



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

Permit Number: AK0053384

**Ward Cove Wastewater Treatment Facility**

**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
Wastewater Discharge Authorization Program**

**555 Cordova Street  
Anchorage, AK 99501**

Public Comment Period Start Date: March 6, 2020

Public Comment Period Expiration Date: April 6, 2020

[Alaska Online Public Notice System](#)

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

**FULL CYCLE LLC**

For wastewater discharges from

Ward Cove Wastewater Treatment Facility  
7559 North Tongass Highway  
Ketchikan, AK, 99901

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

This fact sheet explains the nature of potential discharges from the Ward Cove Wastewater Treatment Facility (WWTF) and the development of the permit including:

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

### Appeals Process

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

Director, Division of Water  
Alaska Department of Environmental Conservation  
555 Cordova Street  
Anchorage AK, 99501

Interested persons can review 18 AAC 15.185 for the procedures and substantive requirements regarding a request for an informal Department review.

See <http://dec.alaska.gov/commish/review-guidance/informal-reviews> for information regarding informal reviews of Department decisions.

An adjudicatory hearing request must be delivered to the Commissioner of the Department within 30 days of the permit decision or a decision issued under the informal review process. An adjudicatory hearing will be conducted by an administrative law judge in the Office of Administrative Hearings within the Department of Administration. A written request for an adjudicatory hearing shall be delivered to the Commissioner at the following address:

Commissioner  
Alaska Department of Environmental Conservation  
**Mail:** P.O. Box 11180  
Juneau, AK 99811  
**In Person:** 555 Cordova Street  
Anchorage, AK 99501

Interested persons can review 18 AAC 15.200 for the procedures and substantive requirements regarding a request for an adjudicatory hearing. See <http://dec.alaska.gov/commish/review-guidance/adjudicatory-hearing-guidance> for information regarding appeals of Department decisions.

### Documents are Available

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

Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 555 Cordova Street Anchorage, AK 99501 (907) 269-6285	Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program <b>Mail:</b> P.O. Box 111800 <b>In Person:</b> 410 Willoughby Avenue, Suite 303 Juneau, AK 99811-1800 (907) 465-5180
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# 1.0 INTRODUCTION

## 1.1 Applicant

This fact sheet provides information on the preliminary draft Alaska Pollutant Discharge Elimination System (APDES) permit for the following entity:

Permittee:	Full Cycle LLC
Facility:	Ward Cove Wastewater Treatment Facility
APDES Permit Number:	AK0053384
Facility Location:	7559 North Tongass Highway, Ketchikan, AK 99901
Mailing Address:	PO Box 772, Ward Cove, AK 99928
Facility Contact:	Mr. David Spokely

The map in Section 2.1 Figure 1 shows the location of the treatment plant and the location of the outfall. The process flow diagram in Section 2.1 Figure 2 illustrates the treatment process.

## 1.2 Authority

Section 301(a) of the Clean Water Act (CWA) and Alaska Administrative Code (AAC) 18 AAC 83.015 provide that the discharge of pollutants to water of the U.S. is unlawful except in accordance with an APDES permit. The individual permit reissuance is being developed per 18 AAC 83. A violation of a condition contained in the Permit constitutes a violation of the CWA and subjects the permittee of the facility with the permitted discharge to the penalties specified in Alaska Statutes (AS) 46.03.760 and AS 46.03.761.

## 1.3 Permit History

The Ward Cove Wastewater Treatment Facility (WWTF, or the facility) was originally constructed to treat the domestic wastewater generated at the Ketchikan Pulp Company (KPC) pulp mill. In 1997 the pulp mill shut down. On December 15, 1998, the United States Environmental Protection Agency (EPA) issued National Pollutant Discharge Elimination System (NPDES) permit AK000092 to the facility authorizing domestic wastewater discharge, storm water discharges and treated landfill leachate from the KPC Ward Cove Landfill.

In 1999 the facility was sold to Gateway Forest Products (GFP) and in 2002 Ketchikan Gateway Borough assumed ownership and operation of the facility. The EPA issued NPDES permit AK0053384 for the domestic wastewater discharge effective on August 24, 2004 and expired on September 30, 2009. In 2007 the dissolved oxygen (DO) Total Maximum Daily Load (TMDL) was revised for Ward Cove.

Authority of the NPDES permit transferred to DEC on October 31, 2008, upon EPA's approval of DEC's application to administer the NPDES Program under the APDES Program. The Administrative Procedures Act and 18 AAC 83.155(c) allow for a federally issued NPDES permit or a state APDES permit to be administratively continued provided that the permittee submits a timely and complete application for a new permit prior to expiration of the permit. A complete application for reissuance was received on April 8, 2009 and APDES permit AK0053384 was administratively continued by DEC on December 17, 2009.

In 2011 the facility was sold to Power Systems & Supplies of Alaska LLC. On October 23, 2013 DEC received an updated complete APDES permit application naming the responsible party as Full Cycle LLC. The reissued APDES permit AK0053384 for the domestic wastewater discharge became effective on November 1, 2014 and expired on October 31, 2019. The storm water and landfill leachate discharges, which remain the responsibility of KPC, are authorized under APDES permit AK0053392.

Full Cycle LLC submitted a complete application for reissuance to DEC on June 21, 2019. DEC notified Full Cycle LLC that the permit was administratively continued per a letter dated October 30, 2019.

## **2.0 BACKGROUND**

### **2.1 Facility Information**

The Ward Cove WWTF is located on the northern boundary of the Tongass Narrows, approximately 5 miles north of the city of Ketchikan, southeast Alaska (see Figure 1). The facility is owned by Power Systems & Supplies of Alaska LLC and is operated by Full Cycle LLC.

The facility treats domestic wastewater from the Ward Cove industrial site and former KPC manufacturing site (approximate population of 125 people, equating to approximately 4,500 gallons per day (gpd)), wastewater and filtrate generated by the onsite sludge composting facility, and domestic sludge and septage from septic tanks and marine vessels (approximately 10,000 gpd). The sludge press/compost facility is located adjacent to the WWTF. Dewatered solids are containerized and shipped to a disposal facility and the filtrate/wastewater is sent to a holding tank that discharges to the WWTF at a maximum rate of 10,000 gpd. The facility does not receive significant contributions from industrial users and the collection system is not combined with a storm water sewer system.

Figure 2 provides a schematic of the facility's process flow system. Wastewater enters the facility via an underground separate sanitary sewer pipeline collection system. Internal Outfall 001A discharges treated wastewater effluent into a wooden stave pipe that carries freshwater from Connell Lake, approximately 3 miles east of the facility. The treated wastewater is discharged to the marine waters of Ward Cove through the wooden stave pipeline that extends approximately 100 feet, terminating in end of pipe Outfall 001B, a single port discharge unit. The outfall terminus is positioned approximately 25 feet below the mean lower low water (MLLW) for Ward Cove.

There have not been any major facility modifications since the previous APDES permit issuance. No mixing zone is authorized for the discharge.

Figure 1: Ward Cove Wastewater Treatment Facility Map

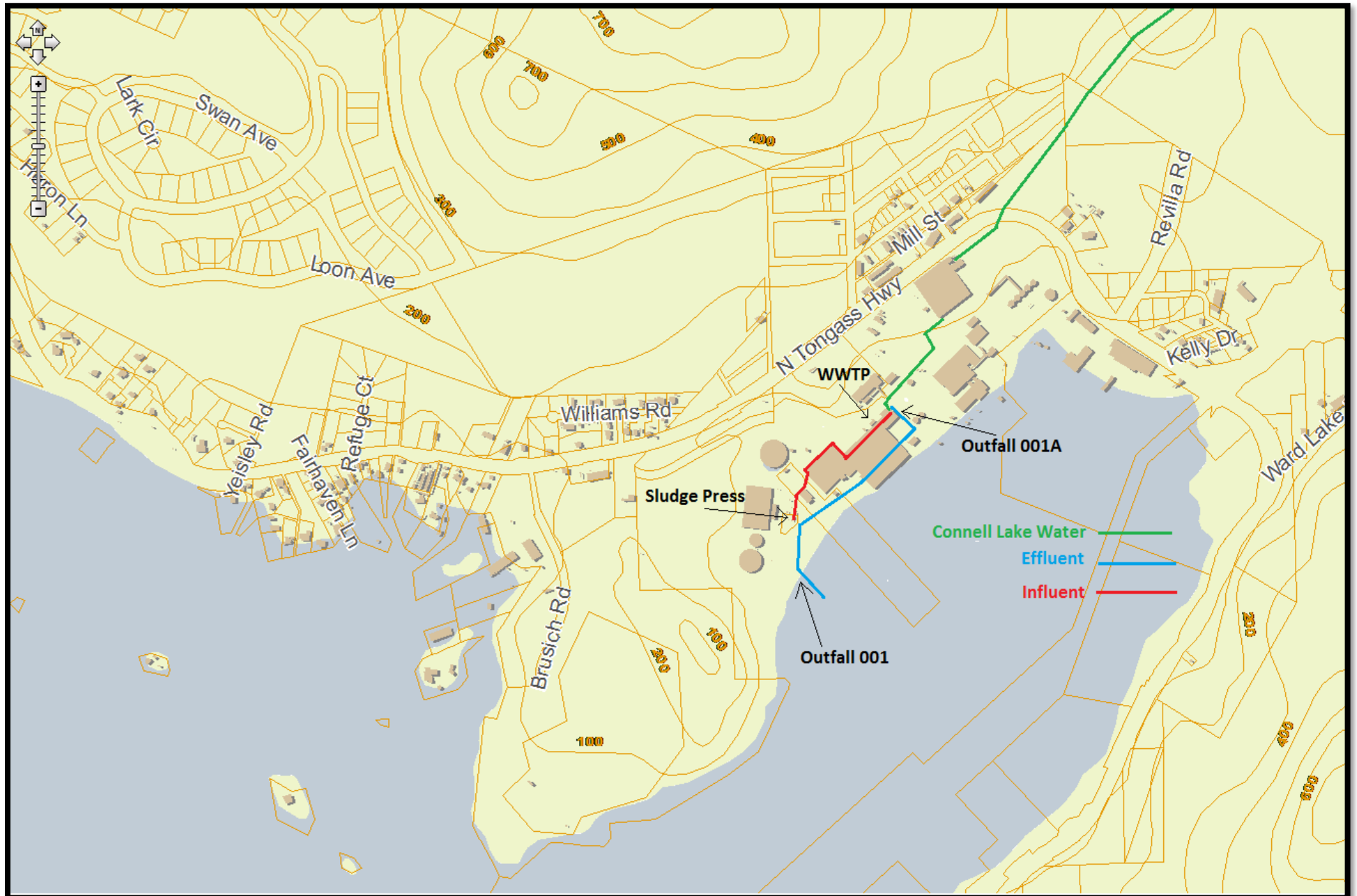
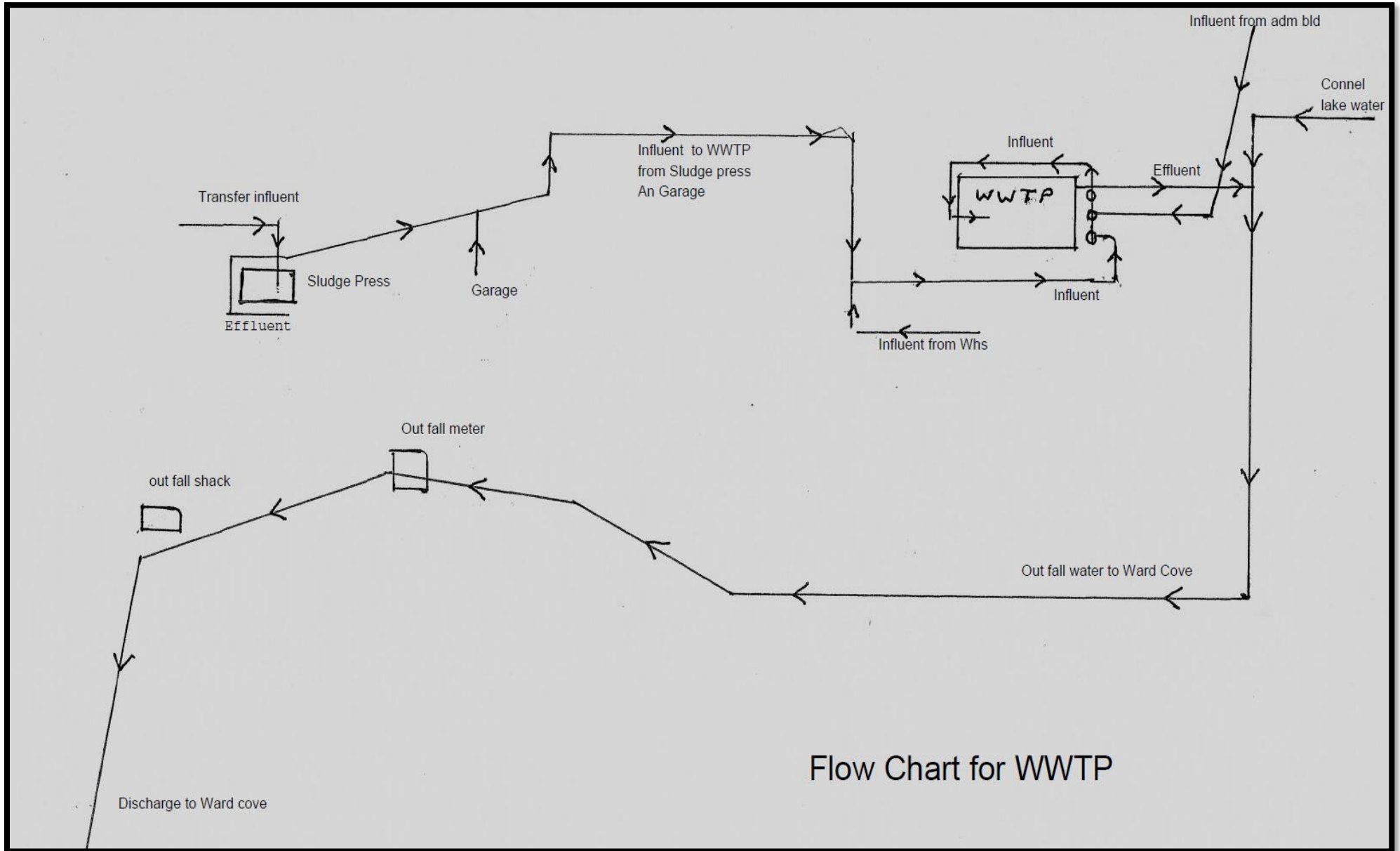


