ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM

PERMIT FACT SHEET – FINAL

General Permit Number: AKG521000

Onshore Seafood Processors in Alaska

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Wastewater Discharge Authorization Program

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Issuance of an Alaska Pollutant Discharge Elimination System (APDES) general permit for:

ONSHORE SEAFOOD PROCESSORS IN ALASKA

The Alaska Department of Environmental Conservation (the Department or DEC) has issued an APDES general permit (permit) to operators of seafood processors and operators of onshore facilities that discharge seafood waste to coastal and fresh water systems. The permit authorizes and sets conditions on the discharge of pollutants from authorized onshore facilities to waters of the United States (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 facilities and outlines best management practices to which each facility must adhere.

This fact sheet explains the nature of potential discharges from onshore seafood processing facilities and those that discharge seafood waste 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 and reporting requirements in the permit

Public Comment

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

Appeals Process

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

Director, Division of Water
Alaska Department of Environmental Conservation
P.O. Box 111800
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:

Commissioner
Alaska Department of Environmental Conservation
P.O. Box 111800
Juneau AK, 99811-1800

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.aspx for information regarding appeals of Department decisions

Documents are Available

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

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 410 Willoughby Avenue, Suite 310 Juneau, AK 99811 (907) 465-5180
Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 610 University Avenue Fairbanks, AK 99709 (907) 451-2100	Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 43335 Kalifornsky Beach Rd. – Suite 11 Soldotna, AK 99669 (907) 262-5210

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1.1. Legal Basis for Issuance of an APDES Permit

Section 301(a) of the Clean Water Act (CWA) provides that the discharge of any pollutant is unlawful except in compliance with Sections 301, 302, 306, 307, 318, 402 and 404 of the CWA. In addition, as established in Alaska Administrative Code (AAC) 18 AAC 83.015, the discharge of any pollutant to surface water designated as waters of the U.S. in Alaska is unlawful except in accordance with an Alaska Pollutant Discharge Elimination System (APDES) permit.

Per 18 AAC 83.205, the Department may regulate categories or subcategories of point source discharges within an area through the use of a general permit when the sources:

- Involve the same or substantially similar types of operations;
- Discharge the same types of wastes;
- Require the same effluent limitations 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.

Federal regulations found in Code of Federal Regulations (CFR) 40 CFR Part 408 establish Effluent Limitation Guidelines (ELGs) for seafood processors under a single category, "Canned and Preserved Seafood Processing Point Source Category." Seafood processing dischargers are further divided into subcategories when applying the ELGs found in 40 CFR Part 408 based on seafood species type and processing method.

The Department determined that it is appropriate to issue a general permit for facilities identified in Fact Sheet Part 1.5 because sources have substantially similar operations, discharge the same types of waste, are subject to the same water quality-based effluent limitations (WQBEL) and technology-based effluent limitations (TBEL), and have similar monitoring requirements.

1.2. Individual Permit

A permittee authorized to discharge under a general permit may request to be excluded from coverage by applying for an individual permit. This request shall be made by submitting APDES permit application Forms 1 and 2C, along with Form 2M (if requesting a mixing zone) with supporting documentation (e.g., modeling, antidegradation information, etc.) to DEC.

The Department may require any person authorized by a general permit to apply for and obtain an individual permit, or any interested person may petition the Department to take this action. Per 18 AAC 83.215, the Department may consider the issuance of an APDES individual permit when:

- The discharger is not in compliance with the terms and conditions of the APDES general permit.
- A change has occurred in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source.
- Effluent limitations guidelines are promulgated for point sources covered by the APDES general permit.
- A water quality management plan containing requirements applicable to a point source is approved.

- Circumstances have changed since the time of the request to be covered so that the discharger is no longer appropriately controlled under the general permit, or the authorized discharge shall be either temporarily or permanently reduced or eliminated.
- The single discharge, or the cumulative number of discharges, is/are a significant contributor(s) of pollutants.

1.3. Permit Issuance History and Coverage Changes

In 1995, EPA issued National Pollutant Discharge Elimination System (NPDES) general permit AKG520000 for seafood processors operating in the State of Alaska. In 2001, EPA reissued general permit AKG520000. The State of Alaska's accompanying July 2001 CWA Section 401 Certificate of Reasonable Assurance (AKG520000 401 Certification) authorized mixing zones for residues, dissolved gas, oil and grease (O&G), fecal coliform (FC) bacteria, pH, temperature, color, turbidity, and total residual chlorine (TRC), as well as authorized a 1.0 acre Zone of Deposit (ZOD) for each facility discharge area authorized by the AKGK520000 general permit.

The 2001 AKG520000 permit authorized the discharge of seafood wastes and other wastewater discharges from seafood processing facilities into waters of the U.S. At the time of the 2001 permit issuance, approximately 250 permitted seafood processing facilities operated in Alaska. This included about 80 onshore facilities (referred to as 'shore-based' facilities in the AKG520000 permit as those located on land or pilings) and about 70 'shore-based' processing vessels. 'Shore-based' processing vessels were defined as "a processor operating and discharging less than one-half nautical mile (0.5 nm) from shore at mean lower low water (MLLW) in the AKG520000 permit." It is important to note that the 2001 AKG520000 permit authorized 'shore-based' vessels that discharged within zero to 0.5 nm mile of shore, but not necessarily in association with any land-based or onshore processing facility. The AKG521000 permit will provide coverage for those moored or anchored vessels acting as support facilities to an onshore seafood processing facility, or permanently moored craft and barges that discharge seafood waste.

The 2001 AKG520000 permit expired on July 27, 2006 and was administratively extended by EPA. Accordingly, all AKG520000 general permit authorizations issued to seafood processors were administratively extended. Administrative extensions of a permit's authorizations are allowed in accordance with 40 CFR 122.6(a), which states that "when a timely and complete application is received by EPA, and through no fault of the permittee, EPA does not reissue a new permit prior to the expiration date of the existing permit, then the permit remains fully effective and enforceable." In accordance with 18 AAC 83.155, the Department continued the 2001 AKG520000 administratively extended permit and issued authorizations when it received authority to administer the NPDES program in Alaska.

On October 31, 2008, EPA approved the State of Alaska Department of Environmental Conservation's (DEC or Department) application to administer the NPDES permitting and compliance program as the Alaska Pollutant Discharge Elimination System (APDES) Program. With EPA's approval of the state's application the Department was delegated the responsibilities of carrying out the applicable CWA NPDES program provisions. The Department developed regulations in the Alaska Administrative Code (AAC) to implement the APDES program (18 AAC 83). As established in 18 AAC 83.015, the discharge of any pollutant is unlawful except in accordance with an APDES permit.

During the time between the expiration of AKG520000 (July 27, 2006) and the approval of the State's application to administer the NPDES Program (October 2008), EPA worked on reissuing the 2001 AKG520000 general permit but did not reissue the permit before approving the State's application. Following approval of the State's application, AKG520000 was divided into multiple state and federal permitting actions. In December 2009, EPA issued NPDES General Permit AKG524000 'Offshore

Seafood Processors in Alaska' to cover vessels discharging in federal waters 3.0 nm or more (outside State waters) from shore or baseline, whichever is greater. In May 2011, DEC issued APDES General Permit AKG523000 'Alaska Offshore Seafood Processors' providing coverage for approximately 40 Offshore Seafood Processors discharging in State waters between 0.5 nm to 3.0 nm from shore as delineated by MLLW or baseline, whichever is greater. Nearshore seafood processing vessels that discharged to waters less than 0.5 nm from shore continued to be authorized to discharge under the 2001 AKG520000 administrative extensions until an appropriate APDES permit was available. In 2018, DEC re-issued APDES general permit AKG523000 to Offshore Seafood Processing operator(s) or owner(s) of vessels. The re-issued AKG5230000 permit provides coverage to seafood processing vessels discharging either stationary and/or in-transit between 0.25 nm to 3.0 nm from shore, and inland water seafood waste discharge vessels that discharge a seafood processor's seafood processing waste and wastewater to inland water of the U.S. behind the baseline and between 0.25 nm to 3.0 nm from Alaska's shores. The 2018 Offshore Seafood general permit also provides coverage to seafood processing vessels discharging stationary and between shore (0.0 nm) and 0.25 nm from shore, but only if the processing vessel can demonstrate previously installed and existing permanent infrastructure is present at the time of general permit issuance to anchor at that location or can demonstrate that discharges are necessary for the protection of the vessel and crew during adverse weather or sea conditions. The reissued AKG523000 permit went effect January 1, 2019.

1.3.1. AKG521000 vessel coverage

Moored/Docked Vessels Providing Support. The AKG521000 permit provides coverage to moored processing vessels and moored barges that provide support to an onshore facility and discharge through the processing facility's outfall, and permanently moored craft and barges. Normally, processing vessels follow the fisheries, moving from waterbody to waterbody. However, some processing vessels and moored barges provide direct support to an onshore seafood processing facility by providing processing services or additional freezing capacity. Direct support vessels and moored barges remain stationary, moored to a dock, pier or permanent anchor to prevent movement, with discharges occurring in the same location throughout the season. Permanently moored craft (PMC) discharging independently of an onshore facility will be covered under this permit, as PMC operate their craft in similar manners to an on-shore seafood processing facility, rather than following a fishery. These PMC moor and remain stationary and their discharges occur in the same location throughout the season, making them eligible for coverage under the AKG521000 permit.

Processing vessels that propose to discharge shore or dock side independent of an onshore processing facility will not be covered by the AKG521000 permit. Additionally, these vessels will no longer be covered under the 2001 AKG520000 administratively extended permit coverage, which will expire upon issuance of this AKG521000 permit.

The permitted onshore facility shall submit an updated Notice of Intent (NOI) listing the barges and/or vessels to be covered under the onshore permittee's authorization. All barge and vessel discharges routed through the facility's outfall and covered under the onshore permittee's authorization shall meet all permit conditions in the AKG521000 general permit. The onshore facility shall list all discharges that the barge and /or vessels propose to route through the onshore facility, and the permittee of the onshore facility is responsible to ensure that the barge and vessel discharges comply with the permit.

Seafood Delivery Vessels. Typical seafood offloading systems include the use of a pump vacuum. These vacuum systems use hydraulic forces sending a mixture of catch transfer water and fish from the vessel to the seafood processing facility. At the end of offloading, the facility sends the catch transfer water through their seafood waste treatment system and outfall, discharges the catch transfer

water back to the vessel, or does a combination thereof. At times, discharging this catch transfer water back to a vessel has been noted as a cause of sea surface residues violations. If there are reoccurring sea surface residues violations at the facility, the permit requires development and implementation of mitigating BMPs. For any catch transfer water discharged from the facility to a vessel, NOI application requirements (Attachments A and A-1), limits under Permit Part 2.1, and monitoring per Permit Part 2.2 apply.

1.3.2. Inland Water Discharges

The 2001 AKG520000 permit authorized seafood processing facilities to transport their seafood processing waste and discharge by vessel "At-Sea". These "At-Sea" discharges were authorized to occur inside and outside of baselines or closing lines, as long as the discharges were located one mile or greater from shore.

In the issuance of the AKG524000 permit, EPA determined that the "At-Sea" discharges to federal waters (i.e., beyond 3.0 nm from baseline) did not fall within the authority of the NPDES Program and that the Ocean Dumping Act provides the authority for these types of discharges. More information can be found in the AKG524000 permit and accompanying RTC document.

The 2018 AKG523000 general permit authorizes in-transit vessel discharges behind baseline or closing lines, defining these discharges as inland water discharges. Inland water discharges will be authorized behind baselines only. Dumping of fish waste seaward of the territorial baseline, closing lines, or in areas where a baseline has not been established falls under the legal jurisdiction of the Ocean Dumping Act administered by the EPA.

The AKG521000 does not authorize "At-Sea" or inland water discharges.

1.3.3. Fresh Water Discharges

The 2001 AKG520000 permit Section III (B)(3) listed lakes, rivers and streams (fresh water systems) as "at risk water resources and waterbodies", yet the 2001 permit allowed an operator with a facility located in a fresh water system to apply for a waiver to discharge to the Excluded Area(s). One of the listed waiver justifications was, "Pre-existing, permanent shore-based siting may be considered justification for a waiver." EPA issued approximately 25 AKG520000 authorizations to pre-existing onshore facilities with discharges to estuarine or fresh water systems. DEC intends to continue to provide coverage to these facilities under the AKG521000, as well as new applicants proposing discharges to estuarine or fresh water systems as long as the new facilities meet permit eligibility criteria (see Permit Appendix Table D – D2 Seafood Processing Facilities Discharging to Fresh Waters).

1.3.4. Remote Facilities

The AKG521000 permit proposes coverage for approximately 80 onshore facilities and several permanently moored craft and barges that are currently covered under the administratively extended 2001 AKG520000 permit. The Department proposes to authorize these facilities under the AKG521000 permit as the discharges are all associated within the same 'seafood processing' category as found in 40 CFR Part 408. The Department finds that operators discharging seafood waste and wastewater, as well as community grinders discharging seafood waste and wastewater, qualify for coverage under the general permit consistent with 18 AAC 83.210(h).

1.3.5. Hatchery and Aquaculture Facility Operators

While administering the AKG520000 general permit, EPA issued authorizations to hatchery operators that were performing seafood processing-like activities (conversion of aquatic animals from a raw form to a marketable form). It is not DEC's intent to cover hatchery operators under the

AKG521000 Onshore Seafood Processors permit. In 2018 DEC issued the AKG130000 general permit applicable to Hatchery and Aquaculture activity discharges, which became effective March 1, 2018. As of December 2018 all hatchery operators with authorization to discharge under the 2001 AKG520000 administrative extensions have applied for and are issued an authorization under the AKG130000 general permit, and those AKG52000 administrative extensions have been terminated.

1.3.6. Operators previously not required to obtain coverage

Low volume discharges from smaller seafood processing facilities were not previously required to obtain coverage under the 2001 AKG520000 general permit.

> **AKG520000 Section I (A)** "Operations which catch and process seafood and which discharge less than one thousand (1,000) pounds of seafood waste per day and less than fifteen tons (30,000 [*pounds*] (lbs)) of seafood waste per calendar year may be, but are not required to be, covered under this general NPDES permit."

DEC determined that it is appropriate to issue an APDES general permit for operators of seafood processing facilities that discharge more than 1,000 pounds of seafood processing waste per day and 30,000 pounds of seafood processing waste per calendar year. Operators of small seafood processing facilities that discharge less than 1,000 pounds of waste per day and 30,000 pounds per calendar year do not operate in a similar manner as the large operators, nor do the small operators require the same effluent conditions, operating conditions, or the same monitoring requirements. Therefore, DEC determined that coverage under this general permit is not appropriate. DEC intends to evaluate the need for an APDES general permit in the future for small processors that discharge less than 1,000 pounds per day and 30,000 pounds per calendar year of seafood processing waste. An operator of a small processor may elect to submit a notice of intent (NOI) for authorization under the AKG521000 permit while waiting for issuance of a potential APDES small processor general permit. Submittal of an NOI requires a permittee to comply with all conditions and requirements of the AKG521000 permit, including reducing seafood processing waste to 0.5 inch or less in any dimension prior to discharge.

1.3.7. Community Grinders

Under the 2001 AKG520000 permit, community grinders and their outfalls were not a covered discharge. Communities began using grinders and outfall discharges to address concerns regarding animals accessing an easy food source left on the beach during large shore-side fisheries, which creates potential for dangerous animal/human interactions. To decrease the amounts of seafood waste (carcasses) left on the beaches, some communities have installed community fish waste grinders. The public is able to bring their seafood carcasses to a collective location and the seafood waste is ground to 1.27 cm (½-inch) and discharged through an outfall. The AKG521000 permit proposes coverage for these community grinder waste discharge systems where communities choose to install such systems. All currently known community grinding facilities and discharge locations that the permit proposes to cover are listed in Appendix D of the permit.

1.4. Description of Seafood Processing Facilities

Seafood processing facilities and vessels (including barges) are primarily in business to convert raw seafood into a marketable form. Alaska's commercial fishing operations target a number of assemblages including groundfish (e.g., walleye pollock, Pacific cod, sablefish, rockfish species, and other species of flatfish); five species of salmon; herring; and shellfish (e.g., species of crab, shrimp, clams, scallops, abalone, sea urchins, and sea cucumbers).

Seafood processing facilities use a variety of techniques and equipment to produce marketable seafood products. Detailed descriptions of specific seafood processing facilities (e.g., salmon canning, fish meal production) are provided by EPA's 'Development Document for Effluent Limitation Guidelines and New Source Performance Standards for the Fish Meal, Salmon, Bottom Fish, Clam, Oyster, Sardine, Scallop, Herring, and Abalone Segment of the Canned and Preserved Fish and Seafood Processing Industry Point Source Category' (1975) (http:/dec.alaska.gov/water/wwdp/seafood/documents.html). Seafood processing can be described as the production of marketable seafood products include packaging whole fresh or frozen seafood for shipment, mechanical filleting, deboning processes, and production of washed and unwashed mince/paste products, and other seafood byproducts. Solid and liquid wastes remaining after production may be further processed into fish meal, fish oil, fish hydrolysate, or other by-products which converts much of the solid waste to marketable products. Additionally, since the early 1980s, new seafood processing techniques have been introduced into facility commodity lines, such as surimi and salmon byproduct (unwashed mince and washed mince) have produced economic gains. New techniques in recent years have also been developed to convert salmon waste to salmon hydrolysate, salmon pet food treats, and other animal food supplements. Salmon hydrolysate is used as dietary supplements, in fertilizer, and in pet food. As shown over the previous 30 years, development of new commodity lines and byproduct commodity lines such as fish oil, fish oil supplements, and bone meal from seafood waste have also proven successful in Alaska.

At any particular plant, the quantity and character of the seafood processing waste varies considerably over the course of a year. Seafood waste produced varies by regions, reflecting the distribution of available fishing stocks, the openings and closings of the fishing seasons, as well as fishing quota allocations used to manage stocks. Generally, groundfish and shellfish wastes constitute the majority of the pollutant discharges in the winter, early spring and autumn, and salmon processing wastes constitute the majority of discharges in the summer. On a state wide basis, groundfish constitute the largest volume of seafood waste discharged. When broken down by region the largest volume of waste comes from the Bering Sea/Aleutian Island area, and the largest volume of waste discharged in all other regions comes from salmon and other finfish fisheries.

The timing of the salmon harvest is closely tied to the period when each salmon species returns to spawn. The fishing season for each salmon species depends on the various management regions around the State and the type of gear used but generally spans the period between June and September. The relatively short salmon fishing seasons and large runs of fish result in short, but intense, periods of seafood waste produced in this sector.

Seafood processing waste discharge facilities are divided into categories depending on the location of the facility and their size. These categories include non-remote seafood processing facilities and remote processing facilities as defined by 40 CFR Part 408. In addition, facilities are also classified as either major or minor facilities in accordance with specific rating criteria established by EPA.

Remote seafood processing facilities are facilities not located in a "processing center or population center", as defined in 40 CFR Part 408. The TBEL requires that seafood processing facilities grind the seafood processing waste into pieces smaller than 1.27 cm (½-inch) in any dimension prior to discharge to waters of the U.S. This AKG521000 permit proposes coverage for those processing facilities defined as remote.

Some remote location permittees have been required to install 1.0 millimeter (1.0 mm) seafood waste screening equipment, due to exceeding the AKG520000 permit's authorized 1.0 acre ZOD size permit condition, and non-compliance with Water Quality Standards (WQS). Screening the seafood waste provides source control for residues and biochemical oxygen demand (BOD), as well as settleable solids (SS) loading prior to discharge. Additionally, some of these same permittees were required to obtain

individual permits. Permittees of remote facilities who installed or were required to install screening equipment as of the effective date of the permit will be required to continue screening their seafood processing waste under the AKG521000 general permit. Screening of waste is considered a best practicable control technology currently available (BPT) at facilities that have installed such technology, and once installed, the use of BPT screening shall continue to be required for these remote facilities. At this time, it is not the Department's intent to provide coverage under the AKG521000 permit to facilities currently issued individual permits.

1.4.1. Butchering Production Descriptions

Seafood processing facilities primarily convert raw seafood into a marketable form. Alaska's commercial fishing operations target a number of assemblages, including bottom fish (e.g., walleye pollock, Pacific cod, sablefish, rockfish species, and other species of flatfish); five species of salmon; herring; and shellfish (e.g., species of crab, shrimp, clams, scallops, abalone, sea urchins, and sea cucumbers).

Seafood processing facilities use a variety of techniques and equipment to produce marketable seafood products. Seafood processing can be described as the production of marketable seafood products and includes packaging whole fresh or frozen seafood for shipment, mechanical filleting, deboning processes, production of washed mince / washed paste products, and producing other seafood byproducts. After butchering, the seafood processing wastes are screened and are processed into fishmeal, fish oil, or other by-products. This converts much of the solid waste to marketable products. Additionally, since the early 1980s, newer seafood processing techniques have been introduced into facility commodity lines, such as washed mince / washed paste) and salmon byproduct (unwashed mince and washed mince), resulting in economic gains.

At any particular seafood processing facility, the quantity and character of the seafood wastewaters varies considerably over the course of a year. Seafood processing effluent's pollutant loading varies by the distribution of available fishing stocks, the openings and closings of the fishing seasons, and the fishing quota allocations used to manage stocks. Generally, bottom fish and shellfish wastewaters constitute much of the pollutant discharges in the winter, early spring, and autumn while the discharge of salmon processing waste occurs primarily in the summer and fall (along with some bottom fish).

The timing of the salmon processing is closely tied to the period when each salmon species returns to spawn. The fishing season for each salmon species depends on the various management regions and the type of gear used but generally spans the period between June and September. The relatively short salmon fishing seasons and large runs of fish result in short, but intense, periods of seafood wastewaters produced in this season by this commodity line.

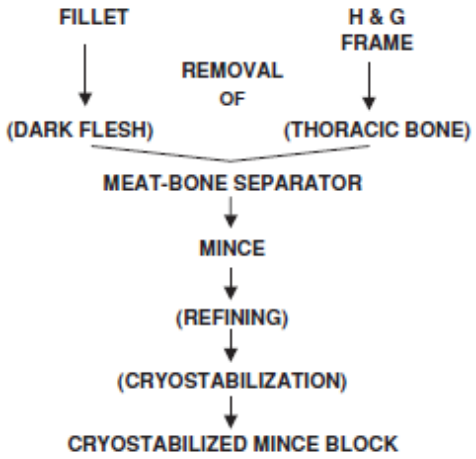
Additional detailed descriptions of specific seafood processing facilities (e.g., salmon canning, fish meal production) are provided in EPA's 'Development Document for Effluent Limitation Guidelines and New Source Performance Standards for the Fish Meal, Salmon, Bottom Fish, Clam, Oyster, Sardine, Scallop, Herring, and Abalone Segment of the Canned and Preserved Fish and Seafood Processing Industry Point Source Category' (1975).

<u>Unwashed mechanical or hand-scraping as deboning, a type of butchering</u>

Mechanical deboning involves grinding the seafood flesh and bone together and forcing the flesh/fillets through a fine screen or slotted surface of a mechanical deboner. The shearing action of the mechanical deboning process causes considerable cellular disruption.

Bone separators working on different principles are available commercially, but the kind most widely used for seafood is of comparatively simple design. Fish, or pieces of fish, are fed from a hopper to pass between a moving rubber belt and the outside of a revolving perforated drum of stainless steel. The flesh is forced through the perforations into the drum from where it is expelled as a coarse mince by a fixed screw. Skin and bone are retained on the outside of the drum and removed continuously by a scraper blade. The drum perforations are commonly 5 mm in diameter, but drums with smaller or larger holes are available, which produce mince of different texture. Yield can be increased by increasing the tension on the belt, at the expense of some increase in the degree of fragmentation of the flesh, and in the amounts of bone, pieces of skin and black belly wall lining. Often flaked ice is fed into these machines to clean and to cool. Further washing is necessary by high-pressure hose for sanitation purposes.

Figure 1: **Flow Chart of Mechanical Deboning**



1.4.2. Macroalgae Processing

There is interest in disinfecting, blanching, and flash freezing commercial marine macroalgae (e.g., seaweed and various kinds of kelps). Seaweeds are crucial in oceanic aquatic food webs, rich in both minerals and essential trace elements, and can be raw materials for the pharmaceutical and cosmetics industry (Chapman, 1970).

The permit proposes coverage for seafood processing facilities that intend to process macroalgae in one of their facility's commodity line(s). The permit does not propose to cover macroalgae processing beyond disinfection, blanching, and freezing. The permit requires the permittee to provide effluent discharge characteristics and identify the proposed macroalgae processing techniques on the NOI.

The permit requires the permittee to provide information for pH, temperature, salinity, BOD_5, TSS, ammonia, and chlorine in effluent from the macroalgae processing line. DEC has identified that, on average, over 40% of total plant effluent BOD in vegetable processing is generated by blanching. Hot-gas blanching has been demonstrated to reduce the volume of wastewater effluent from a blancher to less than 1% of that produced with steam or hot-water blanching (https://www.sciencedirect.com/topics/food-science/blanching, accessed 4/22/2019).

Further macroalgae or microalgae processing and associated waste and wastewater discharges are not covered based on information gathered regarding effluent associated with these processes. Red and brown seaweeds are used to produce three hydrocolloids: agar, alginate, and carrageenan. The process

of producing alginate can involve pre-treating seaweed with hydrochloric acid (HCl - pH 4), followed by extracting the alginate with Sodium Carbonate ($Na_2 CO_3$ solution - pH 10). In other alginate production facilities, the liquid effluent can be highly acidic (around pH 1.4–1.8) due to the use of sulfuric acid as their process material (V. Sivasubramanian, 2008). DEC does not have adequate effluent pollutant loading characteristics for agar, alginate, carrageenan, etc. production to propose coverage under this permit.

Finally, this permit does not propose to provide coverage for aquaculture or for macroalgae or microalgae mariculture operations.

1.4.3. By-product Production Effluent including Fish Meal, Fish Oil, Fish Hydrolysate, and Other

There continues to be increased interest in by-product recovery facilities/commodity lines in seafood processing facilities. By-product recovery/commodity lines include, but are not limited to: fish meal, fish powder, fish oil, and fish hydrolysate. Permittees under the permit may be authorized to discharge by-product effluent under the permit if they perform the required monitoring in Permit Table 3.

Description of Types of Seafood Processing By-Products

Fish Meal

Fish can be reduced to meal and oil in a number of ways. Common to all methods of practical importance are the following processing steps:

- heating, which coagulates the protein, ruptures the fat depots, and liberates oil and physicochemically bound water
- pressing (or occasional centrifugation), which removes a large fraction of the liquids from the mass
- separation of the liquid into oil and water (stickwater). This step may be omitted if the oil content of the fish is less than 3%
- evaporation of the stickwater into a concentrate (fish solubles)
- drying of the solid material (press cake) plus added solubles, which removes sufficient water from the wet material to form a stable meal
- grinding the dried material to the desired particle size

The main first step of the process is cooking for coagulation of the protein, releasing bound water and oil. Separation by pressing the coagulate yields a solid phase (press cake) containing 60-80% of the oil-free dry matter (protein, bones) and oil as well as a liquid phase (press liquor) containing water and the rest of the solids (oil, dissolved and suspended protein, vitamins and minerals). The main part of the sludge in the press liquor is removed by centrifugation in a decanter, and the oil is subsequently removed by centrifuge.

Stickwater is a valuable product containing minerals, vitamins, some residual oil, and as much as 20% soluble and undissolved (suspended) proteins. The stickwater is concentrated through evaporation to a consistency of thick syrup containing from 30% to 50% solids. This material can be sold as “condensed fish solubles.” Alternatively, this solubles material can be further dehydrated by adding it back to the presscake for drying. Therefore, one can purchase “presscake” meal or a “whole” meal (where all of the solubles have been added back). The meals are then dried so that the moisture content is low enough to allow the meal to be stored and transported without any substantial

mold or bacterial growth. Drying can be either direct or indirect; direct drying is the most rapid and requires very hot air to be passed over the meal as it is rapidly tumbled in a cylindrical drum.

