City and Bureau of Sitka Wastewater Treatment Plant Application For A Modified NPDES Permit Under Section 301(h) Of The Clean Water Act

Tentative Decision Document

June 2023

United States Environmental Protection Agency

Region 10

1200 6th Avenue

Seattle, WA 98101

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
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OFFICE OF THE REGIONAL ADMINISTRATOR

City and Borough of Sitka's
Wastewater Treatment Plant
Application for a Modified NPDES Permit
Under Section 301(h) of the Clean Water Act

Tentative Decision of the Regional Administrator
Pursuant to 40 CFR Part 125, Subpart G

I have reviewed the attached evaluation analyzing the merits of the City and Borough of Sitka's request and application for a variance from secondary treatment requirements of the Clean Water Act (the Act) pursuant to Section 301(h) of the Act for the City and Borough of Sitka wastewater treatment plant. It is my tentative decision that the City and Borough of Sitka be granted a variance pursuant to Section 301(h) of the Act for the City and Borough of Sitka wastewater treatment plant in accordance with the terms, conditions, and limitations of the draft 301(h)-modified NPDES permit.

My decision is based on available information specific to the discharge from the City and Borough of Sitka wastewater treatment plant. It is not intended to assess the need for secondary treatment in general, nor does it reflect on the necessity for secondary treatment by other publicly owned treatment works discharging to the marine environment.

Public notice and comment regarding this tentative decision and the accompanying draft NPDES permit is available to interested persons pursuant to 40 CFR Part 124. This tentative decision is subject to change based on information acquired during the public comment period. Following the public comment period on this tentative decision and accompanying draft NPDES permit, EPA Region 10 will issue a final decision under the procedures in 40 CFR Part 124.

Casey Sixkiller
Regional Administrator

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1) INTRODUCTION

The City and Bureau of Sitka, Alaska, ("the City," "the applicant," "CBS," or "the permittee") has requested a renewal of its variance (sometimes informally called a "waiver" or "modification") under Section 301(h) of the Clean Water Act (the Act or CWA) from the secondary treatment requirements contained in Section 301(b)(1)(B) of the Act.

The United States Environmental Protection Agency, Region 10 (EPA) approved the City and Bureau of Sitka's first request for modification of secondary treatment requirements and issued its first CWA Section 301(h)-modified National Pollutant Discharge Elimination System (NPDES) permit on March 14, 1983 [AK0021474]. The most recent NPDES permit was issued on November 27, 2001, became effective on December 31, 2001, and expired on January 2, 2007 (hereinafter, referred to as the 2001 permit). A timely and complete NPDES application for permit reissuance was submitted by the permittee on June 5, 2006. Pursuant to 40 CFR 122.6, the permit has been administratively continued and remains fully effective and enforceable.

The 301(h) variance is being sought for CBS' Wastewater Treatment Plant ("WWTP" or "the facility"), a publicly owned treatment works (POTW). The applicant is seeking a 301(h) variance to discharge wastewater receiving less-than-secondary treatment from a single outfall into the Middle Channel of Sitka Sound. Secondary treatment is defined in the regulations at 40 CFR Part 133 in terms of effluent quality for total suspended solids (TSS), biochemical oxygen demand (BOD_5), and pH. Pursuant to 40 CFR 133.102, secondary treatment requirements for TSS, BOD_5, and pH are as follows:

TSS: (1) The 30-day average concentration shall not exceed 30 mg/l;

(2) The 7-day average concentration shall not exceed 45 mg/l; and

(3) The 30-day average percent removal shall not be less than 85%.

BOD_5: (1) The 30-day average concentration shall not exceed 30 mg/l;

(2) The 7-day average concentration shall not exceed 45 mg/l; and

(3) The 30-day average percent removal shall not be less than 85%.

pH: The pH of the effluent shall be maintained within the limits of 6.0 to 9.0 pH standard units.

The City requested a modification for TSS and BOD_5; the City did not request a modification for pH.

This document presents EPA Region 10's tentative findings, conclusions, and recommendations as to whether the applicant's proposed 301(h)-modified discharge (proposed discharge) will comply with the criteria set forth in sections 301(h) of the Act, as implemented by regulations at 40 CFR Part 125, Subpart G, and Alaska Water Quality Standards (Alaska WQS), as amended.

2) DECISION CRITERIA

Under Section 301(b)(1)(B) of the Act, POTWs in existence on July 1, 1977 are required to meet effluent limits based on secondary treatment as defined by the Administrator of EPA ("the Administrator"). Secondary treatment is defined by the Administrator in terms of three parameters: TSS, BOD_5, and pH. Uniform national effluent limitations for these pollutants were promulgated and included in NPDES permits for POTWs issued under Section 402 of the CWA. POTWs were required to comply with these limitations by July 1, 1977.

Congress subsequently amended the Act, adding Section 301(h), which authorizes the Administrator, with State concurrence, to issue NPDES permits that modify the secondary treatment requirements of the Act with respect to certain discharges. P.L. 95-217, 91 Stat. 1566, as amended by P.L. 97-117, 95 Stat. 1623; and S303 of the Water Quality Act of 1987. Section 301(h) provides that:

> *[T]he Administrator, with the concurrence of the State, may issue a permit under section 402 [of the Act] which modifies the requirements of subsection (b)(1)(B) of this section [the secondary treatment requirements] with respect to the discharge of any pollutant from a publicly owned treatment works into marine waters, if the applicant demonstrates to the satisfaction of the Administrator that:*

(1) there is an applicable water quality standard specific to the pollutant for which the modification is requested, which has been identified under section 304(a)(6) of [the CWA];
(2) the discharge of pollutants in accordance with such modified requirements will not interfere, alone or in combination with pollutants from other sources, with the attainment or maintenance of that water quality which assures protection of public water supplies and the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife, and allows recreational activities, in and on the water;
(3) the applicant has established a system for monitoring the impact of such discharge on a representative sample of aquatic biota, to the extent practicable, and the scope of the monitoring is limited to include only those scientific investigations which are necessary to study the effects of the proposed discharge;
(4) such modified requirements will not result in any additional requirements on any other point or nonpoint source;
(5) all applicable pretreatment requirements for sources introducing waste into such treatment works will be enforced;
(6) in the case of any treatment works serving a population of 50,000 or more, with respect to any toxic pollutant introduced into such works by an industrial discharger for which pollutant there is no applicable pretreatment requirement in

effect, sources introducing waste into such works are in compliance with all applicable pretreatment requirements, the applicant has in effect a pretreatment program which, in combination with the treatment of discharges from such works, removes the same amount of such pollutant as would be removed if such works were to apply secondary treatment to discharges and if such works had no pretreatment program with respect to such pollutant;

(7) to the extent practicable, the applicant has established a schedule of activities designed to eliminate the entrance of toxic pollutants from nonindustrial sources into such treatment works;

(8) there will be no new or substantially increased discharges from the point source of the pollutant into which the modification applies above that volume of discharge specified in the permit; and

(9) the applicant at the time such modification becomes effective will be discharging effluent which has received at least primary or equivalent treatment and which meets the criteria established under [section 304(a)(1) of the CWA] after initial mixing in the waters surrounding or adjacent to the point at which such effluent is discharged.

For the purposes of this subsection the phrase "the discharge of any pollutant into marine waters" refers to a discharge into deep waters of the territorial sea or the waters of the contiguous zone, or into saline estuarine waters where there is strong tidal movement and other hydrological and geological characteristics which the Administrator determines necessary to allow compliance with paragraph (2) of this subsection, and [section 101(a)(2) of the Act]. For the purposes of paragraph (9), "primary or equivalent treatment" means treatment by screening, sedimentation, and skimming adequate to remove at least 30 percent of the biological oxygen demanding material and of the suspended solids in the treatment works influent, and disinfection, where appropriate. A municipality which applies secondary treatment shall be eligible to receive a permit pursuant to this subsection which modifies the requirements of subsection (b)(1)(B) of this section with respect to the discharge of any pollutant from any treatment works owned by such municipality into marine waters. No permit issued under this subsection shall authorize the discharge of sewage sludge into marine waters. In order for a permit to be issued under this subsection for the discharge of a pollutant into marine waters, such marine waters must exhibit characteristics assuring that water providing dilution does not contain significant amounts of previous discharged effluent from such treatment works. No permit issued under this subsection shall authorize the discharge of any pollutant into saline estuarine waters which at the time of application do not support a balanced, indigenous population of shellfish, fish and wildlife, or allow recreation in and on the waters or which exhibit ambient water quality below applicable

> *water quality standards adopted for the protection of public water supplies, shellfish, fish and wildlife or recreational activities or such other standards necessary to assure support and protection of such uses. The prohibition contained in the preceding sentence shall apply without regard to the presence or absence of a causal relationship between such characteristics and the applicant's current or proposed discharge. Notwithstanding any of the other provisions of this subsection, no permit may be issued under this subsection for discharge of a pollutant into the New York Bight Apex consisting of the ocean waters of the Atlantic Ocean westward of 73 degrees 30 minutes west longitude and westward of 40 degrees 10 minutes north latitude.*

On August 9, 1994, EPA promulgated final regulations implementing these statutory criteria at 40 CFR Part 125, Subpart G. The regulations provide that a Section 301(h)-modified NPDES permit may not be issued in violation of 40 CFR 125.59(b) which requires, among other things, compliance with provisions of the Coastal Zone Management Act, as amended, 16 USC 1451 *et seq.*, the Endangered Species Act, as amended, 16 USC 1531 *et seq.*, Title III of the Marine Protection Research and Sanctuaries Act, as amended, 16 USC 1431 *et seq.*, the Magnuson-Stevens Fishery Conservation and Management Act, as amended, 16 USC 1801 *et seq.*, and any other applicable provisions of local, state, and federal laws or Executive Orders.

In accordance with 40 CFR 125.59(i), the decision to grant or deny a CWA Section 301(h) waiver shall be made by the Administrator[1] and shall be based on the applicant's demonstration that it has met all the requirements of 40 CFR 125.59 through 125.68, as described in this 301(h) Tentative Decision Document (301(h) TDD). EPA has reviewed all data submitted by the applicant in the context of applicable statutory and regulatory criteria and has presented its findings and conclusions in this 301(h) TDD.

3) SUMMARY OF FINDINGS

Based upon review of the data, references, and empirical evidence furnished by the applicant and other relevant sources, EPA Region 10 makes the following tentative findings regarding the statutory and regulatory criteria:

1. The applicant's proposed discharge will comply with Alaska WQS for dissolved oxygen and turbidity. [CWA Section 301(h)(1); 40 CFR 125.61]
2. The applicant has demonstrated it can consistently achieve Alaska WQS and federal CWA Section 304(a)(1) water quality criteria beyond the zone of initial dilution (ZID). [CWA Section 301(h)(9); 40 CFR 125.62(a)]

[1] The authority to make tentative (and final) decisions on the eligibility of publicly owned treatment works for variances from the secondary treatment requirements of the Clean Water Act pursuant to Section 301(h) of the CWA has been delegated to the Regional Administrators.

3. The applicant's proposed discharge, alone or in combination with pollutants from other sources, will not adversely impact public water supplies or interfere with the protection and propagation of a balanced, indigenous population (BIP) of shellfish, fish, and wildlife, and will allow for recreational activities in an on the water. [CWA Section 301(h)(2); 40 CFR 125.62(b), (c), (d)]
4. The applicant has a well-established and adequate program to monitor the impact of its proposed discharge on aquatic biota and has demonstrated it has adequate resources to continue the program. These monitoring requirements will remain enforceable terms of the permit. [CWA Section 301(h)(3); 40 CFR 125.63]
5. The applicant's proposed discharge will not result in any additional treatment requirements on any other point or nonpoint sources. The applicant sent a letter to the Alaska Department of Environmental Conservation (ADEC) requesting concurrence with this determination. [CWA Section 301(h)(4); 40 CFR 125.64]
6. The applicant will develop an industrial pretreatment program and will continue to implement its nonindustrial source control program, consisting of public outreach and education designed to minimize the amount of toxic pollutants that enter the treatment system from nonindustrial sources. [CWA Section 301(h)(7);40 CFR 125.65; 40 CFR 125.66]
7. There will be no new or substantially increased discharges from the point source of the pollutants to which the 301(h) variance applies above those specified in the permit. [CWA Section 301(h)(8); 40 CFR 125.67]
8. The 301(h) modified permit contains special conditions in the form of effluent limitations and mass loadings, schedules of compliance, and monitoring and reporting requirements [40 CFR 125.68]
9. The discharge is not expected to conflict with applicable provisions of State, local, or other Federal laws or Executive Orders, and is expected to comply with the Coastal Zone Management Act of 1972, as amended, 16 USC 1451 et seq.; the Endangered Species Act of 1973, as amended, 16 USC 1531 et seq.; Title III of the Marine Protection, Research and Sanctuaries Act, as amended, 16 USC 1431 et seq.; and the Magnuson-Stevens Fishery Conservation and Management Act, as amended, 16 USC § 1801 *et seq.*
10. The applicant has demonstrated the proposed discharge will comply with federal primary treatment requirements. [CWA Section 301(h)(9); 40 CFR 125.60]

4) TENTATIVE DECISION AND RECOMMENDATION

Based on the tentative findings in Section 3, above, EPA has concluded that the applicant's proposed discharge will comply with the requirements of CWA Section 301(h) and 40 CFR Part 125, Subpart G. Accordingly, EPA has tentatively decided to grant the applicant a CWA Section 301(h) variance, contingent upon satisfaction of the following conditions:

1. All requirements determined necessary by ADEC as part of its final CWA Section 401 Certification to ensure that the proposed discharge will comply with applicable

provisions of State law, including WQS, in accordance with Section 401 of the CWA and the regulations at 40 CFR 124.54 and 40 CFR 125.61(b)(2).

2. The determination by ADEC that the proposed discharge will not result in any additional treatment requirements on any other point or nonpoint sources, in accordance with 40 CFR 125.64.
3. The determination by the National Marine Fisheries Service that issuance of a 301(h)-modified permit will not jeopardize the continued existence of any threatened or endangered species or result in the destruction of critical habitat does not conflict with applicable provisions of the Magnuson-Stevens Fishery Conservation and Management Act, as amended.

5) DESCRIPTION OF TREATMENT SYSTEM

The City and Borough of Sitka's Wastewater Treatment Plant is a primary treatment plant which began operation in 1984. The facility has a peak design flow of 5.3 million gallons per day (mgd). The existing outfall discharges to the Middle Channel of Sitka Sound at a depth of 85 feet below mean lower low water (MLLW). The outfall location is 57° 02' 53" N, 135° 21' 13" W, near the airport.

The treatment plant currently serves a population of approximately 8,500 and was designed for a population of 10,500. Sitka's population has held steady over the last several years and the facility does not project a population increase during the term of the proposed permit. Peak design flow is 0.23 m^3/sec (5.3 mgd) and average daily design flow is 0.08 m^3/sec (1.8 mgd). The average flow in 2000 was 1.4 mgd. In accordance with 40 CFR 125.58(c), the facility is a "small applicant."

The collection system is a separate sanitary sewer system consisting of approximately 50 km (31 miles) of mains and interceptors and 29 lift stations. Treatment consists of comminution of 90% of the sewage entering the treatment plant (Japonski, Alice, and Charcoal Islands wastewater is injected into the force mains beyond the comminutor), fine screening (3 rotary screens), grit removal, and primary clarification (with scum skimming, sludge removal, and intermittent coagulant addition to increase BOD reduction). Sludge from the clarifiers is thickened and dewatered. Thickener supernatant is returned to the treatment system prior to the clarifiers. Sludge, scum, grit and screenings are incinerated.

The effluent is discharged through the existing 1,676 m (5,500 ft) long marine outfall, which ends in a diffuser at a depth of 25.9 m (85 feet) below MLLW.

See Appendix A for facility figures, area maps, and the treatment process flow diagram.

6) DESCRIPTION OF RECEIVING WATERS

A. General Features

The facility discharges to the middle channel of Sitka Sound. Information indicates that the receiving water could be considered either open ocean or saline estuary, based on geographic and oceanographic characteristics (Tetra Tech, 1988). EPA believes this analysis remains applicable to the conditions in Sitka Sound. Therefore, EPA determined that it is most appropriate to classify the receiving water as open ocean, in recognition of the absence of a significant salinity gradient during the year and the physical characteristics of Sitka Sound in the vicinity of the outfall (EPA 1989 Tentative Decision Document).

The middle channel of Sitka Sound is classified in Alaska WQS as classes IIA(I)(ii)(iii), B(I)(ii), C and D, for use in aquaculture, seafood processing, industrial water supply, water contact and secondary recreation, growth and propagation of fish, shellfish, aquatic life and wildlife, and harvesting for consumption of raw mollusks or other raw aquatic life.

B. Currents and Flushing

According to NOAA, the mean tide range at Sitka, Alaska (Station ID: 9451600) from 1983 to 2001 is 7.7 ft, with a diurnal range of 9.9 ft. and a mean tide level of 5.3 ft. above MLLW (NOAA 2022a). The maximum tide level is 15 feet above MLLW level. The minimum tide level is -4.1 feet above the MLLW level. More detailed information on currents and flushing is available in the 1988 permit application questionnaire and 2001 Permit Fact Sheet.

In August 1979, Sitka Sound was observed to have wind-driven currents that produced a net eastward displacement of surface water. Currents in Sitka Sound rotate clockwise and tend to transport water to the mouth of the Sound under ebb flow conditions (CBS 1988).