Figure 1: Ward Cove Wastewater Treatment Facility Process Flow Diagram





## 2.2 Wastewater Treatment

The facility was designed and constructed to provide secondary treatment of domestic wastewater using activated sludge and extended aeration prior to final discharge into the marine waters of Ward Cove. Treatment involves preliminary treatment via screening, primary treatment via clarifiers, secondary treatment via activated sludge and extended aeration, further clarification via skimming and settling followed by chlorine disinfection (see Figure 2). The average daily design flow rate for the facility is 25,000 gpd.

Influent is directed through a bar screen and comminutor to remove large solids (greater than 1 inch) and to promote bacterial digestion. After the initial screening the wastewater flows into an aeration tank where it is combined with return activated sludge. The effluent is aerated by submerged bottom air diffusers. A rotary blower mounted at the top of the settling tank provides air in 15-minute intervals, piped to the diffusers at the bottom of the aeration tank. Decomposition of organic waste takes place in the presence of oxygen supplied by the air diffusers. Adequate mixing is achieved by introducing air along one side of the tank through bottom air diffusers, creating mixing currents within the wastewater whilst maintaining adequate air supply for the activated sludge. The aeration tank is designed to provide at least 24 hours detention of the full design flow of 25,000 gpd and contains baffles to prevent the accumulation of sewage solids.

From the aeration tank, the aerated treated wastewater and activated sludge mix passes through a port in the wall that provides flow to a settling tank/clarifier at a rate that sustains a four-hour retention time. A skimmer removes floating solids and discharges them back into the aeration tank. Activated sludge settles and is returned continuously to the aeration tank by an air lift sludge return system. Extended aeration is achieved as the returned activated sludge is fermented using the influent wastewater as the carbon source to promote biological phosphorous removal, nitrification and removal of biochemical oxygen demand (BOD<sub>5</sub>).

The treated effluent flows over a weir into the discharge line and passes into a 750-gallon chlorine contact tank. Effluent flows over chlorine tablets (up to 69%) that disintegrate over time. Baffles in the tank ensure effluent is mixed with the chlorine for approximately 45 minutes before it is discharged from the tank. Treated effluent is tested for residual chlorine three times a week to determine if additional disinfection is needed.

Following disinfection, the final effluent flows past a sample collection point (internal Outfall 001A), used to determine compliance with secondary treatment requirements per 18 AAC 83.010(c), prior to discharging into a wooden stave pipeline that carries freshwater diverted from Connell Lake. The wooden stave pipeline carries the treated wastewater effluent, mixed with freshwater from Connell Lake and terminates approximately 100 feet from the shoreline into Ward Cove (end of pipe Outfall 001B).

### 2.2.1 Sludge Processing

The facility accepts sludge and septage from septic tanks and marine vessels throughout Ketchikan Gateway Borough. The mixed liquid sludge and septage is stored in an aerated sludge storage tank before it is screened and pumped to a belt filter press for dewatering. The belt filter thickens and dewateres the mixture to approximately 12%. Filtrate and spray water from the sludge dewatering process is stored in a holding tank until enough volume is collected to be discharged to the WWTF for treatment at a maximum rate of 10,000 gpd. The screenings are compacted, and the dewatered sludge is conveyed to a shipping container. Sludge processed at the facility does not have industrial waste characteristics and meets ceiling concentrations in Table 1 of 40 CFR 503.13 and pollutant concentrations in Table 3 of 40 CFR 503.13. Dewatered solids are shipped to the Rabanco (Republic Services Company) RCRA Subtitle D certified landfill in Washington State.

## 2.3 Pollutants of Concern

Pollutants of concern known to be present in the effluent of the Ward Cove WWTF consist of domestic wastewater conventional pollutants regulated in the technology-based effluent limits (TBELs) via the secondary treatment standards, including biochemical oxygen demand (BOD<sub>5</sub>), total suspended solids (TSS) and pH. Additional domestic wastewater pollutants known to be in the discharge are dissolved oxygen (DO), total residual chlorine (TRC), fecal coliform (FC) bacteria, enterococci bacteria, and copper. The TMDL for Ward Cove identified residues and DO as pollutants of concern (see Section 4.4). Additionally, temperature and ammonia have been identified as a potential pollutants of concern for POTWs.

The previous APDES permit identified copper as a pollutant of concern from effluent metals testing conducted prior to reissuance. Monitoring for copper at internal Outfall 001A generated data to establish associated WQBELs. Based on the number of samples collected last permit cycle, the associated results above the WQS criteria, and the results of reasonable potential analysis calculations, copper remains a pollutant of concern. Monitoring required in the previous APDES permit is continued and extended in the permit with an increased monitoring frequency from quarterly to monthly and the inclusion of monitoring at end of pipe Outfall 001B (see A.3.4.9).

Pollutants observed in the effluent at least once above water quality criteria between November 2014 and December 2019 are listed in Table 1 below.

**Table 1: Pollutants Observed in Effluent Above Criteria**

Pollutant	Units <sup>a</sup>	Internal Outfall 001A		End of Pipe Outfall 001B	
		Maximum Observed Concentration	Water Quality Criteria or Permit Limit <sup>b</sup>	Maximum Observed Concentration	Water Quality Criteria or Permit Limit
Biochemical Oxygen Demand (BOD <sub>5</sub> )	mg/L	62	60	N/A	
Total Suspended Solids (TSS)	mg/L	203	60	N/A	
pH (Daily Minimum)	S.U.	5.7 (lowest)	6.0	6.2 (lowest)	6.5
Dissolved Oxygen (DO)	mg/L	0.1 (lowest)	2.0	N/A	
Total Residual Chlorine (TRC)	mg/L	1.16	1.0	0.1	0.0075 <sup>c</sup>
Fecal Coliform (FC) Bacteria	FC/100 mL	30,000	800	420	43
Enterococci bacteria	cfu/100 mL	8,400	Report	N/A	
Copper, total recoverable	µg/L	300	Report	N/A	

Footnotes:

a. Units: mg/L = milligrams per liter, S.U.= standard units, FC/100mL = Fecal Coliform per 100 milliliters, cfu/100 mL = colony forming units per 100 milliliters, and µg/L = micrograms per liter.

b. Daily Maximum unless specified otherwise.

c. The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter

## 2.4 Compliance History

DEC reviewed Discharge Monitoring Reports (DMRs) submitted by Full Cycle LLC for monitoring periods from November 2014 to December 2019 to determine the facility's compliance with effluent limits. The DMR review revealed inconsistent effluent monitoring and identified multiple permit exceedances. Effluent limit exceedances for internal Outfall 001A are summarized in Table 2, and in Table 3 for end of pipe Outfall 001B.

DEC Compliance Program conducted a facility inspection on July 18, 2018. The inspection report indicated that the facility was not operating within the permit requirements. DEC's Compliance and Enforcement Program issued a Notice of Violation (NOV) to the permittee on September 19, 2018. The NOV addressed non-compliance with effluent limits, absence of effluent monitoring and deficiencies in the reporting of monitoring results. The NOV also requested updated copies of the facility Quality Assurance Project Plan (QAPP) and Best Management Practices (BMP) Plan be submitted as these documents were not available on site at the time of inspection.

As required by the NOV, the permittee provided a response to DEC's Compliance and Enforcement Program on November 11, 2018. The response included the submission of an updated facility QAPP and BMP Plan, as well as missing DMR submissions, noncompliance reports and updated staff training records.

**Table 2: Outfall 001A Effluent Limit Exceedances**

Parameter	Units <sup>a</sup>	Basis	Permit Limit	Number of Exceedances	Maximum Reported Value	Date of Maximum Reported Value
BOD <sub>5</sub>	mg/L	Daily maximum	60	2	62	December 2016, January 2017
BOD <sub>5</sub>	mg/L	Weekly average	45	2	62	December 2016, January 2017
BOD <sub>5</sub>	mg/L	Monthly average	30	2	62	December 2016, January 2017
BOD <sub>5</sub>	%	Minimum monthly % removal	85	3	29 (lowest)	August 2016
TSS	mg/L	Daily maximum	60	8	203	January 2017
TSS	mg/L	Weekly average	45	14	203	January 2017
TSS	mg/L	Monthly average	30	19	203	January 2017
TSS	%	Minimum monthly % removal	85	2	80 (lowest)	June 2017
pH	S.U.	Daily minimum	6.0	2	5.7 (lowest)	May 2019, July 2019
DO	mg/L	Daily minimum	2.0	4	0.1 (lowest)	July 2019
TRC	mg/L	Daily maximum	1.0	3	1.16	June 2019
FC Bacteria	FC/100 mL	Daily maximum	800	7	30,000	February 2015, September 2015
FC Bacteria	FC/100 mL	Weekly average	400	7	30,000	February 2015, September 2015
FC Bacteria	FC/100 mL	Monthly average	200	10	30,000	February 2015, September 2015

Footnotes:

a. Units: mg/L = milligrams per liter, S.U. = standard units, and FC/100 mL = Fecal Coliform per 100 milliliters.

