ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM
PERMIT FACT SHEET – FINAL

Permit Number: AK0028657

UniSea, Inc. – Dutch Harbor Facility

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

Public Comment Period Start Date: May 30, 2024
Public Comment Period Expiration Date: June 28, 2024
Alaska Online Public Notice System

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

UNISEA, INC.

For wastewater discharges from

UniSea, Inc. – Dutch Harbor Facility
88 Salmon Way
Dutch Harbor, AK 99692

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

This fact sheet explains the nature of potential discharges from UniSea and the permit development, including:

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

Informal Review and Adjudicatory Hearing

A person authorized under a provision of 18 AAC 15 may request an informal review of a contested decision by the Division Director in accordance with 18 AAC 15.185 and/or an adjudicatory hearing in accordance with 18 AAC 15.195 – 18 AAC 15.340. See DEC's "Appeal a DEC Decision" web page https://dec.alaska.gov/commish/review-guidance/ for access to the required forms and guidance on the appeal process. Please provide a courtesy copy of the adjudicatory hearing request in an electronic format to the parties required to be served under 18 AAC 15.200. Requests must be submitted no later than the deadline specified in 18 AAC 15.

Documents are Available

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

Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 555 Cordova Street **Anchorage**, AK 99501 (907) 269-6285	Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program Mailing Address: P.O. Box 111800 **Juneau**, Alaska 99811 Location: 333 Willoughby Avenue, 8th Floor, Ste 800, State Office Building, **Juneau** (907) 465-5180

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Name of Facility:	UniSea, Inc. – Dutch Harbor Facility
APDES Permit Number:	AK0028657
Facility Location:	88 Salmon Way, Dutch Harbor, AK 99692
Mailing Address:	P.O. Box 920008, Dutch Harbor, AK 99692
Facility Contact:	Tom Enlow

Figure 1 shows the facility and discharge locations.

2.0 FACILITY INFORMATION

2.1 Background

2.1.1 Facility Location and Description

The permit and this fact sheet are based on information submitted by UniSea with their APDES application for the Dutch Harbor facility. UniSea owns, operates, and maintains the facility, which conducts seafood processing and seafood meal reduction. The facility is located in the City of Unalaska, Alaska. The facility is located on the southwest shore of Amaknak Island (on the southwest corner of Iliuliuk Harbor) in the easternmost Aleutian Islands, U.S.G.S. hydrologic unit number 19030102. Figure 2 shows the facility layout. The facility consists of (1) a cod and crab plant (G1), (2) a Pollock plant (G2), (3) a fish meal plant, (4) a powerhouse, (5) warehouses, (6) residential buildings, (7) a tank farm, and (8) docks.

2.1.2 Process Overview

The facility processes surimi, roe, and fillet block Pollock; fillet block Pacific cod; raw, cooked, and frozen crab (king, bairdi, and opilio); fish meal; and fish oil.

UniSea takes receipt of the seafood catch from fishermen along its docks, offloading the catch in large vacuum lines or baskets hoisted by crane. Cod and crab are offloaded at the G1 dock. Pollock is offloaded at the G2 dock. There is a (holding) tank farm, of refrigerated saltwater holding tanks, outside of the G2 plant. The Cod Warehouse is used as an ancillary processing facility. The facility typically processes over 300 million pounds of raw seafood annually, of which around 90% is Pollock, and the next most commonly processed species are Pacific cod and crab. The facility uses both fresh (potable) water and saltwater (with G1 and G2 intake lines) for processing. Seafood is butchered by machine and by hand in any of several processing lines throughout the facility. Processing wastes (i.e., heads, offal, unusable tissue parts) are dewatered and transported to the meal plant for reduction to fish meal, a marketable secondary product. Water used in bailing, butchering, processing, and fluming is screened to recover residual tissue pieces. The wastewater passes through one of five rotary screens, each with mesh size of either 0.4 mm or 0.5 mm, and is then collected in the Main Screening Treatment Plant (MSTP) sump, a 53,000-gallon holding tank. Next, skimmers on the surface and bottom of the sump harvest the floatable and settleable solids, and then the wastewater exits the MSTP sump over a weir and passes through another 0.4 mm screen before it is mixed with meal plant stickwater and the G1 crab processing water (which is screened to 0.5 mm) and discharged through Outfall 001A-E. Storm water from the G2 sump, G2 offload sump pit, cod warehouse loading dock and

dumpster pit, and G1 loading dock and dumpster pit is also routed to the MSTP and Outfall 001A-E. Sampling is done after all commingling.

Some product is recovered from the wastewater upstream prior to screening. The G2 plant has its own sump system with a rotary screen and skimmer system. The screen's first two sections have 3.18 mm diameter holes and the next four sections have 1.59 mm diameter holes. The captured solids are sent to the meal plant, and the wastewater enters the G2 sump. The floating weir skimmer system in the G2 sump collects floating solids, which are pumped to small rotary screens with 0.25 mm holes. The screened solids are sent to the meal plant and the wastewater reenters the G2 sump before it is sent to the MSTP. Additionally, surimi wash water is re-used as conveyance water to limit the overall volume of wastewater generated, and double decanting is used on all feasible surimi lines. UniSea has previously evaluated several other source control measures (membrane filtration, dissolved air floatation, coalesce gravity/floatation, and electrocoagulation) but found them to be infeasible.

Non-contact cooling water from refrigeration systems and boiler blowdown from heat generation are also discharged from Outfall 001A-E. Total flow is around 6-8 million gallons per day (mgd).

Screened solids, unusable seafood parts (including crab shell), and bycatch are sent to the meal reduction plant by pump or in totes. One fish meal waste stream is stickwater (fish tissue liquids removed in the dehydration process). Stickwater is typically discharged by vessel at an approved location (previously Outfall 004) June through September and discharged from Outfall 001A-E October through May. Material periodically cleaned out of the sumps (fish flesh and crab shell) and screened to half inch or less is also discharged by vessel. Additionally, fish meal processing produces a waste stream of water used in evaporation machinery and to scrub dryer vapors from the meal dryers. This wastewater is discharged from Outfall 003A, which flows around 5 mgd.

Storm water as well as non-contact cooling water from ammonia and freon refrigeration condensers, boiler blowdown water, and powerhouse sump water is discharged from Outfall 002A, which flows around 2-4 mgd. Boiler blowdown is boiler condensate return water that contains boiler chemicals used to increase the pH of the water and reduce scale buildup in the boiler system. Powerhouse sump water includes an emulsified blend of diesel and fish oil, discharged to the powerhouse floor drains during centrifuge start-up. Additionally, empty drums of used petroleum-based products are rinsed inside the Power Plant or Motor Pool buildings, and spent rinse water from that and from vehicle maintenance and cleaning is routed to the powerhouse sump. Powerhouse sump water passes through an oil-water separator and then past a hydrocarbon monitoring sensor and an isolation valve in the sump discharge pipe prior to commingling with the non-contact cooling water and discharging. The TD4100 oil water monitor detects aromatic hydrocarbons in water and has an alarm at 14 ppm. When a reading of 15 ppm is detected, the alarm shuts down the sump pumps and diverts all powerhouse sump water back to the powerhouse sump instead of to Outfall 002A. The diverter valve routes the sump water to the outfall once total aromatic hydrocarbon (TAH) levels have been at 14 ppm or less for 180 seconds. This occurs 5-10 times per month.

Storm water discharged at the facility is covered by Multi-Sector General Permit (MSGP) authorization AKR06AC21, and the facility operates under a corresponding Storm water Pollution Prevention Plan (SWPPP) as well as a Spill Prevention, Control, and Countermeasure (SPCC) Plan for above ground fuel storage tanks. Staff inspect dock areas daily during seafood production seasons for the presence of raw seafood materials and other storm water pollutant sources, such as leaks from materials handling equipment. The

facility employs control measures to address raw material unloading, product loading, liquid storage, solid waste management, and ancillary operations.

The outfalls are located north of Arch Rock within a small embayment of Unalaska Bay on the west shore of Amaknak Island, where the main entrance to Captains Bay opens to the north into Unalaska Bay. The bottom slopes steeply from the shoreline on all three sides and is protected on the north and south sides by extensive reefs. The natural bowl that the slopes form flattens out at a depth of 80 to 90 feet.

Outfall 001 consists of five pipes. Four pipes (two 10-inch and two 12-inch) are known as the Quad Lines, Outfall 001A-D. The pipes are approximately 200 feet long, lie two feet apart, and are positioned parallel to each other and discharge perpendicular to the shoreline. Outfall 001A-D terminate at -67 feet mean lower low water (MLLW) in water 70 feet deep.

The fifth pipe, Outfall 001E, is called the Pac Pearl Line and is located approximately 210 feet north of the Quad Lines. It also discharges perpendicular to the shoreline. The line terminates at approximately -77 feet MLLW in water 80 feet deep. Outfall 001E is used intermittently, and never concurrently with Outfall 001A-D.

Outfall 002A is an 18-inch diameter line that discharges from the G2 dock to Iliuliuk Harbor at -19 feet MLLW, perpendicular to the shoreline, into water 24 feet deep. It was reconfigured to this location effective September 2022 (it previously discharged above the water surface).

Outfall 003A discharges at -3 feet MLLW under the G2 dock to Iliuliuk Harbor. It is a 12-inch diameter pipe that tees into a manifold with two ten-foot sections, each with five 8-inch ports. The pipe assembly is enclosed in a metal casing attached to the seawall and open at the bottom. The water depth at the diffuser location is 28 feet.

For a facility flow diagram, see Figure 3.

The facility operates year-round, with peak production between February-March and June-August. Pollock “A” Season begins in January and runs until mid-to-late April, and “B” Season begins in June and ends in October. Crab species and Pacific cod are processed intermittently during both of these seasons. There is no processing in May and minimal processing in December. Sanitary wastewater is discharged to the City of Unalaska’s sewage collection system and treated at the City’s treatment plant.

Table 1: Outfall Descriptions

Number	Location	Description
001A-D	53.879317 N, 166.560433 W	Seafood processing and meal plant wastewaters
001E	53.879788 N, 166.560356 W	
002A	53.879033 N, 166.552217 W	Non-seafood contact effluent: heat and power generation, refrigeration system cooling, boiler blowdown, vehicle maintenance
003A	53.878617 N, 166.551717 W	Fish meal plant scrubber, condenser, and evaporator water

2.1.3 Process Descriptions and Pollutants of Concern

Pollutants of concern known to be present in the facility’s discharge, discussed further below, include pH, biochemical oxygen demand (BOD_5), total suspended solids (TSS), settleable solids (SS), oil and grease (O&G), total residual chlorine (TRC), ammonia, temperature, and residues. Arsenic, copper, and zinc are also pollutants of concern and

require monitoring to determine their prevalence in the effluent (see discussion in Part 4.4.2). Total aromatic hydrocarbons (TAH), total aqueous hydrocarbons (TAqH), and chemical oxygen demand (COD) are pollutants of concern for the powerhouse and vehicle maintenance waste streams. Silver and fecal coliform are additional pollutants of concern that have been previously detected in the effluent from the facility.

Overview and Butchering

The major types of waste found in seafood processing wastewater are blood, offal products, viscera, fins, fish heads, shells, skins, and meat fines. Operations include product receiving, vessel unloading, sorting and weighing, preparation (butchering, scaling, filleting, skinning, evisceration), inspection and trimming, product processing (e.g., freezing), further processing (e.g., cooking), packaging, and dispatch. The butchering process adds organic materials, such as blood and guts, to the wastewater stream. Thus, wastewater from the seafood processing operations can be very high in dissolved and suspended organic materials. This results in high BOD. Oils and grease are also present in high amounts. This material can settle out as SS residues. Ammonia is included in contact water effluent streams due to its production during organic matter decomposition. The 40 CFR Part 408 effluent limitation guidelines (ELG) development document recommended monitoring seafood processing wastewaters for pH even though processing waters are generally neutral.

The small residue particles from mince production can travel through the receiving waters by buoyant spreading, or horizontal spreading of mixed effluent flow due to buoyant forces caused by density difference relative to ambient density. This process can quickly spread effluent laterally over large distances in the transverse direction, particularly in cases of strong ambient stratification.

Fish Meal and Oil Production

The first step in fish meal processing is steam cooking to facilitate oil and water release. The cooked fish is then pressed to separate liquid (press liquor) and solid (press cake). The press cake is then dried to remove most of the moisture. A cyclone separates out the meal from hot air and vapors, which then pass through a scrubber to remove the entrained organic material. Solids from the press liquor are then removed by centrifugal decanters (which separate the solids, oil, and stickwater). The separated solids are dried along with the press cake. Oil from the centrifuges is stored for sale or use. Stickwater is then discharged (after being combined with other wastewater as described in Part 2.1.2) after undergoing evaporation to concentrate it. Condenser water, which contains entrained vapors produced in the evaporation bodies, is discharged with the stickwater.

Stickwater contains high levels of BOD, TSS, and O&G. It has one of the strongest waste loads produced by the seafood industry. Scrubber and condenser water contain the same parameters, but generally lower in concentration by several orders of magnitude. High BOD levels can depress dissolved oxygen (DO) in the water column and on the seafloor.

Fish meal/oil production can also result in high pH, ammonia, and temperature discharges.

Cleaning Agent and Disinfectant Discharges

Cleaning, disinfectant, and defoaming agents used for seafood processing where the permittee follows the manufacturer's use and disposal recommendations are authorized discharges under the permit. This includes the use of disinfectants added to wash down water to meet applicable state and federal sanitation standards while processing or sanitizing seafood processing areas. Wash-down activities can add residual chlorine to wastewater streams.

Catch Transfer Water

Fish are delivered to the plant from vessel holds. Catch transfer water is directed through the waste treatment screen and ultimately discharged with the seafood processing wastewater through Outfall 001A-E.

Catch transfer water can be high in BOD, TSS, and O&G, with concentrations dependent on how long fish are held. Additionally, catch transfer water may create foam and scum on the surface of the receiving water (violating the Water Quality Standards (WQS) for residues).

The permit authorizes Outfall 001A-E's discharges of catch transfer water (fish hold waste and wastewater, live tank water, refrigerated seawater, or brine) conveyed to the onshore facility.

2.1.4 Facility History

UniSea was founded in 1974 and began processing using a shore-based seafood processing barge, the Barge UniSea, in October 1975. Over the next several years, the company acquired several Dutch Harbor production facilities. UniSea began processing Pollock into surimi in 1986. UniSea built the G2 surimi plant in 1989 and began processing there in 1990. In March 1991, the company installed new crab and cod lines in the G1 plant. The Barge UniSea was relocated in 1993 and sold in 2000.

The original Quad Outfalls were put into service in 1985, and waste discharge of half-inch or less was permitted. Beginning in 1992, discharges were screened to 1 mm size. The original Quad Outfalls were decommissioned in 1995, and the current Outfall 001A-D pipes were installed slightly south of the original outfalls. The Pac Pearl Outfall was replaced in 1996, also to the south of its original location. In 2000, screening to 0.5 mm began. The Outfall 001A-D pipes were replaced in June 2011 for maintenance purposes but kept in the same location and configuration.

The Environmental Protection Agency (EPA) issued UniSea an individual National Pollutant Discharge Elimination System (NPDES) permit (AK0028657) in 1996, which expired in 2001. The EPA reissued permit became effective April 1, 2003, was modified effective April 28, 2003 (to allow for vessel refueling that had inadvertently been precluded in the reissuance), and had an expiration date of March 31, 2008. The permittee applied in a timely manner for permit reissuance, and EPA administratively extended the permit in March 2008. It has been in administrative extension since then.

While the 2003 permit authorized "At-Sea" discharges from UniSea's onshore facility (Outfall 004), the reissued permit will no longer provide coverage for these types of discharges. Instead, for any "At-Sea" discharges in state waters (such as in the case of a problem with the meal plant or main outfall line or if barging waste is necessary to meet effluent limitations), the permittee will be required to obtain AKG523000 Offshore Seafood Processors Wastewater Discharge General Permit coverage.

2.2 Discharges not Authorized by the Permit

This permit does not authorize the discharge of any waste streams, including spills and other unintentional or non-routine discharges of pollutants, that are not part of the normal operation of the facility as disclosed in the permit application, or any pollutants that are not ordinarily present in such waste streams. Discharges not covered include those that may require coverage under other APDES permits.

Unused products – The Alaska Department of Environmental Conservation (DEC or the Department) has been made aware through review of some processors' at-sea disposal logs 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 food additives (e.g., sugars, salts) or processed by-products (e.g., oils, hydrolysates, etc.) can severely alter the chemistry of the receiving water (including by causing high BOD and COD pollutant loading) and is not authorized under the permit. The restriction does not apply to by-product effluents meeting the terms of the permit.

Chemicals (e.g., sodium hydroxide, hydrochloric acid, aldehydes, ketones) that are not actively used in production or disinfection and are instead poured directly into wastewater discharge lines are prohibited discharges under Permit Part 1.3. Unmonitored and/or untreated discharges of these chemicals can lead to violations of WQS.

Hazardous or toxic substances – The WQS for toxic and other deleterious organic and inorganic substances for marine waters are codified in 18 AAC 70.020(b) and found in the *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.

Storm water - Both commingled and non-commingled industrial storm water discharge coverage is available under the 2020 APDES Multi-Sector General Permit (MSGP). The 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. 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 on-site which are identified by a list of primary SIC codes. The MSGP lists 'SECTOR U: FOOD AND KINDRED PRODUCTS – U3' with SIC codes as 2091-2099 Miscellaneous Food Preparations and Kindred Products. Seafood Processing falls under Section U3 SIC codes (Frozen, Fresh or Canned).

For commingled discharges, the 2020 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).

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 seafood/plant products are "spoiled" due to temperature, histamine concentration, or decomposition, these materials are prohibited from being discharged.

3.0 COMPLIANCE HISTORY

DEC reviewed the facility's Annual Reports from 2008 to 2023 and 2022 supplemental effluent monitoring to determine the facility's compliance with permit limits. Table 2, Table 3, and Table 4 present the reported effluent characterizations. Permit effluent limit exceedances were reported for pH and for TRC at Outfall 001A-E.

Table 2: Outfall 001A-E Effluent Characterization

Parameter	Units [a]	Existing Limits			Reported Range (Low - High)
		Daily Maximum	Monthly Average	Annual Maximum	
BOD_5 (June – October)	lbs/day	297,000	185,000	—	1,510 – 80,553 (average) 1 – 221,144 (maximum) [b]
pH	SU	8.5	—	—	6.5 – 8.4 [c]
Total Suspended Solids (TSS)	lbs/day	Report	—	—	2 – 226,810
Settleable Solids (SS), 0.5 mm width	lbs/yr	Report	—	Report	2 – 177,311 (daily, lbs/day) [b] 7,345,370 – 10,747,859 (annual) [d]
Total Residual Chlorine (TRC)	mg/L	0.100	—	—	0.00 – 0.07 [e]
Flow	million gallons	Report	—	—	0.004 – 8.955

Footnotes:

a. Units: lbs/day = pounds per day, SU = standard units, lbs/yr = pounds per year, mg/L = milligrams per liter.
b. Estimated values for SS wet lbs/day and for daily BOD_5 lbs/day were reported for days when samples were not taken. This was done to estimate the amount of these parameters discharged per month, for annual reporting.
c. This range does not include the 9.4 SU value recorded on 6/1/2015.
d. The total quantity of SS wet pounds discharged per month was estimated based on the annual ratio of SS to round pounds processed.
e. This range does not include the 5.04 mg/L value recorded on 6/9/2013.