7) PHYSICAL CHARACTERISTICS OF THE DISCHARGE

A. Outfall/Diffuser Design and Initial Dilution

Pursuant to 40 CFR 125.62(a)(1), the outfall and diffuser must be located and designed to provide adequate initial dilution, dispersion, and transport of wastewater to meet all applicable WQS at and beyond the boundary of the ZID during periods of maximum stratification and during other periods when discharge characteristics, water quality, biological seasons, or oceanographic conditions indicate more critical situations may exist.

The existing marine outfall consists of 5,500 ft of 24-inch pipe and 197 ft of diffuser located at approximately 25.9 m (85 ft) below MLLW. The diffuser consists of 54 ft of 24-inch pipe, 65 ft of 20-inch pipe, 26 ft of 16-inch pipe, 26 feet of 14-inch pipe, and 24 ft of 10-inch pipe. There are sixteen round, 4-inch, bell-mouthed ports, located at 0° from the horizontal along the length of

the diffuser. The ports are spaced alternately left and right of the pipe on 13 ft centers, 18 inches above the seabed. The average daily design flow rate for each port is 79.26 gallons per minute at 1.8 mgd.

Zone of Initial Dilution (ZID)

Section 301(h)(9) of the CWA and 40 CFR 125.62 require 301(h) discharges to meet state WQS and federal 304(a) criteria at the boundary of the ZID, which is the region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffuser ports. The ZID may not be larger than allowed by mixing zone restrictions in applicable water quality standards. 40 CFR 125.58(dd). The dilution ratio achieved at the completion of initial mixing at the edge of the ZID is used to determine compliance with these requirements. Dilution is defined as the ratio of the total volume of the sample (ambient water plus effluent) to the volume of effluent in the sample. The ZID is not intended to describe the area bounding the entire mixing process or the total area impacted. Rather, the ZID, or region of *initial mixing* is the area of rapid, turbulent mixing of the effluent and receiving water and results from the interaction between the buoyancy and momentum of the discharge and the density and momentum of the receiving water. Initial dilution is normally complete within several minutes after discharge. In guidance, EPA has operationally delimited the ZID to include the bottom area within a horizontal distance equal to the water depth from any point on the diffuser and the water column above that area. Beyond the ZID boundary (i.e., after initial mixing is complete), the effluent is diluted further by passive diffusion processes and far-field ambient receiving water conditions. The ZID is not inclusive of this far-field mixing process.

The prior permit used a dilution factor of 122:1 based on the critical summer season and the diffuser design at that time. EPA has refined the dilution factor using more current information and available effluent and receiving water data.

EPA modeled the discharge to determine the dilution achieved at the edge of the ZID using recent effluent and receiving water data provided by the applicant (2016-2021). In accordance with the *1994 Amended Section 301(h) Technical Support Document* (301(h) TSD), EPA used data reflecting critical discharge and receiving water conditions to determine dilution under critical conditions. The dilution modeling report is included in Appendix G.

According to the model, the discharge achieves initial mixing and a dilution of 87:1 at 80 feet from the outfall at a depth of approximately 80 feet within two minutes of discharge. EPA used 87:1 dilution as the basis for determining compliance with 301(h)(9) and 40 CFR 125.62. Consistent with the recommendations in the 301(h) TSD for setting spatial boundaries for the ZID, EPA has established the spatial dimensions of the ZID which include the entire water column within 60 feet of any point of the 25-foot diffuser. In its 401 certification, EPA expects ADEC to authorize acute and chronic dilution factors of 46:1 and 76:1, respectively. These dilutions fall within the boundary of the ZID.

8) APPLICATION OF STATUTORY AND REGULATORY CRITERIA

The sections below describe the statutory and regulatory requirements of 301(h) discharges and explains the basis for the permit conditions.

A. Compliance with Primary or Equivalent Treatment Requirements [CWA Section 301(h)(9); 40 CFR 125.60]

Under CWA Section 301(h)(9) and 40 CFR 125.60, the applicant must demonstrate it will be discharging effluent that has received at least primary or equivalent treatment at the time the 301(h)-modified permit becomes effective. 40 CFR 125.58(r) defines primary or equivalent treatment as treatment by screening, sedimentation, and skimming adequate to remove at least 30 percent of the biochemical oxygen demanding material and other suspended solids in the treatment works influent, and disinfection, where appropriate. To ensure the effluent has received primary or equivalent treatment, 40 CFR 125.60 requires the applicant to perform monitoring of their influent and effluent and assess BOD_5 and TSS removal rates based on a monthly average.

Applicants for 301(h) waivers request concentration and loading (lb/day) limits for BOD_5 and TSS based on what the facility can achieve. Therefore, the technology-based requirements for POTWs with 301(h) waivers are established on a case-by-case basis taking into consideration facility performance, and the federal primary treatment standards.

1. Total Suspended Solids

EPA reviewed influent and effluent monitoring data for TSS between November 2016 and September 2021. A summary table and graphical representation of the data is provided below.

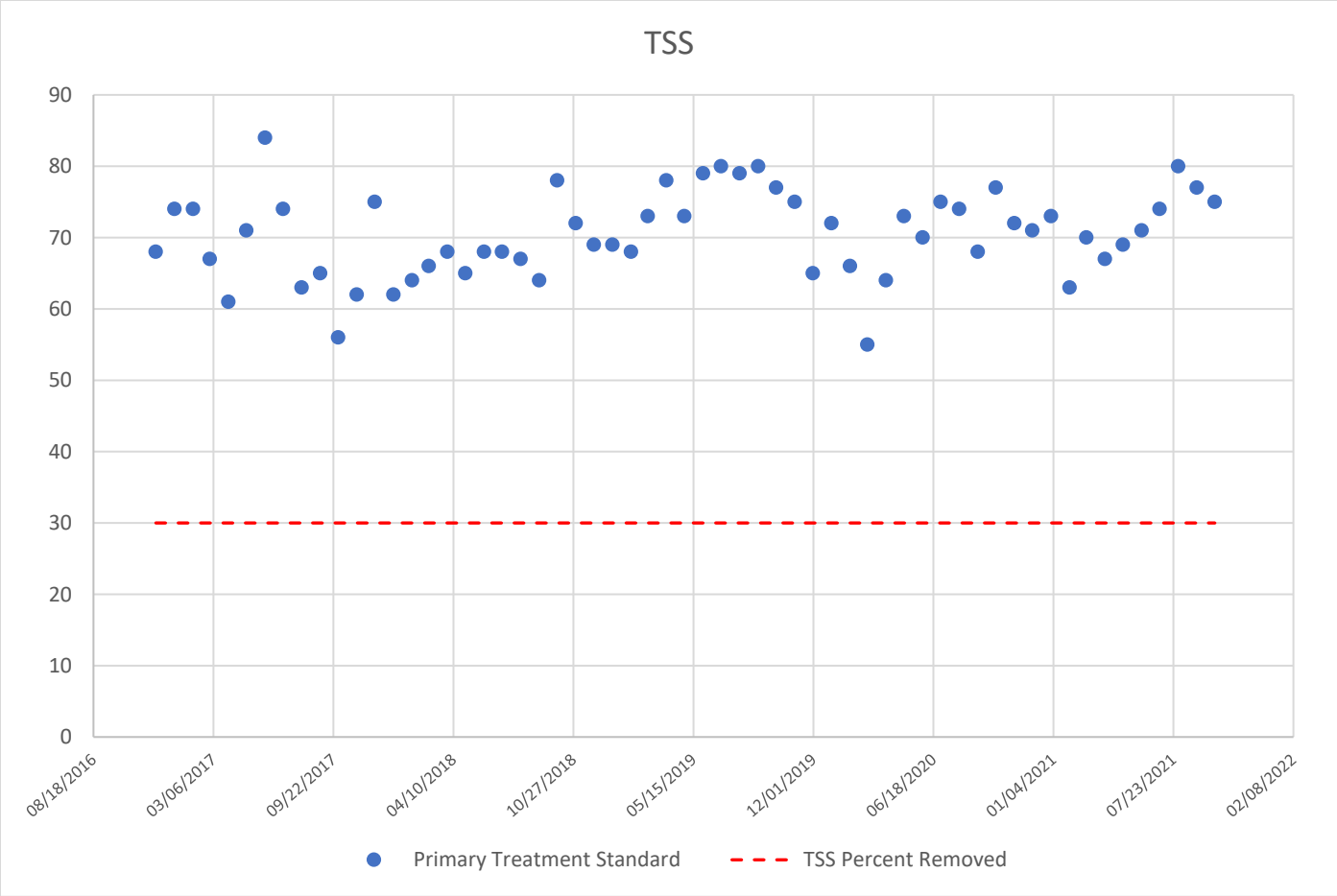

Figure 1. Minimum Monthly TSS Removal (2016-2021)

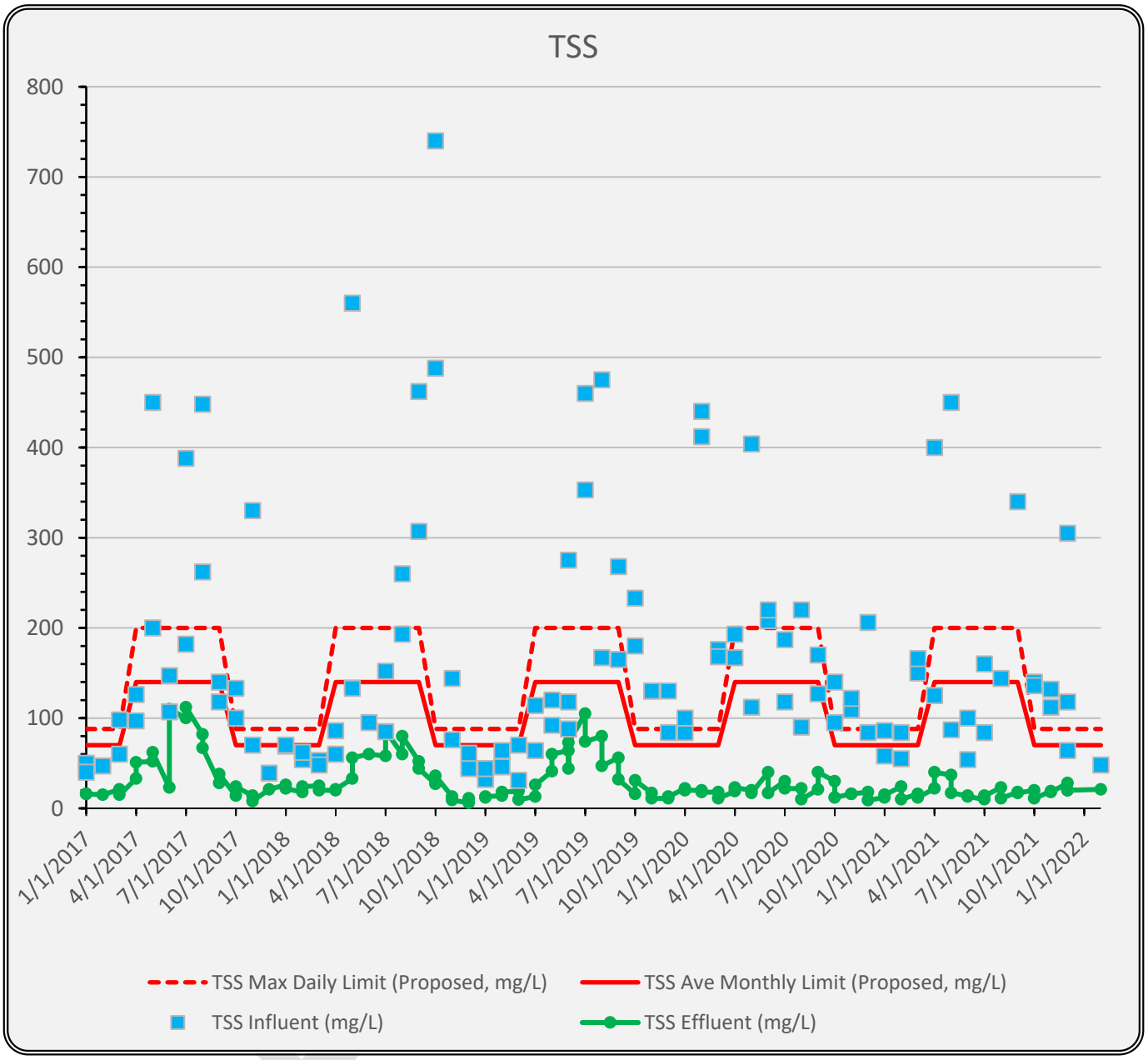

Figure 2. Monthly Influent and Effluent TSS Concentrations (mg/L)

The applicant achieved the minimum 30% removal requirement for TSS 100% of the time with the lowest monthly removal being 55% on February 29, 2020. Between 2016 and 2021 the facility achieved an average of nearly 71% removal of TSS, with maximum percent removal efficiencies as high as 84%.

Table 1. Influent and Effluent TSS Data (2016-2021)

Statistic	Influent, TSS, mg/L	Effluent, TSS, mg/L	Percent Removal
PROPOSED LIMIT	---	58 (daily max)/ 73 (mo avg)	≥30%
COUNT	59	59	59
MEAN	129	35	71%
MINIMUM	56	21	55
MAX	254	60	84
STDV	36.9	8.8	6.1
CV	0.3	0.2	0.1
5th	83.3	23.0	61.9
95th	188.1	50.2	80.0

The applicant has demonstrated that it will be discharging effluent that has received at least primary treatment for TSS when the 301(h)-modified permit becomes effective. [CWA Section 301(h)(9) and 40 CFR 125.60].

2. Biochemical Oxygen Demand

EPA reviewed influent and effluent data for BOD_5 between 2016 and 2021. A summary table and graphical representation of the data is provided below.

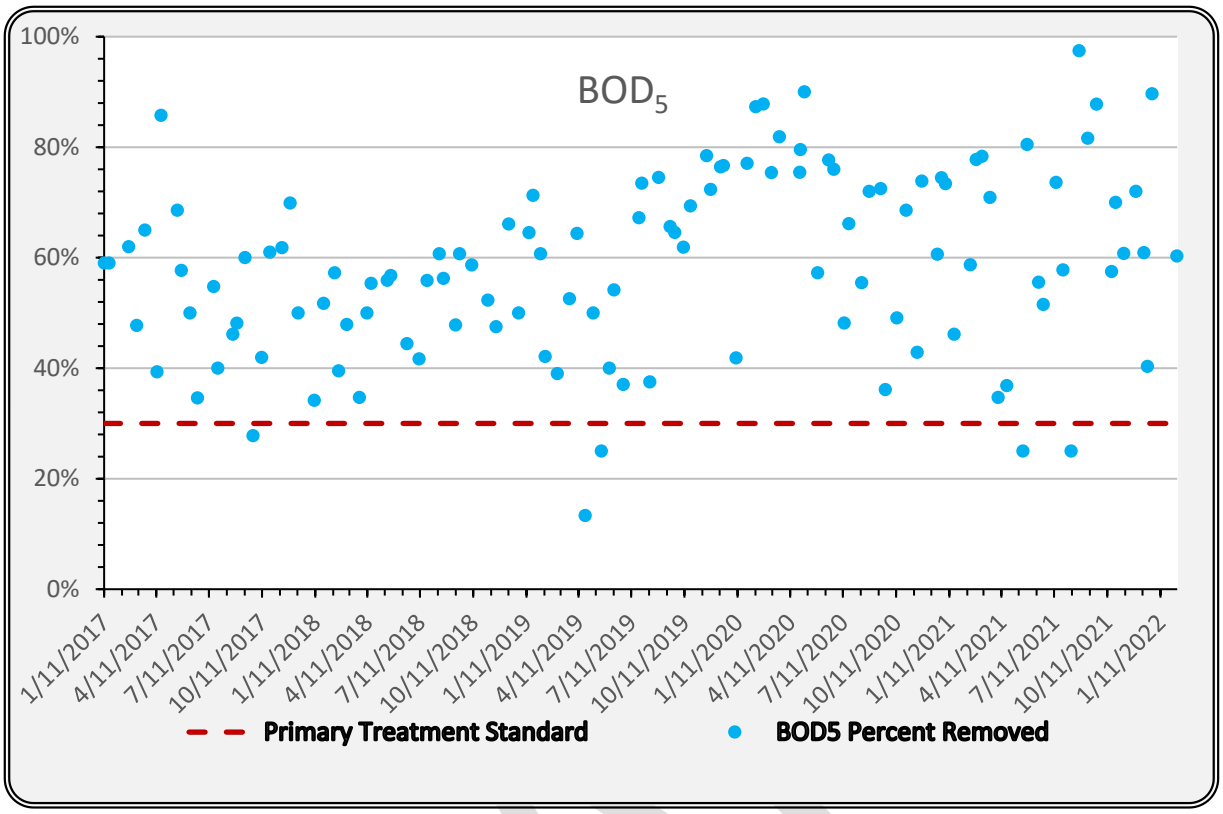

Figure 3. Minimum Monthly BOD5 Removal (2016-2021)

