Fact Sheet

The U.S. Environmental Protection Agency (EPA)
Proposes to reissue a National Pollutant Discharge Elimination System (NPDES) Permit to Discharge Pollutants Pursuant to the Provisions of the Clean Water Act (CWA) to:

Makah Tribal Council
Makah Wastewater Treatment Plant
2250 Cape Flattery Road
Neah Bay, Washington 98357

And

The State of Washington Proposes to Certify the Permit

Public Comment Start Date: April 18, 2016
Public Comment Expiration Date: May 18, 2016

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The EPA Proposes To Reissue NPDES Permit
The EPA proposes to reissue the NPDES permit for the facility referenced above. The draft permit places conditions on the discharge of pollutants from the wastewater treatment plant 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.

This Fact Sheet includes:
- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limitations and other conditions for the facility
- a map and description of the discharge location
- technical material supporting the conditions in the permit

401 Certification
EPA is requesting that the Washington State Department of Ecology to certify the NPDES permit for this facility, under Section 401 of the Clean Water Act.

Tribal Coordination and Consultation
In the course of issuing this NPDES Permit, EPA coordinated with the Makah Nation.

Public Comment
Persons wishing to comment on or request a Public Hearing on the draft permit for this facility may do so in writing by the expiration date of the Public Comment period. A request for a Public Hearing must state the nature of the issues to be raised as well as the requester's name, address and telephone number. All comments and requests for Public Hearings must be in writing and should be submitted to the EPA as described in the Public Comments Section of the attached Public Notice.

After the Public Notice expires, and all comments have been considered, the EPA's regional Director for the Office of Water and Watersheds will make a final decision regarding permit issuance. If no substantive comments are received, the tentative conditions in the draft permit will become final, and the permit will become effective upon issuance. If substantive comments are received, the EPA will address the comments and issue the permit. The permit will become effective no less than 30 days after the issuance date, unless an appeal is submitted to the Environmental Appeals Board within 30 days pursuant to 40 CFR 124.19.

Documents are Available for Review
The draft NPDES permit and related documents can be reviewed or obtained by visiting or contacting the EPA's Regional Office in Seattle between 8:30 a.m. and 4:00 p.m., Monday through Friday at the address below. The draft permit, fact sheet, and other information can also be found by visiting the Region 10 NPDES website at "http://EPA.gov/r10earth/waterpermits.htm."

United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OWW-191
Seattle, Washington 98101
(206) 553-0523 or
Toll Free 1-800-424-4372 (within Alaska, Idaho, Oregon and Washington)

The fact sheet and draft permit are also available at:

Makah Wastewater Treatment Plan
Makah Nation
2250 Cape Flattery Road
Neah Bay, WA 98357
Attention: Steve Jimmicum
Phone: (360) 645-2474

Acronyms

1-DAD Max	1-day maximum temperature
7-DAD Max	7-day average of the daily maximum temperatures
1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
30Q10	30 day, 10 year low flow
ACR	Acute-to-Chronic Ratio
AML	Average Monthly Limit
ASR	Alternative State Requirement
AWL	Average Weekly Limit
BA	Biological Assessment
BAT	Best Available Technology economically achievable
BCT	Best Conventional pollutant control Technology
BE	Biological Evaluation
BO or BiOp	Biological Opinion
BOD_5	Biochemical oxygen demand, five-day
BOD_{5u}	Biochemical oxygen demand, ultimate
BMP	Best Management Practices
BPT	Best Practicable
°C	Degrees Celsius
C BOD_5	Carbonaceous Biochemical Oxygen Demand
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
COD	Chemical Oxygen Demand
CSO	Combined Sewer Overflow
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report

DO	Dissolved oxygen
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FOTW	Federally Owned Treatment Works
FR	Federal Register
gpd	Gallons per day
HUC	Hydrologic Unit Code
ICIS	Integrated Compliance Information System
I/I	Infiltration and Inflow
LA	Load Allocation
lbs/day	Pounds per day
LTA	Long Term Average
LTCP	Long Term Control Plan
meg/l	Milliequivalents per liter
mg/l	Milligrams per liter
ml	Milliliters
ML	Minimum Level
µg/l	Micrograms per liter
mgd	Million gallons per day
MDL	Maximum Daily Limit or Method Detection Limit
N	Nitrogen
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observable Effect Concentration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NSPS	New Source Performance Standards
OWW	Office of Water and Watersheds
O&M	Operations and maintenance

POTW	Publicly owned treatment works
PSES	Pretreatment Standards for Existing Sources
PSNS	Pretreatment Standards for New Sources
QAP	Quality assurance plan
RP	Reasonable Potential
RPM	Reasonable Potential Multiplier
SIC	Standard Industrial Classification
SPCC	Spill Prevention and Control and Countermeasure
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
s.u.	Standard Units
TBEL(s)	Technology Based Effluent Limit(s)
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TRC	Total Residual Chlorine
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standard(s)
WWTP	Wastewater treatment plant

I. Applicant

A. General Information

This fact sheet provides information on the draft NPDES permit for the following entity:

Physical Address:
2250 Cape Flattery Road
Neah Bay, WA 98357

Mailing Address:
P.O. Box 115
Neah Bay, WA 98357

NPDES Permit Number: WA0023213

Contacts:
Steve Jimmicum, Wastewater Treatment Plant Operator - (360) 645-2474
David Lucus, Makah Public Works Manager - (360) 645-3116

B. Permit History

The most recent NPDES permit for the Makah Wastewater Treatment Plant (MWWTP) was issued on September 25, 2006, became effective on November 1, 2006, and expired on October 31, 2011. EPA determined that as of July 12, 2011, a complete NPDES application for permit issuance was submitted by the permittee; accordingly, the existing permit was administratively extended until the permit is reissued.

II. Facility Information

A. Treatment Plant Description

Service Area

The Makah Indian Nation owns and operates the MWWTP which is located in the Makah Reservation (MR) on the Olympic Peninsula of Washington State. The collection system has no combined sewers. The facility serves a resident population of 2500 according to the Permit Application.

Treatment Process

The MWWTP has primary and secondary treatment, and handles only sanitary wastes, serving approximately 2500 residents and several small businesses. The MWWTP does not accept industrial waste waters. The plant was constructed in 1997, replacing an older WWTP that is no longer used. This NPDES permit concerns the 1997 plant; it has an estimated steady-state design flow rate of 0.41 million gallons per day (mgd), and the average daily flow rate reported on the permit application is 0.21 mgd. Details about the wastewater treatment process and a map showing the location of the treatment facility and discharge are included in Appendix A. EPA regards facilities that have a design flow of less than 1.0 mgd

as minor facilities. Because the design flow of the MWWTP is 0.41 mgd, the facility is considered a minor facility.

The MWWTP consists of a total of four compounds where primary and secondary treatment takes place in two settling ponds and two aeration lagoons. After primary and secondary treatment, the wastewater passes through the Chlorine Contact Chamber before discharge at the marine outfall at the Strait of Juan de Fuca. In the Permit Application, the facility stated that it uses sodium hypochlorite for disinfection, and does not utilize dechlorination or post aeration processes prior to effluent discharge at the outfall.

B. Outfall Description

Effluent is discharged through one outfall into the Strait of Juan de Fuca, approximately 3,580 feet from shore at a depth of approximately 45 feet. The location of the marine outfall in the Strait of Juan de Fuca is approximately halfway between Koitlah Point and Waadah Island. The coordinates of the outfall are: 48° 22' 58.2" N, and 124° 37' 10.5" W. The outfall is equipped with a diffuser.

Construction drawings (dated 8/8/95) provided by the facility indicate that the diffuser is 120 feet long, has 4 ports, where are 6 inches in diameter, and spaced 40 feet apart. The construction drawings also showed that the diffuser pipe is 14 inches above the sea floor, at a depth of 45 feet (MLLW level).

According to Craig Haugland of the U.S. Indian Health Service (IHS) in an email dated December 24, 2015, there is an on-going project to re-secure the outfall pipe by reattaching some of the concrete anchors to the sea-floor. In that project, the alignment and diffuser location will remain unchanged.

C. Background Information

Effluent Characterization

In order to determine pollutants of concern for further analysis, EPA evaluated the application form, additional discharge data, and the nature of the discharge. The wastewater treatment process for this facility includes both primary and secondary treatment, as well as chlorine disinfection. Pollutants typical of a sewage treatment plant include five-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), fecal coliform bacteria, pH, ammonia, chlorine, dissolved oxygen (DO), Total Kjeldahl Nitrogen (TKN), Nitrate plus Nitrite Nitrogen, oil and grease, and phosphorus. The concentrations of pollutants in the discharge were reported in the NPDES application.

Compliance History

The facility's last NPDES Permit expired on October 31, 2011. The Facility had reapplied prior to permit expiration, and in an EPA letter dated July 14, 2011, EPA determined that a complete NPDES application was submitted on July 12, 2011. Communications with the Facility and with the IHS indicate that the Facility is currently operated in an unchanged manner from the last permit cycle; other than maintenance, there were no changes to its infrastructure. The Facility reported no citizen complaints due to its operation during the last permit cycle.

D. Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* directs each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities." EPA is striving to enhance the ability of overburdened communities to participate fully and meaningfully in the permitting process for EPA-issued permits, including NPDES permits. "Overburdened" communities can include minority, low-income, tribal, and indigenous populations or communities that potentially experience disproportionate environmental harms and risks. As part of an agency-wide effort, EPA Region 10 will consider prioritizing enhanced public involvement opportunities for EPA-issued permits that may involve activities with significant public health or environmental impacts on already overburdened communities. For more information, please visit http://www.epa.gov/compliance/ej/plan-ej/.

As part of the permit development process, EPA Region 10 conducted an "EJSCREEN" to determine whether a permit action could affect overburdened communities. EJSCREEN is a nationally consistent geospatial tool that contains demographic and environmental data for the United States at the census block group level. As a pre-decisional tool, EJSCREEN is used to highlight permit candidates for additional review where enhanced outreach may be warranted.

The EPA also encourages permittees to review (and to consider adopting, where appropriate) Promising Practices for Permit Applicants Seeking EPA-Issued Permits: Ways To Engage Neighboring Communities (see https://www.federalregister.gov/articles/2013/05/09/2013-10945/epa-activities-to-promote-environmental-justice-in-the-permit-application-process#h-13). Examples of promising practices include: thinking ahead about community's characteristics and the effects of the permit on the community, engaging the right community leaders, providing progress or status reports, inviting members of the community for tours of the facility, providing informational materials translated into different languages, setting up a hotline for community members to voice concerns or request information, follow up, etc.

EPA's EJSCREEN tool identified the Makah Reservation as a potentially overburdened community because the WWTP discharges from within the boundaries of the Makah Reservation. During the screening process, EPA considered specific case-by-case circumstances, and EPA concluded that there is no indication that the issuance of this permit would trigger significant environmental justice concerns. Separate from the environmental justice screening effort, EPA also conducted tribal coordination with the Makah Reservation.

III. Receiving Water

This facility discharges into the marine waters of the Strait of Juan de Fuca, into waters of Washington State. According to the construction diagrams, the location of the submerged outfall is 3,580 feet from shore, and approximately 45 feet below surface (MLLW).

A. Receiving Water Quality

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet Water Quality Standards (WQS) by July 1, 1977. Federal regulations at 40 CFR 122.4(d) require that the conditions in NPDES permits ensure compliance with the WQS of all affected States. A State's WQS are composed of beneficial use designations, numeric and/or narrative water quality criteria, and an anti-degradation policy. The WQS designates the beneficial uses (such as drinking water supply, contact recreation, and aquatic life) that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the State to support the beneficial use designations of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

For the purposes of this permit, EPA is using the State of Washington's WQS found at WAC 173-201A. However, if more current standards are approved before this permit is finalized, they will be incorporated into the permit.

The applicable criteria are determined based on the designation of the receiving waterbody of the Strait of Juan de Fuca. In WAC 173-201A-612, the Strait of Juan de Fuca is designated as marine water.

The receiving water body is considered "estuarine" for purposes of determining the size of a mixing zone. This position is supported by Washington State regulations, WAC 173-201A-400(7)(b)(ii), which states that: "All waters existing within bays from Point Wilson westward to Cape Flattery …… shall also be categorized as estuarine." The outfall of the MWWTP is located in Neah Bay, which is between Point Wilson and Cape Flattery; therefore the receiving water is considered "estuarine".

WAC 173-201A-400(8)(b) states that in estuarine waters, a zone where acute criteria may be exceeded shall not extend beyond ten percent of the distance established in subsection (7)(b) of this section as measured independently from the discharge port(s).

For the Chronic Criteria, pertaining to the estuarine designation, in WAC 173-201A-100(7)(b)(i), the mixing zone shall, "Not extend in any horizontal direction from the discharge port(s) for a distance greater than two hundred feet plus the depth of water over the discharge port(s) as measured during mean lower low water".

Facility construction diagrams indicate that the MLLW level at the discharge port is 45 feet. Therefore, it is determined that the size of the mixing zone is 245 feet for the Chronic Criteria. Pertaining to WAC 173-201A-400(8)(b), for the acute criteria, the size of the mixing zone is 10%, which calculates to 24.5 feet. EPA used these site specific parameters to determine dilution ratios, and reasonable potential calculations as shown in the appendices.