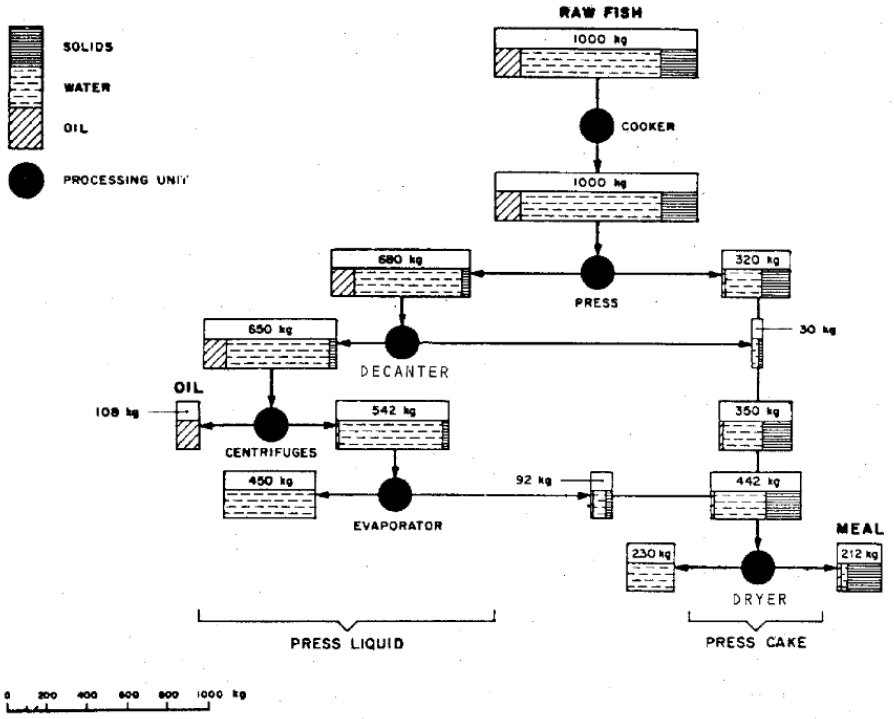
This drying activity may result in significant odor levels, and in populated areas the odor production requires use of air scrubbers that remove odors. Air scrubbers remove odors by spraying significant amounts of fine mist water through the evaporative coming off the drying of the fish meal. Evaporators for the stickwater, however expensive, may today be considered standard items of equipment for fishmeal facilities because they recover dry matter that can increase the yield of meal by 20 percent or more, depending upon the freshness and nature of the raw material (Bykowski, et al., 1996).

Stickwater from fish meal facilities often contains high levels of proteins and oils, which has made recovery of oils and proteins financially feasible. Many seafood processing companies in Alaska who have begun using fish meal plants have also integrated fish oil recovery into their facility. These Alaska seafood processors in turn use the produced fish oil to supplant past diesel use. Consequently, the most current technology and best cost recovery systems in newly installed fish meal facilities now have fish oil and stickwater evaporation, where the liquid fraction after the press is evaporated and the proteins and oils are recovered (Bykowski, et al., 1996). The following measures reduce the volume of disposable waste generated from fish meal waste and wastewater treatment processes:

- Land application (as fertilizer) of wastes from on-site wastewater treatment in agricultural production;
- Sludge dewatering on sludge drying beds for small-scale factories and dewatering using belt presses and decanter centrifuges for medium and large-scale factories;
- Pathogens can be destroyed during controlled anaerobic digestion (biogas) or aerobic treatment (composting);
- Disposal of wastes in landfill if not used for biogas production or combustion.

Pressing during fish meal production removes approximately 70% of the raw material mass as water and 10% as oil.

Figure 2: Figure from FOA, 1996 – Mass Balance in Fishmeal Production



Permittees are required to record the total weight of seafood coming in for various commodity lines.

Each by-products processing line should be depicted in the permittee's BMP plan using process waste and wastewater flow diagrams, which should be updated as process lines are added and/or subtracted. The flow diagrams should clearly depict how the permittee calculates total seafood raw product coming into a facility and any interim or final commodities produced and how the permittee calculates flows for reporting on DMRs and in the Annual Report (Permit Part 2.6).

Fish Oil

Fish oil production is typically an integrated part of fish meal production. However, the production of cod liver oil and other specialty products can be established as stand-alone production units. The quality of the fish oil obtained depends largely on the quality and type of the fish raw material and the equipment used. Today, the extraction of fish oil is conducted typically by centrifugal machinery, three-phase decanters, and separators.

Fish Hydrolysate

Production of fish hydrolysate (silage) to be used as feed is the cheapest way of utilizing offal. Considering the capital needed and the operating costs for fishmeal and hydrolysate production (cost ratio 4:1), production of the liquid form of this by-product is very profitable and it can be done by small plants. The main phases of offal processing are the grinding of offal or whole fish, acidifying of the pulp, and liquefying what results in a self-digestion (autolysis) process or in an enzyme/chemically induced digestion process. Adequate grinding is a basic operation of the process.

Liquefaction is an autolytic process carried out by enzymes already present in the fish and accelerated by an acid that induces the proper conditions for the enzymes to break down the tissues and limit the growth of spoilage bacteria (Gildberg, 1993). Typically, malic acid is used, but pH is often adjusted with sodium chloride (NaCl) or hydrochloric acid (HCl). Preservatives are used to produce

pyrosilage, such as sodium pyrosulphite (Na2S2O5) (1% for fatty and medium fatty offal, and 1.3% for lean product) or sulfuric or hydrochloric acid (both at 1% concentration in the mix).

Hydrolysate research indicates that measured pH should always be the final indicator of a proper level of acidification and should range from 3.5 to 4.5. Industry documents indicate the pH should never exceed 4.5.

Chitin and Chitosan By-product

Chitin is a structural component in crustacean exoskeletons, which contain 15–20% chitin by dry weight. The production of chitin and chitosan from food industry waste (crustacean canning) has proved environmentally attractive and economically feasible, especially when it includes the recovery of carotenoids. Considerable amounts of chitin are present in the wastes and are marketed as a fish food additive (Arvanitoyannis, 1999; Kumar, 2000). Coward-Kelly et al. (2006) demonstrated shrimp head waste (Penaeus indicus) can be treated with lime at different temperatures (75, 100, and 125 °C) to form chitin. Below are examples of chemicals used in the chitin and chitosan production mechanisms:

Crustacean shells→size reduction→protein separation → (NaOH) →washing demineralization → (HCl) →washing and dewatering → de-coloration → chitin →deacetylation (NaOH) → washing and dewatering → Chitosan

Chitosans also exhibit excellent film-forming ability with use of acetic or formic acids, resulting in flexible and transparent films that resemble plastic films (USDA, 2004). Additionally, chitosan forms aldimines and ketimines with the addition of aldehydes and ketones, respectively, at room temperature.

Biodiesel / Biogas

The use of animal fat to produce bio-diesel is not a new technology. However, the adaptability of this technology to aquatic resources has only attracted public interest recently. The bio-diesel produced from seafood waste would be a non-toxic and fully biodegradable renewable fuel easily adapted without any modification to current diesel engines. The fish oil is similar to a vegetable oil or animal oil, and it reacts with an alcohol (methanol) with the catalyst caustic soda. This produces a pure bio-diesel, or B100 (100% bio-diesel), with a valued by-product glycerin. Glycerin is an important by-product and is currently further being enhanced and could become a new source of income for bio-diesel producers. It is a colorless, odorless liquid which is used for pharmaceutical, food, and cosmetic purposes. One other note of care is the acid content of the oil extracted. For example, salmon oil is high in acid, and this acid often needs to be removed. Therefore, an additional step in removing this acid is required. Sulfuric acid and a catalyst are added to reduce the acid value of the oil.

Typical Pollutant Loading

During fishmeal and fish oil production, the effluent TSS results are often in the 30,000 mg/L range, while COD and BOD_5 have concentrations of 30,000 – 50,000 mg/L, and O&G of 10,000 mg/L (Colic, 2007, Sridang, 2006). Other research provides information that the large volume and high concentration of COD (80,000 to 100,000 ppm) can result in significant oxygen depletion in the area of discharge (Bechtel, 2009 (Petersen et al. – Stickwater Processing by Membrane Filtration)). Membrane filtration resulted in COD reduction from 170,000 to 15,000 mg/L – a 90% reduction (Bechtel, 2009). Carawan et al. (1986) reports fish meal plants having a BOD of 100–24,000 mg/L, COD of 150–42,000 mg/L, TSS of 70–20,000 mg/L, and fats, oils, and grease of 20–5,000 mg/L.

1.5. Facility Eligibility

Subject to meeting the conditions of the permit, the following categories of facilities are eligible for coverage to discharge the pollutants set out in Permit Part 1.2 after receiving an APDES permit authorization including an authorization number:

1.5.1. **Onshore Seafood Processing Facilities.** Onshore seafood processing facilities that discharge pollutants generated at a seafood processing facility from shore to waters of the U.S. and are engaged in the processing of fresh, frozen, canned, smoked, salted, or pickled seafood; the processing of unwashed seafood mince or paste; or the processing of meal and other secondary by-products.

Onshore Facilities in Kodiak, Alaska. The permit does not authorize the discharge of pollutants to receiving waters adjacent to the City of Kodiak, including Kodiak Harbor, St. Paul Harbor, Gibson Cove, Near Island Channel, Women's Bay, and Woody Island Channel. Discharges to these waterbodies are covered under the AKG528000 Seafood Processors Operating Onshore Facilities in Kodiak, Alaska, which authorizes discharges from onshore seafood processors and by-product recovery facilities located in Kodiak, AK. The AKG528000 permit applies Non-remote location permit conditions to these water bodies and therefore are not appropriate to be covered under the AKG521000 permit. For more information regarding Non-remote facilities and permit requirements, see the AKG528000 permit and accompanying Fact Sheet.

1.5.2. **Permanently Moored Craft and Barges.** Permanently moored craft that discharge pollutants generated at a seafood processing facility to waters of the U.S. and are engaged in the processing of fresh, frozen, canned, smoked, salted, or pickled seafood; the processing of unwashed seafood mince or paste; or the processing of meal and other secondary by-products.

1.5.3. **Community Grinders.** Community grinders that discharge seafood waste and wastewater pollutants to waters of the U.S. As defined in Appendix C, community grinders offer a central location to provide grinding and discharge services for seafood waste, but may not necessarily process seafood (bring seafood to a marketable form).

1.6. Discharges Covered

The permit authorizes the discharge of pollutants to waters of the U.S., subject to the provisions, limitations and conditions set forth herein, including:

1.6.1. Seafood processing waste and process wastewaters from seafood butchering, unwashed mince and/or paste production, and seafood by-product production

The permit authorizes the discharge of pollutants to waters of the U.S., subject to the limitations and conditions set forth herein, including seafood processing waste and wastewaters from seafood butchering, unwashed mince and/or unwashed paste commodity line production, and seafood byproduct production into hydro-dynamically energetic waters with a high capacity of dilution and dispersion. The permit also provides coverage to catch transfer water (delivering vessel fish hold waste and wastewater, live tank water, refrigerated seawater, or brine) conveyed to the onshore seafood facility.

Additionally, the permit provides coverage for cleaning agents used in process areas where the permittee follows the manufacturer's use and disposal recommendations. This includes the use of disinfectants added to wash down water to meet applicable sanitation standards by facilitating waste removal while processing or sanitizing seafood processing areas.

Pollutants of concern associated with seafood processing wastewater discharges include: residues, biochemical oxygen demand (BOD), total suspended solids (TSS), bacteria, and non-petroleum oil and grease (polar) (O&G). These pollutants result from waste solids (shell, bones, skin, scales, flesh, and organs), blood, body fluids, slime, stickwater, and oils and fats from byproduct operations. Ammonia may be present due to natural degradation processes, refrigeration system leaks, and the use of quaternary ammonia cleaning compounds. Chlorine may be present due to use as a disinfectant. Other regulated parameters include color, turbidity, pH, and temperature.

Pollutants of concern in catch transfer water may include BOD_5 results ranging 7,000 – 34,000 mg/L, TSS results ranging 5,100-26,000 mg/L, and O&G results ranging 360-4,000 mg/L (Drew, 1994). Additionally, dependent on handling, pollutants may also include ammonia, residues, pH, Settleable Solids, color, and temperature.

1.6.2. "Other Wastewaters" generated as part of the normal seafood processing operation, including non-process wastewaters

"Other Wastewaters" includes cooling water, boiler water, freshwater pressure relief water, refrigeration condensate, refrigerated seawater, cooking water, scrubber water, wastewater generated from wash stations directly related to and located in the seafood processing area, and live tank water.

Pollutants of concern for "Other Wastewaters" discharges may include: ammonia, chlorine, residues, pH, non-petroleum O&G, BOD, Settleable Solids, TSS, color, and temperature. Further explanation of seafood waste discharge pollutants are found throughout the Fact Sheet. A specific "Other Wastewaters" pollutant discussions can be found in Fact Sheet Part 3.2.5.

1.6.3. Macroalgae Waste and Wastewaters

The permit authorizes the discharge of macroalgae processing waste and wastewaters into hydro-dynamically energetic waters with a high capacity of dilution and dispersion.

Pollutants of concern associated with macroalgae wastewater discharges include: residues, BOD, TSS, pH, temperature, and sanitizing agents. These pollutants result from the disinfection, blanching, and freezing operations. Ammonia may be present due to natural degradation processes, refrigeration system leaks, and the use of quaternary ammonia cleaning compounds. Chlorine may be present due to use as a disinfectant.

1.7. Discharges Not Covered by the Permit

All discharges to waters of the U.S. shall comply with State Water Quality Standards (WQS) found in 18 AAC 70. The discharge of any pollutants to waters of the U.S. that are not expressly included in the Notice of Intent (NOI) and authorized by the permit is not covered. Discharges not covered are those that may require coverage under other APDES permits.

Unauthorized discharges include, but are not limited to:

1.7.1. Washed mince or washed paste process wastes and/or wastewaters.

The basis for the prohibition is the high pollutant loading of BOD in these waste streams, which can depress dissolved oxygen (DO) in the water column and on the seafloor. These effluents often result in pH, ammonia and temperature discharge levels beyond applicable WQS, and require further distance from shore for adequate flushing to meet WQS at the boundary of the mixing zone. The AKG520000 permit prohibited this type of discharge, and the AKG521000 continues the prohibition. If a permittee desires to discharge washed mince and/or paste wastes and/or wastewaters, the permittee shall submit an application for individual permit coverage.

1.7.2. Domestic Wastewater

The most current version of the APDES Small Publicly Owned Treatment Works and other Small Treatment Works Providing Secondary Treatment of Domestic Wastewater and Discharging to Surface Water covers the discharge of domestic wastewater.

1.7.3. Drinking water treatment wastewaters.

The most current version of the APDES Wastewater Discharges from Drinking Water Treatment Facilities General Permit for owners and operators of drinking water treatment facilities covers the discharge of drinking water treatment wastewaters.

1.7.4. Bilge Water Discharges

The permit does not cover the discharge of vessel bilge waters, as the 2018 Vessel Incidental Discharges Act (VIDA) addresses these discharges.

1.7.5. Commingled or non-commingled storm water associated with construction activity.

The most current version of the APDES Construction General Permit covers discharges associated with construction activity disturbing 1.0 acre or more, or that are part of a larger common plan of development or sale if the larger common plan will ultimately disturb 1.0 acre.

1.7.6. Storm Water Discharges.

Both commingled and non-commingled industrial storm water discharge coverage is available under the 2015 APDES Multi-Sector General Permit (MSGP). The 2015 APDES MSGP contains provisions that require industrial facilities in 29 different industrial sectors to implement control measures and develop site-specific storm water pollution prevention plans (SWPPP) to comply with APDES requirements. APDES MSGP Part 1.2.1 states that to be eligible to discharge, a permittee shall have a storm water discharge associated with an identified primary industrial activity. The MSGP defines 'Primary Industrial Activity' as including any activities performed onsite which are identified by a list of primary SIC codes. The APDES MSGP lists two subsections of 'Food and Kindred Products' which seafood processors in Alaska fall under. These include 'Sector U2 – SIC Codes 2074-2079 Fats and Oils Products (e.g., Animal and Marine Fats and Oils - SIC Code 2077)' as well as 'Sector U3 - SIC Codes 2091-2099 Miscellaneous Food Preparations and Kindred Products (e.g., Canned and Cured Fish and Seafoods - SIC Code 2091 & Prepared Fresh or Frozen Fish and Seafoods – SIC Code 2092).'

Seafood processing facility permittees discharging storm water must determine if coverage under the 2015 APDES MSGP (or most recent version) is required. The AKG521000 permit requires the permittee to identify the facility's current MSGP authorization number or identify that the facility has submitted a No Exposure Certification. For commingled discharges, the 2015 APDES MSGP Permit Part 1.2.3.1 provides coverage if the storm water is commingled with a discharge authorized by a different APDES permit (in this case, the seafood discharge authorized under AKG521000).

Permittees may choose to keep storm water separate from seafood processing waste and wastewater discharges or may choose to commingle these discharges. If the permittee allows storm water to come in contact with seafood or seafood processing waste or wastewater, then the processor must treat the storm water with the seafood processing wastewaters.

Seafood processing wastewaters commingled with storm water may contain pollutants that can cause harm to aquatic life and habitat. Therefore, the permit requires facilities to provide treatment to reduce pollutants from the wastewater and any commingled storm water to meet the limits in the permit prior to discharge. Facilities choosing to commingle storm water and seafood processing

wastewaters must grind or screen the commingled wastewaters to less than 1.27 cm (½-inch) in any dimension, as otherwise seafood processing waste and wastewaters would be left untreated. In this case, only the seafood processing waste and wastewaters portion of the commingled effluent steam would be covered under the AKG521000 permit. For the storm water portion of the commingled effluent stream, the permittee would need to determine whether coverage was needed under the MSGP.

Permittees should be aware that under the APDES MSGP Part 1.3, a seafood processing facility whose raw materials (seafood) or intermediate, byproduct, final, or waste seafood processing products are not protected by storm water resistant shelter to prevent the seafood, seafood process products, or industrial areas from being exposed to rain, snow, snowmelt, or runoff does not qualify for a No Exposure Certification, and the permittee must obtain MSGP AKR060000 coverage and develop a SWPPP.

1.7.7. Disposal by vessel of seafood wastes and wastewaters.

Disposal by vessel to the waters of the open seas lying seaward of the baseline from which the territorial sea is measured, appearing on charts mapped by National Oceanic and Atmospheric Administration (NOAA), or discharge by vessel to territorial seas where no closing baseline has been determined, as provided for in the Convention of the Territorial Sea and the Contiguous Zone (33 USE 1402(b) and 40 CFR 220.2) are covered by the Ocean Dumping Act.

The 2018 AKG523000 reissued general permit covers discharges associated with disposal by vessel to inland waters of the U.S. behind the baseline.

1.8. Prohibited Discharges

As specified, discharges that violate the 2003 WQS are prohibited, including violations of narrative criteria for residues found in 18 AAC 70.020(b)(20). Seafood wastewaters at times may create floating scum and oil sheens that are not allowed. Additionally, seafood wastes and wastewaters have been observed to create attractive and/or nuisance conditions to both fish and wildlife species and existing users of the waterbody.

The permit prohibits the following discharges:

1.8.1. Interim, Finished, or Unused products

DEC has been made aware through review of Ocean Dumping, at-sea disposal logs and noncompliance notifications that additives or other products other than raw or cooked seafood wastes have been disposed of in State waters. The discharge or disposal of these chemicals, food (e.g., sugars, salts) or food additives, and processed byproducts (e.g., oils, hydrolysates, etc.) can severely alter the chemistry of the receiving water and are not authorized under the permit. Facilities that have previously been discharging these materials by vessel or through their outfalls are required to seek other permitted disposal methods. The discharge of seafood processing interim or finished byproducts results in very high BOD and chemical oxygen demand (COD) pollutant loading. The restriction does not apply to byproduct effluents meeting the terms of the permit.

Chemicals/additives used in the seafood processing lines (those not actively used in production or disinfection) such as sodium hydroxide, hydrochloric acid, aldehydes, or ketones may not be poured directly into wastewater discharge lines. Unmonitored and/or untreated discharges of these chemicals can lead to violations of WQS.

1.8.2. Spoiled Seafood Waste

If a vessel delivers fish or other aquatic animals or plants to the permittee, or the permittee experiences a refrigeration system failure, and raw or processed seafood/plant products are "spoiled" due to temperature, histamine concentration, or decomposition, these materials are prohibited from being discharged.

Early Post Mortem Changes. Ordinarily, the most important post mortem change in fish is the changing of muscle metabolism reactions largely to irreversible ones, with a resulting accumulation of lactic acid in the tissue and a decline in its pH. The pH of the living fish muscle is not far from 7.0; however, as a result of post mortem accumulation of lactic acid, pH values in the range of 5.8 to 6.2 are reached at peak rigor development. Shellfish, which contain relatively large quantities of glycogen, attain a much lower pH as a result of post mortem changes, with values of pH 5.0 or even lower being not uncommonly reached (Stansby, 1976).

1.8.3. Hazardous or Toxic Substances

The WQS for toxic and other deleterious organic and inorganic substances for marine water uses are codified in 18 AAC 70.020(b) and as found in *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances*, as amended through December 12, 2008. The permit requires compliance with these WQS; therefore, any toxic or hazardous substance discharges that may impair or violate WQS are prohibited.

1.9. Excluded Area Provisions

As provided for in 18 AAC 83.205(d), the Department establishes conditions applicable to a general permit for each category of discharger and may establish areas excluded from coverage. Permit Part 1.8 sets conditions applicable to Excluded Areas. In 1994, EPA formed a work group of state and federal managers of fish and wildlife, public lands, and the environment to determine areas meriting exclusion from coverage under the Alaska seafood processors' general permit. The work group reached consensus on the Excluded Areas, and EPA included the list of Excluded Areas in the 1995 and 2001 AKG520000 permits. The Excluded Areas included protected water resources, such as National Parks, National Wildlife Refuges, and Critical Habitat Areas (CHAs). The permit established 1.0 – 3.0 nm buffer zones around most Excluded Area waters to allow for the dilution of pollutants to ambient levels under worst-case conditions. The permit also excluded discharges to Wilderness Areas, State Parks and Conservation areas, at-risk waters, special waters, and degraded water bodies. These Excluded Areas from the 2001 AKG520000 permit are being carried forward in the AKG521000 permit. Refinement of the location of the Excluded Areas through GIS mapping, and updates to endangered and threatened species (ETS) lists have occurred since the AKG520000 permit was issued. Changes to ETS lists or the available resources to identify various Excluded Areas are discussed below.

In consideration of the seafood processing industry's interest in continuing to operate in some of these areas and to meet future processing needs, EPA made an allowance in the 2001 AKG520000 permit for an operator to apply for a waiver to discharge to a water in an Excluded Area. The 2001 AKG520000 permit required additional information to be submitted in the form of a waiver request regarding the Excluded Area, including alternatives to discharging within the Excluded Area. The permit required EPA and DEC to evaluate the waiver request and work with other federal, state, local and tribal organizations before making a decision to authorize a discharge to an Excluded Area. An operator also had the choice of applying for an APDES individual permit to discharge in an Excluded Area.

The AKG521000 permit continues to provide the case-by-case requests to discharge to Excluded Areas based on conditions included in the 2001 AKG520000 permit and other conditions established in the 2012 AKG523000 permit modification, consistent with Alaska Statute (AS) 46.03.110(d) and 18 AAC 83.205(d) where a general permit clearly identifies the conditions applicable to each category or

subcategory of discharges and areas of coverage authorized by the permit. The AKG521000 permit NOI review process for discharges to Excluded Areas waters or near otherwise Excluded Areas carries forward the same evaluation approval process as established in the 2001 AKG520000 permit. There is a new requirement that DEC will now public notice the draft authorization when discharge to a new Excluded Area under the AKG521000 permit is proposed. DEC will take into consideration agency or public recommended site-specific conditions provided during the public notice period. DEC views a request to discharge to an Excluded Area and the approval process as a permit condition added to the AKG521000 permit to address issues raised during the 1994 Seafood Processors Work Group and for the 2001 AKG520000 draft permit development. DEC does not consider the approval as a "waiver" to exceed water quality standards (WQS) or a waiver to meeting established ELGs. Thus, DEC is eliminating confusion by not referring to the request to discharge to these areas as a "waiver" request.

The AKG521000 permit proposes to continue authorizing previously approved 2001 AKG520000 discharges listed in Appendix D for facilities discharging to 'Excluded Areas'. The AKG521000 permit requires that a new facility submit a request to discharge to an Excluded Area in compliance with Permit Part 1.8. DEC may require the permittee to apply for APDES individual permit coverage if the discharge to the Excluded Area causes water quality concerns. See Permit Part 1.8 for the applicable Excluded Area's Special Conditions for discharges to CHAs. The special conditions were submitted to DEC by agencies with management authority over the Excluded Areas during the previous AKG520000 and AKG523000 permit cycles.

If a permittee that is authorized to discharge to an Excluded Area, including an existing facility permittee listed in Appendix D, proposes a material change to the operation of the facility after the initial authorization is granted, the permittee is responsible for providing information required in Permit Part 1.8.2 to DEC to evaluate the proposed change of the discharges to the Excluded Area. As applicable, Permit Part 1.8.4 conditions will be added as Excluded Area APDES authorization requirements. The permittee shall submit copies of any special studies required by the agency with management authority over the Excluded Areas, and/or respond to comments submitted by the agency to DEC.

Excluded Areas in the AKG521000 include:

1.9.1. One nautical mile limit

A one nautical mile limit is set from State Designated Game Refuges, Sanctuaries, State Designated CHAs, Federal Designated Critical Habitat, National Parks, Preserves or Monuments, National Wilderness Areas, National Wildlife Refuges and nesting colonies of 1000 birds or more.

The AKG521000 permit clarifies ambiguous areas listed in the 2001 AKG520000 permit and identifies new areas that warrant inclusion as sensitive areas and that require site-specific evaluation. Two examples include CHAs identified as Steller eider concentration habitat areas and Western Steller sea lion habitat areas, which were established after the 1994 consensus workgroup decision making process. Additional information on these areas can be found at the DEC Maps webpage, the DEC Seafood Wastewater Discharge Map, and the Alaska Protected Water Maps document, as well as NOAA and U.S. Fish and Wildlife Service (USFWS) mapping websites.

The permit removes Eastern Stellar sea lion critical habitat as previously covered under the AKG520000 permit. On November 4, 2013 the NMFS public noticed a final action in the federal register, [Docket No. 110901553–3764–02] titled, "Delisting of the Eastern Distinct Population Segment (DPS) of Steller Sea Lion under the Endangered Species Act; Amendment to Special Protection Measures for Endangered Marine Mammals."

1.9.2. Three nautical mile limit

A three nautical mile limit is set from critical habitat for Western Steller's sea lions and Pacific walrus haulout locations. Sea lions and Pacific Walrus have high site fidelity and the tendency to return to a previously occupied location. Even minor human activity, such as sight, sound and odors from humans and machines, cause walruses to flee haulout locations. Thus, 3.0 nm buffer zones have been established to provide disturbance protection.

1.9.3. Special Water Resources

1.9.3.1. Orca Inlet. No discharge of uncooked seafood processing pollutants to Orca Inlet may occur during the months of November, December, January, February, and March. Sea Otters, which are protected under the Marine Mammal Protection Act, are attracted to the discharge and waste deposit as a food source.

1.9.3.2. Within 300 feet of Living Substrates

"Living substrates" have been identified as important marine habitat and are susceptible to impacts from human activities. Installation of seafood processing outfalls and possible subsequent burying of living substrate by seafood processing residues must be minimized. Thus, the AKG521000 permit will continue to provide areas with living substrates special protection.

