percent (%) Removal ^h	%	85	---	---	---	Influent and Effluent ⁱ	2/month	Calculated
Fecal Coliform Bacteria (FC)	FC/100 mL	20 (fresh) ^j 14 (marine) ^j	---	40 (fresh) ^k 43 (marine) ^k	---	Effluent	2/month	Grab
Enterococci (marine water)	cfu/100 mL	35 ^j	---	130 ^k	---	Effluent	1/month ^l	Grab
E. coli (freshwater)	cfu/100 mL	126 ^j	---	410 ^k	---	Effluent	1/month ^l	Grab
Total Ammonia as Nitrogen	mg/L	---	---	Report	---	Effluent	1/quarter ^c	Grab
Temperature ^b	° Celsius	---	---	Report	---	Receiving Waterbody	1/quarter ^c	Grab
Salinity ^{b, m}	grams per kilogram	---	---	Report	---	Receiving Waterbody	1/quarter ^c	Grab

Footnotes:

- a. Units: gpd = 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, cfu/100 mL = colony forming units per 100 milliliters, µg/L = micrograms per liter.
- b. Monitoring for pH, temperature, and salinity should occur at approximately the same time as ammonia monitoring.
- c. Once per quarter means the time period of three months based on the calendar year: Jan-March, April-June, July-Sept, and Oct-Dec.
- d. The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter.
- e. Monitoring for TRC is not required if chlorine is not used as a disinfectant or introduced elsewhere in the treatment process.
- f. $\text{lbs/day} = \text{concentration (mg/L)} \times [\text{flow (gpd)}/1,000,000] \times 8.34$ (conversion factor)
- g. See Appendix C for a definition.
- h. $\text{Minimum \% Removal} = [(\text{monthly average influent concentration in mg/L} - \text{monthly average effluent concentration in mg/L}) / (\text{monthly average influent concentration in mg/L})] \times 100$. 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.
- i. Limits apply to effluent. Report average monthly influent concentration. Influent and effluent composite samples shall be collected during the same 24-hour period.
- j. If more than one bacteria sample {FC, E.coli, enterococci} is collected within the reporting period, the average results 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 quantities. For example, the geometric mean of 100, 200, and 300 is $(100 \times 200 \times 300)^{1/3} = 181.7$.
- k. 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.
- l. One Sample shall be collected each month, May through September, on the same day as a fecal coliform sample is collected.
- m. Salinity monitoring is only required for marine water dischargers.

Table 4. Class B: Effluent Limits and Monitoring Requirements for Wastewater Treatment Facilities with a Design Flow above 5,000 – 250,000 gallons per day

Parameter	Units ^a	Effluent Limits				Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Minimum Daily	Sample Location	Sample Frequency	Sample Type
Total Discharge Flow	gpd	---	---	---	---	Effluent	1/day (5/week)	Measured
pH	s.u.	---	---	8.5	6.5	Effluent	3/week	Grab
Total Residual Chlorine (TRC) ^{b,c}	mg/L	0.011 (fresh) 0.0075 (marine)	---	0.019 (fresh) 0.013 (marine)	---	Effluent	3/week	Grab
Dissolved Oxygen (DO)	mg/L	---	---	17	7 (fresh) 6 (marine)	Effluent	1/month	Grab
Biochemical Oxygen Demand (BOD ₅)	mg/L	30	45	60	---	Effluent	1/month	Grab or Composite ^e
	lbs/day ^d	---	---	---				Calculated
BOD ₅ Percent (%) Removal ^f	%	85	---	---	---	Influent and Effluent ^g	1/month	Calculated
Total Suspended Solids (TSS)	mg/L	30	45	60	---	Effluent	1/month	Grab or Composite ^e
	lbs/day ^d	---	---	---				Calculated
TSS Percent (%) Removal ^f	%	85	---	---	---	Influent and Effluent ^g	1/month	Calculated
Fecal Coliform Bacteria (FC)	FC/100 mL	20 (fresh) ^h 14 (marine) ^h	---	40 (fresh) ⁱ 43 (marine) ⁱ	---	Effluent	1/month	Grab
Enterococci (marine water)	cfu/100 mL	35 ^h	---	130 ⁱ	---	Effluent	1/month ^j	Grab
E. coli (freshwater)	cfu/100 mL	126 ^h	---	410 ⁱ	---	Effluent	1/month ^j	Grab