The Makah Nation does not currently have EPA-approved WQS. Until they establish their own regulations for water quality, Washington State's standards will be used as a reference to protect downstream uses in Washington waters.

The State of Washington's WQS are composed of beneficial use designations, numeric and/or narrative water quality criteria, and an anti-degradation policy. The WQS designates

the beneficial uses (such as cold water aquatic life communities, contact recreation, etc.) that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary to support the beneficial use designations of each water body. The anti-degradation policy represents a three tiered approach to maintain and protect various levels of water quality and uses.

The WQS's designation system identifies the beneficial uses that each water body is expected to achieve, such as drinking water supply, contact recreation, and aquatic life. The numeric and narrative water quality criteria are those deemed necessary by the State to support the beneficial use designations of each water body. The anti-degradation policy represents a three-tiered approach to maintain and protect various levels of water quality and uses.

Designated Beneficial Uses

In determining the applicable Washington WQS, EPA referred to Ecology's WQS which describes waters at Neah Bay having Extraordinary Life Use (see Specific Use Designations for Marine Water (WAC 173-201A-612), as "Strait of Juan de Fuca", (Aquatic Life Use – Extraordinary).

The Extraordinary Aquatic Life Use designation has a General Description in WAC 173-201A-610, as follows: *"Extraordinary quality salmonid and other fish migration, rearing, and spawning; clam, oyster, and mussel rearing and spawning; crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing and spawning."*

WAC 173-201A-612 describes the Strait of Juan de Fuca as having the following specific Use Designations:

- Extraordinary Aquatic Life Uses
- Shellfish Harvesting
- Primary Contact Recreational Uses
- Misc. Uses: Wildlife Habitat, Harvesting, Commerce and Navigation, Boating, and, Aesthetics.

The State of Washington's anti-degradation policy is summarized below.

Antidegradation

The proposed issuance of an NPDES permit triggers the need to ensure that the conditions in the permit ensure that Tier I, II, and III of the State's antidegradation policy are met. An anti-degradation analysis was conducted by EPA (see Appendix D), which concluded that the permit would not result in deterioration of water quality.

B. Water Quality Limited Waters

Any waterbody for which the water quality does not, and/or is not expected to meet, applicable WQS is defined as a "water quality limited segment."
Section 303(d) of the CWA requires states to develop a Total Maximum Daily Load (TMDL) management plan for water bodies determined to be water quality limited segments. A

TMDL is a detailed analysis of the water body to determine its assimilative capacity. The assimilative capacity is the loading of a pollutant that a water body can assimilate without causing or contributing to a violation of WQS. Once the assimilative capacity of the water body has been determined, the TMDL will allocate that capacity among point and non-point pollutant sources, taking into account natural background levels and a margin of safety. Allocations for non-point sources are known as "load allocations" (LAs). The allocations for point sources, known as "waste load allocations" (WLAs), are implemented through effluent limitations in NPDES permits. Effluent limitations for point sources must be consistent with applicable TMDL allocations.

The area where the WWTP discharges is categorized by Ecology at Water Resource Inventory Area 19 (WRIA 19). There are no TMDLs completed in this area; accordingly, there is no WLA applicable to this NPDES Permit in WRIA 19. EPA also checked Ecology's website which mapped impaired waterbodies in Washington. Based on Ecology's mapping tool (https://fortress.wa.gov/ecy/wqamapviewer/default.aspx?res=1280x1024), EPA concluded that there is no 303(d) listing in Neah Bay where the facility is discharging.

IV. Effluent Limitations

A. Basis for Effluent Limitations

In general, the CWA requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits (TBELs) or water quality-based effluent limits (WQBELs). TBELs are set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the WQS applicable to a waterbody are being met and may be more stringent than TBELs. The basis for the effluent limits proposed in the draft permit is provided in Appendix B.

B. Proposed Effluent Limitations

The following summarizes the proposed effluent limits that are in the draft permit.

1. The permittee must not discharge floating, suspended, or submerged matter of any kind in concentrations causing nuisance or objectionable conditions or that may impair designated beneficial uses.
2. The pH range shall be between 6.0 to 9.0 standard units.

Numeric Limitations

Table 3 below presents the proposed effluent limits for BOD_5, TSS, and fecal coliform.

Table 3: Proposed Effluent Limits

Parameter	Units	Effluent Limits		
		Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
Five-Day Biochemical Oxygen Demand (BOD_5)	mg/l	30	45	
	lb/day	102.6	153.9	
BOD_5 Removal	percent	85 minimum		
Total Suspended Solids (TSS)	mg/l	30	45	
	lb/day	102.6	153.9	

Table 3: Proposed Effluent Limits				
Parameter	**Units**	**Effluent Limits**		
		Average Monthly Limit	**Average Weekly Limit**	**Maximum Daily Limit**
TSS Removal	percent	85 minimum		
Fecal coliform bacteria[2] (geometric mean)	#/100 ml	200[1]	400[1]	
Total Residual Chlorine	Mg/l	0.5	0.75	
	Lbs/day	1.71	2.56	

1. The permittee must report the geometric mean fecal coliform concentration. If any value used to calculate the geometric mean is less than 1, the permittee must round that value up to 1 for purposes of calculating the geometric mean.
2. The Department of Ecology (Ecology) provides directions to calculate the monthly and the weekly geometric mean in publication No. 04-10-020, Information Manual for Treatment Plant Operators available at: http://www.ecy.wa.gov/pubs/0410020.pdf

C. Changes in Effluent Limits From the Previous Permit

EPA did not propose changes to the effluent limitations in the draft permit from the last permit.

V. Monitoring Requirements

A. Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality.

The permit also requires the permittee to perform effluent monitoring required by the NPDES Form 2A application, so that these data will be available when the permittee applies for a renewal of its NPDES permit.

The permittee is responsible for conducting the monitoring and for reporting results on DMRs or on the application for renewal, as appropriate, to the EPA.

B. Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples must be used for averaging if they are conducted using the EPA-approved test methods (generally found in 40 CFR 136) or as specified in the permit.

Table 4, below, presents the proposed effluent monitoring requirements in the draft permit. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. The samples must be representative of the volume and nature of the

monitored discharge. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

Table 4: Effluent Monitoring Requirements

Parameter	Units	Sample Location	Sample Frequency	Sample Type
Flow	Mgd	Effluent	Continuous	recording
Temperature	ºC	Effluent	5/week	grab
BOD_5	mg/L	Influent & Effluent	1/week	24-hour composite
	lb/day	Influent & Effluent	1/week	calculation[1]
	% Removal	--	1/month	calculation[2]
TSS	mg/L	Influent & Effluent	1/week	24-hour composite
	lb/day	Influent & Effluent	1/week	calculation[1]
	% Removal	--	1/month	calculation[2]
Total Residual Chlorine	Mg/l	Effluent	5/week	Grab
	Lb/day	Effluent	1/month	Calculation[1]
pH	standard units	Effluent	5/week	grab
Fecal coliform bacteria	#/100 ml	Effluent	2/week	grab
Total Ammonia as N	mg/L	Effluent	1/quarter	24-hour composite
	lb/day	Effluent		calculation[1]
Alkalinity as $CaCO_3$	mg/l	Effluent	1/quarter	grab
NPDES Application Form 2A (Part B.6) Effluent Testing Data	mg/l	Effluent	3 times[3]	24-hour composite

Notes:
1. Loading is calculated by multiplying the concentration (in mg/l) by the flow (in mgd) on the day sampling occurred and a conversion factor of 8.34.
2. The monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month, i.e.:.
   (average monthly influent – average monthly effluent) ÷ average monthly influent.
   Influent and effluent samples must be taken over approximately the same time period.
3. In accordance with instructions in NPDES Application Form 2A, Part B.6, and where a minimum of one scan for each test to be conducted during years 2017, 2018, and 2019. Monitoring results shall be reported in the January DMR of the following year.

Monitoring Changes from the Previous Permit

EPA did not propose changes to the monitoring frequencies in the draft permit from the last permit.

C. Electronic Submission of Discharge Monitoring Reports

The draft permit includes new provisions to require the permittee to submit DMR data electronically using NetDMR. NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application. NetDMR allows participants to discontinue mailing in paper forms under 40 CFR § 122.41 and § 403.12. The permittee may use NetDMR after requesting and receiving permission from the EPA Region 10.

Under NetDMR, all reports required under the permit are submitted to the EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it is no longer required to submit paper copies of DMRs or other reports to the EPA.

EPA encourages permittees to sign up for NetDMR, and currently conducts free training on the use of NetDMR. Further information about NetDMR, is provided on the following website: https://netdmr.epa.gov/netdmr/public/home.htm

The draft permit requires that the permittee submit DMR data electronically using NetDMR by December 20, 2016 (for the November 2016 DMR). NetDMR is a national web-based tool that allows DMR data to be submitted electronically via a secure Internet application. NetDMR allows participants to discontinue mailing in paper forms under 40 CFR 122.41 and 403.12. Under NetDMR, all reports required under the permit are submitted to EPA as an electronic attachment to the DMR. Once a permittee begins submitting reports using NetDMR, it is no longer required to submit paper copies of DMRs or other reports to EPA.

VI. Sludge (Biosolids) Requirements

EPA Region 10 separates wastewater and sludge permitting. EPA has authority under the CWA to issue separate sludge-only permits for the purposes of regulating biosolids. The EPA may issue a sludge-only permit to each facility at a later date, as appropriate.

Until future issuance of a sludge-only permit, sludge management and disposal activities at each facility continue to be subject to the national sewage sludge standards at 40 CFR Part 503 and any requirements of the State's biosolids program. The Part 503 regulations are self-implementing, which means that facilities must comply with them whether or not a permit has been issued.

VII. Other Permit Conditions

A. Quality Assurance Plan

In order to ensure compliance with the federal regulation at 40 CFR 122.41(e) for proper operation and maintenance, the draft permit requires the permittee 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 develop or update the Quality Assurance Plan within 180 days of the effective date of the final permit. The Quality Assurance Plan must include standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan must be retained on site and be made available to EPA upon request.

B. Operation and Maintenance Plan

The draft permit requires the permittee to properly operate and maintain all facilities and systems of treatment and control. Proper operation and maintenance is essential to meeting discharge limits, monitoring requirements, and all other permit requirements at all times. The permittee is required to develop and implement an operation and maintenance plan for their facility within 180 days of the effective date of the final permit. The plan must be retained on site and made available to the EPA upon request.

C. Sanitary Sewer Overflows and Proper Operation and Maintenance of the Collection System

Untreated or partially treated discharges from separate sanitary sewer systems are referred to as sanitary sewer overflows (SSOs). SSOs may present serious risks of human exposure

when released to certain areas, such as streets, private property, basements, and receiving waters used for drinking water, fishing and shellfishing, or contact recreation. Untreated sewage contains pathogens and other pollutants, which are toxic. SSOs are not authorized under this permit. Pursuant to the NPDES regulations, discharges from separate sanitary sewer systems authorized by NPDES permits must meet effluent limitations that are based upon secondary treatment. Further, discharges must meet any more stringent effluent limitations that are established to meet the EPA-approved state WQS.

The permit contains language to address SSO reporting and public notice and operation and maintenance of the collection system. The permit requires that the permittee identify SSO occurrences and their causes. In addition, the permit establishes reporting, record keeping and third party notification of SSOs. Finally, the permit requires proper operation and maintenance of the collection system. The following specific permit conditions apply:

Immediate Reporting – The permittee is required to notify the EPA of an SSO within 24 hours of the time the permittee becomes aware of the overflow. (See 40 CFR 122.41(l)(6)).

Written Reports – The permittee is required to provide the EPA a written report within five days of the time it became aware of any overflow that is subject to the immediate reporting provision. (See 40 CFR 122.41(l)(6)(i)).

Third Party Notice – The permit requires that the permittee establish a process to notify specified third parties of SSOs that may endanger health due to a likelihood of human exposure; or unanticipated bypass and upset that exceeds any effluent limitation in the permit or that may endanger health due to a likelihood of human exposure. The permittee is required to develop, in consultation with appropriate authorities at the local, county, tribal and/or state level, a plan that describes how, under various overflow (and unanticipated bypass and upset) scenarios, the public, as well as other entities, would be notified of overflows that may endanger health. The plan should identify all overflows that would be reported and to whom, and the specific information that would be reported. The plan should include a description of lines of communication and the identities of responsible officials. (See 40 CFR 122.41(l)(6)).

Record Keeping – The permittee is required to keep records of SSOs. The permittee must retain the reports submitted to the EPA and other appropriate reports that could include work orders associated with investigation of system problems related to a SSO, that describes the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the SSO. (See 40 CFR 122.41(j)).

Proper Operation and Maintenance – The permit requires proper operation and maintenance of the collection system. (See 40 CFR 122.41(d) and (e)). SSOs may be indicative of improper operation and maintenance of the collection system. The permittee may consider the development and implementation of a capacity, management, operation and maintenance (CMOM) program.

The permittee may refer to the Guide for Evaluating Capacity, Management, Operation, and Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems (EPA 305-B-05-002). This guide identifies some of the criteria used by the EPA inspectors to evaluate a collection system's management, operation and maintenance program activities.