1.9.3.3. The territorial seas surrounding St. Paul Island and St. George Island (The Pribilof Islands).

1.9.4. At Risk Waterbodies

Areas with a water depth of less than 10 fathoms (60 feet) at MLLW are excluded from permit coverage if the areas have or are likely to have less than 0.33 knots average current within 300 feet of the discharge point of seafood waste. In the 2001 AKG520000 permit, waters within 3.0 nm of the Pribilof Islands were considered 'At Risk Waterbodies', because seafood waste discharged in these waters was found not to disperse quickly, got trapped, and settled within these areas, and did not decompose as quickly as modeling predicted. The 2001 AKG520000 permit listed Akun Island's Lost Harbor, Captain's Bay, and Udagak Bays as an Excluded Area because of seafood processing waste deposits forming in the deep-water bays, which are mostly enclosed by a shallow sill. The sill was found to limit the flushing that normally occurs with tidal currents. The AKG521000 permit continues to list "At Risk Waterbodies' as Excluded Areas, defining the water bodies as 'semi-enclosed water basins with depths deeper than the bordering or enclosed sills of less than 10 fathoms'. Permittees shall identify on their NOI if the permittee is proposing to discharge to an 'At Risk Waterbody' and are responsible to prove adequate flushing for each proposed discharge location.

1.9.5. Degraded Water Resources

Any discharges to a waterbody included in DEC's most recent EPA-approved *Final Integrated Water Quality Monitoring Assessment Report* of waters which are impaired or water quality-limited. See http://dec.alaska.gov/water/water-quality/integrated-report/ for the most recent integrated report.

The permit excludes discharge to degraded waters unless the subject water is protected from further degradation and the permittee demonstrates that the pollutant(s) for which the waterbody is impaired is not present at the facility, or that the discharge is not expected to cause or contribute to an excursion of a WQS.

Facility permittees proposing to discharge to impaired waterbodies where the permittee applies to the Department with revisions to a Total Maximum Daily Load (TMDL) for a specified waterbody, changes to the water use classes and subclasses, revisions to water quality criteria, adoption of site-specific criteria, and / or the reclassification of waters will be required to apply for an individual permit.

If an existing facility permittee's receiving water becomes listed as an impaired waterbody (Permit Part 1.5.5) due to the actions of the permittee during the life of the permit, DEC may request that the applicant perform a site-specific analysis of the assimilative capacity of the receiving water. Based on the results, the Department may develop a TMDL or may propose interim discharge limitations (i.e., limiting amounts of total waste solids that may be discharged) in the authorization. A permittee can, or the Department may require the permittee to apply for an APDES individual permit if a new discharge is proposed to an area listed in Permit Part 1.5.5, or if a TMDL is being developed. Discharges will not be authorized for those pollutants for which the waterbody is impaired.

1.10. Requesting Authorization

A permittee shall apply electronically or by hard copy for coverage and authorization under the permit. It is likely due to the EPA promulgated e-Reporting Rule that, with a few exceptions, only electronic submittals will be accepted at some point during the permit cycle. Permittees will be notified in advance of this change. A permittee wishing to apply for new coverage for a seafood processing or Community grinding facility shall submit a complete NOI and required attachments 90 days prior to the start of discharge. The 90-day notice is increased from the 60 days specified in the 2001 AKG520000 permit to allow for adequate time for the Department to review the NOI and complete any necessary review that may be required per 18 AAC 72.

The AKG521000 permit supersedes the 2001 AKG520000 administratively continued general permit authorizations for onshore seafood processors. All currently authorized permittees are required to submit a new NOI (Attachment A & A-1) along with all required attachements at least 90 days prior to the permit's effective date to obtain coverage. If the permittee does not submit a complete NOI application 90 days prior to the effective date of this permit, the permittee may be at risk of not receiving an authorization by the effective date of the AKG521000 permit. Existing coverage under the AKG520000 will expire upon the effective date of the AKG52100 permit.

The permit does not authorize any discharges from a permittee unless a complete NOI application has been submitted as specified and the permittee has received written authorization from DEC to discharge under the permit, or has been notified in writing by DEC that the permittee is covered under the permit as provided for in 18 AAC 83.210(h). Relocation to a new site(s) will require the permittee to submit an updated NOI at least 90 days prior to commencing discharge from the new site(s). The permittee shall retain a copy of the APDES Authorization and the permit, as well as applicable inspection and monitoring records at the facility, as applicable. Records may be kept electronically if made available immediately upon request, except those requiring hard signature.

Only facilities meeting the provisions of the permit will be provided an APDES AKG521000 written authorization. The Department's evaluation will include reviewing the facility's NOI, the required attachments, the receiving water characteristics, and the cumulative monitoring results.

Providing Notice. The following draft authorizations under the permit will be noticed in accordance with 18 AAC 83.120 requirements:

- Proposed project area ZODs that are not included in, or are different from, those described in Appendix D- Table1.
- Proposed discharges into waters of Excluded Areas listed in Permit Parts 1.5.1 – 1.5.5 other than at the facilities listed in Appendix D- Table D3, and as necessary under Permit Part 1.8.2.3.
- Proposed mixing zone requests with dimensions or parameters different from those of the standard mixing zone described under Permit Part 2.3.1.3.

- Proposed discharges at depths less than required in Permit Parts 2.1.5.1 and 2.1.5.2, other than as already noted in Appendix D- Table D1.

Multiple parties. Multiple parties may discharge out of a single outfall line and operate under a single authorization if a single Responsible Party is identified on the NOI. Many seafood processing facility permittees accept seafood waste from outside their facility. Also many communities have installed seafood waste grinding stations in order to decrease seafood waste accumulations on the beach and decrease human wildlife interaction. Additionally, many Alaskan communities desire to install a seafood waste grinding station to serve not only their community members, but also provide a service to small volume seafood processors as a way to decrease overall capital investment costs. In order to eliminate confusion as to which entity is responsible for permit compliance responsibilities when multiple facilities or sources are discharging out a single outfall line, the permit requires a single responsible party to be identified. The owner of the outfall and waste/wastewater treatment system or community grinder shall be designated as the responsible party, unless otherwise indicated on the NOI. The responsible party must submit a Best Management Practices (BMP) certification signed by all parties clearly identifying who is responsible for various parts of permit compliance inspections and/or monitoring. Additionally, the responsible party is required to provide training to the delivering parties regarding the type of seafood waste that is accepted. The responsible party must provide a tracking mechanism to the delivering parties for annual reporting purposes. If the responsible party enters into an agreement with other entities to perform permit responsibilities, a copy of that agreement must be submitted to the Department.

1.11. Requirement to Submit a Complete Notice of Intent

An applicant seeking coverage under the permit shall submit a complete and timely NOI (Attachment A, A-1 and A-2, if necessary), per 18 AAC 83.210(b) to fulfill the duty to apply for a permit. Permit Part 1.7 states the written information found on the NOI, along with the list of required submittals. A discharger that fails to submit a complete NOI in compliance with the requirements of the permit and NOI is not authorized to discharge under the general permit unless the Department determines that a NOI is not required for coverage under the general permit as provided for in 18 AAC 83.210(g), or the Department notifies a discharger that it is covered by a general permit as provided for in 18 AAC 83.210(h).

DEC requires previous permit information, permittee information, billing contact information, owner information, and facility name and address/location information in order to accurately maintain facility permit records.

1.11.1. Production Capacity Information.

DEC requires facility production capacity and discharge amounts to determine if the proposed discharge will fit under the permit requirements. There are two reasons the Department is requesting this type of information. First, the permit requires this information for reviewing cumulative discharges to waterbodies and approved discharge sites. Cumulative discharges to waterbodies and discharge sites increases the probability that greater than a 1.0 acre deposit of seafood waste will form on the seafloor if the total cumulative seafood waste discharge is greater than 10 million pounds to a single waterbody. This assumption is based on the modeling and previous seafloor surveys discussed in Fact Sheet Part 4.4.2.

The second reason the permit requires this information is for reviewing discharges to Excluded Areas (Permit Part 1.5). If requesting to process seafood near Excluded Areas, permittees are required to submit the proposed amount of seafood waste to be discharged to DEC. Should the permittee request an increase in discharge allowance, the permittee shall submit the proposed increase on a NOI, and

may trigger additional seafloor monitoring if there is a 25% increase in the amount of seafood waste discharged (Permit Part 1.8.2.2). Further discussion of Excluded Areas is found in Fact Sheet Part 1.9.

1.11.2. Line Drawing and Flow Volumes.

The permit added a new requirement of providing line drawings and approximate incoming flow volumes and effluent flow of the seafood processing lines and waste treatment systems. The line drawings assist DEC in understanding the flow of seafood processing facility wastewater. Additionally, the flow line drawings will assist permittees in identifying areas in which water usage may be decreased as an opportunity to decrease pollutant loading, as the longer distances and time the seafood waste spends in contact with water the greater the pollutant loading that occurs.

Alaskan seafood processing typically requires large amounts of water, primarily for washing and cleaning purposes, but also as media for storage, refrigeration and cooking of seafood products before and during processing. In addition, water is an important lubricant and transport medium in the various handling and processing steps of bulk seafood processing. Seafood processing wastewater has a high organic content, and subsequently a high BOD, because of the presence of blood, tissue, and dissolved protein. It also typically has a high content of nitrogen (especially if blood is present) and phosphorus. Detergents and disinfectants may also be present in the wastewater stream after application during facility cleaning activities. A range of chemicals is typically used for cleaning, including quaternary ammonia sanitizers/disinfectants, acids, alkalines, and neutral detergents, as well as disinfectants. The disinfectants commonly used include chlorine compounds, hydrogen peroxide, ammonium salts, and formaldehyde. Other compounds also may be used for select activities (e.g., disinfection of fishmeal processing equipment).

As a general rule, water used for all purposes in food production must meet drinking water standards. Process water must often undergo disinfection prior to use. The following chemicals are often used as disinfectants: chlorine, chloramine, ozone or UV irradiation (Bykowski, Piotr & Dutkiewicz, Daniel, FAO, 1996).

These chemicals and processes can lead to greater pollutant loading of the seafood processing effluents. As a result, the permit requires increased monitoring and reporting of chemicals and disinfectants used in the facility. This information should be used by the facility in updating their NOI. The requirement to provide a list of chemicals used outside manufacturer's recommended use or application rates, annual amounts used, and the use in the facility is a new Annual Report (Permit Part 2.6) reporting requirement.

1.11.3. Outfall Terminus Identification

The permit requires the identification of all outfalls and the types of waste and wastewater discharged from each outfall, as well as monitoring all outfalls. In order to accurately model environmental impacts, the permittee must identify the correct number and location of outfalls, along with the associated pollutant loading, flow and depth associated with each outfall.

Based on experience administering the AKG520000 permit, DEC found permittees often made changes to seafood processing line and outfall configurations, which occasionally resulted in plumbing cross-connections or unanticipated routing. Non-process drain pipes would be cut off, reconnected, re-routed, or often left uncapped in seafood processing plants, discharging directly to the receiving water. Reconnected or rerouted storm water discharges were often found to be connected to seafood processing plant floor clean up drains, loading and unloading areas, seafood and fish transfer areas, and processing water drains that then were discharged directly to waters of the U.S. without

passing through the correct waste treatment systems. The permit now requires the permittee to identify all outfalls and waste streams on the NOI.

Requiring identification of all outfall lines, types of wastewater effluent being discharged and monitored, along with the development and implementation of a robust BMP Plan, should increase permit compliance and ultimately result in increased water quality protection.

Additionally, compliance actions have been taken for permittees discharging ammonia (a refrigerant often used at seafood processing facilities, and created during the natural decomposition of seafood). This discharge has occurred without monitoring on the part of the permittee to ensure the discharge is meeting WQS, or providing information on the NOI application. DEC cautions permittees to select an analytical method for ammonia monitoring which meets all permit requirements and is applicable to the sample matrix. Most field or handheld ammonia monitors, e.g. ISE probes, cannot be used to monitor ammonia in seafood processing plants due to the ion interference from salt water, as salt water is still found in a majority of the seafood processing water.

1.12. Department Review of the Notice of Intent and Issuance of a Permit Authorization

Only permittees meeting the provisions of the permit will be provided a written authorization. The Department's evaluation will include review of the applicant's NOI and the receiving water characteristics of the proposed discharge locations as part of the decision making process.

Those permittees as listed in Permit Appendix D applying for coverage will have the standard 100 foot radius mixing zone(s) (Permit Part 2.3.1.3) and will be issued a mapped project area ZOD (Permit Part 2.3.4.2).

At the completion of the Department's NOI review process, DEC will either:

- Prepare and transmit a written authorization, which will include whether a mixing zone has been authorized and at what size; the location and size of the Project Area ZOD; and the maximum amount (pounds) of seafood processing waste that can be discharged.
- Find the NOI incomplete and notify the permittee of needed revisions or updates to the NOI submittal; or
- Deny coverage under general permit and require a permittee to submit an APDES individual permit application.

In determining the appropriateness of granting an authorization, whether a mixing zone is appropriate at the proposed discharge location, and whether a Project Area ZOD is appropriate at the proposed stationary discharge location, the Department will evaluate the information provided by the permittee, including whether:

- The discharge is to a water in an Excluded Area (Permit Parts 1.5.1 – 1.5.5).
- Multiple permittees are proposing to discharge to the same or in close proximity to the same receiving water.
- The amount of seafood processing waste discharge authorized may be limited by the conditions at the proposed discharge location. When determining whether to limit the amount of discharge, the Department will include in its consideration the following:
  1. The effects that the discharge might have on the uses of the receiving water;
  2. The flushing and mixing characteristics of the receiving water;

3. The results of seafloor surveys indicating the location and size of seafood waste deposits, if any;
4. Available effluent monitoring results showing the proposed waste or wastewater treatment system is able to meet the requirements of the permit; and
5. Compliance with permit requirements, including receiving water monitoring results.

1.13. Transfer of Authorization or Change in Location

As found in 18 AAC 83.150, the permit requires the submittal of a Name Change/Notice of Transfer (NOT) form when the information regarding ownership or operator change and requires submittal of an updated NOI if changes to management, authorized representative or plant discharges, production levels, treatment systems, mixing zone or Project Area ZOD requests occur.

The permit allows for a transfer only for an authorized facility located at the site designated in the original NOI. Discharge authorization for a particular existing facility may not be transferred to the same facility permittee at a new facility location. Authorization under the permit is specific to the outfall(s), outfall-specific pollutants identified in the NOI, and the specified outfall terminus Geographic Information System (GIS) location(s), ± 50 feet.

If a permittee permanently ceases discharging, or moves seafood processing activities to a new facility or discharge location, the permittee shall submit a Notice of Termination (NOT) form for the former facility's location within 30 days of ceasing discharge. The permittee shall apply for coverage for a new facility location by submitting a new NOI.

If a permittee intends to change the location of any outfall/outfall terminus, the permittee shall contact the Department and submit an updated NOI with the proposed new outfall location at least 90 days prior to moving the outfall and shall submit engineering documents as required under Permit Part 1.6.

Another new permit requirement is that if a Seafloor Survey or other survey identifies a broken, floating or moved outfall, (e.g., a boat's anchor has drug the line), the permittee must submit a notice of non-compliance and update their NOI (if necessary). The APDES permit program requires the outfall latitude and longitude location(s) be identified to the nearest 15 seconds (40 CFR 122.21(g)). The permit requires reporting outfall terminus latitude and longitude to the fifth decimal place, acknowledging recent changes in Global Positioning System (GPS) and Wide Area Augmentation System (WAAS) technology that have improved precision in determining outfall terminus location(s). Permittees are also required to update the NOI's outfall terminus location(s) with revised locations as needed based on Seafloor Survey information.

1.14. Continuation of Expired General Permit

The permit expires five years after the effective date. If the AKG521000 permit is not reissued prior to the permit's specified expiration date, it will be administratively continued in accordance with 18 AAC 83.155 and remain in force and effect for those permittees who have applied for continued coverage. In order to continue coverage, the permittee shall submit an updated NOI to the Department six months (180 days) prior to the expiration of the permit requesting authorization for coverage under a reissued permit. The Department may allow the NOI to be submitted at a later date, but prior to the permit's expiration. Following a permittee's timely and complete submittal of an NOI, and receipt of a DEC APDES administrative continuation letter, the permittee is covered under administrative continuation until the permit is reissued or the authorization is terminated.

If an applicant that previously did not have coverage under the permit intends to seek coverage under the continued general permit, new applicants may seek coverage by submitting a complete NOI to the Department.

The permittee is required to abide by all limitations, monitoring, and reporting included in the permit when the permit enters administrative continuation until such time the permit is reissued or a NOT is submitted by the permittee and processed by the Department.

If the permit is administratively continued beyond five years, the permittee shall be required to reinitiate all of the originally required monitoring schedules established in the permit. If reduction in monitoring, or alternative permit compliance conditions(s) were granted in an APDES authorization prior to administrative continuation, the permittee shall re-request any reductions in monitoring or other operating conditions with submittal of a new NOI.

1.15. Termination of Permit Coverage

If a permittee wants to terminate coverage, the permit requires the permittee to provide a NOT to DEC within 30 days following cessation of discharges. The notice shall include certification that the facility is not subject to an enforcement action or citizen suit. The notice shall also include any final reports required by the permit.

2.0 Compliance History

The compliance histories of the existing facilities authorized by the 2001 AKG520000 permit were evaluated. Various instances of violations with the grind size requirement, maximum 1.0 acre Zone of Deposit allotment, and violations of the residues standard (floating foam, residues) were reporting during the past five years.

Due to the large number of existing authorized facilities, a detailed breakdown of the instances of non-compliance is not provided in the fact sheet. Specific details regarding the compliance history of a specific facility can be found by visiting the EPA's Enforcement & Compliance History Online (ECHO) at http://www.epa-echo.gov/echo/. Permit Appendix D provides a list of facility permit numbers and facility names that can be used to search for summary and detailed information about a specific facility's compliance and enforcement status and history.

3.0 Effluent Limits and Monitoring Requirements

3.1. Basis for Permit Effluent Limits

In general, the CWA requires that the limits for a particular pollutant be the more stringent of either TBELs or WQBELs. A TBEL is set according to the level of treatment that is achievable using available technology. For industrial sources, the national ELGs in the form of TBELs are developed based on the demonstrated performance of a reasonable level of treatment that is within the economic means for specific categories of industrial facilities. A WQBEL is designed to ensure that the WQS of the waterbody are met and may be more stringent than a TBEL. The most stringent limitations of either TBELs or WQBELs will be selected as the final permit limitations.

3.1.1. Technology-Based Effluent Limits

The CWA requires particular categories of industrial dischargers to meet TBELs established by EPA. The CWA initially focused on the control of traditional pollutants (i.e., conventional pollutants and some metals) through the use of best practicable control technology currently available (BPT). For conventional pollutants (i.e., pH, BOD, TSS, oil and grease, and fecal coliform), CWA Section 301(b)(1)(E) requires the imposition of effluent limitations based on best conventional pollutant control technology (BCT). For nonconventional and toxic pollutants, CWA Section 301(b)(2)(A), (C), and (D), require the imposition of effluent limitations based on best available technology economically achievable (BAT). CWA Section 301(b), required compliance with BCT and BAT no later than March 31, 1989. Where EPA has not yet developed guidelines for a particular industry, permit conditions may be established using Best Professional Judgment (BPJ) procedures (18 AAC 83.425 and 18 AAC 83.010).

For New Sources, as that term is defined in 18 AAC 83.990, CWA Section 306 requires the imposition of effluent limitations for conventional and toxic pollutants based on new source performance standards (NSPS). CWA Section 306 requires compliance with NSPS no later than the effective date of such standards.

3.1.1.1. Seafood Processing Waste

EPA has promulgated final ELGs specifying BCT, BPT, and NSPS for specific categories of Alaska seafood processing. The ELGs are codified at 40 CFR Part 408, adopted by reference at 18 AAC 83.010. The ELGs are applicable to the following seafood processing industries: crab meat processing, whole crab and crab section processing, shrimp processing, hand-butchered salmon processing, mechanized salmon processing, bottom fish processing, scallop processing, and herring fillet processing (40 CFR Part 408, Subparts E, G, J, P, Q, T, AC, AE). Onshore Alaskan seafood processors processing fresh, frozen, canned and cured fish and shellfish are covered by the ELGs established at 40 CFR Part 408 for remote Alaskan locations. Onshore Alaskan seafood processors are considered remote because the processors are not located in population or processing centers as described in 40 CFR Part 408.

BPT and BCT for Alaskan seafood processors in remote locations require that no pollutants may be discharged which exceed 1.27 cm (0.5 inch) in any dimension. This technology-based requirement has been incorporated into the permit.

NSPS for remote Alaskan seafood processors is that no pollutants may be discharged which exceed 1.27 cm (0.5 inch) in any dimension. This technology-based requirement has been incorporated into the permit.

The permit does not provide specific treatment types (e.g., grinder specifications) to meet the 0.5 inch or smaller in all dimensions performance standard, rather the permit requires that seafood processing waste solids be ground or treated by other methods to 0.5 inch or smaller in any dimension prior to discharge. The grinder system or other method of treatment must be designed to reduce seafood processing wastes to 0.5 inch or smaller in any dimension prior to discharge. The 0.5 inch treatment requirement does not apply to (1) the calcareous shells of scallops, clams, oysters and abalones; (2) the calcareous shells of sea urchins; or (3) incidental catches of prohibited and by-catch species which are neither retained nor processed.

3.1.2. Water-Quality Based Effluent Limits

18 AAC 83.435 prohibits conduct that causes or contributes to a violation of WQS. 18 AAC 83.435 also requires that permits include terms and conditions to ensure criteria are met, including operating, monitoring, and reporting requirements. 18 AAC 83.435 requires DEC to make this evaluation using procedures that account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. 18 AAC 83.435 requires that permits include WQBELs on all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." The WQBELs must be stringent enough to ensure that WQS are met and must be consistent with any available wasteload allocation.

The permit requires that discharges shall meet all WQS at: the boundary of an authorized mixing zone; at every point outside an allowed ZOD; or in the receiving water at the point of discharge if neither a mixing zone nor ZOD is authorized.

The permit may authorize exceedances of the following numeric or narrative water quality criteria within an authorized mixing zone and the residues standard in an authorized ZOD. The applicable WQS are in bold, and selected portions of the water quality criteria are italicized. The complete water quality criteria is found in 18 AAC 70.

Dissolved Gas. The amount of oxygen consumed by organisms in breaking down waste is known as the biochemical oxygen demand (BOD). The amount of BOD in a waste discharge affects the dissolved gases in the receiving water, and the amount of BOD in seafood processing waste that a processor can discharge is limited by the applicable water quality criterion for dissolved gas. *Surface dissolved oxygen (DO) may not be less than 6.0 mg/l for a depth of one meter, except when natural conditions cause this value to be depressed. DO in estuaries and tidal tributaries may not be less than 5.0 mg/l, except where natural conditions cause this value to be depressed. DO may not be reduced below 4 mg/l at any point below the surface [18 AAC 70.020(b)(15)].*

Residues. Total suspended solids and settleable solids are components of seafood processing waste and the amount of solids in seafood processing waste that can be discharged is limited by the applicable water quality criterion for residues. *Floating solids, debris, sludge, deposits, foam, scum, or other residues shall not alone or in combination with other substances or wastes cause the water to be unfit or unsafe for use; cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines [18 AAC 70.020(b)(20)].*

Fecal coliform (FC) **bacteria**. FC bacteria are indicator organisms in sanitary and graywater discharges and the amount of FC bacteria discharged is limited by the applicable water quality criterion for FC bacteria. *Based on a 5-tube decimal dilution test, the fecal coliform median MPN (most probable number)may not exceed 14 FC/100 ml and not more than 10% of the samples may exceed a fecal coliform median MPN of 43 FC/100 ml [18 AAC 70.020(b)(14)]*.

Enterococci Bacteria. Enterococci bacteria are indicator organisms in sanitary and graywater discharges and the number of enterococci bacteria discharged is limited by the applicable water quality criterion. *The geometric mean shall not exceed 35 enterococci CFU/100 ml and not more than 10% of the samples may exceed a statistical threshold value (STV) of 130 enterococci CFU/100 ml [18 AAC 70.020(b)(14).]*

Oil and grease. Oil and grease (polar) from animal fats are components of seafood processing waste and the amount of oil and grease (polar) in seafood processing waste that can be discharged is limited by the applicable water quality criterion for oil and grease. *The discharge may not cause a film, sheen, or discoloration on the surface or floor of the waterbody or adjoining shorelines. Surface waters must be virtually free from floating oils. There may be no concentrations of animal fats in shoreline or bottom sediments that cause deleterious effects to aquatic life. Substances shall not exceed concentrations that individually or in combination impart undesirable odor or taste to organisms as determined by either bioassay or organoleptic tests [18 AAC 70.020(b)(17)].*

pH. Some of the wastewater associated with seafood processing waste can be slightly alkaline or acidic but should generally be within the range of the water quality criteria. This range is evidenced by monitoring data from individual seafood processing permits, which show most values within the 6.5-8.5 range between 2002 and 2005. The applicable water quality criterion for pH limits the pH of the seafood processing waste discharges. *pH shall be no less than 6.5 or greater than 8.5, and shall not vary more than 0.2 pH units from the naturally occurring range [18 AAC 70.020(b)(18)].*

Temperature. The applicable water quality criterion for temperature limits the temperature of seafood processing waste discharges. May not exceed 15º C and may not cause the weekly average temperature to increase more than 1º C. Normal daily temperature cycles shall not be altered in amplitude or frequency [18 AAC 70.020(b)(22)].

Color. Color is a component of seafood processing waste. The applicable water quality criterion for color limits the color of seafood processing waste discharges. *Surface waters must be free of substances that produce objectionable color, and the water may not exceed 15 color units [18 AAC 70.020(b)(13)].*

Turbidity. Turbidity is a component of seafood processing waste. The applicable water quality criterion for turbidity limits the discharge of seafood processing waste. *May not exceed 25 nephelometric turbidity units (NTU); may not reduce the depth of the compensation point for photosynthetic activity by more than 10%; and may not cause detrimental effects on established levels of water supply treatment [18 AAC 70.020(b)(24)].*

Chlorine, total residual. Total residual chlorine may be present in residual amounts from periodic use to sanitize equipment. The applicable water quality criterion for chlorine limits the amount of chlorine in the seafood processing waste discharge. *The 1 hour average shall not exceed 13 µg/l and 4 day average shall not exceed 7.5 µg/l [December 12, 2008 Toxics Manual].* The TRC effluent limits adopted by reference at 18 AAC 83.010 (most current version) and those found in 18 AAC 70 are not quantifiable using EPA-approved standard

analytical methods found in 40 CFR Part 136 (most current version). DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter.

3.2. Other Effluent Limitations and Requirements

The discharge of seafood processing waste from seafood processors covered by the permit will not result in a violation of the WQS provided that the permittee complies with the limits and conditions in the permit.

The permit requires facilities to install flow meters, perform pre-installation outfall surveys, and monitor and report the operability of their seafood waste treatment systems. The following paragraphs discuss these requirements in more detail.

3.2.1. Flow Meter and Totalizer Installation

The permit requires facilities to provide information regarding each outfall's discharge flow and outfall depth. The permit requires the installation of permanent devices (flow meter and totalizer) that continuously record flow for all new facilities. Currently permitted facilities are required to have a flow meter on the seafood waste outfall by the permit's effective date. The proposed permit requires the installation of flow meters within 24 months of the effective date of the permit for all other un-metered outfalls (e.g. retort water discharges, boiler blowdown waters, commingled storm water, etc.) except for those with intermittent flows. A device that allows only visual observation of instantaneous flows is usually inadequate for the following reasons:

- Flow records are needed to determine average flows for developing future proposed discharge and authorization limits.
- Flow records are required to determine permit compliance and determine whether wastewater is discharged at unexpected times.

The permit requires the identification of all outfalls, sampling locations, and types of wastewater discharge from each outfall.

Future permit reissuance may evaluate the size of a mixing zone, where the mixing zone modeling requires certain parameter (e.g., flow and depth) inputs to assess the mixing behavior, as well as plume geometry of the effluents' pollutant loading effects on the receiving water. Permit compliance inspections have often revealed multiple outfalls installed at a facility but only one outfall identified on the NOI. In order to accurately model environmental impacts, as well as fully disclose all wastewaters discharged at the facility, the permittee must identify the correct number and location of all outfalls, along with the associated flow volumes and terminus depths.