Footnotes:

- Units: gpd = 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, cfu/100 mL = colony forming units per 100 milliliters, µg/L = micrograms per liter.
- The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter.
- Monitoring for TRC is not required if chlorine is not used as a disinfectant or introduced elsewhere in the treatment process.
- lbs/day = concentration (mg/L) x [flow (gpd)/1,000,000] x 8.34 (conversion factor)
- See Appendix C for a definition.
- 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.
- Limits apply to effluent. Report average monthly influent concentration. Influent and effluent composite samples shall be collected during the same 24-hour period.
- If more than one bacteria sample {FC, E.coli, enterococci} is collected within the reporting period, the average results 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 quantities. For example, the geometric mean of 100, 200, and 300 is $(100 \times 200 \times 300)^{1/3} = 181.7$
- 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.
- Sampling required once per month only during the time period May-Sept. Sampling should be conducted at the same time as FC sampling.

Table 5. Class C: Effluent Limits and Monitoring Requirements for Wastewater Treatment Facilities with a Design Flow less than 5,000 gallons per day

Parameter	Units ^a	Effluent Limits				Monitoring Requirements		
		Average Monthly	Average Weekly	Maximum Daily	Minimum Daily	Sample Location	Sample Frequency	Sample Type
Total Discharge Flow	gpd	---	---	---	---	Effluent	1/week	Measured or Estimated
pH	s.u.	---	---	8.5	6.5	Effluent	1/quarter ^b	Grab
Total Residual Chlorine (TRC) ^{c,d}	mg/L	0.011 (fresh) 0.0075 (marine)	---	0.019 (fresh) 0.013 (marine)	---	Effluent	1/week	Grab
Dissolved Oxygen (DO)	mg/L	---	---	17	7 (fresh) 6 (marine)	Effluent	1/quarter ^b	Grab
Biochemical Oxygen Demand (BOD ₅)	mg/L	30	45	60	---	Effluent	1/quarter ^b	Grab or Composite ^f
	lbs/day ^e	---	---	---				Calculated
BOD ₅ Percent (%) Removal ^g	%	85	---	---	---	Influent and Effluent ^h	1/quarter ^b	Calculated
Total Suspended Solids (TSS)	mg/L	30	45	60	---	Effluent	1/quarter ^b	Grab or Composite ^f
	lbs/day ^e	---	---	---				Calculated
TSS Percent (%) Removal ^g	%	85	---	---	---	Influent and Effluent ^h	1/quarter ^b	Calculated
Fecal Coliform Bacteria (FC)	FC/100 mL	20 (fresh) ⁱ 14 (marine) ⁱ	---	40 (fresh) ^j 43 (marine) ^j	---	Effluent	1/quarter ^b	Grab
Enterococci (marine water)	cfu/100 mL	35 ⁱ	---	130 ^j	---	Effluent	1/quarter ^{b,k}	Grab
E. coli (freshwater)	cfu/100 mL	126 ⁱ	---	410 ^j	---	Effluent	1/quarter ^{b,k}	Grab

Footnotes:

- Units: gpd = 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, cfu/100 mL = colony forming units per 100 milliliters, µg/L = micrograms per liter.
- Once per quarter means the time period of three months based on the calendar year: Jan-March, April-June, July-Sept, and Oct-Dec.
- The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter.
- Monitoring for TRC is not required if chlorine is not used as a disinfectant or introduced elsewhere in the treatment process.
- lbs/day = concentration (mg/L) x [flow (gpd)/1,000,000] x 8.34 (conversion factor)
- See Appendix C for a definition.
- 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.
- Limits apply to effluent. Report average monthly influent concentration. Influent and effluent composite samples shall be collected during the same 24-hour period.
- If more than one bacteria sample {FC, E.coli, enterococci} is collected within the reporting period, the average results 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 quantities. For example, the geometric mean of 100, 200, and 300 is $(100 \times 200 \times 300)^{1/3} = 181.7$
- 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.
- One sample shall be collected quarterly, May through September, on the same day as a fecal coliform sample is collected.

6.0 MIXING ZONES

Mixing zones are DEC authorized areas where an effluent undergoes initial dilution. A mixing zone is an allocated impact zone in the receiving waterbody where water quality criteria can be exceeded as long as toxic conditions are prevented and the designated use of the water as a whole are not impaired as a result of the mixing zone. All water quality criteria must be met at the boundary of the mixing zone.

In accordance with 18 AAC 70.240, DEC may authorize a mixing zone in a permit upon receipt of a complete application. A NOI serves as the mixing zone application under the general permit. The NOI provides information required by 18 AAC 70.240 (application requirements), including the information and available evidence necessary to demonstrate consistency with 18 AAC 70.240. Permittees may request modification to effluent limits pursuant to 18 AAC 70.240. If a mixing zone is requested, Form 2M must also be submitted with the NOI. Form 2M may be located through the link in part 1.4.2 of the general permit. Per 18 AAC 70.240, the burden of proof for justifying a mixing zone rests with the applicant. Note the Department has determined that existing dischargers listed in Appendix D of the permit (that requested a mixing zone) have satisfied this requirement. The Department will consider mixing zone requests on a case-by-case basis, and the Department will, in its discretion, only authorize a mixing zone if it finds that available evidence reasonably demonstrates that the requirements of 18 AAC 70 will be met.

Appendix A outlines criteria that must be met prior to the Department authorizing a mixing zone. These criteria include an analysis of the size of the mixing zone, treatment technology, existing uses of the waterbody, human consumption, spawning areas, human health, aquatic life, and endangered species. All criteria must be met in order to authorize a mixing zone. If criteria are not met, then a mixing zone is prohibited, and effluent limits must be met at the end of the outfall line prior to discharge to the receiving waterbody.

In the prior permit cycles, the Department historically assigned established limits and monitoring requirements at the boundary for authorized mixing zones on a case-by-case basis in the receiving waterbody. The limits were based on the limits and requirements of 18 AAC 70 that included pH, dissolved oxygen (DO), total residual chlorine (TRC), if applicable, fecal coliform bacteria (FC), and either e.coli or enterococci depending on if the discharge was to fresh or marine waters. After further analysis, it was determined that the sampling requirement at the boundary of the mixing zone was inconclusive and will not be carried over in this permit cycle. When a permittee is compliant with their effluent limits, the edge or mixing zone boundary is protected both through their limit as well as demonstrated through the required mixing zone size modeling. Therefore, the mixing zones for each of the facilities previously authorized under AKG572000 shall be reviewed and reauthorized as needed. If facility conditions change (e.g., increase flow volume) requiring the permittee to provide updated mixing information, DEC will evaluate the submitted information to determine if modification of the existing mixing zone authorization is warranted.

New or modified mixing zones that the Department has not previously public noticed will be public noticed in accordance with 18 AAC 83.120.

7.0 COMPLIANCE SCHEDULES

Per 18 AAC 70.910, the Department has authority to include compliance schedules as conditions of a permit, certification, or approval.

8.0 ANTIBACKSLIDING

18 AAC 83.480(a) 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.” The effluent limitations in this permit reissuance are consistent with 18 AAC 83.480. Therefore, the permit effluent limitations, standards, and conditions in AKG572000 are as stringent as in the previously issued permit. Accordingly, no further backsliding analysis is required for this permit reissuance.