Owners/operators can review their own systems against the checklist (Chapter 3) to reduce the occurrence of sewer overflows and improve or maintain compliance.

D. Design Criteria

The permit includes design criteria requirements. This provision requires the permittee to compare influent flow and loading to the facility's design flow and loading and prepare a facility plan for maintaining compliance with NPDES permit effluent limits when the annual average flow or loading exceeds 85% of the design criteria values for three consecutive months.

E. Industrial Waste Management Requirements

EPA implements and enforces the National Pretreatment Program regulations of 40 CFR 403, per authority from sections 204(b)(1), 208(b)(2)(C)(iii), 301(b)(1)(A)(ii), 301(b)(2)(A)(ii), 301(h)(5) and 301(i)(2), 304(e) and (g), 307, 308, 309, 402(b), 405, and 501(a) of the Federal Water Pollutant Control Act as amended by the CWA of 1977. Because the Makah Nation does not have an approved pretreatment program per 40 CFR 403.10, EPA is the Approval Authority for the Makah Nation's POTW(s). In addition, because the Makah Nation does not have an approved POTW pretreatment program per 40 CFR 403.8, the EPA is also the Control Authority of industrial users that might introduce pollutants into the MWWTP.

Per 40 CFR 122.44(j)(1), all POTWs need to identify, in terms of character and volume of pollutants, any significant industrial users (SIUs) discharging into the POTW. This condition is included as Special Condition C.1 of the draft permit with a due date 90 days following the effective date of the POTW permit.

Since the Makah Nation does not have an approved pretreatment program, Special Condition C.2 of the permit reminds the Makah Nation that it cannot authorize discharges which may violate the national specific prohibitions of the General Pretreatment Program, which are applicable to all industrial users introducing pollutants into a publicly owned treatment works (40 CFR 403.5(b)).

Consequently, Special Condition C.6 requires the Permittee to develop legal authority enforceable in Federal, State or local courts which authorizes or enables the POTW to apply and to enforce the requirement of sections 307 (b) and (c) and 402(b)(8) of the Clean Water Act, as described in 40 CFR 403.8(f)(1). The draft legal authority shall be submitted to EPA for review and comment, and then shall be adopted and enforced by the POTW.

F. Standard Permit Provisions

Sections III, IV and V of the draft permit contain standard regulatory language that must be included in all NPDES permits. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

VIII. Other Legal Requirements

A. Endangered Species Act

The Endangered Species Act requires federal agencies to consult with National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. A review of the threatened and endangered species located in the Makah Nation finds that there is NO EFFECT caused by the discharge from the MWWTP (see Appendix E).

B. Essential Fish Habitat

Essential fish habitat (EFH) is the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires the EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect EFH (i.e., reduce quality and/or quantity of EFH). A review of the Essential Fish Habitat documents shows that there is no effect to essential fish habitat.

The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

For the same reasons as listed for endangered species the EPA has determined that issuance of this permit would have no effect to EFH in the vicinity of the discharge. The EPA has provided NOAA Fisheries with copies of the draft permit and fact sheet during the public notice period. Any comments received from NOAA Fisheries regarding EFH will be considered prior to issuance of this permit.

C. State Certification

Section 401 of the CWA requires EPA to seek State certification before issuing a final permit. As a result of the certification, the State may require more stringent permit conditions or additional monitoring requirements to ensure that the permit complies with WQS, or treatment standards established pursuant to any State law or regulation. On March 9, 2016, Ecology indicated to EPA that Ecology has reviewed the draft Permit and draft Fact Sheet and concurs with the terms and conditions. Ecology will provide certification that the permit meets Washington WQS prior to final issuance.

D. Permit Expiration

The permit will expire five years from the effective date.

IX. References

EPA. 1991. *Technical Support Document for Water Quality-based Toxics Control.* US Environmental Protection Agency, Office of Water, EPA/505/2-90-001.

Water Pollution Control Federation. Subcommittee on Chlorination of Wastewater. *Chlorination of Wastewater.* Water Pollution Control Federation. Washington, D.C. 1976.

EPA. 2010. *NPDES Permit Writers' Manual.* Environmental Protection Agency, Office of Wastewater Management, EPA-833-K-10-001.

Appendix A: Facility Information

General Information	
NPDES ID Number:	WA0023213
Physical Address:	2250 Cape Flattery Road, Neah Bay, WA 98357
Mailing Address:	P.O. Box 115, Neah Bay, WA 98357
Facility Background:	Wastewater Treatment Plant located on the Makah Reservation.
Facility Information	
Type of Facility:	Wastewater Treatment Plant
Treatment Train:	Secondary Treatment
Flow:	Designed Flow Rate: 0.41 mgd
Probable Outfall Location:	Latitude 48º 22' 58.2" N; Longitude 124º 37' 10.5" W
Receiving Water Information	
Receiving Water:	Strait of Juan de Fuca

Figure A1: Area Map of Makah WWTP

Based on diagrams and maps provided by the facility, EPA created this map to show the locations of the MWWTP and the probable location of the submerged marine outfall. The coordinates of the marine outfall are:

48° 22' 58.2" N, and 124° 37' 10.5" W

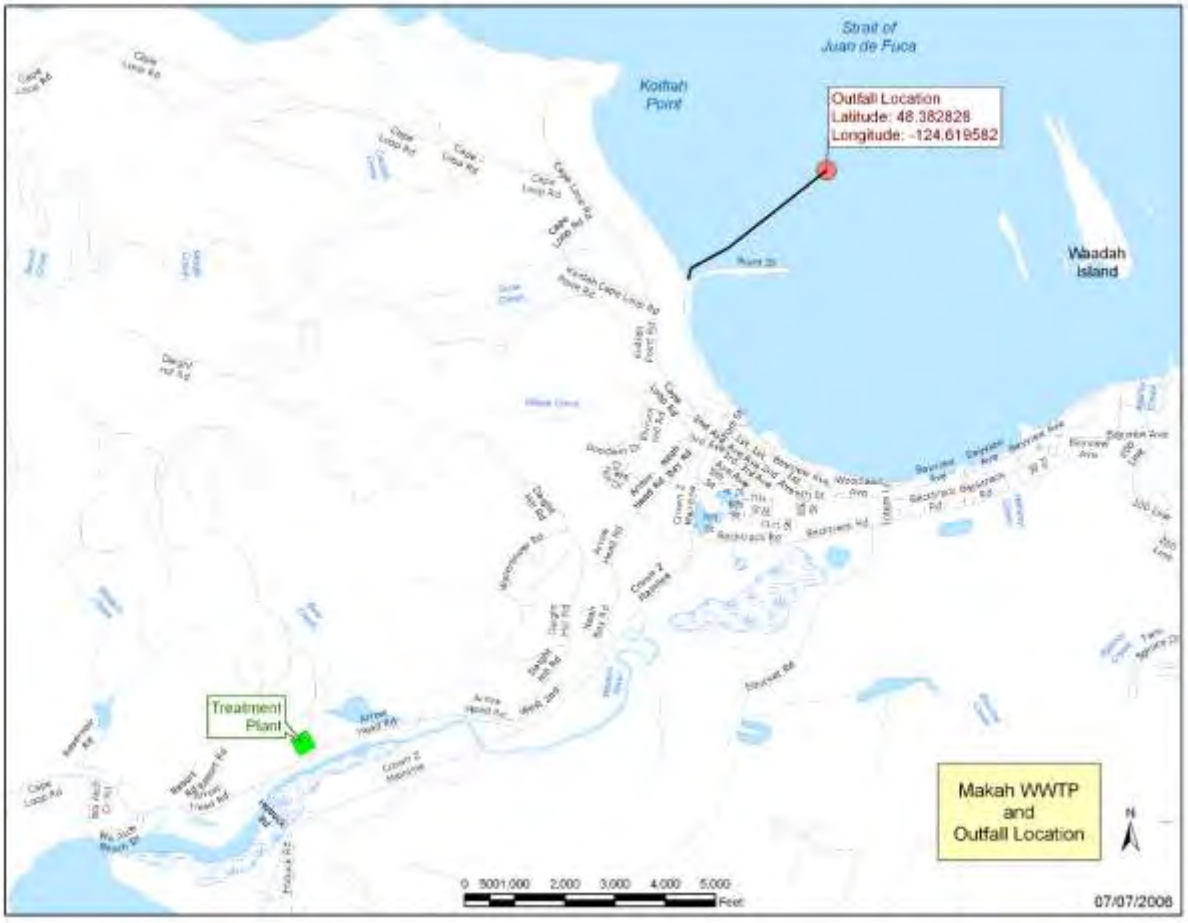
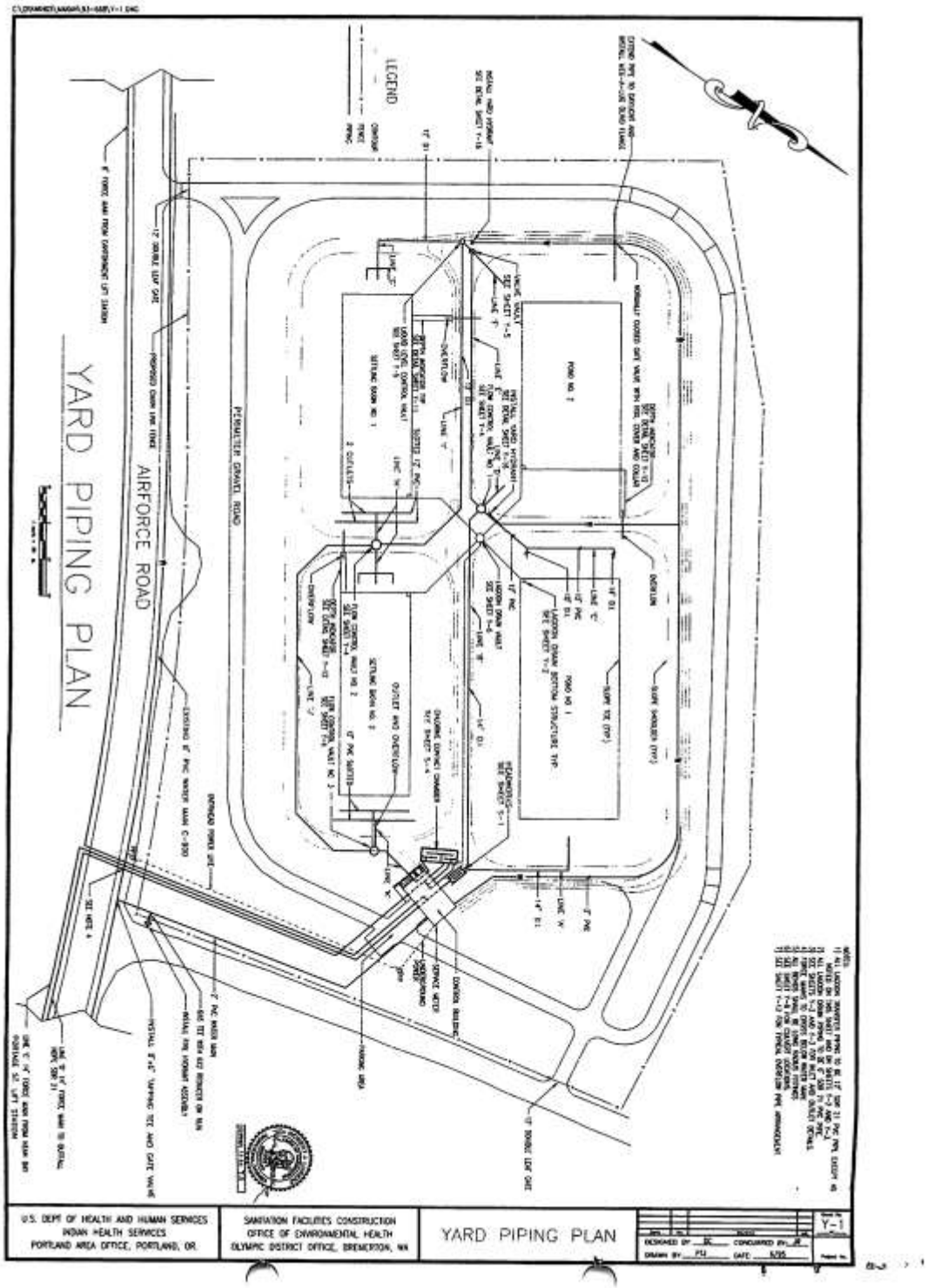


Figure A2: Yard Piping Plan Diagram



Appendix B: Water Quality Criteria Summary

This appendix provides a summary of water quality criteria applicable to the MWWTP.

Washington State's WQS include criteria necessary to protect designated beneficial uses. The standards are divided into three sections: General Water Quality Criteria, Surface Water Quality Criteria for Use Designations, and Site-Specific Surface Water Quality Criteria. The EPA has determined that the criteria listed below are applicable to the Strait of Juan de Fuca. This determination was based on (1) the applicable beneficial uses (2) the type of facility, (3) a review of the application materials submitted by the permittee, and (4) the quality of the receiving water. EPA is applying Washington State's WQS for specific marine waters with Extraordinary Primary Contact Recreation criteria.

A. Applicable Specific Water Quality Criteria

For the Makah WWTP, the discharge characteristics require the following water quality criteria that are necessary for the protection of the beneficial uses of the receiving waters at Neah Bay.