**Table 3: Outfall 001B Effluent Limit Exceedances**

<b>Parameter</b>	<b>Units <sup>a</sup></b>	<b>Basis</b>	<b>Permit Limit</b>	<b>Number of Exceedances</b>	<b>Maximum Reported Value</b>	<b>Date of Maximum Reported Value</b>
pH	S.U.	Daily minimum	6.5	4	6.2 (lowest)	December 2019
TRC	mg/L	Daily maximum	0.0075 <sup>b</sup>	2	0.1	October 2018
FC bacteria	FC/100 mL	Daily maximum	43	4	420	March 2017
FC bacteria	FC/100 mL	Monthly average	14	5	420	March 2017

Footnotes:

- a. Units: S.U. = standard units, mg/L = milligrams per liter, and FC/100 mL = Fecal Coliform per 100 milliliters.
- b. The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level (ML) of 0.1mg/L as the compliance evaluation level for this parameter.

### **3.0 EFFLUENT LIMITS AND MONITORING REQUIREMENTS**

#### **3.1 Basis for Permit Effluent Limits**

Per 18 AAC 83.015, the Department prohibits the discharge of pollutants to waters of the U.S. unless the permittee has first obtained a permit issued by the APDES Program that meet the purposes of AS 46.03 and is in accordance with the CWA Section 402. Per these statutory and regulatory provisions, the Permit includes effluent limits that require the discharger to (1) meet standards reflecting levels of technological capability, (2) comply with 18 AAC 70 – WQS, and (3) comply with other state requirements that may be more stringent.

The CWA requires that the limits for a pollutant be the more stringent of either TBELs or QBELs. TBELs are set according to the level of treatment that is achievable using available technology. A QBEL is designed to ensure that the WQS are met. QBELs may be more stringent than TBELs.

The permit contains a combination of both TBELs and QBELs. The Department first determines if TBELs are required to be incorporated into the permit. TBELs for publicly owned treatment works (POTWs), which apply to the Ward Cove WWTF, are derived from the secondary treatment standards found in Title 40 Code of Federal Regulations (40 CFR) §133.102 and 40 CFR §133.105, adopted by reference 18 AAC 83.010(e). The following section summarizes the proposed effluent limits. A more expansive technical and legal basis for the proposed effluent limits is provided in Appendix A Basis for Effluent Limitations.

#### **3.2 Basis for Effluent and Receiving Water Monitoring**

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

The Department may also require the permittee to perform the additional effluent monitoring required by the APDES application Form 2A for POTWs, so that this data will be available when the permittee applies to reissue the APDES permit. The permittee is responsible for conducting the monitoring and submitting the results with the application for renewal of the APDES permit. The permittee should consult and review Form 2A upon permit issuance to ensure that the required monitoring in the application will be completed prior to submitting a request for permit renewal. A copy of Form 2A can be found at

<http://dec.alaska.gov/water/wastewater/permit-entry/domestic-and-municipal/>

### **3.3 Effluent Limits and Monitoring Requirements**

The wastewater characteristics of Ward Cove WWTF are identical to a POTW and effluent limits have been established to meet requirements based on available wastewater treatment technology. Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance, and to evaluate effluent quality and variability.

The permittee has the option of taking more frequent samples than required under the permit. These additional samples must be used for averaging (for pollutants results reported on a monthly or weekly average) if they are conducted using the Department approved test methods (found in 18 AAC 70 and 40 CFR §136, adopted by reference in 18 AAC 83.010). For all effluent monitoring the permittees must use a sufficiently sensitive EPA approved test method that quantifies the pollutants to a level lower than applicable limits or water quality standards or use the most sensitive test method available, per 40 CFR §136, adopted by reference in 18 AAC 83.010(f).

#### **3.3.1 Internal Outfall 001A**

The permit requires influent and effluent monitoring at internal Outfall 001A. The permit carries forward the monitoring requirements and effluent limits for BOD<sub>5</sub>, TSS, pH, TRC, DO and FC bacteria from the previous permit, including case-by-case TBELs based on Best Professional Judgment (BPJ) consistent with the requirements found in 40 CFR §133.102 (adopted in 18 AAC 83.010). Further information outlining the details of the effluent limits and monitoring requirements for internal Outfall 001A can be found in Table 4 and in Appendix A.

The permit requires that the total discharge flow is monitored for internal Outfall 001A. The effluent limit for total discharge flow is based on the design flow for the Ward Cove WWTF and is changed from an average monthly limit to a maximum daily limit, per 18 AAC 83.520.

The permit requires the monitoring of BOD<sub>5</sub>, TSS and pH. Effluent limits are based on the secondary treatment standards adopted in 18 AAC 83.010(e). The monitoring requirements and effluent limits are carried forward from the previous permit. This includes the permit requirement to monitor the influent for BOD<sub>5</sub> and TSS to calculate monthly removal rates for these parameters.

The permit requires the monitoring of DO concentration based on the standard recommended minimum concentration of DO for wastewater facilities with mixed liquor aeration tank systems, applicable to Ward Cove WWTF. The monitoring requirement and effluent limit are carried forward from the previous permit.

The permit requires the monitoring of TRC concentrations and loadings. Effluent limits are based on standard operating procedures for domestic wastewater plants that use chlorine to disinfect wastewater, applicable to Ward Cove WWTF. The monitoring requirement and effluent limits are carried forward from the previous permit.

The permit requires monitoring of FC bacteria and enterococci bacteria. Effluent limits are based on BPJ consistent with the requirements in 40 CFR §133.102 (adopted in 18 AAC 83.010) and 18 AAC 72.990. The monitoring requirement and effluent limits are carried forward from the previous permit. This monitoring requirement will produce a more robust dataset to conduct reasonable potential analysis for the next permit reissuance.

The permit requires monitoring for temperature and ammonia, as nitrogen. The parameters are identified as potential pollutants of concern associated with POTW, applicable to the Ward Cove WWTF. This is a new monitoring requirement that will produce a robust dataset to conduct reasonable potential analysis for the next permit reissuance.

The permit requires monitoring for copper. Copper was identified as a pollutant of concern in the previous permit and the monitoring requirement is carried forward. Monitoring frequency is increased from quarterly to

monthly reporting in order to sufficiently monitor the facility’s performance and variability, and to produce a more robust dataset to conduct reasonable potential analysis for the next permit reissuance.

**Table 4: Internal Outfall 001A Effluent Limits and Monitoring Requirements**

Parameter	Effluent Limits					Monitoring Requirements		
	Units <sup>a</sup>	Daily Minimum	Monthly Average	Weekly Average	Daily Maximum	Sample Location	Sample Frequency	Sample Type
Total Discharge Flow	mgd	N/A	Report	N/A	0.025	Effluent	Continuous	Metered
Biochemical Oxygen Demand (BOD <sub>5</sub> )	mg/L	N/A	30	45	60	Influent and Effluent <sup>b</sup>	1/Month	24-hour Composite <sup>c</sup>
	lbs/day <sup>d</sup>		6.3	9.4	12.5			Calculated
Total Suspended Solids (TSS)	mg/L	N/A	30	45	60	Influent and Effluent	1/Month	24-hour Composite
	lbs/day		6.3	9.4	12.5			Calculated
BOD <sub>5</sub> & TSS Minimum Percent (%) Removal	%	N/A	85 <sup>e</sup>	N/A	N/A	Influent and Effluent	1/Month	Calculated
pH	S.U.	6.0	N/A	N/A	9.0	Effluent	3/Week	Grab
Temperature	° C	N/A	N/A	N/A	Report	Effluent	3/Week	Grab
Dissolved Oxygen (DO)	mg/L	2.0	N/A	N/A	N/A	Effluent	1/Month	Grab
Total Residual Chlorine (TRC)	mg/L	N/A	0.5	0.75	1.0	Effluent	3/Week	Grab
	lbs/day	N/A	0.1	0.16	0.21			
Fecal coliform Bacteria (FC)	FC/100 mL	N/A	200 <sup>f</sup>	400 <sup>f</sup>	800	Effluent	1/Month	Grab
Enterococci Bacteria	cfu/100 mL	N/A	N/A	N/A	Report	Effluent	1/Month <sup>g</sup>	Grab
Total Ammonia, as Nitrogen	mg/L	N/A	N/A	N/A	Report	Effluent	1/Quarter <sup>h</sup>	Grab
Copper, total recoverable	µg/L	N/A	N/A	N/A	Report	Effluent	1/Month	24-hour Composite

**Footnotes:**

a. Units: mgd = million gallons per day, mg/L = milligrams per liter, lbs/day = pounds per day, S.U.= standard units, °C= degrees Celsius, FC/100 mL = Fecal Coliform per 100 milliliters, cfu/100 mL = colony forming units per 100 milliliters, µg/L = micrograms per liter.

b. Limits apply to effluent. Report average monthly influent concentration. Influent and effluent composite samples shall be collected during the same 24-hour period.

c. See Appendix C for definition

d. lbs/day = concentration (mg/L) x flow (mgd) x 8.34 (conversion factor)

e. Minimum % Removal = [(monthly average influent concentration in mg/L – monthly average effluent concentration in mg/L) / (monthly average influent concentration in mg/L)] x 100. The monthly average percent removal must be calculated using the arithmetic mean of the influent value and the arithmetic mean of the effluent value for that month.

f. If more than one FC bacteria sample is collected within the reporting period, the average result must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of “n” quantities is the “nth” root of the product of the quantities. For example, the geometric mean of 100, 200, and 300 is (100 X 200 X 300)<sup>1/3</sup> = 181.7.

g. One sample shall be collected each month, May through September, on the same day as a fecal coliform bacteria sample is collected.

h. Once per quarter means once every three months based on the calendar year beginning with January: Jan–March, April–June, July–Sept, and Oct–Dec.

### 3.3.2 End of Pipe Outfall 001B

The permit requires effluent monitoring at end of pipe Outfall 001B and puts in place case-by-case WQBELs. Limits and monitoring requirements for total discharge flow, pH, DO, TRC, and FC bacteria have been retained from the previous permit. Effluent limits are from the Alaska WQS 18 AAC 70.020. Further information outlining the details of the effluent limits and monitoring requirements for end of pipe Outfall 001B can be found in Table 5 and in Appendix A.

The permit requires the reporting of TRC maximum daily and average monthly concentrations. Effluent limits are based on the acute and chronic limits for aquatic life for marine water in the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances*. The daily maximum limit has changed and is in line with the acute limit. The average monthly limit is a new permit requirement and is in line with the chronic limit. Monitoring frequency has increased from quarterly to monthly reporting in order to sufficiently monitor the facility's performance and variability, and to produce a robust dataset for conducting reasonable potential analysis for the next permit reissuance.

The monitoring frequency for FC bacteria has increased from quarterly to monthly reporting to sufficiently monitor the facility's performance and variability, and to produce a robust dataset for conducting reasonable potential analysis for the next permit reissuance.

The permit includes seasonal monitoring and effluent limits for enterococci bacteria. Effluent limits are taken from the WQS in 18 AAC 70.020(b)(14)(B). This is a requirement based on reasonable potential analysis conducted on monitoring data from the previous permit cycle. Monitoring frequency of monthly reporting is required to sufficiently monitor the facility's performance and variability, and monitor end of pipe compliance with the Alaska WQS.

The permit requires monitoring for temperature and ammonia, as nitrogen. The parameters are identified as potential pollutants of concern associated with POTW, applicable to the Ward Cove WWTF. This is a new monitoring requirement that will monitor end of pipe compliance with the Alaska WQS.

The permit requires monitoring for copper. Copper was identified as a pollutant of concern in the previous permit but was only monitored at internal Outfall 001A. This is a new effluent monitoring requirement for end of pipe Outfall 001B and is based on reasonable potential analysis conducted on monitoring data from internal Outfall 001A. Monitoring frequency of monthly reporting is required to sufficiently monitor the facility's performance and variability, and to produce a robust dataset for conducting reasonable potential analysis for the next permit reissuance.

