



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

Permit Number: AKG573000

Domestic Wastewater Treatment Lagoons Discharging to Surface Water

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

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Technical Contact: Amber Bennett
Alaska Department of Environmental Conservation
Division of Water
Wastewater Discharge Authorization Program
610 University Avenue
Fairbanks, AK 99709
Phone: (907) 451-2190
Fax: (907) 451-2187
amber.bennett@alaska.gov

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

Domestic Wastewater Treatment Lagoons Discharging to Surface Water

For wastewater discharges from

Statewide domestic wastewater treatment lagoons

The Alaska Department of Environmental Conservation (the Department or DEC) proposes to reissue Alaska Pollutant Discharge Elimination (APDES) general permit to domestic wastewater treatment lagoons discharging to surface 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 lagoons and outlines best management practices to which they must adhere.

This fact sheet explains the nature of potential discharges from domestic wastewater treatment lagoons 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, 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://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:

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 <http://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 also located on the Department's Wastewater Discharge Authorization Program website: <http://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 DEC to issue an APDES general permit 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 United States 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 treating predominately domestic wastewater to secondary or equivalent to secondary treatment standards, discharging less than 1.0 million gallons per day (mgd), 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. Therefore, EPA determined that a general permit was an 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, 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 effluent 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 identified four different operations for development into separate general permits: mechanical treatment plants, lagoons, facilities that discharge to tundra wetlands, and common collectors.

The first reissued permit for mechanical treatment plants, general permit number AKG572000, was issued in September 2012, and combined the fresh and marine water requirements of AKG570000 and AKG571000 under one general permit. AKG572000 was subsequently reissued in August 2017. AKG573000 was the second general permit partitioned out of AKG570000 and AKG571000 and provided coverage for domestic wastewater lagoon discharges to fresh and marine water. Unlike the previous general permits, AKG572000 and AKG573000 excluded common collectors and facilities that discharge to land. Types of facilities and discharges not covered by AKG573000 are listed in Permit Section 1.3.

AKG573000 became effective September 1, 2013 and expired on August 31, 2018. It was then reissued on July 12, 2018 and became effective on September 1, 2018 with an expiration date of August 31, 2023. Since the effective date, there was one termination and one new authorization added. A total of 42 lagoons have been authorized to discharge under the general permit. The lagoons that are listed in Appendix D of the general permit are eligible for reissuance under AKG573000. The Department may administratively extend this permit and subsequent authorizations until the reissuance is complete and in effect.

1.3 Description of Domestic Wastewater Treatment Lagoons

Domestic wastewater treatment lagoons consist of shallow bodies of wastewater contained in an earthen basin. Lagoons generally provide a feasible alternative to the higher operational and maintenance costs of a mechanical treatment plant and do not require the same level of wastewater operator attention. In addition, lagoons are better suited than a mechanical treatment plant to handle hydraulic and organic shock loads.

The design of a lagoon system depends on a number of factors including: the projected hydraulic flow of the community, the 5-day biochemical oxygen demand (BOD₅) loading rate, climatic and local soil conditions, hydraulic retention time, and the desired effluent quality. Because multiple cell lagoons provide a higher level of treatment than single-cell lagoons, many lagoon systems are comprised of two or more cells that may be operated in series or in parallel.

The biological community present in lagoons is similar to that found in an activated-sludge mechanical treatment plant, however, a lagoon system adds an algal population. The majority of lagoons authorized by the general permit are facultative lagoons that are identified by a combination of aerobic and anaerobic treatment processes and generally have a long detention time. Aerobic treatment occurs near the surface of the lagoon where natural processes such as wind, heat, and fermentation typically provide mixing, and oxygen is supplied by natural re-aeration from the atmosphere and algal photosynthesis. The oxygen released by photosynthetic algae is used by bacteria to degrade organic matter. Anaerobic treatment occurs at the bottom of the lagoon where fermentation processes break down accumulated sludge and provide further removal of organic wastes (EPA 2011). Facultative lagoon systems are a common design choice in rural Alaska where the cost of electricity is generally prohibitive of long-term operation of more advanced systems.