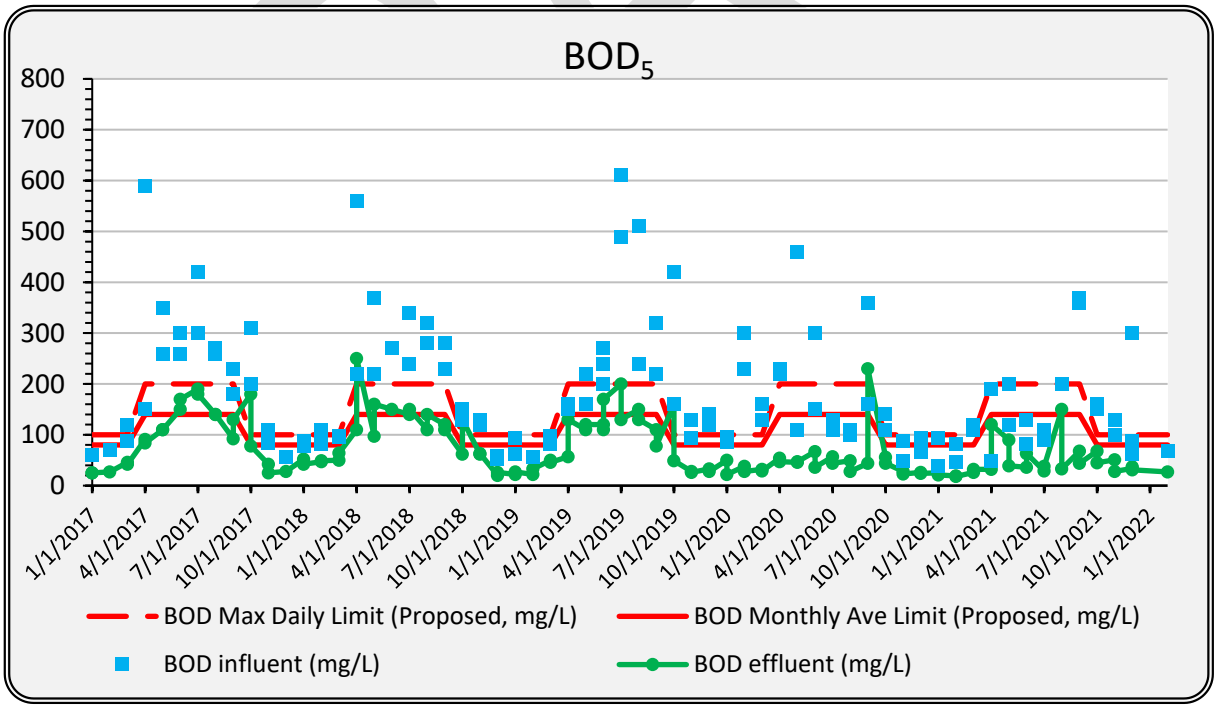

Figure 4. Monthly Influent and Effluent BOD5 Concentrations (2016-2021)

The facility achieved the minimum 30% removal requirement for BOD_5 100% of the time with the lowest monthly removal being 30% in January 2018. Between 2016 and 2021, the facility achieved an average of 42% removal of BOD_5, with maximum percent removal efficiencies as high as 57%.

Table 2. Influent and Effluent BOD5 Data (2016-2021)

Statistic	Influent, BOD_5, mg/L	Effluent, BOD_5, mg/L	Percent Removal
LIMIT	---	200 (daily max)/ 180 (mo avg)	≥30%
COUNT	59	59	59
MEAN	153	85	42%
MIN	78	45	30%
MAX	271	134	57%
STDV	41	21	5.5
CV	0.3	0.2	0.1
5th	216	117	49
95th	97	55	34

The applicant has demonstrated that it will be discharging effluent that has received at least primary treatment for BOD_5 when the 301(h)-modified permit becomes effective. [CWA Section 301(h)(9) and 40 CFR 125.60].

B. Attainment of Water Quality Standards Related to TSS and BOD_5 [CWA § 301(h)(1); 40 CFR § 125.61]

Under 40 CFR 125.61, which implements Section 301(h)(1) of the CWA, there must be water quality standards applicable to the pollutants for which the modification is requested, and the applicant must demonstrate that the proposed discharge will comply with these standards. The applicant has requested modified secondary treatment requirements for BOD_5, which affects dissolved oxygen (DO), and TSS, which affects the color or turbidity in the receiving water. The State of Alaska has water quality standards for DO and turbidity.

1. Turbidity and Light Transmittance/Attenuation

Alaska WQS applicable to the estuarine waters of Sitka Sound provide that turbidity shall not exceed 25 nephelometric turbidity units (NTU), may not interfere with disinfection, may not cause detrimental effect on established levels of water supply treatment, and may not reduce the depth of the compensation point for photosynthetic activity by more than 10% (Table 3). In addition, turbidity may not reduce the maximum Secchi disc depth by more than 10%. Alaska WQS for turbidity can be found in Appendix E.

The applicant collected Secchi disc depth data in Sitka Sound in July 2018 and July 2020 at the following sites:

Station A: Western edge of the ZID
Station B: Eastern edge of ZID reference stations
Station C: Reference station west of discharge
Station D: Reference station east of discharge

Stations C and D are considered reference sites, and Stations A and B are ZID boundary sites. Monitoring results are presented in Table 3.

Table 3. Secchi Disk Depth in Sitka Sound

	2018	Percent Difference 2018	2020	Percent Difference 2020	Average Percent Difference
Station A-western edge of the ZID	24 ft	11.1%	17 ft	5.6 %	8.4 %
Station C-reference station west of discharge	27 ft		18 ft		
Station B-eastern edge of ZID reference stations	26 ft	Not Applicable	19 ft	5.0 %	4.4 %
Station D- reference station east of discharge	25 ft		20 ft		
Source: 7/2018 & -7/2020 CBS receiving water monitoring					

EPA evaluated Secchi disk data from July 2018 and July 2020 and found that while there was one measurement exceeding 10% by one percent, the other two instances were well below the state standard of not reducing Secchi disk depth more than 10%. In another instance, the Secchi disk depth at the reference station was greater than the ZID station depth, indicating better conditions at the ZID compared to the reference station. The facility also had consistent TSS reduction well above the required 30% reduction. Lastly, the draft permit contains a narrative limitation prohibiting the discharge of floating, suspended or submerged matter of any kind in concentrations that would impair designated beneficial uses.

Sitka did not collect turbidity data. Therefore, based on the above analyses, the proposed discharge is expected to comply with Alaska WQS for turbidity and light transmittance/attenuation.

2. Dissolved Oxygen (DO)

The effect of the effluent discharge on DO can occur in the nearshore and far-field as effluent mixes with the receiving water and the oxygen demand of the effluent BOD_5 load is exerted. Pursuant to 40 CFR 125.61(b)(1) and 125.62(a)(1), the applicant must demonstrate that the proposed discharge will comply with water quality criteria for DO and that the outfall and diffuser are located and designed to provide adequate initial dilution, dispersion, and transport of wastewater such that the discharge does not exceed criteria at and beyond the ZID. Alaska WQS for DO applicable to the estuarine waters of Sitka Sound provide that DO may not be less than 5.0 mg/L except where natural conditions cause this value to be depressed, and in no case may DO levels exceed 17 mg/L [18 AAC 70.15(a)(i)]. Alaska WQS for DO are shown in Appendix D.

In accordance with the procedures outlined in the 301(h) TSD, Section B-11, p.188 and p. 194, EPA conducted a near-field and far-field analysis to estimate the impacts on DO levels in the vicinity of the discharge. Analysis of DO impacts can be found in Appendix E and summarized below.

Near Field DO Impacts

For CBS, the following values were used for the near field DO analysis:

DO_a = 12.4 mg/L (worst case from station C, modeling indicated station C was limiting for DO and other parameters).

Do_e = 4 mg/L (min value effluent DO)

IDOD = 3 mg/L (from Table B-3 in TSD)

S_a = 87 (ZID dilution)

$DO_f = DO_a - (DO_a + IDOD – DO_e)/S_a$ = 12.4mg/L + (4 mg/L – 3 mg/L - 12.4 mg/L)/(87)=12.3 mg/L

The near-field DO reduction is approximately 0.1 mg/L under worst case condition. Therefore, the Alaska WQS of no less than 5 mg/L and no greater than 17 mg/L are not violated.

Far Field Analysis

To assess the potential for far field impacts to DO, the final BOD_5 concentration after initial mixing was determined using the simplified procedures described in Appendix B of the 301(h) TSD and outlined in Appendix E of this 301(h) TDD. The calculation resulted in a final BOD_5 concentration of 3.0 mg/L after initial mixing, a concentration that is not anticipated to cause or contribute to any measurable far field DO impacts beyond the ZID. Therefore, the Alaska WQS of no less than 5 mg/L and no greater than 17 mg/L are not violated.

Suspended Solids Accumulation

Impacts to DO concentrations resulting from the discharge of wastewater can also be assessed by examining the accumulation of suspended solids. 40 CFR 125.62 states that wastewater and particulates must be adequately dispersed following initial dilution so as not to adversely affect water use areas. The accumulation of suspended solids may lower DO in near-bottom waters and cause changes in the benthic communities. Accumulation of suspended solids in the vicinity of a discharge is influenced by the amount of solids discharged, the settling velocity distribution of the particles in the discharge, the plume height-of-rise, and current velocities. Hence, sedimentation of suspended solids is generally of little concern for small discharges into well-flushed receiving waters.

The questionnaire submitted by the applicant in 2006 states there are no known water quality issues associated with the accumulation of suspended solids from the discharge.

To evaluate the potential impact of solids sedimentation, a simplified approach for small dischargers that are not likely to have sediment accumulation related problems can be found in Figure B-2 of the 301(h) TSD. To use Figure B-2 of the 301(h) TSD to evaluate whether steady state solids accumulation will result in sufficient sediment accumulation to cause a 0.2 mg/L oxygen depression, the TSS mass emissions rate is needed, as well as plume height-of-rise. The mass emission or loading rate was calculated using the TSS concentration limit, facility design flow, and a conversion factor (Loading (lbs/day)) = 58 mg/L X 5.3 mgd X 8.34= 2564 lbs/day, 1163 kg/day. Plume height-of-rise was calculated to be 80 feet (24 meters), using the approach on page B-5 in the 301(h) TSD, which involves multiplying the water depth at the point of discharge (100 feet at MLLW) by 0.6. When a height-of-rise of 24 meters and a loading rate of 1163 kg/day are input in Figure B-2, steady state accumulation is well below the line at which greater than 0.2 mg/L oxygen depression is expected. Per the 301(h) TSD, no further analysis is needed to demonstrate that accumulating solids will not result in unacceptable DO depressions.

Based on the above analyses of DO depletion and suspended solids accumulation, the proposed discharge is expected to comply with AK WQS for DO.

C. Attainment of Other Water Quality Standards and Impact Of the Discharge On Shellfish, Fish And Wildlife; Public Water Supplies; And Recreation [CWA Section 301(h)(2); 40 CFR 125.62]

CWA Section 301(h)(2) requires that the proposed discharge not interfere, either alone or in combination with other sources, with the attainment or maintenance of that water quality which assures protection of public water supplies and protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife, and allows recreational activities in and on the water. Pursuant to 40 CFR 125.62(a), the applicant's outfall and diffuser must be located and designed to provide adequate initial dilution, dispersion, and transport of wastewater such that the discharge does not exceed, at and beyond the ZID, all applicable EPA-approved state WQS and, where no such standards exist, EPA's CWA Section 304(a)(1) aquatic

life criteria for acute and chronic toxicity and human health criteria for carcinogens and noncarcinogens, after initial mixing in the waters surrounding or adjacent to the outfall. In addition, 40 CFR 125.59(b)(1) prohibits issuance of a 301(h)-modified permit that would not assure compliance with all applicable NPDES requirements of 40 CFR Part 122; under these requirements a permit must ensure compliance with all WQS.

Attainment of water quality criteria for DO and turbidity was previously discussed. However, in accordance with 40 CFR 125.62(a), the applicant must also demonstrate that the proposed discharge will attain other WQS, including those for pH, temperature, toxic pollutants, and bacteria. EPA used Alaska WQS and the processes described in the 301(h) TSD and the 1991 *Technical Support Document for Water Quality-based Toxics Control* to determine whether the proposed discharge has the reasonable potential to cause or contribute to an excursion above AK WQS, to calculate WQBELs, and to assess compliance with CWA Section 301(h)(2) and 40 CFR 125.62. To determine reasonable potential, EPA compares the maximum projected receiving water concentration at the ZID boundary to the water quality criterion for that pollutant. If the projected receiving water concentration exceeds the criterion, there is reasonable potential for that pollutant to cause or contribute to an excursion above AK WQS, and a WQBEL must be included in the permit. If a permittee is unable to meet their WQBEL it would fail to satisfy CWA Section 301(h)(9) and 40 CFR 125.62 and would be ineligible for a CWA Section 301(h) modification.

Pursuant to 40 CFR 125.62(a)(1)(iv), EPA's evaluation of compliance with WQS must be based upon conditions reflecting periods of maximum stratification and during other periods when discharge characteristics, water quality, biological seasons, or oceanographic conditions indicate more critical situations may exist, commonly referred to as critical conditions.

1. pH

Alaska's WQS provide that pH may not be less than 6.5 or greater than 8.5 and may not vary more than 0.2 pH unit outside of the naturally occurring range.

The effect of pH on the receiving water following initial dilution was estimated using Table 1. *Estimated pH Values After Initial Dilution* in the 301(h) TSD and a reasonable potential spreadsheet.

EPA reviewed DMR data for pH between 2016 and 2021. The facility met the pH limits in the 2001 permit 100% of the time. The maximum and minimum pH values observed were 7.9 and 6.4, respectively. EPA used the dilution factor and measured alkalinity, temperature, and pH data to calculate the minimum and maximum pH at the edge of the ZID and found that pH would be between 7.4 and 7.9 units. This is within the range of 6.5 to 8.5 and meets Alaska WQS for pH.

The proposed discharge is expected to comply with Alaska WQS for pH after initial mixing at the edge of the ZID.

2. Temperature

Alaska's WQS for water temperature provide that the discharge may not cause the temperatures of the receiving water to exceed 15°C for marine uses and the discharge may not cause the weekly average temperature to increase more than 1°C. The maximum rate of change may not exceed 0.5°C per hour. Normal daily temperature cycles may not be altered in amplitude or frequency.

EPA reviewed surface water and DMR data between 2016 and 2021 to assess whether the modified discharge will comply with Alaska WQS for temperature. The maximum ocean temperature recorded in Sitka Sound during receiving water monitoring in 2018 and 2020 was 12°C, and the maximum recorded effluent temperature between 2016 and 2021 was 15°C. The maximum temperatures in the CBS WWTP's discharge and Sitka Sound are both below Alaska WQS for temperature. Therefore, the proposed discharge is expected to comply with Alaska WQS for temperature.

3. Toxics

Alaska WQS for toxics for marine uses can be found in 18 AAC 70.020(b)(23) and the *Alaska Water Quality Criteria Manual for Toxics* (ADEC, 2008).

To assess whether the proposed discharge will comply with Alaska WQS for toxics after initial mixing EPA reviewed DMR data collected between 2016 and 2021 and the results of three priority pollutant scans performed on the effluent in 2002, 2005, 2007, 2010, 2012, 2015, and 2017.

Several metals were reported above their respective detection limits. Using this data along with DMR data for ammonia, EPA performed reasonable potential analyses using the numeric criteria in the *Alaska Water Quality Criteria Manual* (ADEC 2008) and the processes outlined in the *Technical Support Document for Water Quality-based Toxics Control* (USEPA 1991).

Chlorine and copper have reasonable potential to cause or contribute to a violation of Alaska WQS at the edge of the ZID. WQBELs have been developed and included in the draft permit for chlorine and copper.

The effluent limits developed for chlorine and copper are protective of Alaska WQS, and the proposed discharge is expected to comply with AK WQS for toxics after initial mixing at the edge of the ZID.

4. Bacteria

Alaska's WQS for bacteria are found at 18 AAC 17.020(b)(14).

I. Fecal Coliform (FC)

Alaska's most restrictive marine criterion for FC bacteria concentrations is in areas protected for the harvesting and use of raw mollusks and other aquatic life. The WQS specifies that the geometric mean of samples shall not exceed 14 MPN/100 mL, and that not more than 10 percent of the samples shall exceed:

- 43 MPN/100 mL for a five-tube decimal dilution test;
- 49 MPN/100 mL for a three-tube decimal dilution test;
- 28 MPN/100 mL for a twelve-tube single dilution test;
- 31 CFU/100 mL for a membrane filtration test.

This standard must be met at the edge of the ZID.

On June 26, 2001, ADEC provided a CWA Section 401 Certificate of Reasonable Assurance (401 certification) that included a mixing zone defined as an arc of a circle with a 1600-meter radius, centered on the outfall going from one shoreline to the other extending on either side of the outfall line, and extending from the marine bottom to the surface. In the 2001 permit, the number of FC bacteria in the primary treated effluent was not to exceed a 30-day average of 1.0 million FC per 100 mL and a daily limit of 1.5 million FC per 100 mL of sample. Outside this mixing zone the FC concentrations were not to exceed a maximum of 14 FC/100 mL for a monthly average and 43 FC/100 mL for a daily maximum. Facility DMR data from the past 5 years shows FC values ranges from 9800—998,000 FC/100mL, with a 95th percentile of 856,000 FC/100mL. Summary statistics of DMR data are provided in Table 4 below.