1. Bacteria criteria for Primary Contact Recreation use – "*Fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 ml, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 ml.*"

2. Marine Water Quality Standards

   Marine Water Quality Standards at WAC 173-201A-210 would apply.

Parameter	Marine Standard
Fecal Coliform bacteria	Shellfish harvesting: WAC 173-201A-210(2)(b) - To protect shellfish harvesting, fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 ml, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 ml. Primary Contact Recreation: WAC 173-201A-210(3)(b) – Fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100ml, with not more than 10 percent of all samples (or any single sample when less than ten samples points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100ml.
Temperature	WAC 173-201A-210(1)(c) - 13°C (55.4°F) Highest 1-DMax (1-day maximum). The 1-DMax temperature is the highest water temperature reached on any given day. This measure can be obtained using calibrated maximum/minimum thermometers or

	continuous monitoring probes having sampling intervals of thirty minutes or less.
	WAC 173-201A-210(1)(c)(i) -When the background temperature is warmer than 13°C then the facility may not cause the 7-DAD Max temperature of the receiving water to increase more than 0.3°C (0.54°F). The 7-DAD Max temperature is the arithmetic average of seven consecutive measures of daily maximum temperatures. The 7-DADMax for any individual day is calculated by averaging that day's daily maximum temperature with the daily maximum temperatures of the three days prior and the three days after that date.
Ammonia	WAC 173-201A-240(3)
Acute	233 µg/l (A 1-hour average concentration not to be exceeded more than once every three years on the average.)
Chronic	35 µg/l (A 4-day average concentration not to be exceeded more than once every three years on the average.)
Total Residual Chlorine	WAC 173-201A-240(3)
Acute (µg/l)	13.0 µg/l (A 1-hour average concentration not to be exceeded more than once every three years on the average.)
Chronic (µg/l)	7.5 µg/l (A 4-day average concentration not to be exceeded more than once every three years on the average.)
pH	For Extraordinary quality criteria (aquatic life) pH Criteria in Marine Water must be within the range of 7.0 to 8.5 standard units with a human-caused variation within the above range of less than 0.2 units.
Dissolved Oxygen	For Extraordinary quality criteria (aquatic life) Dissolved Oxygen Criteria in Marine Water is 7.0 mg/l, at the lowest 1-day minimum.
Turbidity criteria	For Extraordinary quality criteria (aquatic life) turbidity, Turbidity must not exceed: • 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU

B. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

The CWA requires POTWs to meet requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," which all POTWs were required to meet by July 1, 1977. EPA has

developed and promulgated "secondary treatment" effluent limitations, which are found in 40 CFR 133.102. These TBELs 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_5, TSS, and pH. The federally promulgated secondary treatment effluent limits are listed in Table C-1.

Table C-1: Secondary Treatment Effluent Limits
(40 CFR 133.102)

Parameter	Average Monthly Limit	Average Weekly Limit	Range
BOD_5	30 mg/L	45 mg/L	---
TSS	30 mg/L	45 mg/L	---
Removal Rates for BOD_5 and TSS	85% (minimum)	---	---
pH	---	---	6.0 – 9.0 s.u.

Chlorine

Chlorine is often used to disinfect municipal wastewater prior to discharge. The MWWTP uses chlorine disinfection.

A 0.5 mg/L average monthly limit for chlorine 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. Therefore, a wastewater treatment plant that provides adequate chlorine contact time can meet a 0.5 mg/L total residual chlorine limit on a monthly average basis. In addition to average monthly limits (AMLs), NPDES regulations require effluent limits for POTWs to be expressed as average weekly limits (AWLs) unless impracticable. The AWL is calculated to be 1.5 times the AML, consistent with the "secondary treatment" limits for BOD_5 and TSS. This results in an AWL for chlorine of 0.75 mg/L.

Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass based limits of the proposed NPDES Permit are expressed in pounds per day and are calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/l) × design flow (mgd) × 8.34[1]

Mass based limits for BOD_5 and TSS (lb/day), AML = 30 x 0.41 x 8.34 = 102.58

Mass based limits for BOD_5 and TSS (lb/day), AWL = 45 x 0.41 x 8.34 = 153.87

[1] 8.34 is a conversion factor with units (lb ×L)/(mg × gallon×10^6)

Mass based limits for chlorine (lb/day), AML = 0.5 x 0.41 x 8.34 = 1.71

Mass based limits for chlorine (lb/day), AWL = 0.75 x 0.41 x 8.34 = 2.56

C. Water Quality-based Effluent Limits

Statutory and Regulatory Basis

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet WQS by July 1, 1977. Discharges to State or Tribal waters must also comply with limitations imposed by the State or Tribe as part of its certification of NPDES permits under section 401 of the CWA. Federal regulations at 40 CFR 122.4(d) prohibit the issuance of an NPDES permit that does not ensure compliance with the WQS of all affected States. The NPDES regulation (40 CFR 122.44(d)(1)) implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State or Tribal WQS, including narrative criteria for water quality.

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

Reasonable Potential Analysis

When evaluating the effluent to determine if WQBLs are needed, based on numeric criteria, EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern. EPA uses the concentration of the pollutant in the effluent and receiving water and, if appropriate, the dilution available from the receiving water, to project the receiving water concentration. If the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific chemical, then the discharge has the reasonable potential to cause or contribute to an exceedance of the applicable Water Quality Standards (WQS), and a WQBEL is required. Based on the Reasonable Potential analysis on site-specific factors, WQBELs are not necessary in this case.

Sometimes it is appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will increase the mass loadings of the pollutant to the water body and will decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and when the receiving water meets the criteria necessary to protect the designated uses of the water body. Mixing zones must be authorized by Washington State Department of Ecology (Ecology). Based on the previous permit and the draft certification, the WQBELs in this permit have been calculated using a mixing zone. If Ecology does not grant a mixing zone, the WQBELs will be recalculated such that the criteria are met before the effluent is discharged to the receiving water.

Procedure for Deriving Water Quality-based Effluent Limits

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

In cases where a mixing zone is not authorized, either because the receiving water already exceeds the criterion, the receiving water flow is too low to provide dilution, or the State does not authorize one, the criterion becomes the WLA. Establishing the criterion as the wasteload allocation ensures that the permittee will not cause or contribute to an exceedance of the criterion. The following discussion details the specific WQBELs in the draft permit with the expectation that Ecology would certify the final permit.

D. Facility-Specific Water Quality-based Limits

pH

The Washington water quality criterion for Extraordinary quality marine water specifies a pH range of 7.0 to 8.5 standard units, with human-caused variation within the above range of less than 0.2 units (WAC 173-201A-210(1)(f)). In the previous permit, the technology based limit allowed the range of pH from 6.0 to 9.0; in the permit application, the facility reported its Maximum Daily Value for pH as 6.4 (minimum) and 9.2 (maximum). Since EPA does not expect the relatively small volume of effluent to change the pH of marine waters in the Strait of Juan de Fuca with very large dilution (1676:1, chronic dilution factor), and the previous permit limit was 6.0 to 9.0; therefore, the draft permit requires that the effluent have a pH of no less than 6.0 and no greater than 9.0 standard units. In addition, analyses also show that the technology based limit is protective of Washington's WQS, and the effluent would not change background pH levels of the receiving water.

Calculation of pH of a Mixture in Marine Water

Based on the CO2SYS program (Lewis and Wallace, 1998), http://cdiac.esd.ornl.gov/oceans/co2rprt.html

INPUT	
1. MIXING ZONE BOUNDARY CHARACTERISTICS	
Dilution factor at mixing zone boundary	1676.0
Depth at plume trapping level (m)	13.700
2. BACKGROUND RECEIVING WATER CHARACTERISTICS	
Temperature (deg C):	9.75
pH:	7.90
Salinity (psu):	30.20
Total alkalinity (meq/L)	2.32
3. EFFLUENT CHARACTERISTICS	
Temperature (deg C):	26.30
pH:	9.20
Salinity (psu)	12.00
Total alkalinity (meq/L):	1.78
4. CLICK THE 'Calculate" BUTTON TO UPDATE OUTPUT RESULTS -->	Calculat
OUTPUT	
CONDITIONS AT THE MIXING ZONE BOUNDARY	
Temperature (deg C):	9.76
Salinity (psu)	30.19
Density (kg/m^3)	1023
Alkalinity (mmol/kg-SW):	2.26
Total Inorganic Carbon (mmol/kg-SW):	2
pH at Mixing Zone Boundary:	**7.90**

Note: Using Washington State Department of Ecology Spreadsheet.

Alkalinity

Alkalinity is a parameter used for modeling pH of the receiving water (see Table C2). The receiving water alkalinity value used is from an EPA publication (EPA, "Voluntary Estuary Monitoring Manual", March 2006, Chapter 11, page 11-6) which stated that the average alkalinity of seawater is 116 mg/l. This value is equivalent to 2.32 meg/l used in the calculation above. The effluent alkalinity value used in the calculation is the average value from alkalinity results reported by the facility (1.78 meg/l). Quarterly monitoring of alkalinity is also proposed in the draft permit for modeling purposes in the next permit cycle.

Ammonia

In WAC 173-201A-240(3), the Washington state water quality criteria for marine waters require that ammonia be less than 0.233 mg/l as a 1-hour average concentration for acute criteria, not to be exceeded more than once every three years on the average; ammonia is further limited to no more than 0.035 mg/l as a 4-day average concentration for chronic criteria, not to be exceeded more than once every three years on average. DMRs submitted by the facility during the last permit cycle indicated that it had 6 ammonia monitoring results. The highest of these ammonia results was 24.1 mg/l (August, 2015). Based on the high dilution rates as provided by the Visual Plumes model, EPA believes it is not necessary to propose effluent limits for ammonia under the present circumstances. However, EPA believes that the facility should monitor ammonia on a quarterly basis to generate sufficient data for the evaluation in the next permit cycle.

Temperature

In WAC 173-201A-230(1)(c), the Washington water quality criteria limit the ambient water temperature to 13.0ºC (1-day Maximum) for Extraordinary Quality marine water; when natural conditions exceed 13.0 ºC, no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3º C. The ambient temperature of water in the Juan de Fuca is highest at the surface of approximately 10º C, and is less than 1 degree cooler at depths below 100 m. Compared with WQS for temperature, the ambient (background) temperature of the receiving water is significantly cooler than Washington's water quality criteria for temperature. Due to the vast amount of water in the Strait of Juan de Fuca compared to the relative small volume of effluent (design flow rate of 0.41 mgd of the WWTP, and high dilution ratios), no significant increase in temperature of the receiving water body is expected from outfall effluent; therefore, no temperature limits have been proposed in the draft permit. Temperature as a parameter is proposed to be monitored in the draft permit for comparison with past effluent, for monitoring plant operations, for calculation of the ammonia criteria, and to obtain data for future effluent modeling purposes.

Fecal Coliform

In WAC 173-201A-030(1)(c)(i)(B), the Washington water quality criteria for Extraordinary quality marine water requires that the fecal coliform levels shall both not exceed a geometric mean of 14 colonies/100ml and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 43 colonies/100ml. These criteria are to be met at the edges of the mixing zone. The facility reported in its DMRs that its effluent had a maximum monthly discharge of 164 colonies/100ml in December 2013, and had a maximum weekly discharge of 290 colonies/100ml in August 2014. These Facility reported results are within the permitted limits. EPA's Visual Plumes model show that the dilution ratio for the

acute mixing zone is 427:1, and the dilution ratio for the chronic mixing zone is 1676:1. Due to the high dilution rates, specifically when the permitted monthly average is divided by the acute dilution factor, the result is 0.5 colonies/100ml, which is much less than the WQS for protection of Shellfish Harvesting of 14 colonies/100 ml. Therefore, EPA believes that the effluent limitations in the previous permit are protective of designated beneficial uses of Shellfish Harvesting and for Primary Contact Recreation. Therefore, EPA believes that the fecal coliform limits should be retained: 200 count/100 ml for monthly average, and 400 count/100ml for weekly average. The proposed limit is a TBEL in Chapter 173-221 WAC.

Chlorine (Total Residual)

In WAC 173-201A-240(3), the Washington water quality criteria for marine water limit total residual chlorine at 13 µg/l as a 1-hour average concentration for acute criteria, not to be exceeded more than once every three years on the average; it is further limited to 7.5 µg/l as a 4-day average concentration for chronic criteria, not to be exceeded more than once every three years on an average. The Washington water quality criteria has to be met at the edge of the mixing zone. The facility reported in its DMRs that effluent testing showed that its maximum weekly average discharge for chlorine is 1.03 mg/l (May, 2015). Reasonable potential calculations show that there is no reasonable potential for chlorine criteria to be exceeded, therefore no WQBELs are proposed.

However, as discussed in the previous section, 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 0.5 mg/l chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment plant that provides adequate chlorine contact time can meet a 0.5 mg/l total residual chlorine limit on a monthly average basis. In addition to average monthly limits (AMLs), NPDES regulations require effluent limits for POTWs to be expressed as average weekly limits (AWLs) unless impracticable. The AWL is calculated to be 1.5 times the AML, consistent with the "secondary treatment" limits for BOD_5 and TSS. This results in an AWL for chlorine of 0.75 mg/l. These limits above, are the TBELs for Total Residual Chlorine.