<u>Calculating Flow Volumes</u>

Historically, permittees have not been required to meter the flow of all outfall(s). Permittees have expressed concern that this new requirement would be used by the Department for compliance actions if the DEC Compliance inspector measured the flow rate and found the volume to be incorrect as compared to the NOI. Since not historically metered, it is not expected that all operators would know the exact flow volumes to be proposed on the NOI. DEC expects the operator's NOI to include best estimated flow, based on previous calculations. As the permit cycle progresses, and meters are installed or pump discharge rate calculations are refined, permittees may find that their initial flow estimates were inaccurate. In this case the permittee would need to submit an updated NOI. The Department expects it may take time to refine flow volume(s), based on dates of meter installation.

Requiring identification of all outfall lines and their depths, average flow volumes, and types of wastewater effluent being discharged, along with requiring the development and implementation of a robust BMP Plan, should increase permittees' compliance with permit requirements and ultimately result in increased water quality protection.

3.2.2. Pre-Installation / Pre-Discharge Survey Requirements

The permit includes a new requirement to conduct a pre-biological survey prior to the placement of a new outfall or planned movement of an existing outfall. The purpose of the survey is two-fold. First, the survey must demonstrate that the proposed placement of the outfall will not result in the discharge occurring into "living substrate." Living substrates have been identified as important marine habitat and are susceptible to impacts from human activities. Installation of seafood processing outfalls and possible subsequent burying of living substrate by seafood processing residues must be minimized. Thus, the permit will require the permittee to survey the seafloor for living substrates and place new outfalls outside these habitats.

New facilities planning on installing outfalls are required to identify if the receiving water is hydrodynamically energetic. The surveyor is required to report ambient tidal current velocity and direction at the time of the survey.

3.2.3. Outfall Terminus Discharge Depths

The permit includes a new requirement for permittees that discharge during extreme negative tide conditions. If a permittee discharges during conditions that result in a "no-water" condition at the outfall terminus, the permittee must conduct sea surface and shoreline monitoring at the end of the "no water" condition and at the beginning of the next "no water" condition and document whether any seafood waste residues accumulation is observed. After the 5-year permit cycle the Department will review the monitoring logs for periods of seafood waste residues accumulation, any complaints received, and review any negative impacts that may be occurring due to discharge during the exposed outfall periods. The Department recommends that facilities discharging with periods of "no water" conditions during processing address issues that may occur during the permit cycle due to the periods of no water at their outfall terminus(es).

3.2.4. Seafood Processing Waste Limitations

Limitations Based on Discharge Solid Size

The TBELs applicable to Remote seafood processing facilities are found in 40 CFR Part 408 - Canned and Preserved Seafood Processing Point Source Category. The regulatory ELGs found in 40 CFR Part 408 for Alaskan seafood processors in Remote locations require that no pollutants may be discharged which exceed 1.27 cm (0.5 inch) in any dimension. This technology-based requirement has been incorporated into the permit.

DEC does not require the use or installation of particular technologies. Rather, the CWA requires permittees to meet certain performance standards (TBELs) that are based upon the proper operation of pollution prevention and treatment technologies identified by EPA during an effluent guidelines and pretreatment standards rulemaking.

In addition to seafood processors subject to TBELs, the Department finds the performance-based level of pollutant controls applicable to seafood processors is most appropriate pollution control mechanism for community grinders discharging seafood waste. Community grinders discharging seafood waste generally do not create seafood processing waste as defined in AKG520000 (the

conversion of aquatic animals from a raw form to a marketable form), yet seafood waste from community grinders contains similar types of pollutants as compared with that of seafood processors. The AKG521000 permit proposes community grinding systems / facilities discharging seafood waste meet the same waste treatment requirement of 1.27 cm (0.5 inch) in any dimension and perform monitoring as described in the permit.

The 0.5 inch or smaller in any dimension size requirement has been retained in the AKG521000 permit, as have the grinder system (or other method of treatment) and waste conveyance daily monitoring, sea/shoreline monitoring while discharging, and seafloor monitoring requirements. The 0.5 inch or smaller size requirement does not apply to (1) the calcareous shells of scallops, clams, oysters and abalones; (2) the calcareous shells of sea urchins; or (3) incidental catches of prohibited and by-catch species that are neither retained nor processed.

Limitations Based on Weight

The 10 million pound (10,000,000 lb.) maximum annual permit limit for seafood waste discharge has been retained in the AKG521000 permit based upon previous residue modeling performed. Fact Sheet Part 4.4.5 provides a summary of the 1993 conceptual modeling effort that is still deemed applicable. DEC continues to rely on the 1993 modeling in order to authorize discharge volumes and ZODs in the subject permit. See Fact Sheet Part 4.4 for more information regarding deposits, revised seafloor survey methods and the mixing zone study (Fact Sheet Part 4.3.4). Waivers from the 10 million pound annual permit limit issued by the EPA under AKG520000 Part V(C)(1)(a) are not continued in the AKG521000 permit.

Treatment Limits Applicable to All Permittees

All permittees are required to meet effluent limits for temperature and pH. These effluent limits correspond to Alaska WQS found in 18 AAC 70.020(b) and are found in Table 1. If a facility is authorized mixing zone(s), the effluent limits in Table 1 for which a mixing zone is authorized are superseded by the corresponding modified effluent limits in the individual authorization to discharge. DEC will notify the permittee of any modified effluent limits when issuing an authorization to discharge under this general permit.

Table 1: Final Effluent Limits Applicable to All Permittees

Parameter	Units	Minimum	Maximum
Temperature	° C	--	15
pH	SU	6.5	8.5

3.2.5. Seafood Processing Waste System Inspection Requirements

The permit requires routine inspection of both the outfall and the waste discharge system. The purpose of the monitoring is to confirm permit compliance and implement operational corrections based on BMP Plan requirements and the observations made by the permittee. DEC compliance inspections and sites visits have found that operational maintenance issues are often the cause of historical permit violations. Requiring inspections of the outfall line, along with the development and implementation of a robust BMP Plant, should increase permit compliance. The outfall system survey shall be repeated at regular intervals (matching the seafloor survey) to ascertain a deterioration rate and pattern, if any. This is a significant and useful tool to assist estimating the remaining life of the outfall pipe.

The AKG521000 permit continues to require permittees inspect the grinder system or other treatment methods to evaluate compliance with the discharge size limitations requirement and to ensure that foreign objects (e.g., ear plugs, plastic, etc.) are not being discharged. The inspection shall evaluate the effectiveness of currently established BMPs in place for the maintenance of the seafood waste treatment conveyance system. The permit requires that the permittee follow the standard seafood waste size sampling and analysis protocol (Permit Appendix G). Protocol modifications are authorized, but require written approval from the Department prior to implementation. As a new permit requirement, when ten or more seafood processing waste particles exceed the maximum size requirement in a 5-gallon buck of wastewater, corrective action (e.g., replacement of or sharpening the grinder plates, pump speed adjustment, size of cutting plate reduced from 0.5 inch down to 0.375 inch, addition of audio grinder, etc.) is required within seven days and must be noted on the log. This requirement provides a standardization of when the corrective actions must be taken.

Digital pictures of the grinder system or other methods of treatment in operation shall be captured at least once per calendar month while seafood processing waste discharge is occurring. This is a new permit requirement to document compliance with the grind size limitation and implement operational corrections based on BMP Plan requirements and the observations made by the permittee. Facilities with grind size violations are not required to verbally report the non-compliance event(s) within 24 hours, nor follow-up with a 5 day written report, as the Department does not view single day or single sample grind size violations as a noncompliance event that may endanger health or the environment. Grind size noncompliance events are required to be recorded on the Grinder Logs and submitted as noncompliance occurrences with the Annual Report consistent with 18 AAC 83.455(e) and 18 AAC 83.410(f) and (g).

Outfall System Inspection

The permit requires routine outfall inspection and condition reporting to be submitted with the seafloor survey. Inspection techniques such as pressure testing, visual, ROV, dye testing, or diver inspection are allowed. The inspection methods must be documented in the BMP Plan and made available upon request. Permittees are required to report on cathodic protection remaining life and on outfall condition, including breaks and leaks. Permittees must also keep a log of outfall system repairs.

DEC compliance inspections and site visits have found that operational maintenance issues are often the cause of historical permit violations. Requiring inspections of the outfall line, along with the development and implementation of a robust BMP Plan, should increase permit compliance. It is intended that the outfall system survey be repeated at regular intervals (matching the seafloor surveys) to ascertain a deterioration rate and pattern, if any. This is a significant and useful tool to assist estimating the remaining life of the outfall pipe.

The purpose of the monitoring is to confirm permit compliance and implement operational corrections based on BMP Plan requirements and the observations made by the permittee.

3.2.6. "Other Wastewaters" Outfall Discharges

Discussion of the 2001 Permit's "Non-process wastewaters" and Other Outfall Monitoring

The 2001 AKG520000 permit states:

AKG520000 (V)(A, B & C)(1)(h) "A permittee shall not discharge any other wastewaters that contain foam, floating solids, grease or oily wastes which produce a scum or sheen on the water surface, not wastes that deposit residues which accumulate on the seafloor or shoreline. The

incidental foam and scum produced by discharge of seafood catch transfer water must be minimized to the extent practicable as described in the best management practices plan of Part VI.A. Wastewaters that have not had contact with seafood are not required to be discharged through the seafood process waste-handling system."

"Other Wastewaters" authorized by the 2001 AKG520000 permit generated in the seafood processing operations included: domestic graywater, seafood catch transfer water, live tank water, refrigerated seawater, cooking water, boiler water, cooling water, refrigeration condensate, freshwater pressure relief water, clean-up water, storm water and scrubber water.

The AKG521000 permit carries over the definition from the 2001 AKG520000 permit, but removes domestic graywater and storm water from the "Other Wastewaters" definition. Permittees interpreted the "Other Wastewaters" language found in the 2001 permit to allow the discharges of "Other Wastewaters" (or 'non-process' wastewater from multiple outfall configurations and discharge points), without monitoring.

The permit includes new requirements that the permittee monitor all outfalls discharging any effluents to water of the U.S. and implement BMPs to treat the wastewaters to ensure permit requirements are met. Monitoring is required to ensure compliance with Alaska state WQS.

The permit proposes monitoring requirements applicable to the discharge from any outfall separate from the seafood processing main outfall or the byproduct effluent's main outfall. If the permittee discharges from a single outfall line, the monitoring under Permit Part 2.2.6 does not apply. If the permittee has multiple discharge points (outfalls) that historically have been considered "other wastewaters" outfalls, or non-process wastewater outfalls, they are now required to monitor these outfalls.

The permit allows commingling of industrial storm water discharges, as long as the permittee has obtained APDES MSGP coverage or has submitted No Exposure Certification under the 2015 APDES MSGP. This monitoring is not applicable to non-commingled storm water discharges covered under the APDES MSGP permit, or non-commingled storm water outfalls where No Exposure Certifications have been submitted to the Department.

When catch transfer waters are accepted into the facility, they become part of the facility's process waste water, per the definition found in 18 AAC 83.990(54). Facilities often route all or a portion of the catch transfer water back to vessels, which may subsequently discharge that process wastewater. Catch transfer water comes into direct contact with raw, unprocessed seafood and may contain significant amounts of solids and pollutant loading from blood, slime, and fish excrement. If these wastewaters are left untreated, receiving water pollutant loading increases. Therefore, the permit establishes that the removal of seafood processing waste solids to 1.27 cm (0.5 inch) or smaller in any dimension prior to discharge is applicable to all effluents that have come into contact with seafood at the facility.

DEC acknowledges the industry concern that currently-installed seafood waste treatment pumps often do not function as designed when large hydraulic loads (such as catch transfer flows) are forced through treatment pump systems. Sending the catch transfer waste streams through the currently-installed seafood waste treatment system is not the only way to meet the treatment requirements. If permittees do not have the existing capability to treat catch transfer water as required prior to discharging to the vessel, they must submit a Catch Transfer Water Treatment Practicability Report to DEC within two years of the permit effective date. The Department will use the submitted reports, along with the treated and untreated effluent data, to determine whether screening is the best practicable control technology available for treating catch transfer water. This

determination will consider the total cost of applying control technologies in relation to the effluent reduction benefits to be achieved from such application, in accordance with CWA Section 304(b)(1)(B).

Monitoring these "other wastewaters" discharges, and writing and implementing BMPs to control these documented waste streams, is a new permit requirement. If a permittee is planning on discharging toxics (ammonia, chlorine) and other deleterious organic or inorganic discharges through these other outfalls, the facility's QAPP shall discuss the permittee's monitoring procedures for these effluents. Additionally, the NOI shall discuss in which waste streams the chemicals and pollutants are found. The BMP Plan shall discuss the standard operating procedures for how these substances are handled and how discharges will be controlled to meet WQS. Note, the permit does not authorize the discharge of spills or other non-monitored, uncontrolled releases.

Identify All Other Outfalls on the NOI

Additionally, based on experience administering the AKG520000 permit, DEC found permittees often made changes to seafood processing line and outfall configurations, which occasionally resulted in plumbing cross connections or other unanticipated routing. Non-process drain pipes would be cut off, reconnected, rerouted, or often left uncapped in seafood processing plants, discharging directly to the receiving water. Reconnected or rerouted storm water discharges were often found to be connected to seafood processing plant floor clean up drains, loading and unloading areas, seafood and fish transfer areas, and processing water drains that then were discharged directly to waters of the U.S. without passing through the correct waste treatment systems. The permit now requires the permittees to identify all outfalls and waste streams on the NOI.

Calculating Flow Volumes for Other Outfalls

Historically, permittees have not been required to calculate or measure flow of these other outfalls. To provide further information to the Department regarding other outfall discharges, the permit requires the operator to meter or calculate other outfall flow volumes (mgd). As discussed previously, flow meter installation is required by the end of a 24-month timeframe (except for on outfalls with intermittent flows). Calculating flow volumes is allowed to continue for two years after the permit's effective date. Permittees have expressed concern that this new requirement (i.e., to calculate, estimate, or measure flow) would be used by the Department for compliance actions if the DEC Compliance inspector measured the flow rate and found the volume to be incorrect as compared to the NOI. Since not historically measured, it is not expected that all operators would know the exact flow volumes to be proposed on the NOI for the initial application. DEC expects the operator's initial application for other outfalls to be a 'proposed' or 'estimated' flow. As the permit cycle progresses, if the permittee finds through the installation of meters, or refining of pump discharge rate calculations, that the initial estimate was inaccurate, the permittee may need to submit an updated NOI. The Department expects it may take the permittee one to two discharge seasons to better refine flow volume(s).

Similar to most food processing industries, effluents from seafood processing plants are characterized by high concentrations of nutrients, high levels of nitrogen content as ammonia (NH3-N; 29 to 35 mg/L), high TSS (0.26 to 125,000 mg/L), increased BOD (10 to 110,000 mg/L) and COD (496 to 140,000 mg/L), and the presence of sanitizers (Theriault et al., 2007).

3.3. Effluent Monitoring and Analysis Requirements

In accordance with AS 46.03.110(d) and 18 AAC 83.430, the Department may specify the terms and conditions under which waste material may be disposed. Monitoring and waste treatment system inspection requirements established in a permit are required to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and receiving water data to determine if additional effluent limits are required and/or to monitor effluent impact on receiving water quality.

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. The permittee has the option of taking more frequent samples than required under the permit. If the permittee monitors any pollutant more frequently than the permit requires using test procedures approved under 40 CFR Part 136, adopted by reference in 18 AAC 83.010, or as specified in the permit, the results of that additional monitoring must be included in the calculation and reporting of the data reported on the DMR and the Annual Report. All limits that require averaging of measurements shall be calculated using an arithmetic mean unless the Department specifies another method in the permit. Tests shall be conducted using the Department-approved test methods, and monitoring data reported even if the method detection limits (MDLs) are less than the effluent limits. The use of approved sampling and test methods as found in 40 CFR Part 136 is required.

The 2020 permit requires effluent sampling and provides detailed collection and reporting information for effluent and receiving water sampling locations and results.

Effluent samples shall be collected at a time that is within twelve hours of receiving water monitoring performed meeting the requirements found in Permit Part 2.3 for the parameters found in Table 5. The effluent and receiving water samples shall be collected during times of comparative production rates and flow.

The permittee shall record monitoring results on a monthly DMR and submit the DMR by the 28th day of the following month. Copies shall be kept at the facility and made available upon request. A summary report of pollutants monitored and monitoring data shall be submitted with the Annual Report (Permit Part 2.6). This summary report has been included in the permit for ease of future permit issuance and the data review process, and to ensure that all required pollutants are being monitored.

<u>Ammonia</u>

Monitoring of ammonia is a new permit requirement. Ammonia was documented as a pollutant in the 1975 Development Document for Seafood Processing Effluent Limit Guidelines (40 CFR Part 408). DEC is requiring monitoring for ammonia to determine whether ammonia is a pollutant of concern in waste streams authorized by the permit. This monitoring information is being collected for future potential permit limit development.

The permit requires ammonia monitoring for all seafood processing waste and non-commingled "other wastewater" outfalls. Ammonia monitoring is required from seafood processing discharges because monitoring performed in other seafood processing locations around the state has found ammonia as a pollutant.

Monitoring of ammonia is required in facilities that discharge evaporator, fish meal plant condenser (scrubber water), cooling waters, refrigeration system effluents, fish hold waters, refrigerated sea water, and other non-process wastewaters from other outfalls. Monitoring includes discharges to docked vessels who then discharge at the dock to waters of the U.S. Typically, facilities can contain oil fired boilers to operate ammonia refrigeration plants, fishmeal dryers, process heat boilers,

fishmeal plants with a wet scrubber for odor control, vapor extraction systems, an assortment of small heaters, and home heating units. Facilities that use various generators and scrubbers may have DEC Air Quality permits that limit their output of NO_x in an air stream. NO_x can disassociate in water, and total ammonia and ammonia ions are then found in the wastewater stream. In these types of systems, ammonia is highly soluble in water, with one volume of water absorbing 1.148 volumes of ammonia at 32 °F. Thus, if found as an air pollutant, ammonia in air can be stripped or "scrubbed" out of air streams by fine mist vapor and condensation, but then the ammonia is found in the wastewater stream. The amount of free ammonia at the base of the scrubber's columns can range from 100 ppm to 200 ppm (https://www3.epa.gov/ttn/catc/dir1/ammonia.pdf). An ammonia destructor can be used to condense and remove the ammonia, but if there is not one in place, these levels of ammonia can enter the wastewater discharge stream.

Ammonia may also be lost to wastewater by various facility activities, such as seafood processing's ammonia refrigeration system leaks and purging. The permit requires the permittee to analyze effluent for ammonia, temperature, and pH from the same grab sample.

WQS information for ammonia is located in the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances (Toxics Manual)*, dated December 12, 2008, adopted by reference in 18 AAC 70.020(b). Alaska's ammonia WQS criteria are dependent on pH, temperature, and salinity.

3.3.1. Seafood Processing Waste, Wastewaters, and "Other Wastewaters" Monitoring

Fact Sheet Table 2 and Table 3 summarize the monitoring requirements for each outfall discharging seafood processing waste and wastewaters and/or commingled "Other Wastewaters". Samples shall be collected while seafood processing and discharge is occurring. Samples shall be representative of the effluent being discharged before entering the receiving water.

Some permittees have historically interpreted the "Other Wastewaters" language found in the AKG520000 and AKG52300 permits to allow the discharges of "Other Wastewaters" from multiple outfall configurations. The seafood processing ELGs make no differentiation for these "Other wastewaters" discharges from seafood processing facilities and vessels. Thus, the AKG521000 permit requires monitoring for each "Other Wastewaters" outfall for the same pollutant parameters as seafood processing waste outfall discharges. Monitoring "Other Wastewaters" discharges not commingled with seafood processing waste will be required during the permit cycle. This will allow the Department to build an industry-wide dataset to evaluate potential impacts. If DEC finds no impact during the review of the "Other Wastewater" monitoring data, this monitoring may be dropped from future permit issuances. After 2 years of monitoring has been completed, a reduction in monitoring may be granted if "Other Wastewaters" outfall(s) demonstrate compliance with WQS and no impact to the waterbody. "Other Wastewaters" monitoring is only required when seafood processing is occurring at the facility. "Other Wastewaters" not being commingled with seafood processing waste and/or wastewaters shall be sampled according to Table 4. Commingled "Other Wastewaters" shall be sampled as required in Table 2.

<u>Conventional or Mechanized Butchering Monitoring</u>

Effluent from conventional or mechanized butchering (i.e. filleting, canning, etc.) seafood processing waste and wastewater treatment systems shall be monitored as specified in Table 2.

<u>Seafood Processing By-products Monitoring</u>

The AKG521000 permit includes new monitoring requirements on a monthly basis for effluent TSS, BOD, O&G, SS, TRC, temperature, pH, and ammonia during the discharge of fish meal, fish powder, fish oil, fish hydrolysate or other by-product effluents. The permit requires recording the daily flow (mgd) of effluent discharged and reporting the monthly averageIf the permittee estimates flow prior to installing flow meters, the calculation used to estimate flow shall be included with the Annual Report.

Monitoring the effluent generated by the by-products' commodity lines will provide data to the Department to evaluate the possible pollutant loading effects on water quality. The sampling point shall be located prior to commingling (internal outfall) with other waste streams, or prior to discharge if discharged directly to water of the U.S., depending on facility design.

Monitoring results will be reported on DMRs. Fact Sheet Table 3 below summarizes the frequency at which effluent parameters must be sampled and reported.

"Other Wastewaters" Outfall(s) Discharges (Outfall(s) 003)

If any wastewaters are discharged through other outfalls, including discharged to vessels who may then discharge to waters of the U.S., the new monitoring requirements found in Fact Sheet Table 4 are required. Each outfall that discharges "Other Wastewaters" shall be monitored separately. See Fact Sheet Part 3.2.5 for further discussion of "Other Wastewaters". This monitoring information if being collected for future potential permit limit development. Permittees are required to sample these other outfalls monthly.

Temperature

The discharge of non-contact cooling water, retort water, boiler water blowdown, etc., have the potential to affect the temperature of the receiving water. If these effluents are discharged through outfalls separate from the seafood processing outfall, directly to waters of the U.S., the new monitoring requirements found in Permit Table 3 are required. This monitoring information is being collected for future potential permit limit development. Permittees are required to sample these other outfalls monthly.

Permittees discharging wastewater to waters of the U.S from any outfall(s) other than the main seafood processing outfall (commingled or non-commingled) are required to monitor the discharge as specified in Fact Sheet Table 4. Each separate outfall shall be monitored prior to discharge for all parameters established. If the permittee only discharges from a single outfall (all discharges commingled and monitored under Permit Part 2.2, the permit does not require "other outfalls" monitoring.

Table 2: Outfall(s) 001 Conventional/Mechanized Seafood Processing (Butchering) Effluent Monitoring

Effluent Parameter	Units [a]	Effluent Limits			Monitoring Requirements		
		Average Monthly Limit	Minimum Daily Limit	Maximum Daily Limit	Sample Location	Sample Frequency	Sample Type
Flow	mgd	report	---	report	effluent	record daily	metered
Amount of waste discharged [b]	lbs	Per Part 2.1.6.2.1	---	Per Part 2.1.6.2.1	n/a	record daily, report maximum daily and cumulative annual	calculated
Size of Seafood Waste Discharged	cm	Per Part 2.1.6.1	---	1.27 cm (0.5 inch)	effluent	record daily, report maximum daily	grab
Number of Days Processing	days	report	---	---	n/a	record daily, report monthly total	measured
Total Residual Chlorine (TRC) [c]	µg/L	report	---	---	effluent	monthly	grab
Biochemical Oxygen Demand (BOD_5)	mg/L	report	---	---	effluent	monthly	grab
Total Suspended Solids (TSS)	mg/L	report	---	---	effluent	monthly	grab
Oil and Grease (O&G)	mg/L	report	---	---	effluent	monthly	grab
Total Ammonia	mg-N/L	report	---	---	effluent	monthly	grab
pH	S.U.	report	6.5	8.5	effluent	monthly	grab
Salinity	ppt	report	---	---	effluent	monthly	grab
Temperature	°C	report	---	15	effluent	monthly	grab
Density	g/mL	report	---	---	effluent	monthly	grab

Footnotes:

a. Units: mgd = million gallons per day, lbs = pounds, cm = centimeter, µg/L = micrograms per liter, mg/L = milligrams per liter, mg-N/L = milligrams nitrogen per liter, S.U. = standard units, ppt = parts per thousand, °C = degrees Celsius, and g/mL= grams per milliliter.

b. Amount of waste discharge = raw product minus finished product.

c. Chlorine monitoring is required only if used as a disinfectant or introduced elsewhere in the seafood processing area. Compliance with the receiving water limits for total residual chlorine cannot be determined using EPA-approved analytical methods. DEC will use 0.1 mg/L as the compliance evaluation limit for this parameter. Shall be calculated as Density = (measured mass) / (measured volume)

Table 3: Outfall(s) 002 Seafood By-product Production Effluent Monitoring

Effluent Parameter	Units [a]	Sample Frequency	Reporting Requirements	Sample Type
Flow	mgd	record daily	report monthly average	metered/estimated
Number of Days Processing [b]	days	daily	report monthly total	measured
Amount seafood received by the by-product recovery line	lbs	daily	report monthly total	measured (weighed) or estimated
Biochemical Oxygen Demand (BOD_5)	mg/L	monthly	Report	grab
Total Suspended Solids (TSS)	mg/L	monthly	Report	grab
Oil & Grease (O&G)	mg/L	monthly	Report	grab
Total Residual Chlorine (TRC) [c]	µg/L	monthly	Report	grab
Settleable Solids	mL/L	monthly	Report	grab
Total Ammonia	mg-N/L	monthly	Report	grab
pH	S.U.	monthly	Report	grab
Temperature	° C	monthly	Report	grab
Density	g/mL	monthly	Report	grab

Footnotes:

a. Units: mgd = million gallons per day, lbs = pounds, mg/L = milligrams per liter, µg/L = micrograms per liter, mL/L = milliliter per liter, mg-N/L = milligrams nitrogen per liter, S.U. = standard units, °C = degrees Celsius, and g/mL = grams per milliliter and ppt = parts per thousand.

b. The permittee shall report the number of days per month that by-product production occurred.

c. Chlorine monitoring is required only if used as a disinfectant, or introduced elsewhere in the seafood processing area. Compliance with the receiving water limits for total residual chlorine cannot be determined using EPA-approved analytical methods. DEC will use the 0.1 mg/L as the compliance evaluation limit for this parameter.

Table 4: Outfall(s) 003 "Other Wastewaters" Effluent Monitoring

Effluent Parameter	Units [a]	Sample Frequency [b,c]	Reporting Requirements	Sample Type
Flow	mgd	record daily	report monthly average	metered/estimated [d]
Biochemical Oxygen Demand (BOD_5)	mg/L	monthly	Report	grab
Total Suspended Solids (TSS)	mg/L	monthly	Report	grab
Oil and Grease (O&G)	mg/L	monthly	Report	grab
pH	S.U.	monthly	Report	grab
Temperature [e]	^{o} C	monthly	Report	grab
Total Ammonia	mg-N/L	monthly	Report	grab
Total Residual Chlorine [f]	µg/l	monthly	Report	grab
Density	g/mL	monthly	Report	grab

Footnotes:

a. Units: mgd= million gallons per day, mg/L = milligrams per liter, S.U. = standard units, °C = degrees Celsius, mg-N/L = milligrams nitrogen per liter, µg/L = micrograms per liter, and g/mL = grams per milliliter.

b. The permittee may request in writing that parameter monitoring frequencies be reduced or eliminated for parameters without associated effluent limits after two years of monitoring and reporting if results indicate no detections above applicable water quality criteria. Monitoring reductions can only occur if the permittee receives written approval from the Department.

c. Catch transfer water monitoring under this table is only required to occur during the 2nd and 4th years of permit coverage.

d. Catch transfer water flow discharged to vessels after offloading, and other flows that are intermittent (occur for less than three continuous hours), may be estimated instead of metered. Flow estimation methods must be documented in the QAPP.

e. For thermal discharges, the permittee must record the temperature during the time of thermal discharge. Inline temperature metering is acceptable.

f. Chlorine monitoring is required only if used as a disinfectant or introduced elsewhere in the seafood processing area. Compliance with the receiving water limits for total residual chlorine cannot be determined using EPA-approved analytical methods. DEC will use 0.1 mg/L as the compliance evaluation limit for this parameter.