Table 4. FC DMR Summary Data 2016-2021

	# of samples	Min	Max	95th Percentile	Average
Fecal Coliform (FC/100mL)	**59**	**9800**	**998,000**	**856,000**	**397,000**

CWA Section 301(h)(9) requires 301(h) discharges to meet WQS and federal 304(a) criteria at the edge of the ZID. The current 1600-meter mixing zone for FC is inconsistent with the statutory or regulatory definition of a ZID: *the region of initial mixing surrounding or adjacent to the outfall.* ADEC will not reauthorize the 1600m mixing zone for fecal coliform and the point of compliance for all bacteria limits is now the edge of the ZID.

Consistent with Section 301(h)(9) of the CWA and 40 CFR 125.62, EPA used the 76:1 dilution achieved at the edge of the chronic mixing zone within the ZID boundary, to evaluate reasonable potential and assess compliance with CWA Section 301(h)(9) and 40 CFR 125.62.

Using effluent data from 2016 – 2021 and the same process and equations as those used for toxics, EPA conducted a reasonable potential analysis and determined fecal coliform has the reasonable potential to cause or contribute to a violation of Alaska WQS at the point of discharge. EPA expects that DEC will provide a lower WQBEL using Alaska WQS that is more protective than a WQBEL that uses the ZID dilution factor. For more information on the effluent limits for fecal coliform, refer to the Fact Sheet.

The effluent limits developed for fecal coliform will be protective of Alaska WQS after mixing at the edge of the ZID and will satisfy the requirements of CWA Section 301(h)(9) and 40 CFR 125.63(a).

II. Enterococcus Bacteria

Enterococci bacteria are indicator organisms of harmful pathogens recommended by EPA to protect primary contact recreation for marine waters. The EPA Beaches Environmental Assessment and Coastal Health Act (BEACH Act) requires states and territories with coastal recreation waters to adopt enterococci bacteria criteria into their WQS. EPA approved Alaska's WQS for enterococcus in 2017. The WQS at 18 AAC 70.020(b)(14)(B) for contact recreation specifies that the enterococci bacteria concentration shall not exceed 35 enterococci CFU/100mL, and not more than an 10% of the samples may exceed a concentration of 130 enterococci CFU/100mL.

The 2001 permit does not contain an effluent limitation for enterococcus bacteria because there was no applicable enterococcus WQS in effect when the permit was issued.

40 CFR 122.44(d)(1) requires EPA to account for existing controls on discharges when determining whether a discharge has the reasonable potential to cause or contribute to an excursion of state WQS. The 2001 permit did not require enterococcus monitoring, but it reasons that the high FC loads observed are also indicative of high loads of other pathogens commonly found in WWTP effluents, including enterococcus. With the available FC data and lack of disinfection capacity at the facility, EPA has determined there is reasonable potential for the discharge to cause or contribute to a violation of Alaska WQS for enterococcus. With the available FC data and lack of disinfection capacity at the facility, EPA has determined there is reasonable potential for the discharge to cause or contribute to a violation of Alaska WQS for enterococcus. EPA calculated a WQBEL for enterococcus using Alaska WQS and the ZID dilution. EPA expects that DEC will provide a lower WQBEL using Alaska WQS and a smaller dilution factor than the ZID. For more information on the effluent limits for enterococcus, refer to the Fact Sheet.

The effluent limits developed for enterococcus will be protective of Alaska WQS after mixing at the edge of the ZID and will satisfy the requirements of CWA Section 301(h)(9) and 40 CFR 125.63(a).

D. Impact of the Discharge on Public Water Supplies [40 CFR 125.62(b)]

40 CFR 125.62(b) requires that the applicant's 301(h) proposed discharge must allow for the attainment or maintenance of water quality that assures protection of public water supplies and must not interfere with the use of planned or existing public water supplies. Based on the 2006 Questionnaire submitted by the applicant, there are no existing or planned public water supply intakes in the vicinity of the discharge. Therefore, EPA concludes that the applicant's proposed discharge will have no effect on the protection of public water supplies and will not interfere with the use of planned or existing public water supplies.

E. Biological Impact of Discharge [40 CFR 125.62(c)]

40 CFR 125.62(c) requires that in addition to complying with applicable WQS, the proposed discharge must allow for the attainment or maintenance of water quality that assures the protection and propagation of a balanced indigenous population (BIP) of shellfish, fish, and wildlife. A BIP of shellfish, fish, and wildlife must exist immediately beyond the ZID and in all other areas beyond the ZID where marine life is actually or potentially affected by the applicant's discharge. In addition, conditions within or beyond the ZID must not cause or contribute to adverse biological impacts, including, but not limited to, the destruction of distinctive habitats of limited distribution, the presence of disease epicenter, or the simulation of phytoplankton blooms which have adverse effects beyond the ZID, interfere with estuarine migratory pathways within the ZID, or result in the accumulation of toxic pollutants or pesticides at levels which exert adverse effects on the biota within the ZID.

According to the applicant the discharge will not cause adverse impacts to habitats of limited distribution or commercial or recreational fisheries. There have been no known cases of mass mortalities of fish or invertebrates, no increased incidence of disease in marine organisms, and no other known cases of adverse biological impacts. The application materials indicate the discharge does not cause or contribute to significant biological impacts. The discharge is relatively small in volume and is composed of domestic wastewater and leachate from the Kimsham Street Landfill with limited quantities of toxics. Toxic conditions are not expected since the effluent achieves rapid mixing within minutes of discharge, minimizing the potential exposure area.

The 2001 permit required the facility to conduct biological monitoring, which consisted of a benthic survey and sediment analysis for total volatile solids (TVS) at the western and eastern ZID boundaries and at two reference locations. From 1987 to 2018, there were 11 surveys conducted at three locations: at the northwest ZID boundary, 150 feet northwest of the ZID boundary, and a northwest reference station. There was no evidence in these surveys of rippling or settleable solids deposition, or impacts to the benthic community. Video taken of the physical environment at each sampling station showed considerable physical and ecological diversity (CBS 2008; 2018). Based on these studies, it does not appear that excess organic sediment is accumulating around the outfall as compared to stations at the ZID boundary and reference sites. Based on visual observations of the benthic infauna collected in sediment samples, it does not appear that the CBS WWTP's discharge is causing significant changes in the benthic community structure.

The Biological Monitoring Program from the 2001 permit is being retained in the draft permit.

F. Impact of Discharge on Recreational Activities [40 CFR 125.62(d)]

Under 40 CFR 125.62(d), the applicant's discharge must allow for the attainment or maintenance of water quality that allows for recreational activities beyond the zone of initial

dilution, including, without limitation, swimming, diving, boating, fishing, and picnicking, and sports activities along shorelines and beaches. There must be no Federal, State, or local restrictions on recreational activities within the vicinity of the applicant's outfall unless such restrictions are routinely imposed around sewage outfalls.

In its 2006 Questionnaire, the applicant stated that no impacts on recreational activities were expected due to the proposed discharge. Sport fishing, boating, swimming, diving, picnicking and various other beach activities and beach combing activities occur on a small scale but are not common in Sitka Sound due to the cold water temperatures, prevailing winds, climate, and steep glacial terrain. In its 2006 Questionnaire, the applicant indicated that there are no significant commercial or recreational fisheries in the discharge vicinity. No adverse effects linked to the CBS WWTP's discharge have been reported.

The 2001 permit required signs to be placed on the shoreline near the 1600-meter fecal coliform mixing zone and the outfall line that state primary treated domestic wastewater is being discharged, and certain activities such as the harvesting of shellfish for raw consumption and bathing should not take place within the mixing zone. EPA has retained the requirement to place these signs on the shoreline in the draft permit until the final fecal coliform and enterococcus limits are maintained.

The applicant has demonstrated that the proposed discharge meets the requirements to allow for the attainment or maintenance of water quality which allows for recreational activities beyond the ZID.

G. Establishment of Monitoring Programs [CWA 301(h)(3); 40 CFR 125.63]

Under 40 CFR 125.63, which implements Section 301(h)(3) of the Act, the applicant must have a monitoring program designed to provide data to evaluate the impact of the proposed discharge on the marine biota, demonstrate compliance with applicable WQS, and measure toxic substances in the discharge. The applicant must demonstrate the capability to implement these programs upon issuance of a 301(h)-modified NPDES permit. In accordance with 40 CFR 125.63(a)(2), the applicant's monitoring programs are subject to revision as may be required by EPA.

1. Influent/Effluent Monitoring Program [40 CFR 125.63(d)]

40 CFR 125.63(d) requires an effluent monitoring program; the applicant proposes continuation of the current monitoring program. In addition to the 301(h) specific monitoring requirements, Section 308 of the CWA and 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. Throughout the previous permit term (and the administratively continued period), the applicant submitted effluent monitoring data as required by the 2001 permit.

Parameters for which effluent monitoring were required in the 2001 permit include:

- Flow[1]
- BOD_5 [1]
- TSS[1]
- Fecal Coliform
- Ammonia
- pH
- Temperature
- Dissolved oxygen
- Total Residual Chlorine
- Copper
- Chronic Whole Effluent Toxicity
- Toxic Pollutants and Pesticides

[1]Influent monitoring also required

Summary statistics of the effluent data submitted by the permittee between 2016 and 2021 is presented in Appendix C.

The draft permit retains largely the same effluent and influent monitoring requirements and includes the new requirement to monitor the effluent for enterococcus and increases fecal coliform monitoring from 1/month to 1/week. Consistent with 40 CFR 125.66, the draft permit also includes a new requirement for the permittee to perform whole effluent toxicity (WET) analysis of their effluent quarterly during the first two years of the permit. If WET tests indicate compliance with Alaska water quality standards, then WET testing is reduced to annual monitoring, as described in Permit Part I.C.

2. Receiving Water Quality Monitoring Program [40 CFR 125.63(c)]

40 CFR 125.63(c) requires that the receiving water quality monitoring program must provide data adequate to evaluate compliance with applicable WQS. The applicant proposes continuation of the current receiving water monitoring program. As is the case of effluent monitoring, NPDES permits include receiving water monitoring requirements to allow for compliance assessment, and to determine if additional effluent limitations and/or monitoring requirements are necessary in future permitting actions.

EPA is retaining most of the receiving water monitoring program from the 2001 permit in the new draft permit. Changes to the receiving water monitoring program include the addition of enterococcus and turbidity to the suite of parameters analyzed and the removal of fecal coliform sampling at the edge of the 1600-meter mixing zone (Stations 5, 6, and 7). Sampling at the edge of the 1600-meter mixing zone is no longer required because the 1600-meter mixing zone is not being reauthorized by ADEC and the compliance for all parameters must be met at

the edge of the ZID, which is a rectangle 387 feet (118m) in length and 191 feet (58.2m) wide, centered on the diffuser of the outfall.

3. Biological Monitoring Program [40 CFR 125.63(b)]

40 CFR 125.63(b) requires a permittee to implement a biological monitoring program that provides data adequate to evaluate the impact of the applicant's discharge on the marine biota. Such a program should, at a minimum, allow for evaluation of any ecosystems impacts; any changes in the amount of organic material in the seafloor sediment; any changes to benthic communities; and the effectiveness/bases for permit conditions.

The Biological Monitoring Program in the 2001 permit consisted of a benthic survey and sediment analysis for total volatile solids (TVS) at the eastern and western ZID boundaries and at two reference locations.

Based on the results of the TVS analysis of sediment, it does not appear that excess organic sediment is accumulating around the outfall as compared to stations at the ZID boundary and reference sites.

Based on visual observations of the benthic infauna collected in sediment samples, it does not appear that the CBS WWTP discharge is causing significant changes in the benthic community structure.

The Biological Monitoring Program from the 2001 permit is being retained in the draft permit.

H. Effect of Discharge on Other Point and Nonpoint Sources [CWA 301(h)(4); 40 CFR 25.64]

Under 40 CFR 125.64, which implements Section 301(h)(4) of the Act, the applicant's proposed discharge must not result in the imposition of additional treatment requirements on any other point or nonpoint source. Pursuant to 40 CFR 125.64(b), the applicant is required to submit a determination signed by the State of Alaska indicating whether the applicant’s discharge will result in an additional treatment pollution control, or other requirement on any other point or nonpoint sources. The State determination must include a discussion of the basis for its conclusion. EPA cannot take final action on the 301(h)-modified permit until it receives this determination. EPA expects that ADEC will include this determination in the 401 certification for this permit.

I. Urban Area Pretreatment Program [CWA 301(h)(6); 40 CFR 125.65]

Under 40 CFR 125.65, dischargers serving a population greater than 50,000 are required to have a pretreatment program. As previously discussed, the CBS WWTP serves a population of approximately 10,500 people so this provision is not applicable to this analysis; however, since there is an industrial discharge to the WWTP, EPA has included a condition in the permit that

requires the facility to develop and implement a pretreatment program (see below for further discussion).

J. Industrial and Nonindustrial Sources and Toxics Control [CWA 301(h)(7); 40 CFR 125.66]

1. Chemical Analysis and Toxic Pollutant Source Identification [40 CFR 125.66(a) and (b)]

Under 40 CFR 125.66(a) and (b), applicants are required to perform chemical testing for toxic pollutants and pesticides and identify the source of any parameters detected.

The 2001 permit required an industrial user survey and toxic chemical analyses of the effluent be submitted with the permit reapplication. As previously discussed, the permittee conducted three toxics pollutant scans, the results of which EPA used in development of the draft permit.

2. Industrial Pretreatment Program [40 CFR 125.66(c)]

40 CFR 125.66(c) requires that applicants that have known or suspected industrial sources of toxic pollutants shall have an approved pretreatment program in accordance with the requirements of 40 CFR Part 403 (Pretreatment Regulations).

The facility has one industrial user, the Kimsham Street Landfill. The CBS WWTP receives the landfill leachate via a lift station and force main that connect to the sewer collection system. The CBS WWTP monitors the leachate for metals and other toxics in accordance with a permit issued by the State of Alaska. The Kimsham Street Landfill meets the definition of an industrial source under 40 CFR 125.58(j). Therefore, the permit requires CBS to develop a pretreatment program in accordance with 40 CFR Part 403. Further details of the pretreatment program are discussed in the Fact Sheet and draft permit. After CBS develops and EPA approves the pretreatment program, EPA will modify the permit to incorporate the pretreatment program.

3. Nonindustrial Source Control Program [40 CFR 125.66(d)]

40 CFR 125.66(d), which implements Section 301(h)(6) of the Act, requires the applicant to submit a proposed public education program designed to minimize the introduction of non-industrial toxic pollutants and pesticides into the POTW. The applicant must also develop and implement additional nonindustrial source control programs on the earliest possible schedule. The requirement to develop and implement additional nonindustrial source control programs does not apply to a small Section 301(h) applicant that certifies there are no known or suspected water quality, sediment accumulation, or biological problems related to toxic pollutants or pesticides in its discharge.

In the permit application, CBS indicated that they are implementing the permit conditions that require a public education program to address non-hazardous alternatives to hazardous household products and pesticides, and proper disposal of hazardous wastes. These meet the

requirements of 40 CFR 125.66(d)(1). EPA has included the previous permit's public education and outreach program conditions in the draft permit.

K. Effluent Volume and Amount of Pollutants Discharged [40 CFR 125.67]

Under 40 CFR 125.67, which implements Section 301(h)(7) of the Act, the applicant's proposed discharge may not result in any new or substantially increased discharges of the pollutant to which the modification applies above the discharge specified in the 301(h)-modified permit. The applicant has applied on the basis of the current discharge and does not propose any new or substantially increased discharges of TSS or BOD_5, the two parameters for which the facility has requested a waiver.

L. Compliance With Other Applicable Laws [40 CFR 125.59]

Under 40 CFR 125.59(b)(3), a 301(h)-modified permit may not be issued if such issuance would conflict with applicable provisions of state, local, or other federal laws or executive orders. As part of the application renewal, the applicant must demonstrate compliance with all applicable Alaska and federal laws and regulations, and executive orders, including the Coastal Zone Management Act, Marine Protection Research and Sanctuaries Act, and the Endangered Species Act.

1. Coastal Zone Management Act

Alaska withdrew from the voluntary National Coastal Zone Management Program on July 1, 2011 (NOAA 2019c); therefore, this requirement is not applicable.

2. Marine Protection, Research, and Sanctuaries Act

Under 40 CFR 125.59(b)(3), no section 301(h) modified permit shall be issued if such issuance would conflict with Title III of the Marine Protection, Research, and Sanctuaries Act (MPRSA), 16 USC § 1431 *et seq.*, which authorizes the Secretary of Commerce (i.e., NOAA) to designate and protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational or esthetic qualities as national marine sanctuaries. In the U.S., there are 14 national marine sanctuaries and two marine national monuments, none of which are in Alaska (NOAA 2019d).

The draft permit is therefore expected to comply with Title III of the MPRSA.

3. Endangered Species Act

Under 40 CFR 125.59(b)(3), no section 301(h) modified permit shall be issued if such issuance would conflict with the Endangered Species Act (ESA), 16 USC 1531 *et seq.* The ESA requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service (USFWS) (collectively, the Services) if their actions could beneficially or

adversely affect any threatened or endangered species (ESA-listed species) or such species designated critical habitat.

EPA has prepared a biological evaluation that identified the following species and/or critical habitat in the vicinity of the discharge using the following web-based applications. All lists will be verified with the Services.

- NOAA's Alaska Protected Resource Division Species Distribution Mapper: (https://alaskafisheries.noaa.gov/portal/apps/webappviewer/index.html?id=0c4a81f75310491d9010c17b6c081c81)
    - Western Distinct Population Segment (Western DPS or WDPS) Stellar sea lion
    - Humpback whale
- USFWS' Information for Planning and Consultation (IPaC): https://ecos.fws.gov/ipac/
    - None

EPA has determined the draft permit is not likely to affect ESA-listed species and/or their critical habitats and, pursuant to Section 7 of the ESA, will consult with NMFS prior to taking final action. If necessary, EPA will incorporate required provisions into the final permit.