Based on the Reasonable Potential analysis, there is no reasonable potential to exceed Washington WQS based on both the facility's effluent data, and the TBEL. Therefore, the TBELs are appropriate, and are retained in the draft permit.

Appendix C: Reasonable Potential Calculations

EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) to determine reasonable potential.

To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, EPA compares the maximum projected receiving water concentration to the criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a WQBEL must be included in the permit. This section discusses how the maximum projected receiving water concentration is determined.

Before a reasonable potential calculation is completed, it is essential to model the effluent in the receiving water. The following Visual Plumes Modeling was used to determine the dilution factors in the Acute and Chronic mixing zone during the last permit cycle. Since there has not been any changes to the operation of the facility, this modeling is still valid, and as shown below.

A. Visual Plumes Modeling

In consideration that the MWWTP has a marine outfall, EPA modeled the dilution at the edge of the acute and chronic mixing zones using site-specific conditions. The following dilution ratios were determined from the model:

Dilution at the Acute Mixing Zone: 426 : 1

Dilution at the Chronic Mixing Zone: 1676 : 1

The Visual Plumes model factored the site-specific conditions:

- Depth to top of diffuser: 42.5 feet (bottom of diffuser is at 45 feet).
- Geometry of diffuser: 4 ports; 6-inch diameter each, at 40-foot spacing.
- Washington State WQS for Acute and Chronic mixing zones: Acute Mixing Zone of 24.5 feet; Chronic Mixing Zone of 245 feet.
- The model applied the Brooks Method calculation, Constant Eddy Diffusivity, and Farfield dispersion methodologies.

The output from the Visual Plumes model is illustrated in the table below. The modeled dilution ratios are high-lighted and illustrated in bolded for ease of recognition:

Table D1: Output from Visual Plumes Model for the Makah WWTP

```
/ Windows UM3. 7/13/2006 4:50:16 PM
Case 1; ambient file F:\KSHUM\Makah.plumes.001.db; Diffuser table record 1: ---------------------------------
      Depth    Amb-cur    Amb-dir    Amb-sal    Amb-tem    Amb-pol      Decay    Far-spd    Far-dir    Disprsn
          m        m/s        deg        psu          C      kg/kg        s-1        m/s        deg   m0.67/s2
        0.0        0.1        0.0       30.2       9.75        0.0        0.0        0.1        0.0    0.00003
        8.0        0.1        0.0       30.2        9.6        0.0        0.0        0.1        0.0    0.00003
       18.0        0.1        0.0       30.3        9.6        0.0        0.0        0.1        0.0    0.00003
       40.0        0.1        0.0      30.35        9.6        0.0        0.0        0.1        0.0    0.00003
   P-dia  P-elev V-angle H-angle   Ports Spacing AcuteMZ ChrncMZ P-depth Ttl-flo Eff-sal    Temp Polutnt
    (in)    (in)   (deg)   (deg)      ()    (ft)    (ft)    (ft)    (ft)   (MGD)   (psu)     (C) (kg/kg)
     6.0    30.0     0.0   38.22     4.0    40.0    24.5   245.0    42.5    0.41     0.0    24.3   100.0
Froude number:      1.246
        Depth  Amb-cur    P-dia  Polutnt   Dilutn   x-posn   y-posn
Step     (ft)   (cm/s)     (in)  (kg/kg)       ()     (ft)     (ft)
   0     42.5     10.0      6.0    100.0      1.0      0.0      0.0;
 100     41.79    10.0    15.55    20.88    4.693    1.053    0.504;
 200     38.75    10.0    47.59    2.882    33.84    4.322    0.842;
 300     31.57    10.0    140.0    0.398    245.0    16.55    1.025; axial vel  0.0102
 328     28.23    10.0    187.5    0.228    426.6    24.52    1.061; acute zone,
 397     15.51    10.0    380.6   0.0583   1672.6    70.34    1.136; surface, merging,
Plumes not merged, Brooks method may be overly conservative.
Const Eddy Diffusivity.  Farfield dispersion based on wastefield width of      38.40 m
    conc  dilutn   width distnce    time
 (kg/kg)            (m)      (m)     (hrs) (kg/kg)    (s-1)   (cm/s)(m0.67/s2)
 5.80E-2  1680.4   38.45    25.0 0.00988     0.0      0.0    10.0 3.00E-5
 5.81E-2  1677.4   38.75    50.0  0.0793     0.0      0.0    10.0 3.00E-5
 5.82E-2  1676.0   39.05    75.0   0.149     0.0      0.0    10.0 3.00E-5 Chronic Zone
count: 3
 ;
4:50:16 PM. amb fills: 2
```

B. Mixing Zones and Dilution

A mixing zone is an area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient water body. A mixing zone is an allocated impact zone where the WQS may be exceeded as long as acutely toxic conditions are prevented. The federal regulations at 40 CFR 131.13 states that "States may, at their discretion, include in their State standards, policies generally affecting their application and implementation, such as mixing zones, low flows and variances."

In addition to the "Extraordinary" marine water designation for WQS, the receiving water body is considered "estuarine" for purposes of determining the size of a mixing zone. This position is supported by Washington State regulations, WAC 173-201A-400(7)(b)(ii), which states that: "All waters existing within bays from Point Wilson westward to Cape Flattery …… shall also be categorized as estuarine." The outfall of the MWWTP is located in Neah Bay, which is between Point Wilson and Cape Flattery; therefore the receiving water is considered "estuarine".

Pertaining to the estuarine designation, in WAC 173-201A-400(7)(b)(i), the mixing zone shall, "Not extend in any horizontal direction from the discharge port(s) for a distance greater than two hundred feet plus the depth of water over the discharge port(s) as measured during mean lower low water".

WAC 173-201A-400(8)(b) states that in estuarine waters, a zone where acute criteria may be exceeded shall not extend beyond ten percent of the distance established in subsection (7)(b) of this section as measured independently from the discharge port(s).

Construction diagrams obtained from the facility indicate that the MLLW level at the discharge port is 45 feet. Therefore, it is determined that the size of the mixing zone is 245 feet (Chronic criteria). Pertaining to WAC 173-201A-400(8)(b), for the acute criteria, the size of the mixing zone is 10%, which calculates to 24.5 feet. EPA used these site specific parameters to determine dilution ratios, and reasonable potential calculations as shown. Compliance with WQS pertaining to Washington's Mixing Zone Policy is required for discharge into the Strait of Juan de Fuca, which are waters of Washington State.

Appendix D: Basis for Effluent Limits

The following discussion explains the derivation of TBELs and WQBELs in the draft permit. Part A discusses TBELs, Part B discusses WQBELs in general, Part C discusses anti-backsliding provisions, Part D discusses the effluent limits imposed due to the State's anti-degradation policy, and Part E presents a summary of the facility specific limits.

A. Technology-Based Effluent Limits

Federal Secondary Treatment Effluent Limits

The CWA requires POTWs to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," which all POTWs were required to meet by July 1, 1977. The EPA has developed and promulgated "secondary treatment" effluent limitations, which are found in 40 CFR 133.102. These TBELs 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_5, TSS, and pH. The federally promulgated secondary treatment effluent limits are listed in Table D-1.

Table D-1: Secondary Treatment Effluent Limits (40 CFR 133.102)

Parameter	30-day average	7-day average
BOD_5	30 mg/L	45 mg/L
TSS	30 mg/L	45 mg/L
Removal for BOD_5 and TSS (concentration)	85% (minimum)	---
pH	within the limits of 6.0 - 9.0 s.u.	

Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass based limits are expressed in pounds per day and are calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34[2]

Since the design flow for this facility is 0.41 mgd, the technology based mass limits for BOD_5 and TSS are calculated as follows:

Average Monthly Limit = 30 mg/L × 0.41 mgd × 8.34 = 102.6 lbs/day

Average Weekly Limit = 45 mg/L × 0.41 mgd × 8.34 = 153.9 lbs/day

[2] 8.34 is a conversion factor with units (lb ×L)/(mg × gallon×10^6)

C. Water Quality-based Effluent Limits

Statutory and Regulatory Basis

The MWWTP discharges to Washington State waters. Accordingly, this discharge is subject to Washington State WQS.

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet WQS. Discharges to State waters must also comply with limitations imposed by the State as part of its certification of NPDES permits under section 401 of the CWA. Federal regulations at 40 CFR 122.4(d) prohibit the issuance of an NPDES permit that does not ensure compliance with the WQS of all affected States.

The NPDES regulation (40 CFR 122.44(d)(1)) implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State WQS, including narrative criteria for water quality, and that the level of water quality to be achieved by limits on point sources is derived from and complies with all applicable WQS.

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

Reasonable Potential Analysis

Reasonable Potential Analysis is used to evaluate if the effluent can cause, or contribute to an excursion above any State water quality criterion. The EPA projects the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern. The EPA uses the concentration of the pollutant in the effluent and receiving water and, if appropriate, the dilution available from the receiving water, to project the receiving water concentration. If the projected concentration of the pollutant in the receiving water exceeds the numeric criterion for that specific pollutant, then the discharge has the reasonable potential to cause or contribute to an excursion above the applicable WQS, and a WQBEL is required.

Sometimes it may be appropriate to allow a small area of the receiving water to provide dilution of the effluent. These areas are called mixing zones. Mixing zone allowances will increase the mass loadings of the pollutant to the water body and will decrease treatment requirements. Mixing zones can be used only when there is adequate receiving water flow volume and the concentration of the pollutant in the receiving water is less than the criterion necessary to protect the designated uses of the water body. Mixing zones must be authorized by the State.

Reasonable Potential Analysis for Ammonia

Based on site-specific factors concerning this discharge, Total Ammonia and Total Residual Chlorine would be the only parameters necessary for conducting a reasonable potential analysis. Details of the reasonable potential analysis are shown in Appendix E. The analysis showed no reasonable potential to violate Washington's WQS.

Calculation of Ammonia Criteria

Ammonia's toxicity depends on that portion which is available in the unionized form. Therefore, based on Washington Ecology's WQS for Surface Waters, Chapter 173-201A WAC, amended May 9, 2011, ammonia criteria is calculated using Ecology's spreadsheet as shown below.

Using Ecology's spreadsheet, the ammonia criteria is as follows. The following printout from Ecology's spreadsheet calculated the acute and chronic ammonia criteria using the methodology of Washington State WQS:

Acute Criteria = 15.64 mg/l

Chronic Criteria = 2.35 mg/l

Marine Un-ionized Ammonia Criteria Calculation

Calculation of seawater fraction of un-ionized ammonia from Hampson (1977). Un-ionized ammonia criteria for salt water are from EPA 440/5-88-004. Revised 19-Oct-93.

INPUT	
1. Receiving Water Temperature, deg C (90th percentile):	9.8
2. Receiving Water pH, (90th percentile):	7.9
3. Receiving Water Salinity, g/kg (10th percentile):	30.2
4. Pressure, atm (EPA criteria assumes 1 atm):	1.0
5. Unionized ammonia criteria (mg un-ionized NH_3 per liter) from EPA 440/5-88-004:	
Acute:	0.233
Chronic:	0.035
OUTPUT	
Using mixed temp and pH at mixing zone boundaries?	No
1. Molal Ionic Strength (not valid if >0.85):	0.621
2. pKa8 at 25 deg C (Whitfield model "B"):	9.317
3. Percent of Total Ammonia Present as Unionized:	1.2%
4. Total Ammonia Criteria (mg/L as NH_3):	
Acute:	19.01
Chronic:	2.86
RESULTS	
Total Ammonia Criteria (mg/L as N)	
Acute:	**15.64**
Chronic:	**2.35**

EPA used these calculated ammonia acute and chronic criteria to determine if there is reasonable potential to exceed Washington WQS, as shown in Appendix E.

Facility Specific Water Quality Based Effluent Limits

(a) Toxic Substances

This application will not be screened against the toxic substances found in the National Toxics Rule since the Makah WWTP will not be required to submit Expanded Effluent Testing Data or Toxicity Testing Data as the treatment plant design flow is less than 1.0 MGD.

(b) Metals

The Makah WWTP accepts wastewater from residential and from small businesses in Neah Bay. It is not expected that the effluent would contain metals in amounts that would impact aquatic life given the high levels of dilution at a marine outfall. Accordingly, there are no specific effluent limits for metals in the proposed permit.

(c) Fecal Coliform Bacteria

The WQS apply pertaining to Fecal coliform bacteria is for the beneficial uses of Shellfish Harvesting, and Primary Contact Recreation.

WAC 173.201A.210: For Shellfish harvesting: To protect shellfish harvesting, fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100 ml, and not have more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100 ml.

WAC 173-201A-210(3)(b) – Primary Contact Recreation: Fecal coliform organism levels must not exceed a geometric mean value of 14 colonies/100ml, with not more than 10 percent of all samples (or any single sample when less than ten samples points exist) obtained for calculating the geometric mean value exceeding 43 colonies/100ml.

Due to huge dilution available in the receiving water of Strait of Juan de Fuca, EPA determined that the existing permit limits are sufficiently protective. Accordingly, EPA is proposing the same effluent limit of: 200 colonies/100 ml as the Average Monthly Limit; and, 400 colonies/ 100 ml as the Average Weekly Limit. EPA is requiring the permittee perform monitoring at the same frequency of 2 times per week as the previous permit cycle.