Table 3: Outfall 002A Effluent Characterization

Parameter	Units [a]	Existing Limits			Reported Range (Low - High)
		Daily Minimum	Daily Maximum	Monthly Average	
Temperature	°C	—	20	—	4.5 – 19.1
Flow	mgd	—	Report	—	0.10 – 4.50

Footnotes:

a. Units: °C = degrees Celsius, mgd = million gallons per day.

Table 4: Outfall 003A Effluent Characterization

Parameter	Units [a]	Reported Range (Low - High)
Flow	mgd	3.05 – 3.19
Temperature	º C	13.7 – 17.5
pH	SU	7.11 – 8.05
Total Ammonia, as N	mg/L	0.0845 – 1.48
Copper, Total Recoverable	µg/L	<2.0 - 1630
Fecal Coliform (FC)	FC/100 mL	<10 – 63,000
Total Residual Chlorine (TRC)	mg/L	0.00 – 0.00

Footnotes:

a. Units: mgd = million gallons per day, °C = degrees Celsius, SU = standard units, mg/L = milligrams per liter, µg/L = micrograms per liter, FC/100 mL = colony forming units per 100 mL.

Compliance Monitoring and Reporting

In the 2007 Annual Report, noncompliance incidents included a dumped tote of meal plant seafood processing waste flowing to a storm drain, fish oil discharge to a storm drain from the powerhouse, unscreened processing waste discharge to Iliuliuk Harbor due to a sump overflow, propylene glycol leaking to a storm drain from a severed heat transfer line and from manifold leaks, stickwater holding tank cleaning water discharge to Iliuliuk Harbor due to backflow through the saltwater supply pump, and oily refrigeration condenser system cleaning water discharge to Iliuliuk Harbor from a powerhouse sump overflow. Additionally, around 18,000 pounds of anhydrous ammonia were discharged through Outfall 002A in December 2007 after release from the refrigeration condenser system.

In the 2008 Annual Report, noncompliance incidents included multiple refrigeration condenser system anhydrous ammonia leaks (less than 20 pounds total) through Outfall 001 and Outfall 002A and an emulsified oil (fish oil and diesel blend) discharge through Outfall 002A due to overloading of the powerhouse sump oil water separator.

In the 2009 Annual Report, noncompliance incidents included propylene glycol leakage to Iliuliuk Harbor from a district heating loop and unscreened crab processing wastewater discharge to Iliuliuk Harbor due to a sump pipe repair clamp failure.

In the 2010 Annual Report, noncompliance incidents included boiler feed water discharge to a storm drain and hydraulic oil discharge to the surface waters of Iliuliuk Harbor from a failed crane hose fitting.

In the 2011 Annual Report, noncompliance incidents included screened wastewater discharge to Unalaska Bay from a seam separation in the Outfall 001A piping, several incidents of liver particle accumulation on the shoreline and water surface around Outfall 001, and boiler water discharge from a cooling tank to a storm drain during maintenance cleaning.

In the 2012 Annual Report, noncompliance incidents included unscreened processing waste discharge from Outfall 001 due to surging flow bypassing the rotary screen, at-sea discharge at a speed of less than 3 knots due to weather conditions, refrigeration cooling water discharge from a ruptured line to a storm drain, inadvertent at-sea discharge outside of the permitted area, receiving water DO readings under WQS, and failure to report BOD_5 values for one week in October.

In the 2013 Annual Report, noncompliance incidents included screened and unscreened process wastewater discharges to storm drains from breaks in Outfall 001 piping, TRC permit limit exceedance during pre-season sanitation, and failure to complete settleable solids analysis during the first two weeks of June.

In the 2014 Annual Report, noncompliance incidents included liver particle accumulation on the shoreline and water surface around Outfall 001, failure to sample TSS and BOD_5 for one week in October, and unscreened crab processing wastewater discharge to Iliuliuk Harbor from the G1 dock due to a parted underground line.

In the 2015 Annual Report, noncompliance incidents included screened processing water discharge to a roadway and Iliuliuk Harbor from a parted underground line and exceedance of the permit's maximum pH limit due to ammonia from the refrigeration system entering the wastewater stream during maintenance.

In the 2016 Annual Report, noncompliance incidents included receiving water DO readings under WQS and screened processing wastewater discharge through a storm drain.

In the 2017 Annual Report, noncompliance incidents included a stickwater release to Iliuliuk Bay near the G2 dock due to failed cooling tank gaskets and at-sea stickwater discharge outside of the permitted area due to U.S. Naval operations being conducted in the area.

In the 2018 Annual Report, noncompliance incidents included a screened process water discharge through a storm drain due to a pipe rupture, seafood residue aggregation on the shoreline due to a G2 plant rotary screen malfunction, and a missed BOD_5 reporting week due to invalid sample results.

In the 2019 Annual Report, there was one noncompliance incident. A hundred pounds of fish meal was discharged through Outfall 003A (designated for condenser and scrubber water discharge) due to restricted cyclone air flow forcing the fish meal through the condenser.

In the 2020 Annual Report, there were four noncompliance incidents: incomplete ambient DO monitoring for the first July sampling event due to limitations of the available instrument, an incidence of aggregate seafood processing residues visible near Outfall 001 and the shoreline due to a clogged liver skimming system pump, an incidence of missed BOD_5 reporting due to the lab voiding the sample results, and a release of food grade hydraulic oil into the waste stream.

In the 2021 Annual Report, there was one noncompliance incident: receiving water DO below WQS at one station.

In the 2022 Annual Report, there were three noncompliance incidents: process wastewater overflowing a sump into a storm drain, receiving water DO below WQS at one station, and ground crab shell discharge by vessel outside of the designated area.

In the 2023 Annual Report, there were four noncompliance incidents: process wastewater overflow, process water discharge through Outfall 003, propylene glycol discharge through Outfall 002, and receiving water DO below WQS.

The permittee reported no sightings of dead, sick, or injured Steller's eiders or Steller sea lions at the facility between 2007 and 2023.

The permittee reported several sheens observed at the facility's G1 and G2 docks between 2007 and 2023, either of unknown origin or attributed to on-site refueling activities or to vessels docking or moored at the facility. These observations are summarized in Table 5.

Table 5: Petroleum Spill Summary 2007 - 2023

Year [a]	Number of Sheens Reported	Sheen Cause(s) Identified
2007	6	Brought in by winds, crack in vessel fuel tank
2008	5	Residual oil from vessel hydraulic repairs
2009	3	Oil leak from vessel crane gearbox
2010	2	Hydraulic leak from G1 dock crane, truck
2013	1	Sheen from housing unit heating fuel tank leak
2014	1	Oil leak from moored vessel mechanical failure
2019	1	Diesel spilled to the ground near UniSea's fuel dispenser and discharged to Iliuliuk Harbor via a storm drain

Footnotes:

a. No sheens were reported in 2011-2012, 2015-2018, or 2020-2023.

Facility Inspections

Inspections were carried out during the permit term by DEC on August 20, 2002; July 29, 2010; August 19, 2014; September 20, 2016; August 15, 2018; and November 6, 2020 and by EPA on October 2, 2012.

During the 2002 inspection, no permit violations were definitively noted. However, the inspector did observe that there was a discoloration of the entire general area of the small cove that UniSea was discharging into compared to the color of the surrounding bay. In addition, the discoloration appeared to drift into the mouth of Captains Bay.

During the 2010 inspection, no violations were definitively noted, but the inspector did point out that the WQS for color, residues, and/or petroleum hydrocarbons may have been in violation due to foam and sheen observed near vessels at the dock and discoloration discernable in the bay when viewed from a nearby hillside.

During the 2014 inspection, a violation pertaining to a missing signature on the Sea Surface and Shoreline Monitoring Plan was noted but resolved the following day.

During the 2016 inspection, the facility was cited for several violations: residues (liver particles) larger than 0.5 mm observed on the sea surface, screened and unscreened processing wastewater discharges at locations other than through the approved outfall terminuses, and an exceedance of the maximum allowable wastewater pH. DEC issued UniSea a Notice of Violation on November 10, 2016.

During the 2018 inspection, the facility was cited for screened and unscreened processing wastewater discharges at locations other than through the approved outfall terminuses.

During the 2020 inspection, the facility was cited for fatty aggregate seafood residues discharge on the shoreline due to a G2 plant rotary screen malfunction, an invalid BOD sample, fish meal discharge through Outfall 003A due to built up material on a cyclone causing the conveyor to operate in reverse, hydraulic oil discharge through Outfall 001 due to a faulty O-ring and bolt, and the existence of a 3.2-acre zone of deposit. DEC issued a Notice of Violation on December 4, 2020.

Consent Decree

On May 26, 2011, a Consent Decree (CD) was entered between EPA and UniSea negotiated to avoid litigation over alleged violations of the Clean Water Act (CWA) at the Dutch Harbor facility. The alleged violations pertained to releases of anhydrous ammonia, elevated pH, propylene glycol, and seafood processing waste and wastewaters in violation of the terms of permit AK0028657, beginning in October 2005 and continuing thereafter.

The CD required that UniSea complete a Benthic Impact Survey of all seafood processing waste deposited on the seafloor at the discharge location and, depending on the results of that survey, remove some or all of the seafood processing waste. The CD also stated that the EPA would review UniSea's Environmental Management Systems (EMS) audit analysis, prepared in April 2009 by the contractor ERM-West, and determine whether supplemental EMS analysis would be required.

An Environmental Management Systems Improvement Plan was submitted to EPA in October 2011, the Benthic Impact Survey was completed in June 2012, and the Waste Remediation project was completed in summer 2016. UniSea stated in the December 2016 Waste Remediation Completion Report that all of the Compliance Requirements in the CD had been completed. In order for the CD to be terminated, UniSea must maintain continuous satisfactory compliance with the facility's wastewater discharge permit for a period of three years after completion of the Compliance Requirements in the CD.

Seafloor Monitoring and Waste Pile Remediation

UniSea's 2003 permit did not authorize a Zone of Deposit in Unalaska Bay for deposits from Outfall 001. The permit required bi-annual seafloor monitoring to determine compliance with the WQS for residues in marine waters and to monitor the bioremediation of the historic waste piles by delineating the continuous waste deposits that were at least a half inch thick. Table 6 summarizes seafloor monitoring results from 2007 – 2023. These surveys are directly comparable because they were all performed by the same survey consultants using the same methods.

Table 6: Seafloor Survey Results 2007 - 2023

Year	Waste Pile Area (acres)	Maximum Thickness (ft)
2023 (May-June)	1.61	0.6
2021 (May-June)	2.75	0.5
2019 (September)	3.21	2.8
2017 (May-June)	3.17	2.7
2015 (May)	3.15	16.5
2013 (May)	3.33	16.5
2011 (August)	3.68	17.0
2011 (April)	3.50	16.7
2009 (August)	3.64	17.8
2008 (August)	3.72	16.6
2007 (May)	4.35	16.5

All seafloor surveying at the facility since 2007 has been conducted using a combination of three methods: (1) single-beam and multi-beam surveys to develop bathymetric contours; (2) underwater video to characterize the waste deposit, determine the half-inch thick boundary of the waste deposit, document marine species present, and identify any potential water quality problems; and (3) core sampling to delineate and further define the half-inch thick boundary of the waste deposit. These surveys use geophysical sub-bottom profiling data collected in 2007 to define the natural seafloor at the base of the waste piles.

Two surveys were completed in 2011 due to hydro-jetting of the waste pile around Outfall 001A-D for maintenance.

A Benthic Impact Survey was conducted in June 2012 and defined a 2.2-acre Zone of Impact (ZOI), or the portion of the seafood waste pile area showing impacts to benthic habitat due to the presence of seafood waste. The ZOI delineation was based on the presence of sulfate-reducing bacteria (Beggiatoa), an Organism-Sediment Index, an Infaunal Fish Waste Impact Index, benthic infauna analysis, and sediment chemistry.

Site conditions within the 5.3-acre survey area changed significantly in May-June 2016, when approximately 13,400 cubic yards of seafood waste were removed via mechanical dredging from all areas where waste accumulations were greater than one foot thick. Post-dredging bathymetric conditions were captured through a multi-beam survey, and those conditions have since been used as the baseline for seafloor monitoring.

Prior to the waste pile removal, the majority of the dredge area exhibited no apparent redox potential discontinuity depths due to high sediment-oxygen demand and the presence of black anoxic sediments and Beggiatoa. Patchy, discontinuous, or thin layers of Beggiatoa were observed in the northern portion of the dredge area and thicker bacterial mats were observed in the southern portion of the dredge area, west of the Quad Outfalls. Sedimentary methane gas bubbles were observed following a similar distribution pattern.

The seafood waste was contained within the natural swale of the embayment into which it is discharged. There were two larger legacy piles of seafood waste present, one at the terminus of the original Quad Outfalls and the other at the terminus of the current Quad Outfalls. The seafood waste at the site was deepest within those two piles, generally exceeding six feet thick. The piles consisted of heavier waste materials, such as shell and bone, and appeared static in extent and depth. The peripheral areas of the site's seafood waste piles consisted mainly of a thin layer of fine organic sediment, a mixture of native detritus and some seafood waste. Smaller particulates discharged after screening was implemented had accumulated across a wider area than the wastes discharged earlier, since they stayed suspended longer

and could travel farther before settling. Thus, there were legacy waste piles located within a larger total extent of accumulated seafood waste. Waste accretion was observed beginning to bury the new Quad Outfall lines, shoreward of the terminus, during the 2015 survey. Surveyors also noted deposition in line with the outfall discharge. The low energy environment (lack of a discernable water current, typically less than 8 cm/s) within the embayment does not significantly redistribute deposited waste, and fine sediments at depth settle out quickly when disturbed.

Post-dredge surveying completed in July 2016 showed that there were approximately 4-6 inches of dredge residual overlying native sediment within much of the dredge footprint. Beggiatoa patches were still observed in the eastern portion of the site near the outfalls as well as outside the 3.04-acre dredge footprint in the western portion of the survey area. Sedimentary methane gas bubbles were still observed at 30 stations, mostly in the southern portion of the dredge area west of the Quad Outfalls, similar to the pre-survey distribution and indicating the continued presence of excess organic material in surface sediments.

Surveying in September 2019 showed a slight indication of material accretion 10 – 15 feet back from the Outfall 001A-D terminus. This area was exposed in 2017 and now shows localized deposition. The Outfall 001E diffuser pipe was completely exposed in 2017 but is now halfway buried on the south side. Additionally, an overall deposition of about 1 – 2 inches of algae and plankton appeared to be present and mixed in with Beggiatoa throughout and beyond the survey area.

Surveying April – June 2021 suggested that material has redistributed from the non-dredged upslope shoreline to lower areas within the dredging zone due to sediment slumping. The seafood waste at least half inch thick covers 2.75 acres.

Surveying May – June 2023 suggested that natural benthic recovery is occurring in large portions of the dredged area, albeit at a slower rate in the area around Outfall 001A-D (which still exhibits an absence of benthic organisms, minimal or absent sedimentary oxygen, and the presence of sedimentary methane). The extent of waste in the northern and northwestern portions of the removal area decreased since 2021. The outfall ports are still exposed, and accretion of waste on the outfall lines has not increased in the last few years.

Ambient Water Quality Monitoring

The Department reviewed 2013 – 2023 data submitted from the ambient water quality monitoring program described in Part 4.6.1. As summarized in Table 7, in the last eleven years the permittee recorded over 89 total violations of the 5 mg/L permit limit for DO within the portion of the water column below one meter depth.

UniSea noted that on the 2016 occasions when low DO values were observed, there were algae blooms in the ambient waters around the facility, and the algae as well as other outfalls in the area may have contributed to the depressed DO levels around the facility. UniSea's Best Management Practices (BMP) plan discusses the potential for seafood processing wastewater discharge to result in nutrient enrichment of the receiving waters. This enrichment can cause algal blooms.

Table 7: Dissolved Oxygen Ambient Water Quality Standard Violations

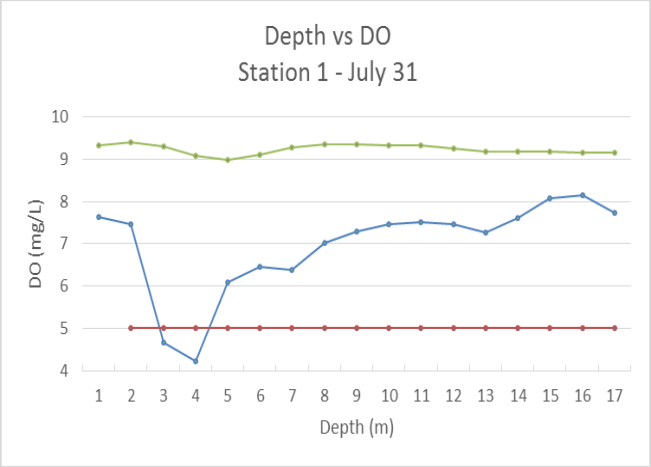
Year [a]	Sampling Date	Sampling Depth (m)	Min DO (mg/L)	Total Number of Violations [b]
2023	7/24	3 - 4	2.4	4
	8/21	3 - 8	2.1	11
2022	7/21	2	4.3	1 [c]
2021	8/31	2-6	3.8	12 [c]

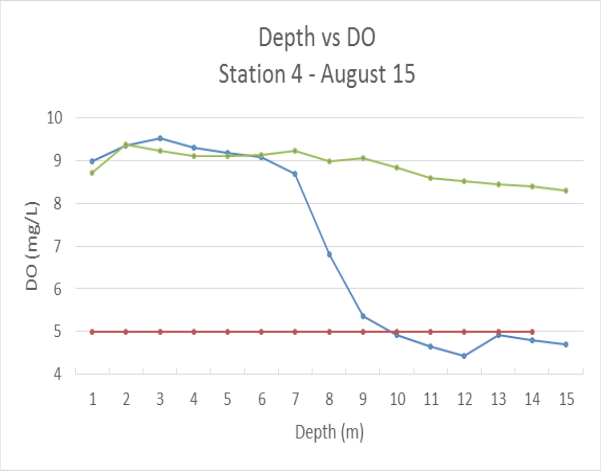
Year [a]	Sampling Date	Sampling Depth (m)	Min DO (mg/L)	Total Number of Violations [b]
2019	7/24	2 - 8	3.99	9
2017	7/31	3 – 7	4.14	10
	8/15	7 - 15	4.42	8
2016	7/15	2 – 5	2.799	10
	8/11	2 – 4	1.961	6 [c]
2014	7/3	1 – 7	4.075	18 [c]

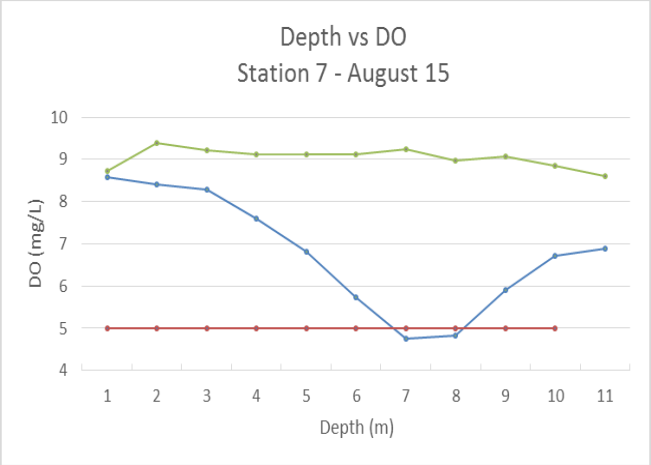
Footnotes:

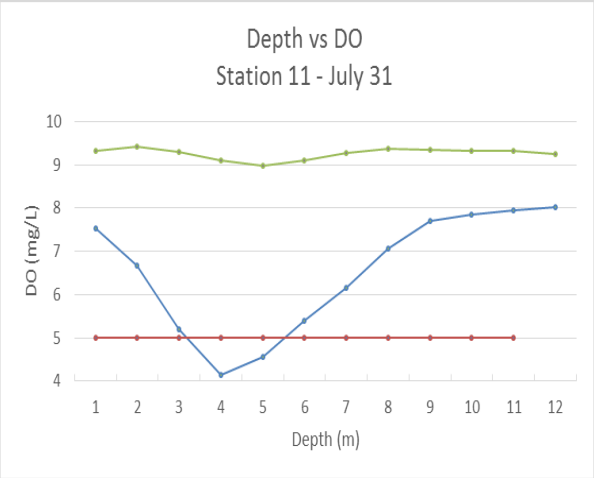
a. There were less than five violations of the 5 mg/L DO permit limit per year in the years 2013 and 2015 and none in 2018 or 2020.
b. These numbers represent the number of violations of the DO permit limit in the water column greater than one meter depth. Some of the violations were at far field stations, which may be influenced by other dischargers in the area.
c. In addition, surface DO concentrations (in the top meter of the water column) were below the 6 mg/L DO WQS at six stations on 7/3/2014 and one station on 8/11/2016, 8/31/2021, and 7/21/2022.