**Table 5: End of Pipe Outfall 001B Effluent Limits and Monitoring Requirements**

Parameter	Effluent Limits					Monitoring Requirements	
	Units <sup>a</sup>	Daily Minimum	Monthly Average	Daily Maximum	Sample Location	Sample Frequency	Sample Type
Total Discharge Flow	mgd	Report	N/A	Report	Effluent	Continuous	Metered
pH	S.U.	6.5	N/A	8.5	Effluent	1/Quarter <sup>e</sup>	Grab
Temperature	° C	N/A	N/A	Report	Effluent	1/Quarter	Grab
Dissolved Oxygen (DO)	mg/L	6.0	N/A	17	Effluent	1/Quarter	Grab
Total Residual Chlorine (TRC) <sup>b</sup>	mg/L	N/A	0.0075	0.013	Effluent	1/Month	Grab
Fecal coliform Bacteria (FC)	FC/100 mL	N/A	14 <sup>c</sup>	43 <sup>d</sup>	Effluent	1/Month	Grab
Enterococci Bacteria	cfu/100mL	N/A	35 <sup>c</sup>	130 <sup>d</sup>	Effluent	1/Month <sup>f</sup>	Grab
Total Ammonia, as Nitrogen	mg/L	N/A	N/A	Report	Effluent	1/Quarter	Grab
Copper, total recoverable	µg/L	N/A	N/A	Report	Effluent	1/Month	Grab

**Footnotes:**

- a. Units: mgd = million gallons per day, S.U.= standard units, °C= degrees Celsius, mg/L = milligrams per liter, FC/100 mL = Fecal Coliform per 100 milliliters, cfu/100 mL = colony forming units per 100 milliliters, µg/L = micrograms per liter.
- b. The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter.
- c. If more than one FC bacteria or Enterococci bacteria sample is collected within the reporting period, the average result must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of “n” quantities is the “nth” root of the product of the quantities. For example, the geometric mean of 100, 200, and 300 is  $(100 \times 200 \times 300)^{1/3} = 181.7$
- d. If less than ten samples are collected in a 30-day period, the effluent limit cannot be exceeded. If ten or more samples are collected in a 30-day period, not more than 10% of the samples may exceed the effluent limit.
- e. Once per quarter means once every three months based on the calendar year beginning with January: Jan–March, April–June, July–Sept, and Oct–Dec.
- f. One sample shall be collected each month, May through September, on the same day as a fecal coliform bacteria sample is collected.

**3.4 Whole Effluent Toxicity Monitoring**

Per 18 AAC 70.030 WQS require that an effluent discharged to a waterbody may not impart chronic toxicity to aquatic organisms, expressed as 1.0 chronic toxic unity (TUC), at the point of discharge, or if the Department authorizes a mixing zone in a permit, approval, or certification, at or beyond the mixing zone boundary, based on the minimum effluent dilution achieved in the mixing zone. 18 AAC 83.435 requires that a permit contain limitations on whole effluent toxicity (WET) when a discharge has reasonable potential to cause or contribute to an exceedance of a WQS.

WET tests are laboratory tests that measure total toxic effect of an effluent on living organisms, WET tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. WET testing is not included in the permit as the discharge from the Ward Cove WWTF is expected to meet the water quality criteria at the end of pipe Outfall 001B. The Department has determined that compliance with the terms and conditions of the permit will ensure that reasonable potential for WET does not exist. The Department has established permit monitoring requirements for other specific ‘indicator’ pollutants, e.g. total residual chlorine



and copper, to evaluate pollutants of concern associated with the effluent that have the highest likelihood of imparting toxicity.

## **4.0 RECEIVING WATERBODY**

### **4.1 Description of Receiving Waterbody**

Ward Cove is an estuary on the west side of Revillagigedo Island approximately 5 miles north of the city of Ketchikan, in southeast Alaska. The area surrounding the cove is mountainous and largely forested. The predominant orientation of the cove is from northeast at the head to southwest at the mouth, which opens onto the Tongass Narrows.

The cove is approximately 1 mile long and 0.5-mile-wide at its widest point. The depth at the head of the cove (the northeast portion) is 10 feet below mean lower low water (MLLW) and at the mouth (the southwest portion) is 200 feet below MLLW. The shoreline is mostly rocky basalt and is relatively steep.

Ward Creek is the cove's primary source of fresh water, with Walsh Creek and other unnamed intermittent streams also entering the cove. Runoff from precipitation enters Ward Cove along the shoreline from the immediate watershed. The cove is characterized by an estuarine flow pattern with relatively low salinity waters near the surface and saline waters at depth. Currents in Ward Cove are driven by a semidiurnal tide with a mean tidal range of 13.3 feet. Flow velocities vary with depth and there appears to be no area of stagnation in Ward Cove. Benthic habitats of the cove are comprised of areas of soft substrate as well as areas of exposed rock. Soft substrates consist of varying amounts of clay, silt, and sand.

### **4.2 Outfall Description**

The Ward Cove WWTF continually discharges treated effluent into Ward Cove through end of pipe Outfall 001B, a single port discharge without a diffuser. The terminus of end of pipe Outfall 001B is positioned approximately 100 feet from the north shore and approximately 25 feet below the mean lower low water (MLLW). Geographic coordinates of the outfall are 55°24'15" North latitude and 131°43'58" West longitude.

### **4.3 Water Quality Standards**

Section 301(b)(1)(C) of the CWA required the development of limits in permits necessary to meet water quality standards by July 1, 1977. Per 18 AAC 83.435, APDES permits must include conditions to ensure compliance with WQS. Additionally, regulations in 18 AAC 70 require that the conditions in permits ensure compliance with the WQS. The State's WQS are composed of waterbody use classifications, numeric and/or narrative water quality criteria, and an Antidegradation Policy. The use classification system identifies the designated uses that each waterbody is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the state to support the designated use classification of each waterbody. The antidegradation policy ensures that the existing uses and the level of water quality necessary to protect the uses are maintained and protected.

Water bodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230 as listed under 18 AAC 70.230(e). Some waterbodies in Alaska can also have site-specific water quality criterion per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b). The receiving water for this discharge, Ward Cove, has not been reclassified, nor have site-specific water quality criteria been established. Therefore, existing uses and designated uses are the same and Ward Cove must be protected for all marine use classes as per 18 AAC 70.020(a)(2) and 18 AAC 70.050. The designated use classes for marine water include (A) water supply (aquaculture, seafood processing, and industrial), (B) water recreation (contact and secondary), (C) growth and propagation of fish, shellfish, other aquatic life, and wildlife, and (D) harvesting for consumption of raw mollusks or other raw aquatic life.

The discharge from the Ward Cove WWTF is expected to meet water quality standards to protect all uses at the end of pipe Outfall 001B. The permit does not include receiving waterbody limits or monitoring requirements.

#### **4.4 Water Quality Status of Receiving Water**

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

Ward Cove was placed on the Section 303(d) list in 1990 for non-attainment of WQS for residues and dissolved gas criteria due to pulp residues, logs, bark and woody debris, and low DO concentrations from historical discharges and associated activity from the Ketchikan Pulp Company (KPC) pulp mill operations and a seafood processing facility formally located in Ward Cove..

A water quality assessment of Ward Cove was completed by 1996, and the 1996 303(d)-list included Ward Cove as water quality-limited for four pollutant parameters: residues (wood residues), dissolved gas (dissolved oxygen), color, and toxic and other deleterious substances (sediment toxicity).

The 1998 303(d) list removed color as a pollutant because KPC’s mill wastewater discharges to the waterbody ceased in 1997. DO, toxics and other deleterious organic and inorganic substances and residues (debris) remained on the list and required the development of a waterbody recovery plan or TMDL. Sediment toxicity was removed from the 2004 303(d) list and Ward Cove was placed in category 4b (other pollutant controls) because the Record of Decision for the Superfund sediment remediation project for Ward Cove was accepted as a pollution control requirement that achieved WQS for sediment toxicity.

The sediment toxicity impairment was removed from Section 303(d)/Category 5 list and moved to Category 2 in the 2006 Integrated Report. EPA completed and finalized a TMDL for Ward Cove in 2007 with WLAs in place for residues and DO. These impairments were removed from Section 303(d)/Category 5 list and moved to Category 4a in the 2008 Integrated Report.

In developing the 2007 TMDL, DEC and EPA identified all permitted discharges to Ward Cove, including the discharge of wastewater from the Ward Cove WWTF. The TMDL concluded that the Ward Cove WWTF does not discharge wood residues, and the small amount of suspended sediment that the facility is permitted to discharge is not considered relevant to the residues TMDL. The TMDL established a WLA for DO that prohibited “point source loading of oxygen-demanding substances that will cause a measurable decrease (0.2 mg/L) in DO level below 5.0 mg/L from June through September”. The TMDL also acknowledged that the WWTF permit requires that the standard for DO be met at the point of discharge (that no mixing zone is authorized). The TMDL outlines that it expects that the freshwater discharge of the facility will rise in the water and be contained above the pycnocline in the summer. The impaired waters were those waters below the pycnocline.

The 2014/16 Integrated Water Quality Monitoring and Assessment Report classifies Ward Cove as a category 2 impaired waterbody for toxic and other deleterious organic and inorganic substances. Waterbodies are classified as category 2 if it has been determined that some of the WQS criteria are attained. Ward Cove remains classified as a category 4a impaired waterbody for DO and residues. Category 4a waterbodies are defined as being impaired but EPA approved TMDL has been established.

The permit includes the DO WQS effluent limit of 6.0 mg/L for end of pipe Outfall 001B. Since this is met prior to discharge to Ward Cove the discharge will not contribute to a depletion of DO from what had previously been permitted and the TMDL is met.

## 4.5 Mixing Zone Analysis

In accordance with 18 AAC 70.240, the Department may authorize a mixing zone in a permit. Determination of the mixing zone requires an evaluation of critical conditions of the flow regimes of the receiving waterbody, effluent characterization and concentration projections, and discharge rates. These critical conditions are addressed in the permit application. A chronic mixing zone is sized to protect the ecology of the waterbody as a whole and an acute mixing zone is sized to prevent lethality to passing organisms.

The permittee did not request a mixing zone for the discharge from the Ward Cove WWTF. Accordingly, the Department has not considered authorization of a mixing zone for this permit. Compliance monitoring at internal Outfall 001A and end of pipe Outfall 001B as required by the permit will continue to verify that the effluent is in compliance with applicable water quality criteria prior to discharge.

## 4.6 Additional Monitoring

The permit is a reissuance of the prior APDES permit for an existing facility. The permit carries forward the total discharge flow reporting requirements for end of pipe Outfall 001B from the previous permit (see additional information in Section 3.3.2, Appendix 3.4.1). Full Cycle LLC does not have direct control over the flow from Connell Lake into the wooden stave outfall pipeline. The Ward Cove WWTF already implements effluent chlorine disinfection to meet the Outfall 001A fecal coliform bacteria limits. Water quality standards are monitored and must be met at Outfall 001B, prior to entering the receiving waterbody. Therefore, the Department determined that no additional treatment or revisions to operating methods are practicable and necessary at this time.

Monitoring samples must be collected upstream of where the treated effluent is discharged to the wooden stave pipeline. Monitoring is to take place at the same time as the sample collection and monitoring of end of pipe Outfall 001B and samples must be analyzed for the parameters listed in Table 6.