Aerated lagoon systems use mechanical processes to actively pump air into the lagoon. In aerated lagoon systems, biological treatment is enhanced with mechanical or diffused aeration. Detention times in these types of lagoons are generally decreased, which allows for a higher volume of wastewater to be processed. Aerated lagoons require a higher degree of operation and maintenance

and have much larger electrical requirements but have been operated successfully in Alaska for many years (Clark et al., 1970).

Discharge of the treated wastewater may be on a continuous or controlled basis. For those lagoons that discharge on a controlled basis, many communities will discharge once or twice a year, typically either after spring thaw or in the fall prior to freeze-up. The sun's ultraviolet radiation contributes to natural disinfection, especially during the long Alaskan summer days; however, some lagoons that discharge on a continuous basis and lack a sufficient amount of detention time to allow natural disinfection to occur may chlorinate prior to discharge.

Identified pollutants of concern include the conventional domestic wastewater pollutants pH, 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.

2.0 PERMIT COVERAGE

2.1 Lagoons and Discharges Covered by the Permit

Coverage under the general permit will be limited to domestic wastewater treatment lagoons providing secondary or equivalent to secondary treatment that discharge less than 1,000,000 gallons per day (gpd) directly to or within 100 feet of fresh or marine surface water.

There are 42 wastewater lagoons that were authorized to discharge under the existing AKG573000 general permit that are eligible for coverage under the reissued general permit. All are either facultative or aerated wastewater lagoons as described in Fact Sheet Section 1.3. DEC will review the notice of intent (NOI) submitted by the previously authorized wastewater lagoons for continued authorization to discharge and will amend, as necessary, any existing authorization to reflect current operations and general permit requirements. (New facilities are also eligible for coverage under the reissued general permit; See Section 2.3 below.) Upon permit coverage, an authorization letter identifying the APDES authorization number and a copy of the final general permit and fact sheet will be sent to qualified lagoon facilities.

Reauthorization to discharge under the general permit does not begin until the permittee receives a written notice from the Department.

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 lagoons that are eligible for coverage under the general permit. These include lagoons that are currently operating as well as new lagoons. The procedure for obtaining authorization to discharge under the general permit is as follows:

- 2.3.1 The eligible lagoon submits a completed NOI to the Department at least 30 days before 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 Department determines the lagoon is eligible for coverage under the general permit, the Department will send 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 from the Department. If the Department determines that the NOI is incomplete, the Department will request that additional information be submitted. If the Department determines that the lagoon 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 determined by the Department to be 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 42 lagoons authorized to discharge under AKG573000. Throughout this permit cycle, there was one authorization terminated due to facility closure or system changes and one additional lagoon received authorization to discharge. In order to evaluate the compliance of lagoons currently authorized under AKG573000, DEC reviewed the DMR data submitted by facilities through the NetDMR E-reporting system as well as completed inspections count reports.

Of the 42 currently authorized lagoons, 16 have neither submitted any discharge monitoring reports (DMRs) for the entire authorization period, nor notified DEC that there was no discharge as required by the permit. These facilities will continue to remain under evaluation by DEC's Compliance and Enforcement Program. In the prior permit cycle, 36% or 15 of the 41 permitted facilities submitted data to the DEC. During this last permit cycle, 62% or 26 of the 42 permitted facilities submitted data to the DEC in varying degrees and frequency.

Of the 42 currently authorized, there were approximately 10 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, for this permit cycle DEC chose to assess compliance with the general permit effluent limits by reviewing FC bacteria and TRC maximum daily limit (MDL) violations, as these pollutants have the highest potential to endanger public health or the environment.