4. Magnuson-Stevens Fishery Conservation and Management Act

Under 40 CFR 125.59(b)(3), no section 301(h) modified permit shall be issued if such issuance would conflict with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), 16 USC 1801 *et seq*., which protects against adverse impacts to Essential Fish Habitat (EFH).The MSFCMA requires federal agencies to consult with the National Marine Fisheries Service (NMFS) when any activity proposed to be permitted, funded, or undertaken by a federal agency may have an adverse effect on designated Essential Fish Habitat (EFH) as defined by the Act. The EFH regulations define an *adverse effect* as any impact which reduces quality and/or quantity of EFH and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey, reduction in species' fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

EPA has prepared an EFH Assessment and determined the proposed permit will not have an adverse effect on EFH for any managed species.

M. State Determination and Concurrence [40 CFR 125.61(b)(2); 40 CFR 125.64(d)]

Under 40 CFR 125.61(b)(2) the applicant must provide a determination signed by the state or interstate agency(s) authorized to provide certification under 40 CFR 124.53 and 124.54 that the proposed discharge will comply with applicable provisions of state law, including WQS. This determination must include a discussion of the basis for the conclusion reached. Furthermore, pursuant to 40 CFR 124.53 and 124.54, the state must either grant a certification pursuant to Section 401(a)(1) of the CWA or waive this certification before EPA may issue a 301(h)-modified permit. The applicant did not provide this certification at the time of application; EPA will

request 401 certification and a determination under 40 CFR 125.61(b)(2) from ADEC during the public notice period of the draft permit.

40 CFR 125.64(d) requires applicants to provide a determination from the state or interstate agency(s) having authority to establish wasteload allocations indicating whether the applicant's discharge will result in an additional treatment pollution control, or other requirement on any other point or nonpoint sources. The state determination shall include a discussion of the basis for its conclusion. The applicant did not submit this determination with their application. EPA will request that this determination be included in ADEC's 401 certification of the permit.

9) REFERENCES

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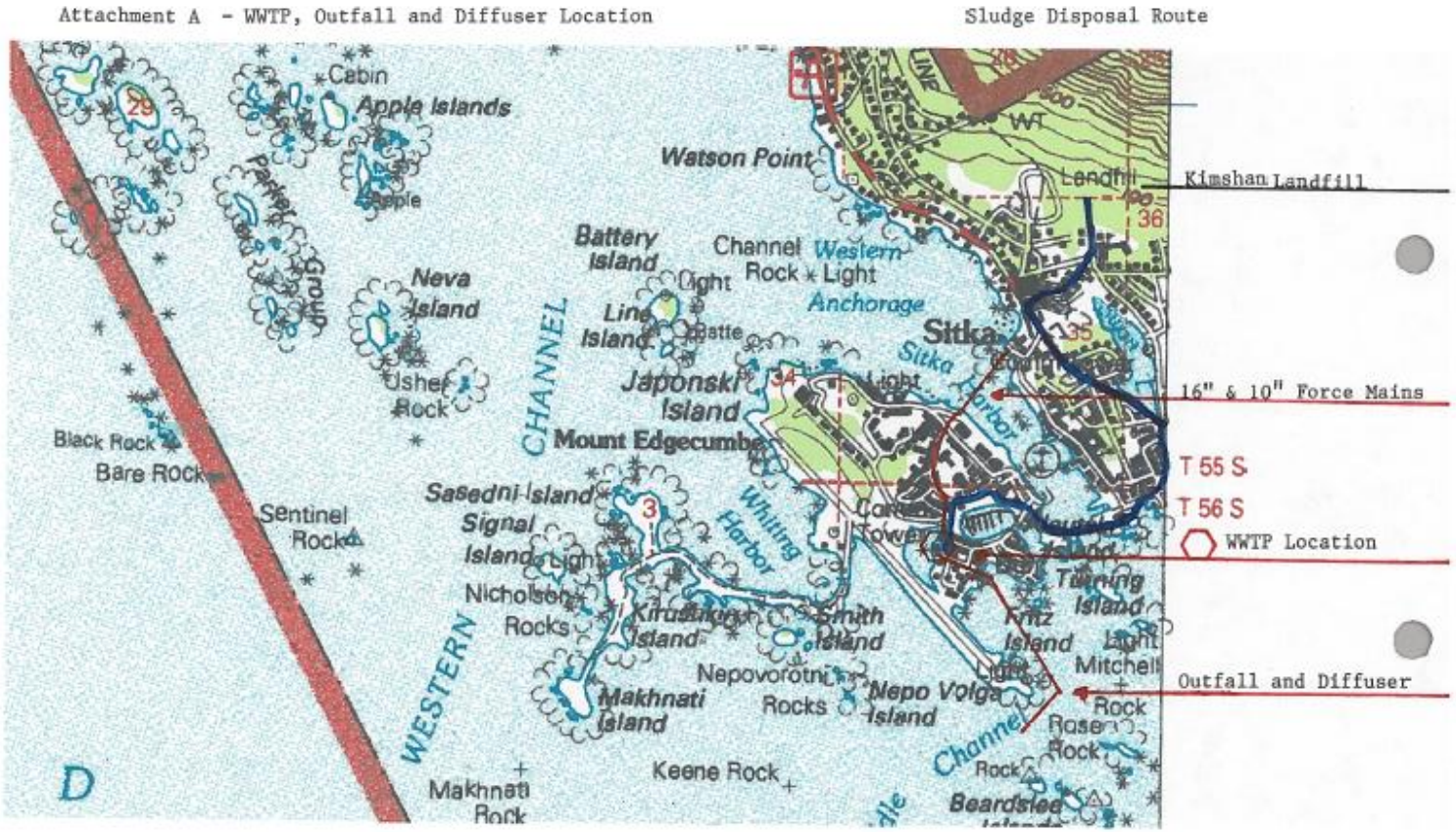
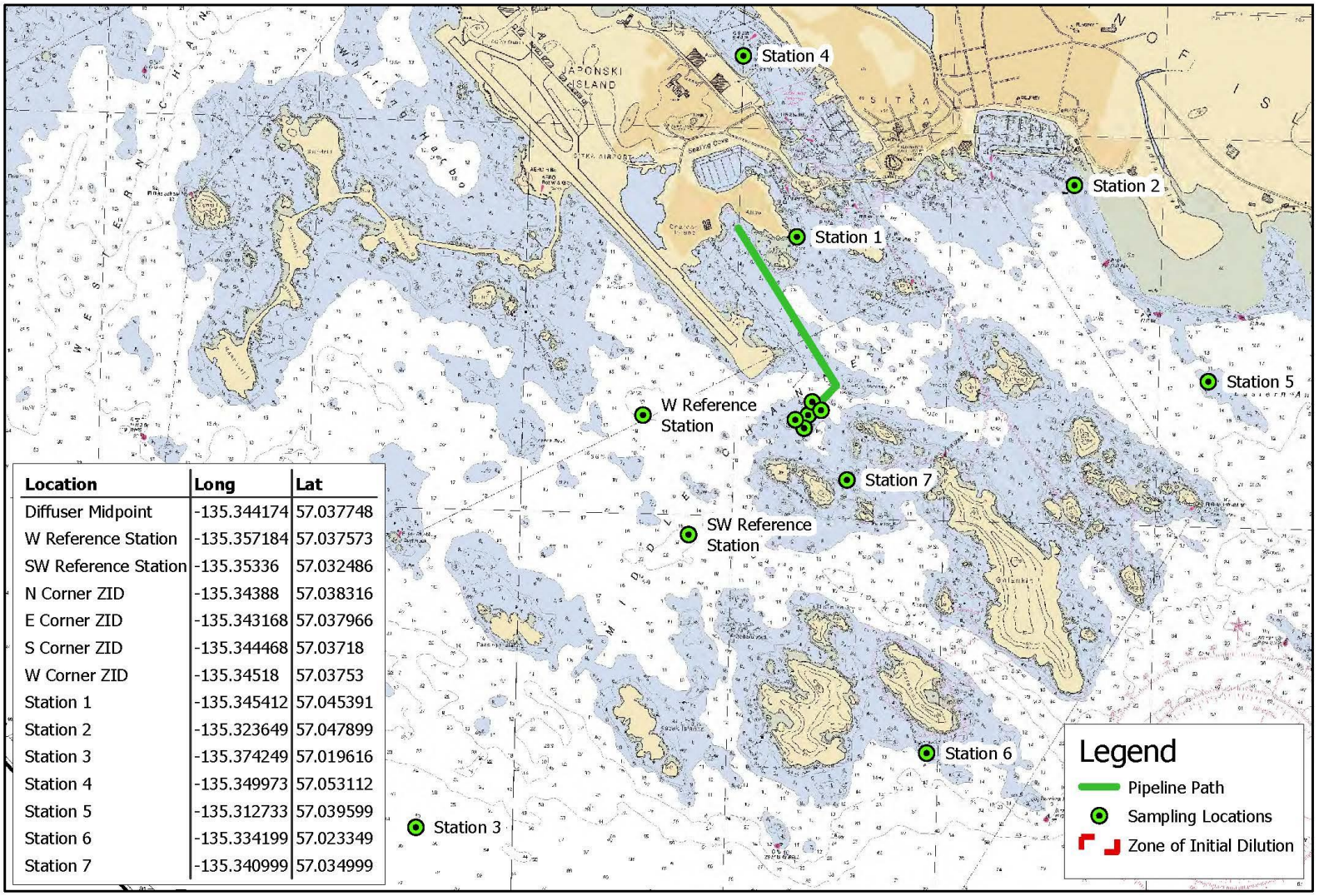
Appendices

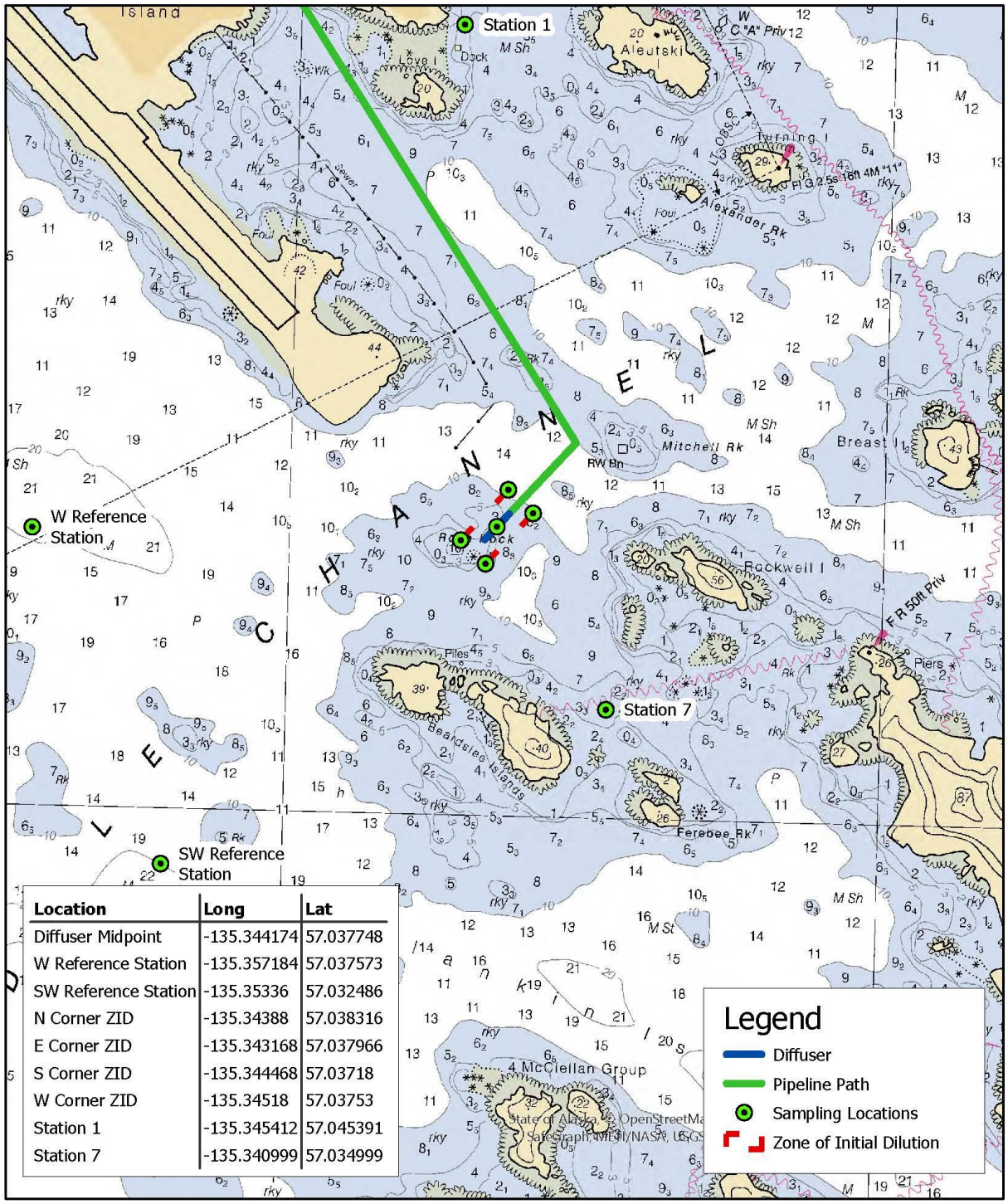
A. Facility and Outfall Locations





Location	Long	Lat
Diffuser Midpoint	-135.344174	57.037748
W Reference Station	-135.357184	57.037573
SW Reference Station	-135.35336	57.032486
N Corner ZID	-135.34388	57.038316
E Corner ZID	-135.343168	57.037966
S Corner ZID	-135.344468	57.03718
W Corner ZID	-135.34518	57.03753
Station 1	-135.345412	57.045391
Station 2	-135.323649	57.047899
Station 3	-135.374249	57.019616
Station 4	-135.349973	57.053112
Station 5	-135.312733	57.039599
Station 6	-135.334199	57.023349
Station 7	-135.340999	57.034999

Figure 2. Receiving Water Sampling Locations. City of Sitka Wastewater Treatment Plant. NPDES Permit No. AK0021474.

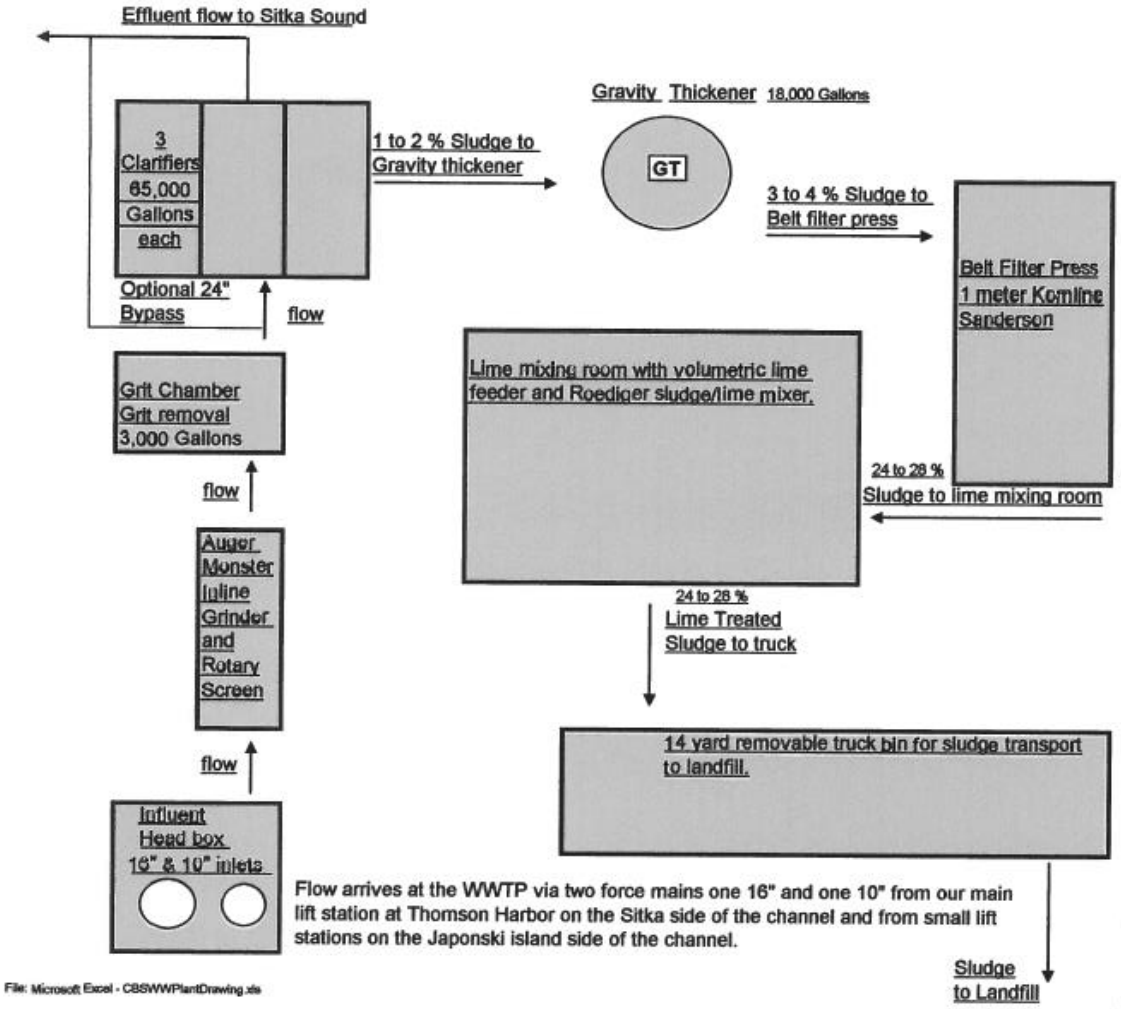


Location	Long	Lat
Diffuser Midpoint	-135.344174	57.037748
W Reference Station	-135.357184	57.037573
SW Reference Station	-135.35336	57.032486
N Corner ZID	-135.34388	57.038316
E Corner ZID	-135.343168	57.037966
S Corner ZID	-135.344468	57.03718
W Corner ZID	-135.34518	57.03753
Station 1	-135.345412	57.045391
Station 7	-135.340999	57.034999

Figure 1. Receiving Water Sampling Locations. City of Sitka Wastewater Treatment Plant. NPDES Permit No. AK0021474.