**Table 6: Connell Lake Additional Monitoring Requirements**

Parameter	Units <sup>a</sup>	Sample Frequency	Sample Type
FC Bacteria	FC/100mL	1/Month	Grab
Enterococci Bacteria	cfu/100mL	1/Month <sup>b</sup>	
Copper, total recoverable	µg/L	1/Quarter <sup>c</sup>	
<b>Footnotes:</b>			
a. FC/100 mL = Fecal Coliform per 100 milliliters, cfu/100 mL = colony forming units per 100 milliliters, µg/L = micrograms per liter.			
b. One sample shall be collected each month, May through September, on the same day as a fecal coliform bacteria sample is collected.			
c. Once per quarter means once every three months based on the calendar year beginning with January: Jan–March, April–June, July–Sept, and Oct–Dec.			

Monitoring of FC bacteria at internal Outfall 001A and end of pipe Outfall 001B and of enterococci bacteria and copper at internal Outfall 001A during the last permit cycle indicated the presence of FC bacteria, enterococci bacteria, and copper at levels exceeding water quality standards. Additional monitoring will produce a more robust data set to support reasonable potential analysis for FC bacteria and enterococci bacteria, and copper in the next permit reissuance (see section A.3.4.6, A.3.4.7, and A.3.4.9).

## 5.0 ANTIBACKSLIDING

18 AAC 83.480 requires that “interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit, unless the circumstances on which the previous permit was based have materially and substantially changed since the permit was issued, and the change in circumstances would cause for permit modification or revocation and reissuance under

18 AAC 83.135.” 18 AAC 83.480(c) also states that a permit may not be reissued “to contain an effluent limitation that is less stringent than required by effluent guidelines in effect at the time the permit is renewed or reissued.”

Effluent limitations may be relaxed as allowed under 18 AAC 83.480, CWA §402(o) and CWA §303(d)(4). 18 AAC 83.480(b) allows relaxed limitations in renewed, reissued, or modified permits when there have been material and substantial alterations or additions to the permitted facility that justify the relaxation, or, if the Department determines that technical mistakes were made.

The effluent limitations in this permit reissuance are consistent with 18 AAC 83.480. Therefore, the permit effluent limitations, standards, and conditions in AK0053384 are as stringent as in the previously issued permit. Accordingly, no further backsliding analysis is required for this permit reissuance.

## 6.0 ANTIDegradation

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the waterbody's designated uses, WQBELs may be revised as long as the revision is consistent with the State's Antidegradation policy. The State's Antidegradation policy is found in the 18 AAC 70 Water Quality Standards (WQS) regulations at 18 AAC 70.015. The Department's approach to implementing the Antidegradation policy is found in 18 AAC 70.016 *Antidegradation implementation methods for discharges authorized under the federal Clean Water Act*. Both the Antidegradation policy and the implementation methods are consistent with 40 CFR 131.12 and approved by EPA. This section analyzes and provides rationale for the Department's decisions in the permit issuance with respect to the Antidegradation policy and implementation methods.

Using the policy and corresponding implementation methods, the Department determines a Tier 1 or Tier 2 classification and protection level on a parameter by parameter basis. A Tier 3 protection level applies to a designated water. At this time, no Tier 3 waters have been designated in Alaska.

18 AAC 70.015(a)(1) states that the existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected (Tier 1 protection level).

Ward Cove is listed in category 4a on DEC's most recent 2014/2016 Integrated Water Quality Monitoring and Assessment Report (Alaska's 2014-16 Integrated Report); therefore, the listed parameters, DO and residues, have been identified where only the Tier 1 protection level applies. Accordingly, this antidegradation analysis conservatively assumes that the Tier 2 protection level applies to all other parameters, consistent with 18 AAC 70.016(c)(1).

18 AAC 70.015(a)(2) states that if the quality of water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality must be maintained and protected, unless the Department authorizes a reduction in water quality (Tier 2 protection level).

The Department may allow a reduction of water quality only after the specific analysis and requirements under 18 AAC 70.016(b)(5)(A-C), 18 AAC 70.016(c)(7)(A-F), and 18 AAC 70.016(d) are met. The Department's findings are as follows:

### **18 AAC 70.016(b)(5)**

*(A) existing uses and the water quality necessary for protection of existing uses have been identified based on available evidence, including water quality and use related data, information submitted by the applicant, and water quality and use related data and information received during public comment;*

*(B) existing uses will be maintained and protected; and*

*(C) the discharge will not cause water quality to be lowered further where the department finds that the parameter already exceeds applicable criteria in 18 AAC 70.020(b), 18 AAC 70.030, or 18 AAC 70.236(b).*

The water quality criteria, upon which the permit effluent limits are based, serve the specific purpose of protecting the existing and designated uses of the receiving water. Per 18 AAC 70.020 and 18 AAC 70.050 all marine waters are protected for all uses; therefore, the most stringent water quality criteria found in 18 AAC 70.020 and in the DEC Toxics Manual apply and were evaluated. This will ensure existing uses and the water quality necessary for protection of existing uses of the receiving waterbody are fully maintained and protected.

The permit places limits and conditions on the discharge of pollutants. The limits and conditions are established after comparing TBELs and WQBELs and applying the more restrictive of these limits. The WQ criteria, upon which the permit effluent limits are based, serve the specific purpose of protecting the existing and designated uses of the receiving water. WQBELs are set equal to the most stringent water quality criteria available for any of the protected water use classes.

Conventional pollutants of concern in domestic wastewater are BOD<sub>5</sub>, TSS, and pH. Additional domestic wastewater pollutants are temperature, DO, ammonia, FC bacteria, and enterococci bacteria. Another wastewater pollutant of concern in the Ward Cove WWTF effluent is copper. The permit includes numeric effluent limits or continued monitoring addressing each of these pollutants of concern. The permit requires facilities to implement an Operation and Maintenance (O&M) Plan to minimize the production of waste and the discharge of pollutants to waters of the U.S., to ensure that domestic wastewater facilities provide for the protection or attainment of existing and designated uses.

Section 1.2.2 of the permit requires that the discharge shall not cause or contribute to a violation of the Alaska WQS at 18 AAC 70. Ward Cove is designated as a Category 4A impaired water body for DO with an associated TMDL, therefore Tier 1 antidegradation analysis is required for the parameter of DO (see Fact Sheet Section 4.4). The Department implements a more stringent minimum effluent limit for DO (6 mg/L instead of the previous permit limit of 5 mg/L) that is based on the water quality criteria for uses of the receiving water.

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

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

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

As previously stated, Section 1.2.2 of the permit requires that the discharge shall not cause or contribute to a violation of the WQS at 18 AAC 70. WQBELs are set equal to the most stringent water quality criteria available under 18 AAC 70.020(b) for any of the protected water use classes. Because of the nature of the permitted discharges, other pollutants are not expected to be present in the discharges at levels that would cause, have the reasonable potential to cause, or contribute to an exceedance of any Alaska WQS.

The permit reissuance application does not propose any changes that would likely result in wastewater of lower quality to be discharged than has been discharged under the previously issued permit. The WQS, upon which the permit effluent limits are based, serve the specific purposes of protecting the existing and designated uses. After a review of the expected volume of discharge, the types and amounts of regulated pollutants, and the monitoring and effluent limits included in the permit, the Department concludes that the resulting water quality will be adequate to fully protect existing uses.

The discharge authorized by the permit is in compliance with 18 AAC 70.020(b). As discussed in Section 3.4, the permit does not require WET monitoring. All water quality criteria are required to be met at the end of pipe Outfall 001B prior to discharge to Ward Cove. Site-specific criteria as allowed by 18 AAC 70.235 have not

been established for Ward Cove, as listed in 18 AAC 70.236(b), and are therefore not applicable. The permit does not authorize short term variance or zones of deposit under 18 AAC 70.200 or 18 AAC 70.210; therefore, does not apply. A mixing zone under 18 AAC 70.240 is not authorized in the permit; therefore, does not apply.

The Department concludes that the reduction of water quality will not violate the applicable criteria specified in 18 AAC 70.016(c)(7)(A) and that the finding is met.

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

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

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

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

- (i) for new and existing point sources, the highest statutory and regulatory requirements; and*
- (ii) for nonpoint sources, all cost-effective and reasonable best management practices;*

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

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

- (1) any federal technology-based effluent limitation identified in 40 C.F.R. 122.29 and 125.3, revised as of July 1, 2017 and adopted by reference;*
- (2) any minimum treatment standards identified in 18 AAC 72.050;*
- (3) any treatment requirements imposed under another state law that is more stringent than a requirement of this chapter; and*
- (4) any water quality-based effluent limitations established in accordance with 33 U.S.C. 1311(b)(1)(C) (Clean Water Act, sec. 301(b)(1)(C)).*

The first part of the definition includes all federal technology-based effluent limit guidelines (ELGs) including “For POTWs, effluent limitations based upon... Secondary Treatment” at 40 CFR § 125.3(a)(1) defined at 40 CFR § 133.102, adopted by reference at 18 AAC 83.010(e). The ELGs set standards of performance for existing and new sources and are incorporated in the permit.

The second part of the definition references the minimum treatment standards for domestic wastewater discharges found at 18 AAC 72.050. The terms and conditions of the permit require the permittee to meet or exceed the minimum treatment standards described in 18 AAC 72.050. Wastewater operations at Ward Cove WWTF includes preliminary treatment, primary treatment, extended aeration activated sludge, secondary clarifiers, and chlorine disinfection. The Department finds that this requirement is met.

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

The fourth part of the definition refers to WQBELs. WQBELs are designed to ensure that the WQS of a waterbody are met and may be more stringent than TBELs. Section 301(b)(1)(C) of the CWA requires the development of limits in permits necessary to meet WQS by July 1, 1977. WQBELs included in APDES permits are derived from EPA approved 18 AAC 70 WQS. APDES regulation 18 AAC 83.435(a)(1) requires that permits include WQBELs that can “achieve water quality standards established under CWA §303, including state narrative criteria for water quality.” The permit requires compliance with the 18 AAC 70 WQS, and includes effluent limits for pH, DO, TRC, FC bacteria, and enterococci bacteria.

The Department reviewed available information on known point source discharges to receiving waters covered under the permit and found no outstanding noncompliance issues.

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

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

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

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

The Department has determined the lowering of water quality is necessary given the facility’s proximity to Ward Cove, and on the premise that the facility is fully constructed and operational. It could be a financial hardship for the permittee to implement other treatment measures. The permittee has not proposed an increase in discharge volume, and the concentrations of pollutants discharged are carried forward from the previous permit.

The Department finds the most effective and reasonable methods of prevention, control, and treatment are the practices and requirements set out in the APDES permit for the facility and meet federal (40 CFR 133) and State (18 AAC 72.050) requirements. This type of treatment (biological, secondary treatment) and associated discharge is similar in nature to other like facilities and their discharges located throughout the U.S. Additionally, chlorine disinfection for FC and enterococci bacteria is an accepted practicable alternative for bacterial treatment. The Ward Cove WWTF utilizes a variety of measures to prevent, control and treat the pollution that may be generated as a result of the facility’s wastewater treatment operations. The permittee is required to develop and implement a QAPP and O&M Plan to establish standard operational procedures and regular maintenance schedules for the prevention, control, and treatment of all wastes and other substances discharged from the facility. This includes preventative maintenance, spill preventions, water conservation and public information and education. The permit requires that pollutants removed in the course of treatment such as screenings and grit be disposed of in accordance with Alaska Solid Waste Management Regulations at 18 AAC 60.

The Department has determined that the methods of pollution prevention, control, and treatment applied to all waste and other substances to be discharged are found by the Department to be the most effective and practicable; therefore 18 AAC 70.016(c)(7)(D)(ii) finding is met.

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

The Ward Cove WWTF offers a septic tank sludge disposal and treatment location for many on site systems located throughout the Ketchikan Gateway Borough. On site domestic wastewater treatment units are prevalent in the area due to the practical and economic infeasibility of providing municipal sewer connections and treatment. Ward Cove WWTF also provides a facility to treat marine vessel domestic waste. The facility's continued operation is important to the public health and the regional economy. Eliminating or requiring implementation of alternatives to the existing discharge would inhibit important socioeconomic growth and development in the area.