DMRs for each of the remaining 26 lagoons were reviewed from September 2018 through March 2023 and revealed that two facilities actively used TRC to disinfect lagoon effluent. Of the two facilities, one exceeded their TRC MDL of 1.0 milligrams per liter (mg/L) at least once. Results ranged from .42 mg/L to 6.1 mg/L. Additionally, there was a third facility with TRC effluent limits that reported in the form of a no data indicator (NODI) code of no discharge one time during the permit cycle. The FC effluent limits in authorizations range from 14 FC/100 milliliter (mL) to 800 FC/100 mL with a majority of them having the 800 FC/100 mL as the MDL. DEC's review of the FC effluent data revealed that 14 lagoons reported as having no discharge during this permit cycle. Of the remaining 12 lagoons, 10 lagoons exceeded their FC MDL by at least once. The reported FC MDL exceedances results ranged from 43 FC/100 milliliters to 200,000 FC/100 milliliters.

It is beyond the scope and intent of this section to provide specific details on each lagoon's compliance history. For facility-specific discharge monitoring results, see EPA's Enforcement and Compliance History Online 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 (TBELs) or water quality-based effluent limits (WQBELs). TBELs are set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the WQS of a waterbody are met and may be more stringent than TBELs. A more detailed legal and technical discussion of the basis for the effluent limits contained in AKG573000 follows.

4.2 Technology-Based Effluent Limits

BOD₅, TSS, pH, and 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 that do not have a waiver or modification of

secondary treatment requirements. The promulgated TBELs identify the minimum level of effluent quality attainable by application of secondary treatment in terms of the pollutants BOD₅, TSS, and pH.

In 1984, EPA revised 40 CFR §133.102 for facilities that use trickling filters or lagoons as the principal treatment process. These regulatory revisions established effluent limitations for a category of treatment performance called Treatment Equivalent to Secondary Treatment (40 CFR §133.105). To be eligible for discharge limitations based on equivalent to secondary treatment standards, a facility must demonstrate that the BOD₅ and TSS effluent concentrations despite proper operation and maintenance, consistently exceed the secondary standards at 40 CFR §133.102(a) and (b), the principle treatment process is a trickling filter or waste stabilization pond, and the treatment works provide significant biological treatment of municipal wastewater [40 CFR § 133.101(g)].

Further, in accordance with 40 CFR §133.103(c), States, subject to EPA approval, can adjust the maximum allowable TSS concentration for waste stabilization ponds upward from those specified in the equivalent to secondary treatment federal regulations to conform to TSS concentrations deemed achievable with waste stabilization ponds. The Department applied for and received approval from EPA for an alternate TSS average monthly limit of 70 mg/L (Alaska's secondary treatment requirements at 18 AAC 72.990.59(D)). In 2004 equivalent to secondary TSS standards were selected by EPA for aerated lagoons based on the rationale that TSS performance is variable. EPA also noted that the TSS limits were similar to DEC's permitting practices and that DEC had included the limits in the state's preliminary certification of the 2004 general permits. EPA selected BOD₅ limits for non-aerated lagoons in the 2004 issuances of AKG570000 and AKG571000 from a range of values bordered by the more stringent TBELs at 40 CFR §133.102 and the less stringent equivalent to secondary effluent limitations at 40 CFR §133.105. BOD₅ secondary treatment standards (with the exception of the equivalent to secondary percent removal) were selected for aerated lagoons because monitoring data indicated that aerated lagoons could reliably produce effluent that met those standards. Consistent with 18 AAC 72.990.59(A)(iii), EPA also applied a BOD₅ maximum daily limit for aerated lagoons of 60 mg/L. In 2013, AKG573000 was issued that followed EPA's rationale for establishing TBELs for BOD₅, TSS, pH, and TRC.

The equivalent to secondary treatment effluent limitations at 40 CFR §133.105 represent the minimum effluent limitations that equivalent to secondary treatment facilities can obtain. Therefore, equivalent to secondary treatment BOD₅ and TSS percent removal standards were established for both aerated and non-aerated lagoons. Furthermore, 40 CFR §133.105 requires that equivalent to secondary treatment facilities meet the pH effluent requirements found at 40 CFR §133.102(c), which are secondary treatment standards. Therefore, the secondary treatment standards for pH were established for both aerated and non-aerated lagoons.