9.0 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).

There is insufficient information to make a reasonable determination of water quality for all potential waterbodies under AKG572000 on a parameter-by-parameter basis. Accordingly, this antidegradation analysis conservatively assumes that all parameters and discharges under the APDES general permit will be to Tier 2 receiving waters, which is the next highest level of protection and is more rigorous than a Tier 1 analysis.

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, that 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

The State's Antidegradation Policy in 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 (i.e. Tier 2 waters), that quality must be maintained and protected. The Department may allow a reduction of water quality only after finding that five specific requirements of the Antidegradation Policy at 18 AAC 70.015(a)(2)(A)-(E) are met. 18 AAC 70.015(a)(2)(A)-(E) and 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).

18 AAC 70.020 and 18 AAC 70.050 specify the protected water use classes for the State; therefore, the most stringent water quality criteria found in 18 AAC 70.020 and in the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* (DEC 2008) 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. This also ensures that the resulting water quality at and beyond the boundary of any authorized mixing zone will fully protect all existing and designated uses of the receiving waterbody as a whole.

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)

(c) Tier 2 analysis for the lowering or potential lowering of water quality not exceeding applicable criteria. Tier 2 applies when the water quality for a parameter in a water of the United States within this state does not exceed the applicable criteria under 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b) and receives the protection under 18 AAC 70.015(a)(2).

(3) the department will not conduct a Tier 2 antidegradation analysis for

(A) reissuance of a license or general or individual permit for a discharge that the applicant is not proposing to expand;

In the prior APDES general permit cycle, DEC conservatively assumed that all discharges under AKG572000 were Tier 2 waters and accordingly conducted a Tier 2 antidegradation analysis. DEC determined the AKG572000 general permit would meet the Antidegradation Policy and the Department's July 14, *Policy and Procedure Guidance for Interim Antidegradation Implementation Methods* requirements. The *Interim Guidance* has been superseded by the 18 AAC 70.016 regulations.

18 AAC 70.16(c)(3)(A) states that the Department will not conduct a Tier 2 antidegradation analysis for reissuance of a license or general or individual permit for a discharge that the applicant is not proposing to expand. 18 AAC 70.990(75) states that an expanded discharge is one in which discharges are expanded such that they could result in an increase in a permitted parameter load or concentration or other changes in discharge characteristics that could lower water quality or have other adverse environmental impacts. The discharges covered under AKG572000 are not expanded from the 2017 general permit. There will not be an increase in a permitted parameter load, concentration, or other change in discharge characteristics that could lower water quality or have other adverse environmental impacts.

18 AAC 70.016(c)(3)(A) states that the Department will not conduct a Tier 2 antidegradation analysis for reissuance of a license or general or individual permit for a discharge that the applicant is not proposing to expand. Therefore, consistent with 18 AAC 70.016(c)(2)(A) and 18 AAC 70.16(c)(3)(A), DEC is not conducting a Tier 2 antidegradation analysis for this permit reissuance.

10.0 SPECIAL CONDITIONS

10.1 Quality Assurance Project Plan

The permittee is required to develop, implement, and maintain a quality assurance project plan (QAPP). The QAPP must be designed to assist in planning for the collection and analysis of effluent and receiving water samples in support of the permit. 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; and quality assurance /quality control criteria. The QAPP will help ensure the accuracy of monitoring data and potentially explain anomalies if they occur. The QAPP must be developed and implemented within 180 days of receiving authorization under this general permit. Any existing QAPP for the facility may be modified to meet the requirements of Section 2.6 of the permit. The QAPP is required to be retained onsite and made available to DEC upon request.

10.2 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.

10.3 Electronic Reporting (E-Reporting) Rule

10.3.1 E-Reporting Rule for DMR's (Phase I)

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://cdxnodengn.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 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. Training materials and webinars for NetDMR can be found at https://usepa.servicenowservices.com/oeca_icis?id=netdmr_homepage.