4.0 Receiving Waterbody

4.1. Applicable Water Quality Standards

The CWA Section 301(b)(1)(C) requires the development of limits in permits necessary to meet WQS. State regulations at 18 AAC 83.435 require that the conditions in APDES permits ensure compliance with the Alaska WQS, which are codified in 18 AAC 70. The WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an Antidegradation Policy. The use classification system designates uses that each waterbody is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the State to support the designated use classification of each waterbody. The Antidegradation Policy ensures that the designated uses and existing water quality are maintained.

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

The receiving waters for the permit include fresh, estuarine and marine surface waters of Alaska that are designated for all uses, and the most stringent of the WQS for these uses shall be met. The designated use classes are: water supply (aquaculture, seafood processing, and industrial); water recreation (contact and secondary); growth and propagation of fish, shellfish, and other aquatic life; and harvesting for consumption of raw mollusks or other raw aquatic life. Any existing uses (e.g., fresh water withdrawal location(s), set net or aquaculture locations) within a one mile distance of the proposed discharge is now required to be identified on the NOI.

The receiving waters for the permit are the territorial seas between shore (0.0 nm at MLLW) and 3.0 nm from shore as delineated by MLLW, baseline(s) or any closing lines, whichever is greatest.

The applicable WQS applied to the permit are in 18 AAC 70, as revised through April 6, 2018, with the exception of the residue standards. EPA has not approved the revised residues standard; therefore, the water quality criteria for residues at 18 AAC 70.020(b)(20), as revised through June 26, 2003, applies.

4.2. Discharges to Water Quality Impaired Waters

As found in 40 CFR 122.4(i), a permit, or authorization, may not be issued to an owner or permittee of a new source or new discharger whose discharge from its construction or operation will cause or contribute to the violation of WQS. The permit requires that the facility's discharges meet WQS.

If a waterbody that an existing permittee discharges to is listed as impaired during the permit cycle, the permittee may submit information to DEC that demonstrates that the discharge has not, or is not, expected to cause or contribute to an exceedance(s) of WQS. DEC will first determine based on the submittal whether the discharge is or would cause or contribute to an exceedance or impairment. Second, the Department will determine whether the facility may remain covered under the general permit or if an individual permit is needed.

The Department finds when reviewing the most currently EPA approved 303(d) list, there are currently no facilities (See Appendix D) discharging to impaired waterbodies. Historically, facilities previously covered under the AKG520000 permit with associated discharges that caused water quality impairments have been required to apply for individual permit coverage. A permittee can apply for an individual permit, or DEC may require a permittee to apply for an individual permit, if a new discharge is proposed to an impaired waterbody.

4.3. Mixing Zone

In accordance with state regulations at 18 AAC 70.240, as amended through March 23, 2006, the Department may authorize a mixing zone in a permit. According to 18 AAC 70.990(38), a mixing zone is an area in a waterbody surrounding, or downstream of, a discharge where the effluent plume is diluted by the receiving water within which specified water quality criteria may be exceeded. Water quality criteria may be exceeded within a mixing zone. A mixing zone can be authorized only when adequate receiving waterbody flow exists, and the concentration of the pollutant of concern in the receiving waterbody is below the numeric criterion necessary to protect the designated uses of the waterbody. A discharge can neither partially nor completely eliminate an existing use of the waterbody outside the mixing zone and shall not impair the overall biological integrity of the waterbody.

4.3.1. Mixing zones: Department Authorization and Regulatory Basis

Consistent with 18 AAC 70.240, the Department is authorizing a mixing zone in the permit. Authorizations will include a mixing zone for each facility that applied for or was granted a mixing zone in the previous AKG520000 permit, as well as applications for new mixing zones.

Permit Appendix D lists the facilities with previously authorized mixing zones and the size of the authorized mixing zone sizes that are being publicly noticed via the general permit's and fact sheet's public notice process. Permit Appendix D also public notices facilities that have applied for coverage after the AKG520000 permit expiration, but have not been able to obtain coverage under the AKG520000 permit. These facilities that were unable to obtain permit coverage will be authorized a standard mixing zone after submitting an NOI that demonstrates the permittee can meet the requirements of the permit.

After completing a review of a NOI, the Department may authorize a mixing zone for each outfall from a facility. The maximum mixing zone size that the Department will authorize under the permit in the general permit defined standard mixing zone, which is a circle with a 100 foot radius around the outfall terminus extending vertically up to the surface and down to the seafloor.

- The proposed permit will issue a standard mixing zone to every authorized facility that requests a mixing zone in waters where the Department determines available assimilative capacity exists, and will require monitoring at the boundary of the mixing zone and in the ambient water.
- If a permittee proposes a mixing zone outside of the general permit defined mixing zone size, the permittee is required to perform a reasonable potential analysis, submit form 2M and 2G, and the proposed mixing zone will be public noticed.

When determining whether the general permit defined standard mixing zone size is appropriate or whether a smaller mixing zone size is more appropriate for a specific receiving area, the Department included in its consideration the following (see 18 AAC 70.240(b)(1-5) for the list in its entirety) :

- The effects that the discharge might have on the uses of the receiving water,
- The flushing and mixing characteristics of the receiving water, and
- The cumulative effects of multiple mixing zones and other inputs affecting the receiving water.

Within the authorized mixing zone, the water quality criteria of 18 AAC 70.020(b) may be exceeded for dissolved oxygen, pH, temperature, color, turbidity, residues, and total residual chlorine.

All water quality criteria shall be met at the boundary of the mixing zone. The written authorization will specify whether a mixing zone has been authorized, the size of the authorized mixing zone, and the water quality criteria that may be exceeded within the authorized mixing zone.

If through the review of a NOI the Department determines that it has insufficient information to determine whether a mixing zone is appropriate to ensure compliance with 18 AAC 70.240, a permittee may be required to submit additional information or may be required to submit an individual permit application and mixing zone application. The burden of proof for providing the required information is on the applicant seeking a mixing zone.

4.3.2. Mixing Zone History

Historical Mixing Zone Modeling

In the 1995 issuance of the AKG520000 permit, three mixing zones sizes were authorized: a 300-foot radius mixing zone for offshore processors, a 200-foot radius mixing zone for nearshore processors, and a 100-foot radius mixing zone for shore-based processors. The 2001 issuance of the AKG520000 permit estimated that a 100-foot radius mixing zone would provide a minimum dilution of 30:1 at the boundary of the mixing zone and would be authorized for all three categories of dischargers. However, upon review of the EPA and DEC administrative record for the 2001 AKG520000 permit reissuance, no record was found of any modeling performed to determine the basis of the 30:1 dilution factor or 100 foot size determination. Also, the 2001 AKG520000 permit did not require receiving water sampling or end of pipe sampling to determine whether the 100-foot radius mixing zone was sized appropriately or that a 30:1 dilution was available at the boundary of the mixing zone.

Due to the lack of information available for mixing zone verification DEC finds that further effluent data, as well as ambient receiving water information, is needed to refine the size of the general permit defined standard mixing zone for receiving waters within the coverage area of the permit. During the 2020 – 2025 AKG521000 permit cycle, permittees will be required to conduct effluent and receiving water monitoring in an attempt to assist the Department to evaluate the general permit-defined standard mixing zone size determination.

Mixing Zone Applicability

The 2001 AKG520000 Permit Parts V(A)(1)(i), V(B)(1)(k) and V(C)(1)(k) indicate:

> "State-authorized mixing zone [see 18 AAC 70]. The mixing zone for the discharges authorized in Part II of this permit shall be a cylindrical shape with dimensions described as follows: the horizontal extent determined by a 100-foot radius around the terminus of the outfall, extending vertically up to the sea surface and extending vertically down to the seafloor. The mixing zone is a volume of water that surrounds the discharge outfall where the effluent plume is diluted by the receiving water and within which the following specific water quality criteria may be exceeded: residues, dissolved gas, oil and grease, fecal coliform, pH, temperature, color, turbidity and total residual chlorine. Discharges shall not violate Alaska Water Quality Standards criteria beyond the 100-foot mixing zone."

Mixing Zones were authorized in AKG520000 401 Certification - Part I – Mixing Zones:

> "The mixing zone for discharges authorized by the NPDES Permit, Part II, is a cylindrical shape with dimensions described as follows: i.) Horizontal extent determined by 100 foot radius from Outfall. Extends vertically up to the sea surface. ii.) Extends vertically down to the seabed."

Therefore, the Department's AKG520000 401 Certification provided a mixing zone, not only for the seafood processing wastewaters and wastes, but also for other discharges listed in the AKG520000 NPDES Permit, Part II, such as wash-down water, vessel's sanitary waste discharges, secondary treated (domestic) wastewaters, and "Other Wastewaters" such as domestic graywater, seafood catch transfer water, live tank water, refrigerated seawater, cooking water, boiler water, cooling water, refrigeration condensate, freshwater pressure relief water, clean-up water, and scrubber water.

As discussed in Fact Sheet Part 3.2.5, as a result of language found in the AKG5200000 permit, permittees have installed "Other Wastewater" outfall(s) separate from the seafood processing wastewater outfalls. EPA and DEC Compliance inspections have documented numerous instances of multiple outfalls at seafood processing facilities.

The AKG521000 permit proposes to continue to apply the 100-foot radius mixing zone for permittees' seafood processing outfalls as found in the 2001 AKG520000 permit, as well as apply the standard mixing zone to facilities discharging through "Other Wastewaters" outfalls (Permit Part 3.2.5). The permittees listed in Appendix D with administratively extended NPDES AKG520000 coverage all have been operating with 100-foot radius mixing zones. Less than 5 % of the permittees have submitted monitoring data resulting in permit violations and/or water quality violations. Those that did have violations were not operating within the constraints of the 2001 AKG520000 permit requirements.

4.3.3. Mixing Zone Evaluation

This section provides the criteria and information the Department used to evaluate the appropriateness of establishing a 100 foot radius general permit defined standard mixing zone. Fact Sheet Appendix A, Mixing Zone Analysis Check List, outlines criteria that is considered when the Department analyzes a permittee's request for a mixing zone. These criteria include the size of the mixing zone, treatment technology, existing uses of the waterbody, human consumption, spawning areas, human health, aquatic life, and endangered species. All criteria must be met in order to authorize a mixing zone. The following summarizes the Department's analysis:

> Size. In accordance with 18 AAC 70.240(k) and the currently available data, the Department determined that the size of the general permit defined standard size mixing zone (100 foot radius) for each facility is as small as practicable. In accordance with 18 AAC 70.240(c)(2-3), the Department finds that existing uses of the waterbody outside the mixing zone are maintained and fully protected so that any discharge will neither partially nor completely eliminate an existing use of the waterbody outside the mixing zone and will not impair the overall biological integrity of the waterbody. Permittees of new facilities may request and DEC may authorize a mixing zone for seafood waste discharges, domestic wastewater discharges or other wastewater discharges. The standard mixing zone size that DEC will authorize for each outfall is a circle with a 100 foot radius centered at the discharge terminus extending from the seafloor up to the surface to ensure the waterbody as a whole is protected. DEC may decrease individual mixing zone sizes during review of submitted NOIs consistent with 18 AAC 70.240.

Technology. In accordance with 18 AAC 70.240(c)(1), the most effective technological and economical methods are used to disperse, treat, remove, and reduce pollutants.

> Treatment Technology for Seafood waste – EPA has promulgated final ELGs, treatment technology requirements, specifying the minimum treatment standards for specific methods of processing Alaska seafood, such as mechanical butchering of salmon. The ELGs are codified at 40 CFR Part 408, adopted by reference at 18 AAC 83.010. The ELGs are applicable to the following seafood processing industries: crab meat processing, whole crab and crab section processing, shrimp processing, hand-butchered salmon processing, mechanized salmon processing, bottom fish processing, scallop processing, and herring fillet processing (40 CFR Part 408, Subparts E, G, J, P, Q, T, AC, AE). The TBELs from the ELGs have been incorporated into the permit

Existing Use. Consistent with 18 AAC 70.240(b-c), mixing zones will only be authorized if it has been appropriately sized to fully protect the existing uses outside the mixing zone. The permit requires the applicant identify other existing uses within 1.0 nm of the discharge. DEC will review available information to determine that the existing uses and biological integrity of the water bodies as a whole will be maintained and fully protected prior to authorizing a mixing zone. Permittees must operate in compliance with the terms of the permit, as required by AAC 70.240(c)(2-3), and the permit requires compliance with water quality criteria, which serves the specific function of protecting uses. Additional receiving water monitoring will be conducted during the life of the permit to ensure that existing uses will continue to be protected.

Human Consumption. In accordance with 18 AAC 70.240(d)(6) and (c)(4)(C), the pollutants discharged cannot produce objectionable color, taste, or odor in aquatic resources harvested for human consumption; nor can the discharge preclude or limit established processing activities or commercial, sport, personal use, or subsistence fish and shellfish harvesting. Mixing zones will not be authorized in areas of active seafood harvesting.

Spawning Areas. In accordance with 18 AAC 70.240(e-f) mixing zones will not be authorized in a known spawning area for anadromous fish or resident fish spawning redds.

Human Health. In accordance with 18 AAC70.240(c-d), the mixing zone authorized in the permit must be protective of human health.

Seafood wastes are not expected to contain significant quantities of pollutants that may bioaccumulate in aquatic organisms. Seafood waste discharges are not expected to result in elevated levels of toxic or carcinogenic pollutants in marine organisms consumed by humans. DEC has determined that the permit satisfies 18 AAC 70.240(d)(1-2) and 18 AAC 70.240(c)(4)(B).

Aquatic Life and Wildlife. In accordance with 18 AAC 70.240(c), (d), and (g), the mixing zone authorized in the permit shall be protective of aquatic life and wildlife.

Impacts from permittees discharging seafood processing waste in compliance with the requirements of the permit have shown to be localized. Although benthic organisms may be smothered or community composition altered in residues excursions authorized by a ZOD where seafood deposits are allowed to form, the benthic communities in Alaskan coastal waters would not be expected to decline noticeably. The ZOD is not authorized for the entire waterbody, just a small portion of the waterbody and benthic organisms move and repopulate to varying degrees. Deposition of the majority of discharged solids is expected

to be rapid and localized, not creating a barrier to migratory species. Therefore, adverse physical effects to biota from ground seafood discharge should be limited to the nearfield vicinity of the outfall. Within this region, zooplankton and fish larvae near the discharge may experience altered respiratory or feeding ability due to stress, or clogging of gills and feeding apparatus. Phytoplankton entrained in the discharge plume may have reduced productivity due to decreased light availability. These impacts should result in negligible impacts to populations in the region, as impacts should be restricted to the immediate vicinity of the discharge. Mobile invertebrates, fish, birds, and mammals presumably will avoid the discharge plume if conditions become stressful and therefore be provided a zone of passage and prevent lethality to passing organisms. Additionally, biota may also be attracted to the discharge plume to feed on the discharged particulates, thereby increasing the biodiversity in some areas. Infaunal or sessile organisms near the discharge are not likely to be impacted by the suspended solids and should not result in the permanent or irreparable displacement of indigenous organisms.

Endangered Species In accordance with 18 AAC 70. 240(c)(4)(F), the authorized mixing zones will not cause an adverse effect on threatened or endangered species.

On July 23, 2012, DEC provided the USFWS a list of existing facilities, discharge locations, discharge amounts, and seafloor survey results of existing seafood processing facilities discharging to sensitive areas. In an August 16, 2012 response, the USFWS indicated that discharges to waters in Kodiak and Chignik harbors could present significant risk to Steller's eiders in those harbors and provided recommendations for incorporation into authorizations for those specific facilities that discharge to those areas. DEC again provided USFWS the opportunity for early draft review October 2015. No further endangered species special considerations were requested beyond using the critical habitat GIS layers in permitting, which DEC already utilizes for seafood APDES permits. DEC will continue to access the Sensitive Area Mapping when evaluating NOIs. Authorizations will incorporate site-specific water quality-based requirements where appropriate (Permit Part 1.8). The Department will now public notice the draft authorization when discharge to a new Excluded Area under the AKG521000 permit is proposed. DEC will take into consideration agency or public recommended site-specific conditions provided during the public notice period. The permit also requires the applicant to provide copies of any biological surveys, and environmental reports previously performed or required in Excluded Areas. If these documents do not exist, the permit requires the applicant to inform the Department that such documents do not exist.

4.3.4. Receiving Water Quality Monitoring

The Department finds it necessary to further evaluate receiving water quality. Permittees shall monitor the receiving water as indicated in Fact Sheet Table 5. The Department is requiring the data collection for evaluation regarding the pollutants being discharged in comparison to the receiving water conditions and seafloor conditions. In accordance with AS 46.03.020 (13) and Section 308 of the CWA, DEC has the authority to require the owner or permittee of a facility to undertake this type of monitoring, sampling, and reporting as codified in 33 U.S.C 1318. The Department has specifically required this monitoring to occur inside the confines of the permit instead of a separate CWA Section 308 letter to ensure that effluent monitoring and receiving water monitoring data can be correlated.

The 2001 AKG520000 permit did not require effluent monitoring of the wastewater discharge from a seafood processor to determine compliance with WQS or to validate the general permit-

defined standard mixing zone size. The Department has found that there is necessity to further evaluate the mixing zone size developed for the onshore seafood processors. The 2011 AKG523000 Offshore Seafood Processing permit and fast sheet also identified the need to evaluate the waterbody mixing characteristics for vessels.

Permit Part 2.3.2 establishes receiving water quality monitoring which is required to begin upon issuance of the authorization. The permittee shall monitor the receiving water until the permittee collects a minimum of 10 samples over the 5 year term of the permit. The monitoring frequency may change during the next permit cycle, including a reduction of monitoring for certain parameters if appropriate. At the next permit reissuance the Department will not consider such a reduction in monitoring to be backsliding.

The 2021 AKG521000 permit requires permittees to perform monitoring at the boundary of the mixing zone (near field) and/or at certain locations in the ambient receiving water. Evaluating the pollutant parameters at the boundary of the mixing zone and in the ambient receiving water will assist the permittee and the Department to determine if the discharge meets the required mixing zone criteria at the compliance point (boundary of mixing zone), and further evaluate the appropriateness of the mixing zone historically authorized as part of the 2001 AKG520000 permit.

DEC will evaluate the compiled Annual Report data as compared to variable commodity line effluent discharges and facility outfall configurations. The receiving water monitoring and seafloor survey protocol will provide oceanographic data (local current speeds), pollutants of concern and discharge-related impacts, and chemistry data needed to address existing data gaps for those parameters listed in the permit.

Table 5: Receiving Water Quality Monitoring

Parameter	Units [a]	Sample Location	Sample Frequency	Reporting Requirement	Sample Type
Color	Color unit	As found in Part 2.3.2.5 and Part 2.3.2.6	2 per year	report	grab
Turbidity	NTU	As found in Part 2.3.2.5 and Part 2.3.2.6	2 per year	report	grab
Total ammonia	mg-N/L	As found in Part 2.3.2.5 and Part 2.3.2.6	2 per year	report	grab
Dissolved Oxygen	mg/L	As found in Part 2.3.2.5 and Part 2.3.2.6	2 per year	report	grab
pH	S.U.	As found in Part 2.3.2.5 and Part 2.3.2.6	2 per year	report	grab
Temperature	^{o} C	As found in Part 2.3.2.5 and Part 2.3.2.6	2 per year	report	grab
Salinity	ppt	As found in Part 2.3.2.5 and Part 2.3.2.6	2 per year	report	grab
Total Residual Chlorine (TRC) [b]	µg/l	As found in Part 2.3.2.5 and Part 2.3.2.6	2 per year	report	grab

Footnotes:

a. Units: NTU = Nephelometric Turbidity Unit, mg-N/L = milligrams nitrogen per liter, mg/L = milligrams per liter, S.U. = standard units, °C = degrees Celsius, ppt = parts per thousand, mg-N/L = milligrams nitrogen per liter, µg/L = micrograms per liter.

b. Chlorine monitoring is required only if used as a disinfectant or introduced elsewhere in the seafood processing areas.

4.4. Zone of Deposit (ZOD)

A ZOD is defined as a limited area where substances may be authorized to be deposited on the seafloor of marine waters. Pursuant to 18 AAC 70.210, the Department reviewed available information and has determined that the available information reasonably demonstrates that a general permit defined ZOD of 1.0 acre or less for each marine and estuarine discharge location will protect the existing uses of the receiving water. The methods of treatment and dispersal are the most effective and are technologically and economically feasible when a seafood processing facility discharges in conformance with the permit requirements, limitations, and conditions.

If the Department finds that available evidence reasonably demonstrates that the general permit defined standard ZOD area authorized by the Department has a significant unforeseen adverse environmental effect, the Department will reassess the general permit defined ZOD and modify the ZOD authorization of the permit in accordance with applicable regulations.

The following Parts provide the regulatory basis, criteria and information the Department used to evaluate the appropriateness of authorizing a general permit defined standard ZOD.

4.4.1. Zone of Deposit: Department Authorization and Regulatory Basis

After completing a review of a NOI, the Department may authorize a ZOD of seafood processing waste up to 1.0 acre on the seafloor for each permittee's authorized marine and estuarine discharge location.

The 2020 AKG521000 general permit does not authorize a ZOD for any freshwater discharge locations (e.g. fresh water rivers or streams above tidally-influenced reaches), as restricted in 18 AAC 70.210.

When determining whether the general permit defined standard ZOD area is appropriate or whether a smaller ZOD is more appropriate for a specific receiving area, the Department will include in its consideration the following:

- The effects that the discharge might have on the uses of the receiving water.
- The flushing and mixing characteristics of the receiving water.
- The cumulative effects of multiple ZODs and other inputs affecting the receiving water.

Within an authorized ZOD, the water quality criteria of 18 AAC 70.020(b) for residues and the antidegradation requirement of 18 AAC 70.015 may be exceeded. However, the WQS shall be met at every point outside the authorized ZOD area. In no case shall the WQS be violated in the water column outside the ZOD by any action, including leaching from, or suspension of, deposited materials. The written authorization will specify whether the Department has authorized a ZOD and the area of the authorized ZOD for each discharge location.

If through the review of a NOI the Department determines that it has insufficient information to determine whether a ZOD is appropriate at a discharge location, a permittee may be required to submit additional information (see 18 AAC 70.210(b)(1-6)) or may be required to submit an individual permit application. The burden of proof for providing the required information is on the person requesting a ZOD.

If multiple permittees request coverage under the permit to discharge in the same area, the cumulative amount of seafood processing waste authorized to be discharged will be evaluated and when appropriate, limitations or prohibitions on the amount of waste authorized to be discharged will be placed in a written authorization for each permittee. If a written authorization

has been issued that authorizes a discharge to a specific discharge location or area-of-operation and the Department receives a new or updated NOI requesting coverage for another permittee in the same area, the Department will determine whether circumstances have changed such that the existing authorization requires modification or if the discharges are no longer appropriately controlled under the general permit before issuing an authorization to the new permittee. If the Department determines that the discharges are significant contributors of pollutants, the Department may require that the dischargers apply for and obtain individual permits (see 18 AAC 83.215(a)(5) and (6)).

4.4.2. Seafood ZOD History

A 1.0 acre ZOD for seafood processing waste deposits was authorized in both the 1995 and 2001 AKG520000 permits via the State's CWA Section 401 Certification for shore-based (onshore) processors discharging zero to 0.5 nm from shore, and near-shore processors (vessels) discharging 0.5 to 1.0 nm from shore. The Section 401 Certification also provided a ZOD for each shore-based processor and each single discharge location where a near-shore processor discharged. The Section 401 Certification did not authorize a single, 1.0 acre ZOD that would be cumulatively applied to all discharge locations where a near-shore processor was authorized to discharge. When EPA incorporated ZOD language into the AKG520000 permit, the following language was used:

> ***Section V(B)****Near Shore Seafood Processors (1)(l)"State-authorized zone of deposit [see 18 AAC 70]. The ADEC authorizes a zone of deposit of one (1) acre for each facility authorized by this general permit under the classification of near-shore seafood processor in marine waters (includes estuaries and coastal waters)."*
>
> And,
>
> ***Section V(C)(1)*** *Shore-based Seafood Processors(l)"State-authorized zone of deposit [see 18 AAC 70]. The ADEC authorizes a zone of deposit of one (1) acre for each facility authorized by this general permit under the classification of shore-based seafood processors in marine waters (includes estuaries and coastal waters).*
>
> *The permittee shall inform EPA and ADEC at least 60 days in advance of any planned relocation of its outfall as in Part VII.H; relocation of an outfall line does not authorize a new zone of deposit."*

DEC reviewed the administrative record and in the final AKG520000 permit, EPA did not include language from the DEC AKG520000 CWA Section 401 Certification Part III(B)(1), which read:

> *"The waste load limit is ten million pounds per year of settleable solid processing waste residues within one nautical mile of shore at MLLW, in accordance with the preliminary final NPDES Permit. For mobile facilities,* ***this waste limit applies to each location*** *at which a facility discharges." [*Emphasis added*]*

Seafloor surveys were only required for shore-based and near-shore facilities if a permittee discharged at a single location for more than 7 days in water less than -120 feet at MLLW. A "single location" was defined as an outfall(s) (past and present) of an on-shore facility or the anchorage of a vessel within a circular area with a radius equal to 0.5 nm.

A majority of the vessel permittees in the AKG520000 coverage area moved to a different location within the 7 day period in order to avoid the need to perform a seafloor survey or applied for a waiver under the AKG520000 permit from performing a seafloor survey. Due to

diver safety issues and lack of survey methods that did not involve divers performing a seafloor survey in deep water, the AKG520000 permit did not require seafloor monitoring in waters exceeding -120 feet deep at MLLW. There was also a limited number of divers that could perform seafloor surveys.

The AKG520000 permit established a 10 million pound limit on the amount of seafood processing waste that could be discharged from a shore-based or near-shore facility. The 10 million pound limit was based upon modeling performed for an outfall located approximately 6 feet above the seafloor. As discussed in Part 3.2.3, the 10 million pound limit is continued in the 2020 AKG521000 general permit.

Continuous, Discontinuous and Trace Coverage

The 2001 AKG520000 permit did not clearly define what level of seafood waste coverage (continuous, discontinuous, or trace deposits) on the seafloor counted towards the maximum 1.0 acre ZOD. This lack of clarification has led to differing agency interpretations as to what constitutes compliance with the 1.0 acre ZOD provision. The EPA NPDES permitting unit has interpreted the AKG520000 401 Certification of the 1.0 acre ZOD as a total limit applicable to all continuous, discontinuous and trace deposits. The EPA NPDES permitting unit has counted any cumulative, small deposits (discontinuous coverage) or floating seafood waste (trace coverage) in amounts greater than the allowed 1.0 acre ZOD as a violation of the permit. The Department on the other hand has held a long-standing interpretation of applying the 1.0 acre ZOD requirement to the continuous deposits only. Application of the Department's policy regarding ZODs can be found in the EPA approved Alaska Integrated Water Quality Monitoring and Assessment Report (Integrated Report). Reviewing the Integrated Report(s) for residues or settleable solids listings corroborates the Department's long standing enforcement of the 1.0 acre ZOD to continuous coverage only, while continuing to provide water quality protection and working toward water quality improvement.

During the development of the AKG521000 permit, DEC and EPA discussed what level of seafood waste coverage counts towards the 1.0 acre ZOD. The consensus discussion and definitions that the AKG521000 permit uses can be found below in Fact Sheet Part 4.4.3.