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 AKG573000 for facilities with authorized TRC mixing zones. (See Fact Sheet Section 6.0 for a discussion on

mixing zones.) AKG573000 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 to indicate TRC technological advances that would alter the WPCF's 1976 conclusions, the TRC limits that were applied as TBELs in the previous permit are being retained as TRC TBELs in this permit.

See Table 1 for a summary of the TBELs contained in this section.

Table 1: Technology-Based Effluent Limits

Parameter	Units ^a	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit	Minimum Removal	Basis for Limit
pH	s.u.	maintained within the range of 6.0 - 9.0 s.u.				18 AAC 83.010 (e)
TRC ^b	mg/L	0.5	---	1.0	---	18 AAC 83.480
BOD ₅	mg/L	30 (aerated)	45 (aerated)	60 (aerated)	65 % ^a	18 AAC 83.010 (e)
		45 (non-aerated)	65 (non-aerated)			
TSS	mg/L	45 (aerated)	65 (aerated)	---	65 % ^a	18 AAC 83.010 (e)
		70 (non-aerated)				
<u>Footnotes:</u> a. mg/L = milligram per liter, s.u.= standard pH units, % = percent. b. TRC monitoring required only if chlorine is used as a disinfectant in the treatment process.						

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 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 WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an Antidegradation Policy (see Fact Sheet Section 9.0, Antidegradation). The use classification system designates the beneficial 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).

AKG573000 authorizes discharges of equivalent to 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. The numeric WQS for freshwater uses and marine uses can be different and are noted below.

4.3.1 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.

4.3.2 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.

4.3.3 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 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.

Table 2 lists the applicable water quality criteria as WQBELs for pH, TRC, DO and FC bacteria.

Table 2: Water Quality-Based Effluent Limits

Parameter	Units ^a	Water	Chronic	Acute	Basis for Limit
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)
TRC ^{b, c}	mg/L	fresh	0.011	0.019	18 AAC 70.020(b)(11)
		marine	0.0075	0.013	18 AAC 70.020(b)(23)
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)
FC Bacteria	FC/ 100 mL	fresh	20	40 ^d	18 AAC 70.020(b)(2)
		marine	14	43 ^e	18 AAC 70.020(b)(14)

Footnotes:

a. mg/L = milligram per liter, s.u.= standard pH units, FC/100ml = fecal coliform per 100 milliliters.

b. TRC effluent limits are only applicable if chlorine is used as a disinfectant.

c. 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.

d. In a 30-day period, not more than 10% of the samples may exceed 40 FC/100 mL

e. In a 30-day period, not more than 10% of the samples may exceed 43 FC/100 mL

4.4 Flow

Flow is based on the hydraulic design capacity of the lagoon (flow rate as gallons per day) and shall be calculated by a professional engineer. The systems must comply with the regulatory requirements of 18 AAC 83 and 18 AAC 72, as updated. A flow limit based on the design capacity ensures that the lagoon 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 facility. Expressing limitations in terms of concentration as well as mass encourages the proper operation of a facility at all times.

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

$$\text{Mass based limit} \left(\frac{\text{lbs}}{\text{day}} \right) = [(\text{concentration limit} \left(\frac{\text{mg}}{\text{L}} \right)) \times (\text{design flow (gpd)}) \times (8.34 \left(\frac{\text{lbs}}{\text{gal}} \right))] / 1,000,000]$$

4.6 Effluent Limits Summary

The more stringent of TBELs or WQBELs have been selected as the final permit limits. See Table 3 through Table 6 below for a summaries of the effluent limits and monitoring requirements contained in general permit AKG573000.