10.3.2 E-reporting Rule for Other Reports (Phase II)

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 begin December 2025. Permittees should monitor DEC's E-Reporting Information website located at <http://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 Appendix A – Standard Conditions.

11.0 OTHER CONSIDERATIONS

11.1 Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species or their habitats. NMFS is responsible for administration of the ESA for listed cetaceans, seals, sea lions, sea turtles, anadromous fish, marine fish, marine plants, and corals. All other species (including polar bears, walrus, and sea otters) are administered by the USFWS. As a state agency, DEC is not required to consult with USFWS or NMFS regarding permitting actions; however, DEC interacts voluntarily with these federal agencies to obtain listings of threatened and endangered species and critical habitat.

DEC interacts voluntarily with the Services to provide them an early opportunity to provide listings of threatened and endangered species and notify DEC of any potential impacts on listed species or critical habitat under their respective jurisdictions. On June 22, 2022, DEC contacted National Oceanic Atmosphere Administration (NOAA) to also provide them early notification of DEC's intent to reissue AKG572000 and to provide them the above-mentioned opportunity to share concerns with DEC regarding listed species. NOAA did not have any comments at the time to DEC's notification but forwarded the email to their Essential Fish Habitat section for comment.

For a listing of threatened and endangered species, DEC also consulted the NMFS site at <http://www.nmfs.noaa.gov/pr/species/esa>. The Department reviewed the listing for updates since the last reissuance. Species of concern that inhabit or that have inhabited Alaskan waters at least at one time and that are listed as threatened, endangered or as a candidate for listing are included in Table 6.

Table 6: Threatened and Endangered Species

Species Name	Scientific Name	Listing Status
Albatross, short-tailed	<i>Phoebastria albatrus</i>	Endangered
Bear, polar	<i>Ursus maritimus</i>	Threatened
Eider, spectacled	<i>Somateria fischeri</i>	Threatened
Eider, Stellar's	<i>Polysticta stelleri</i>	Threatened
Herring, Pacific Southeast Alaska distinct population segment	<i>Clupea pallasii</i>	Candidate for listing
Loon, yellow-billed	<i>Gavia adamsii</i>	Candidate for listing
Otter, northern sea Southwest Alaska distinct population segment	<i>Enhydra lutris kenyoni</i>	Threatened
Seal, bearded Beringia distinct population segment	<i>Erignathus barbatus nauticus</i>	Threatened
Seal, ringed, Arctic subspecies	<i>Phoca hispida hispida</i>	Endangered
Seal, Ringed	<i>Phoca (pusa) hispida</i>	Endangered
Seal, Guadalupe Fur	<i>Arctocephalus townsendi</i>	Threatened
Sea turtle, loggerhead*	<i>Caretta caretta</i>	Threatened
Sea turtle, Olive Ridley*	<i>Lepidochelys olivacea</i>	Threatened
Sea-lion, Stellar	<i>Eumetopias jubatus</i>	Endangered
Whale, blue*	<i>Balaenoptera musculus</i>	Endangered
Whale, bowhead	<i>Balaena mysticetus</i>	Endangered
Whale, Cook Inlet beluga	<i>Delphinapterus leucas</i>	Endangered
Whale, False Killer	<i>Pseudorca crassidens</i>	Endangered
Whale, fin	<i>Balaenoptera physalus</i>	Endangered
Whale, humpback	<i>Megaptera novaeangliae</i>	Endangered
Whale, gray* western North Pacific distinct population segment	<i>Eschrichtius robustus</i>	Endangered
Whale, Killer	<i>Orcinus orca</i>	Endangered
Whale, North Pacific right*	<i>Eubalaena japonica</i>	Endangered
Whale, sei*	<i>Balaenoptera borealis</i>	Endangered
Whale, sperm	<i>Physeter macrocephalus</i>	Endangered
*Occurs rarely in Alaska		

11.2 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) designates Essential Fish Habitat (EFH) in waters used by anadromous salmon and various life stages of marine fish under NMFS jurisdiction. EFH refers to those waters and associated river bottom substrates necessary for fish spawning, breeding, feeding, or growth to maturity—including aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish. Spawning, breeding, feeding, or growth to maturity covers a species' full life cycle necessary for fish from commercially-fished species to spawn, breed, feed, or grow to maturity.