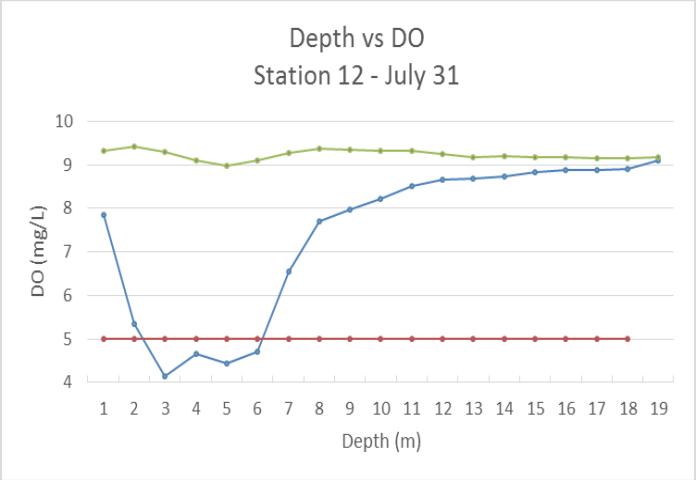
DEC analyzed the permittee's DO data tables from ambient monitoring in 2017 and noted that there was a notable drop-off in DO levels to under the permit limit, and it was more evident at the monitoring stations than at the reference station. The figure below shows graphed data gathered on July 31 and August 15, 2017 at six monitoring stations in comparison to data from the reference station and to the permit limit. The blue line shows the monitoring site's DO, the green line shows the reference site's DO, and the red line shows the permit limit. A map of the monitoring stations is shown in Figure 4.

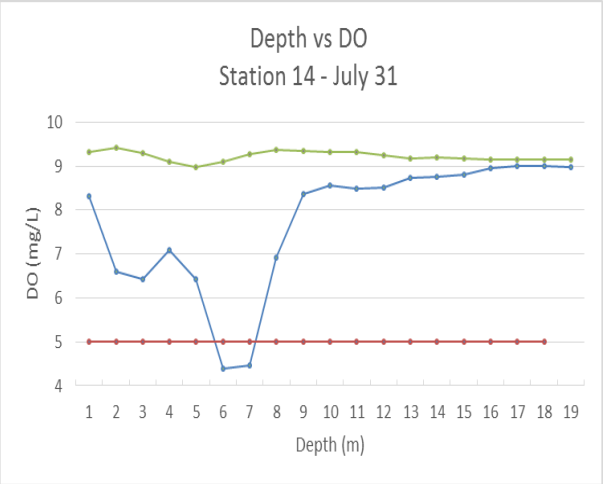












4.0 EFFLUENT LIMITS AND MONITORING REQUIREMENTS

4.1 Basis for Permit Effluent Limits

The CWA requires that the limits for a particular pollutant be the more stringent of either technology-based effluent limits (TBELs) or water quality-based effluent limits (WQBELs). TBELs are set according to the level of treatment that is achievable using available technology. EPA established ELGs for the Canned and Preserved Seafood Processing Point Source Category in 40 CFR Part 408. A WQBEL is designed to ensure that the WQS, 18 AAC 70 as amended June 26, 2003, are met for the waterbody as a whole. WQBELs may be more stringent than TBELs. A more extensive discussion providing the basis for the effluent limits in the permit is provided in APPENDIX B.

4.2 Basis for Effluent and Receiving Water Monitoring

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

4.3 General Requirements

4.3.1 Flow Meters

Mixing zone modeling requires certain parameter inputs (e.g., outfall depth, waterbody hydrodynamics, pollutant loading, flow, etc.) to assess mixing behavior and plume geometry. In order to accurately model environmental impacts as well as fully disclose all wastewaters discharged at the facility, the permittee needs to monitor the flow volumes to accurately determine pollutant loading for each outfall. Note, the daily flow used for pollutant loading calculations must represent the pollutant sampling day's total flow, not an average daily flow.

4.3.2 Outfall System Requirements

The permit includes a new requirement to conduct a pre-installation biological survey prior to outfall replacement or movement. The survey must demonstrate that the proposed outfall placement will not result in discharge into "living substrate." The surveyor is required to report ambient tidal current velocity and direction and the water chemistry on the survey day, including salinity, water temperature, density, turbidity, DO, and pH. These parameters should be taken on the day the survey is performed at the proposed outfall terminus location and depth, as a grab sample or in-situ probe sampling. For grab sampling at depth, a Van Dorn sampling bottle can be used to obtain water samples. The survey report should also contain seasonal data, if known.

The permit requires regular outfall system(s) inspections. These inspections may be performed with any number of techniques, such as pressure testing, dye testing, or visual, remotely operated vehicle, or diver inspection.

4.3.3 Waste Treatment System Inspection

The permit requires daily visual inspection of the discharge system. The permit prohibits the discharge of gloves, earplugs, rubber bands, or other equipment used during seafood processing that may be inadvertently entrained in the wastewater. Logs of daily inspections shall be kept at the facility and made available to DEC upon request.

The permit requires maintaining a written log of corrective actions taken on the solids recovery system(s) and occurrences of wastewater overflows, bypass incidents, and other operational problems. Examples of screened waste system corrective actions include screening system improvements, such as upstream removal of solids, or pump speed adjustments.

4.3.4 Monitoring and Reporting Requirements

Where sampling is required, the permittee must use a sufficiently sensitive EPA-approved test method that quantifies the pollutants to a level lower than applicable limits or WQS, or use the most sensitive test method available, per 40 CFR Part 136 (Guidelines Establishing Test Procedures for the Analysis of Pollutants), adopted by reference at 18 AAC 83.010(f).

Methods which a vendor has designated as EPA-equivalent, but which EPA has not approved for use in compliance monitoring, are not acceptable methods for the monitoring required in this permit.

The permit continues the requirement to monitor for "residues." Residues include floating and suspended solids, debris, foam, and scum and may cause a film, sheen, or discoloration on the water surface or cause a sludge, solid, or emulsion to be deposited upon adjoining shorelines or seafloor. The permit contains limits that are based on WQBELs. In compliance with 18 AAC 70.020(b)(20), the permittee shall not discharge effluents that cause a foam, film, sheen, scum, or deposit to form on the surface of the receiving water; the adjacent shoreline; or the structures, vessels, or vessel moorages of the adjacent

harbors. The permit requires recording the occurrence and extent (size and presence, or "none") of films, foam, scum, discoloration, or sheens on the sea surface and shoreline monitoring log.

4.3.5 Discharge Monitoring Report (DMR)

The permit requires that monitoring results be recorded on a DMR and submitted monthly. Copies shall be kept at the facility and made available to DEC upon request.

4.4 Effluent Limits and Monitoring Requirements

The following summarizes the effluent limits contained in the permit (see APPENDIX B for more details).

4.4.1 Outfall 001A-E Effluent Limits and Monitoring (Table 8 and Table 9)

The previous permit only required monitoring Outfall 001A-E for parameters other than flow during the months of February, June, July, August, September, and October under the premise that 'the sampling months coincide with fishing seasons and attendant high levels of pollutant discharge.' Since a review of discharge over the permit term showed that there was as much effluent flow in some previously unmonitored months as in monitored months, and given that concentrated surimi discharges occur during previously unmonitored months, the Department determined that it is appropriate to require monthly effluent monitoring in this permit.

The permit requires monitoring daily for effluent flow and weekly for TSS and pH, carried forward from the previous permit. DEC has changed the TSS (and BOD_5) sample type from a grab or composite sample to a composite sample. One grab sample is not sufficient to represent the variations in the effluent stream. Composite sampling is described in the *Standard Methods for the Examination of Water and Wastewater*, Part 1060B. Flow is limited to 7.3 mgd, as this was the highest flow modeled, and larger flows could result in a larger mixing zone that may not meet DEC requirements.

BOD_5 is required to be monitored May 1 – October 31 and is limited, as under the last permit, in accordance with the facility's 1995 Total Maximum Daily Load (TMDL) Waste Load Allocation (WLA). The previous permit only required BOD_5 monitoring from June 1 – October 31, but since monthly monitoring including May will be required under this permit, the permit requires BOD_5 monitoring during the full date range specified in the TMDL. The previous permit noted that the permittee could request using COD as a surrogate measure for BOD_5 if EPA approved the correlation. The Department did not retain the option to use a BOD_5 surrogate for reporting in this permit, in accordance with the finding in the 1975 ELG development document that COD is not a reliable predictor of BOD_5.

The permit adds required monitoring for non-petroleum O&G and turbidity. These parameters were not monitored for in the Outfall 001A-E effluent during the previous permit term. Since the parameters are pollutants of concern for seafood processing wastewater, monitoring is necessary in order for the Department to evaluate whether discharges might cause an exceedance of the WQS outside of the mixing zone.

The permit requires monitoring for TRC once per week, continued from the previous permit. See APPENDIX B, Part B.3.4.6 for additional information on the TRC WQBEL.

Monitoring ammonia in the Outfall 001A-E effluent is a new permit requirement. Temperature and density monitoring is required in concurrence with the ammonia monitoring in order for the Department to collect data that may be needed to conduct mixing zone modeling in future permit issuances. Ammonia was documented as a pollutant

in the 1975 Development Document for the seafood processing ELGs (40 CFR Part 408). Ammonia is entrained in fish parts and wastes and a fraction of it, depending on the pH of the receiving water, is in the un-ionized toxic form (EPA, 2010).

The permit does not limit the mass of SS discharged from Outfall 001, in accordance with the 1995 TMDL's statement that 'EPA has therefore determined that the limitation on SS residues applies only to particles of more than 0.5 mm diameter in average current speeds of 10 cm/s or less.' The permit requires seafood processing wastewater treatment to 0.5 mm or less, and UniSea discharges to receiving water with an annual average current velocity of 5 cm/s. The permit includes weekly SS monitoring, continued from the previous permit and in accordance with the TMDL's stated expectation that monitoring process wastewater discharges for SS would continue under reissued permits.

The permit includes new requirements to monitor for arsenic, copper, zinc, silver, and fecal coliform.

Table 8: Outfall 001A-E Effluent Limits and Monitoring Requirements

Parameter	Effluent Limits				Monitoring Requirements	
	Units [a]	Daily Minimum	Daily Maximum	Monthly Average	Sample Frequency	Sample Type
Flow [b]	mgd	N/A	7.3	Report	Daily	Measured
Biochemical Oxygen Demand (BOD_5)	mg/L	N/A	Report	Report	1/Week [d]	Composite [e]
	lbs/day [c]	N/A	297,000 [d]	185,000 [d]		
Total Suspended Solids (TSS)	mg/L	N/A	Report	Report	1/Week	Composite [e]
	lbs/day [c]	N/A	Report	Report		
Oil and Grease (O&G)	mg/L	N/A	Report	Report	1/Week	Grab
	lbs/day [c]	N/A	Report	Report		
pH	SU	6.5	8.5	N/A	1/Week	Grab
Total Residual Chlorine (TRC) [f]	mg/L	N/A	0.013 [g]	0.0075 [g]	1/Week	Grab
Temperature	°C	N/A	Report	Report	1/Week	Grab
Turbidity	NTU	N/A	Report	Report	1/Week	Grab
Density	kg/m^3	N/A	Report on Attachment A Only	N/A	1/Week	Grab
Total Ammonia, as N	mg/L	N/A	Report	Report	1/Month	Grab
Arsenic, Total Recoverable	µg/L	N/A	Report	Report	1/Quarter	Composite [e]
Copper, Total Recoverable	µg/L	N/A	Report	Report	1/Quarter	Composite [e]
Zinc, Total Recoverable	µg/L	N/A	Report	Report	1/Quarter	Composite [e]
Silver, Total Recoverable	µg/L	N/A	Report	Report	1/Quarter	Composite [e]
Fecal Coliform (FC)	FC/100 mL	N/A	Report	Report [h]	1/Quarter	Grab

Footnotes:

a. Units: mgd = million gallons per day, mg/L = milligrams per liter, lbs/day = pounds per day, SU = standard units, °C = degrees Celsius, NTU = Nephelometric Turbidity unit, kg/m^3 = kilograms per cubic meter, µg/L = micrograms per liter, FC/100 mL = colony forming units per 100 mL.

b. Daily flow recorded shall be the totalized 24-hour flow meter reading.

c. Loading in lbs/day = concentration (mg/L) x flow (mgd) x 8.34 (conversation factor). The permittee must use the calculations in Permit Appendix E and the daily flow (mgd) from the day sample collection occurred.

d. The BOD_5 limits and monitoring are applicable from May 1 – October 31.

e. The compositing period shall be for 24 hours or for the total amount of time on the sampling day during which there is flow from the outfall. The composite sample shall consist of at least one equal volume aliquot per every full three hours in the compositing period.

f. Monitoring for chlorine is not required if the permittee does not use chlorine as a disinfectant nor introduce it elsewhere in the seafood processing area.

g. Effluent limits for TRC are not quantifiable using EPA-approved analytical methods. The permittee will be in compliance with the effluent limits provided the TRC levels are below the compliance evaluation level of 0.1 mg/L.

h. When more than one sample is collected in a month, the FC average results must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero (0) with a one (1). The geometric mean of "n" quantities is the "nth" root of the quantities. For example, the geometric mean of 100, 200, and 300 is (100 x 200 x 300)^(1/3)= 181.7.

Table 9: Outfall 001A-E Settleable Solids (SS) Effluent Limit and Monitoring Requirements

Parameter	Effluent Limits				Monitoring Requirements	
	Units [a]	Daily	Monthly	Yearly	Sample Frequency	Sample Type
Imhoff Cone Result [b]	mL/L	Report Maximum	Report Average	N/A	1/Week	Grab
Daily Discharge	lbs/day	Report Maximum	Report Average	N/A		Calculate [c]
Monthly Total Discharge	lbs/ month	N/A	Report Total	N/A	N/A	Calculate [c]
Yearly Total Discharge	lbs/yr	N/A	N/A	Report Year-to-Date Total	N/A	Calculate [c]
1.13 g/mL or Facility-Specific Conversion Factor [d]	g/mL	N/A	Report on Attachment A Only	N/A	N/A	N/A

Footnotes:

a. Units: mL/L = milliliters per liter, lbs/day = pounds per day, lbs/yr = pounds per year, g/mL = grams per milliliter.
b. The permittee shall determine SS (mL/L) as the volume of solids settled in an Imhoff cone (Standard Methods 2540-F).
c. The permittee shall use the mass balance calculations/formulas found in Permit Appendix E.
d. The permittee shall use 1.13 g/mL for calculation for the first 12 months or until facility-specific conversion factor development, then report conversion factor used monthly.

4.4.2 Outfall 002A Effluent Limits and Monitoring (Table 10)

The permit requires monitoring daily for effluent flow, changed from weekly in the previous permit, and weekly for temperature, carried forward from the previous permit. The permit applies a temperature limit of 20 °C, continued from the previous permit. Flow is limited to 3.5 mgd, as this was the highest flow modeled, and larger flows could result in a larger mixing zone that may not meet DEC requirements.

The permit includes new requirements to monitor for pH, arsenic, copper, and zinc. The Department has determined that these requirements are appropriate for the Outfall 002A discharge, in accordance with the monitoring that non-contact cooling water dischargers must carry out under the state's AKG250000 general permit.

The permit includes new requirements to monitor for ammonia, TRC, TAqH, TAH, O&G, TSS, and COD. The Department has determined that these requirements are appropriate for the Outfall 002A discharge, as they have been historically detected in the effluent.

Table 10: Outfall 002A Effluent Limits and Monitoring Requirements

Parameter	Effluent Limits				Monitoring Requirements	
	Units [a]	Daily Minimum	Daily Maximum	Monthly Average	Sample Frequency	Sample Type
Flow [b]	mgd	N/A	3.5	Report	Daily	Measured/ estimated
Temperature	˚C	N/A	20	Report	1/Week	Grab
pH	SU	6.5	8.5	N/A	1/Week	Grab
Total Ammonia, as N	mg/L	N/A	Report	Report	1/Month [c]	Grab
Arsenic, Total Recoverable	µg/L	N/A	Report	Report	1/Quarter [c]	Composite [d]
Copper, Total Recoverable	µg/L	N/A	Report	Report	1/Quarter	Composite [d]
Zinc, Total Recoverable	µg/L	N/A	Report	Report	1/Quarter	Composite [d]
Total Residual Chlorine (TRC)	mg/L	N/A	0.013 [e]	0.0075 [e]	1/Quarter	Grab
Total Aqueous Hydrocarbons (TAqH)	µg/L	N/A	15	Report	1/Quarter [f]	Grab
Total Aromatic Hydrocarbons (TAH)	µg/L	N/A	10	Report	1/Quarter [f]	Grab
Oil and Grease (O&G)	mg/L	N/A	Report	Report	1/Quarter [c]	Grab
Total Suspended Solids (TSS)	mg/L	N/A	Report	Report	1/Quarter [c]	Composite [d]
Chemical Oxygen Demand (COD)	mg/L	N/A	Report	Report	1/Quarter [c]	Composite [d]

Footnotes:

a. Units: mgd = million gallons per day, °C = degrees Celsius, SU = standard units, mg/L = milligrams per liter, µg/L = micrograms per liter.

b. Daily flow recorded shall be the totalized 24-hour flow meter reading.

c. The permittee may request in writing that monitoring frequencies be reduced or eliminated for the parameters after two years of monitoring and reporting if results indicate no detections outside of applicable water quality criteria. Monitoring reductions can only occur if prior written approval from the Department is received.

d. The compositing period shall be for 24 hours or for the total amount of time on the sampling day during which there is flow from the outfall. The composite sample shall consist of at least one equal volume aliquot per every full three hours in the compositing period.

e. Effluent limits for TRC are not quantifiable using EPA-approved analytical methods. The permittee will be in compliance with the effluent limits provided the TRC levels are below the compliance evaluation level of 0.1 mg/L.

f. TAH/TAqH sampling must occur as effluent is discharged directly after the sump exits recirculation mode after an oily water alarm.