Table 3: Class A: Effluent Limits and Monitoring Requirements for Aerated and Non-Aerated Lagoons that Discharge on a Controlled Basis up to 1,000,000 gpd

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	A flow limitation shall be included in the discharge authorization.				Effluent	Daily during discharge	Measured or Estimated
pH	s.u.	---	---	8.5	6.5	Effluent	2/Discharge event ^b	Grab
Total Residual Chlorine (TRC) ^{c, d}	mg/L	0.011 (fresh) 0.0075 (marine)	---	0.019 (fresh) 0.013 (marine)	---	Effluent	2/Discharge event ^b	Grab
Dissolved Oxygen DO	mg/L	---	---	17	7 (fresh) 6 (marine)	Effluent	Upon DEC request	Grab
Biochemical Oxygen Demand (BOD ₅)	mg/L	30 (aerated) 45 (non-aerated)	45 (aerated) 65 (non-aerated)	60 (aerated) (does not apply to non-aerated)	---	Effluent	2/Discharge event ^b	Grab
	lbs/day ^e	---	---	---	---			Calculated
	% removal	65 (minimum) ^f	---	---	---	Influent and Effluent ^g		Calculated
Total Suspended Solids (TSS)	mg/L	45 (aerated) 70 (non-aerated)	65 (aerated) (does not apply to non-aerated)	---	---	Effluent	2/Discharge event ^b	Grab
	lbs/day ^e	---	---	---	---			Calculated
	% removal	65 (minimum) ^f	---	---	---	Influent and Effluent ^g		Calculated
Fecal Coliform Bacteria (FC)	FC/100 mL	20 (fresh) ^h 14 (marine) ^h	---	40 (fresh) ⁱ 43 (marine) ⁱ	---	Effluent	2/Discharge event ^b	Grab
Enterococci (marine water) ^{h,i}	cfu/100 mL	---	---	Report	---	Effluent	1/Discharge event ^j	Grab
Escherichia coli (E. coli) (fresh water) ^{h,i}	cfu/100 mL	---	---	Report	---	Effluent	1/Discharge event ^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
- Twice per discharge event means once at the beginning or middle, and once near the end of the discharge event.
- The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level 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) x 8.34 (conversion factor) / 1,000,000
- 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 x 200 x 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 each month, May-September, on the same day as a fecal coliform sample is collected.

Table 4: Class B: Effluent Limits and Monitoring Requirements for Aerated and Non-Aerated Lagoons that Discharge on a Continuous Basis with a Design Flow above 250,000 – 1,000,000 gpd

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	A flow limitation shall be included in the discharge authorization.				Effluent	5/Week	Measured
pH	s.u.	---	---	8.5	6.5	Effluent	5/Week	Grab
Total Residual Chlorine (TRC) ^{b,c}	mg/L	0.011 (fresh) 0.0075 (marine)	---	0.019 (fresh) 0.013 (marine)	---	Effluent	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 (aerated) 45 (non-aerated)	45 (aerated) 65 (non-aerated)	60 (aerated) (does not apply to non-aerated)	---	Effluent	2/Month	24-hour Composite ^d
	lbs/day ^e	---	---	---	---			Calculated
	% removal	65 (minimum) ^f	---	---	---	Influent and Effluent ^g		Calculated
Total Suspended Solids (TSS)	mg/L	45 (aerated) 70 (non-aerated)	65 (aerated) (does not apply to non-aerated)	---	---	Effluent	2/Month	24-hour Composite ^d
	lbs/day ^e	---	---	---	---			Calculated
	% removal	65 (minimum) ^f	---	---	---	Influent and Effluent ^g		Calculated
Fecal Coliform Bacteria (FC)	FC/100 mL	20 (fresh) ^h 14 (marine) ^h	---	40 (fresh) ⁱ 43 (marine) ⁱ	---	Effluent	2/Month	Grab
Enterococci (marine water) ^{h, i}	cfu/100 mL	---	---	Report	---	Effluent	1/Month ^j	Grab
Escherichia coli (E. coli) (fresh water) ^{h, i}	cfu/100 mL	---	---	Report	---	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 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.
- See Appendix C for a definition.
- lbs/day = concentration (mg/L) x flow (gpd) x 8.34 (conversion factor) / 1,000,000
- 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 each month, May-September, on the same day as a fecal coliform sample is collected.