The EFH regulations define an adverse effect as any impact which 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.

Section 305(b) of the Magnuson-Stevens Act 916 USC 1855(b) requires federal agencies to consult the NMFS when any activity proposed to be permitted, funded, or undertaken by a federal agency may have an adverse effect on designated EFH as defined by the Act. As a state agency, DEC is not required to consult with NMFS regarding permitting actions but interacts voluntarily with NMFS to identify EFH.

On June 22, 2022, DEC's early notification was forwarded to the EFH unit with NOAA. NOAA responded indirectly on June 29, 2022, that they had received the notification.

11.3 Ocean Discharge Criteria Evaluation

Section 403(a) of the CWA, Ocean Discharge Criteria, prohibits the issuance of a permit under Section 402 of the CWA for a discharge into the territorial sea, the water of the contiguous zone, or the oceans except in compliance with Section 403. Permits for discharges seaward of the baseline on the territorial seas must comply with the requirements of Section 403, which include development of an Ocean Discharge Criteria Evaluation (ODCE).

Interactive nautical charts depicting Alaska's baseline plus additional boundary lines are available at <http://www.charts.noaa.gov/OnLineViewer/AlaskaViewerTable.shtml> and interactive maps at https://alaskafisheries.noaa.gov/mapping/arcgis/rest/services/NOAA_Baseline/MapServer.

The charts and maps are provided for informational purposes only. The U.S. Baseline committee makes the official determinations on baseline. Ocean Discharge Criteria are not applicable for marine discharges to areas located landward of the baseline of the territorial sea.

The general permit requires compliance with State WQS. Consistent with 40 CFR §125.122(b), adopted by reference at 18 AAC 83.010(C)(8), discharges in compliance with State WQS shall be presumed not to cause unreasonable degradation of the marine environment. EPA made the connection between the similar protections provided by ODCE requirements and WQS when promulgating ocean discharge criteria rules in 1980, as stated, "the similarity between the objectives and requirements of [state WQS] and those of CWA Section 403 warrants a presumption that discharges in compliance with these [standards] also satisfy CWA Section 403." (Ocean Discharge

Criteria, 45 Federal Register 65943.) As such, given the permit requires compliance with State WQS, unreasonable degradation to the marine environment is not expected and further analysis under 40 CFR §125.122 is not warranted for this permitting action.

11.4 Permit Expiration

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

12.0 REFERENCES

ADEC, 2020. 18 AAC 70 Water Quality Standards, as amended through March 5, 2020.

ADEC). 2022. Integrated water quality monitoring and assessment report. <https://dec.alaska.gov/water/water-quality/integrated-report#2018> Accessed May 16, 2022

ADEC. 2008. Alaska water quality criteria manual for toxics and other deleterious organic and inorganic substances, as amended through December 12, 2008.

ADEC. 2010. Interim antidegradation methods, Effective July 14, 2010.

EPA (Environmental Protection Agency). 1986. Ambient water quality criteria for bacteria-1986. US Environmental Protection Agency, Office of Water, EPA 440/5-84-002, Washington D.C.

National Oceanic and Atmospheric Administration (NOAA Fisheries), 2022. Endangered, threatened, and candidate species https://www.fisheries.noaa.gov/species-directory/threatened-endangered?title=&species_category=any&species_status=any®ions=1000001106&items_per_page=25&sort= Accessed June 10th and August 5th, 2022

APPENDIX A. MIXING ZONE ANALYSIS CHECKLIST

The purpose of the Mixing Zone Checklist is to guide the permit writer through the mixing zone regulatory requirements to determine if all the mixing zone criteria at 18 AAC 70.240 are satisfied, as well as provide justification to authorize a mixing zone in an Alaska Pollutant Discharge Elimination System permit.