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

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

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

## **7.0 OTHER PERMIT CONDITIONS**

### **7.1 Quality Assurance Project Plan**

The permittee is required to develop procedures to ensure that the monitoring data submitted is accurate and to explain data anomalies if they occur. The permittee is required to update, implement and maintain the Quality Assurance Project Plan (QAPP). The QAPP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing, and shipping samples; laboratory analysis; precision and accuracy requirements; data reporting, including method detection/reporting limits; and quality assurance/quality control criteria. The permittee is required to amend the QAPP whenever any procedure addressed by the QAPP is modified. The plan shall be retained on site and made available to the Department upon request.

### **7.2 Operation and Maintenance Plan**

The permittee is required to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance are essential to meet discharge limitations, monitoring requirements, and all other permit requirements. The permittee is required to update, implement and maintain the Operations and Maintenance Plan and ensure that it includes appropriate best management practices and pollution prevention measures. The plan shall be retained on site and made available within 120 days of the effective date of the final permit and to the Department upon request.

### **7.3 Industrial User Survey**

18 AAC 83.340 requires POTWs to identify and locate all Significant Industrial Users (SIUs) that discharge process wastewaters and associated pollutants to their wastewater treatment system. General and specific pretreatment prohibitions at 40 CFR 403.5, adopted by reference at 18 AAC 83.010(g)(2), contain prohibitions that apply to each industrial user introducing pollutants into a POTW, whether or not the industrial user is subject to other National Pretreatment Standards, or any national, State, or local Pretreatment Requirements. Therefore, in order to assess whether an industry or business has the potential to violate any general or specific pretreatment prohibition, and to determine if a pretreatment program should be developed and/or if pretreatment requirements should be included in the Ward Cove WWTF wastewater discharge permit, the permittee is required to submit with their permit reissuance application, Form 2A, a list of those industries or businesses that discharge and/or have the potential to discharge non-domestic wastewater to the Ward Cove WWTF's collection system. DEC may request further information on specific industries or business to assist in this evaluation.



## 7.4 Electronic Discharge Monitoring Report

The permittee must submit DMR data electronically through NetDMR per Phase I of the E-Reporting Rule (40 CFR 127) upon the effective date of the permit. Authorized persons may access permit information by logging into the NetDMR Portal (<https://cdxnodengn.epa.gov/oeca-netdmr-web/action/login>). DMRs submitted in compliance with the E-Reporting Rule are not required to be submitted as described in permit Appendix A – Standard Conditions unless requested or approved by the Department. Any DMR data required by the Permit that cannot be reported in a NetDMR field (e.g. mixing zone receiving water data, etc.), shall be included as an attachment to the NetDMR submittal. DEC has established an e-Reporting Information website at <https://dec.alaska.gov/water/compliance/electronic-reporting-rule> that contains general information about this new reporting format. Training materials and webinars for NetDMR can be found at <https://netdmr.zendesk.com/home>.

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

## 7.5 Standard Conditions

Appendix A of the permit contains standard regulatory language that must be included in all APDES permits. These requirements are based on the regulations and cannot be challenged in the context of an individual APDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

## 8.0 OTHER LEGAL REQUIREMENTS

### 8.1 Ocean Discharge Criteria Evaluation

Section 403(a) of the CWA, Ocean Discharge Criteria, prohibits the issuance of a permit under Section 402 of the CWA for a discharge into the territorial sea, the water of the contiguous zone, or the oceans except in compliance with Section 403. Permits for discharges seaward of the baseline of the territorial seas must comply with the requirements of Section 403, which include development of an Ocean Discharge Criteria Evaluation (ODCE).

Interactive nautical charts depicting Alaska’s baseline plus additional boundary lines are available at <https://www.charts.noaa.gov/ChartCatalog/Alaska.html> and interactive maps at [https://alaskafisheries.noaa.gov/mapping/arcgis/rest/services/NOAA\\_Baseline/MapServer](https://alaskafisheries.noaa.gov/mapping/arcgis/rest/services/NOAA_Baseline/MapServer).

The charts and maps are provided for information purposes only. The U.S. Baseline committee makes the official determinations on baseline. Ocean Discharge Criteria are not applicable for marine discharges to areas located landward of the baseline of the territorial sea.

A review of the baseline line maps revealed that the Ward Cove WWTF end of pipe Outfall 001B terminus is positioned landward of the baseline of the territorial sea; therefore, Section 403 of the CWA does not apply to the permit, and an ODCE analysis is not required to be completed for this permit reissuance. Further, the permit requires compliance with WQS such that 40 CFR 125.122(b) is met and therefore the discharge is presumed not to cause unreasonable degradation of the marine environment.

## 8.2 Endangered Species Act

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

The Endangered Species Act (ESA) requires federal agencies to consult with the National Oceanic and Atmospheric Administration (NOAA), NMFS and the USFWS if their actions could beneficially or adversely affect any threatened or endangered species. As a state agency, DEC is not required to consult with these federal agencies regarding permitting actions; however, DEC voluntarily contacted the agencies to notify them of the proposed permit issuance and to obtain listings of threatened and endangered species near the discharge.

DEC contacted USFWS and the NMFS on November 1, 2019 and requested them to identify any threatened or endangered species under their jurisdiction in the vicinity of the Ward Cove WWTF end of pipe Outfall 001B.

On November 1, 2019 DEC received a voicemail message from Ms. Jennie Spegon of the USFWS stating that the USFWS online IPAC (Information, Planning, and Conservation) tool should be used to produce an endangered species list for Ward Cove. Accordingly, there are no federally listed, proposed or candidate species within the project area. Further information on this can be found on the USFWS website:

<https://ecos.fws.gov/ipac/>

Ms. Suzie Teerlink, from NOAA, contacted DEC by telephone on November 5, 2019, to convey the information that the only ESA-listed marine mammal is Mexico DPS humpback whales. NOAA currently have a Proposed Ruse out to designate Critical Habitat for humpback whales. This includes Southeast Alaska and specifically details humpback whale prey as the biological feature to be considered in consultation. Further information on this can be found on the NOAA website: <https://www.fisheries.noaa.gov/action/proposed-rule-designate-critical-habitat-central-america-mexico-and-western-north-pacific>

Mr. Mark Minnillo, from Alaska Department of Fish & Game, contacted DEC via email on November 12, 2019 to confirm that “there are no endangered species or critical habitat in Ward Cove”.

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

## 8.3 Essential Fish Habitat

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

As a state agency, DEC is not required to consult with NOAA on EFH; however, DEC voluntary contacts agencies to notify them of the proposed permit issuance and to obtain listings of EFH in the area.

DEC emailed NOAA on November 18, 2019. Mr. Seanbob Kelly, from NOAA, contacted DEC by telephone on November 19, 2019, to convey information that the ADF&G [“Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes”](#) and associated Atlas are the appropriate documents for determining EFH in Ward Cove. Accordingly, the freshwater stream that runs into the head of Ward Cove and the tributaries of this stream support spawning and rearing of sockeye (*Oncorhynchus nerka*), coho (*Oncorhynchus kisutch*), pink (*Oncorhynchus gorbuscha*), and chum salmon (*Oncorhynchus keta*), as well as Dolly Varden trout (*Salvelinus malma*) and steelhead. All these anadromous fishes migrate through Ward Cove as rearing smolt and adults returning to spawn. Juvenile salmon also use nearshore habitat during spring and early summer for feeding and predator avoidance prior to migration out to sea.

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

## **8.4 Sludge (Biosolids) Requirements**

Sludge means any solid, semi-solid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. State and federal requirements regulate the management and disposal of sewage sludge (biosolids). The permittee must consult both state and federal regulations to ensure proper management of the biosolids and compliance with applicable requirements.

### **8.4.1 State Requirements**

The Department separates wastewater and biosolids permitting. The permittee should contact the Department's Solid Waste Program for information regarding state regulations for biosolids. The permittee can access the Department's Solid Waste Program web page (<https://dec.alaska.gov/eh/solid-waste>) for more information and who to contact.

### **8.4.2 Federal Requirements**

EPA is the permitting authority for the federal sewage sludge regulations at 40 CFR Part 503. Biosolids management and disposal activities are subject to federal requirements in Part 503. The Part 503 regulations are self-implementing, which means that a permittee must comply with the regulations even if no federal biosolids permit has been issued for the facility.

A POTW is required to apply for an EPA biosolids permit. The permittee should ensure that a biosolids permit application has been submitted to the EPA. In addition, the permittee is required to submit a biosolids permit application to the EPA for the use or disposal of sewage sludge at least 180 days before this APDES permit expires in accordance with 40 CFR §122.21(c)(2) and §122.21(q) (see also 18 AAC 83.110(c) and 18 AAC 83.310, respectively). The application form NPDES Form 2S can be found on the EPA website [www.epa.gov](http://www.epa.gov) under NPDES forms. The completed NPDES Form 2S should be submitted to:

U.S. Environmental Protection Agency,  
Region 10, NPDES Permits Unit OWW-130,  
Attention: Biosolids Contact,  
1200 Sixth Avenue, Suite 900,  
Seattle, WA 98101-3140.  
The EPA Region 10 telephone number is 1-800-424-4372.

Information about EPA's biosolids program and CWA Part 503 is available at [www.epa.gov](http://www.epa.gov) and either search for 'biosolids' or go to the EPA Region 10 website link and search for 'NPDES Permits'.

## **8.5 Permit Expiration**

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

## 9.0 REFERENCES

- Alaska Department of Environmental Conservation, “Alaska’s Final 2010 Integrated Water Quality Monitoring and Assessment Report,” July 15, 2010.
- Alaska Department of Environmental Conservation, “Alaska’s Final 2014-16 Integrated Water Quality Monitoring and Assessment Report,” April 12, 2019.
- Alaska Department of Environmental Conservation, “Interim Antidegradation Implementation Methods,” Policy and Procedure 05.03.103, July 14, 2010.
- Alaska Department of Environmental Conservation. 18 AAC 70 Water quality standards, as amended through April 6, 2018.
- Alaska Department of Environmental Conservation, “Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances,” as amended through December 12, 2008.
- Alaska Department of Environmental Conservation, “Alaska Pollutant Discharge Elimination System permits reasonable potential analysis and effluent limits development guide.” 2014
- Alaska Department of Fish & Game, [\*Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes\*](#) and associated Atlas. 2019.
- U.S. Environmental Protection Agency, 1994. Total Maximum Daily Load (TMDL) for Biochemical Oxygen Demand (BOD<sub>5</sub>) in the surface waters of Ward Cove, Alaska. 1994.
- U.S. Fish and Wildlife Service, 2014. Information, Planning and Conservation System Initial Project Scoping website. <https://ecos.fws.gov/ipac/>
- Water Pollution Control Federation. *Chlorination of wastewater, manual of practice no. 4*. Moore & Moore, Washington DC 1978

## **APPENDIX A. BASIS FOR EFFLUENT LIMITATIONS**

The Clean Water Act (CWA) requires a Publicly Owned Treatment Works (POTWs) to meet effluent limits based on available wastewater treatment technology, specifically, secondary treatment effluent limit standards found at Title 40 Code of Federal Regulations (40 CFR) 133, adopted by reference in Alaska Administrative Code (AAC) 18 AAC 83.010(e). The Department may find, by analyzing the effect of an effluent discharge on the receiving waterbody, that secondary treatment effluent limits are not sufficiently stringent to meet Alaska water quality standards (WQS). In such cases, the Department is required to develop more stringent water quality-based effluent limits (WQBELs), which are designed to ensure that the WQS of the receiving waterbody are met.