Table 5: Class C: Effluent Limits and Monitoring Requirements for Aerated and Non-Aerated Lagoons that Discharge on a Continuous Basis above 60,000- 250,000 gpd

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	A flow limitation shall be included in the discharge authorization.				Effluent	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 (aerated) 45 (non-aerated)	45 (aerated) 65 (non-aerated)	60 (aerated) (does not apply to non-aerated)	---	Effluent	1/Month	Grab or Composite ^d
	lbs/day ^e	---	---	---	---			Calculated
	% removal	65 (minimum) ^f	---	---	---	Influent and Effluent ^g		Calculated
Total Suspended Solids (TSS)	mg/L	45 (aerated) 70 (non-aerated)	65 (aerated) (does not apply to non-aerated)	---	---	Effluent	1/Month	Grab or Composite ^d
	lbs/day ^e	---	---	---	---			Calculated
	% removal	65 (minimum) ^f	---	---	---	Influent and Effluent ^g		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) ^{h,i}	cfu/100 mL	---	---	Report	---	Effluent	1/Month ^j	Grab
Escherichia coli (E. coli) (fresh water) ^{h,i}	cfu/100 mL	---	---	Report	---	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 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.
- See Appendix C for a definition.
- lbs/day = concentration (mg/L) x flow (gpd) x 8.34 (conversion factor) / 1,000,000
- 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 x 200 x 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 each month, May-September, on the same day as a fecal coliform sample is collected.

Table 6: Class D: Effluent Limits and Monitoring Requirements for Aerated and Non-Aerated Lagoons that Discharge on a Continuous Basis less than 60,000 gpd

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	A flow limitation shall be included in the discharge authorization.				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	Upon DEC request	Grab
Biochemical Oxygen Demand (BOD ₅)	mg/L	30 (aerated) 45 (non-aerated)	45 (aerated) 65 (non-aerated)	60 (aerated) (does not apply to non-aerated)	---	Effluent	1/Quarter ^b	Grab or Composite ^e
	lbs/day ^f	---	---	---	---			Calculated
	% removal	65 (minimum) ^g	---	---	---	Influent and Effluent ^h		Calculated
Total Suspended Solids (TSS)	mg/L	45 (aerated) 70 (non-aerated)	65 (aerated) (does not apply to non-aerated)	---	---	Effluent	1/Quarter ^b	Grab or Composite ^e
	lbs/day ^f	---	---	---	---			Calculated
	% removal	65 (minimum) ^g	---	---	---	Influent and Effluent ^h		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) ^{i,j}	cfu/100 mL	---	---	Report	---	Effluent	1/Quarter ^{b,k}	Grab
Escherichia coli (E. coli) (fresh water) ^{i,j}	cfu/100 mL	---	---	Report	---	Effluent	1/Quarter ^{b,k}	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. Once per quarter means the time period of three months based on calendar year: Jan-March, April-June, July-Sept, and Oct- Dec.
- c. The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level of 0.1 mg/L as the compliance evaluation level for this parameter.
- d. Monitoring for TRC is not required if chlorine is not used as a disinfectant or introduced elsewhere in the treatment process.
- e. See Appendix C for a definition.
- f. lbs/day = concentration (mg/L) x flow (gpd) x 8.34 (conversion factor) / 1,000,000
- g. 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.
- h. Limits apply to effluent. Report average monthly influent concentration. Influent and effluent composite samples shall be collected during the same 24 hour period.
- i. 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 x 200 x 300)^{1/3}= 181.7
- j. 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
- k. One sample shall be collected each month, May-September, on the same day as a fecal coliform sample is collected.

5.0 MONITORING REQUIREMENTS

5.1 Basis for 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, as having permit limits that require monitoring to track compliance, Sections 5.2 and 5.3 outline additional monitoring requirements DEC has determined necessary to implement in the last permit and is carrying forward into this one.

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

Permittees will be notified of additional monitoring when issued a written authorization to discharge under the general permit.

5.2 Monitoring Frequencies

Monitoring frequencies are based on the nature and effect of a pollutant as well as a minimum sampling frequency that the Department determines necessary to adequately monitor a lagoon's treatment performance and compliance.

Lagoons that discharge on a controlled basis monitor per discharge event. A controlled basis means that the lagoon is discharged on an individual event basis, once or twice per year for less than one month. The discharge of the lagoon may be uninterrupted or intermittent during the event.