4.4.3 Outfall 003A Effluent Limits and Monitoring (Table 11)

There was no required Outfall 003A monitoring under the previous permit. To parallel the monitoring required for noncontact water discharged from Outfall 002A, the permit requires monitoring Outfall 003A daily for effluent flow and weekly for temperature. The permit applies a temperature limit of 20 °C, in accordance with updated mixing zone modeling. Flow is limited to 4.9 mgd, as this was the highest flow modeled, and larger flows could result in a larger mixing zone that may not meet DEC requirements.

Scrubber water contains entrained organic material (all process air and vapor from the drier enter the scrubber, where it is sprayed with seawater, condensed, and discharged). The effluent flow has not previously been monitored for other identified seafood processing wastewater pollutants of concern identified under Part 2.1.3. Since the Outfall 003A discharge wastewater is contact wastewater, DEC is requiring that the permittee monitor pH, TRC, and ammonia to make future determinations about the need for WQBELs and/or the need for specific mixing zone authorizations for those parameters.

The permit includes new requirements to monitor for copper and fecal coliform.

Table 11: Outfall 003A Effluent Limits and Monitoring Requirements

Parameter	Effluent Limits				Monitoring Requirements	
	Units [a]	Daily Minimum	Daily Maximum	Monthly Average	Sample Frequency	Sample Type
Flow [b]	mgd	N/A	4.9	Report	Daily	Measured/ estimated
Temperature	˚C	N/A	20	Report	1/Week	Grab
pH	SU	6.5	8.5	N/A	1/Week	Grab
Total Ammonia, as N	mg/L	N/A	Report	N/A	1/Month [c]	Grab
Copper, Total Recoverable	µg/L	N/A	Report	Report	1/Quarter	Composite [d]
Fecal Coliform (FC)	FC/100 mL	N/A	Report	Report [e]	1/Quarter	Grab
Total Residual Chlorine (TRC) [f]	mg/L	N/A	0.013 [g]	0.0075 [g]	1/Quarter	Grab

Footnotes:

b. Units: mgd = million gallons per day, °C = degrees Celsius, SU = standard units, mg/L = milligrams per liter, µg/L = micrograms per liter, FC/100 mL = colony forming units per 100 mL.

c. Daily flow recorded shall be the totalized 24-hour flow meter reading.

d. The permittee may request in writing that monitoring frequencies be reduced or eliminated for the parameters after two years of monitoring and reporting if results indicate no detections outside of applicable water quality criteria. Monitoring reductions can only occur if prior written approval from the Department is received.

e. The compositing period shall be for 24 hours or for the total amount of time on the sampling day during which there is flow from the outfall. The composite sample shall consist of at least one equal volume aliquot per every full three hours in the compositing period.

f. When more than one sample is collected in a month, the FC average results must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero (0) with a one (1). The geometric mean of "n" quantities is the "nth" root of the quantities. For example, the geometric mean of 100, 200, and 300 is (100 x 200 x 300)^(1/3)= 181.7.

g. Monitoring for chlorine is not required if the permittee does not use chlorine as a disinfectant nor introduce it elsewhere in the seafood processing area.

h. Effluent limits for TRC are not quantifiable using EPA-approved analytical methods. The permittee will be in compliance with the effluent limits provided the TRC levels are below the compliance evaluation level of 0.1 mg/L.

4.5 Effluent Monitoring

4.5.1 Routine Monitoring

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. These additional samples shall be used for averaging if they are conducted using the Department-approved test methods (generally found in 18 AAC 70 and 40 CFR Part 136 [adopted by reference in 18 AAC 83.010(f)]). All limits that require averaging measurements shall be calculated using an arithmetic mean unless the Department specifies another method in the permit. Monitoring more frequently for pollutant parameters found in Table 8 and Table 9 must also comply with requirements in Permit Part 1.5.2.3.

4.5.2 Pollutant Loading Calculation

The permit specifies the equations to use in calculating mass loading rates to ensure consistent reporting. The permit requires reporting the daily mass loading using a multi-step conversion process. Examples of the loading calculations can be found in Permit Appendix E.

At the time of writing this fact sheet it is unknown where the previous permit's EPA-estimated 1.17 g/mL wet weight density factor was derived, as it is not mentioned in the previous fact sheet. The South Unalaska Bay TMDL references a theoretical processing waste solids density of 1.13 g/cm^3. Using theoretical estimated SS wet weight densities may result in under- or over-reporting the SS lbs/day discharged, so the permit requires the permittee to ascertain a facility-specific SS conversion factor instead, within 12 months after the permit effective date. The Department understands that the previous permit included a typo in the density units (1.17 mg/mL instead of the correct units, g/mL). The error has been corrected in this permit.

4.6 Receiving Waterbody Limits and Monitoring Requirements

4.6.1 Water Quality Monitoring

The previous permit required UniSea to carry out ambient water quality monitoring at the boundary of the mixing zone and beyond for DO, temperature, density, and salinity every two weeks during operation and discharge from July through October. DEC staff recommended 17 station locations (16 monitoring locations and one reference station) in 2002, selected in order to closely monitor the area in the small cove where the discharge occurs and to monitor known drift of the plume towards Captains Bay. In 2012, UniSea switched from 16 to ten monitoring stations to reduce data source redundancy. Data collection was required at the water surface, one meter above the sea floor, and at one meter increments throughout the water column at each station. The permit required the water quality study to verify the discharge was not degrading the oxygen available to aquatic life in the water column. As noted in Part 3.0, data collection since the previous permit issuance has shown several permit limit violations in the receiving waters. Therefore, to monitor the waterbody's impaired status, the DO monitoring program is continued in the permit. UniSea's sampling stations for DO, temperature, density, and salinity are as follows (see Figure 4 for a map).

STATION I.D.	LATITUDE	LONGITUDE
Near Field #1	N 53° 52' 45.0"	W 166° 33' 39.0"
Near Field #2	N 53° 52' 48.0"	W 166° 33' 42.0"
Near Field #3	N 53° 52' 49.8"	W 166° 33' 39.0"
Far Field #4	N 53° 52' 33.6"	W 166° 34' 01.8"
Far Field #5	N 53° 52' 40.2"	W 166° 34' 12.0"
Far Field #7	N 53° 52' 43.2"	W 166° 33' 48.0"
Far Field #8	N 53° 52' 49.8"	W 166° 34' 07.2"
Far Field #11	N 53° 53' 00.0"	W 166° 33' 34.8"
Far Field #12	N 53° 53' 03.0"	W 166° 33' 40.8"
Far Field #14	N 53° 53' 12.0"	W 166° 33' 25.2"
Background #17	N 53° 54' 25.2"	W 166° 34' 48.0"

4.6.2 Zone of Deposit and Seafloor Monitoring

A ZOD is defined as a limited area where substances may be allowed to be deposited on the seafloor of marine waters. In accordance with state regulations at 18 AAC 70.210, the Department may issue a permit that allows a deposit of substances on the seafloor of marine waters within set limits. The water quality criteria (WQC) in 18 AAC 70.020(b) for marine residues may be exceeded in a ZOD. However, the WQS must be met at every point outside the ZOD. The residue standard applies to any residue discharge (whether permitted or unpermitted); however, one of the most prevalent applications of the residues standard is to permitted discharges of residues in marine waters from seafood processing facilities.

As found in 18 AAC 70.210(b), in deciding whether to authorize a ZOD in a permit, the Department considers the following.

- Alternatives that would eliminate, or reduce, any adverse effects of the deposit;
- The potential direct and indirect impacts on human health;
- The potential impacts on aquatic life and other wildlife, including the potential for bioaccumulation and persistence;
- The potential impacts on other uses of the waterbody;
- The expected duration of the deposit and any adverse effects; and
- The potential transport of pollutants by biological, physical, and chemical processes.

The previous permit did not authorize a Zone of Deposit. The permit required bi-annual surveys of the seafloor to determine compliance with the WQS for settleable residues in marine waters and to monitor the bioremediation of the historic waste piles. As described in Part 3.0, surveying since the previous permit issuance has shown continuing violation of the WQS for residues.

The permit continues the requirement for seafloor monitoring to determine compliance with marine WQS for residues and to document the location, size, and boundaries of continuous and discontinuous seafood processing waste (residues) coverage. In consultation with EPA, DEC established a new methodology for determining which seafood waste deposits count toward the 1.0-acre ZOD limit. The permit requires those seafloor areas with continuous coverage (95-100%) or greater than 50% discontinuous coverage be counted toward the 1.0-acre ZOD limit. The surveys must be done in the second quarter of the year, for consistency when comparing pile size and configuration from year to year.

The permittee shall map and report the total summed area(s) of seafood waste deposit coverage within a project area ZOD boundary. Permit Appendix F includes an initial project area ZOD for the UniSea facility. 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 terminuses.

The required map of seafood waste coverage areas must include continuous coverage (95-100%) and discontinuous coverage ranging from 50% to 94%, which are the coverage areas that count toward the 1.0-acre ZOD limit. The map must also include discontinuous coverage areas ranging from 10% to 49% and those areas with “Trace” coverage (less than 10%). Additionally, the seafloor surveying must determine the approximate thickness of the seafood waste deposits.

The selection of 50% as the coverage threshold for counting towards the 1.0-acre ZOD limit was based on results from two published studies that examined the effects of wood waste discharges from pulp mills. DEC acknowledges that the findings from these studies are not directly applicable to seafood discharges since the studied material was wood, not seafood waste. However, DEC finds that the identified wood waste studies currently provide the most meaningful proxy data until this permit term's seafloor surveying data is collected and analyzed 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 permit establishes clear data gathering and reporting protocols in Permit Appendix F (see Table 12 schedule).

As described in Part 3.0, the most recent reported pile size (from 2023) was 1.61 acres. The permit contains a Compliance Schedule which includes specific actions UniSea must complete to achieve compliance with the 1.0-acre ZOD limit and sets the interim limit at 1.61 acres.

Table 12: Seafloor Monitoring Schedule

Survey Type	Sample Location	Survey Result Triggers	Frequency
Part I Seafloor Survey	Project Area ZOD	Report as required in Permit Appendix F	The first full year of permit coverage
Part II Seafloor Survey	Project Area ZOD	Report as required in Permit Appendix F	The second full year of permit coverage
Additional Part II Seafloor Surveys	Project Area ZOD	Previous Part II Seafloor Survey reporting ≥ **0.75 acres** of deposits	Required every year, See Permit Part 1.8.3.5.2.1
	Project Area ZOD	Previous Part II Seafloor Survey reporting < **0.75 acres** of deposits	Required every two years, See Permit Part 1.8.3.5.2.2
Benthic Assessment Survey	Project Area ZOD	N/A	The third full year of permit coverage

4.6.3 Sea Surface and Shoreline Monitoring

The previous permit required daily observations of residues on the water surface and weekly observations of the shoreline within a 300-foot radius of the end of Outfall 001A-E and a 300-foot perimeter around the UniSea docks and loading areas. The purpose of the visual monitoring for residues was to determine compliance with the WQS for residues in marine waters. These requirements are continued in this permit, although the distance extent of monitoring was broadened in order to more adequately cover potentially impacted areas, and shoreline monitoring was changed to daily. The permittee must also record observations at various tide cycle phases during the calendar month.

The permit requires the facility's observer to be located at an area from which they can see the sea surface area above each outfall terminus. The observer should also be able to see the shoreline areas of the processing facility's seaward boundaries (encompassing a minimum of 100 feet to either side of the parcel lines, and including docks and piers) while a seafood wastewater discharge is occurring. The purpose of the monitoring is to record the occurrence and extent of films, foam, scum, discoloration, or sheens (18 AAC 70.020(b)(20)). Monitoring done by the permittee must include recording the occurrence and numbers of threatened and endangered species in the survey area(s).

The permittee must submit a summary of sea surface and shoreline residues noncompliance occurrences (observations of films, foams, scum, discolorations, or sheens beyond the boundary of the mixing zone) with the Annual Report.

5.0 RECEIVING WATERBODY

5.1 Description of Receiving Waterbody

5.1.1 Nature of Unalaska Bay, Iliuliuk Bay, and Iliuliuk Harbor

Unalaska Bay is located on the north, or Bering Sea side, of Unalaska Island in the eastern Aleutian Islands. It lies at roughly 54° N latitude, 166° 30' W longitude. The bay is the foremost safe harbor and anchorage in the eastern Aleutian Islands and shelters both fishing and cargo vessels. It is about 790 air miles southwest of Anchorage and supports a national airport along its limited coastal bench.

Greater Unalaska Bay, consisting of a number of contiguous subsidiary bays, is 10.4 nautical miles (nm) wide at its mouth from Cape Cheerful on the west to Cape Kalekta on the east. It is roughly 11.6 nm from the mouth of the bay to its head at the south end of Captains Bay. Greater Unalaska Bay is approximately 87 square nm in area and has roughly 50 nm of shoreline.

Iliuliuk Bay is a contiguous and subsidiary bay on the southeast side of Unalaska Bay. It is approximately 1.4 miles wide and 2.7 miles long. Iliuliuk Bay is a steep-sided fjord bay with up to 80% of its width consisting of a relatively flat seafloor deeper than -100 feet, bordered by the mainland of Unalaska Island on the east, Dutch Harbor and Amaknak Island on the west, a convergence of these two islands separated by the entrance to the harbor on the south, and a relatively shallow sill of approximately -45 foot depth on the north. Iliuliuk Harbor is a small, highly sheltered harbor approximately 500 yds across with narrow passage to Iliuliuk Bay through a reefed east channel and to Captains Bay through a hazardous south channel.

5.1.2 Climate

The eastern Aleutian Islands are characterized by a maritime climate. Low-lying fog, overcast skies, rain, and drizzle dominate weather conditions along the islands. Average annual precipitation in the area is estimated to be about 61 inches, some of which falls as snow. Fog occurs frequently in the summer. The mean annual temperature for Dutch Harbor is approximately 41 degrees Fahrenheit (°F), with the average temperature being approximately 32.5 °F in February and approximately 53.5 °F in August.

Unalaska weather data indicate moderate to strong winds throughout the year. The windier part of the year is generally from October through April, and the less windy time of the year is generally from May through September (Weather Spark 2022). Average wind speeds for summer and winter are 11.5 miles per hour (mph; 5.1 meters per second [m/s]) and 15.7 mph (7.0 m/s), respectively.

5.1.3 Water Column

The waters of greater Unalaska Bay are both marine (outer) and estuarine (inner). There is a strong stratification between the water surface and water bottom during the summer (average temperatures of 4.9 degrees Celsius [°C] and 9.4 °C, respectively, and average salinity of 20 parts per trillion [ppt] and 33 ppt, respectively) and uniform stratification during the winter (average temperature of 4.8 °C and average salinity of 25 ppt).

Vertical gradients of temperature and salinity which cause stratification of marine and estuarine waters are strongly seasonal, forming in May and June, becoming more pronounced in July through middle-to-late September, and then rapidly returning to an unstratified condition in October.

Tides in greater Unalaska Bay are relatively small. The mean tidal amplitude (vertical distance from mean high water to mean low water) is approximately one meter. The maximum tidal amplitude is about two meters. The circulation study of greater Unalaska Bay (CH2M-Hill, 1994) indicated that the water circulation within the bay is driven primarily by winds (~90%) and secondarily by tides (~10%). This results in currents which are strongly seasonal and weakly semi-diurnal in direction and velocity. It is only during periods of low-speed winds that tidal currents might dominate the circulation patterns of the bay.

On a large scale, the modeling of circulation in greater Unalaska Bay indicates that wind-driven currents are 5 to 15 cm/s along the western shores of Amaknak Island, the eastern shore of Hog Island and through the pass between the two islands, through the eastern mouth of Captains Bay and Iliuliuk Harbor, and along the northeastern shores of Unalaska Bay proper. The maximum current velocities are approximately 200 meters north of Arch Rock and Outfall 001, with current flow directions to the northeast during the ebb tide following the natural bathymetry of Unalaska Bay. Velocities within the deeper water column are uniformly below 10 cm/s, with surface currents of approximately 20 cm/s during peak flow conditions, with an average annual current velocity of approximately 4.9 cm/s for the UniSea Dutch Harbor Facility Outfall 001 locations. In other areas in the bay (such as at the Outfall 002 and Outfall 003 locations), the wind-driven currents range between 1 and 5 cm/s. Studies indicate that currents in the deep basins of Captains Bay and Dutch Harbor-Iliuliuk Bay may be less than 1 cm/s during much of the year (CH2M-Hill, 1994). The major difference between summer and winter wind-driven circulation patterns is the change in current direction in many sections of the bay.

The circulation study of greater Unalaska Bay suggests that the flushing time required for 95% of the water at a given location in the bay to be replaced by ocean water from outside of the bay ranges from 20 days in central Unalaska Bay to 70 days at the head of Captains Bay. No appreciable differences in flushing times appear to result from changes in wind patterns between summer and winter over most of the year.

Captains Bay and Iliuliuk Bay-Dutch Harbor are the exceptions to these generalizations on flushing time. The replacement of the water in the Captains Bay 113-meter deep basin below a 29-meter deep sill requires the development of a pronounced hydraulic pressure head at the south end of the bay during the unstratified conditions of winter. Flushing of this deep basin occurs intermittently during strong, persistent winds or storms from the north. Similar processes constrain and renew Iliuliuk Bay-Dutch Harbor.

Three large freshwater streams enter greater Unalaska Bay: the Makushin River of Broad Bay, the Shaishnikof River at the head of Captains Bay, and the Iliuliuk River which drains Unalaska Lake east of Iliuliuk Harbor. All three streams are utilized by salmon for spawning. At least five other streams flow into greater Unalaska Bay year-round and more than thirty other streams flow into the bay seasonally.

5.1.4 Seafloor

Greater Unalaska Bay's subsurface topography, or bathymetry, is complex, consisting of five prominent sills (i.e., pronounced elevations in the seafloor) and four water basins (i.e., pronounced depressions). The northernmost basin is established by Chelan Bank in the north and extends from the Bering Sea into the mouth of Unalaska Bay. The second basin,

in Unalaska Bay proper, extends from the mouth adjacent Eider Point along the western portion of the bay and divides into Nateekin Bay to the southwest and South Unalaska Bay (a.k.a. "Processor Bay"). Captains Bay is a separate distinct basin enclosed by steep coast on three sides; it is separated by sills across the west and east entrances. Iliuliuk Bay and Dutch Harbor constitute a single basin bordered by a sill extending from the Dutch Harbor spit east to Unalaska Island on its north side and by the convergence of Amaknak Island and Unalaska Island and the shallower Iliuliuk Harbor to the south.

This information suggests that the bays are typical of deep, steep-sided fjords with sills across their entrances. Circulation in the deep basins of such bays may be restricted seasonally due to a stratified water column and decreased bottom currents. Such basins may act as traps for SS and nutrients and experience seasonal oxygen depletion.

5.2 Water Quality Standards

Regulations in 18 AAC 70 require that the conditions in permits ensure compliance with the WQS. The state's WQS are composed of use classifications, numeric and/or narrative WQC, and an Antidegradation Policy. The use classification system identifies the designated uses that each waterbody is expected to achieve. The numeric and/or narrative WQC are the criteria deemed necessary by the state to support the designated use classification of each waterbody. The Antidegradation Policy ensures that the existing uses and the level of water quality necessary to protect the uses are maintained and protected.