The Integrated Report and Listing Criteria for Residues and Settleable Solids

The CWA mandates that each state develop a program to monitor and report on the quality of its waters and prepare a report describing the status of its water quality. Alaska's Integrated Water Quality Monitoring and Assessment Report (Integrated Report) combines the Section 305 (b) report and Section 303(d) list of impaired waters into a single comprehensive report. The Integrated Report helps the State prioritize waters for data gathering, watershed protection, and restoration of impaired waters. DEC collects water quality information through a public solicitation as well as through a year-round waterbody nomination process. Information, including APDES permittee's monitoring data, is assessed by a multi-state agency process called Alaska Clean Water Actions (ACWA). Based on this assessment, a waterbody is categorized in the Integrated Report in one of five CWA categories:

- **Category 1 Waterbody.** Water quality data and information show that all uses are being attained;

- **Category 2 Waterbody.** Waters are attaining some designated uses and for which insufficient or not data and information are available to determine whether remaining uses are attained;

• **Category 3 Waterbody.** Insufficient or no data and information exists to determine if any designated use is attained. There is not enough information to determine their status;

• **Category 4 (a & b) Waterbody.** Waters are impaired but do not need the development of TMDLs because (**a**) an EPA-approved TMDL has been established and (**b**) other pollution controls are in place. The waters are expected to attain WQS within a reasonable time period;

• **Category 5 Waterbody.** A waterbody is listed in Category 5 and on the Section 303(d) list when a determination is made that the water is impaired. Require that a TMDL or other equivalent pollution control is developed to attain WQS.

As defined in Part 4.4, a ZOD is defined as a limited area where substances may be authorized to be deposited on the seafloor of marine waters, where a facility may temporarily exceed the residue standard in that area so long that the ZOD does not significantly degrade the quality of the waterbody as a whole or the designated uses. In order to self-report permit compliance, seafood processing facilities that have been issued a ZOD have been required to perform dive surveys. If a dive survey reports greater than 1.5 acres of continuous residues coverage that portion of the waterbody is placed in the Integrated Category 4b list. Once the determination is made that the water is impaired the facility submits a remediation plan for approval to the Department. In Alaska's Integrated Reports, DEC reports dive survey acreages as exceedances over the 1.0 acre ZOD threshold. For example, the dive survey information from November 2001 demonstrates an exceedance of 2.1 acres above the permitted continuous residues coverage of 1.0 acre. This reporting approach more accurately portrays actual exceedances of the permitted threshold. Additionally, it is important to recognize that exceedance of a ZOD is not equivalent to impairment; rather, exceedance of 1.5 acres of continuous residues coverage is the impairment standard.

For waterbodies with seafood processing facilities that are permitted to discharge residues, the impairment standard is 1.5 acres of continuous cover. If two or more consecutive dive survey reports adequately document the presence of 1.5 acres or more of continuous residue cover, the waterbody is placed on the Category 5/Section 303(d) list. Two surveys are required to evaluate the total areal extent of continuous coverage. As part of the dive survey review, DEC re-calculates continuous cover based on dive survey reports. When reviewing dive survey reports, the Department has found that facilities overstate the extent of continuous cover. Because of uncertainty about the extent of continuous cover, and by using an impairment standard of 1.5 acres of continuous coverage, DEC is confident that impairment decisions truly reflect actual impairment. Additionally, the waterbody is placed on the impaired list if one of the following conditions is met: (1) the permittee failed to submit a remediation plan, or (2) a remediation plan has been submitted, but the permittee is failing to implement or is not meeting milestones set forth in the approved remediation plan. Once listed as Category 5, those waters require that a TMDL or other equivalent pollution controls are developed to attain WQS.

In order to have a waterbody eligible to be removed from the Integrated Report's Category 5 'impaired' list, the permittee must document through two consecutive dive surveys that the total area of continuous cover has been reduced to less than 1.5 acres. The permittee must have a DEC-approved remediation plan and the facility may be under consent decree or APDES permit limitations that lead to further recovery, or the waterbody has reached Category 1 or 2.

4.4.3. Introduction of Project Area ZODs for Seafood Waste

EPA-issued a NPDES General Permit for Log Transfer Facilities (LTFs) (AKG701000) in 2000, which authorized the discharge of bark and wood debris, under specified terms, to both near shore and offshore marine waters in Alaska within the permit's area of coverage. Permittees authorized by the 2000 LTF General Permit were required to develop and implement Remediation and Pollution Prevention Plans to restrict their discharges to inside the perimeter of a project area ZOD.

The Department certified the 2000 LTF General Permit pursuant to CWA Section 401 on August 24, 1999. DEC's certification included a new project area ZOD provision. The term "project area" meant the entire marine operating area of an LTF, either shore-based or off-shore, including the following components: shore-based log transfer devices; shore-based log transfer, rafting, and storage areas; helicopter drop areas; vessel and barge loading and unloading areas; offshore log storage areas not adjacent to a shore-based LTF; bulkheads, ramps, floating walkways, docks, pilings, dolphins, anchors, buoys and other marine appurtenances; and the marine water and ocean bottom underlying and connecting these features.

The LTF project area ZOD established a 1.0 acre remediation threshold (not a fixed limit) for continuous bark coverage greater than 10 cm deep at any point. If the 1.0 acre threshold was exceeded, the state certification triggered requirements for remediation planning. The project area ZOD authorization associated with the 2000 LTF permit issuance allowed for the presence of discontinuous and trace cover bark and wood waste within the project area. An important consideration was that the fixed 1.0 acre limit for continuous cover bark and wood waste failed to acknowledge that discontinuous (10% to 99% cover) and trace (<10% cover) bark coverage and wood waste was likely to be found within the operational footprint of a facility. In the evaluation of compliance status of bark residues in the AKG701000 general permit, bark found outside a fixed 1.0 acre ZOD would have been a violation of the Alaska WQS and potentially subject to enforcement. By adopting a project area ZOD, DEC allowed for the presence of discontinuous and trace cover bark through the application of WQS 18 AAC 70.210, which was consistent with the logic that the piles would disperse over time and water quality impacts would be mitigated by natural processes (e.g., current-induced dispersion).

While project area ZODs are not a new concept to APDES LTF permitting, project area ZODs and the inspection of the project area ZOD is new to APDES seafood permitting. Given the operational and discharge similarities between LTFs and seafood processors, as well as the natural consequence of tidal action dispersing deposits, the concept of a project area ZOD is a more rational regulatory scheme for seafood processors than the assignment of a simple 1.0 acre ZOD. The permit proposes to assign a project area ZOD to each facility covering all areas where the onshore facility's seafood processing activities are occurring.

Accordingly, in the AKG521000 permit the Department will assign a project area ZOD for each seafood processing facility or seafood waste producing facility, acknowledging that seafood waste is likely to be found within the operational marine footprint of the facility and not solely isolated to the immediate vicinity of the seafood processing outfall terminus. The entire marine operating area of an onshore, or over-water, seafood processing facility shall include fish transfer areas (including docking areas where vessels unload their fish, anchor to wait to unload their fish, and clean fish holds), marine areas that encompass a facility's existing, in-use seafood discharge outfalls, as well as outfall lines no longer in use. At times, due to vessels dragging anchor, poor outfall pipe corrosion protection or various harbor projects, outfall pipes are broken, replaced or even moved several hundred feet, which has resulted in a change of the location of the seafood deposits. Additionally, it is common for incoming vessels to unload their catch, and

then rinse out their vessel hulls or fish holds while tied to the dock while at the dock. This is due to availability of fresh clean water from the onshore facility, thereby is an inherent part of the onshore facility's seafood processing operations to possibly create deposits near the docks.

It is DEC's intent for the permittee to perform the seafloor survey on the entire project area ZOD to capture the "operational" deposits discussed above, as well as other areas of deposits, if any. DEC has determined that the project area ZOD approach is an effective way to survey the operational seafood marine footprint from an onshore facility, as well as to allow for seafood waste deposits to disperse without causing a violation of the residue criteria.

The Project Area ZOD approach in the AKG521000 permit will account for residue criteria exceedances within the authorized area as well as survey the larger operational footprint to evaluate other areas of accumulation and evaluate seafood dispersion. DEC recognizes that seafood deposits may be continuous, discontinuous or trace, depending on discharge amounts, the ocean currents, and in the way deposits are dispersed along the ocean floor within the project area ZOD. Ocean currents move seafood waste in a waterbody, sometimes in short time periods given the nature of the deposit and the ambient velocity of the receiving water. Dive surveys in Alaska have routinely documented the movement of seafood waste deposits, within as little as two months between dive surveys. In some cases, from one dive survey to the next, deposits have increased, decreased and/or disappeared.

DEC proposes a modification to the seafood survey reporting (monitoring and reporting applicable to seafood waste deposits) requirements in the permit (Permit Appendix E). The proposed modification would require permittees to map and report the total area(s) of coverage of seafood waste deposits within the project area ZOD boundary. The first required mapping of coverage areas includes continuous coverage and is defined as 95-100% coverage of the seafloor by seafood waste deposits within a three foot by three foot individual sample plot. Second, discontinuous seafood waste deposits ranging from 50% to 94% coverage at individual sample plots must be measured and reported. The third required mapping of coverage areas includes discontinuous seafood waste coverage ranging from 10 to 49% at individual sample plots. Trace Coverage of less than 10 % seafood waste, or less than 0.5 inch in thickness, will also be required to be mapped and shall be noted as "Trace" on the Seafloor Survey: Transect Data Form (Permit Attachment D). The seafloor survey must also determine the depth of seafood waste deposit piles.

The selection of 50% is based on research results from two studies that have been published that examined the effects of wood waste discharges from pulp mills, not seafood processing facilities. DEC acknowledges that the findings from the two studies are not directly applicable to seafood discharges since the study's subject was wood, not seafood waste. However, at this time, DEC finds the identified wood waste studies to provide the most meaningful corollary to studying seafood deposition in the marine environment until such time monitoring data (seafloor surveys) is collected during this permit cycle and analyzed for facilities operating in compliance with required permit provisions, or new studies are completed or identified that provide useful information on the effects of seafood deposition in the marine environment applicable to the amounts of seafood waste limited by the permit.

The 1984 Kathman study (Effects of Wood Waste on the Recruitment of Potential of Marine Benthic Communities, R.D. Kathman, S.F Cross, and M. Waldichuk, Department of Fisheries and Oceans Fisheries Research Branch, West Vancouver Laboratory, June 1984) found infauna colonization in artificial mixtures of wood waste (not bark) and sediments increased up to 60% for a 20% mixture and just slightly for a 50% mixture. This study concluded that "Species

richness increased at 20% but showed a dramatic reduction at 100%. Diversity and evenness were highest at 20%, with slight decrease at 0% and 50%., and a large decrease at 100%. Dominance, the reciprocal of evenness, indicated that only a few species represented the majority of the individuals at the 100% treatment, but that there were no particular species dominant at the other three concentrations."

DEC also reviewed the study titled "Effects of Wood Waste for Ocean Disposal on the Recruitment of Marine Macrobenthic Communities" by E.R. McGreer, R.D. Munday, and M. Waldichuk (Department of Fisheries and Oceans, Fisheries Research Branch, August 1985). This study evaluated the effects of wood waste depth instead of percent volume. The study abstract concluded that "The effect of different thicknesses (1, 5, and 15 cm) of a fine wood waste material upon the recruitment of marine macrobenthic communities was experimentally assessed using in situ settlement trays. A clean marine sediment was used in the experiment as a reference substrate. Differences in species composition and abundance of macrobenthos settling to the reference and 1 cm wood waste substrate compared to the 5 and 15 cm wood substrate were found. Species richness showed a consistent decrease with increasing thickness of wood waste."

Consistent with how DEC interprets the ZOD provisions included in the 2001 AKG520000 permit, the AKG521000 permit is not increasing the total authorized size of seafood waste deposits from the 1.0 acre ZOD. The permit proposes to count the total area of continuous coverage and 50% or greater discontinuous coverage of seafood waste deposits (residues) to the 1.0 acre of allowed deposits in the project area ZOD. In order to determine Project Area ZOD compliance, the permittee shall sum together the total continuous coverage and 50% - 94% discontinuous coverage areas and report the total summed coverage areas.

The project area ZOD approach will require the permittee to survey a greater area of the seafloor to identify possible areas where deposits may have occurred as a result of the onshore facility's operations, and provide a total areal representation of all deposits in the Seafloor Survey Report in accordance with Appendix E. Appendix E requires the permittee to map the total areal extent and depth of seafood waste deposits, measuring and accounting for all levels of seafood deposit coverage areas (continuous, discontinuous and trace).

DEC has initially assigned a project area ZOD for each facility located in marine water bodies (ZODs are not permitted in fresh water per 18 AAC 70.210). DEC's initial project area ZOD mapping approach is to issue an authorization with the project area ZOD included in the form of a map. This project area ZOD may be refined by the permittee as they perform the seafloor surveys, as many facilities have not performed a seafloor survey since early in the 2001 AKG520000 permit cycle. Due to ocean currents, dispersion, changes in processing, etc. over the course of the previous 19 years, DEC only reviewed those facilities seafloor survey dive reports from the past five years while performing the initial project area ZOD geospatial mapping. Where deposits were noted in seafloor surveys, DEC has spatially mapped the deposits as close as possible (the prior permit did not require the facility permittee to submit the seafood deposits mapping as digital data) reflecting approximate deposit size and location. DEC notes that once the seafloor surveys are performed under the new seafloor survey project area ZOD protocol requirements found in Appendix E, a revised size and location of the project area ZOD may occur. The Seafloor Protocol and Guidance document (Appendix E) provides the acceptable protocols for performing seafloor surveys of the project area ZOD. Seafloor survey results will be used to determine if additional limits are required, to monitor potential effluent impacts on receiving waterbody quality and to inform future permit decisions.

The proposed seafloor survey approach is intended to gather additional information on discontinuous seafood waste coverage distribution within project area ZODs, given the lack of performance monitoring data and published studies on the effects of discontinuous seafood waste and percentages of coverage of discontinuous seafood waste deposits and their effects. During the early permit development stage of the permit and fact sheet, EPA indicated that benthic studies have shown that discontinuous waste have caused negative impacts to the benthic community. To DEC's knowledge, these benthic studies have been performed during the auspices of EPA consent decrees, as part of enforcement actions where the permittee had discharged solids in excess of permit limits, or discharged seafood waste not specifically covered by the permit. For these reasons, DEC is seeking further information regarding the distribution of amounts and sizes (areal distribution) of seafood wastes and observations made of varying percent coverages (10-49% and 50-99%) of discontinuous waste and any observed short term or long term effects of permittees discharging in compliance with permit conditions.

4.4.4. Authorizing a Project Area ZOD

The permit authorizes a project area ZOD to each facility granted a ZOD in the previous AKG520000 permit, as well as those facilities who have applied for coverage up to the effective date of the permit but have been unable to obtain coverage. Permit Appendix D and the Seafood Wastewater GIS Project Area ZOD Map contain lists of facilities proposed to be issued Project area ZODs. When a permittee listed in Appendix D submits an updated NOI for coverage under AKG521000, the permittee is not required to provide a complete Zone of Deposit anaylsis under 18 AAC 70.210(b).

After completing a review of a NOI, the Department may assign a project area ZOD for resulting deposits of residues from seafood waste production activities. The Department will assign project area ZODs to a facility's marine operational area – around docks, where current and previous outfall lines and outfall terminus(s) lie on the seafloor, and thus where seafood waste discharges may have occurred. In this way the applicant and the Department may more accurately evaluate cumulative totals of seafood waste deposits. Seafloor surveys of the project area ZOD shall be used to determine the depth and total areal cover, and shall include the identification of the outer boundary of continuous coverage and the outer boundary of 50% - 95% discontinuous coverage of seafood waste. Within an authorized project area ZOD, the water quality criteria of 18 AAC 70.020(b) for residue and the antidegradation requirement of 18 AAC 70.015 may be exceeded. However, the standards shall be met at every point outside the project area ZOD. The written general permit authorization will specify whether a project area ZOD has been authorized and the boundaries of the authorized project Area ZOD, and will include a map of the assigned project area ZOD.

All assigned project area ZODs contained in and public noticed through the issuance of the permit shall be integrated into new AKG521000 permit authorizations without additional public notice. New project area ZOD authorizations in marine waters of the U.S. after the effective date of the permit shall be public noticed for a minimum of 30 days. The Department will evaluate each application for a ZOD in accordance with DEC's Antidegradation Policy (18 AAC 70.015) and ZOD requirements found in Permit Part 2.3.4. The Department has determined the permittee does not have to provide all the analysis points under 18 AAC 70.210(b)(1-6) as the evaluation criteria found in 18 AAC 70.210(b)(2,3,5 and 6) have been thoroughly discussed in this Fact Sheet Parts 4.4.4 and 4.4.5.

The permittee applying for a project area ZOD will need to provide analysis of their own community waste handling systems and potential by-product markets that would eliminate, or

reduce, any adverse effects of the deposit (18 AAC 70.210(b)(1)). The permittee will need to identify, to the extent feasible, the use of seafood processing waste for by-product utilization, developing methods to reduce seafood/fish processing as a waste material to be discharged. The permittee will also need to identify methods of disposal, other than discharge, for spoiled or contaminated by-products. Additionally, the permittee will have to provide a list of other known uses (secondary recreation, aquaculture facilities, etc.) within 1.0 nm of the proposed discharge in order for the Department to assess the potential impacts on other uses of the waterbody (18 AAC 70.210(b)(4).

The total continuous coverage and 50% - 94% discontinuous coverage areas of seafood waste deposits will be summed to determine compliance with the 1.0 acre ZOD limitation authorized in the project area ZOD.

When determining whether the general permit defined project area ZOD area is appropriate for a specific receiving area, the Department will include in its consideration the following:

- The effects that the discharge might have on the uses of the receiving water. The permit proposes that permittees identify other known waterbody uses (secondary recreation, aquaculture, etc.) within 1.0 nm of the proposed discharge. Facilities requesting a newly proposed project area ZOD after the effective date of the permit (and are not listed in Appendix D) will be publically noticed, providing additional public input to uses surrounding the proposed discharge site.
- The flushing and mixing characteristics of the receiving water. DEC will evaluate the information submitted on the NOI, as well as assessing NOAA maps, current data, and Form 2M data if submitted, to evaluate the flushing effects and mixing characteristics. Additionally, the more robust seafloor monitoring protocol found in Appendix E will provide DEC additional data regarding deposits and their effect on the seafloor.
- The cumulative effects of multiple ZODs and other inputs affecting the receiving water. Multiple ZODs issued in receiving waters with poor flush characteristics and low hydrodynamically energetic waters may have cumulative effects on the seafloor and receiving water. The permit has incorporated seafloor monitoring, sea surface monitoring and WQ monitoring to maintain and collect data regarding multiple dischargers into a single waterbody.

If through the review of a NOI, the Department determines that it has insufficient information to determine whether a project area ZOD is appropriate at a discharge location, a permittee may be required to submit additional information (see 18 AAC 70.210(b)(1)-(6)) or may be required to submit an APDES IP application. The burden of proof for providing the required information is on the applicant seeking to establish a ZOD.

If multiple permittees request coverage under the permit to discharge in the same area, the Department will evaluate the cumulative amount of seafood waste the Department will authorize. When appropriate, the Department will place limitations or prohibitions on the amount of waste the Department will authorize the permittee to discharge and will place the approved amount in a written authorization for each permittee. If the permittee has been issued a written authorization that authorizes a discharge to a specific location or operational area and the Department receives a new or updated NOI requesting coverage for another permittee in the same area, the Department will determine whether circumstances have changed so that the discharges are no longer appropriately controlled under the general permit before issuing an authorization to the new permittee. If the Department determines that the discharges are significant contributors of

pollutants, the Department may require that the dischargers apply for and obtain an APDES individual permit (see 18 AAC 83.215(a)(5) and (6)).

Consistent with 18 AAC 70.210, the Department has determined that the available information reasonably demonstrates that the authorization of a project area ZOD that limits cumulative continuous coverage areas[1] and 50% - 94% discontinuous coverage areas of seafood wastes to a total of 1.0 acre for each onshore seafood processing facility, community grinder, or permanently mooed barge or vessel will protect the existing uses of the receiving waterbody as a whole. The permit required methods of treatment and dispersal are the most appropriate and effective, when a seafood processing facility discharges in conformance with the permit requirements.

The permit does not limit the total size of the authorized project area ZOD, rather it limits the total areal size of continuous coverage and 50% - 94% of discontinuous coverage of seafood residue deposits within the project area ZOD, as the Department sums these coverages to determine compliance with the 1.0 acre permit limitation.

4.4.5. Evaluation of Project Area ZODs in Comparison to 18 AAC 70.210 Requirements

This section provides the criteria and information the Department used to evaluate the appropriateness of authorizing the 1.0 acre coverage of seafood waste deposits (residues) in the project area ZOD in the AKG521000 permit.

Alternatives that would eliminate, or reduce, any adverse effects of the deposit (18 AAC 70(b)(1)).

The Department considered other alternatives to eliminate or reduce any adverse effects of the deposit. Currently, Remote facilities are only required by TBELs to grind to ½ in all dimensions, which under some receiving water characteristics may lead to the formation of deposits (residues) on the seafloor. EPA's 1975 Rule making and subsequent industry petitions for communities to be considered Remote includes further financial analysis of the economic costs of having to screen seafood wastes and delivering the screened solids to a by-product facility (Fish Meal, Oil, Hydrolysate, etc.). Alternatives considered by the Department include the barging of waste to ocean waters, barging by vessel, or conversion of seafood waste product to fish meal, fish oil, and by-product recovery. Given EPA Remote designations, these alternatives were determined infeasible. The permit, however, requires that permittees who discharge seafood ensure that waste is not discharged into poor flushing areas, and requires discharge to hydro-dynamically energetic waters that will ensure dispersion and natural attenuation of the seafood wastes and minimize long term accumulation of these deposits in one area.

The permit also requires that a permittee identify and develop markets, to the extent feasible, for the use of seafood waste as a product, and not as a waste material to be discharged. This requirement is part of the permit-required BMPs.

Disposal of seafood waste solids will have the greatest impact on less mobile benthic organisms such as polychaetes and bivalves, and on demersal fish eggs that cannot move away from the

[1] Continuous Coverage - Seafood waste deposits that are found to be 100% areal coverage as measured along a transect of the seafloor with a 3-foot by 3-foot sample plot. The sample plot of continuous coverage must also consist of greater than 0.5 inch (½") thickness of seafood waste deposits found in the sample plot location as measured with a probe. And will, at DEC's discretion, include boulders, rock outcrops, ridges, and other protrusions within an area of continuous coverage that are not covered by seafood waste.

accumulating waste. The following section discusses the nature of the solid waste deposition and potential impacts to benthos and demersal eggs.

Settling of seafood discharges on the seafloor occurs at varying rates according to the size of the particles. Once settled, these particles can form organic mats or thick waste piles that can smother the underlying substrate and benthic communities within it. Some waste piles have been recorded to rise 40 feet or more above the seafloor (ADEC, 1998). The degradation of this organic material occurs at varying rates according to different characteristics of the discharge area (i.e. biological, physical, and chemical factors). In one study where salmon waste was widely distributed, the waste was completely absent within 33 days following discharge and no adverse effects on DO concentrations noted (Stevens and Haaga 1994). The accumulation of these deposits in some areas indicates that the rate of discharge exceeds the assimilation capacity of some water bodies and more specifically, the assimilation capacity of the benthic community and other aquatic life that metabolize this material. The permit requires that permittees discharge seafood waste in areas with high tidal activity that will ensure dispersion and dilution of the seafood wastes and minimize accumulation of these deposits in one area. If discharge limits are adhered to, the effects on aquatic biota in areas of seafood waste discharge should be minimal.

The following represents the outcomes of some research DEC initiated to evaluate seafood solid waste impacts on the benthos (Germano and Associates, 2004).

The intent of this study was to see what the impacts are to the surrounding benthos and benthic community from seafood solid wastes deposited in a ZOD. The impacts were evaluated using a Sediment Profile Imaging (SPI) camera. The SPI camera takes an image of the top few inches of sediment. Aquatic life within the sediments was also collected for analysis using a Van Veen grab device. The SPI camera showed where seafood wastes made the sediments anoxic and methane producing with the presence of sulfur-producing bacteria, *Beggiatoa,* indicating anoxic conditions.

For two adjacent processors with relatively small, active discharges located approximately 600 feet apart, the visual ZODs were 0.34 and 0.21 acres. However, the area of *Beggiatoa* was approximately 6.0 to 7.4 acres. The presence of *Beggiatoa* indicates reduced oxygen in the sediments and an adverse effect to the benthos and benthic community outside of the ZOD. Other measures for adverse effects include numbers and kinds of species present.

Fish and crab both were discovered foraging, immediately adjacent to the smaller active piles. The diversity of benthic species was less within the first 200 feet of the periphery of the ZOD compared to the diversity observed in a distant control site. However, the few opportunistic species that existed in the vicinity of the ZOD occurred in great numbers. At approximately 500 feet or more from the periphery of the active piles more of the normal resident species were recorded and the overall abundance of the opportunistic species was less. The study determined that normal resident species population levels and diversity did not occur until 1,500 feet or more down-current of the periphery of the waste piles.

Two other seafood processors evaluated had larger discharges and inactive waste piles greater than 1.0 acre in size. Very little to no solid waste discharges had occurred for the 2 years preceding the study. These discharges occurred approximately 1,000 feet apart. In this case, the *Beggiatoa* mats were observed in 2.8 and 0.5 acres around each waste pile respectively. The areas of reduced oxygen due to *Beggiatoa* were significantly smaller for the inactive waste piles than for the active waste piles. From these results, the authors of the study conclude that biota in sediments will revert to natural conditions within 5-10 years after the cessation of seafood waste disposal (Germano and Associates, 2004).

As stated above, seafood wastes can form organic mats within the ZOD, depending on the amount discharged and the biological, chemical, and physical factors affecting decomposition and dispersion of the waste. Depending on the depth of burial, deposits can make the substrate inhospitable, or influence the species composition favoring opportunistic organisms that may out-compete the normal fauna. Algal blooms caused by high nitrogen concentrations can also alter habitat by smothering benthic substrates when they die, and by reducing the available water column or surface aquatic habitat for visual predators, including birds. However, these biological effects appear to be largely localized to the discharge area and are expected to be mitigated in relatively short timeframes based on the natural processes. Further information regarding adverse impacts of deposits is found below.

The potential direct and indirect impacts on human health (18 AAC 70(b)(2)).

Seafood processing discharges are not expected to result in elevated levels of toxic or carcinogenic pollutants in marine organisms consumed by humans.

Eutrophication of marine waters may indirectly result in enhancement of phytoplankton species that are toxic to marine organisms and humans. A separate unrelated toxicity that occurs is Paralytic Shellfish Poisoning (PSP) which is caused by the consumption of shellfish that have concentrated toxins from microscopic algae blooms, composed of such as algae as dinoflagellates, diatoms, and cyanobacteria. Dinoflagellates of the genus Alexandrium (genus) are the most numerous and widespread saxitoxin producers and are responsible for PSP blooms in subarctic, temperate, and tropical locations. The majority of PSP toxic blooms have been caused by the A. tamarense species complex, however, direct links between the occurrence of PSP and eutrophication have not been established. Therefore, the linkage between PSP and seafood processing discharges, while possible, is tenuous. Alterations in phytoplankton species composition is another potential impact of nutrient rich discharges on marine phytoplankton. Concerns regarding alterations in phytoplankton community composition are related to indirect effects resulting from increasing the populations of phytoplankton species that may produce adverse effects on marine organisms and humans. Effects produced by some phytoplankton species include physical damage to marine organisms (e.g., diatom species of *Chaetoceros* that have caused mortality of penned salmon), toxic effects to marine organisms (e.g., a raphidophyte flagellate species of *Hererosigma*), and toxic effects to humans due to the concentration of algal toxins in marine fish and shellfish [e.g., PSP, Diarrheic Shellfish Poisoning (DSP), Neurotoxic Shellfish Poisoning (NSP), Amnesic Shellfish Poisoning (ASP), and ciguatera] (Taylor 1990; Haigh and Taylor 1990). Concerns regarding toxic phytoplankton have been heightened in recent years due to suspicions that the frequency of toxic phytoplankton blooms has increased due to human activities, especially due to agricultural runoff and the discharge of municipal and industrial wastewater to marine coastal areas (Smayda 1990; Smayda and White 1990; United Nations 1990; Anderson 1989).