Due to the wide range of design flow rates of continuous discharge lagoons authorized under the permit, the Department categorized facilities into three separate flow classes and associated monitoring frequencies. A continuous basis means a lagoon that discharges continuously for more than one month during any period of the year.

The following classes of lagoons have been established for the general permit:

- Class A: Lagoons that discharge on a controlled basis up to 1,000,000 gpd;
- Class B: Lagoons that discharge on a continuous basis with a design flow above 250,000 gpd up to 1,000,000 gpd;
- Class C: Lagoons that discharge on a continuous basis with a design flow above 60,000 gpd up to and including 250,000 gpd;
- Class D: Lagoons that discharge on a continuous basis with a design flow less than and including 60,000 gpd.

Refer to Tables 3, 4, 5, and 6 above for parameters, effluent limits and monitoring frequency requirements.

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]).

5.3 Enterococci Bacteria and E.coli

Enterococci and E. coli bacteria have been identified as indicator organisms of “fecal contamination...(and) indirectly indicate the potential presence of fecal pathogens capable of causing (gastro intestinal) illness (EPA 2012).” In 1986 EPA published *EPA’s Ambient Water Quality Criteria for Bacteria – 1986* (EPA 1986) that contained recommended bacteria water quality criteria for primary contact recreational users. These criteria were based on “observed illness levels in swimmers and corresponding levels of bacterial indicators of fecal contamination, specifically enterococci and E. coli for fresh water and enterococci for marine water (EPA 2012).”

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 activities where there’s direct contact with the water including swimming, bathing, water skiing, and similar water contact activities where 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. EPA approved DEC’s revised bacteria water quality criteria on May 15, 2017. Monitoring is required by the permit for the subject parameters May through September when primary contact recreation in which full immersion and ingestion of water is more likely to occur.

In the prior general permit cycle, the Department reviewed submitted discharge monitoring reports (DMRs) and determined that more information was necessary before a formal effluent limit for E. coli and enterococci bacteria could be established. During this reissuance cycle, the Department still lacked enough data based on DMR review from September 2018 through March 2023, and therefore, the Department is retaining the enterococci monitoring requirement for marine water and E. coli monitoring requirement for freshwater, where applicable.

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, the Department 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 new mixing zone is requested, Form 2M must also be submitted with the NOI. Form 2M may be located through the link in Permit Section 1.4.1 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 lagoons listed in Appendix D of the permit (that requested a mixing zone) have satisfied the 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 by the Department 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 in the area of the proposed mixing zone. 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), and if applicable, fecal coliform bacteria (FC). 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 AKG573000 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 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 AKG573000 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 AKG573000 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 AKG573000 were Tier 2 waters and accordingly conducted a Tier 2 antidegradation analysis. DEC determined the AKG573000 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 AKG573000 are not expanded from the 2018 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 the general permit. Any existing QAPP for the facility may be modified to meet the requirements of Permit Section 4. The QAPP is required to be retained onsite and made available to DEC upon request.

10.2 Lagoon Operation and Maintenance Plan

Section 3.0 of the general permit requires the permittee to develop and implement a Lagoon Operation and Maintenance Program Plan within 180 days of the effective date of receiving authorization to discharge. The final Lagoon Maintenance Plan should be signed and dated by the person responsible for the overall management of the lagoon facility. A copy of the Lagoon Maintenance Program Plan shall be maintained onsite and made available to the Department upon request.

10.3 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.

10.4 Electronic Reporting (E-Reporting) Rule

10.4.1 E-Reporting Rule for DMRs (Phase I).

The permittee must submit DMR data electronically through Network Discharge Monitoring Report (NetDMR) per Phase I of the E-Reporting Rule (40 CFR Part 127) upon the effective date of this permit. Authorized persons may access permit information by logging into the NetDMR Portal (<https://cdxnodengn.epa.gov/oeca-netdmr-web/action/login>). DMRs in compliance with the E-Reporting Rule are not required to submit as described in permit Appendix A – Standard Conditions unless requested or approved by DEC. Permittees shall include any DMR data required by the permit that cannot be reported in a NetDMR field (e.g., mixing zone receiving water data, etc.) as an attachment to the NetDMR submittal. DEC has established an E-Reporting 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.