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

The receiving waters for the proposed discharges, Unalaska Bay and Iliuliuk Harbor, have not been reclassified, nor have site-specific WQC been established. Accordingly, Unalaska Bay and Iliuliuk Harbor must be protected for all marine use classes listed in 18 AAC 70.020(a)(2). These marine water designated use classes consist of the following: water supply for aquaculture, seafood processing, and industrial; water recreation for contact and secondary recreation; growth and propagation of fish, shellfish, other aquatic life, and wildlife; and harvesting for consumption of raw mollusks or other raw aquatic life.

5.3 Water Quality Status of Receiving Water

Any part of a waterbody for which the water quality does not or is not expected to meet applicable WQS is defined as a "water quality limited segment" and placed on the state's impaired waterbody list. Section 303(d) of the CWA requires states to develop a TMDL management plan for a waterbody determined to be water quality limited. The TMDL documents the amount of a pollutant a waterbody can assimilate without violating a state's WQS and allocates that load to known point sources and nonpoint sources.

South Unalaska Bay is listed as a Category 4a impaired waterbody for SS residues and low DO. A Category 4a waterbody is an impaired waterbody for which an EPA-approved TMDL exists. Two separate TMDLs for the waterbody, one for SS residues and one for BOD_5, were published by EPA in 1995. The permit implements requirements from both of the TMDLs, as discussed in Part 4.4.1.

Iliuliuk Harbor nearshore area is listed as Category 4a (impaired but with a recovery plan in place). It was Section 303(d) listed in 1990 for non-attainment of the petroleum hydrocarbons WQS. A TMDL for petroleum hydrocarbons, approved by EPA in September 2010, will minimize any new petroleum hydrocarbon inputs to the area.

As part of the TMDL development process, DEC conducted an existing data compilation to identify and prioritize potential risk sources for the Dutch Harbor-Iliuliuk Harbor-Iliuliuk Bay area that focused on sediment and surface water petroleum contamination. Conclusions from this effort are available in a June 2006 report, *Dutch Harbor Water Quality and Impairment Analysis*.

Based on these conclusions, monitoring was conducted to investigate potential areas of impairment, including a 2007 evaluation documented in the report *Water Quality Assessment Dutch Harbor, Iliuliuk Bay, Iliuliuk Harbor – Unalaska, Alaska*. The 2007 study found that ambient WQS for total aromatic hydrocarbons (TAH) and total aqueous hydrocarbons (TAqH) were met but that there were polycyclic aromatic hydrocarbons (PAHs) present in the sediments of all three waterbodies, with Iliuliuk Harbor being the most impacted.

The TMDL indicates the need for consistent development and the application of BMPs at docks and harbors to minimize the potential for fuel and oil spills in the study area, since the impairment conditions are thought to be potentially exacerbated by current sources such as occasional oil spills and the day-to-day heavy boat traffic, maintenance, and docking activities associated with the large shipping and fishing industries that use the harbors. UniSea's annual reports over the last ten years have reported numerous petroleum spills and visible sheens on the water surface, attributed to spills drifting in to the facility area, vessel leaks and repair activities, and other unknown sources. The private docks in the area, including at the UniSea facility, are subject to EPA's Oil Pollution Prevention regulations, which generally require developing and implementing a Spill Prevention, Control, and Countermeasure (SPCC) plan. There is vessel fueling by private contractor trucks at the UniSea docks. Additionally, vessels at the facility can cause leaks from fuel oil in deck drums or portable equipment or from oily bilge water pumping while vessels are moored. The permit continues to specify that petroleum is a prohibited discharge from the UniSea facility. The permit also requires that the UniSea BMP Plan be consistent with the City of Unalaska's master BMP Plan for public dock operations to provide consistency for vessels in the area, as recommended in the TMDL. The permit requires, carried from the previous permit, that any oil or hazardous substance spills from the facility or from a vessel at the facility be immediately reported to the U.S. Coast Guard (USCG) and to DEC.

5.4 Mixing Zone Analysis

In accordance with state regulations at 18 AAC 70.240, the Department has authority to authorize a mixing zone in a permit. A chronic mixing zone is sized to protect the ecology of the waterbody as a whole and an acute mixing zone is sized to prevent lethality to passing organisms.

The 2003 permit included an Outfall 001A-D mixing zone that extended 100 feet around the end of each of the four discharge pipes for temperature, color, turbidity, residues, DO, sediment, nonpetroleum O&G, and TRC. The permit also included an Outfall 001E mixing zone that extended 100 feet around the end of the discharge point for the same parameters. Finally, the permit included a mixing zone for Outfall 002A for temperature, color, and turbidity. It was a vertical cylinder with a 100-foot radius from the point of discharge.

The permittee submitted updated mixing zone modeling, encompassing Outfall 001A-E, Outfall 002A, and Outfall 003A, in December 2022. Using data included in UniSea's application, DEC modeled mixing zones and calculated dilution factors using the Cornell Mixing Zone Expert System (CORMIX) version 12.0 modeling program. CORMIX is a widely used and broadly accepted modeling tool for accurate and reliable point source mixing analysis.

Inputs to CORMIX included the maximum effluent concentration and the acute and chronic WQC for various parameters which demonstrated RP to exceed WQC at the end of pipe prior to discharge, as well as site-specific discharge and ambient data such as varying tidal velocities that

simulate the alternating currents associated with the flow and ebb of tides in South Unalaska Bay.

Mixing zones for metals, fecal coliform, turbidity, and total ammonia would be too large to approve under 18 AAC 70.240 at the levels currently discharged by the facility. Accordingly, the facility has a Compliance Schedule under the permit (Permit Part 1.10) to meet WQS end-of-pipe or apply for approvable mixing zones for those parameters.

Other data inputs required for the mixing zone modeling included the depth of the receiving water at the outfall, ambient current velocity, wind velocity, and outfall and diffuser specifications such as the size, direction, and number of ports. Based on the inputs, CORMIX predicted the distance at which the parameters would meet WQS as well as the corresponding dilution at that point.

APPENDIX C, Mixing Zone Analysis Checklist, outlines criteria that must be met in order for the Department to authorize 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. The following summarizes the Department's mixing zone analysis:

5.4.1 Size

In accordance with 18 AAC 70.240(k), the mixing zones must be as small as practicable. In order to ensure that the mixing zones were as small as practicable, DEC used CORMIX to model the mixing zones at varying critical tidal velocities, effluent temperatures, effluent flow rates, and ambient density profiles. Regulations at 18 AAC 70.240(b)(2) require the Department to consider the characteristics of the effluent after treatment of the wastewater. DEC reviewed effluent data from 2022 to determine which parameters had RP to exceed WQS at the end of pipe.

Table 13 through Table 16 summarize CORMIX inputs that were used to model the mixing zones.

The Department examined summer and winter scenarios at the 10^{th}, 50^{th}, and 90^{th} percentile ambient currents, using density stratifications available via salinity profiles for the receiving water and varied effluent temperature and effluent flow reflecting data reported by the permittee.

The Department sized the mixing zones according to summer 10^{th} percentile current conditions, which were the critical conditions.

In accordance with 18 AAC 70.240, the Department determined that the size of the mixing zones for UniSea's discharges is appropriate. The Outfall 001A-E mixing zone sizes are continued from the previous permit. The Outfall 002A and Outfall 003A mixing zones correspond to a dilution of 1.4 (chronic). The mixing zones are sized to ensure: 1) the WQC found in 18 AAC 70 are met at the boundary of the mixing zones, 2) the mixing zones are as small as practicable, and 3) compliance with all other applicable mixing zone regulations.

Table 13: CORMIX Density Gradients

Table 2.1
Seasonal Ambient Temperature, Salinity, and
Density Data Modeling Input Parameters for Unalaska Bay

Season	Stratification	Location in Water Column	Temperature (°C) [1]	Salinity (ppt) [2]	Density [3] (kg/m^3)
Summer	Strong	Surface	9.4	20	1,015.25
		Bottom	4.9	33	1,026.29
Winter	Uniform	Surface	4.8	25	1,019.91
		Bottom	4.8	25	1,019.91

Notes:

1 https://seatemperature.info/unalaska-water-temperature.html
2 RPS 2014.
3 Calculated using One Atmosphere International Equation of State of Seawater (*Background Papers and Supporting Data on the InternationalEquation of State of Seawater 1980*, UNESCO 1981).

Abbreviations:

°C Degrees Celsius
kg/m^3 Kilograms per cubic meter
ppt Parts per trillion

Table 14: CORMIX Current Speeds

Table 2.3
Ambient Current Velocities (U_A) for UniSea Outfalls

Outfall	Minimum (10^{th} percentile)	Median (50^{th} percentile)	Maximum (90^{th} percentile)	Units
001A-D	1.8	5	13	cm/s
001E	1.8	5	13	cm/s
002	1.4	3	4.6	cm/s
003	1.4	3	4.6	cm/s

Abbreviations:

cm/s Centimeters per second
U_A Current velocity

Table 15: CORMIX Outfall Configurations

Table 2.4
Outfall Parameters for CORMIX Modeling

Parameter	Units	CORMIX Symbol	Outfall			
			001A-D	001E	002	003
Flow Field Data						
Average water depth near discharge	ft	H_A	70	80	24.1	28.3 [1]
Depth at Discharge	ft	H_D	70	80	24.1	28.3 [1]
Steady/Unsteady			Steady	Steady	Steady	Steady
Darcy-Weisbach		f	0.1	0.1	0.1	0.1
Bounded/Unbounded			Unbounded	Unbounded	Unbounded	Unbounded
Discharge Geometry Single Port						
Cormix Model Type [2]			CORMIX1 Single Port	CORMIX1 Single Port	CORMIX1 Single Port	CORMIX2 Multiport
Nearest bank			Right	Right	Right	--
Port diameter	inches	D_0	10, 10, 12, 12	10	18	--
Effective area of combined ports (ft^2)	ft^2	A_0	2.7	0.5	1.8	--
Distance to nearest bank	m	DISTB	42.1	43.9	0.8	--
Port height above bottom	m	h_0	3	3	4.9	--
Vertical Angle	°	Θ_0	15	15	0	--
Horizontal Angle	°	σ_0	90	90	90	--
Discharge Geometry Multi Port						
Nearest bank			--	--	--	Right
			--	--	--	Alternating/Vertical
No. Openings	#		--	--	--	10
Diffuser length	ft	LD	--	--	--	21
Dist to 1st endpoint	ft	YB1	--	--	--	1
Dist to 2nd endpoint	ft	YB2	--	--	--	1
Port Height	ft	h_0	--	--	--	23.9 [3]
Port Diameter	inches	D_0	--	--	--	8
Contraction Ratio		CR0	--	--	--	1
Vert Angle	°	Θ	--	--	--	-90
Align. Angle	°	y	--	--	--	0
Nozzle direction:			--	--	--	Same
Mixing Zone Data						
Toxic/Non-Toxic			Non-Toxic Effluent	Non-Toxic Effluent	Non-Toxic Effluent	Non-Toxic Effluent
WQ Standard/No WQ Standard			No WQ Standard	No WQ Standard	No WQ Standard	No WQ Standard
Downstream distance	ft	XREG	100	100	100	100
Region of Interest	m	XINT	1,500	1,500	1,500	2,000
Grid Intervals for Display		NSTEP	100	100	100	100

Notes:

Blank cells are intentional.

-- Not applicable

1 Schematized as 21 feet.

2 CORMIX1 is the model used for single port discharges and CORMIX2 is the model used for multiport diffuser discharges.

3 Schematized as 16.7 feet.

Abbreviations:

CORMIX Cornell Mixing Zone Expert System

ft Feet

ft^2 Square feet

HHW Higher high water

m Meters

WQ Water quality

Table 16: CORMIX Effluent Characterization

Table 3.1
Effluent Parameters for CORMIX Modeling

Parameter	Units	Symbol	Outfall			
			001A-D	001E	002	003
Effluent discharge flow [1] (Max Summer)	MGD	$Q_{0\ Summer}$	5.5	1.2	3.5	4.9
Effluent discharge flow [1] (Max Winter)	MGD	$Q_{0\ Winter}$	7.3	1.2	2.2	4.9
Effluent discharge density [2]	kg/m^3	ρ_0 - Summer	1,014.97	1,014.97	1,013.60	1,013.36
		ρ_0 - Winter	1,019.76	1,019.76	1,018.03	1,018.66
Effluent temperature [1]	°C	T_0 - Summer	12	12	19	20
		T_0 - Winter	5	5	16.2	13
Effluent salinity [3]	ppt	S_0 - Summer	20	20	20	20
		S_0 - Winter	25	25	25	25

Notes:

1 Information provided by UniSea.
2 Calculated using UNESCO 1980.
3 MixZon 2014.

Abbreviations:

°C Degrees Celsius
CORMIX Cornell Mixing Zone Expert System
kg/m^3 Kilograms per cubic meter
MGD Million gallons per day
ppt Parts per trillion

5.4.2 Technology

In accordance with 18 AAC 70.240(c)(1), the Department finds that available evidence reasonably demonstrates that the wastewater at UniSea will be treated to remove, reduce, and disperse pollutants using methods found by the Department to be the most effective and technologically and economically feasible, consistent with the statutory and regulatory treatment requirements. The UniSea facility has been subject to a 1995 TMDL recommendation to screen seafood wastes to 1.0 mm, and since then permittee has installed 0.5 mm screening. The permit now requires the use of this installed 0.5 mm screening technology, at a minimum. Recovered seafood processing solids are delivered to the fish meal, bone meal, and fish oil plant, thereby reducing the residues loading to receiving waters.

Wastewater treatment systems currently in place at the facility reflect cost effective methods to meet the applicable regulatory requirements.

The nature and extent of discharge plumes in marine systems are influenced by tides, riverine input, wind intensity and direction, and thermal and saline stratification.

5.4.3 Existing Use

In accordance with 18 AAC 70.240(b-c), the mixing zones have been appropriately sized to fully protect the existing uses of South Unalaska Bay. The existing uses have been maintained and protected under the terms of the previous permit. The permit reissuance application does not propose any operational changes that would result in a lower quality effluent. The discharge neither partially nor completely eliminates an existing use of the waterbody outside boundaries of the mixing zones. Flushing is adequate to ensure full protection of uses of the waterbody outside of the mixing zones. There is no indication that toxicity exists at levels that might result in biological impairment or cause an effect or damage to the ecosystem that the Department considers so adverse that a mixing zone is not appropriate. DEC has determined that the existing uses and biological integrity of the waterbody will be maintained and fully protected under the terms of the permit as required by 18 AAC 70.240(c)(2-4).

5.4.4 Human Consumption

In accordance with the conditions of the permit, and 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

There is no indication that the pollutants discharged have produced objectionable color, taste, or odor in aquatic resources harvested for human consumption. Additionally, the discharge has not precluded or limited established processing activities or commercial, sport, personal use, or subsistence fish and shellfish harvesting.

It is expected that the maximum expected effluent concentrations of pollutants will be diluted rapidly and that the mixing zones will not preclude or limit established fishery activities per 18 AAC 70.240(c)(4)(C). DEC has determined that pollutants discharged will neither produce objectionable color, taste, or odor in harvested aquatic resources for human

consumption nor preclude or limit fish and shellfish harvesting per 18 AAC 70.240(d)(6) and (c)(4)(C).

5.4.5 Spawning Areas

The mixing zones are authorized in the marine waters of South Unalaska Bay. Regulations at 18 AAC 70.240(e-f), which prohibit authorizing mixing zones in lakes, streams, rivers, or other flowing fresh waters in spawning areas unless certain requirements are met, do not apply. Discharges to fresh waters are not authorized under the permit.

5.4.6 Human Health

In accordance with 18 AAC 70.240(c-d), the mixing zones must be protective of human health and must not result in pollutants discharged at levels that will bioaccumulate, bioconcentrate, or persist above natural levels in sediments, water, or biota or at levels that otherwise will create a public health hazard through encroachment on a water supply or contact recreation uses. UniSea's effluent data was used in conjunction with applicable WQC, which serve the purpose of protecting human and aquatic life, to size the mixing zones to ensure all WQC are met in the waterbody at the boundaries of the mixing zones.

DEC has determined that the permit satisfies 18 AAC 70.240(d)(1-2) and (c)(4)(B) and that the level of treatment at UniSea is protective of human health.

5.4.7 Aquatic Life and Wildlife

In accordance with 18 AAC 70.240(c), (d), and (g), the mixing zones authorized in the permit shall be protective of aquatic life and wildlife. Pollutants for which the mixing zones will be authorized will not accumulate in concentrations outside of the mixing zones that are undesirable, present a nuisance to aquatic life, cause permanent or irreparable displacement of indigenous organisms, or result in a reduction in fish or shellfish population levels. It is expected that all WQC will be met at the boundary of the authorized mixing zones, as dilution will occur relatively rapidly, and pollutants discharged will have a relatively short residence time in the mixing zones prior to mixing to WQC levels. The Department determined that the mixing zones will not create a significant adverse effect to fish spawning or rearing, form a barrier to migratory species, fail to provide a zone of passage, result in undesirable or nuisance aquatic life, result in permanent or irreparable displacement of indigenous organisms, or result in reduction in fish population levels and that 18 AAC 70.240(g)(1), (c)(4)(D-E, G), and (d)(5) are met.

5.4.8 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. DEC consulted the United States Fish and Wildlife Service (USFWS) website and the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) to identify any threatened or endangered species under their jurisdiction in the vicinity of UniSea's discharge. See Part 9.2 for summary information regarding critical habitat and endangered species.

No detrimental effects to fauna in the area have been documented with previously authorized mixing zones for the facility, nor do the mixing zones appear to pose an

undesirable nuisance to aquatic life. Due to the short residence time of pollutants in the mixing zones, the Department has concluded that the mixing zones are sized to not cause an adverse effect on threatened or endangered species in the vicinity of the discharge. DEC will provide a copy of the permit and fact sheet to NMFS and USFWS when they are public noticed. Any comments received from the agencies regarding endangered species will be considered prior to issuance of the permit.

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." Also, 18 AAC 83.480(c) states that a permit may not be reissued "to contain an effluent limitation that is less stringent than required by effluent guidelines in effect at the time the permit is renewed or reissued."

As discussed in Part 4.4.3, data collected by the permittee in the previous permit term showed the presence of temperature in the Outfall 003A effluent. The Department conducted RPA and mixing zone analyses (see APPENDIX C) and authorized a temperature mixing zone for Outfall 003A, where there was not one authorized in the previous permit. The added mixing zone was a result of analyzing new information about effluent discharged that was not available when the previous permit was written.

This permit authorizes a 1.0-acre ZOD. No ZOD was authorized in the previous permit. However, the 1995 TMDL for Settleable Solids Residues in South Unalaska Bay assumed that each of the seafood processors discharging to the bay, including UniSea, would be authorized a 1.0-acre ZOD.

All other permit effluent limits, standards, and conditions in the permit are at least as stringent—if not more so—as in the previously issued permit and are consistent with 18 AAC 83.480. Accordingly, no further backsliding analysis is required for this permit issuance.

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).

South Unalaska Bay is designated as a Category 4a impaired waterbody for SS residues and low DO, with associated TMDLs for SS residues and for BOD_5 (see Part 5.3). Therefore, a Tier 1 antidegradation

analysis is required for those parameters. Permit limits for SS residues and BOD_5 are consistent with the final 1995 TMDLs. This consistency ensures that existing uses and the level of water quality necessary to support them are maintained and protected, and no further analysis is required for those parameters. Iliuliuk Harbor is designated as a Category 4a impaired water for petroleum hydrocarbons. Petroleum hydrocarbons are not expected to be present in the discharge to that waterbody, so no further degradation of Iliuliuk Harbor is expected. Therefore, the existing uses and the level of water quality necessary to support them are maintained and protected.