Although there have been several reports linking mortalities of relatively large numbers of marine mammals (e.g., O'Shea et al. 1991; Anderson and White 1989; Geraci 1989; Geraci et al. 1989; Gilmartin et al. 1980), fish and shellfish (e.g., Cosper et al. 1990; Harper and Guillen 1989; Smayda and Fofonoff 1989), and aquatic plants (e.g., Cosper et al. 1990) to the occurrence of toxic phytoplankton in other parts of the U.S., only very recently, 2015, were such episodes of marine mammal deaths directly tied to increase toxic phytoplankton blooms on the coastal waters of Alaska. The occurrence of human intoxication due to PSP has been recorded at locations in southeast and the Aleutian Islands in Alaska (Sundstrom et al. 1990). PSP is caused by the consumption of shellfish that have concentrated toxins from an algae of the species

Protogonyaulax (Shimizu 1989). However, direct links between the occurrence of PSP and eutrophication have not been established (Anderson 1989). Therefore, the linkage between PSP and seafood processing discharges, while possible, is tenuous.

Although there is a potential for the discharge of seafood waste to cause localized changes in phytoplankton species composition, there are no known studies to verify that discharges of seafood wastes have produced toxic or harmful phytoplankton blooms. Similarly, while PSP has been documented in Southeast Alaska, there is currently no evidence suggesting a linkage with seafood processing discharges.

<u>The potential impacts on aquatic life and other wildlife, including the potential for bioaccumulation and persistence (18 AAC 70(b)(3)).</u>

The potential adverse effects of seafood waste include direct and indirect impacts of the solid and liquid waste discharges to marine organisms. Potential direct impacts of solid waste discharges, including burial of benthic communities, alteration of the sediment texture, and chemical changes within the sediments as a result of decaying organic matter accumulations, are expected to be minimal. The permit limits discharges into areas of poor flushing, those areas with average currents of less than one-third of a knot at any point in the receiving water within 300 feet of the outfall, including the requirement that discharges occur into hydrodynamically energetic waters to minimize the potential of accumulation of seafood wastes. The decay of accumulated solid waste may reduce concentrations of DO in the overlying water column and release potentially toxic decay byproducts like unionized ammonia and un-dissociated hydrogen sulfide. Permitted discharges of seafood waste to oxygenated well-flushed areas at rates consistent with permit limitations are not generally expected to cause levels of DO or toxic substances that could have an adverse effect on marine organisms.

The attraction of marine mammals and birds to seafood waste discharges has the potential to create indirect impacts. Prohibition for Excluded areas and required monitoring in the permit are intended to reduce, eliminate and monitor for these types of potential impacts. In some cases, project area ZODs will extend to the shoreline. It is not the Department's intent that seafood waste be allowed to wash up on the shoreline exposing more marine mammals and birds to seafood waste through the project area ZOD. Rather the intent of the project area ZOD is to allow seafood wastes to naturally attenuate *at depth*. Facilities whose shoreline monitoring reveals deposits forming or landing on the shoreline should take proactive action on investigating the cause of deposits, including outfall inspection, replacement, and/or lengthening; and making changes to facility discharge practices by altering the BMP in order to control these types of deposits.

<u>The potential impacts on other uses of the waterbody (18 AAC 70(b)(4)).</u>

Impacts from any individual seafood processing facility discharging in compliance with the requirements of the permit are likely to be localized. Although benthic organisms may be smothered or community composition altered in localized areas of seafood deposits, the benthic communities in Alaskan coastal waters would not be expected to alter significantly. The AKG521000 permit proposes to require the permittee to identify other water uses within one (1) nautical mile.

Impacts from toxicity due to anoxic conditions and changes in benthic community structure could be cumulative spatially and over time. Although more complete knowledge would be of value in assessing the magnitude and significance of cumulative environmental impact, available data indicate that unreasonable degradation is not likely to occur in areas of adequate dispersion

and dilution. Receiving waterbody monitoring has been included in the permit cycle to evaluate waterbody impacts.

The expected duration of the deposit and any adverse effect (18 AAC 70(b)(5)).

The extent of bottom seafood processing waste accumulation over the long-term depends primarily on the amount of waste discharged, the decay rate of the waste organic matter and the degree of resuspension and transport of the deposited waste.

Settling of seafood discharges on the seafloor occurs at varying rates according to the size of the particles. Once settled, these particles can form organic mats or thick waste piles that can smother the underlying substrate and benthic communities within it. The degradation of this organic material occurs at varying rates according to different characteristics of the discharge area (i.e., biological, physical, and chemical factors). In one study where salmon waste was widely distributed, the waste was completely absent within 33 days following discharge and no adverse effects on DO concentrations noted. The accumulation of these deposits in some waterbody areas with different flushing characteristics indicates that the rate of discharge exceeds the assimilation capacity of some water bodies and more specifically, the assimilation capacity of the benthic community and other aquatic life that metabolize this material. The permit requires that processors discharge seafood waste in hydro-dynamically energetic waters to assist in dispersion, dilution and assimilation of the seafood wastes and minimize accumulation of these deposits. If discharge limits are adhered to, the effects on aquatic biota in areas of seafood waste discharge should be minimal.

DEC initiated a research project to evaluate ground up seafood solid waste impacts on the benthos in 2004. The study looked at the impacts to the sea floor from four seafood processors' waste discharge along the coast of Ketchikan, Alaska, from the ZODs out to distances of approximately 500 meters down current and 180 meters perpendicular to the prevailing current from the point of discharge.

A total of four seafood waste deposits were examined. Two of the deposits were not actively receiving solid wastes at time of the study, nor had they been for the two years prior to the study. When they had been discharging, the annual amount discharged was between 7-11 million pounds. Two other deposits were receiving waste at the time of the study, approximately 2-3.5 million pounds of waste annually. Maximum currents around the inactive piles were 3-4 knots, while the maximum current near the active piles were lower and approached two knots. The presence of seafood waste on the bottom was readily apparent from all four areas surveyed. The largest area of bottom affected was at the active discharge sites, where the waste piles merged. A more through assessment of the area of seafloor actually affected by the waste discharge was determined from looking at the extent of sulfur-reducing bacterial colonies (Beggiatoa) that had formed around the waste deposits. These colonies were chosen as indicators of low oxygen conditions and representative of areas of stress from organic loading. The area of bottom experiencing adverse effects from excess loading around the two active facilities was cumulatively about 7 acres.

The benthic infaunal community was responding to the seafood waste discharge with predictable patterns of successional recovery; there have been numerous studies documenting the response of benthic infauna to organic loading, and both the sediment profile images as well as the results from the bottom grab analysis showed the classic pattern of high densities of opportunistic species nearest to the source of the organic loading. As one moves away from the waste deposits, evidence appears of more mature infaunal communities with a higher frequency of deposit-

feeding infauna. The study documented enhanced secondary production and their ready availability as prey items for higher trophic levels.

The study concluded that the strong tidal currents of Tongass Narrows prevents any significant accumulation of fine-grained deposits and that there was little chance of organic material from seafood waste accumulating to the point of causing severe sediment oxygen demand and causing either hypoxia or anoxia in the overlying waters. While the sampling stations right under the active discharge points were clearly impacted, there were dense assemblages of opportunistic fauna within 50-100 meters of the discharge deposit centers, following the classic pattern of benthic community response to organic enrichment.

The study also concluded that given the rapid recovery of the benthic community as one moves out from the active piles, it is assumed that the areas of the seafloor closest to the active discharge points that are currently showing adverse effects would readily recover if seafood waste discharge was discontinued in the future. The study estimated that if the fish processing operations ceased operations, the effects caused by the waste discharge would disappear over time and the benthic community would recover within 5-10 years with few adverse effects remaining from the point sources of organic loading. (Germano 2004, pg 81).

<u>The potential transport of pollutants by biological, physical, and chemical processes (18 AAC 70(b)(6)).</u>

The extent of the initial accumulation of solid waste on the bottom depends on the height of the discharge above the seafloor, current speed, and the settling velocities of the waste particles. Soluble wastes from these discharges are expected to be rapidly diluted or degraded by biological, physical, and chemical processes.

Once discharged to the receiving water, the rate at which the liquid and solid wastes are dispersed, and advect away, from the point of discharge will depend on the physical and chemical properties of the discharged waste and the physical oceanographic characteristics of the receiving water. These oceanographic characteristics include the location of the discharge in the water column, the presence or absence of density stratification, water depth and bottom topography, and prevailing directions and speeds of wind- and tidally-forced currents. The solid waste particles will settle to the bottom at a rate that depends on the shape, density, and size of the individual particles. Once deposited on the bottom, periods of high currents or storm wave-induced bottom turbulence can result in the resuspension and transport of deposited seafood waste solids away from the point of discharge.

Currently, few studies have been identified that have adequately characterized the particle size distribution of ground seafood waste or the characteristic settling velocities of these particles. One study of the open water disposal of ground seafood waste conducted in Chiniak Bay, Kodiak Island, Alaska, provides a first-approximation of the settling velocities of seafood waste particles. Unground particles (primarily gills, skin, fins, and viscera 2-10 inches in diameter) required approximately 0.5 hr to settle to the bottom at depths of 400 to 500 feet. Smaller particles (less than 0.5 inch diameter) required more than 1 hr. to settle to the bottom. These ranges in settling times and water depths provide approximate bounds for the settling speeds of typical seafood waste particles of 0.098-0.262 foot/sec.

The settling velocity of the solid waste particles (and the height of the discharge above the bottom) affects the initial areal extent of the deposit of solid waste on the bottom in the vicinity of the discharge. However, in regions that experience high currents it is important to consider the potential for the solid waste particles to be resuspended and disperse following deposition. If

solid waste is resuspended and transported away from the vicinity of the discharge, the accumulation of solid waste would be less than that predicted based on the settling velocity and decay rate of the waste solids, which is why the discharge of seafood waste to energetic waters is important. The potential adverse localized impacts to benthic communities would also be reduced.

Following discharge to the receiving water, the particulate and soluble wastes are subjected to chemical and biological transformations that result in the decomposition of the waste materials and the production of bacteria and chemical compounds. The decomposition of the soluble and particulate organic matter consumes DO and results in the production of varying quantities of soluble compounds including carbon dioxide, methane, ammonia, soluble phosphorus, and hydrogen sulfide. Scavenging organisms including sharks, fish, crabs, and polychaete worms may also feed on the particulate waste that is suspended in the water column or fresh waste that has accumulated on the bottom.

A number of biological, chemical, and physical factors control the fate of the discharged wastes. Biological factors include microbial decay and scavenging of the waste by organisms. Chemical factors include the chemical composition of the waste, particularly the content of protein and soluble organic compounds, fats and carbohydrates, and skeletal and connective tissue. Each of these components has a characteristic chemical composition and decay rate. Physical factors that control the fate, transport, and persistence of the waste include density stratification, storm-, tidal-, and wind-induced currents, and water temperature. Current speed direction and duration strongly influences the transport and dispersion of the waste and critical current speeds can resuspend and transport waste solids deposited on the bottom.

Computer modeling effort was developed in 1993 to predict the accumulation, persistence, and areal coverage of discharged seafood waste. Multiple computer modeling programs were used to determine the areal extent of the waste pile, WASP5, SURFER™ and DECAL. The focus of the transport, fate and persistence analysis was to predict the area covered by a persistent (year-round) accumulation of seafood waste of no more than 1.0 acre and the depth of the deposited solids as a function of distance from the discharge point. The WASP5 seafood waste accumulation model was run iteratively to predict the steady-state solid waste discharge rate that would produce a bottom accumulation of seafood waste with a depth of 0.4 inch or greater over an area of 1.0 acre. This iterative process was conducted for twelve case scenarios, six for onshore processors discharging near the seafloor and six scenarios for floating processors discharging near the surface in open water within 1.0 mile of shore. The model predictions are based upon the assumption that the resuspension and transport of deposited solids may occur at some discharge locations if bottom current speeds exceed the critical current speeds required to re-suspend bottom waste accumulations. With the assumption that resuspension and transport is negligible, the model predictions may be considered conservative estimates of the potential for waste accumulation under the conditions described in the model for the twelve case scenarios.

Two current speeds (5 and 15 cm/sec, 0.10 and 0.29 knots respectively) and three bottom slopes (0.0, 12.5 and 25 percent) were simulated. For the simulations of the onshore facilities the water depth was varied which resulted in six case scenarios. The model was used to provide a first-approximation of the amount of waste solids discharge that would result in an approximately 1.0 acre bottom deposit of seafood waste. The scenario included six simulations for discharges from shore-based facilities with discharge outfall pipe located 6.6 feet above the bottom in 50 feet of water. Six case scenarios were also selected to evaluate the effect of varying current speed and water depth on the model-predicted accumulation of seafood waste solids due to surface

discharges from stationary. The scenarios were selected to evaluate the effects of varying slope and current velocities on the mode-predicted accumulation of seafood waste solids from shore-based facilities.

Model predictions were based on decay rates of 0.02 /day and various particle sizes settling velocities of 0.28 ft./sec, 0.15 ft./sec and 0.072 ft./sec, respectively.

A first areal coverage estimate was developed based on interpolation of the WASP model-estimated waste deposit depths in each modeling cell using the computer program SURFER™. This program creates contour plots of the depth of the waste pile based on the model-estimated waste deposit depths in each WASP5 modeling cell and calculates the area covered by waste deposits 0.4 inch deep or greater.

The second estimate of the areal extent of the waste pile was based on summing the areas of the WASP5 modeling cells that contain accumulations of seafood waste solids 0.4 inch deep or greater.

1.0 Acre Size of Continuous Deposits within Project Area ZOD based on Modeling Seafood Residues Coverage Areas

The 10 million pound limit. The 2001 AKG520000 permit had a 10 million pound limit on the amount of seafood waste that could be discharged from an onshore or near shore facility. The 10 million pound limit was based upon modeling performed in the 1994 ODCE. The ODCE provided discussion on the modeling performed and basis for the 10 million pound limit for an outfall located approximately six feet above the seafloor forming a 1.0 acre of continuous coverage (ZOD). The first-approximation of the annual near-bottom discharges shore-based solids discharge that would result in deposits greater than 1.0 acre was current speed of 0.16 ft./sec, depth of 50 ft. and a flat bottom discharges of 16 million pounds (wet weight) of waste solids. Next, the current speed increased to 0.49 ft./sec, the other factors remaining the same only allowed 12 million pounds (wet weight) of waste solids discharged. Further modeling was performed with the varying slope to the bottom, with both modeling results concluding that with higher current speeds serves to spread the waste over a larger area. Thus, conservatively the EPA and the Department chose to limit the total seafood waste discharges to per outfall to 10 million pounds annually. These assumptions based upon the current modeling effort are still deemed to be applicable to this ZOD evaluation.

The model predictions discussed above are considered conservative estimates of bottom waste accumulation because the WASP5 model did not consider the resuspension and transport of the deposited wastes. It is DEC's goal during the permit cycle to further refine ZOD modeling efforts and evaluate data collected during the permittees' seafloor survey reports. In early 2014, DEC contracted to have available modeling software evaluated and compared to further gather information on the formation of ZODs. During the permit cycle, DEC will likely contract to have further modeling performed and staff trained to complete the newest ZOD formation modeling. For example, a future ZOD modeling effort combining WASP8 with a hydro-dynamic computer modeling system such as the Environmental Fluid Dynamics Code (EFDC Hydro) (which is a model that can be used to simulate aquatic systems in one, two, and three dimensions) may provide more accurate estimates of bottom waste accumulation.

During the AKG521000 permit cycle, DEC will continue to rely on the 1993 modeling and the concept of a project area ZOD similar to log transfer/storage ZODs in order to authorize ZODs in the subject permit.

4.5. Seafloor Surveys

The previous permit required a seafloor survey to determine compliance with the authorized zone of deposit and Alaska water quality standards for deposited residues on the bottom (seafloor). The purpose of the seafloor monitoring program was to determine the configuration, area, thickness, volume, and any changes in these aspects for deposits of sludge, solid, or emulsion on the seafloor.

The permit requires that seafloor surveys be performed to verify permit compliance by analyzing the extent of the seafood deposits. In the 2001 AKG520000 permit, seafloor surveys were required for onshore (shore-based) facilities to depths of -120ft MLLW; and for near shore facilities if a permittee discharged at a single location for more than seven consecutive days in waters less than -120 feet at MLLW. The EPA's RTC document provided this depth was chosen due to diver safety issues and lack of practical survey methods that do not involve divers performing a seafloor survey in deep water. New technologies have been introduced in recent years to make surveying at deeper depths possible. One of these technologies includes underwater Remotely Operated Vehicles (ROVs). ROVs are linked to a host ship by a neutrally buoyant tether or, often when working in rough conditions or in deeper water, a load-carrying umbilical cable is used along with a tether management system (TMS). Most ROVs are equipped with at least a video camera and lights. Additional equipment is commonly added to expand the vehicle's capabilities. These may include sonars, magnetometers, a still camera, a manipulator or cutting arm, water samplers, and instruments that measure water clarity, water temperature, water density, sound velocity, light penetration, and temperature. The AKG521000 permit proposes to require seafloor surveys in depths beyond -120 feet MLLW due to changes in survey method technology.

The permit continues the requirement for seafloor monitoring to determine compliance for residues and to document the location, size and boundaries of continuous and discontinuous seafood processing waste (residues) coverage. The 1999 permit did not clearly define what level of seafood waste coverage (continuous, discontinuous, or trace deposits) on the seafloor had to be reported. The 2001 AKG520000 permit also did not clearly define what level of seafood waste coverage (continuous, discontinuous, or trace deposits) on the seafloor counted towards the maximum 1.0 acre ZOD. This lack of clarification has led to differing agency interpretations as to what constitutes compliance with the 1.0 acre ZOD provision. The EPA NPDES permitting unit has interpreted the AKG520000 401 Certification of the 1.0 acre ZOD as a total limit applicable to all continuous, discontinuous and trace deposits. The EPA NPDES permitting unit has counted any cumulative, small deposits (discontinuous coverage) or floating seafood waste (trace coverage) in amounts greater than the allowed 1.0 acre ZOD as a violation of the permit. The Department on the other hand has held a long-standing interpretation of applying the 1.0 acre ZOD requirement to the continuous deposits only. Application of the Department's policy regarding ZODs can be found in the EPA approved Alaska Integrated Water Quality Monitoring and Assessment Report (Integrated Report). Reviewing the Integrated Report(s) for residues or settleable solids listings corroborates the Department's long standing enforcement of the 1.0 acre ZOD to continuous coverage only, while continuing to provide water quality protection and working toward water quality improvement.

The AKG521000 permit establishes clear data gathering and reporting protocol in Appendix E, and updates the Department's interpretation of applying the 1.0 acre ZOD requirement. The Department consulted with EPA during the early permit review period and established a new methodology for determining amounts of seafood waste deposits that would count toward the 1.0 acre limit. The permit now requires those seafloor areas with both continuous coverage (95-100%), as well as those areas with greater than fifty percent (50%) discontinuous coverage count toward the 1.0 acre limit.

The seafloor survey requires monitoring seafloor area(s) where seafood waste deposits may have accumulated or are currently accumulating. This shall include those areas along historic or current discharge outfall line(s), previously documented seafloor waste deposit areas, and vessel loading and unloading areas next to the docks. The seafloor survey involves an initial Part I survey to determine the general location(s) and initial areal extent of seafood waste seafloor deposits and shall inform the Part II- seafloor survey. The permit allows the permittee to propose alternative seafloor survey protocols, which may include using remotely operated vehicles (ROV), sonar, grab samples, or an underwater camera to perform the seafloor survey. The protocol modifications may also include changes in survey stations, times, parameters, or methods. Modification will only be effective if it meets the data collection objectives in Appendix E and DEC approves the proposed survey protocol.

The permit requires sampling for Dissolved Oxygen (DO) gases if bubbles are seen escaping from seafood waste deposit areas. DO samples are required to be taken within 12-inches of the seafloor, near where gas(es) are escaping, which often occur near the Beggiatoa mats and seafood waste pile decay. The deposits can cause the release of methane and sulfur gases, which can impact WQS by reducing DO. This is due to the shallow oxygen penetration in coastal marine sediments, thus anoxic conditions prevail and sulfate is a major electron acceptor in these ecosystems. If oxygen is available near the surface of the Beggiatoa mats, it will be used up first during oxidative reactions. While it has been found that DO levels in marine water column greater than 12-inches above the seafloor may be normal (6.5 or greater), the DO is effected in the water column directly above the seafood waste deposits (Unalaska Bay, 1998 - 2004, Akutan Bay, 2011), and those areas within 12-inches above the Beggiatoa mats (or other bacterial mats) from seafood waste deposits. These white, filamentous bacterial colonies only appear at the sediment surface when dissolved oxygen concentrations in the benthic boundary layer drop below 1 mg/L (Rosenberg and Diaz 1993). In conditions of extreme organic loading, Beggiatoa often presents as a mat covering much of the sediment surface, an effect that can be observed in both sediment profile imaging (SPI) and plan view (PV) images. PV images permit the measuring of the percent of the seafloor in each image that is covered with Beggiatoa and SPI images allow the detection of Beggiatoa at low densities that are often not detectable in PV images.

The permit requires the identification of Beggiatoa mats and their approximate coverage area(s). Beggiatoa and other filamentous bacteria can be found in marine environments, and as applicable to the permit use seafood waste (a type of organic waste) as a food source. They can usually be found in habitats where the reduction of sulfur and nitrates in the sediment and waste materials is occurring. As the seafood wastes decay, the nitrates and sulfur consume the oxygen molecules, thus depleting the oxygen in the water column directly above Beggiatoa mats. These environments may also include cold seeps, sulfur springs, areas of where high levels of organic pollutant loading (other than seafood waste discharge) is occurring in the receiving water, and near deep hydrothermal vents. Thus, if these features are found by the surveyor, it should be noted in the Part II Seafloor Survey Report.

Additionally, as a new monitoring requirement, the permit requires a permittee to submit a map depicting seafood waste deposits, including the continuous and discontinuous coverage areas, and other WQ data required to be gathered in Appendix E.

Waivers from performing seafloor surveys issued under AKG520000 Part VI(C)(10) are not continued in the AKG521000 permit. Those permittees who received EPA or DEC seafloor waivers from having to perform surveys in estuarine areas or in marine tidally influenced systems are required to complete the seafloor survey. However, the survey may not necessarily need to be

performed using a diver. Permittees may request that observations be made at MLLW tidal times, documenting seafood waste deposits on the seafloor and/or bedlands at low tide if the seafloor survey data objectives can be met without using a diver.

The permit requires the seafloor survey protocol Part I-Seafloor Survey to be completed 60 days after cessation of seasonal processing, or by December 31st of the first year of permit coverage. A schedule of how often the Seafloor Survey Protocol Part II must be completed is found in Table 6. The permittee shall document the circumstances that delayed the survey (beyond 60 days) in the seafloor survey report. Such as, the survey cannot be conducted within the 60 day timeline due to weather, unavailability of survey services (provided there is documented evidence that the permittee requested survey services more than three months in advance of when the survey was due to be performed), or other adverse conditions.

For informational purposes, the following table compares the various survey methods and the data that they provide. The video survey is somewhat similar to the dive survey in that visual evaluation is the primary tool for collecting the necessary data. The grab sample technique is similar to the SPI in that subsurface data about the seafloor can be obtained.

Survey Method	Depth Limit	Current Limit	Low Visibility Limit	Survey Area Daily Limit	Seafood waste pile size determination	Waste Thickness	Particle Size	Percent Waste Coverage	Benthic Assessment
Dive Survey	120+ ft depending on equipment	2 knots	15 feet	2 acres/day	Excellent	Good	Good	Good	Poor
Video Survey	1500+ ft	3 to 5 knots	3 inches	12 acres/day	Good (depth of waste estimated)	Estimated	Good if laser scale is used	Good if visibility is acceptable	Poor
Grab Sampler Survey	200 ft	3 knots	0 inches	500 acres/day (Depends on method)	Good (depends on method and substrate)	Good (depends on sample method and equip.)	Good	N/A	Good
SPI Survey	400+ ft	2 knots	0 inches except plan view photos	12 acres/day	Good (depends on substrate)	Poor beyond depth of probe window	Good	Good	Good

The NPDES Program is based on the premise of permittee self-monitoring and reporting based on specific performance objectives. The seafloor surveys are performed by third party contractors hired by the permittee. A new permit requirement is that a certified copy of the original seafloor survey produced by the surveyor must be submitted, and any changes to the survey be documented in a track changes document signed by the permittee's signatory. This third party audit allows for more accountability in reporting of seafloor residues. DEC may at any time request a copy of the original

seafloor survey from the surveyor or the permittee. The permit requires seafloor surveys to begin within one year of permit coverage and then as required in Table 6 through the life of the permit.

The permittee must submit a Seafloor Survey Report, which presents all parameters required by the permit and Permit Appendix E, with the Annual Report.

Using data from Seafloor Surveys performed during the permit cycle, and further modeling as discussed in the previous section, the Department will refine the authorized project area ZODs during the permit cycle and at permit reissuance.

4.6. Sea Surface and Shoreline Monitoring

Permittees are required to conduct visual sea surface and shoreline monitoring. The permit requires visual monitoring of the receiving water for all points of discharge and shoreline areas, including areas surrounding docks and piers and areas where the seafood processing waste and wastewater residues typically come ashore (if any). The purpose of the monitoring is to record the occurrence and extent of films, foam, scum or sheens (compliance with water quality criteria 18 AAC 70.020(b)); to record the occurrence and numbers of Western Steller sea lions, Steller's eider, Spectacled eider, Northern Sea otter or short-tailed albatross; and record any incidents of injured or dead Steller's eiders and other listed endangered or threatened species. This monitoring shall be conducted daily while seafood processing waste discharge occurs, and the monitoring frequency is retained from the 2001 AKG520000 permit. The permittee shall develop facility specific QAPP monitoring instructions for the observer.

Table 6: Seafloor Monitoring Schedule

Facility Type	Survey Type [a]	Sample Location	Sample Frequency
Permittees with a Project Area ZOD, or Fresh Water Facilities with mapped riverbed survey areas [b]	**Part I** - Seafloor Survey	Seafloor Project Area ZOD	within one year of obtaining permit coverage, within 60 days of the end of processing season [c]
Permittees with Part I or Part II survey reporting **< 0.75 acres** of deposits [d]	**Part II** - Seafloor Survey	Seafloor Project Area ZOD	biennial (every two years) [d]
Permittees with Part I or Part II Survey reporting **≥ 0.75 acres** of deposits [d]	**Part II** – Annual Seafloor Survey	Seafloor Project Area ZOD	annual [d]
Installation of a new outfall location	Pre-Discharge Biological Survey [e]	Proposed Discharge Area	prior to discharging

Notes:

a. The seafloor surveys must be performed as established in the Appendix E Seafloor Survey protocol, or with other Department approved methodologies. Use of a modified seafloor survey protocol can only occur upon written request to the Department and after the permittee has received written approval of the modification request.

b. A ZOD will not be issued to facilities discharging to fresh water. If deposits are found to be above detectable in any 3-foot by 3-foot square sample plot within a fresh water mapped survey area, annual surveys and a Remediation Plan will be required.

c. If the processing season is year-round, the survey shall be completed by December 31st.

d. Appendix E- Seafloor Survey Protocol is set up as a two-year evaluation, initially. The Part I survey shall be within one year of coverage. After the Part II Seafloor Survey in completed (initially during the second year of coverage), the schedule of how often a Seafloor Survey shall be completed will be determined on the size of the seafloor deposits. If permittees do not discharge during a calendar year when a survey would otherwise be required, they may complete the required survey the next year during which discharge occurs.

e. The permittee must perform the pre-discharge biological survey according to Appendix H- Pre-Discharge Biological Survey.

