ANTIDEGRADATION

Section 303(d)(4) of the Clean Water Act (CWA) states that, for waterbodies where the water quality meets or exceeds the level necessary to support the waterbody's designated uses, water quality-based effluent limitations (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 the Environmental Protection Agency (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).

Saint Paul Harbor is not listed as impaired (Category 4 or 5) in Alaska's 2018 Integrated Water Quality Monitoring and Assessment Report; therefore, this antidegradation analysis conservatively assumes that the Tier 2 protection level applies to all parameters, consistent with 18 AAC 70.016(c)(1).

18 AAC 70.015(a)(2) states that if the quality of water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, 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), 18 AAC 70.016(c)(7)(A-F), and 18 AAC 70.016(d) are met. The Department's findings are as follows:

18 AAC 70.016(b)(5)

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

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 technology-based effluent limitations (TBELs) and WQBELs and applying the more restrictive of these limits. The water quality criteria, upon which the permit effluent limits are based, serve the specific purpose of protecting the existing and designated uses of the receiving water. WQBELs are set equal to the most stringent water quality criteria available for any of the protected water use classes. This 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 permit also requires receiving waterbody monitoring to establish facility-specific WQBELs.

The Department concludes that the terms and conditions of the permit will be adequate to fully protect and maintain the existing uses of the water and that the findings under 18 AAC 70.016(b)(5) are met.

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

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

The General Permit AKG528000, Part 1.4.1.8, requires that the discharge shall not cause contamination of surface or ground waters or a violation of the WQS at 18 AAC 70, unless as authorized in accordance with applicable provisions in 18 AAC 70.200 – 70.240 (e.g., variance, mixing zone). As a result of the facility's reasonable potential to exceed water quality criteria for temperature, a mixing zone is authorized in the OBI Kodiak Seafood Processing Plant authorization in accordance with 18 AAC 70.240. The resulting effluent end-of-pipe limitation and monitoring requirements protect WQS. Therefore, the facility's thermal discharge will not violate the water quality criteria found at 18 AAC 70.020.

Regulations at 18 AAC 70.030 require that an effluent discharged to a waterbody may not impart chronic toxicity to aquatic organisms at the point of discharge, or if the Department authorizes a mixing zone, at or beyond the mixing zone boundary. The Department has not authorized a toxicity mixing zone in this authorization; the facility will not violate the toxicity limit in 18 AAC 70.030.

There are no applicable site-specific criteria associated with 18 AAC 70.236(b). The permit does not authorize short-term variances or a zone of deposit under 18 AAC 70.200 or 18 AAC 70.210.

The Department determined that the reduction in water quality will not violate the criteria of 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b) and that the finding is met.

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

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

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

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

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

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

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

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

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

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

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

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

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

The first part of the definition includes all federal technology-based effluent limit guidelines (ELGs) including "For POTWs, effluent limitations based upon…Secondary Treatment" at 40 CFR §125.3(a)(1) defined at 40 CFR §133.102, adopted by reference at 18 AAC 83.010(e). The ELGs set standards of performance for existing and new Publicly Owned Treatment Works (POTWs). Since the facility is not a POTW, the ELGs are not incorporated in the permit.

The second part of the definition references the minimum treatment standards for domestic wastewater discharges found at 18 AAC 72.050. Since the facility does not discharge domestic waste to receiving waters, the permit does not include the referenced minimum treatment standards described in 18 AAC 72.050.

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

The fourth part of the definition refers to WQBELS. WQBELs are designed to ensure that the WQS of a waterbody are met

and may be more stringent than TBELs. Section 301(b)(1)(C) of the CWA requires the development of limits in permits necessary to meet WQS by July 1, 1977. WQBELs included in Alaska Pollutant Discharge Elimination System (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 standards established under CWA Section 303, including state narrative criteria for water quality." The permit requires compliance with 18 AAC 70 and includes a WQBEL developed for temperature that is protective of water quality criteria at the boundary of the mixing zone.

After review of the applicable statutory and regulatory requirements, including 18 AAC 70, 18 AAC 72, and 18 AAC 83, the Department finds that the discharge from the OBI Kodiak Seafood Processing Plant meets the highest applicable statutory and regulatory requirements and that the finding is met.