(d) Total Residual Chlorine (TRC)

The MWWTP uses chlorine for disinfection; therefore, total residual chlorine is a pollutant of concern. EPA performed a reasonable potential calculation at the previous TBEL of 0.5 mg/l, which has shown not to have reasonable potential.

EPA also performed a reasonable potential calculation based on monitoring results from the previous permit cycle. EPA also determined that is no reasonable potential to exceed WQS based on results from the facility's DMRs.

Accordingly, EPA is proposing to retain the same TBEL for Total Residual Chlorine: 0.5 mg/l – Average Monthly Limit; and 0.75 mg/l – Average Weekly Limit.

(e) pH

Federal Secondary Treatment Standards require that discharges must be within the range of 6.0 to 9.0 Standard Units (SU). Washington's WQS require that for the Extraordinary quality criteria, the Aquatic Life pH Criteria in Marine water (WAC 173-201A-210(1)(f)) must be in the range of 7.0 to 8.5 with a human-caused variation of less than 0.2 units.

The dilution factor for the Acute Criteria is 426; and, the dilution factor for the Chronic Criteria is 1,676. Because there is massive dilution in the receiving water, EPA determined that Washington WQS will be attained if the existing effluent limits for pH are retained.

Minimum and maximum pH values have been included in the draft permit in the range of 6.0 and 9.0 standard units.

(f) Dissolved Oxygen

BOD discharged into the marine waters from the MWWTP is not expected to have an appreciable effect on the dissolved oxygen concentration in the Strait of Juan de Fuca. The discharge is also close to the Pacific Ocean. If the point of maximum oxygen depletion occurs miles from the source, the dilution factor will be far greater than the chronic dilution factor of 1,676 in the Pacific Ocean. The proposed effluent limitation for BOD are not only required Federal Secondary Treatment Standards, but would also control the discharge of oxygen demanding constituents into the Strait of Juan de Fuca. Therefore no dissolved oxygen effluent limits are proposed.

(g) Ammonia

Ammonia's toxicity depends on that portion which is available in the unionized form. The amount of unionized ammonia depends on the temperature, pH, and salinity of the receiving marine water. To evaluate ammonia toxicity, EPA used available receiving water information and Ecology spreadsheet tools. As discussed above, a reasonable potential analysis was conducted which showed that there is no reasonable potential to exceed Washington WQS for ammonia. Accordingly, EPA is not proposing effluent limits for total ammonia. EPA is requiring monitoring of total ammonia in the effluent. EPA will use the monitoring results to conduct a reasonable potential analysis for ammonia in the next permit cycle and determine if effluent limits for ammonia are warranted.

(h) Temperature

The applicable temperature standards criteria found in:

- WAC 173.201A.210(1)(c) requires a temperature of no more than 13°C (55.4°F) Highest 1-DMax (1-day maximum).
- WAC 173-201A-210(1)(c)(i) requires that when the background temperature is warmer than 13°C then the facility may not cause the 7-DAD Max temperature of the receiving water to increase more than 0.3°C (0.54°F).

Based on DMRs from the last permit cycle, the 95th percentile effluent temperature is 26.2ºC as measured at the WWTP. The dilution factor for the Acute Criteria is 426; and, the dilution factor for the Chronic Criteria is 1,676. The ambient temperature of sea-water in Strait of Juan de Fuca at a depth of 45 feet is estimated at 9.6 ºC (Reference: "Water Properties in the Strait of Georgia

and Juan de Fuca", Davenne and Masson, August 2001 (http://www.pac.dfo-mpo.gc.ca/science/oceans/cotesud-southcoast/JdFG_e.pdf)). The outfall pipe is also equipped with a 120-foot, multiport diffuser which enables rapid mixing with marine water. The outfall pipe is 3,580 feet from shore and is surrounded by the marine environment during that 3,580 foot distance which also enables temperature dissipation. Therefore rapid temperature dissipation of the effluent is expected even before the effluent reaches the diffuser, which then allows for additional temperature dissipation when the effluent is in direct contact with marine water. Because there is substantial heat dissipation into the surrounding media, rapid mixing and massive dilution in the receiving water that has a substantially (~3°C) lower ambient temperature than the WQS. Accordingly, EPA determined that Washington WQS for temperature will be attained within the chronic mixing zone, and no temperature limits are necessary.

D. Anti-backsliding Provisions

The proposed permit is a permit reissuance of an existing source, anti-backsliding requirements apply. The following paragraphs explains how this proposed permit issuance would also meet anti-backsliding provisions. In essence, all effluent limits in the existing permit are unchanged, where no effluent limit in the draft permit is less stringent than the existing permit.

Section 402(o) of the Clean Water Act and federal regulations at 40 CFR §122.44 (l) generally prohibit the renewal, reissuance or modification of an existing NPDES permit that contains effluent limits, permit conditions or standards that are less stringent than those established in the previous permit (i.e., anti-backsliding) but provides limited exceptions. Section 402(o)(1) of the CWA states that a permit may not be reissued with less-stringent limits established based on Sections 301(b)(1)(C), 303(d) or 303(e) (i.e. WQBELs or limits established in accordance with State treatment standards) except in compliance with Section 303(d)(4). Section 402(o)(1) also prohibits backsliding on TBELS established using best professional judgment (i.e. based on Section 402(a)(1)(B)), but in this case, the effluent limits being revised are WQBELs.

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 water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. Additionally, Section 402(o)(2) contains exceptions to the general prohibition on backsliding in 402(o)(1). According to the EPA NPDES Permit Writers' Manual (EPA-833-K-10-001) the 402(o)(2) exceptions are applicable to WQBELs (except for 402(o)(2)(B)(ii) and 402(o)(2)(D)) and are independent of the requirements of 303(d)(4). Therefore, WQBELs may be relaxed as long as either the 402(o)(2) exceptions or the requirements of 303(d)(4) are satisfied.

Even if the requirements of Sections 303(d)(4) or 402(o)(2) are satisfied, Section 402(o)(3) prohibits backsliding which would result in violations of WQS or effluent limit guidelines.

The proposed permit would not result in violations of the WQS or effluent guidelines, therefore, the proposed permit complies with Section 402(o)(3).

The Makah WWTP had previously been permitted, pursuant to Section 122.29(a)(3), the WWTP is an existing source rather than a new source or a new discharger.

All proposed effluent limitations are exactly the same as permitted in the previous permit. In conclusion, based on the factors above, for the proposed action, anti-backsliding requirements are met.

E. Antidegradation

The EPA is required under Section 301(b)(1)(C) of the Clean Water Act (CWA) and implementing regulations (40 CFR 122.4(d) and 122.44(d)) to establish conditions in NPDES permits that ensure protection of the downstream State WQS, including antidegradation requirements. EPA has prepared an antidegradation analysis consistent with Ecology's antidegradation implementation procedures. EPA referred to Washington's antidegradation policy (WAC 173-201A-300) and Ecology's 2011 Supplemental Guidance on Implementing Tier II Antidegradation (http://www.ecy.wa.gov/biblio/1110073.html)

The purpose of Washington's Antidegradation Policy is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three tiers of protection (described below) for surface waters of the state.
    - Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollution as described in WAC 173-201A-310.
    - Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to new or expanded actions described in WAC 173-201A-320(2).
    - Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution. Tier III is described in WAC 173-201A-330.

The receiving water from the outfall is the Strait of Juan de Fuca and the anti-degradation analysis was completed for this receiving water body. Accordingly, EPA will use the designated criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses because the facility is unchanged from the previous permit, and all the beneficial uses are intact.

In consideration of the anti-degradation analysis in the Strait of Juan de Fuca, the facility is considered an existing facility because the last permit is administratively extended, and there has not been any changes in the process of the facility, and there is no change in the design flow. Therefore, EPA concludes that the discharge does not trigger the need for any further anti-degradation analysis beyond Tier I Protection.

Tier I Protection – Protection and maintenance of existing and designated uses
According to Washington's antidegradation policy, WAC 172-210A-310, a facility must first meet Tier I requirements. Existing and designated uses must be maintained and protected. No degradation may be allowed that would interfere with, or become injurious to, existing or designated uses, except as provided for in WAC 173-201A-612. The marine waters of Strait of Juan de Fuca at the point of discharge has the following designated beneficial uses:

Aquatic Life Uses: Extraordinary;
Shellfish Harvesting;
Recreational Uses: Primary Contact
Misc. Uses: Wildlife Habitat; Harvesting; Commerce/Navigation; Boating; and Aesthetics.

The effluent limits in the draft permit ensure compliance with applicable numeric and narrative water quality criteria. The numeric and narrative water quality criteria are set at levels that ensure protection of the designated uses. As there is no information indicating the presence of existing beneficial uses other than those that are designated, the draft permit ensures a level of water quality necessary to protect the designated uses and, in compliance with WAC 173-201A-310 and 40 CFR 131.12(a)(1), also ensures that the level of water quality necessary to protect existing uses is maintained and protected.

If EPA receives information during the public comment period demonstrating that there are existing uses for which the Strait of Juan de Fuca is not designated, EPA will consider this information before issuing a final permit and will establish additional or more stringent permit conditions if necessary to ensure protection of existing uses.

Tier II Protection – Protection of waters of higher quality than the standards
EPA determined that analysis for a Tier II Protection is not necessary because the facility is not a new or expanded action that has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.

According to WAC 173-210A-320(2), a facility must prepare a Tier II analysis when the facility is planning a new or expanded action that has the potential to cause measurable degradation to the physical, chemical, or biological quality of the water body. A Tier II analysis consists of an evaluation of whether or not the proposed degradation of water quality that would be associated with a new or expanded action would be both necessary and in the overriding public interest. A Tier II analysis focuses on evaluating feasible alternatives that would eliminate or significantly reduce the level of degradation. The analysis also includes a review of the benefits and costs associated with the lowering of water quality. New discharges and facility expansions are prohibited from lowering water quality without providing overriding public benefits.

The effluent from the Makah WWTP is not considered a new discharge and therefore is not considered a new or expanded source of pollution. Accordingly, EPA determined that a Tier II antidegradation analysis would not be necessary.

Tier III Protection – Protection of Outstanding Resource Waters

EPA determined that a Tier III antidegradation analysis is not necessary because the receiving water does not meet the conditions as an Outstanding Resource Waters pertaining to WAC 173-201A-330(1).

F. Facility Specific Limits

Table D-2 summarizes the numeric effluent limits that are in the proposed permit. The final limits are the more stringent of technology treatment requirements, or limits retained as the result of anti-backsliding analysis or to meet the State's anti-degradation policy.

Table D-2: Proposed Effluent Limits

Parameter	Units	Effluent Limits		Basis for Effluent Limits
		Average Monthly Limit	Average Weekly Limit	
Five-Day Biochemical Oxygen Demand (BOD_5)	mg/L	30	45	Federal Secondary Treatment Standards
	lb/day	102.6	153.9	
BOD_5 Removal	percent	85 minimum		
Total Suspended Solids (TSS)	mg/L	30	45	Federal Secondary Treatment Standards
	lb/day	102.6	153.9	
TSS Removal	percent	85 minimum		
Fecal coliform bacteria	Colonies per #/100 ml	200 (geometric mean)	400 (geometric mean)	Washington State WQS
pH	s.u.	6.0 – 9.0		Washington State WQS and Federal Secondary Treatment Standards
Total Residual Chlorine	Mg/l	0.5	0.75	TBELs
	Lb/day	1.71	2.56	

Appendix E: Reasonable Potential and WQBEL Calculations

Part A of this appendix explains the process the EPA used to determine if the discharge authorized in the draft permit has the reasonable potential to cause or contribute to a violation of Idaho's federally approved WQS. Part B demonstrates how the WQBELs in the draft permit were calculated.

A. Reasonable Potential Analysis

The EPA uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, the EPA compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a WQBEL must be included in the permit. In this case, EPA completed reasonable potential analysis for both Ammonia and Total Residual Chlorine. EPA determined that neither Ammonia nor Total Residual Chlorine would exceed Washington WQS based on reasonable potential analysis. The analysis incorporated Ecology's mixing zone policy, as discussed in Appendix C, and, authorization of the mixing zone is subject to Ecology's approval.

Maximum Projected Effluent Concentration

When determining the projected receiving water concentration downstream of the effluent discharge, the EPA's Technical Support Document for Water Quality-based Toxics Controls (TSD, 1991) recommends using the maximum projected effluent concentration (Ce) in the mass balance calculation (see equation 3, page C-5). To determine the maximum projected effluent concentration (Ce) the EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV for each pollutant parameter has been calculated, the reasonable potential multiplier (RPM) used to derive the maximum projected effluent concentration (Ce) can be calculated using the following equations:

First, the percentile represented by the highest reported concentration is calculated.