5.0 Other Permit Requirements

5.1. Standard Conditions

Permit Appendix A 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 APDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

5.2. Quality Assurance Project Plan (QAPP)

The permittee is required to develop QAPP sampling and monitoring procedures to ensure that the monitoring data submitted is accurate and explains data anomalies if anomalies occur. The permittee is required to develop and implement the QAPP within 60 days of authorization to discharge under the permit. A permittee with current authorization shall review and update the QAPP annually or more frequently, in compliance with the permit. The QAPP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples; conducting laboratory analysis; calculating limits; and reporting data. The QAPP shall be retained on site and made available to the Department upon request.

5.3. Best Management Practices (BMPs) Plan

In accordance with AS 46.03.110 (d), the Department may specify in a permit the terms and conditions under which waste material may be disposed or discharged. The permit requires the permittee to develop a BMP Plan in order to prevent or minimize the potential for the release of pollutants to waters of the U.S. through plant site runoff, spillage or leaks, or erosion. The permit contains certain BMP conditions that must be included in the BMP Plan. The BMP Plan must be kept on site and made available to the Department upon request.

A new permittee shall develop and implement a BMP Plan within 60 days of authorization to discharge under the permit. A previously permitted permittee shall review and update the BMP Plan. The BMP Plan shall be reviewed at least annually and be revised as needed, and the permittee shall ensure that the BMP Plan has been implemented.

Facilities may use BMPs, in addition to numerical effluent limitations, to control or abate the discharge of pollutants in accordance with 18 AAC 83.475. National policy requires that, whenever feasible, pollution should be prevented or reduced at the source, that pollution which cannot be prevented should be recycled in an environmentally safe manner, and that discharge or release of the pollution into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner. EPA's reassessment of the ELGs for seafood processors (Jordan 1979; EPA 1980b) recommended facility management directed towards total utilization of the raw materials and by-product recovery as a fundamental and central element of waste reduction. Materials accounting, audits of facility utilization of water and materials, and BMPs were repeatedly recommended as the profitable approach to waste management in seafood processing at the "Wastewater Technology Conference and Exhibition for Seafood Processors" convened by the Fisheries Council of British Columbia in Vancouver, Canada in February 1994 (Ismond 1994).

The NPDES Program is based on the premise of permittee self-monitoring and reporting based on specific performance objectives described in the permit (See CWA Section 308). As such, APDES permits are often crafted with stated performance objectives that must be met by the permittee and,

as discussed in the Fact Sheet NPDES regulations at 40 CFR Part 122.44(k), allow for use of BMPs when numeric limits are infeasible.

Purged Ammonia from Refrigeration Systems. Ammonia can be lost to wastewater by various means, such as seafood processing, cleaning, and refrigeration system leaking and purging. Historically, seafood processing facilities have "purged" their refrigerant systems to remove the air and water from the refrigeration lines for proper system operation. Historically, DEC has found that purged ammonia refrigeration system wastewater has typically been placed in a barrel, diluted, and disposed into the effluent stream as a routine maintenance procedure. The ammonia can also enter the effluent stream through refrigeration transport lines' breaks or leaks. Therefore, the permit requires the permittee to develop BMPs that minimize refrigerant release and propose treatment and discharge plans. The BMPs must include how maintenance, purging, and wastewater disposal is handled at the facility. The permit also requires analyzing purge water pH prior to commingling with other wastewater flows, in addition to the final effluent ammonia monitoring included in the permit. Finally, the permittee is required to develop plans for mitigating and reporting any ammonia accidental or emergency releases (not a covered discharge).

The permit provides the permittee with flexibility to formulate a site-specific plan consisting of pollution control measures to meet the stated performance objectives while still providing instructive guidance on minimum, permit mandated requirements. The BMP Plan should be continually updated to reflect any future operational and design modifications or monitoring practices that are found to control or minimize the potential pollutant discharges, as allowed by the permit.

The permit requires the development and implementation of BMPs that prevent or minimize the generation and release of pollutants to receiving waters.

EPA developed a general handbook to assist industry in identifying and using BMPs and in developing and implementing materials accounting and BMP Plans (EPA 1993). EPA also developed an industry-specific handbook to assist seafood processors in identifying and using BMPs and in developing and implementing materials accounting and BMP Plans (EPA and Bottomline Performance 1994). These documents are still available for permittees during facility specific BMP Plan development.

The BMP Plan must be amended whenever a change in the seafood processor or in the operation of the seafood processor occurs that materially increases the generation of pollutants and their release or potential release to the receiving water.

5.4. Annual Report

The purpose of the annual report is to document the status of implementation of the permit's limitations and requirements, including:

- A self-assessment review of compliance with the permit conditions,
- An assessment of the progress towards achieving the measurable goals,
- A summary of results of monitoring information that has been collected and analyzed,
- A discussion of proposed process changes or improvements for the next permit year and submittal of an updated NOI, if needed,
- An assessment of the appropriateness of the selected BMPs along with a discussion of any changes to the BMPs or measurable goals, and

- Reference to any reliance on another entity (e.g. a fish meal plant for reducing seafood waste discharges) for achieving any measurable goal.

The permit includes a new requirement in the Annual Report to provide a summary of any occurrences of leaks or breaks in the refrigerator condenser system or outfall. The permit also requires the permittee to provide a list of chemicals, disinfectants, cleaners, biocides, and food processing additives (salts, acids, bases, enzymes, etc.) used and discharged during the annual reporting period. If substances are not used per the manufacturer's recommended use and application rates, the report must include the total annual amounts used, dilution ratio during use, and what the product is used for (e.g., 55 pounds of sodium hydroxide for Chitin production, 55 3-gallon containers of 12% hydrochloric acid used as 1% solution disinfectant and 3% solution for washed mince bleaching). Permittees that do not use chemicals in their seafood processing operations (e.g. hand or mechanical filleting only) are not required to submit this list.

The increase in seafood processing byproduct production often results in the increased use of chemicals in production. Extremes of pH or rapid pH changes (often can occur during improper discharge of these chemicals) can exert stress conditions or cause mortality to aquatic life (EPA, 1975).

Permittees need to perform an inventory of chemicals used on site to inform updated NOI submittals. The permit does not address the separate requirements of hazardous waste or solid waste reporting. As previously discussed, many chemicals and food processing additives can be used in various seafood processing commodity lines. These chemicals have not been included on operators' NOIs, nor in previous permits, and thus have not been tested for in waste streams. Requiring industrial facilities to identify chemicals in their processing wastewater discharges is an integral part of the CWA.

5.5. Compliance Schedules

Per 18 AAC 70.910, the Department has authority to include compliance schedules as conditions of a permit, certification, or approval. Schedules under this provision require compliance by the permittee as soon as possible, and may not extend beyond the compliance date established by the Department in the permittee's written authorization. Compliance schedules shall not exceed 18 months from the time of issuance and shall not extend past the expiration date of the permit. The compliance schedule will include an enforceable date for its achievement that is within the timeframe allowed by the permit.

In order to grant a compliance schedule under this permit, the Department must make a reasonable finding, adequately supported by the administrative record and including factors listed in Permit Part 2.7.2, that the compliance schedule will lead to compliance with a permit and/or effluent limitation to meet water quality standards by the end of the compliance schedule. The Department may not establish a compliance schedule for TBELS because the statutory deadlines for meeting technology standards have passed.

The permittee shall demonstrate that they cannot immediately comply with the new limits and conditions upon the effective date of the permit. The Department cannot issue a compliance schedule for a permit limitation and condition that was included in the previous AKG520000 General Permit, which includes the requirement that all discharges shall comply with the Alaska WQS found in 18 AAC 70. Examples of requirements for which a compliance schedulate might be appropriate include:

- Flow Meter and Totalizer Installation

- Effluent Monitoring and Analysis
- Receiving Water Monitoring and Analysis

A permittee who fails to comply with an interim or final compliance date set out in a compliance schedule will be in violation of the permit, certification, or approval to which the compliance schedule applies and is subject to enforcement action by the Department, including modification, suspension, or revocation of the permit, certification, or approval.

6.0 Antibacksliding

Regulations at 18 AAC 83.480 require that "effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit." Regulations at 18 AAC 83.480(c) also state 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 previous AKG520000 permit did not include a mechanism that allowed permittees the option of applying for a mixing zone larger than the general permit defined standard mixing zone, which is a circle with a 100 foot radius around the outfall terminus extending vertically up to the surface and down to the seafloor. The AKG521000 allows a permittee to propose a mixing zone outside of the general permit defined mixing zone size. This could result in a relaxation of effluent limits, as under the AKG520000 permit all WQS were required to be met at the boundary of the 100 foot standard mixing zone. Per CWA Section 303(d)(4)(B), limitations based on WQS can only be relaxed where the action is consistent with the state's antidegradation policy. This requirement will be fulfilled through the application process for individual authorizations, as the permit requires permittees requesting a mixing zone to submit Form 2M, perform a reasonable potential analysis, submit Form 2G and include sufficient information for the Department to complete an antidegradation analysis and make findings under 18 AAC 70.016(b), (c), and (d). The proposed mixing zone will be public noticed.

All other effluent limits in the permit are at least as stringent as in the previously issued permit and are consistent with 18 AAC 83.480. Accordingly, no further backsliding analysis is required for this permit.

7.0 Antidegradation

Section 303(d)(4) of the CWA states that, for waterbodies 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 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 Part 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 Tier 3 designated water. At this time, no Tier 3 waters have been designated in Alaska.

Regulatory requirements of 18 AAC 70.015(a)(1) state 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 are no marine waters covered under the general permit listed as impaired (Category 4 or 5) on DEC's most recent *Alaska's Final 2018 Integrated Water Quality Monitoring and Assessment Report*; therefore, no parameters have been identified where only the Tier 1 protection level would apply. Accordingly, this antidegradation analysis conservatively assumes that the Tier 2 protection level applies to all parameters, consistent with 18 AAC 70.016(c)(1).

Regulations at 18 AAC 70.015(a)(2) state 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:

7.1. 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).

Per 18 AAC 70.020 and 18 AAC 70.050, all marine waters are protected for all uses; 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 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. The permit also requires ambient water quality monitoring to evaluate possible impacts to the receiving waters and existing uses.

Pollutants of concern in seafood waste are primarily the biological wastes generated by processing raw seafood into a marketable form and the chemicals used for processing or cleaning processing equipment and fish containment structures in order to maintain sanitary conditions. Biological wastes are primarily seafood parts: heads, fins, bones, entrails, and shells. The chemicals used for cleaning are primarily disinfectants, which shall be used in accordance with EPA specifications. Refrigerants used are generally ammonia and Freon. Monitoring for ammonia is a new permit requirement to evaluate whether WQS are being met.

The general permit includes numeric or narrative effluent limits and BMPs addressing each of these pollutants of concern. The permit requires facilities to implement BMP Plans to minimize the production of waste and the discharge of pollutants to waters of the U.S. to ensure that seafood processing facilities provide for the protection or attainment of existing and designated uses.

Part 1.4.8 of the permit requires that the discharge shall not cause or contribute to a violation of the WQS at 18 AAC 70. As previously stated, there are no marine waters covered under the general permit that are listed as impaired; therefore, no parameters were identified as already exceeding the applicable criteria in 18 AAC 70.020(b) or 18 AAC 70.030. Marine waters covered under the general permit are not listed under 18 AAC 70.236(b) as subject to site-specific criteria.

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.

7.2. 18 AAC 70.016(c)(7)(A-F)

7.2.1. ***18 AAC 70.016(c)(7)(A)*** *the reduction of water quality meets the applicable criteria of 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b), unless allowed under 18 AAC 70.200, 18 AAC 70.210, or 18 AAC 70.240;*

As previously stated, Part 1.4.8 of the permit requires that the discharge shall not cause or contribute to a violation of the WQS at 18 AAC 70. WQBELs are set equal to the most stringent water quality criteria available under 18 AAC 70.020(b) for any of the protected water use classes. Because of the nature of the permitted discharges, other pollutants are not expected to be present in the discharges at levels that would cause, have the reasonable potential to cause, or contribute to an exceedance of any Alaska WQS, including the whole effluent toxicity limit at 18 AAC 70.030. The Department will not authorize a discharge under the general permit to waters that have established or adopted site-specific criteria in the vicinity of the discharge. Currently, marine waters covered under the general permit are not listed under 18 AAC 70.236(b) as subject to site-specific criteria.

Except where a mixing zone or a zone of deposit has been authorized by the Department, all parameters at the point of discharge must meet the most stringent water quality criteria available for any of the protected water use classes. In addition, if a mixing zone is authorized, all water quality criteria must be met at the boundary of the mixing zone to ensure all criteria are met in the waterbody and the waterbody as a whole is protected. The water quality criteria in 18 AAC 70.020 is a legal basis for the permit effluent limits, of which serve the specific purpose of protecting the existing and designated uses.

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

7.2.2. ***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.

7.2.3. ***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 TBELs. The permit requires permittees of seafood processing facilities to comply with 40 CFR Part 408, Canned and Preserved Seafood Processing Point Source Category. The effluent limitations guidelines (ELGs) set standards of performance for new sources and are incorporated in the permit.

The second part of the definition references the minimum treatment standards found at 18 AAC 72.050, which refers to domestic wastewater discharges only. The permit does not authorize the discharge of domestic wastewater (Permit Part 1.3.2). The permit requires support vessel sanitary wastewater to be routed to the local municipal domestic wastewater treatment facility, routed to the onshore facility, or held on the vessel, and requires a permanently moored craft or barge to route sanitary or domestic wastewater to the local municipal domestic wastewater treatment facility. Therefore, a finding under this Part is not applicable.

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

The Department reviewed available information on known point source discharges to receiving waters covered under the permit and found no outstanding noncompliance issues. There are no state regulated nonpoint sources that discharge to, or otherwise impact, the receiving waters covered under the permit.

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

7.2.4. *18* ***AAC 70.016(c)(7)(D)(i-ii)*** *the alternatives analysis provided under (4)(C-F) of this subsection demonstrates that*

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

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

The Department performed an alternatives analysis and found that temporary lowering of water quality to accommodate important economic development throughout the State of Alaska is necessary. Alternatives were evaluated based on practicability, as defined at 18 AAC 70.990(48). Alternatives, such as ceasing discharge, sending seafood processing waste streams to a municipal wastewater treatment facility, and moving processing locations offshore were determined to be non-practicable. Therefore, discharge under the limitations and requirements of the permit is identified as the practicable alternative, and the 18 AAC 70.016(c)(7)(D)(i) finding is met.

Permit requirements include the implementation of BMPs, installation of flow meters, and increased ambient water quality monitoring to evaluate the need for updated limits in future permits.

The permit requires permittees of seafood processing facilities to follow prescribed BMPs to minimize pollutant discharges, as well as to comply with 40 CFR Part 408, Canned and Preserved Seafood Processing Point Source Category. The regulations at 40 CFR Part 408 require remote seafood processors to meet the following: “No pollutants may be discharged which exceed 1.27 cm (0.5 inch) in any dimension.” This limitation is included as a permit condition. No mixing zones or zones of deposits will be issued that conflict with the limitations applied in the general permit. As part of the ELG process, EPA prepared a report in support of 40 CFR Part 408 titled ‘Development Document for the Seafood Processing Industry Point Source Category,’ which provides more documentation regarding treatment technologies used to develop the performance standards. EPA concluded in the development document in Section IX (page 438), “There is substantial evidence that processors in isolated and remote areas of Alaska are at a comparative economic disadvantage to the processors located in population or processing centers regarding attempts to meet the effluent limitations (screening of waste). The isolated location of some Alaskan seafood processing plants eliminates almost all waste water treatment alternatives because of undependable access to ocean, land, or commercial transportation disposal methods during extended severe sea or weather conditions, high fuel and energy costs, and the high costs of eliminating the engineering obstacles due to adverse climatic and geologic conditions.” (EPA 1975)

With the permit-required implementation of BMP controls and the requirement to meet grind size limitations and WQS, the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the Department to be the most effective and practicable; therefore, the 18 AAC 70.016(c)(7)(D)(ii) finding is met.

7.2.5. ***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); and*

Alaska has the most prolific commercial fishing industry in the United States, producing more harvest volume than all other states combined. According to a 2018 report released by the Alaska Seafood Marketing Institute, Alaska's seafood industry creates $5.2 billion in economic value for Alaska and generates an additional $7.6 billion in value as industry income circulates throughout the U.S. economy. Total direct and secondary economic output in the U.S. stemming from the Alaska seafood industry was estimated at $15.7 billion. The Alaska seafood industry directly employed 66,323 workers in Alaska in 2017, and is the largest manufacturing sector in Alaska, accounting for 72% of the state's manufacturing employment. Since 2016, the sector includes 169 shore-based plants, 73 catcher-processors, and more than a dozen floating processors.

Seafood processing facilities provide a service to communities throughout the areas where they are located. Many subsistence fisherman are also commercial fisherman, and their commercial catch provides income adequate for subsistence fishing: gas, nets, boats, and other gear. Fishing and fish processing are the economic backbone of many villages, towns and communities in Alaska. Many fishing vessels from outside Alaska fish within Alaska waters and sell their catch to processors located in Alaska, which provide jobs for local workers. Seafood production in Alaska is also important to interstate commerce as seafood caught in Alaska is sold to buyers from the lower 48 states, as well as international commerce as it is sold to other countries.

Fishing is the core economy for much of coastal Alaska where fish harvesting and processing often provide the only significant opportunities for private sector employment. Fisheries in turn support sector businesses, which provide property and sales tax as the largest source of local government revenues. Seafood harvesting and processing jobs provide more than 50 percent of the private sector employment in coastal Alaska.

Issuance of the permit will allow existing seafood processing facilities to continue to operate, allow new seafood processing facilities to begin operations, and regulate seafood processing and seafood waste discharges to protect water quality. The localized lowering of water quality is temporary and limited due to natural attenuation and dispersion of seafood waste.

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

7.2.6. ***18 AAC 70.016(c)(7)(F)*** *18 AAC 70.015 and this section have been applied consistent with 33 U.S.C. 1326 (Clean Water Act, sec. 316) with regard to potential thermal discharge impairments.*

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

8.0 Other Legal Requirements

8.1. Ocean Discharge Criteria Evaluation

The Ocean Discharge Criteria establish guidelines for permitting discharges into the territorial seas, the contiguous zone, and the ocean.

EPA regulations, 40 CFR 125.122(b) and adopted by reference at 18 AAC 83.010(C)(8), state that discharges found to be in compliance with CWA section 303 WQS will be presumed to also be in compliance with CWA section 403 ocean discharge criteria. As such, EPA itself equated ocean discharge criteria with WQS, a fact it emphasized when promulgating ocean discharge criteria rules in 1980: "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 Fed. Reg. 65,943 (proposed Oct. 3, 1980) (codified at 40 CFR Part 125).) As with any permit, the CWA requires the general permit to contain any applicable TBELs, as well as limits and conditions necessary to meet applicable state WQS. State WQS apply in the territorial seas, defined in the CWA section 502(8) as extending three miles from the baseline (Pacific Legal Foundation v. Costle, 586 F.2d 650, 655-656 (9th Cir. 1978); Natural Resources Defense Council., Inc. v. U.S. EPA, 863 F.2d 1420, 1435 (9th Cir. 1988). Unlike ocean discharge criteria, however, state WQS trigger additional requirements under the CWA, including WQBELs requirements under section 302. Specifically, state WQS established pursuant to CWA section 303 are designed to preserve the quality of waters under State jurisdiction, including the territorial seas, and compliance with these standards should ensure protection of the uses for which the waters are designated with respect to pollutants for which standards have been established. The State of Alaska WQS protect all uses, and the permit requires authorized discharges to be in compliance with WQS. Therefore discharges in compliance with the permit shall be presumed not to cause unreasonable degradation of the marine environment, for any of the pollutants or conditions specified.

8.2. Endangered Species Act

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

The ESA requires federal agencies to consult with NOAA, NMFS, and the USFWS if their actions could beneficially or adversely affect any threatened or endangered species. As a state agency, DEC is not required to consult with these federal agencies regarding permitting actions. However, DEC voluntarily contacted the agencies to notify them of the proposed permit issuance and to obtain listings of threatened and endangered species near the discharge. The permit has integrated specific monitoring and permit requirements to those seafood processing facilities located near CHAs. The permit requires permittees to collect data regarding threatened and endangered species during sea surface and shoreline monitoring activities and provide the data to the agency(ies).

In 2016, the USFWS directed the Department to consult their Information for Planning and Consultation system (https://ecos.fws.gov/ipac) to obtain lists of threatened and endangered species within the jurisdiction of the USFWS in the discharge area. In 2016, NOAA/NMFS directed the Department to consult their Marine Mammal Species Range and Critical Habitat Interactive Map at http://alaskafisheries.noaa.gov/mapping/esa/. The Department used these websites to gain an

approximate determination of threatened and endangered species in the area surrounding the discharges, and used this determination to update the Excluded Areas as found in Permit Part 1.5.

Authorizations may incorporate site-specific water quality-based and threatened or endangered species-related requirements, as established in the permit.

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

8.3. Essential Fish Habitat

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

As a state agency, DEC is not required to consult with NOAA on EFH. However, DEC voluntarily contacted NOAA to notify them of the proposed permit issuance and to obtain listings of EFH in the area. NOAA has generally directed the Department to consult their EFH Mapper at http://www.habitat.noaa.gov/protection/efh/efhmapper/index.html to obtain locations of EFH in the area of proposed discharges. The Department used this website to make an approximate determination that the area of proposed discharges could be EFH for all five species of Pacific salmon, skate, Pacific cod, arrowtooth flounder, yellowfin sole, walleye pollock, rock sole, and flathead sole. DEC has also determined that seafood waste discharges could occur to the following EFH areas:

- Bering Sea and Aleutian Island (BSAI) Groundfish
- Gulf of Alaska (GOA) Groundfish
- Bering Sea and Aleutian Island King and Tanner (BSAI) Crab
- Alaska Scallops
- Alaska Stocks of Pacific Salmon

Additionally, during permit development for a separate seafood processing general permit, AKG523000 Offshore Seafood Processors, NMFS and the ADF&G provided comment that anchoring and discharge of seafood waste should not occur into or onto “living substrates,” such as submerged aquatic vegetation, kelp, or eelgrass. This recommendation has been directly incorporated into a requirement to perform seafloor surveys prior to placements of new outfalls. The protocol can be found in Permit Appendix H to assist the permittee and DEC in determining that siting requirements are being met. The pre-discharge survey provides information to DEC regarding the existing benthos prior to installation of an outfall. The pre-discharge survey is due with submittal of the NOI and/or prior to installation of an outfall.

DEC will provide NMFS with copies of the permit and fact sheet during the public notice period. Any comments received from NMFS regarding EFH will be considered prior to issuance of the permit.

8.4. Permit Expiration

The permit will expire five years from the effective date of the permit, but it may be administratively continued.

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Appendix A
Mixing Zone Analysis Check List
Based on
Alaska Water Quality Standards (2003)

The purpose of the Mixing Zone Check List 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, and to provide justification to establish a mixing zone in an APDES permit. In order to establish a mixing zone, all criteria shall be met. The permit writer shall document all conclusions in the permit Fact Sheet; however, if the permit writer determines that one criterion cannot be met, then a mixing zone is prohibited, and the permit writer need not include in the Fact Sheet the conclusions for when other criteria were met.

CRITERIA	DESCRIPTION	ANSWER & RESOURCES	REGULATIONS	MIXING ZONE APPROVED Y/N
Size	Is the mixing zone as small as practicable? Section 4.3.1, 4.3.3	**Answer: Yes,** mixing zone as small as practicable. •Technical Support Document for Water Quality Based Toxics Control •Fact Sheet, Part 4.3 •Fact Sheet, Part 4.3.1, 4.3.3 • DEC's RPA Guidance • EPA Permit Writers' Manual	18 AAC 70.240 (k) 18 AAC 70.240 (b)(1) - (b)(5) 18 AAC 70.240(d)(8)	Y
Technology	Were the most effective technological and economical methods used to disperse, treat, remove, and reduce pollutants?	**Answer: Yes** Fact Sheet Part 3.1.1	18 AAC 70.240 (c)(1)	Y
Low Flow Rate Design	**For river, streams, and other flowing fresh waters.** -Determine low flow calculations or documentation for the applicable parameters.	**Answer:** Fact Sheet Part 4.3.1 Form 2M if other than standard selected	18 AAC 70.240(l)	Y

Existing Use	Does the mixing zone….			
	(1) Partially or completely eliminate an existing use of the waterbody outside the mixing zone? **If yes, mixing zone prohibited.**	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(c)(2)	Y
	(2) Impair overall biological integrity of the waterbody? **If yes, mixing zone prohibited.**	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240.(c)(3)	Y
	(3) Provide for adequate flushing of the waterbody to ensure full protection of uses of the waterbody outside the proposed mixing zone? **If no, then mixing zone prohibited.**	**Answer: Yes** Fact Sheet Part 4.3.3	18 AAC 70.240(c)(2)	Y
	(4) Cause an environmental effect or damage to the ecosystem that the department considers to be so adverse that a mixing zone is not appropriate? **If yes, then mixing zone prohibited.**	**Answer: No** Fact Sheet Part 4.3	18 AAC 70.240(a)	Y
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 be reduced in size or prohibited.**	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(d)(6)	Y
	(2) Preclude or limit established processing activities of commercial, sport, personal use, or subsistence shellfish harvesting? **If yes, mixing zone may be reduced in size or prohibited.**		18 AAC 70.240(c)(4)(C)	Y
Spawning Areas	Does the mixing zone…			
	(1) Discharge in a spawning area for anadramous 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**.	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(f)	Y

Human Health	Does the mixing zone…			
	(1) Contain bioaccumulating, bioconcentrating, or persistent chemical above natural or significantly adverse levels? **If yes, mixing zone may be reduced in size or prohibited**.	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(d)(1-2)	Y
	(2) Contain chemicals expected to cause carcinogenic, mutagenic, teratogenic, or otherwise harmful effects to human health? **If yes, mixing zone prohibited**.	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(d)(1-2)	Y
	(3) Create a public health hazard through encroachment on water supply or through contact recreation? **If yes, mixing zone prohibited.**	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(c)(4)(B)	Y
	(4) Meet human health and aquatic life quality criteria at the boundary of the mixing zone? **If no, mixing zone prohibited.**	**Answer: Yes** Fact Sheet Part 4.3.3	18 AAC 70.240(c)(4), (d)(8)	Y
	(5) Occur in a location where the department determines that a public health hazard reasonably could be expected? **If yes, mixing zone prohibited**.	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(k)(4)	Y
Aquatic Life	Does the mixing zone…			
	(1) Create a significant adverse effect to anadromous, resident, or shellfish spawning or rearing? **If yes, mixing zone prohibited.**	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(c)(4)(G), (g)(1)	Y
	(2) Form a barrier to migratory species? **If yes, mixing zone prohibited.**			Y
	(3) Fail to provide a zone of passage? **If yes, mixing zone prohibited**.			Y
	(4) Result in undesirable or nuisance aquatic life? **If yes, mixing zone prohibited.**	**Answer: No**	18 AAC 70.240(d)(5)	Y

		Fact Sheet Part 4.3.3		
	(5) Result in permanent or irreparable displacement of indigenous organisms? **If yes, mixing zone prohibited.**	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(c)(4)(E)	Y
	(6) Result in a reduction in fish or shellfish population levels? **If yes, mixing zone prohibited.**	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(c)(4)(D)	Y
	(7) Prevent lethality to passing organisms by reducing the size of the acute zone? **If yes, mixing zone prohibited.**	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(d)(7)	Y
	(8) Cause a toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone? **If yes, mixing zone prohibited.**	**Answer: No** Fact Sheet Part 4.3.3	18 AAC 70.240(C)(4)(A)	Y
Endangered Species	Are threatened or endangered species located within or near the mixing zone? If yes, are effects to threatened or endangered species likely to be adverse based on comments received from USFWS or NOAA? If yes, will conservation measures be included in the permit to avoid adverse effects?	**Answer: Yes** Fact Sheet Part 4.3.3 Fact Sheet Part 1.8	Program Description, 6.4.1 #5 18 AAC 70.240(c)(4)(F)	Y