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

(i) a lowering of water quality under 18 AAC 70.015(a)(2)(A) is necessary; when one or more practicable alternatives that would prevent or lessen the degradation associated with the proposed discharge are identified, the department will select one of the alternatives for implementation; and

(ii) the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the department to be the most effective and practicable.

Form 2G Sections 1 (Questions 1 and 2) and 2 - Facility Information (18 AAC 70.016(a)(5)(A-G)) and Baseline Water Quality Provisions (18 AAC 70.016(a)(6)(A-C)):

The receiving waterbody, Saint Paul Harbor, should have a Tier 2 protection level. Temperature is the pollutant of concern in need of a Tier 2 analysis. OBI submitted the maximum expected effluent temperature upon discharge along with other information which could alter the effects of the discharge to the receiving water. Information submitted included ambient background waterbody temperature, expected pollutant persistence, and expected increase or decrease in ambient background waterbody temperature due to the discharge. Temperature is not expected to persist in the receiving water, but the discharge of heated effluent is expected to increase the ambient background temperature in Saint Paul Harbor.

Form 2G Section 4 (Questions 1-3) – Tier 2 Protection Level and Analysis (18 AAC 70.016(c)):

The antidegradation application is for a new or expanded discharge (regulated for the first time or discharges that are expanded such that they could result in an increase in permitted parameter load or concentration or other changes in discharge characteristics that could lower water quality or have other adverse environmental impacts) that requires a Tier 2 analysis for parameters as defined under 18 AAC 70.016(c)(2)(A)-(E). Temperature was identified as the pollutant of concern requiring a practicable alternatives analysis (a description and analysis of a range of practicable alternatives that have the potential to prevent or lessen the degradation associated with the proposed discharge).

Temperature Practicable Alternatives Analysis:

The OBI Kodiak Seafood Processing Plant uses fresh water piped from the city as cannery retort cooling water. The retort cooling water effluent stream has a maximum expected temperature of 76.7 °C, and after mixing with seafood processing

water prior to discharge the combined effluent stream has a maximum expected temperature of 24.4 °C. The receiving water ambient background temperature during salmon processing (canning) season, based on National Oceanic and Atmospheric Administration (NOAA) data collected at tidal Station 9457292, is 11.7 °C.

OBI analyzed three options to further treat the retort water prior to discharge. All three options started with providing initial cooling of the retort water with an array of dry fan coolers. After the initial cooling, OBI evaluated: A) using a mechanical refrigeration unit (chiller), B) adding seawater, and C) mixing fan-cooled retort water with seafood processing water (this differs from the proposed option in that OBI does not propose implementing the fan cooling).

Table 1 provides relative capital and operations and maintenance (O&M) costs of the analyzed temperature treatment options at the OBI Kodiak Seafood Processing Plant.

Table 1 - Retort Water Cooling Options

Treatment Option	Estimated Capital Cost	Estimated Annual O&M Cost	Effluent Discharge Temperature Achieved
Proposed – mix with seafood processing water	Not specified	Not specified	24.4 °C
Option A – fan cooling + refrigeration unit	$629,000	$20,360	15 °C
Option B – fan cooling + mix with seawater	$654,000	Not specified	15 °C
Option C – fan cooling + mix with seafood processing water	$473,000	$2,500	16.7 °C

The Department has determined that based on the analysis provided by OBI regarding retort water cooling options, and considering technical and economic constraints, the methods of pollution prevention, control, and treatment proposed to be applied are the most effective and practicable. OBI must comply with specific WQBELs. Therefore, the finding under 18 AAC 70.016(c)(7)(D)(i-ii) is met.

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

Form 2G Section 4 (Question 4) - Social or Economic Importance (18 AAC 70.016(c)(5))

The OBI Kodiak Seafood Processing Plant provides employment opportunities (at the plant) for residents of Kodiak. The plant also purchases fish from Alaska fishermen, which provides a source of income for them.

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

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

CWA Section 316 pertains to minimizing the adverse environmental impact of cooling water intake structures. Since OBI does not propose taking in ambient seawater as cooling water (the facility obtains fresh cooling water from the city), the finding is not applicable.