$p_n = (1 - \text{confidence level})^{1/n}$

where,

p_n = the percentile represented by the highest reported concentration
n = the number of samples
confidence level = 99% = 0.99

and

$$RPM = \frac{C_{99}}{C_{P_n}} = \frac{e^{Z_{99} \times \sigma - 0.5 \times \sigma^2}}{e^{Z_{P_n} \times \sigma - 0.5 \times \sigma^2}}$$

Where,

σ^2 = $\ln(CV^2 + 1)$
Z_{99} = 2.326 (z-score for the 99th percentile)
Z_{Pn} = z-score for the P_n percentile (inverse of the normal cumulative distribution function at a given percentile)
CV = coefficient of variation (standard deviation ÷ mean)

The maximum projected effluent concentration is determined by simply multiplying the maximum reported effluent concentration by the RPM:

$$C_e = (RPM)(MRC)$$

where MRC = Maximum Reported Concentration

Maximum Projected Effluent Concentration at the Edge of the Mixing Zone

Once the maximum projected effluent concentration is calculated, the maximum projected effluent concentration at the edge of the acute and chronic mixing zones is calculated using the mass balance equations presented previously.

Reasonable Potential

The discharge has reasonable potential to cause or contribute to an exceedance of water quality criteria if the maximum projected concentration of the pollutant at the edge of the mixing zone exceeds the most stringent criterion for that pollutant.

For this permit, Ammonia and Total Residual Chlorine are the only parameters of concern applicable for a reasonable potential analysis because these two parameters are present in the waste stream, and have WQ-based standards. Using a spreadsheet shown below, EPA analyzed if reasonable potential existed to exceed Washington State WQS for Ammonia and Total Residual Chlorine.

For ammonia, EPA assumed the 90th percentile concentration of the ambient receiving water (Strait of Juan de Fuca) as 27 ug/l. This is consistent with the background concentration that Ecology had used in its 2014 NPDES Permit for the Sekiu Wastewater Treatment Plant which also discharges to the Strait of Juan de Fuca.

For Total Residual Chlorine, EPA determined that there are no significant sources of Total Residual Chlorine in the marine waters of the Strait of Juan de Fuca, accordingly, the background concentration of Total Residual Chlorine is assumed to be zero.

Results of the reasonable potential analyses for the two parameters, Ammonia, and Total Residual Chlorine are shown below.

Reasonable Potential Analysis (RPA) and Water Quality Effluent Limit (WQBEL) Calculations

Reasonable Potential Calculation

Facility	Makah WWTP
Water Body Type	Marine

Dilution Factors:	Acute	Chronic
Aquatic Life	426.6	1676.0
Human Health Carcinogenic		1676.0
Human Health Non-Carcinogenic		1676.0

Pollutant, CAS No. & NPDES Application Ref. No.			AMMONIA, Criteria as Total NH3	CHLORINE (Total Residual) 7782505	CHLORINE (Total Residual) 7782505
Effluent Data	# of Samples (n)		6	45	20
	Coeff of Variation (Cv)		0.6	0.58	0.6
	Effluent Concentration, ug/L (Max. or 95th Percentile)		24,100	1030	500
	Calculated 50th percentile Effluent Conc. (when n>10)				
Receiving Water Data	90th Percentile Conc., ug/L		27	0	0
	Geo Mean, ug/L				
Water Quality Criteria	Aquatic Life Criteria, ug/L	Acute	15,639	13	13
		Chronic	2,349	7.5	7.5
	WQ Criteria for Protection of Human Health, ug/L		-	-	-
	Metal Criteria Translator, decimal	Acute	-	-	-
		Chronic	-	-	-
	Carcinogen?		N	N	N

Aquatic Life Reasonable Potential

Effluent percentile value		0.990	0.990	0.990
s	$s^2=\ln(CV^2+1)$	0.555	0.538	0.555
Pn	$Pn=(1\text{-confidence level})^{1/n}$	0.464	0.903	0.794
Multiplier		3.82	1.00	2.30
Max concentration (ug/L) at edge of…	Acute	243	2.414	2.700
	Chronic	82	0.615	0.687
Reasonable Potential? Limit Required?		**NO**	**NO**	**NO**

Summary of Reasonable Potential Analyses

Total Ammonia

EPA is not proposing effluent limits for Total Ammonia. However, EPA is requiring continued monitoring for Total Ammonia so that an evaluation can be done if an ammonia limit is necessary for the next permit cycle. Total Ammonia is a parameter used to evaluate the operation of the treatment system.

Total Residual Chlorine

EPA is proposing that existing effluent limits for Total Residual Chlorine be retained. EPA determined that there is no reasonable potential to exceed Washington WQS for Total Residual Chlorine discharged from the facility. In addition, there is also no reasonable potential to exceed Washington WQS if the effluent is discharged at the TBELs of 0.5 mg/l. Therefore, the TBELs (Average Monthly limit, 0.5 mg/l; and, Average Weekly Limit, 0.75 mg/l) are appropriate, and is proposed to be retained for the next permit cycle.

Appendix F: Endangered Species Act and Essential Fish Habitat

A. Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to evaluate potential effects an action may have on listed endangered species. EPA determined that the issuance of the permit will have no effect on listed endangered species based on the nature of the discharge and the listed species.

EPA used the U.S Fish and Wildlife Service's Information, Planning and Conservation System (IPAC) online search database (https://ecos.fws.gov/ipac/) to determine the service's species list where the WWTP is located.

The report identified 7 species that could be of concern. The breakdown of all the 7 listed species that are either threatened, endangered or critical habitat are: 4 bird species; 2 fish species; and 1 critical habitat. Because the outfall is located under 45 feet of marine water, EPA determined that birds could not be affected by discharge, and is therefore not further analyzed for the purposes of this permit action. Accordingly, EPA determined that the issuance of the draft permit would have no effect on the listed bird species because they are terrestrial species and could not be affected by the proposed discharge. Of these species identified by USFWS, there are only 2 fish species (Bull Trout, and Dolly Varden) listed as threatened, and 1 species (Killer Whale) that have listed Critical Habitat.

EPA considered the effluent from the MWWTP for possible impacts to the two Threatened USFWS listed fish species: Bull Trout and the Dolly Varden in the Strait of Juan de Fuca. EPA also considered possible impacts to the Killer Whale that is listed by U.S. Fish and Wildlife and NOAA as Critical Habitat.

EPA concluded that there would be no effect on fish species in the Strait of Juan de Fuca because the discharge from the WWTP is extremely small compared with the volume of water in the Strait of Juan de Fuca. With a conservative mixing using Ecology's methodology the chronic dilution factor is 1,676 from the long, multi-port diffuser. Also using Ecology's conservative mixing policy, the acute dilution factor is 426. Considering that the effluent had already undergone secondary treatment, and disinfection prior to discharge, EPA concludes that the draft permit would have no effect on the USFWS listed species.

USFWS Fish Species:

1. Bull Trout (*Salvelinus confluentus*) – Threatened
2. Dolly Varden *(Salvelinus malma)* – Proposed Similarity of Appearance (Threatened)

USFWS Critical Habitat:

3. Killer Whale (*Orcinus orca*) - Final designated

EPA checked with NOAA Fisheries website concerning the Status of ESA Listings and Critical Habitat Designations for West Coast Salmon and Steelhead. The following website does not list the potentially affected area. Therefore this draft permit has no effect on West Coast Salmon and Steelhead.
http://www.westcoast.fisheries.noaa.gov/publications/protected_species/salmon_steelhead/status_of_esa_salmon_listings_and_ch_designations_map.pdf

EPA also checked with NOAA Fisheries website (http://www.westcoast.fisheries.noaa.gov/maps_data/endangered_species_act_critical_habitat.html) concerning other species that potentially could be affected by the draft permit. The species lists available are: ESA-Listed Marine Mammals; ESA-Listed Other Marine Fishes; and, ESA-Listed Marine Turtles. EPA located 2 species that may be impacted. These species are as follows:

NOAA Fisheries Designated Critical Habitat:

1. Southern Resident Killer Whale (*Orcinus orca*)
2. Green Sturgeon *(Acipenser medirostris)*

There are large dilution factors caused by massive amounts of water in the Strait of Juan de Fuca relative to the small volume of discharge from the Makah WWTP. EPA also considered that the MWWTP has secondary treatment, with disinfection, EPA determined that there is no effect to the Southern Resident Killer Whale or the Green Sturgeon.

In conclusion, the proposed draft permit has no effect on all species pursuant to Section 7 of the Endangered Species Act.

The following are descriptions of all the listed species that EPA had considered pursuant to Section 7 of the Endangered Species Act.

Coastal Bull Trout and Dolly Varden Trout

Status

The Dolly Varden trout has similarity of appearance with the Bull Trout. The coastal/Puget Sound (PS) bull trout distinct population segment (DPS) encompasses all Pacific coast drainages within Washington, including Puget Sound and Olympic Peninsula (50 FR Part 17). The Bull Trout ESU has been designated as threatened on June 10, 1998 (63 FR 31693).

Geographic Range and Spatial Distribution

The coastal/Puget Sound bull trout DPS encompasses all the Pacific coast drainages north of the Columbia River in Washington including those flowing into Puget Sound. This

population is comprised of 34 populations which are segregated from other subpopulations by the Pacific Ocean and the Cascade Mountains. Within this area, bull trout often occur with Dolly Varden. Because these species are virtually indistinguishable, USFWS currently manages them together as "native char". The Puget Sound DPS is significant because it is thought to contain the only anadromous forms of bull trout in the coterminous United States (64 FR 58910).

The coastal bull trout subpopulations occur in five river basins: Chehalis River, Grays Harbor, Coastal Plains, Quinault River, Queets River, Hoh River, and Quillayute River. While most of the northwest coast subpopulations occur within Olympic National Park with relatively undisturbed habitats, subpopulations in the southwestern coastal area are in relatively low abundance.

Critical Habitat

Critical habitat was designated for Puget Sound bull trout on September 26, 2005 (70 FR 56213). The critical habitat designation for Puget Sound bull trout includes a total of 388 miles of streams in the Olympic Peninsula and 646 miles of streams in Puget Sound as well as 419 shoreline miles in the Olympic Peninsula marine areas and 566 shoreline miles in the Puget Sound marine areas.

Historical Information

Historical reports for the Puget Sound bull trout population demonstrate that bull trout were once more abundant and widely distributed throughout Puget Sound and the Olympic Peninsula (Suckley and Cooper 1860, Norgore and Anderson 1921, King County Department of Natural Resources 2000). Bull trout are now rarely observed in the Nisqually River and Chehalis River systems, which may have supported spawning populations in the past (USFWS 2002c, 2004). In the Puyallup River system the amphidromous life history forms currently exist in low numbers, as does the migratory form in the South Fork Skokomish River (USFWS 2002c, 2004). Until the dams were removed, in the Elwha River and parts of the Nooksack River, amphidromous bull trout are unable to access historic spawning habitat resulting from manmade barriers (USFWS 2002c, 2004).

Historically, sport fishing regulations were liberal for bull trout. However, recent decline of fish abundance has led to more restrictive regulations (WDFW 2003).

Life History

Small bull trout eat terrestrial and aquatic insects but shift to preying on other fish as they grow larger. Large bull trout are primarily fish predators. Bull trout evolved with whitefish, sculpins and other trout and use all of them as food sources. Adult bull trout are usually small, but can grow to 36 inches in length and up to 32 pounds. Bull trout reach sexual maturity at between four and seven years of age and are known to live as long as 12 years. They spawn in the fall after temperatures drop below 9ºC, in streams

with abundant cold, unpolluted water, clean gravel and cobble substrate, and gentle stream slopes. Many spawning areas are associated with cold water springs or areas where stream flow is influenced by groundwater. Bull trout eggs require a long incubation period compared to other salmon and trout, hatching in late winter or early spring. Fry may remain in the stream gravels for up to three weeks before emerging (USFWS 2002a).

Bull trout may be either resident or migratory. Resident fish live their whole life near areas where they were spawned. Migratory fish are usually spawned in small headwater streams, and then migrate to larger streams, rivers, lakes, reservoirs or salt water where they grow to maturity. Smaller resident fish remain near the areas where they were spawned while larger, migratory, fish will move considerable distances to spawn when habitat conditions allow. For instance, bull trout in Montana's Flathead Lake have been known to migrate up to 250 km to spawn (USFWS 2002a).

Habitat and Hydrology

Bull trout are seldom found in waters where temperatures are warmer than 15°C to 18°C. Besides very cold water, bull trout require stable stream channels, clean spawning gravel, complex and diverse cover, and unblocked migration routes (USFWS 2002a).

Hatchery Influence

No information was found on the influence of hatcheries on bull trout.

Population Trends and Risks

The Coastal-Puget Sound bull trout are vulnerable to many of the same threats that have reduced bull trout in the Columbia River and Klamath River Basins including hybridization and competition with non-native brook trout, brown trout and lake trout, degradation of spawning and rearing habitat, and isolation of local populations due to dams and diversions (67 FR 71240). Due to their need for very cold waters and long incubation time, bull trout are more sensitive to increased water temperatures, poor water quality and degraded stream habitat than many other salmonids.

In many areas, continued survival of the species is threatened by a combination of factors rather than one major problem. For example, past and continuing land management activities have degraded stream habitat, especially along larger river systems and streams located in valley bottoms. Degraded conditions have severely reduced or eliminated migratory bull trout as water temperature, stream flow and other water quality parameters fall below the range of conditions which these fish can tolerate. In many watersheds, remaining bull trout are smaller, resident fish isolated in headwater streams. Brook trout, introduced throughout much of the range of bull trout, easily hybridize with them, producing sterile offspring. Brook trout also reproduce earlier and at a higher rate than bull trout so bull trout populations are often supplanted by these non-natives. Dams and other in-stream structures also affect bull trout by blocking migration routes, altering

water temperatures and killing fish as they pass through and over dams or are trapped in irrigation and other diversion structures (USFWS 2002a).