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

The state's Antidegradation policy in 18 AAC 70.015(a)(2) states that if the quality of water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, 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:

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; an*d

(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, including South Unalaska Bay and Iliuliuk Harbor, are protected for all uses; therefore, the most stringent WQC 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. The evaluation ensures 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 those limits. The WQC, 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 WQC available for any of the protected water use classes based on the driving parameter requiring the most dilution in the mixing zones. 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, along with chemicals used for processing or for cleaning processing equipment and fish containment structures in order to maintain sanitary conditions. Biological wastes are primarily seafood parts: heads, fins, bones, entrails, skins,

blood, and shells. The chemicals used for cleaning are primarily disinfectants, which shall be used in accordance with EPA specifications. Refrigerant used is generally ammonia. The natural fish waste degradation process also creates ammonia pollutant loading. Monitoring for ammonia is required to evaluate whether WQS are being met.

The permit includes numeric or narrative effluent limits addressing each of the pollutants of concern. The permit also requires the facility to implement a BMP Plan to minimize the production of waste and the discharge of pollutants to waters of the U.S., to ensure that the facility provides for the protection or attainment of existing and designated uses. UniSea has an existing BMP Plan, and it is updated as necessary to reflect current conditions at the facility.

The BMP Plan reflects current facility equipment, processes, operations, and outfalls in accordance with Permit Part 2.2 to ensure that the amount of discharged waste and pollutants is minimized. The facility must screen all seafood processing waste streams. Management staff and employees are trained on appropriate waste disposal and permit requirements. Key employees are properly trained to ensure that monitoring procedures in Permit Part 1.5 and Part 1.7 are adhered to and quality assurance requirements in Permit Part 2.1 are met. The facility also coordinates with fishermen and tender boats (who offload product at the dock) prior to and during the season to ensure that WQS for residues are not exceeded.

Permit Part 1.4.2.1 requires that discharges shall not cause or contribute to a violation of the WQS at 18 AAC 70.

The permit implements a 1.0-acre ZOD limitation for residues discharge to South Unalaska Bay. In compliance with 18 AAC 70.210, the WQC of 18 AAC 70.020(b)(20) and the antidegradation requirement of 18 AAC 70.015 may be exceeded within an authorized ZOD. However, the standards must be met at every point outside the boundary of the ZOD (18 AAC 70.210) or a mixing zone (18 AAC 70.240). The ZOD and mixing zones are sized to ensure that the existing uses of the waterbody as a whole are maintained and protected.

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

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

1***8 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, Permit Part 1.4.2.1 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 WQC 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. Site-specific criteria as allowed by 18 AAC 70.235 have not been established for South Unalaska Bay or Iliuliuk Harbor; therefore, 18 AAC 70.236(b) is not applicable.

The permit does not authorize a short-term variance under 18 AAC 70.200; therefore, a finding under this section does not apply.

The permit does authorize mixing zones under 18 AAC 70.240.

UniSea submitted updated mixing zone modeling in December 2022. The modeling provided evidence that wastewater discharge would not violate WQS outside of each mixing zone. As a result of UniSea's RP to exceed WQC for several parameters, and available assimilative capacity in the receiving waters, mixing zones are authorized in the permit in accordance with 18 AAC 70.240 (see Part 5.4). Modeling performed by the applicant's contractor and DEC provided evidence that wastewater discharged within permit limits will not violate WQS outside any of the mixing zones.

Daily sea surface monitoring data dating back several years has shown that, in general, the marine environment around and nearby the outfall quickly disperses wastewater.

The facility has collected thousands of water quality measurements from nine locations around Outfall 001A-E at one-meter increments for DO, salinity, density, and temperature. Analytical results showed that DO measurements in the receiving water generally meet the WQC.

Discharges from the facility shall meet all WQC at the boundary of authorized mixing zones. Within the mixing zones for Outfall 001A-E, the WQC for color, turbidity, residues, non-petroleum oil and grease, DO, and sediment may be exceeded. Within the mixing zone for Outfall 002A, the WQC for temperature may be exceeded. Within the mixing zone for Outfall 003A, the WQC for temperature may be exceeded.

The permit does authorize a zone of deposit under 18 AAC 70.210.

The Department may allow the deposition of substances on the seafloor of marine waters within specified limits. The permit establishes a 1.0-acre limit for seafood waste residues deposits.

The WQC of 18 AAC 70.020(b) and the antidegradation requirements of 18 AAC 70.015 may be exceeded in a zone of deposit. However, the standards must be met at every point outside the zone of deposit. In no case may the WQS be violated in the water column outside the zone of deposit by any action, including leaching from, or suspension of, deposited materials. The Department will review monitoring information submitted by the permittee during the permit term to ensure WQC are being met outside the boundary of the ZOD.

The Department concludes that the reduction in water quality will not violate the WQS of 18 AAC 70.020, 18 AAC 70.235, or 18 AAC 70.030 outside of the authorized mixing zones or ZOD and that the finding under 18 AAC 70.016(c)(7)(A) is met.

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

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

18 AAC 70.016(c)(7)(C) *point source and state-regulated nonpoint source discharges to the receiving water will meet requirements under 18 AAC 70.015(a)(2)(D); to make this finding the department will:*

i. Identify point sources and state-regulated nonpoint sources that discharge to, or otherwise impact, the receiving water; and

ii.

a. *Consider whether there are outstanding noncompliance issues with point source permits or required state-regulated nonpoint source best management practices;*
b. *Consider whether receiving water quality has improved or degraded over time; and*
c. *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.*

(i) & (ii-1st bullet) The Department reviewed available information on known point source discharges to the South Unalaska Bay and Iliuliuk Harbor receiving waters. The City of Unalaska Wastewater Treatment Facility and UniSea are both subject to the terms of EPA Consent Decrees negotiated due to CWA violations. There are no regulated nonpoint sources that discharge to, or otherwise impact, the receiving waters covered under the permit.

(ii-2nd bullet) As previously discussed, dredging at UniSea in 2016 resulted in a reduction of the volume of the Zone of Deposit. Additionally, UniSea installed a 1.0 mm waste recovery screen in 1992 and 5 mm screening in 2000. Therefore, the operator has improved the water quality over time.

(ii- 3rd bullet) The requirements under 18 AAC 70.015(a)(2)(D) state:

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

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

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

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

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

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

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

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

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

The first part of the definition includes all federal technology-based ELGs. The permit requirements comply with the ELGs established in 40 CFR Part 408, Canned and Preserved Seafood Processing Point Source Category (adopted by reference at 18 AAC 83.010(g)). The ELGs require seafood processing wastes to be less than 0.5-inch in all dimensions prior to discharge. The permit applies a more stringent standard by requiring treatment of all seafood processing waste and wastewater to 0.5 mm or less.

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, as the permittee routes domestic wastewater to the City of Unalaska Wastewater Treatment Facility. Therefore, a finding under this section is not applicable.

The third part of the definition refers to treatment requirements imposed under another state law. State regulations that apply to this permitting action include 18 AAC 70 and 18 AAC 72. The permit requires discharge to comply with WQS (18 AAC 70) and to comply with non-domestic waste and wastewater system requirements found in 18 AAC 72. The Department is not aware of more stringent requirements in other state laws.

The fourth part of the definition refers to WQBELs. A WQBEL is designed to ensure that the WQS of a waterbody are met. Section 301(b)(1)(C) of the CWA requires the development of permit limits necessary to meet WQS. Accordingly, the permit includes effluent limits for pH, temperature, BOD_5, TRC, TAH, and TAqH, along with monitoring for other pollutants of concern.

(iii) As discussed in Part 9.2, DEC has coordinated and will continue to coordinate with other state or federal agencies as necessary to comply with (i) and (ii).

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 permit meets the highest applicable statutory and regulatory requirements; therefore, the 18 AAC 70.016(c)(7)(C) finding is met.

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

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

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

The following is derived from UniSea's Antidegradation Form 2G submittals:

Form 2G Section 4 – (Questions 1-3) Tier 2 Protection and Analysis (18 AAC 70.016(c)): 1 and 2. The antidegradation application is for a new or expanded discharge, as determined by DEC, that requires a Tier 2 analysis. Fecal coliform and metals are the pollutants of concern that require a Tier 2 analysis.

3.A./B. Identification of receiving water quality and accompanying environmental impacts on the receiving water for each of the practicable alternatives and Evaluation of the cost for each of the practicable alternatives:

Fecal coliform:

Fecal coliform is present in the effluent discharged through Outfall 001A-E. The source of the fecal coliform in the discharge is likely storm water runoff from the facility's roofs and exposed surface area, as a large volume of storm water commingles with the processing wastewater discharged. UniSea conducted a Microbial Source Tracking analysis, which returned avian sources for the fecal coliform levels.

Options to decrease fecal coliform concentration in the effluent include membrane filtration or aeration and ultraviolet disinfection.

Membrane filtration, such as nanofiltration or reverse osmosis, can be effective at removing fecal coliform and other bacteria from wastewater; however, these methods can be cost prohibitive due to (1) high capital cost for system installation, (2) high energy consumption required for operation, and (3) high maintenance costs associated with removal of fouling from the membrane as well as with lifecycle materials and equipment replacement. The capital cost for installation of a nanofiltration or reverse osmosis system would likely be on the order of $10 million, not including build-out of new indoor facility space to house such a system. This technology also would require a pretreatment step, further increasing costs. Operation and maintenance of the treatment system would cause other undesirable environmental impacts, including increased air pollution associated with increased energy usage to operate the system. Additionally, it is unlikely that the local municipal landfill would accept the waste sludge; therefore, additional environmental impacts associated with barging the material to a solids waste landfill would be expected. While this treatment technology would be expected to reduce fecal coliform concentrations in facility effluent, membrane filtration is not expected to reliably reduce fecal coliform concentrations to levels less than the WQS based on limitations of the technology. Due to these factors, this option is not practicable.

The combination of aeration and ultraviolet (UV) disinfection can be effective at reducing the concentration of fecal coliform in water. Aeration is the process of adding air into wastewater to allow aerobic biodegradation of the organic materials. The conversion of organic to inorganic matter produces an airstream containing carbon dioxide, which is then discharged to the atmosphere. The process allows remaining organic matter to form clusters that settle out and can be removed from the system prior to discharge. Dissolved air flotation (DAF) is a common type of aeration/separation wastewater treatment system that may be considered as a representative technology for the purposes of this evaluation. The effluent from this system would go to a UV chamber for disinfection. The disadvantages of using these processes include (1) the high costs to install and maintain the system, (2) the large operational area required to install appropriately sized aeration ponds and UV disinfection equipment, and (3) worsening environmental impacts caused by increased power demand and disposal of sludge produced, which would both result in greater air pollution. The capital cost for installation of a DAF system with associated equalization tank would likely be on the order of $4 million, not including UV disinfection, maintenance/equipment replacement or buildout of new facility space to house such a system. Additionally, it is unlikely that the local municipal landfill would accept the waste sludge; therefore, additional environmental impacts associated with barging the material to a solids waste landfill would be expected. While this treatment technology would be expected to reduce fecal coliform concentrations in facility effluent, aeration and UV disinfection is not expected to reliably reduce wastewater concentrations to levels less than the WQS based on limitations of the technology. Due to these factors, this option is not practicable.

Metals:

Elevated metals concentration occurs in the effluent discharged through Outfall 001A-E, Outfall 002A, and Outfall 003A.

Options to decrease metals levels include membrane filtration, ion exchange, electrocoagulation, and adsorption.

For membrane filtration, see the analysis above. This option is not considered practicable.

Ion exchange systems for selective removal of metals from wastewater can be effective, though competing ions in solution can lessen the efficacy. Further site-specific evaluation of this technology to remove metals from facility process wastewater would be necessary to fully assess efficacy. Ion exchange can be labor intensive and cost prohibitive due to the need to change out the media on a regular basis. The capital cost for installation of an ion exchange system for a freshwater-based wastewater stream would likely be on the order of $340,000. Accounting for inefficiencies associated with the seawater-basis of the facility's process wastewater may require system scale-up by a factor of two to four times, resulting in a capital cost in the range of $680,000 to $1.4 million. These order-of-magnitude estimates do not include the costs associated with buildout of new indoor facility space to house such a system. This technology would also require a pretreatment step, further increasing costs. Annual operation and maintenance (O&M) costs for an ion exchange system would be significantly greater than for other alternatives due to the need to replace media frequently, the need to dispose of spent media or media regeneration chemicals, and labor-intensive operations characteristic of this technology. O&M of this treatment system would also cause other undesirable environmental impacts, including increased air pollution associated with increased energy usage to operate the system and potentially off-island barging of spent media or chemical wastes for disposal. Due to these factors, this option is not practicable.

Electrocoagulation can be effective at removing particulate-adsorbed contaminants, including metals, from wastewater. Electrocoagulation involves passing a wastewater stream through an electric field to induce an electrical charge onto particulates present in the wastewater, which facilitates coagulation and precipitation of these particulates. The process produces a waste sludge that either floats (floatation) or sinks (sedimentation) depending on the specific gravity. Electrocoagulation has been shown to effectively remove particulate-adsorbed contaminates at high rates but would be cost prohibitive due to high capital costs for system installation and high O&M costs. The capital cost for installation of an electrocoagulation system would likely be on the order of $5 million, not including buildout of new indoor facility space to house such a system. The disadvantages of this process are the high energy consumption required for operation, the need to replace electrodes and chemicals regularly, a large footprint, and generation of sludge waste that must be managed and disposed. O&M of the treatment system would cause other undesirable environmental impacts, including increased air pollution associated with increased energy usage to operate the system. Additionally, it is unlikely that the local municipal landfill would accept the waste sludge; therefore, additional environmental impacts associated with barging the material to a solids waste landfill off-island would be expected. Due to these factors, this option is not practicable.

Adsorption is a common process used to remove copper from industrial wastewater. It provides many advantages compared to other treatment techniques because of the simplicity of design and relatively low capital costs. This process uses an adsorptive media that is selected based on the effectiveness of removal for the contaminants of concern. This process can require high maintenance costs associated with media changeout. The capital cost for installation of an adsorption system would likely be on the order of $1 million, not including buildout of new facility space to house such a system. Another advantage of this process is the relatively lower energy consumption required for operation compared to the other alternatives considered. Like the other alternatives, O&M of the treatment system would cause other undesirable environmental impacts, particularly the likely need to barge spent media to a solids waste landfill off-island, as it is unlikely that the local municipal landfill would accept this material.

3.C. Identification of a proposed practicable alternative that prevents or lessens water quality degradation while also considering accompanying cross-media environmental impacts:

Addressing storm water inputs to the processing water, using adsorption, and obtaining mixing zones are the most desirable because the other discussed options involve impracticality, high capital and O&M costs, an increase in other environmental issues like high energy consumption and air quality impacts, or a combination of the above.

Alternatives were evaluated based on practicability, as defined at 18 AAC 70.990(48). Discharge under the limitations and requirements of the permit is identified as the most practicable alternative; therefore, the 18 AAC 70.016(c)(7)(D)(i) finding is met.

Permit requirements are more stringent than the applicable TBELs and include screening seafood solids, implementing BMPs, installing flow meters, and broadening effluent monitoring to ensure WQS compliance and to assist with development of future permits.

With the requirement for the permittee to implement BMPs and to meet (and exceed) TBELs and meet 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.

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

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

UniSea provides many social and economic benefits to the community of Unalaska through donations, services, and resources.

Social Importance aspects include community services provided, public health and safety improvements, education and training opportunities, and cultural amenities. In total UniSea donates between $25,000 and $30,000 annually as financial donations and/or product donations to the community of Unalaska.

a. Community Services Provided

(i) Annual donations to nearly all, if not all, local non-profit organizations

(ii) Daily lunch service provided to the Unalaska Senior Center

(iii) Facilitating shipping (free of charge) of all produce to the Unalaska City School District (UCSD) for the school lunch program

b. Public Health or Safety Improvements

(i) Donated use of an entire bunkhouse building to the City of Unalaska for two years in response to the COVID-19 pandemic

(ii) Annual donation to the local clinic, Iliuliuk Family and Health Services (IFHS)

c. Education and Training

(i) Annual donation to the Scholarship Committee for the UCSD graduating class

(ii) Annual donations to the Senior Parent Committee fundraisers

(iii) Providing paid internships with local high school students

d. Cultural Amenities

(i) Annual donation to the Qawalangin Tribe of Unalaska for Camp Qungaayux, a week-long cultural camp that was created to preserve the Unangan ways of life, knowledge, and wisdom for the Unalaska youth

Economic development aspects that demonstrate the impact and importance that UniSea has on the community of Unalaska include employment, tax base impacts, expanded leases and royalties, access to resources, and transportation. Please note that the information included below is specific to the seafood production side of operations and does not include employment, taxes, or other costs associated with the Hospitality (Hotels, Restaurants, Stores) division of UniSea operations.

a. Employment, Job Availability, and Salary Impacts

(i) UniSea employs approximately 1,000 people annually in A season (January – April) and 750 people annually in B season (June – September). Current total, as of February 23, 2024, for full-time, seasonal, and salaried staff is 1,017 employees. These people provide immeasurable impact to the City of Unalaska and community through engagement with local businesses and services (groceries, restaurants, small business owners, museums, community center, etc.). Of those employee counts above, there are approximately 215 employees who are full time, year-round residents and contributing members of the community, many with children in the local school system and spouses and other family members who work in the community and participate in many different city and nonprofit organizations.

b. Tax Base Impacts

(i) There are multiple fish taxes (Raw Fish Tax, State Fisheries Business Tax, and State Fisheries Resource Landing Tax) associated with the seafood processing industry. As these tax amounts are a direct reflection of the seafood market and sale price, there is high potential for variability in this income. But as the largest seafood processor in the community, a significant portion of that income stream is a result of the seafood that is processed at UniSea.

1. The Raw Fish Tax is 2% of the purchase price of all types of landings that is deducted from the amount paid to the harvesters and paid directly to the City of Unalaska. The City of Unalaska has received approximately $3-4 million annually as part of the Raw Fish Tax.

2. The two State of Alaska taxes are redistributed back out to the communities in which the species were processed and/or landed. The City of Unalaska has received approximately $9-10 million annually, for the last several years, from the State of Alaska for this tax.

(ii) The City of Unalaska sales tax of 3% results in approximately $25,000 annually.

(iii) The City of Unalaska Real Property Tax amounts to approximately $650,000 annually on 11 different parcels of land associated with production operations.

(iv) The City of Unalaska Personal Property Tax amounts to approximately $740,000 annually.

c. Expanded Leases and Royalties

(i) UniSea has multiple land leases that are paid annually to the City of Unalaska for different parcels of land, tidelands, and docking facilities in the amount of $18,500 annually.

(ii) There are also land, tideland, and docking facilities leased with the Ounalashka Corporation for over $125,000 annually.

d. Access to Resources

(i) UniSea plays a key role in delivering raw and finished products throughout the State of Alaska, the United States, and the world. As the second largest seafood processing plant in Alaska, UniSea processes between 275-300 million round pounds of seafood annually, with 93% of that seafood being Wild Alaska Pollock.

e. Access to a Transportation Network

(i) In connection with the number of seasonal workers UniSea employs, all of those workers arrive in the City of Unalaska via airplane. For A Season 2024, this resulted in a minimum of 795 people traveling through the Tom Madsen Airport in Dutch Harbor, Alaska, the Ted Stevens Anchorage International Airport in Anchorage, Alaska, and the Seattle-Tacoma International Airport in Seattle, Washington. This number does not include the full time and salaried employees and their dependents' travel.