Technology-based effluent limits (TBELs) are established by the Environmental Protection Agency (EPA) for many industries in the form of Effluent Limitation Guidelines (ELGs), are based on available pollution control technology and are adopted by reference in 18 AAC 83. The Department adopts the subject ELGs by reference in 18 AAC 83.010. The secondary treatment effluent limits for POTWs are TBELs; however, do not limit every pollutant that may be present in the effluent. TBELs have only been developed for five-day biochemical oxygen demand (BOD<sub>5</sub>), total suspended solids (TSS), and pH. Effluent from a POTW may contain other pollutants, such as bacteria, ammonia, or metals, depending on the type of treatment system used and the quality of the influent to the POTW.

The CWA requires that the effluent limit for a pollutant be the more stringent of either TBELs or WQBELs. When TBELs do not exist for a particular pollutant expected to be present in the effluent, the Department must determine if the pollutant may cause or contribute to an exceedance of a water quality criteria (WQC) for the waterbody. If a pollutant causes or contributes to an exceedance of a WQC, a WQBEL for the pollutant must be established in the permit.

### **A.1 Secondary Treatment Effluent Limitations**

The CWA requires a POTW to meet requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as “secondary treatment,” that all POTWs were required to meet by July 1, 1977. The secondary treatment standards in 40 CFR §133.102, which the Department has adopted in 18 AAC 83.010(e), are TBELs that apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD<sub>5</sub>, TSS, and pH. In addition to the federal secondary treatment regulations in 40 CFR Part 133, the State of Alaska requires maximum daily limitations (MDLs) for BOD<sub>5</sub> and TSS in its own secondary treatment regulations (18 AAC 72.990(59)).

The secondary treatment standards (TBELs) are not directly applicable to the Ward Cove WWTF since the facility is not a POTW. Because the wastewater characteristics are identical to a POTW, the Department established a case-by-case TBELs based on Best Professional Judgment (BPJ) consistent with the requirements found in 40 CFR §133.102 (adopted in 18 AAC 83.010) and 18 AAC 72.990. The TBELs listed in Table A-1 are applicable to internal Outfall 001A, domestic wastewater discharge, before any mixing occurs with the freshwater diverted from Connell Lake in the wooden stave discharge pipe.

Application of secondary treatment standards at internal Outfall 001A rather than the end of pipe Outfall 001B is appropriate because the domestic wastewater at internal Outfall 001A is treated separately and then combined with water prior to final marine discharge to Ward Cove. Per 18 AAC 83.550(a) “When permit effluent limitations or standards imposed at the point of discharge are impractical or infeasible, effluent limitations or standards for dischargers of pollutants may be imposed on internal waste streams before mixing with other waste streams”. As such, and as in the previous permit, internal Outfall 001A is established to apply the secondary treatment standards and to ensure that other water does not dilute the domestic waste stream to the point where the pollutants are not detectable. The TBELs applicable at internal Outfall 001A (including BPJ TBELs as described below) are listed in Table A-1.

**Table A-1: Technology Based Effluent Limits at Internal Outfall 001A**

Parameter	Units <sup>a</sup>	Average Monthly Limit (AML)	Average Weekly Limit (AWL)	Maximum Daily Limit (MDL)
BOD <sub>5</sub>	mg/L	30	45	60
TSS	mg/L	30	45	60
BOD <sub>5</sub> and TSS Percent Removal	Percent (%)	85% (minimum)	N/A	N/A
pH	S.U.	6.0 – 9.0 SU at all times		
Total Residual Chlorine (TRC)	mg/L	0.5	0.75	1.0
Fecal Coliform Bacteria	FC/100 mL	200	400	800
a. Units: mg/L = milligrams per liter, S.U.= standard units, FC/100 mL = Fecal Coliform per 100 milliliters,				

**A.1.1 Total Residual Chlorine (TRC)**

The internal Outfall 001A effluent limits for TRC outlined in Table A-1 are carried forward from the previous permit.

Ward Cove WWTF uses chlorine to disinfect wastewater prior to discharge. For internal Outfall 001A, a 0.5 mg/L TRC average monthly limit is derived from standard operating practices. The Water Pollution Control Federation’s Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Ward Cove WWTF effluent has a chlorine contact time of approximately 45 minutes; adequate for internal Outfall 001A to meet a 0.5 mg/L average monthly limit. These limits serve as Best Professional Judgment (BPJ) case-by-case TBELs consistent with the requirements found in 40 CFR §133.102 (adopted in 18 AAC 83.010) and State 18 AAC 72.990. In addition to average monthly limitations (AMLs), DEC regulations at 18 AAC 83.530 require that effluent limitations for POTWs to be expressed as average weekly limits (AWLs) unless impracticable. The AWL for internal Outfall 001A is calculated to be 1.5 times the AML, consistent with the “secondary treatment” limits for BOD<sub>5</sub> and TSS. This results in an AWL for TRC of 0.75 mg/L.

**A.1.2 Fecal Coliform Bacteria**

The internal Outfall 001A effluent limits fecal coliform (FC) bacteria outlined in Table A-1 are carried forward from the previous permit.

The basis for these limits was described in the previous permit fact sheet as follows. The probable basis for the limits (widely implemented in other domestic wastewater discharge permits) is the definition of disinfection found in 18 AAC 72.990 (21)(A) & (B). The definition states that facilities that disinfect using different technologies, including chlorination, designed to eliminate pathogenic organisms, can produce effluent with the characteristics of meeting an AML of 200 FC/100 mL and an AWL of 400 FC/100 mL. These limits serve as BPJ case-by-case TBELs consistent with the requirements found in 40 CFR §133.102 (adopted in 18 AAC 83.010) and 18 AAC 72.990.

**A.2 Mass-Based Limitations**

Per 18 AAC 83.540 effluent limits are required to be expressed in terms of mass unless they cannot appropriately be expressed by mass, if it is infeasible, or if the limits can be expressed in terms of other units of measurement. In addition, 18 AAC 83.520 requires that effluent limits for a POTW be calculated based on the design flow of the facility in million gallons per day (mgd). The design flow of the Ward Cove WWTF is 0.025 mgd. The Department used the design flow to calculate loading limits in the permit for BOD<sub>5</sub>, TSS, and TRC. The mass-based limits are expressed in pounds per day (lbs/day) and are calculated as follows:

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

Where: 8.34 is a conversion factor with units (lbs x L) / (mg x gallon x 10<sup>6</sup>)

### **A.3 Water Quality Based Effluent Limitations**

#### **A.3.1 Statutory and Regulatory Basis**

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

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

As previously described, the CWA requires that the effluent limit for a pollutant be the more stringent of either TBELs or QBELs. The discharge from end of pipe Outfall 001B is required to meet QBELs set equal to applicable water quality criteria for pH, DO, TRC, FC bacteria, and enterococci bacteria.

#### **A.3.2 Reasonable Potential Analysis**

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

According to 18 AAC 70.990(38), a mixing zone is an area in a waterbody surrounding, or downstream of, a discharge where the effluent plume is diluted by the receiving water within which specified water quality criteria may be exceeded. Water quality criteria and limits may be exceeded within a mixing zone. A mixing zone can be authorized only when adequate receiving waterbody flow exists, and the concentration of the pollutant of concern in the receiving waterbody is below the numeric criterion necessary to protect the designated uses of the waterbody. The permittee has not requested a mixing zone so the Department did not consider mixing zone authorization and the discharge must meet water quality criteria at end of pipe Outfall 001B.

Reasonable Potential Analysis (RPA) calculations are conducted in accordance with the Department's *APDES Permits Reasonable Potential Analysis and Effluent Limits Development Guide*. Monitoring data from internal Outfall 001A was used to run RPA calculations for copper (see A3.4.9). Monitoring data from end of pipe Outfall 001B was used to run RPA calculations for TRC (See A3.4.5), and enterococci bacteria (see A3.4.6).

#### **A.3.3 Procedure for Deriving Water Quality-Based Effluent Limits**

The *Technical Support Document for Water Quality-Based Toxics Control (TSD)* (Environmental Protection Agency (EPA), 1991) and the AWQC recommend the flow conditions for use in calculating QBELs using steady-state modeling. The TSD, APDES Guide, and the WQS state the QBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years (7Q10) for chronic criteria and the lowest one-day average flow rate expected to occur

once every ten years (1Q10) for acute criteria. In marine settings, tidal velocities must be representative of critical conditions as well.

The first step in developing a WQBEL is to develop a WLA for the pollutant. A WLA is the concentration or loading of a pollutant that the permittee may discharge without causing or contributing to an exceedance of the WQC or a total maximum daily load (TMDL) in the receiving waterbody. If a mixing zone is authorized in the permit, the WQC apply at all points outside the mixing zone.

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

### **A.3.4 Specific Water Quality-Based Effluent Limits**

#### **A.3.4.1 Total Discharge Flow**

Flow is based on the hydraulic design capacity of the wastewater treatment facility (flow rate as gallons or million gallons per day (mgd)) and is determined by a professional engineer and approved by DEC during the WWTF plan review process conducted per 18 AAC 72. A flow limit based on the design capacity ensures that the WWTF operated within its capabilities to receive and properly treat sustained average flow quantities and specific pollutants.

The previous permit included an effluent limit for Total Discharge Flow for internal Outfall 001A to be reported as a monthly average of 0.025 (mgd). Per 18 AAC 83.520, permit effluent limits for a POTW are required to be calculated based on the design flow of the facility in mgd, and that the measure of production must be calculated over a time period of the time period corresponding to the permit limitations. The design flow of the Ward Cove WWTF is 0.025 mgd. The effluent limit for Total Discharge Flow for internal Outfall 001A has been corrected to report a daily maximum of 0.025 million gallons per day (mgd).

Full Cycle LLC does not have direct control over the flow from Connell Lake into the wooden stave outfall pipeline. The previous permit removed the total discharge flow daily minimum limit of 2.025 MGD for end of pipe Outfall 001B and replaced it with the monitoring only requirement to report the daily minimum flow. As explained in the 09/25/14 Response to Comments, “The permit requires that WQS, including bacteria WQS, be met at the end of pipe Outfall 001B. Accordingly, there is no need to require a minimum flow of freshwater to be diverted from Lake Connell.” The purpose of the minimum flow limit in the prior EPA issued NPDES permit (August 24, 2004) was to ensure bacteria levels were below applicable water quality criteria at the outfall. The Department calculated the contribution of Connell Lake in the wooden stave pipe using flow data reported during the previous permit cycle from internal Outfall 001A and end of pipe Outfall 001B. The minimum dilution factor provided by the Lake Connell water was 74.6. When this is applied to the FC bacteria maximum daily limit of 800 cfu/100, the WQS of 14 cfu/100 at 18 AAC 70.020 (14)(D) is met. The monitoring only requirement for end of pipe Outfall 001B is carried forward in the permit. Compliance monitoring at the end of pipe Outfall 001B will continue to verify that the effluent is in compliance with applicable WQS prior to discharge to Ward Cove.

#### **A.3.4.2 pH**

The WQS at 18 AAC 70.020(b)(18)(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife states that the pH water quality criteria for marine waters may not be less than 6.5 or greater than 8.5 Standard Units (S.U.).



DEC reviewed pH monitoring data for end of pipe Outfall 001B from November 2014 to December 2019. During this time period the average pH value observed was 7.0 S.U. The previous permit implemented WQBELs for pH that required a minimum of 6.5 S.U. and a maximum of 8.5 S.U., monitored once per quarter. The WQBEL and monitoring frequency requirement for end of pipe Outfall 001B is carried forward in the permit.

#### **A.3.4.3            *Temperature***

The WQS at 18 AAC 70.020(b)(22)(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife state that temperature 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. The next most stringent criteria is for water supply and may not exceed 15° C.