Criteria	Description	Resources	Regulation
Size	Is the mixing zone as small as practicable? If yes, mixing zone may be approved as proposed or authorized with conditions.	Technical Support Document for Water Quality-Based Toxics Control DEC's Reasonable Potential Analysis Guidance Environmental Protection Agency's Permit Writers' Manual CORMIX	18 AAC 70.240(k)
Technology	Were the most effective technological and economical methods used to disperse, treat, remove, and reduce pollutants? If yes, mixing zone may be approved as proposed or authorized with conditions		18 AAC 70.240(c)(1)
Low Flow Design	For streams, rivers, or other flowing fresh waters. - Determine low flow calculations or documentation for the applicable parameters.		18 AAC 70.240(l)
Existing Use	Does the mixing zone... (1) maintain and protect designated and existing uses of the waterbody as a whole? If yes, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(2)
	(2) impair overall biological integrity of the waterbody? If yes, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(3)
	(3) create a public health hazard that would preclude or limit existing uses of the waterbody for water supply or contact recreation? If yes, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(B)

Criteria	Description	Resources	Regulation
	(4) preclude or limit established processing activities or established commercial, sport, personal use, or subsistence fish and shellfish harvesting? If yes, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(C)
Human consumption	Does the mixing zone... (1) produce objectionable color, taste, or odor in aquatic resources harvested for human consumption? If yes, mixing zone may not be approved.		18 AAC 70.240(d)(6)
Spawning Areas	Does the mixing zone... (1) discharge in a spawning area for anadromous fish or Arctic grayling, northern pike, rainbow trout, lake trout, brook trout, cutthroat trout, whitefish, sheefish, Arctic char (Dolly Varden), burbot, and landlocked coho, chinook, and sockeye salmon? If yes, mixing zone may not be approved.		18 AAC 70.240(f)
Human Health	Does the mixing zone... (1) contain bioaccumulating, bioconcentrating, or persistent chemical above natural or significantly adverse levels? If yes, mixing zone may not be approved		18 AAC 70.240(d)(1)
	2) contain chemicals expected to present an unacceptable risk to human health from carcinogenic, mutagenic, teratogenic, or other effects as determined using risk assessment methods approved by the Department? If yes, mixing zone may not be approved		18 AAC 70.240(d)(2)
	(3) occur in a location where the department determines that a public health hazard reasonably could be expected? If yes, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(k)(4)

Criteria	Description	Resources	Regulation
Aquatic Life	Does the mixing zone... (1) cause a toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone? If yes, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(A)
	(2) result in a reduction in fish and shellfish population levels? If yes, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(D)
	(3) result in permanent or irreparable displacement of indigenous organisms? If yes, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(E)
	(4) form a barrier to migratory species or fish passage? If yes, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(G)
	(5) result in undesirable or nuisance aquatic life? If yes, mixing zone may not be approved		18 AAC 70.240(d)(5)
	(6) prevent lethality to passing organisms; or exceed acute aquatic life criteria at and beyond the boundaries of a smaller initial mixing zone surrounding the outfall, the size of which shall be determined using methods approved by the Department? If yes, mixing zone may not be approved		18 AAC 70.240(d)(7) 18 AAC 70.240(d)(8)

Criteria	Description	Resources	Regulation
Endangered Species	Are there threatened or endangered species (T/E spp) at the location of the mixing zone? If yes, are there likely to be adverse effects to T/E spp based on comments received from the United States Fish and Wildlife Service or National Oceanic and Atmospheric Association? If yes, will conservation measures be included in the permit to avoid adverse effects? If yes, mixing zone may be approved as proposed or authorized with conditions.		18 AAC 70.240(c)(4)(F)