B. Facility Figures and Process Flow Diagram

Line drawing for flow and sludge processing at CBS 1.8 MGD primary WWTP. With a description of processes for sludge collection, dewatering, storage, treatment and destination. Also included is a summary of methods used for pathogen reduction and vector control.



Flow arrives at the WWTP via two force mains one 16" and one 10" from our main lift station at Thomson Harbor on the Sitka side of the channel and from small lift stations on the Japonski island side of the channel.

File: Microsoft Excel - CBSWWPlantDrawing.xls

Flow arrives at the WWTP in a head box. Then flows to a common header, to a Auger Monster inline grinder and rotory drum screen for removal of larger material. The flow continues to the Grit Chamber where more dense material such as sand and rocks are removed. The grit is dewatered and is pumped into a small container (~250 gallons) for disposal in the 14 yard sludge bin. The flow continues to the clarifiers where sludge settles . The flow then exits the clarifies/plant via 24" glass lined DIP for discharge to the ocean through the diffusor. Sludge from the clarifiers is pumped to the Gravity Thickener at ~ 1 to 2 % solids. Sludge is then pumped twice per/wk to the Belt Filter Press with a consistancy of ~ 3 to 4 % solids. The resulting 24 to 28% sludge cake from the belt fiter press then travels via screw conveyor to the lime mixing room. Lime is added volumetrically and mixed with a Rodiger mixer. The final product with a pH > 12 then travels via screw conveyor to the 14 yard bin on the delivery truck for transport to the landfill.

Pathogen reduction and vector control is achived by the addition of lime. We confirm that the pH is maintained at 12 or higher with bench testing every hour during the press run. pH analysis indicates our product remains at a pH of 12 or higher for at least 22 hours. At the landfill the lime treated sludge is typically buried within 20 minutes of arrival, although our current permit stipulates burial within 4 hours.

C. Summary Statistics of Discharge Monitoring Data (2016-2021)

The water quality data are from discharge monitoring reports (DMRs) from 2016 to 2021.

CBS WWTP DMR Data (2016-2021)

Parameter	Flow, in conduit or thru treatment plant	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	Solids, total suspended	Solids, total suspended	Solids, total suspended	Solids, total suspended	Solids, total suspended	Solids, total suspended	Nitrogen, ammonia total [as N]	pH	pH	Fecal Coliform	Fecal Coliform	Temperature	Copper, Total Recoverable	Copper, Total Recoverable	Dissolved Oxygen	Chlorine, Total
Monitoring Location	Effluent Gross	Influent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Percent Removal	Influent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Percent Removal	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross
Statistical Base	MO AVE	MO AVG	MO AVG	MO AVG	DAILY MAX	DAILY MAX	MIN % RMV	MO AVG	MO AVG	MO AVG	DAILY MAX	DAILY MAX	MIN % RMV	Monthly 24 HR Composite	INST MAX	INST MIN	INST MAX	MO GEO MN	MX DA AV	MO AVG	DAILY MAX	Minimum Daily Limit	DAILY MAX
Limit Units	MGD	mg/L	mg/L	lb/d	mg/L	lb/d	%	mg/L	mg/L	lb/d	mg/L	lb/d	%	mg/L	SU	SU	#/100mL	#/100mL	C	mcg/L	mcg/L	mg/L	mg/L
Current Limit	Report	Report	140	2100	200	3000	30	Report	140	2100	200	3000	30	Report	Report	Report	1,500,000	1,000,000	Report	243	354	2	0.244
Proposed Limit	Report	Report	140	2100	200	3000	30						Performance Based		8.5	6.5				23	50		
11/30/2016	1.6	144	72	662	82	1041	47	128	38	354	49	580	68	15	7.2	6.8	151201	151201	11	48	48	4	
12/31/2016	1.9	146	75	702	82	759	45	147	35	329	43	402	74	13	7.3	6.9	247385	247385	9	44	44	9	
01/31/2017	2.2	144	74	571	91	643	48	119	31	241	46	303	74	16	7.3	6.9	268823	268823	8	47	47	7	
02/28/2017	2.7	118	67	476	92	575	44	104	34	243	45	304	67	18	7.3	6.8	705744	705744	8	34	34	9	
03/31/2017	1.5	124	72	518	86	554	39	107	40	290	49	349	61	23	7.3	7	898517	898517	7	42	42	6	
04/30/2017	1.5	198	104	604	129	654	44	183	47	273	63	315	71	14	7.4	7	252749	252749	8	47	47	7	
05/31/2017	1.5	271	111	629	130	694	57	254	38	218	46	246	84	21	7.1	7	445965	445965	10	44	44	7	
06/30/2017	1	206	132	720	143	763	36	189	47	258	51	276	74	22	7.2	6.8	276168	276168	12	56	56	6	
07/31/2017	0.8	195	110	670	126	778	42	163	60	362	68	425	63	18	7.1	6.9	233923	233923	13	62	62	8	
08/31/2017	1.8	162	104	764	138	902	35	146	50	377	65	451	65	29	7.1	6.7	287259	287259	14	73	73	6	
09/30/2017	2.9	109	57	744	71	1466	48	118	48	665	55	1344	56	13	7.3	6.7	44777	44777	14	108	108	8	
10/31/2017	2.3	110	72	602	92	668	34	121	45	379	63	531	62	13	7.2	6.8	114118	114118	12	96	96	8	
11/30/2017	1	207	113	773	175	1197	44	178	39	269	45	315	75	16	7.3	7	196932	196932	12	57	57	8	
12/31/2017	1.4	125	75	532	89	644	40	95	36	260	43	332	62	14	7.3	6.8	261549	261549	10	45	45	9	
01/31/2018	1.4	125	87	502	109	585	30	110	39	229	51	291	64	12	7.2	6.9	203215	203215	8	32	32	9	
02/28/2018	1.1	216	121	797	205	1145	36	175	40	275	45	368	66	19	7.3	6.7	655226	655226	7	127	127	8	
03/31/2018	1.1	138	82	528	104	651	40	121	40	257	73	457	68	12	7.4	6.7	185341	185341	8	36	36	8	
04/30/2018	1.1	198	114	643	165	881	40	130	46	262	64	342	65	20	7.2	6.5	226790	226790	10	52	52	7	
05/31/2018	1	148	89	585	97	619	39	124	40	265	51	336	68	17	7.4	6.8	449730	373684	11	56	56	8	
06/30/2018	1	209	104	658	118	738	51	161	52	330	61	412	68	21	7.2	7	287775	287775	13	54	54	4	
07/31/2018	1.2	207	134	932	230	1554	37	159	52	364	69	466	67	17	7.3	6.8	143104	143104	14	55	55	4	
08/31/2018	2	134	82	888	108	1495	39	123	45	510	82	1135	64	14	7.1	6.6	9798	9798	15	189	189	6	
09/30/2018	1.4	171	90	609	105	640	47	141	31	212	39	263	78	22	7.3	6.9	112558	112558	14	58	58	5	
10/31/2018	1.6	136	73	598	122	702	47	111	31	272	36	432	72	12	7	6.6	98368	98368	12	29	29	8	
11/30/2018	1.8	109	67	561	77	604	38	101	30	250	39	270	69	12	7.3	6.5	377056	377056	11	34	34	6	
12/31/2018	1.5	118	71	558	82	605	39	95	29	225	40	275	69	18	7.1	6.6	594198	594198	9.7	46	46	8	

CBS WWTP DMR Data 2016 -2021 (continued)

Parameter	Flow, in conduit or thru treatment plant	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	BOD, 5-day, 20 deg. C	Solids, total suspended	Solids, total suspended	Solids, total suspended	Solids, total suspended	Solids, total suspended	Solids, total suspended	Nitrogen, ammonia total [as N]	pH	pH	Fecal Coliform	Fecal Coliform	Temperature	Copper, Total Recoverable	Copper, Total Recoverable	Dissolved Oxygen	Chlorine, Total
Monitoring Location	Effluent Gross	Influent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Percent Removal	Influent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Percent Removal	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross	Effluent Gross
Statistical Base	MO AVE	MO AVG	MO AVG	MO AVG	DAILY MAX	DAILY MAX	MIN % RMV	MO AVG	MO AVG	MO AVG	DAILY MAX	DAILY MAX	MIN % RMV	Monthly 24 HR Composite	INST MAX	INST MIN	INST MAX	MO GEO MN	MX DA AV	MO AVG	DAILY MAX	Minimum Daily Limit	DAILY MAX
Limit Units	MGD	mg/L	mg/L	lb/d	mg/L	lb/d	%	mg/L	mg/L	lb/d	mg/L	lb/d	%	mg/L	SU	SU	#/100mL	#/100mL	C	mcg/L	mcg/L	mg/L	mg/L
Current Limit	Report	Report	140	2100	200	3000	30	Report	140	2100	200	3000	30	Report	Report	Report	1,500,000	1,000,000	Report	243	354	2	0.244
Proposed Limit	Report	Report	140	2100	200	3000	30						Performance Based		8.5	6.5				23	50		
01/31/2019	1.7	126	70	509	77	624	44	92	28	204	39	338	68	14	7.2	6.6	689464	689464	9	147	147	5	
02/28/2019	1.2	135	75	464	92	514	44	110	30	186	43	240	73	12	7.4	6.8	151582	151582	7	46	46	7	
03/31/2019	1.1	149	85	448	103	524	42	117	24	129	29	148	78	18	7.3	6.5	406389	406389	8	197	197	9	
04/30/2019	0.9	141	83	487	97	534	41	115	30	180	35	202	73	19	7.3	7.1	624343	624343	9	107	107	7	
05/31/2019	1.2	175	90	540	100	661	48	141	29	175	33	231	79	19	7.5	6.8	764883	486089	11	43	43	7	
06/30/2019	1.2	223	98	576	113	631	55	188	38	224	44	252	80	23	7.3	6.7	751136	561985	12	55	55	5	
07/31/2019	0.8	203	109	592	117	656	46	174	36	197	43	226	79	25	7.2	6.6	2009778	552127	15	57	57	5	
08/31/2019	0.9	209	110	618	116	629	45	162	31	174	34	198	80	22	7	6.7	841461	664110	15	45	45	6	
09/30/2019	2.7	135	72	529	90	595	46	117	25	194	30	305	77	15	7.3	6.6	1099550	161971	14	43	43	7	
10/31/2019	1.7	111	55	481	67	527	49	100	23	207	29	301	75	14	7.5	6.6	794788	794788	13	27	27	7	
11/30/2019	3.1	80	45	479	50	560	43	64	21	226	24	336	65	11	7.4	6.5	446874	405929	11	25	25	10	
12/31/2019	1.5	113	58	515	66	647	48	95	27	229	36	258	72	10	7.4	6.7	585790	585790	10	28	28	7.2	
01/31/2020	1.7	89	54	423	64	466	39	68	24	182	36	231	66	12	7.4	6.4	569615	569615	9	38	38	8.4	
02/29/2020	2.6	78	45	555	52	679	36	56	23	279	37	349	55	7.5	7.4	7.1	851162	851162	7.2	31.4	31.4	11	
03/31/2020	2.6	107	70	536	87	575	34	89	32	241	38	283	64	10	7.5	6.8	1373452	836581	8	38	38	9	
04/30/2020	1.9	112	68	537	79	616	39	97	27	205	38	282	73	8.2	7.6	7.2	19797	19797	8.6	37.4	37.4	7.8	
05/31/2020	0.9	153	96	498	111	578	37	136	41	212	50	284	70	18	7.4	6.8	32761	32761	11	36	36	6	
06/30/2020	0.9	187	98	497	108	549	48	190	50	247	87	399	75	10	7.6	7.3	222253	222253	12	34	34	6.3	
07/31/2020	1.4	149	90	507	110	574	38	122	30	170	38	209	74	16	7.5	7.1	489011	489011	13	30.3	30.3	5.7	
08/31/2020	1.3	179	93	597	103	649	45	151	44	281	69	426	68	16	7.4	6.8	489011	489011	14	31	31	5.3	
09/30/2020	1.4	160	87	683	101	773	46	144	33	259	45	342	77	16	7.3	7.2	998303	998303	13	43	43	7.7	
10/31/2020	3.2	117	68	547	83	613	41	85	22	180	26	280	72	16	7.7	7	388697	388697	11	67	67	6.1	
11/30/2020	2.5	138	68	641	89	809	43	115	25	238	29	336	71	12	7.4	7.1	219856	219856	9	21	21	7.7	
12/31/2020	3	178	75	752	151	1272	48	106	24	263	31	295	73	16	7.1	6.8	340799	340799	9	24	24	7	
01/31/2021	1.8	110	68	666	82	896	31	99	30	300	37	488	63	10	7.7	7.2	168862	168862	9	20	20	5.5	
02/28/2021	2	133	76	640	86	680	43	110	33	275	46	430	70	16	7.5	7	918331	918331	8	23	23	6.8	
03/31/2021	2	98	62	671	75	830	35	91	29	339	40	677	67	9	7.9	7.1	58733	58733	7	19.5	19.5	10.1	
04/30/2021	1.4	142	89	687	106	741	37	105	33	256	53	389	69	13	7.7	7.1	1196248	720188	9	24	24	6.3	
05/31/2021	1.1	191	103	727	112	818	45	132	38	266	43	323	71	19	7.6	7.1	850469	850469	10	50	50	8	
06/30/2021	2	190	98	807	106	1090	46	173	45	380	57	628	74	23	7.6	7.4	570150	570150	12	34	34	5.2	
07/31/2021	0.9	219	116	854	124	920	47	183	37	272	49	372	80	23	7.8	7.4	638719	638719	13	34	34	6	
08/31/2021	1.9	168	92	829	108	857	43	162	33	306	37	382	77	23	7.6	7.3	126810	126810	14	44	44	6.9	
09/30/2021	1.2	138	74	726	81	787	46	124	32	318	46	503	75	18.6	7.7	7	167615	167615	13	36.1	36.1	8	
Average	1.6	152.6	84.6	617.7	104.3	753.1	42.4	129.1	35.4	267.2	46.3	375.6	70.5	16.2	7.4	6.9	467541.7	396856.2	10.8	52.7	52.7	7.1	#DIV/0!
Minimum	0.8	78	45	423	50	466	30	56	21	129	24	148	55	7.5	7	6.4	9798	9798	7	19.5	19.5	4	0
Maximum	3.2	271	134	932	230	1554	57	254	60	665	87	1344	84	29	7.9	7.4	2009778	998303	15	197	197	11	0
Count	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	0
Std Dev	0.6	41.4	20.5	117.5	32.8	245.2	5.5	36.9	8.8	84.8	13.6	194.9	6.1	4.6	0.2	0.2	381908.0	265446.0	2.4	36.4	36.4	1.5	#DIV/0!
CV	0.4	0.3	0.2	0.2	0.3	0.3	0.1	0.3	0.2	0.3	0.3	0.5	0.1	0.3	0.0	0.0	0.8	0.7	0.2	0.7	0.7	0.2	#DIV/0!
95th Percentl	2.9	216.3	116.5	831.5	166.0	1291.4	49.2	188.1	50.2	379.1	69.4	632.9	80.0	23.0	7.7	7.3	1109219.8	855897.5	14.1	129.0	129.0	9.1	#NUM!
5th Percentile	0.9	97.1	54.9	474.8	65.8	526.7	34.0	83.3	23.0	174.9	29.0	208.3	61.9	9.9	7.1	6.5	43575.4	43575.4	7.0	22.8	22.8	4.9	#NUM!
90th percenti	2.6	207.4	111.4	777.8	139.0	1101.0	48.0	179.0	47.2	362.4	65.6	508.6	78.2	23.0	7.6	7.2	902479.8	803146.6	14.0	98.2	98.2	9.0	#NUM!
50th percentile																				44.0	44.0	7.0	#NUM!