(ii) UniSea provides, as a benefit to full time employees in Dutch Harbor, two round-trip tickets to Seattle annually, as well as two round-trip tickets for the first dependent and one round-trip ticket for each additional dependent thereafter. The average ticket price, currently, for Dutch Harbor, Alaska to Seattle, Washington, is between $1,700 and $1,800. UniSea currently employs 215 people full-time, year-round, that are eligible for this benefit.

Discharges to South Unalaska Bay are a necessary circumstance of the seafood processing industry, and allowing the discharge from the UniSea facility is necessary to accommodate important economic development in the area. Therefore, the 18 AAC 70.016(c)(7)(E) finding is met.

***1*8 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 under *1*8 AAC 70.016(c)(7)(F) is not applicable.

8.0 OTHER PERMIT CONDITIONS

8.1 Quality Assurance Project Plan (QAPP)

The permittee is required to develop procedures to ensure that the monitoring data submitted are accurate and to explain data anomalies if they occur. The permittee is required to develop or update and implement the QAPP within 60 days of the final permit effective date. The QAPP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing, and shipping samples; laboratory analysis; precision and accuracy requirements; data reporting, including method detection/reporting limits; and quality assurance/quality control criteria. The permittee is required to amend the QAPP whenever any procedure addressed by the

QAPP is modified. The current QAPP shall be retained onsite and made available to the Department upon request.

8.2 Best Management Practices 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. This permit requires the permittee to develop a BMP Plan in order to prevent or minimize the release and potential for the release of pollutants to waters of the U.S. The permit contains certain BMP conditions that must be included in the BMP Plan. The permit requires the permittee to develop or update and implement the BMP Plan within 60 days of the final permit effective date. The plan shall be reviewed annually, be updated as necessary, be retained onsite, and be made available to the Department upon request.

The permit contains a new requirement for the UniSea BMP Plan to be consistent with the City of Unalaska's master BMP Plan for public dock operations, as recommended by the 2010 Iliuliuk Harbor petroleum hydrocarbons TMDL (see Part 5.3 for more information).

8.3 Annual Report

The permit requires the permittee to complete and submit an Annual Report which compiles effluent and environmental monitoring data and reports permit violations, upset conditions, by-pass conditions, and corrective actions undertaken to improve wastewater treatment and pollution prevention at the facility. The Annual Report provides a comprehensive record of wastewater discharge at the facility and its effect on the receiving water.

The permit includes a new requirement that the Annual Report provide a summary of any occurrences of leaks or breaks in the refrigeration/freezer systems that led to discharges to receiving waters. Discharging purged refrigerants untreated is prohibited. A recent review of processors statewide has revealed improper handling and discharge of these substances, and DEC wishes to collect further information. Discharging these compounds can cause extreme shifts in pH in the receiving water and can exert stress on or cause mortality to aquatic life (EPA, 1975). Due to similar concerns about impacts on receiving water quality, the permit also requires the permittee to provide a list of chemicals, disinfectants, cleaners, biocides, and food processing additives (salts, acids, bases, enzymes, etc.) that are used and discharged during the annual reporting period.

8.4 Electronic Reporting

E-Reporting Rule - Phase I (DMRs). The permittee must submit a DMR for each month by the 20th day of the following month. DMRs shall be submitted electronically through NetDMR, per Phase I of the E-Reporting Rule (40 CFR Part 127). For access to the NetDMR Portal, go to https://npdes-ereporting.epa.gov/net-netdmr. DMRs submitted in compliance with the E-Reporting Rule are not required to be submitted as described in Permit Appendix A – Standard Conditions unless requested or approved by the Department. Any DMR data required by the permit that cannot be reported in a NetDMR field (e.g., receiving water data, etc.), shall be included as an attachment to the NetDMR submittal. DEC has established an e-Reporting Information website at https://dec.alaska.gov/water/compliance/electronic-reporting-rule, which contains general information about this reporting format. Training modules and webinars for NetDMR can be found at https://usepa.servicenowservices.com/oeca_icis.

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

8.5 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 individual APDES permit action. The standard regulatory language covers monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

9.0 OTHER LEGAL REQUIREMENTS

9.1 Ocean Discharge Criteria Evaluation

Section 403(a) of the CWA, Ocean Discharge Criteria, prohibits issuing a permit under Section 402 of the CWA for a discharge into the territorial sea, the water of the contiguous zone, or the oceans except in compliance with Section 403. Permits for discharges seaward of the baseline of the territorial seas must comply with the requirements of Section 403, which include development of an Ocean Discharge Criteria Evaluation (ODCE). An interactive map depicting Alaska's baseline plus additional boundary lines is available at:

https://alaskafisheries.noaa.gov/mapping/arcgis/rest/services/NOAA_Baseline/MapServer

The map is provided for informational purposes only. The U.S. Baseline Committee makes the official determinations on baseline.

A review of the baseline maps revealed that the UniSea discharges are positioned landward of the territorial sea baseline. Therefore, Section 403 of the CWA does not apply to the permit, and an ODCE analysis is not required to be completed for this permit reissuance. Further, the permit requires compliance with WQS such that 40 CFR §125.122(b) is met, and therefore the discharge is presumed not to cause unreasonable degradation of the marine environment.

9.2 Endangered Species Act

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 NMFS and 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 threatened and/or endangered species or critical habitat near the discharges to South Unalaska Bay and Iliuliuk Harbor on April 6, 2022. 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 USFWS jurisdiction in the facility's discharge area. The Department used this website to gain an approximate determination that the discharge vicinity may contain the endangered short-tailed albatross and the threatened Steller's eider and northern sea otter.

NOAA directed the Department to consult their Alaska Endangered Species and Critical Habitat Mapper Web Application to obtain lists of threatened and endangered species within the jurisdiction of NOAA in the facility's discharge area. The Department used this website to gain an approximate determination that the discharge vicinity may contain the endangered blue whales, fin whales, humpback whales, North Pacific right whales, North Pacific gray whales, sperm whales, and Steller sea lions.

DEC concludes that with the exception of the Steller's eider, the localized effluent discharges authorized by this permit will have no effect on the continued existence of these species. In an April 2011 biological opinion, USFWS expressed concern that most eiders wintering in the vicinity of Unalaska use South Unalaska Bay on a regular basis and that eiders are attracted to seafood processing activities by either macroinvertebrates feeding on seafood residues or by the residues themselves, causing high risk of predation by eagles and exposure to harmful agents in the waterbody (such as bacteria). Seafood processing can also pose risks to Steller's eiders through diesel fuel spills and the release of contaminated bilge water associated with off-loading vessel traffic.

However, it is valuable to record general observations of all listed species' interactions with seafood processing wastes, especially since northern sea otters, humpback whales, and Steller sea lions have critical habitat in the discharge vicinity. Thus, the permit requires noting observations of listed species as part of the sea surface monitoring program.

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

9.3 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 on April 6, 2022. NOAA directed the Department to consult their EFH Mapper at https://www.habitat.noaa.gov/apps/efhmapper/ to obtain locations of EFH in the area. The Department used this website to gain an approximate determination that the area of UniSea's discharges could be EFH for several species, including salmon. However, no Habitat Areas of Particular Concern or EFH Areas Protected from Fishing were identified as overlapping with the discharge location.

NMFS maintains the following information link for EFH text descriptions and maps: https://www.habitat.noaa.gov/protection/efh/newInv/index.html

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 permit issuance.

9.4 Permit Expiration

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

10.0 References

1. Alaska Department of Environmental Conservation, 2008. *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances*, as amended through December 12, 2008.
2. Alaska Department of Environmental Conservation, 2014. *Alaska Pollutant Discharge Elimination System (ADPES) Permits Reasonable Potential Analysis and Effluent Limits Development Guide*, June 30, 2014.
3. CH2M-Hill. 1994. *Circulation Study of Unalaska Bay and Contiguous Inshore Marine Waters.*
4. MIXZON, Inc. 2014. C*ORMIX Mixing Zone Modeling Analysis for the UniSea Facility, Unalaska, AK*.
5. National Marine Fisheries Service, Office of Habitat Conservation. *Essential Fish Habitat Mapper*. Retrieved from https://www.habitat.noaa.gov/apps/efhmapper/.
6. Oasis Environmental, 2006. *Dutch Harbor Water Quality and Impairment Analysis – Final Report*.
7. Oasis Environmental, 2007. *Water Quality Assessment Dutch Harbor, Iliuliuk Bay, Iliuliuk Harbor.*
8. U.S. Environmental Protection Agency, 1974. 40 CFR Part 408. *Canned and Preserved Seafood Processing Point Source Category*. June 26, 1974.
9. U.S. Environmental Protection Agency, 1975. *Development Document for Effluent Limitations 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.* Effluent Guidelines Division, Office of Water and Hazardous Materials. September 1975.
10. U.S. Environmental Protection Agency, 1991. *Technical Support Document for Water Quality-based Toxics Control*. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington DC, March 1991. EPA/505/2-90-001.
11. U.S. Environmental Protection Agency, 1995. *Total Maximum Daily Load (TMDL) for Biochemical Oxygen Demand (BOD_5) in the Waters of South Unalaska Bay, Alaska*. Region 10. February 12, 1995.
12. U.S. Environmental Protection Agency, 1995. *Total Maximum Daily Load (TMDL) for Settleable Solid Residues in the Waters of South Unalaska Bay, Alaska*. Region 10. February 12, 1995.
13. U.S. Environmental Protection Agency. 2001. *Fact Sheet: NPDES Permit AK0028657 for UniSea, Inc*.
14. U.S. Environmental Protection Agency, 2010. *Total Maximum Daily Load (TMDL) for Petroleum Hydrocarbons in the Waters of Dutch Harbor and Iliuliuk Harbor in Unalaska, Alaska*. Region 10. September 16, 2010.
15. U.S. Environmental Protection Agency, 2010. *National Pollution Discharge Elimination System* (*NPDES) Permit Writers' Manual*. Office of Wastewater Management, Water Permits Division

State and Regional Branch Office of Water Regulations and Standards. Washington DC, September 2010. EPA-833-K-10-001.

16. U.S. Fish & Wildlife Service, 2011. *Biological Opinion for Approval of the State of Alaska's Mixing Zones Regulation Section of the Alaska Water Quality Standards.* April 25, 2011.
17. U.S. Fish & Wildlife Service. *Information for Planning and Consultation*. Retrieved from https://ecos.fws.gov/ipac/

APPENDIX A. FACILITY INFORMATION

Figure 1: UniSea Outfall 001A-E, 002A, and 003A Discharge Locations

Figure 2: UniSea Facility Layout, with Outfalls 002A and 003A

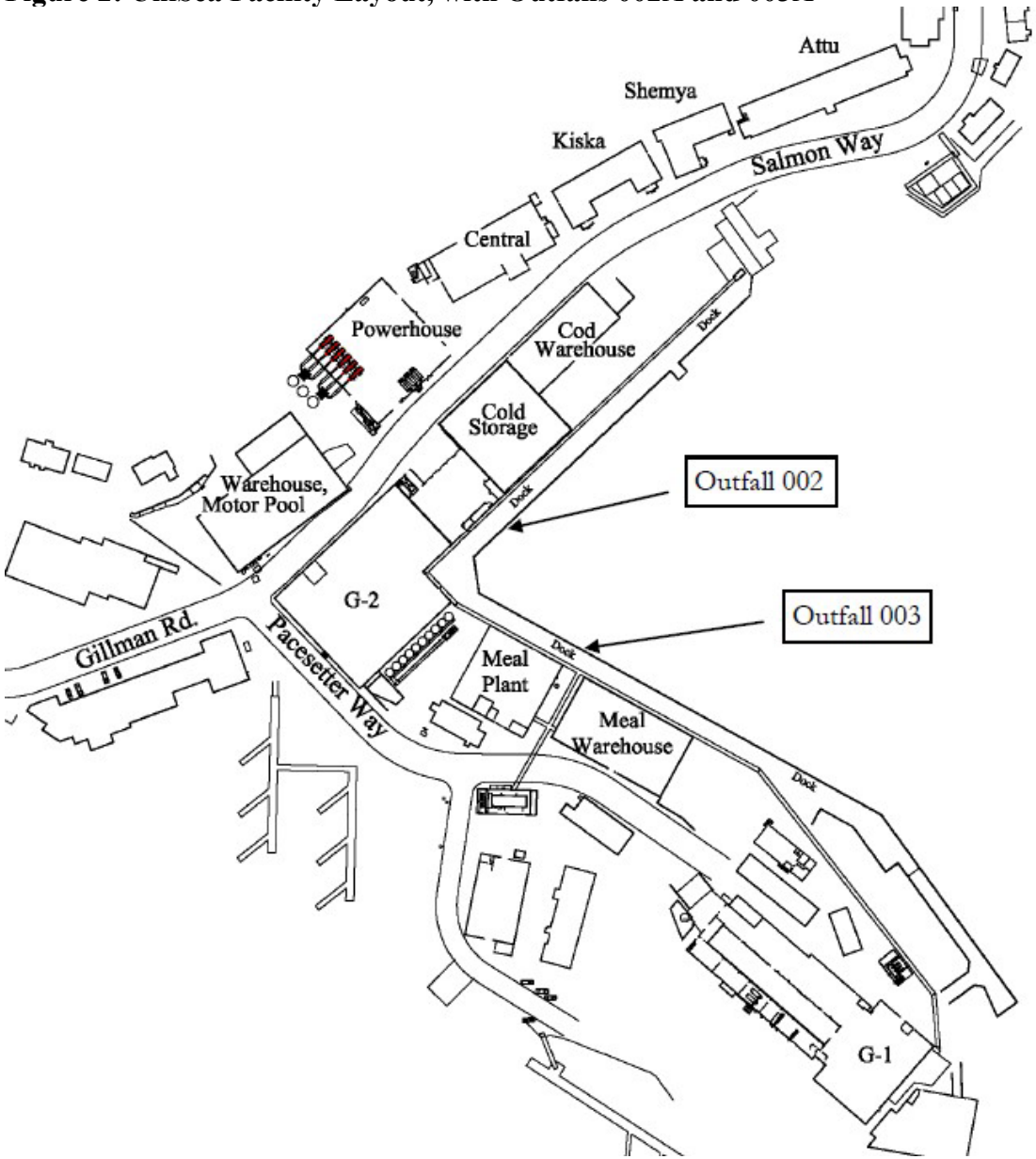


Figure 3: UniSea Flow Diagram

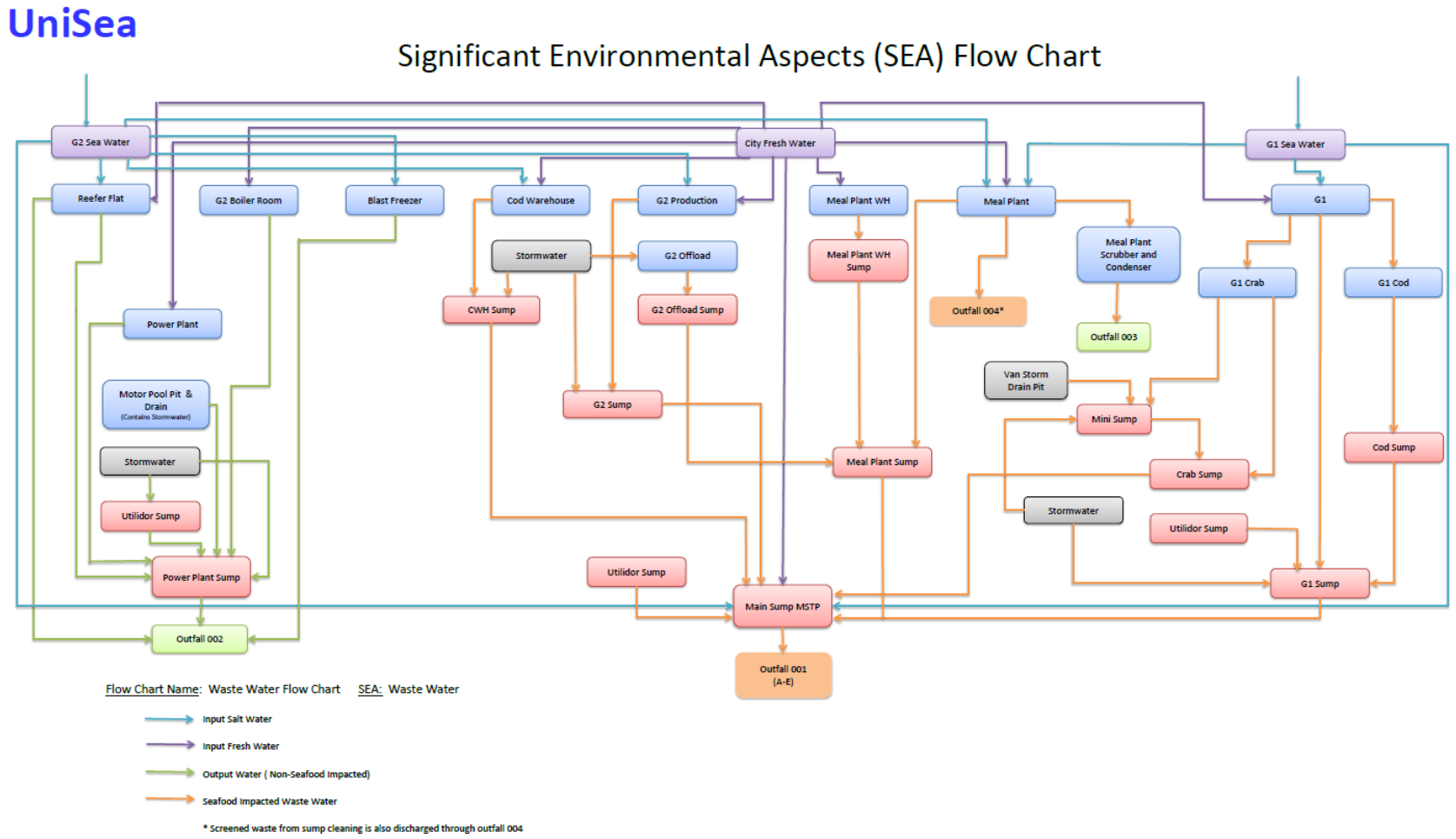


Figure 4: UniSea Dissolved Oxygen Monitoring Stations

APPENDIX B. BASIS FOR EFFLUENT LIMITATIONS

The Clean Water Act (CWA) requires seafood processing facilities to meet effluent limits based on available wastewater treatment technology, specifically technology-based effluent limits (TBELs). TBELs are national in scope and establish performance standards for all facilities within an industrial category or subcategory. The Alaska Department of Environmental Conservation (DEC or the Department) may find, by analyzing the effect of an effluent discharge on the receiving waterbody, that TBELs are not sufficiently stringent to meet Water Quality Standards (WQS). In such cases, the Department is required to develop more stringent water quality-based effluent limits (WQBELs), which are designed to ensure that the WQS of the receiving waterbody are met.