Critical Habitat for Killer Whale and Green Sturgeon.

Southern Resident Killer Whale

Status

The Southern Resident killer whale (Orcinus orca) has been designated as endangered throughout their entire range under the Endangered Species Act on November 18, 2005 (70 FR 69903).

Geographic Range and Spatial Distribution

Killer whales are the most widely distributed marine mammals. They are found in all parts of the ocean and in most seas from the Arctic to the Antarctic. In the North Pacific Ocean, killer whales are often sighted from the eastern Bering Sea to the Aleutian Islands; in the waters of southeastern Alaska and the intercoastal waterways of British Columbia and Washington State; along the coasts of Washington, Oregon and California; along the Russian coast in the Bering Sea and the Sea of Okhotsk; and on the eastern side of Sakhalin and the Kuril Islands and the Sea of Japan.

The Southern Resident killer whale population contains three pods – J pod, K pod and L pod. Their range during the spring, summer and fall includes the island waterways of Puget Sound, the Strait of Juan de Fuca, and Southern Georgia Strait. Their occurrence in the coastal waters off Oregon, Washington and Vancouver Island, and more recently off the coast of central California in the south and off Queen Charlotte Islands to the north has been documented. Little is known about the winter movements and range of the Southern Resident stock.

Critical Habitat

Critical habitat for the Southern Resident killer whale was designated on November 29, 2006. Approximately 2,560 square miles of marine habitat within the area occupied by Southern Resident killer whales in Washington was designated as critical habitat. Three areas are encompassed in the critical habitat and include 1) the summer core area of marine waters in Whatcom and San Juan counties and all marine waters in Skagit County west and north of Deception Pass Bridge; 2) the Puget Sound area and 3) the Strait of Juan de Fuca area.

Life History

Killer whales are the most widely distributed cetacean species in the world. Killer whales have a distinctive color pattern, with black dorsal and white ventral portions.

They also have a white patchabove and behind the eye and a gray or white saddle behind the dorsal fin. Adult male killer whales can reach up to 32 feet in length and can weigh nearly 22,000 lbs; females can reach 28 feet in length and can weigh up to 16,500 lbs.

Sexual maturity of female killer whales occurs when the whales reach approximately 15-18 feet in length, depending on the geographic location. The gestation period for killer whales varies from 15-18 months, and birth may occur in any month. Calves nurse for at least one year, and wean between one and two years of age. The birth rate for killer whales is estimated as every 5 years for an average period of 25 years. Life expectancy for wild female killer whales is approximately 50 years , but it is estimated they can live to 80-90 years. Male killer whales usually live for about 30 years, but it is estimated they can live up to 50-60 years.

The diet of killer whales can be specific to geography or population. In the eastern North Pacific, resident killer whale populations feed mainly on salmonids including Chinook and chum salmon, while transient whale populations feed more on marine mammals, including Dall's porpoises, Pacific white-sided dolphins, California and Steller sea lions, harbor seals, sea otters, and even large baleen whales.

Killer whales are highly social mammals and usually occur in pods, or groups of up to 40-50 animals. Single whales, usually adult males, may also occur in populations. Differences in spatial distribution, abundance, behavior, availability of food resources probably account for the variation in group size for whale populations. Like all cetaceans, killer whales depend heavily on underwater sound for orientation, feeding and communication. Killer whales of different populations demonstrate specific vocalization types.

Population Trends and Risks

There is litte historical information on the abundance of killer whales worldwide. It is thought that many populations have declined since 1800 due to diminished stocks of fish, whales, seals and sea lions in the ocean. During the past few decades, the use of photo-identification studies or line-transect counts have been used to survey killer whale populations. The Southern Resident killer whale population is currently estimated at about 88 whales, a decline from its estimated historical levels of about 200 in mid-to late 1800s. Beginning around 1967 and estimated 47 whales were removed using live-capture fishery for oceanarium display. The population fell approximately 30% to about 67 whales by 1971. By 2003, the population is estimated to have increased to 83 whales, still reduced from historical estimates.

Green Sturgeon *(Acipenser medirostris)*

The following information concerning the Green Sturgeon is from NOAA's website: http://www.fisheries.noaa.gov/pr/species/fish/green-sturgeon.html

Green Sturgeon are long-lived, slow-growing fish, and are the most marine-oriented of the sturgeon species. Mature males range from 4.5-6.5 feet (1.4-2 m) in **"fork length"** and do not mature until they are at least 15 years old (Van Eenennaam, 2002), while mature females range from 5-7 feet (1.6-2.2 m) fork length and do not mature until they are at least 17 years old. They can weigh up to 350 pounds (160 kg). Maximum ages of adult green sturgeon are likely to range from 60-70 years (Moyle, 2002).

Although they are members of the class of bony fishes, the skeleton of sturgeons is composed mostly of cartilage. Sturgeon don't have scales, but they have five rows of characteristic bony plates on their body called **"scutes"**. The backbone of the sturgeon curves upward into the caudal fin, forming their shark-like tail. On the ventral, or underside, of their flattened snouts are sensory barbels and a siphon-shaped, toothless mouth.

Green sturgeon are believed to spend the majority of their lives in nearshore oceanic waters, bays, and estuaries. Younger green sturgeon reside in fresh water, with adults returning to freshwater to spawn when they are about 15 years of age and more than 4 feet (1.3 m) in size. Spawning is believed to occur every 2-5 years (Moyle, 2002). Adults typically migrate into fresh water beginning in late February, and spawning occurs from March-July, with peak activity from April-June (Moyle et al., 1995). Females produce 60,000-140,000 eggs (Moyle et al., 1992). Juvenile green sturgeon spend a few years in fresh and estuarine waters before they leave for saltwater. They then disperse widely in the ocean.

The only feeding data we have on adult green sturgeon shows that they are eating **"benthic"** invertebrates including shrimp, mollusks, amphipods, and even small fish (Moyle et al., 1992).

Habitat

Green sturgeon utilize both freshwater and saltwater habitat. Green sturgeon spawn in deep pools or "holes" in large, turbulent, freshwater river mainstems (Moyle et al., 1992). Specific spawning habitat preferences are unclear, but eggs likely are broadcast over large cobble substrates, but range from clean sand to bedrock substrates as well (Moyle et al., 1995). It is likely that cold, clean water is important for proper embryonic development.

Adults live in oceanic waters, bays, and estuaries when not spawning. Green sturgeon are known to forage in estuaries and bays ranging from San Francisco Bay to British Columbia.

Critical Habitat
In October 2009, NMFS **designated critical habitat for the Southern DPS**.

Distribution

This species is found along the west coast of Mexico, the United States, and Canada. Green sturgeon are the most broadly distributed, wide-ranging, and most marine-oriented species of the sturgeon family. The green sturgeon ranges from Mexico to at least Alaska in marine waters, and is observed in bays and estuaries up and down the west coast of North America (Moyle et al., 1995).

The actual historical and current distribution of where this species spawns is unclear as green sturgeon make non-spawning movements into coastal lagoons and bays in the late summer to fall, and because their original spawning distribution may have been reduced due to harvest and other anthropogenic effects.

Green sturgeon are believed to spawn in the Rogue River, Klamath River Basin, and the Sacramento River. Spawning appears to rarely occur in the Umpqua River. Green sturgeon in the South Fork of the Trinity River were thought extirpated (Moyle, 2002), but juveniles captured at Willow Creek on the Trinity River (Scheiff et al., 2001) suggest that the fish could be coming from either the South Fork or the Trinity River (Adams et al., in press). Green sturgeon appear to occasionally occupy the Eel River.

Population Trends

No good data on current population sizes exists and data on population trends is lacking. Tagging experiments have been conducted irregularly since 1954, though regular tagging did not occur until 1990. Over 500 green sturgeon have been captured and over 200 have been tagged.

Threats

The principal factor in the decline of the Southern DPS is the reduction of the spawning area to a limited section of the Sacramento.

Other Factors include insufficient freshwater flow rates in spawning areas; contaminants (e.g., pesticides); bycatch of green sturgeon in fisheries; potential poaching (e.g., for caviar); entrainment by water projects; influence of exotic species; small population size; impassable barriers; and, elevated water temperatures.

Other threats to the Southern DPS include:

- insufficient freshwater flow rates in spawning areas,
- contaminants (e.g., pesticides)
- bycatch of green sturgeon in fisheries
- potential poaching (e.g., for caviar)
- entrainment by water projects
- influence of exotic species
- small population size
- impassable barriers
- elevated water temperatures

Analysis of Potential Impacts to Listed Species

In consideration of all factors pertaining to the listed species, it is predicted that there will be no impact to any of these species. The discharge does not contribute to the factors responsible for the decline of any of these species as described above. The characteristics of the discharge and permit conditions will not cause any harmful or beneficial effects. All these species are highly mobile. In addition, the discharge is from a minor facility, and the effluent is treated to Federal Secondary Treatment Standards, is disinfected, as well as meeting State WQS; therefore, no measurable impacts are predicted to listed species. **No effect** is predicted on the Bull Trout or the Dolly Varden trout, the Killer Whale, and the Green Sturgeon from the discharge.

Other considerations

Issuance of an NPDES permit for the Makah WWTP will not result in loss of habitat and will not result in habitat destruction. In addition, the Washington State WQS, and the Federal Secondary Treatment Standards for wastewater treatment plants have been used in permit evaluation, where the more stringent effluent limitations have been applied in the proposed permit. EPA also proposed that the facility conduct effluent monitoring.

EPA also considered the size of the facility for evaluation of potential impacts. The existing treatment plant has a design flow rate of 0.41 mgd. For purposes of comparison based on the design flow rate criteria, EPA generally considers wastewater treatment plants having 1.0 mgd or greater to be major facilities. This facility is obviously much smaller than having a designed flow rate of 1.0 mgd, and is not considered a major facility.

As shown above, the evaluation of each listed species has resulted in no measurable impact. In consideration of this conclusion, EPA has tentatively determined that issuance of the NPDES permit is protective and there is **no effect** on listed species in the vicinity of the discharge.

B. Essential Fish Habitat

Essential fish habitat (EFH) includes the waters and substrate (sediments, etc.) necessary for fish to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires EPA to consult with NOAA Fisheries when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. The EFH regulations define an adverse effect as any impact which reduces quality and/or quantity of EFH and may include direct (e.g. contamination or physical disruption), indirect (e.g. loss of prey, reduction in species' fecundity), site specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions. It is predicted that the MWWTP would not cause any of the above adverse effects to fish habitat.

As stated for the endangered species the circumstances discussed indicate that there is no measurable impact on essential habitat. Therefore EPA has determined that the issuance of this permit has **no effect** on EFH in the vicinity of discharge.

Appendix G: Clean Water Act Section 401 Pre-Certification

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

Mr. Michael J. Lidgard
US EPA Region 10
NPDES Permits Unit
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

Re: CWA § 401 Certification for Makah Wastewater Treatment Plant, NPDES Permit No.: WA0023213

Mr. Lidgard:

We have reviewed the draft NPDES permit that EPA has prepared for issuance to the Makah Tribal Council, for discharges from the Makah Wastewater Treatment Plant to the Strait of Juan de Fuca.

The Wastewater Treatment Plant (the facility) is located on the Makah Indian Reservation and is owned and operated by the Makah Tribe. The facility provides primary and secondary treatment, and disinfection. The design flow rate is 0.41 MGD; the average daily flow rate is 0.21 MGD. The facility serves approximately 2500 residents and several small businesses but does not accept any industrial wastes.

We understand from the current fact sheet and previous fact sheet that the treatment plant consists of an influent pump station and bar screen, four lagoons (operated in series), a chlorine contact chamber, effluent pump station, outfall and diffuser. The first lagoon is aerated and the second lagoon is partially aerated. The third and fourth lagoons are not aerated and are used for settling. There are six lift stations located outside the plant that services this system. The disinfected effluent is pumped from the fourth lagoon though the outfall and diffuser to the Strait of Juan de Fuca, approximately 3580 feet from shore at a depth of 45 feet.

The permit contains technology-based limits for 5-Day Biochemical Oxygen Demand (BOD_5); Total Suspended Solids (TSS); Fecal Coliform Bacteria; pH; and Residual Chorine. There are no water quality-based limits in the permit as there is no reasonable potential to violate water quality standards. The estimated dilution, as determined by Visual Plumes Modeling, at the edge of the acute mixing zone is 426: 1; and 1676:1 at the edge of the chronic mixing zone.

This letter is our certification that the discharge as permitted will comply with the Chapter 173-201A of the Washington Administrative Code (Water Quality Standards for Surface Waters). The standards include, by reference, the human heath-based criteria in the National Toxics Rule. As part of this certification, we authorize the mixing zone discussed in the Fact Sheet.

If you have any questions regarding this certification, please call Gregory Zentner, Supervisor, Municipal Operations Unit at (360) 407-6368.

Sincerely,

Richard Doenges
Southwest Region Manager
Water Quality Program