Ambient Receiving Water Data, 2018 and 2020. (Source: CBS WWTP Receiving Water Quality Monitoring)

	Ambient pH	Ambient DO	Ambient Temperature	Ambient Salinity	Secchi Disk Depth
	Receiving Water	Receiving Water	Receiving Water	Receiving Water	Receiving Water
	Site C-Summer	Site C-Summer	Site C-Summer	Site C-Summer	Site C-Summer
	SU	mg/L	C	ppt	ft
8/14/2018	8.1	9.5	8.4	31	26
8/12/2020	8.1	12.4	12.2	43.7	18
Average	8.1	11.0	10.3	37.4	22.0
Minimum	8.1	9.5	8.4	31	18
Maximum	8.1	12.4	12.2	43.7	26
Count	2	2	2	2	2
Std Dev	0.0	2.1	2.7	9.0	5.7
CV	0.0	0.2	0.3	0.2	0.3
95th Percentile	8.1	12.3	12.0	43.1	25.6
5th Percentile	8.1	9.6	8.6	31.6	18.4

Ambient Receiving Water Quality Data, 2021. (Source: ARRI, 2022. Water Quality Measures in Alaska's Ports and Shipping Lanes, 2021 Annual Report.)

	Ambient Fecal	Ambient Enterococci	Ambient Ammonia as N	Ambient Copper (Dissolved)	Ambient Nickel (Dissolved)	Ambient Zinc (Dissolved)
	Receiving Water	Receiving Water	Receiving Water	Receiving Water	Receiving Water	Receiving Water
	Geo Mean	Geo Mean				
	CFU/100 mL	mg/L	mg/L	µg/L	µg/L	µg/L
	1.1	3.2	0.031	1.02	0.29	4.88
	1.2	3.6	0.016	0.3	0.27	0.59
	1.1	3.2	0.01	3.98	0.28	3.43
	0.9	3.2	0.011	0.21	0.29	0.48
	1.1	7.2	0.024	0.26	0.27	0.54
	2.1	8.2	0.026	0.39	0.29	1.63
	1.8	6.6	0.007	0.61	0.29	2.69
	0.9	3.2	0.014	0.4	0.28	1.77
	1.4	3.2	0.01	0.28	0.28	0.61
	4.6	3.2	0.008	0.14	0.28	0.25
Average	1.6	4.5	0.0	0.8	0.3	1.7
Minimum	0.9	3.2	0.007	0.14	0.27	0.25
Maximum	4.6	8.2	0.031	3.98	0.29	4.88
Count	10	10	10	10	10	10
Std Dev	1.1	2.0	0.0	1.2	0.0	1.5
CV	0.7	0.4	0.5	1.5	0.0	0.9
95th Percentile	3.5	7.8	0.0	2.6	0.3	4.2
5th Percentile	0.9	3.2	0.0	0.2	0.3	0.4

Weekly CBS WWTP TSS Effluent Data, 2016-2021

Date	Influent		Effluent			Date	Influent		Effluent	
	TSS mg/t	TSS lbs.	TSS mg/t	TSS lbs.			TSS mg/t	TSS lbs.	TSS mg/t	TSS lbs.
						2017-01-04	111	722	24	156
2016-08-03	140	1284	49	450		2017-01-11	144	949	46	303
2016-08-09	87	784	45	405		2017-01-18	121	1080	27	241
2016-08-16	95	856	33	297		2017-01-25	101	952	28	264
2016-08-17	113	961	37	315		2017-02-01	103	679	31	204
2016-08-24	126	1040	45	372		2017-02-08	113	763	45	304
2016-08-25	121	1100	37	336		2017-02-15	76	748	25	246
2016-08-31	116	977	40	337		2017-02-22	125	782	35	219
2016-09-07	101	1146	38	431		2017-03-01	144	913	49	311
2016-09-14	99	1726	23	401		2017-03-08	90	646	34	244
2016-09-20	108	955	31	274		2017-03-15	98	776	33	261
2016-09-28	161	1383	31	266		2017-03-22	120	821	42	287
2016-10-05	153	1136	43	319		2017-03-29	84	666	44	349
2016-10-12	149	1081	40	290		2017-04-05	114	865	29	220
2016-10-19	89	1447	32	520		2017-04-13	143	799	52	291
2016-10-25	134	1475	34	374		2017-04-18	168	841	63	315
2016-11-02	130	932	49	351		2017-04-26	305	1806	45	266
2016-11-08	86	889	27	279		2017-05-02	161	1007	37	231
2016-11-16	94	792	33	278		2017-05-09	198	1172	37	219
2016-11-22	206	1529	38	282		2017-05-17	299	1421	38	181
2016-11-29	125	1647	44	580		2017-05-24	344	2152	34	213
2016-12-06	155	1280	27	223		2017-05-31	268	1430	46	246
2016-12-13	128	1026	39	312		2017-06-07	150	801	45	240
2016-12-21	75	982	29	380		2017-06-14	274	1463	50	267
2016-12-28	231	2158	43	402		2017-06-21	135	777	43	247
						2017-06-27	198	1073	51	276
						2017-07-05	146	865	45	266
						2017-07-12	194	1197	68	420
						2017-07-19	145	859	57	338
						2017-07-26	165	1032	68	425
						2017-08-02	223	1451	65	423
						2017-08-09	150	838	51	285
						2017-08-16	123	903	43	316
						2017-08-22	113	1159	40	410
						2017-08-30	121	1050	52	451
						2017-09-06	73	1065	41	598
						2017-09-13	126	999	45	357
						2017-09-20	165	1197	50	363
						2017-09-26	106	2590	55	1344
						2017-10-04	105	1016	34	329
						2017-10-11	109	836	26	199
						2017-10-18	92	829	59	531
						2017-10-25	151	1096	63	457
						2017-10-31	146	1279	43	377
						2017-11-07	285	1997	45	315
						2017-11-15	200	1368	35	239
						2017-11-20	124	817	39	257
						2017-11-29	103	739	37	265
						2017-12-06	103	661	43	276
						2017-12-12	89	868	34	332
						2017-12-19	79	540	29	198
						2017-12-27	109	655	39	234

Weekly CBS WWTP TSS Effluent Data, 2016-2021

(continued)

Date	Influent		Effluent		Date	Influent		Effluent		Date	Influent		Effluent		Date	Influent		Effluent	
	TSS mg/t	TSS lbs.	TSS mg/t	TSS lbs.		TSS mg/t	TSS lbs.	TSS mg/t	TSS lbs.		TSS mg/t	TSS lbs.	TSS mg/t	TSS lbs.		TSS mg/t	TSS lbs.	TSS mg/t	TSS lbs.
2018-01-03	80	647	36	291	2019-01-05	65	564	39	338	2020-02-05	80	861	14	151	2021-01-06	205	1932	33	311
2018-01-10	115	643	34	190	2019-01-09	104	746	29	208	2020-02-12	41	633	21	324	2021-01-13	88	1160	37	488
2018-01-17	118	679	38	219	2019-01-16	103	636	24	148	2020-02-19	65	613	37	349	2021-01-20	47	498	23	244
2018-01-23	113	565	34	170	2019-01-23	108	712	28	184	2020-02-27	38	529	21	292	2021-01-25	47	384	23	188
2018-01-31	123	667	51	276	2019-01-30	80	634	18	143	2020-03-04	64	587	22	202	2021-01-27	107	901	32	270
2018-02-07	168	939	42	235	2019-02-06	87	646	28	208	2020-03-12	94	886	30	283	2021-03-03	63	788	24	300
2018-02-13	83	699	35	295	2019-02-13	145	810	43	240	2020-03-17	85	567	36	240	2021-03-10	130	1084	33	275
2018-02-21	371	2104	36	204	2019-02-20	95	658	22	152	2020-03-23	112	710	38	241	2021-03-17	96	865	25	225
2018-02-28	78	638	45	368	2019-02-27	113	603	27	144	2020-07-01	91	455	35	175	2021-03-24	86	839	22	215
2018-03-07	118	718	38	231	2019-03-06	139	707	29	148	2020-07-08	139	661	38	181	2021-03-31	80	1354	40	677
2018-03-14	103	730	24	170	2019-03-13	104	598	21	121	2020-07-15	128	726	16	91	2021-04-07	108	1000	25	231
2018-03-21	109	718	26	171	2019-03-20	78	462	25	148	2020-07-22	129	871	29	196	2021-04-14	108	874	26	210
2018-03-27	155	970	73	457	2019-03-27	145	665	22	101	2020-07-29	123	780	33	209	2021-04-21	100	684	28	191
2018-05-01	130	1063	39	319	2019-04-03	136	647	31	147	2020-09-02	158	1489	28	264	2021-04-28	105	771	53	389
2018-05-09	134	793	36	213	2019-04-11	105	534	35	178	2020-09-09	110	862	30	235	2021-05-05	104	781	43	323
2018-05-15	101	649	40	257	2019-04-18	123	954	26	202	2020-09-16	159	1074	33	223	2021-05-12	171	1112	40	260
2018-05-23	119	715	33	198	2019-04-23	96	633	29	191	2020-09-23	164	1245	45	342	2021-05-19	143	954	42	280
2018-05-30	135	889	51	336	2019-05-01	140	747	27	144	2020-09-30	131	1038	29	230	2021-05-25	109	845	26	201
2018-06-06	154	912	43	255	2019-05-08	119	983	28	231	2020-10-07	70	531	12	91	2021-06-02	141	1152	39	319
2018-06-14	145	980	61	412	2019-05-15	141	870	28	173	2020-10-14	104	789	22	167	2021-06-09	158	1146	53	385
2018-06-19	164	1067	56	364	2019-05-22	158	909	33	190	2020-10-21	116	813	26	182	2021-06-17	165	1128	40	274
2018-06-26	180	1126	46	288	2019-05-29	145	713	28	138	2020-10-28	50	538	26	280	2021-06-23	224	2466	57	628
2018-07-04	153	957	49	306	2019-06-05	173	923	44	235	2020-11-04	45	522	29	336	2021-06-30	179	1418	37	293
2018-07-11	163	1183	49	356	2019-06-12	200	1101	34	187	2020-11-11	88	881	14	140	2021-07-07	189	1403	36	267
2018-07-18	148	1137	42	323	2019-06-19	200	1485	34	252	2020-11-18	190	1442	28	213	2021-07-14	216	1639	49	372
2018-07-24	175	1211	53	367	2019-06-26	180	1006	40	224	2020-11-23	135	1227	29	264	2021-07-21	175	1343	37	284
2018-07-31	155	1047	69	466	2019-07-02	156	885	34	193	2020-12-02	37	710	14	269	2021-07-28	153	1021	25	167
2018-08-08	159	2201	82	1135	2019-07-10	170	936	35	193	2020-12-09	77	905	25	294	2021-08-04	169	1254	37	275
2018-08-15	108	982	34	309	2019-07-17	189	993	43	226	2020-12-16	93	861	23	213	2021-08-11	185	1527	33	272
2018-08-22	143	1157	36	291	2019-07-24	201	1023	37	188	2020-12-22	125	1188	31	295	2021-08-18	76	1001	29	382
2018-08-29	81	885	28	306	2019-07-31	153	880	32	184	2020-12-29	196	1651	29	244	2021-08-25	219	1900	34	295
2018-09-05	155	1047	39	263	2019-08-07	185	1065	30	173						2021-09-01	154	1361	31	274
2018-09-12	138	863	35	219	2019-08-14	176	954	30	163						2021-09-08	114	1284	38	428
2018-09-18	175	949	26	141	2019-08-21	158	857	30	163						2021-09-15	66	683	7	72.4
2018-09-26	96	945	23	226	2019-08-28	129	753	34	198						2021-09-22	130	1420	46	503
2018-10-02	161	926	36	207	2019-09-04	122	814	24	160						2021-09-29	158	1209	39	312
2018-10-10	108	1297	36	432	2019-09-11	151	756	30	150						2021-10-06	101	901	23	205
2018-10-16	89	1084	28	341	2019-09-18	131	951	22	160						2021-10-13	65	970	20	299
2018-10-24	91	797	18	158	2019-09-25	65	900	22	305						2021-10-20	141	1129	37	296
2018-10-31	108	685	35	222	2019-11-06	68	686	20	202						2021-10-27	108	1234	50	571
2018-11-07	141	917	39	254	2019-11-13	79	817	20	207						2021-11-03	136	1066	36	282
2018-11-14	82	793	24	232	2019-11-21	45	631	24	336						2021-11-10	130	932	38	273
2018-11-20	79	791	27	270	2019-11-26	63	531	19	160						2021-11-17	82	903	38	418
2018-11-28	100	784	31	243	2019-12-04	70	677	23	223						2021-11-23	77	713	32	296
2018-12-06	126	778	40	247	2019-12-11	115	825	36	258										
2018-12-12	71	651	30	275	2019-12-18	118	846	29	208										
2018-12-18	70	601	21	180	2019-12-26	76	963	18	228										
2018-12-26	113	924	24	196															

D. Alaska WQS

Alaska WQS for Turbidity for Marine Uses

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(24) TURBIDITY, FOR MARINE WATER USES	
(A) Water Supply (i) aquaculture	May not exceed 25 nephelometric turbidity units (NTU).
(A) Water Supply (ii) seafood processing	May not interfere with disinfection.
(A) Water Supply (iii) industrial	May not cause detrimental effects on established levels of water supply treatment.
(B) Water Recreation (i) contact recreation	Same as (24)(A)(i).
(B) Water Recreation (ii) secondary recreation	Same as (24)(A)(i).
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	May not reduce the depth of the compensation point for photosynthetic activity by more than 10%. May not reduce the maximum Secchi disk depth by more than 10%.
(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	Same as (24)(C).

Alaska WQS for Dissolved Gas for Marine Uses

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(15) DISSOLVED GAS, FOR MARINE WATER USES	
(B) Water Supply (i) aquaculture	Surface dissolved oxygen (D.O.) 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. D.O. may not be reduced below 4 mg/l at any point beneath the surface. D.O. 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 D.O. levels exceed 17 mg/l. The concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection.
(A) Water Supply (ii) seafood processing	Not applicable.
(A) Water Supply (iii) industrial	Not applicable.
(C) Water Recreation (i) contact recreation	Same as (15)(A)(i).
(B) Water Recreation (ii) secondary recreation	Same as (15)(A)(i).
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Same as (15)(A)(i).
(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	Same as (15)(A)(i).

Alaska WQS for pH for Marine Uses

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(18) pH, for marine water uses (variation of pH for waters naturally outside the specified range must be toward the range)	
(A) Water Supply (i) Aquaculture	May not be less than 6.5 or greater than 8.5, and may not vary more than 0.2 pH unit outside of the naturally occurring range.
(A) Water Supply (ii) seafood processing	May not be less than 6.0 or greater than 8.5.
(A) Water Supply (iii) industrial	May not be less than 5.0 or greater than 9.0
(D) Water Recreation (i) contact recreation	May not be less than 6.0 or greater than 8.5. If the natural pH condition is outside this range, substances may not be added that cause any increase in buffering capacity of the water.
(B) Water Recreation (ii) secondary recreation	Same as (18)(A)(iii).
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Same as (18)(A)(i).
(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	Same as (18)(A)(ii).

Alaska WQS for Temperature for Marine Uses

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(22) TEMPERATURE, FOR MARINE WATER USES	
(C) Water Supply (i) aquaculture	May not cause the weekly average temperature toincrease more than 1° C. The maximum rate of change may not exceed 0.5° C per hour. Normal daily temperature cycles may not be altered inamplitude or frequency.
(A) Water Supply (ii) seafood processing	May not exceed 15° C.
(A) Water Supply (iii) industrial	May not exceed 25° C.
(E) Water Recreation (i) contact recreation	Not applicable.
(B) Water Recreation (ii) secondary recreation	Not applicable.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Same as (22)(A)(i).
(D) Harvesting for Consumptionof Raw Mollusks or Other Raw Aquatic Life	Same as (22)(A)(i).

Alaska WQS for Toxics for Marine Uses

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(23) TOXIC AND OTHER DELETERIOUS ORGANIC AND INORGANIC SUBSTANCES, FOR MARINE WATER USES	
(D) Water Supply (i) aquaculture	Same as (23)(C).
(A) Water Supply (ii) seafood processing	The concentration of substances in water may not exceed the numeric criteria for aquatic life for marine water shown in the *Alaska Water Quality Criteria Manual* (see note 5). Substances may not be introduced that cause, or can reasonably be expected to cause, either singly or in combination, odor, taste, or other adverse effects on the use.
(A) Water Supply (iii) industrial	Concentrations of substances that pose hazards to worker contact may not be present.
(F) Water Recreation (i) contact recreation	There may be no concentrations of substances in water, that alone or in combination with other substances, make the water unfit or unsafe for the use.
(B) Water Recreation (ii) secondary recreation	Concentrations of substances that pose hazards to incidental human contact may not be present.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	The concentration of substances in water may not exceed the numeric criteria for aquatic life for marine water and human health for consumption of aquatic organisms only shown in the *Alaska Water Quality Criteria Manual* (see note 5), or any chronic and acute criteria established in this chapter, for a toxic pollutant of concern, to protect sensitive and biologically important life stages of resident species of this state. There may be no concentrations of toxic substances in water or in shoreline or bottom sediments, that, singly or in combination, cause, or reasonably can be expected to cause, adverse effects on aquatic life or produce undesirable or nuisance aquatic life, except as authorized by this chapter. Substances may not be present in concentrations that individually or in combination impart undesirable odor or taste to fish or other aquatic organisms, as determined by either bioassay or organoleptic tests.
(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	Same as (23)(C).