In establishing permit limits, the permit writer first determines which TBELs must be incorporated into the permit. When TBELs do not exist for a particular pollutant expected to be in the effluent, the Department must determine whether the pollutant may cause or contribute to an exceedance of a WQS for the waterbody. If a pollutant causes or contributes to an exceedance of a WQS, a WQBEL for the pollutant must be established in the permit.

B.1 Effluent Limitation Guideline

In June 1974, the Environmental Protection Agency (EPA) promulgated an effluent limitation guideline (ELG), 40 CFR Part 408 [adopted by reference at 18 AAC 83.010(g)(3)], for canned and preserved seafood processing point sources. The ELG regulations establish national technology-based effluent performance standards.

The UniSea facility is an existing seafood processing facility that processes as described in Part 2.1.2. Accordingly, 40 CFR Part 408 Subparts E, G, P, Q, T, and AE apply to the discharges. The facility is defined as a remote facility. Thus, the ELG limitation under all applicable Subparts requires that no pollutants be discharged which exceed 1.27 centimeters (0.5 inches) in any dimension. The permit's screening requirement, implemented per the currently installed technology, is more stringent than this ELG.

B.2 Mass-Based Limitations

The regulation at 18 AAC 83.540 requires that effluent limits be expressed in terms of mass, unless they cannot appropriately be expressed by mass, it is infeasible, or the limits can be expressed in terms of other units of measurement. The mass based limits are expressed in pounds per day (lbs/day) and are calculated as follows:

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

The permit requires mass-based reporting for biochemical oxygen demand (BOD_5), total suspended solids (TSS), oil and grease (O&G), and settleable solids (SS), based on the equations in Permit Appendix E and the reported discharge concentration and effluent flow. See further information about pollutant loading calculations in Part 4.4.1.

B.3 Water Quality – Based Effluent Limits

B.3.1 Statutory and Regulatory Basis

Regulations at 18 AAC 70.010 prohibit conduct that causes or contributes to a violation of the WQS. Regulations in 18 AAC 15.090 require that permits include terms and conditions to ensure criteria are met, including operating, monitoring, and reporting requirements.

The regulations require the permitting authority to make this evaluation using procedures that account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and, where appropriate, dilution in the receiving waterbody. The limits must be stringent enough to ensure that WQS are met and must be consistent with any available Waste Load Allocation (WLA).

The CWA requires that the effluent limit for a particular pollutant be the more stringent of either TBELs or WQBELs. TBELs are established by EPA for many industries in the form of ELGs and are based on available pollution control technology. The Department adopts the subject ELGs by reference in 18 AAC 83.010.

B.3.2 Reasonable Potential Analysis (RPA)

When evaluating the effluent to determine whether WQBELs based on chemical-specific numeric water quality criteria (WQC) are needed, the Department projects the receiving waterbody concentration for each pollutant of concern downstream of where the effluent enters the receiving waterbody. The chemical-specific concentration of the effluent and receiving waterbody and, if appropriate, the dilution available from the receiving waterbody are factors used to project the receiving waterbody concentration. If the projected concentration of the receiving waterbody exceeds the WQC for a limited parameter, then there is a reasonable potential (RP) that the discharge may cause or contribute to an excursion above the applicable WQS, and a WQBEL must be developed.

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. WQC and limits 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 WQC necessary to protect the designated uses of the waterbody.

B.3.3 Procedure for Deriving Water Quality-Based Effluent Limits

The *Technical Support Document for Water Quality-Based Toxics Control* (TSD) (EPA, 1991) and the WQS recommend the flow conditions for use in calculating WQBELs using steady-state modeling. The TSD, Alaska Pollutant Discharge Elimination System (APDES) guidance, and the WQS state the WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic WQC and the lowest one-day average flow rate expected to occur once every ten years (1Q10) for acute WQC. In marine settings, tidal velocities must be representative of critical conditions as well.

The first step in developing a WQBEL is to develop a WLA for the pollutant. A WLA is the concentration or loading of a pollutant that the permittee may discharge without causing or contributing to an exceedance of WQS or a Total Maximum Daily Load (TMDL) in the receiving

waterbody. If a mixing zone is authorized in the permit, the WQS apply at all points outside the mixing zone.

In cases where a mixing zone is not authorized, either because the receiving waterbody already exceeds the WQC, the receiving waterbody flow or tidal velocity and duration is too low to provide dilution, or for some other reason one is not authorized, the WQC becomes the WLA. Establishing the WQC as the WLA ensures that the permittee will not cause or contribute to an exceedance of the WQC. The WQS at 18 AAC 70.020(a) designate standards for beneficial uses such as water supply; water recreation; and growth and propagation of fish, shellfish, other aquatic life, and wildlife.

B.3.4 Specific Water Quality-Based Effluent Limits

B.3.4.1 Residues

The WQS for marine "floating solids, debris, sludge, deposits, foam, scum, or" other residues are narrative. The most stringent standard, found at 18 AAC 70.020(b)(20)(A)(ii), states that residues "may not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use; cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or 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." This standard is carried from the previous permit and implemented through the effluent limits in Permit Part 1.5 and through seafloor monitoring in Permit Part 1.8 and sea surface and shoreline monitoring in Permit Part 1.11.

B.3.4.2 pH

Alaska WQS at 18 AAC 70.020(b)(18)(A)(i) (aquaculture) and 18 AAC 70.020(b)(18)(C) (Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife) state that the pH may not be less than 6.5 or greater than 8.5 SU.

The previous permit implemented WQBELs for pH that required a minimum of 6.5 SU and a maximum of 8.5 SU, monitored at a frequency of one time per week. This WQBEL is carried forward in the permit at Outfalls 001A-E, 002A, and 003A.

B.3.4.3 BOD_5

The 1995 TMDL for BOD_5 in South Unalaska Bay established WLAs for the period May 1 through October 31.

The permit implements the UniSea WLA through an end-of-pipe limit at Outfall 001A-E (monthly average of 185,000 lbs/day). This limit and the Outfall 001A-E daily maximum limit of 297,000 lbs/day BOD_5 are carried over from the previous permit.

B.3.4.4 Temperature

The WQS at 18 AAC 70.020(b)(10)(A)(ii) for Water Supply - seafood processing state that temperature may not exceed 15° Celsius (°C).

DEC reviewed monitoring data from 2007 - 2023 and found that effluent monitoring results demonstrate that the UniSea facility regularly produces effluent at a temperature that

exceeds WQS. The highest observed temperature of the Outfall 002A effluent was 15.4 °C, and the highest at Outfall 003A was 17.5 °C.

Because the effluent has RP to violate the temperature WQS, Outfall 002A and Outfall 003A have temperature mixing zones and end-of-pipe effluent limits needed to meet the WQS outside of the mixing zones. No historical or current basis for the turbidity and color parameters previously included in the Outfall 002A mixing zone were found, so they are not included in the mixing zone in this permit. The permit requires the applicant to continue monitoring effluent temperature once per week and report the daily maximum and monthly average observed temperature each month on the Discharge Monitoring Report (DMR).

B.3.4.5 Dissolved Oxygen

The WQS for water supply - aquaculture are the most stringent standards for dissolved oxygen (DO). The standards at 18 AAC 70.020(b)(15)(A)(i) require that "Surface DO concentration in coastal water 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 may not be reduced below 4 mg/l at any point beneath the surface. DO concentrations in estuaries and tidal tributaries may not be less than 5.0 mg/l except where natural conditions cause this value to be depressed. In no case may DO levels exceed 17 mg/l. The concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection."

These WQS apply to the ambient monitoring required by Permit Part 1.7, using a monitoring scheme similar to that in the previous permit (see discussion in Part 4.6.1). The numeric BOD_5 limit necessary to achieve state DO WQS, determined as the facility's WLA in the 1995 South Unalaska Bay TMDL, is implemented in the permit as discussed in Part 4.4.1 and APPENDIX B, Part B.3.4.3.

B.3.4.6 Total Residual Chlorine

The most stringent WQS for total residual chlorine (TRC) to protect designated uses requires that concentrations may not exceed 13 micrograms per liter (µg/L) for acute marine aquatic life and 7.5 µg/L for chronic marine aquatic life [18 AAC 70.020(b)(23)(c)].

These standards are implemented in the permit as end-of-pipe limits at Outfall 001A-E, Outfall 002A, and Outfall 003A. The compliance evaluation level for this parameter is 0.100 mg/L, same as in the previous permit.

The permit requires TRC sampling once per week at Outfall 001A-E, as in the previous permit. The Outfall 001A-E TRC effluent data as reported on DMRs from 2007 - 2023 indicate that the facility did not exceed the 0.100 mg/L compliance level except for one noncompliance event.

B.3.4.7 Total Ammonia (as Nitrogen)

Total ammonia is the sum of ionized (NH_4^+) and un-ionized ammonia (NH_3). Temperature, pH, and salinity affect which form, NH_4^+ or NH_3, is present. NH_3 is more toxic to aquatic organisms than NH_4^+ and predominates with higher temperature and pH. NH_3 is less toxic with increased salinity. Excess ammonia as nitrogen in the environment can lead to DO depletion, eutrophication, and toxicity to aquatic organisms.

The permittee monitored ammonia in the Outfall 001 effluent between February and August 2022. Reported results ranged from 0.1 to 332 mg/L. The average ammonia effluent concentration from 10 reported effluent monitoring events was 81 mg/L.

DEC derived ammonia WQC from the *Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances* (Toxics Manual) (DEC, 2008) consistent with the Department's RPA and Effluent Limits guidance. DEC reviewed receiving water data for the area and determined that a receiving water temperature of 10 °C, salinity of 30 ppt, and pH of 7.8 SU were the closest values to the 85th percentile of the receiving water data collected during the critical (July - October) season. These values were used to derive ammonia WQC (18.9 mg/L and 2.8 mg/L acute and chronic WQC, respectively) from tables contained in Appendix F and G of the Toxics Manual.

B.3.4.8 Arsenic

The permittee monitored arsenic in the Outfall 001 effluent between February and August 2022. Reported results ranged from 43.9 to 84 ug/L, which indicates exceedance of the acute (69 ug/L) and chronic (36 ug/L) arsenic WQC. Accordingly, arsenic was selected for RPA. The average arsenic effluent concentration from 10 reported effluent monitoring events was 62.3 ug/L.

B.3.4.9 Copper

The permittee monitored copper in the Outfall 001 effluent between February and August 2022. Reported results ranged from 19.9 to 399 ug/L, which indicates exceedance of the acute (4.8 ug/L) and chronic (3.1 ug/L) copper WQC. Accordingly, copper was selected for RPA. The average copper effluent concentration from 10 reported effluent monitoring events was 160.8 ug/L.

Similarly, for Outfall 002 reported results ranged from 2.5 to 1,930 ug/L, and average copper effluent concentration from 10 reported effluent monitoring events was 360 ug/L.

For Outfall 003 reported results ranged from 2 to 1,630 ug/L, and average copper effluent concentration from 10 reported effluent monitoring events was 450 ug/L.

B.3.4.10 Zinc

The permittee monitored zinc in the Outfall 001 effluent between February and August 2022. Reported results ranged from 87.5 to 479 ug/L, which indicates exceedance of the acute (90 ug/L) and chronic (81 ug/L) zinc WQC. Accordingly, zinc was selected for RPA. The average zinc effluent concentration from 10 reported effluent monitoring events was 185.3 ug/L.

Similarly, for Outfall 002 reported results ranged from 15 to 1,000 ug/L, and average zinc effluent concentration from 10 reported effluent monitoring events was 184 ug/L.

B.3.4.11 Silver

The permittee monitored silver in the Outfall 001 effluent between February and August 2022. Reported results ranged from 0.5 to 300 ug/L, which indicates exceedance of the acute (1.9 ug/L) silver WQC. Accordingly, silver was selected for RPA. The average silver effluent concentration from 10 reported effluent monitoring events was 70.3 ug/L.

B.3.4.12 Fecal Coliform

The permittee monitored fecal coliform in the Outfall 001 effluent between February and August 2022. Reported results ranged from 3,400 to 173,000 FC/100 mL, which indicates exceedance of the WQC. Accordingly, fecal coliform was selected for RPA. The average fecal coliform effluent concentration from 10 reported effluent monitoring events was 47,840 FC/100 mL.

Similarly, for Outfall 003 reported results ranged from 10 to 1,300 FC/100 mL, and average fecal coliform effluent concentration from 10 reported effluent monitoring events was 139 FC/100 mL.

B.3.4.13 Total Aromatic Hydrocarbons (TAH) and Total Aqueous Hydrocarbons (TAqH)

The permittee monitored TAH and TAqH in the Outfall 002A effluent between February and August 2022. Reported results were below the WQC of 10 ug/L and 15 ug/L, accordingly.

However, the permittee reported that the alarm for petroleum hydrocarbons (indicating a concentration of at least 15 ppm, or mg/L, in the sump) occurs 5-10 times per month, and sampling did not correspond to those alarm periods. Therefore, the permit implements the WQC as end-of-pipe limits and requires that sampling be done when recirculated effluent is discharged after those alarm periods.

B.3.5 Selection of Most Stringent Limitations

B.3.5.1 Waste Particle Dimension

As discussed in Part B.1, the TBEL applicable to the facility's seafood processing waste discharge is found at 40 CFR Part 408 and requires that pollutants discharged do not exceed 0.5 inch in any dimension. However, as discussed in Part 4.4.1, the 1995 South Unalaska Bay residues TMDL determined a WQBEL necessary to protect state WQS. According to the modeling in the TMDL, at the UniSea discharge location particles smaller than 0.5 millimeter (mm) should not settle out to the seafloor. Thus, for seafood processing waste discharged to South Unalaska Bay (i.e., the discharge from Outfall 001A-E), the permit implements 0.5 mm screening. This is more stringent than the TBEL.

B.3.5.2 Parameter Summary

Table B-1 provides a summary and reference to those parameters that contain effluent limits at the point of discharge at the UniSea Facility.

Table B- 1: Summary of Effluent Limitations

Parameter	Fact Sheet Reference	Type of Effluent Limit
Residues	APPENDIX B- Part B.3.4.1	Narrative WQBEL, implemented through Best Management Practices (BMPs) and ambient monitoring
pH	APPENDIX B- Part B.3.4.2	WQBEL, implemented at end of pipe
BOD_5	APPENDIX B- Part B.3.4.3	TMDL limit, implemented at end of pipe
Temperature	APPENDIX B- Part B.3.4.4	WQBEL, dilution from mixing zones applied to meet WQS at boundary of mixing zones
Dissolved Oxygen (DO)	APPENDIX B- Part B.3.4.5	WQBEL, implemented through ambient monitoring
TRC	APPENDIX B- Part B.3.4.6	WQBEL, implemented at end of pipe
TAH/TAqH	APPENDIX B- Part B.3.4.13	WQBEL, implemented at end of pipe
Waste Particle Dimension	APPENDIX B- Part B.3.5.1	WQBEL, implemented through ambient monitoring

APPENDIX C. MIXING ZONE ANALYSIS CHECKLIST

The purpose of the Mixing Zone Checklist is to guide the permit writer through the mixing zone regulatory requirements to determine if all the mixing zone criteria at 18 AAC 70.240 are satisfied, as well as provide justification to authorize a mixing zone in an Alaska Pollutant Discharge Elimination System (APDES) permit. In order to authorize a mixing zone, all criteria must be met. The permit writer must 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. See Part 5.4 for the UniSea Dutch Harbor facility mixing zone analysis.

Criteria	Description	Resources	Regulation	MZ Approved Y/N
Size	Is the mixing zone as small as practicable?	•Technical Support Document for Water Quality Based Toxics Control • Part 5.4.1 • 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?	Part 5.4.2	18 AAC 70.240(c)(1)	Y

Criteria	Description	Resources	Regulation	MZ Approved Y/N
Low Flow Design	**For river, streams, and other flowing fresh waters.**	N/A (discharge is to marine, not fresh, water)	18 AAC 70.240(l)	
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.**	Part 5.4.3	18 AAC 70.240(c)(2)	N
	(2) impair overall biological integrity of the waterbody? **If yes, mixing zone prohibited.**	Part 5.4.3	18 AAC 70.240(c)(3)	N
	(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.**	Part 5.4.3	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.**	Part 5.4.3	18 AAC 70.240(a)	N
Human consumption	Does the mixing zone…			
	(1) produce objectionable color, taste, or odor in aquatic resources harvested for human consumption?	Part 5.4.4	18 AAC 70.240(d)(6)	N

Criteria	Description	Resources	Regulation	MZ Approved Y/N
	If yes, mixing zone may be reduced in size or prohibited.			
	(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.**	Part 5.4.4	18 AAC 70.240(c)(4)(C)	N
Spawning Areas	Does the mixing zone…			
	(1) discharge in a spawning area for anadromous fish or Arctic grayling, northern pike, rainbow trout, lake trout, brook trout, cutthroat trout, whitefish, sheefish, Arctic char (Dolly Varden), burbot, and landlocked coho, king, and sockeye salmon? **If yes, mixing zone may be prohibited.**	Part 5.4.5	18 AAC 70.240(f)	N
Human Health	Does the mixing zone…			
	(1) contain bioaccumulating, bioconcentrating, or persistent chemical above natural or significantly adverse levels? **If yes, mixing zone prohibited.**	Part 5.4.6	18 AAC 70.240(d)(1-2)	N

Criteria	Description	Resources	Regulation	MZ Approved Y/N
	(2) contain chemicals expected to cause carcinogenic, mutagenic, tetragenic, or otherwise harmful effects to human health? **If yes, mixing zone prohibited.**	Part 5.4.6		N
	(3) Create a public health hazard through encroachment on water supply or through contact recreation? **If yes, mixing zone prohibited.**	Part 5.4.6	18 AAC 70.240(c)(4)(B)	N
	(4) meet human health and aquatic life quality criteria at the boundary of the mixing zone? **If no, mixing zone prohibited.**	Part 5.4.6	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.**	Part 5.4.6	18 AAC 70.240(k)(4)	N
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.**	Part 5.4.7	18 AAC 70.240(c)(4)(G), (g)(1)	N
	(2) form a barrier to migratory species? **If yes, mixing zone prohibited.**	Part 5.4.7		N
	(3) fail to provide a zone of passage? **If yes, mixing zone prohibited.**	Part 5.4.7		N

Criteria	Description	Resources	Regulation	MZ Approved Y/N
	(4) result in undesirable or nuisance aquatic life? **If yes, mixing zone prohibited.**	Part 5.4.7	18 AAC 70.240(d)(5)	N
	(5) result in permanent or irreparable displacement of indigenous organisms? **If yes, mixing zone prohibited.**	Part 5.4.7	18 AAC 70.240(c)(4)(E)	N
	(6) result in a reduction in fish or shellfish population levels? **If yes, mixing zone prohibited.**	Part 5.4.7	18 AAC 70.240(c)(4)(D)	N
	(7) cause lethality to passing organisms? **If yes, mixing zone prohibited.**	Part 5.4.7	18 AAC 70.240(d)(7)	N
	(8) cause a toxic effect in the water column, sediments, or biota outside the boundaries of the mixing zone? **If yes, mixing zone prohibited.**	Part 5.4.7	18 AAC 70.240(c)(4)(A)	N
Endangered Species	Are there threatened or endangered species (T/E spp) at the location of the mixing zone? If yes, are there likely to be adverse effects to T/E spp based on comments received from USFWS or NOAA? If yes, will conservation measures be included in the permit to avoid adverse effects?	Part 5.4.8	Program Description, 6.4.1 #5 18 AAC 70.240(c)(4)(F)	Y