Temperature is being monitored at both internal Outfall 001A and end of pipe Outfall 001B. The permit requires the permittee to monitor temperature of the effluent at internal Outfall 001A three times per week, and to report the temperature of the total discharge at end of pipe Outfall 001B once per quarter. This is a new WQBEL and monitoring requirement in the permit to monitor compliance with WQS.

#### **A.3.4.4            *Dissolved Oxygen***

Aerobic microorganisms require dissolved oxygen (DO) in order to metabolize organic wastes into inorganic byproducts and reproduce. Municipal wastewater exerts a demand on the oxygen resource of waterbodies via BOD<sub>5</sub>.

The 2004 Recommended Standards for Wastewater Facilities recommends a minimum concentration of 2.0 mg/L of DO in the mixed liquor aeration tank in design requirements for a mechanical aeration system. Ward Cove WWTF uses an activated sludge process with mechanical aeration. As such, a minimum DO concentration of 2.0 mg/L monitored at internal Outfall 001A is required to ensure a healthy microorganism population and the successful treatment of biological wastes.

The WQS at 18 AAC 70.020(b)(15)(A)(i) for aquaculture water supply are the most stringent standards for DO. The standards require that DO must be greater than 6 mg/L in receiving waters for a depth of one meter except when natural conditions cause this value to be depressed. The 2007 Total Maximum Daily Load (TMDL) developed for Ward Cove requires that no point source loading of oxygen-demanding substances that will cause a measurable decrease (0.2 mg/L) in dissolved oxygen level below 5.0 mg/L from June through September. In no case may DO be greater than 17 mg/L. The concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection.

DEC reviewed DO monitoring data for both internal Outfall 001A and end of pipe Outfall 001B from November 2014 to December 2019. The concentrations ranged from 0.1 mg/L to 12.4 mg/L at internal Outfall 001A and from 6.6 mg/L to 12.9 mg/L at end of pipe Outfall 001B. The previous permit implemented WQBELs for DO that required a minimum DO of 2.0 mg/L at internal Outfall 001A, monitored once per month, and a DO range of 6.0 to 17 mg/L at end of pipe Outfall 001B monitored once per quarter. The WQBEL and monitoring frequency requirements are carried forward in the permit.

#### **A.3.4.5            *Total Residual Chlorine (TRC)***

The WQS at 18 AAC 70.020(b)(23)(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife state that 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*, 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. The *Alaska Water Quality Criteria Manual* lists aquatic life for marine water criteria for total residual chlorine (TRC) as 0.0075 mg/L (chronic) and 0.013 mg/L (acute).

DEC reviewed TRC monitoring data for end of pipe Outfall 001B from November 2014 to December 2019. The data available did not meet the goodness of fit test required to successfully conduct RPA calculations.

The permit implements WQBELs for TRC at end of pipe Outfall 001B of a maximum daily limit of 0.013 mg/L (in line with the WQS acute limit), and an average monthly level of 0.0075 mg/L (in line with the WQS chronic limit). The TRC effluent limits are not quantifiable using EPA-approved analytical methods. DEC will use the minimum level (ML) of 0.1 mg/L as the compliance evaluation level for this parameter. The monitoring frequency has been increased in the permit to monthly reporting. This will produce a more robust dataset for completing RPA calculations during the next permit issuance. The daily maximum/monthly average limits and monitoring requirements are revised WQBELs in the permit.

#### **A.3.4.6 *Fecal Coliform (FC) Bacteria***

Fecal coliform bacteria are a non-pathogenic indicator species whose presence suggests the likelihood that pathogenic bacteria are present. The WQS at 18 AAC 70.020(b)(14)(D) for harvesting of raw mollusk or other aquatic life criterion specifies that the fecal coliform (FC) bacteria concentration shall not exceed 14 FC/100 mL and not more than 10% of samples shall exceed a FC bacteria concentration of 43 FC/100 mL.

DEC reviewed FC bacteria monitoring data for end of pipe Outfall 001B from November 2014 to December 2019. The results ranged from 2.0 to 420 cfu/100mL. Reasonable potential analysis was conducted on the available data and it was determined that there is reasonable potential for FC bacteria to exceed water quality criteria at end of pipe Outfall 001B.

The permit implements WQBELs for FC bacteria at end of pipe Outfall 001B of a maximum daily limit of 43 FC bacteria/100mL, and an average monthly limit of 14 FC bacteria/100mL. The monitoring frequency has been increased in the permit to monthly reporting. This will produce a more robust dataset for completing RPA calculations during the next permit issuance. The WQBEL is carried forward from the previous permit, the monitoring frequency requirement is increased in the permit.

#### **A.3.4.7 *Enterococci Bacteria***

Enterococci bacteria are indicator organisms of harmful pathogens recommended by the 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. 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 10% of the samples may exceed a concentration of 130 enterococci cfu/100mL.

DEC reviewed enterococci bacteria monitoring data for internal Outfall 001A from November 2014 to December 2019. The results ranged from 10 to 8400 cfu/100mL. Reasonable potential analysis was conducted on the available data and it was determined that there is reasonable potential for enterococci bacteria to exceed water quality criteria.

The permit implements WQBELs for enterococci bacteria at end of pipe Outfall 001B of a maximum daily limit of 130 enterococci bacteria/100mL and an average monthly limit of 35 enterococci bacteria/100mL. The monitoring frequency has been increased in the permit to monthly reporting. Enterococci bacteria monitoring is required to be performed at the same time as FC bacteria monitoring and shall be collected at both internal Outfall 001A and end of pipe Outfall 001B on the same day, seasonally between May 1 – September 30, determined to be when the receiving water would most likely be used for primary contact

recreation. This is a new WQBEL and monitoring requirement in the permit and will monitor end of pipe compliance with the Alaska WQS.

#### **A.3.4.8 Total Ammonia as Nitrogen**

Ammonia is a pollutant of concern under the secondary treatment standards for POTWs, therefore the Department determined to include ammonia monitoring in the permit. Total ammonia is the sum of ionized ( $\text{NH}_4^+$ ) and un-ionized ammonia ( $\text{NH}_3$ ). Temperature, pH, and salinity affect which form,  $\text{NH}_4^+$  or  $\text{NH}_3$ , is present.  $\text{NH}_3$  is more toxic to aquatic organisms than  $\text{NH}_4^+$  and predominates with higher temperature and pH. Biological wastewater treatment processes reduce the amount of total nitrogen in domestic wastewater; however, without advanced treatment, wastewater effluent may still contain elevated levels of ammonia as nitrogen. Excess ammonia as nitrogen in the environment can lead to dissolved oxygen depletion, eutrophication, and toxicity to aquatic organisms.

Ammonia monitoring on a quarterly basis has been included as a new monitoring requirement at both internal Outfall 001A and end of pipe Outfall 001B. This parameter shall be collected at both locations on the same day.

Effluent monitoring for this parameter has not historically been undertaken, and as outlined in the DEC Reasonable Potential Analysis procedure, a permit limit has not been established. Monitoring specific to ammonia as nitrogen is required to determine the ammonia as nitrogen concentration in the effluent at internal Outfall 001A and total discharge at end of pipe Outfall 001B, and to gather data during this permit cycle. This is a new monitoring requirement in the permit. Monitoring data will be used to perform RPA calculations during the next permit issuance that will determine if the discharge has the potential to cause or contribute to an exceedance of the ammonia criteria in the receiving water body. Quarterly monitoring at both internal Outfall 001A and end of pipe Outfall 001B will produce a dataset of 20 data points for each outfall location, which is a statistically robust dataset for completing a reasonable potential analysis.

#### **A.3.4.9 Copper**

The WQS at 18 AAC 70.020(b)(23)(C) Growth and Propagation of Fish, Shellfish, Other Aquatic Life, and Wildlife state that 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*, 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. The *Alaska Water Quality Criteria Manual* lists aquatic life for marine water criteria for dissolved copper as 3.1  $\mu\text{g/L}$  (chronic) and 4.8  $\mu\text{g/L}$  (acute).

Copper was identified as a pollutant of concern in the previous permit and monitoring requirements were included for internal Outfall 001A. DEC reviewed copper monitoring data for internal Outfall 001A from November 2014 to December 2019. The limited data set of 13 effluent samples collected at the internal Outfall 001A for copper had results ranging from 1.3  $\mu\text{g/L}$  to 300  $\mu\text{g/L}$ . Additionally, the prior permit did not require copper monitoring at Outfall 001B, therefore there was no data available to evaluate the actual copper concentrations entering the receiving waterbody, Ward Cove. Therefore, the Department determined that due to the limited data set with high variability, the additional monitoring frequency at Outfall 001A and addition of copper monitoring at Outfall 001B were necessary to develop a more accurate and robust data set to be evaluated at the next permit reissuance.

Previous permits have not required monitoring for copper at end of pipe Outfall 001B. Monitoring specific to copper is required to determine the copper concentration in the effluent at internal Outfall 001A and the total discharge at end of pipe Outfall 001B (collected at both locations on the same day) to gather additional data during this permit cycle. This is a new monitoring requirement in the permit, increasing the monitoring requirement to include monitoring at both the internal Outfall 001A and end of pipe Outfall 001B, as well as

increasing the monitoring frequency from quarterly to monthly monitoring for the life of the permit. Monitoring data will be used to perform RPA calculations during the next permit issuance that will determine if the discharge has the potential to cause or contribute to an exceedance of the copper criteria in the receiving water body. Monthly monitoring at both internal Outfall 001A and end of pipe Outfall 001B will produce a robust dataset for completing a reasonable potential analysis during the next permit reissuance development.

**A.3.4.10 Residues: Floating solids, debris, sludge, deposits, foam, scum, or other residues.**

The Alaska WQS (2003) for residues are narrative. The most stringent standard for marine water, found at 18 AAC 70.020(b)(20)(C), “May not, alone or in combination with other substances or wastes, make the water unfit or unsafe for the use, or cause acute or chronic problem levels as determined by bioassay or other appropriate methods. May not, alone or in combination with other substances, cause a film, sheen, or discoloration on the surface of the water or adjoining shorelines; cause leaching of toxic or deleterious substances; or cause a sludge, solid, or emulsion to be deposited beneath or upon the surface of the water, within the water column, on the bottom, or upon adjoining shorelines.” This narrative standard is carried forward from the previous permit.

**A.4 Selection of the Most Stringent Limitations**

Table A-2 provides a summary and reference for parameters that have effluent limits at the internal Outfall 001A and end of pipe Outfall 001B at Ward Cove WWTF.

**Table A-2: Summary of Effluent Limits**

Parameter	Fact Sheet Reference	Type of Effluent Limit
BOD <sub>5</sub>	Fact Sheet Part 3.3 Appendix A.1	TBEL (including minimum percentage removal) implemented at internal Outfall 001A
TSS		
pH	Fact Sheet Part 3.3 Appendix A.1, A.3.4.2	TBEL implemented at internal Outfall 001A. WQBEL equal to 18 AAC 70 WQS implemented at end of pipe Outfall 001B
Dissolved Oxygen	Fact Sheet Part 3.3 Appendix A.3.4.4	WQBEL equal to 18 AAC 70 WQS implemented at end of pipe Outfall 001B
Total Residual Chlorine	Fact Sheet Part 3.3 Appendix A.1.1, A.3.4.5	BPJ TBEL implemented at internal Outfall 001A. WQBEL equal to 18 AAC 70 WQS implemented at end of pipe Outfall 001B
FC Bacteria	Fact Sheet Part 3.3 Appendix A.1.2, A.3.4.6	BPJ TBEL implemented at internal Outfall 001A. WQBEL equal to 18 AAC 70 WQS implemented at end of pipe Outfall 001B
Enterococci Bacteria	Fact Sheet Part 3.3 Appendix A.3.4.7	WQBEL equal to 18 AAC 70 WQS implemented at end of pipe Outfall 001B