Alaska WQS for Bacteria for Marine Uses

Water Quality Standards for Designated Uses	
POLLUTANT & WATER USE	**CRITERIA**
(14) BACTERIA, FOR MARINE WATER USES, (see note 1)	
(E) Water Supply (i) aquaculture	For products normally cooked, the geometric mean of samples taken in a 30-day period may not exceed 200 fecal coliform/100 ml, and not more than 10% of the samples may exceed 400 fecal coliform/100 ml. For products not normally cooked, the geometric mean of samples taken in a 30-day period may not exceed 20 fecal coliform/100 ml, and not more than 10% of the samples may exceed 40 fecal coliform/100 ml.
(A) Water Supply (ii) seafood processing	In a 30-day period, the geometric mean of samples may not exceed 20 fecal coliform/100 ml, and not more than 10% of the samples may exceed 40 fecal coliform/100 ml.
(A) Water Supply (iii) industrial	Where worker contact is present, the geometric mean of samples taken in a 30-day period may not exceed 200 fecal coliform/100 ml, and not more than 10% of the samples may exceed 400 fecal coliform/100 ml.
(G) Water Recreation (i) contact recreation	In a 30-day period, the geometric mean of samples may not exceed 35 enterococci CFU/100 ml, and not more than 10% of the samples may exceed a statistical threshold value (STV) of 130 enterococci CFU/100 ml.
(B) Water Recreation (ii) secondary recreation	In a 30-day period, the geometric mean of samples may not exceed 200 fecal coliform/100ml, and not more than 10% of the samples may exceed 400 fecal coliform/100ml.
(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife	Not applicable.
(D) Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	The geometric mean of samples may not exceed 14 fecal coliform/100 ml; and not more than 10% of the samples may exceed; - 43 MPN per 100 ml for a five-tube decimal dilution test; - 49 MPN per 100 ml for a three-tube decimal dilution test; - 28 MPN per 100 ml for a twelve-tube single dilution test; - 31 CFU per 100 ml for a membrane filtration test (see note 14).

E. Equations and Analysis

1. Section 8.B.1: Attainment of TSS Standard

EPA calculated the maximum change in the concentration of TSS at the edge of the ZID using formula B-32 from the 301(h) TSD. The average weekly TSS limitation of 73 mg/L and the modeled critical initial dilution of 87:1 were used in the equation. The results show a 0.84 mg/L increase in suspended solids in the receiving water after initial dilution, or 1.2%. More detailed analysis is included in Appendix E.

Formula B-2

$$SS = SSe/Sa$$

where,

SS = change in suspended solids concentration following initial dilution

SS_e = effluent suspended solids concentration (73 mg/L)

S_a = critical initial dilution (87:1)

73/87 = 0.84 mg/L

2. Section 8.B.2: Attainment of DO Standard

In accordance with the procedures outline in the 301(h) TSD Section B-11 p.188 and p. 194, EPA conducted near-field and far-field analysis to estimate the impacts on DO levels in the vicinity of the discharge.

Near Field Analysis:

DO_a = 12.4 mg/L (worst case from station C, modeling indicated station C was limiting for DO and other parameters).

Do_e = 4 (min value effluent DO)

IDOD = 3 (from Table B-3 in TSD)

S_a = 87 (ZID dilution)

$DO_f = DO_a - (DO_a + IDOD – DO_e)/S_a$ = 12.4 mg/L- (12.4 mg/L + 3 mg/L – 4 mg/L)/87 = 12.3 mg/L

The near field DO reduction is approximately 0.1 mg/L under worst case conditions, therefore the Alaska WQS of no less than 5 mg/L and no greater than 17 mg/L are not violated.

Far Field Analysis:

The final BOD_5 after initial dilution was also calculated to assess the potential for far field DO using a simplified procedure from Appendix B of the 301(h) TSD. The maximum reported average monthly BOD_5 value is first converted to ultimate BOD_5 by multiplying it by the constant 1.46. The ultimate BOD_5 is then divided by the initial dilution factor (87) to determine the final BOD_5 after initial dilution.

Max BOD_5: 180 mg/L

Ultimate BOD_5: 180 mg/L x 1.46 = 263 mg/L BOD_5

Final BOD_5 after initial dilution: 263 mg/L ÷ 87 = 3 mg/L BOD_5

Final BOD_5 at the boundary of the chronic mixing zone: 263 mg/L ÷ 76 = 3.5 mg/L BOD_5

A final BOD_5 concentrations of 3 mg/L after initial dilution is not expected to cause or contribute to any measurable far field DO impacts.

3. Section 8.C.3. Toxics Analysis

The following mass-balance equation was used to determine whether the discharge has reasonable potential to cause or contribute to an excursion above Alaska WQS:

$$Cd = Ce + \frac{Cu\,(Sa-1)}{Sa}$$

Cd = Resultant magnitude or predicted concentration at edge of mixing zone, µg/L

Ce = Maximum projected effluent concentration, µg/L

Cu = Background receiving water concentration, µg/L

Sa = dilution factor

The maximum projected effluent concentration (Ce) in the mass balance equation is represented by the highest reported concentration measured in the effluent multiplied by a reasonable potential multiplier. The reasonable potential multiplier accounts for uncertainty in the data. The multiplier decreases as the number of data points increases and variability of the data decreases. Variability is measured by the coefficient of variation (CV) of the data. When there is not enough data to reliably determine a CV (n<10), the TSD recommends using 0.6 as a default value. A partial listing of reasonable potential multipliers can be found in Table 3-1 of the TSD. The resulting maximum projected effluent concentration is then divided by the minimum critical dilution. This product represents the maximum effluent concentration at the edge of the ZID. The maximum effluent concentration at the edge of the ZID is then added to the background concentration, Cu, which is represented by the 95th percentile value from the background data set (the 5th percentile value is used for DO). The sum Cd represents the projected maximum receiving water concentration at the edge of the ZID. This concentration is compared to the water quality criterion to determine whether a water-quality based effluent limitation is needed. If the receiving water concentration at the edge of the ZID exceeds the water-quality criteria a water-quality based effluent limitation is developed. If a permittee is unable to meet their WQBEL they would fail to satisfy CWA § 301(h)(9) and 40 CFR 125.62 and would be ineligible for a 301(h)-modified permit.

A summary of the reasonable potential analyses is presented in the 2023 Fact Sheet for the Sitka WWTP NPDES permit. The Table footnotes indicate the criterion source used to evaluate reasonable potential (i.e., the criterion in effect for Clean Water Act purposes). Chlorine is the only constituent that demonstrated reasonable potential. WQBELs for chlorine are included in the draft permit. The effluent limits developed for chlorine are protective of Alaska WQS, and the proposed discharge is expected to comply with AK WQS for toxics after initial mixing, satisfying the requirements of CWA § 301(h)(9) and 40 CFR 125.62. For more information on the process used to develop effluent limits refer to Appendix D of the Fact Sheet.

Table 5. Reasonable potential analysis for pH exceedances at the edge of the ZID

Calculation of pH of a Mixture of Two Flows

Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Suppler

	Yr. Around Basis	
INPUT	**Min Limit**	**Max Limit**
1. Dilution Factor at Mixing Zone Boundary	**87.0**	**87.0**
2. Ambient/Upstream/Background Conditions		
Temperature (deg C):	8.40	12.00
pH:	8.10	8.10
Alkalinity (mg $CaCO_3$/L):	25.00	25.00
3. Effluent Characteristics		
Temperature (deg C):	22.00	5.00
pH:	**6.00**	**9.00**
Alkalinity (mg CaCO3/L):	25.00	25.00
4. Applicable Water Quality Standards	**6.50**	**8.50**
OUTPUT		
1. Ionization Constants		
Upstream/Background pKa:	6.48	6.45
Effluent pKa:	6.37	6.51
2. Ionization Fractions		
Upstream/Background Ionization Fraction:	0.98	0.98
Effluent Ionization Fraction:	0.30	1.00
3. Total Inorganic Carbon		
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	26	26
Effluent Total Inorganic Carbon (mg CaCO3/L):	83	25
4. Conditions at Mixing Zone Boundary		
Temperature (deg C):	8.56	11.92
Alkalinity (mg CaCO3/L):	25.00	25.00
Total Inorganic Carbon (mg CaCO3/L):	26.26	25.55
pKa:	6.48	6.45
RESULTS		
pH at Mixing Zone Boundary:	**7.77**	**8.10**
Reasonable Potential to contribute to excursion above	**NO**	**NO**

F. Dilution Modeling Report

The dilution model is available on our website with the other permit documents: https://www.epa.gov/npdes-permits/npdes-permit-haines-wastewater-treatment-facility-alaska.

G. Minimum Levels

The Table below lists the maximum Minimum Level (ML) for pollutants that may have monitoring requirements in the permit. ML means either the sample concentration equivalent to the lowest calibration

point in a method or a multiple of the method detection limit (MDL). Minimum levels may be obtained in several ways: They may be published in a method; they may be sample concentrations equivalent to the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the MDL in a method, or the MDL determined by a lab, by a factor. The permittee may request different MLs. The request must be in writing and must be approved by EPA. If the Permittee is unable to obtain the required ML in its effluent due to matrix effects, the Permittee must submit a matrix-specific detection limit (MDL) and a ML to EPA with appropriate laboratory documentation.

CONVENTIONAL PARAMETERS

Pollutant & CAS No. (if available)	ML, µg/L unless specified
Biochemical Oxygen Demand	2 mg/L
Total Suspended Solids	5 mg/L
Dissolved oxygen	+/- 0.2 mg/L
Temperature	+/- 0.2°C
pH	N/A

NONCONVENTIONAL PARAMETERS

Pollutant & CAS No. (if available)	ML, µg/L unless specified
Chlorine, Total Residual	50.0
Salinity	3 practical salinity units or scale (PSU or PSS)

PRIORITY POLLUTANTS

Pollutant & CAS No. (if available)	ML, µg/L unless specified
METALS, CYANIDE & TOTAL PHENOLS	
Antimony, Total (7440-36-0)	1.0
Arsenic, Total (7440-38-2)	0.5
Beryllium, Total (7440-41-7)	0.5
Cadmium, Total (7440-43-9)	0.1
Chromium (hex) dissolved (18540-29-9)	1.2
Chromium, Total (7440-47-3)	1.0
Copper, Total (7440-50-8)	2.0
Lead, Total (7439-92-1)	0.16
Mercury, Total (7439-97-6)	0.0005
Nickel, Total (7440-02-0)	0.5
Selenium, Total (7782-49-2)	1.0
Silver, Total (7440-22-4)	0.2
Thallium, Total (7440-28-0)	0.36

Pollutant & CAS No. (if available)	ML, µg/L unless specified
Zinc, Total (7440-66-6)	2.5
Cyanide, Total (57-12-5)	10
Cyanide, Weak Acid Dissociable	10
Cyanide, Free Amenable to Chlorination (Available Cyanide)	10
Phenols, Total	50
2-Chlorophenol (95-57-8)	2.0
2,4-Dichlorophenol (120-83-2)	1.0
2,4-Dimethylphenol (105-67-9)	1.0
4,6-dinitro-o-cresol (534-52-1) (2-methyl-4,6,-dinitrophenol)	2.0
2,4 dinitrophenol (51-28-5)	2.0
2-Nitrophenol (88-75-5)	1.0
4-nitrophenol (100-02-7)	1.0
Parachlorometa cresol (59-50-7) (4-chloro-3-methylphenol)	2.0
Pentachlorophenol (87-86-5)	1.0
Phenol (108-95-2)	4.0
2,4,6-Trichlorophenol (88-06-2)	4.0
VOLATILE COMPOUNDS	
Acrolein (107-02-8)	10
Acrylonitrile (107-13-1)	2.0
Benzene (71-43-2)	2.0
Bromoform (75-25-2)	2.0
Carbon tetrachloride (56-23-5)	2.0
Chlorobenzene (108-90-7)	2.0
Chloroethane (75-00-3)	2.0
2-Chloroethylvinyl Ether (110-75-8)	2.0
Chloroform (67-66-3)	2.0
Dibromochloromethane (124-48-1)	2.0
1,2-Dichlorobenzene (95-50-1)	7.6
1,3-Dichlorobenzene (541-73-1)	7.6
1,4-Dichlorobenzene (106-46-7)	17.6
Dichlorobromomethane (75-27-4)	2.0
1,1-Dichloroethane (75-34-3)	2.0
1,2-Dichloroethane (107-06-2)	2.0
1,1-Dichloroethylene (75-35-4)	2.0
1,2-Dichloropropane (78-87-5)	2.0
1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene) (542-75-6) 6	2.0

Pollutant & CAS No. (if available)	ML, µg/L unless specified
Ethylbenzene (100-41-4)	2.0
Methyl bromide (74-83-9) (Bromomethane)	10.0
Methyl chloride (74-87-3) (Chloromethane)	2.0
Methylene chloride (75-09-2)	10.0
1,1,2,2-Tetrachloroethane (79-34-5)	2.0
Tetrachloroethylene (127-18-4)	2.0
Toluene (108-88-3)	2.0
1,2-Trans-Dichloroethylene (156-60-5) (Ethylene dichloride)	2.0
1,1,1-Trichloroethane (71-55-6)	2.0
1,1,2-Trichloroethane (79-00-5)	2.0
Trichloroethylene (79-01-6)	2.0
Vinyl chloride (75-01-4)	2.0
BASE/NEUTRAL COMPOUNDS	
Acenaphthene (83-32-9)	0.4
Acenaphthylene (208-96-8)	0.6
Anthracene (120-12-7)	0.6
Benzidine (92-87-5)	24
Benzyl butyl phthalate (85-68-7)	0.6
Benzo(a)anthracene (56-55-3)	0.6
Benzo(b)fluoranthene (3,4-benzofluoranthene) (205-99-2) 7	1.6
Benzo(j)fluoranthene (205-82-3) 7	1.0
Benzo(k)fluoranthene (11,12-benzofluoranthene) (207-08-9) 7	1.6
Benzo(r,s,t)pentaphene (189-55-9)	1.0
Benzo(a)pyrene (50-32-8)	1.0
Benzo(ghi)Perylene (191-24-2)	1.0
Bis(2-chloroethoxy)methane (111-91-1)	21.2
Bis(2-chloroethyl)ether (111-44-4)	1.0
Bis(2-chloroisopropyl)ether (39638-32-9)	0.6
Bis(2-ethylhexyl)phthalate (117-81-7)	0.5
4-Bromophenyl phenyl ether (101-55-3)	0.4
2-Chloronaphthalene (91-58-7)	0.6
4-Chlorophenyl phenyl ether (7005-72-3)	0.5
Chrysene (218-01-9)	0.6
Dibenzo (a,h)acridine (226-36-8)	10.0
Dibenzo (a,j)acridine (224-42-0)	10.0

Pollutant & CAS No. (if available)	ML, µg/L unless specified
Dibenzo(a-h)anthracene (53-70-3)(1,2,5,6-dibenzanthracene)	1.6
Dibenzo(a,e)pyrene (192-65-4)	10.0
Dibenzo(a,h)pyrene (189-64-0)	10.0
3,3-Dichlorobenzidine (91-94-1)	1.0
Diethyl phthalate (84-66-2)	7.6
Dimethyl phthalate (131-11-3)	6.4
Di-n-butyl phthalate (84-74-2)	1.0
2,4-dinitrotoluene (121-14-2)	0.4
2,6-dinitrotoluene (606-20-2)	0.4
Di-n-octyl phthalate (117-84-0)	0.6
1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	20
Fluoranthene (206-44-0)	0.6
Fluorene (86-73-7)	0.6
Hexachlorobenzene (118-74-1)	0.6
Hexachlorobutadiene (87-68-3)	1.0
Hexachlorocyclopentadiene (77-47-4)	1.0
Hexachloroethane (67-72-1)	1.0
Indeno(1,2,3-cd)Pyrene (193-39-5)	1.0
Isophorone (78-59-1)	1.0
3-Methyl cholanthrene (56-49-5)	8.0
Naphthalene (91-20-3)	0.6
Nitrobenzene (98-95-3)	1.0
N-Nitrosodimethylamine (62-75-9)	4.0
N-Nitrosodi-n-propylamine (621-64-7)	1.0
N-Nitrosodiphenylamine (86-30-6)	1.0
Perylene (198-55-0)	7.6
Phenanthrene (85-01-8)	0.6
Pyrene (129-00-0)	0.6
1,2,4-Trichlorobenzene (120-82-1)	0.6
DIOXIN	
2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (176-40-16) (2,3,7,8 TCDD)	5 pg/L
PESTICIDES/PCBs	
Aldrin (309-00-2)	0.05
alpha-BHC (319-84-6)	0.05
beta-BHC (319-85-7)	0.05
gamma-BHC (58-89-9)	0.05
delta-BHC (319-86-8)	0.05

Pollutant & CAS No. (if available)	ML, µg/L unless specified
Chlordane (57-74-9)	0.05
4,4'-DDT (50-29-3)	0.05
4,4'-DDE (72-55-9)	0.05
4,4' DDD (72-54-8)	0.05
Dieldrin (60-57-1)	0.05
alpha-Endosulfan (959-98-8)	0.05
beta-Endosulfan (33213-65-9)	0.05
Endosulfan Sulfate (1031-07-8)	0.05
Endrin (72-20-8)	0.05
Endrin Aldehyde (7421-93-4)	0.05
Heptachlor (76-44-8)	0.05
Heptachlor Epoxide (1024-57-3)	0.05
PCB-1242 (53469-21-9)	0.5
PCB-1254 (11097-69-1)	0.5
PCB-1221 (11104-28-2)	0.5
PCB-1232 (11141-16-5)	0.5
PCB-1248 (12672-29-6)	0.5
PCB-1260 (11096-82-5)	0.5
PCB-1016 (12674-11-2)	0.5
Toxaphene (8001-35-2)	0.5