10.4.2 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 <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 Appendix A – Standard Conditions.

11.0 OTHER LEGAL REQUIREMENTS

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 May 9, 2023, DEC contacted National Oceanic Atmosphere Administration (NOAA) to also provide them early notification of DEC's intent to reissue AKG573000 and to provide them the above mentioned opportunity to share concerns with DEC regarding listed species. On May 10,

2023, the NOAA representative responded that they would review the draft permit during the 30 day public notice.

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 7.

Table 7: 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>Chupea 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, 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, 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 May 9, 2023, DEC contacted the EFH unit with NOAA to provide them early notification of DEC's intent to reissue AKG573000 and to provide them the opportunity to share concerns with DEC regarding EFH.

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 <https://nauticalcharts.noaa.gov/data/us-maritime-limits-and-boundaries.html> 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

- Alaska Department of Environmental Conservation (ADEC), 2018. Integrated Water Quality Monitoring and Assessment Report. <https://dec.alaska.gov/water/water-quality/integrated-report#2018>
- ADEC, 2008. Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances, as amended through December 12, 2008.
- ADEC, 2010. Interim antidegradation implementation methods, Policy and Procedure 05.03.103, July 14, 2010.
- ADEC, 2017. 18 AAC 72, Wastewater Disposal, as amended through November 7, 2017, State of Alaska, Department of Environmental Conservation.
- ADEC, 2003. 18 AAC 70, Water Quality Standards, as amended through March 5, 2020. State of Alaska, Department of Environmental Conservation.
- Clark, S. E., H. J. Coutts, and R. L. Jackson. 1970. Alaska Sewage Lagoons. U. S. Department of the Interior, Federal Water Quality Administration, Alaska Water Laboratory, College, Alaska. Working Paper No. 8. Second International Symposium on Sewage Lagoons. Kansas City, Missouri. June 1970.
- U.S. Environmental Protection Agency (USEPA), 1986. Ambient Water Quality Criteria for Bacteria – 1986. EPA440/5-84-002. Office of Water, Regulations and Standards Criteria and Standards Division, USEPA, Washington, DC, January 1986.
- U.S. Environmental Protection Agency, 2011. Principals of Design and Operations of Wastewater Treatment Pond Systems for Plant Operators, Engineers, and Managers. EPA/600/R-11/088. Office of Research and Development, National Risk Management Research Laboratory – Land Remediation and Pollution Control Division, USEPA, Cincinnati, Ohio, August 2011.
- USEPA, 2012. Recreational Water Quality Criteria. EPA-820-F-12-061. Office of Water, USEPA, December 2012.
- USEPA. 1991. Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, USEPA Office of Water, Washington D.C., March 1991.
- National Oceanic and Atmospheric Administration (NOAA Fisheries), 2017. Endangered, Threatened, Proposed, Candidate Species Under NMFS' Authority in Alaska. <<https://alaskafisheries.noaa.gov/pr/esa-species-list>>. Accessed May 4, 2023.
- NOAA Fisheries, 2023. NOAA_Baseline (MapServer). <https://alaskafisheries.noaa.gov/mapping/arcgis/rest/services/NOAA_Baseline/MapServer>. Accessed May 4, 2023.
- Water Pollution Control Federation, 1976. Chlorination of wastewater, manual of practice no. 4. Moore & Moore, Washington D.C

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 EPA 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 70.24(c)(1)
Low Flow Design	For river, streams, and other flowing freshwaters. - Determine low flow calculations or documentation for the applicable parameters.		18 AAC 70.240(I)
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)

Criteria	Description	Resources	Regulation
	(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)
	(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, king, and sockeye salmon? If yes, mixing zone prohibited 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 cause carcinogenic, mutagenic, tetragenic, or otherwise harmful effects to human health? 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)
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 USFWS or NOAA? 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)