FACT SHEET FOR THE PUGET SOUND NUTRIENT DRAFT GENERAL PERMIT

A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM AND STATE WASTE DISCHARGE GENERAL PERMIT

ISSUANCE DATE: DECEMBER 1, 2021

EFFECTIVE DATE: JANUARY 1, 2022

DEPARTMENT OF ECOLOGY
State of Washington

SUMMARY

This fact sheet is a companion document to the draft National ***Pollutant Discharge Elimination System*** (NPDES) Permit for Discharges from municipal wastewater treatment plants in the ***Washington waters of the Salish Sea*** contributing to ***impairments*** within the ***greater Puget Sound region*** (Puget Sound Nutrient General Permit, or PSNGP). The ***permit*** authorizes the discharge of municipal wastewater containing ***total inorganic nitrogen***. Municipal wastewater refers to wastewater primarily from domestic (household) sources as well as commercial, industrial, and institutional sources that are treated at a ***publicly owned treatment works (POTW).*** The PSNGP limits the ***discharge*** of pollutants to ***surface waters*** under the authority of the Federal Water Pollution Control Act (U.S.C.S. 1251) and limits the discharge of ***pollutants*** to surface water under the authority of Chapter 90.48 RCW.

Washington State Department of Ecology (***Ecology***) announced a preliminary determination to develop a ***general permit*** for municipal wastewater containing total inorganic nitrogen on January 30, 2020. The United States Environmental Protection Agency (***EPA***) treats municipal wastewater discharged directly into the greater Puget Sound as a ***point source*** in ***40 Code of Federal Register (CFR)*** 122.2. Discharges from point sources require an NPDES permit. Ecology currently issues individual NPDES permits to municipal wastewater treatment plants. The PSNGP addresses the discharge of nutrient ***pollution*** from POTWs that hold an existing, individual NPDES permit.

The Washington State Department of Ecology is proposing to issue the PSNGP. This would be the first issuance of the PSNGP. This Fact Sheet explains the presence of nutrients in domestic sewage, Ecology's decisions on limiting total inorganic nitrogen in municipal wastewater, and the regulatory and technical basis for those decisions.

This Fact Sheet is a companion document to the draft permit that provides information to help interested parties better understand the technical issues associated with the permit. Ecology generally will not revise a fact sheet following public comment but will prepare a response to comments. This fact sheet does not contain any independently enforceable requirements. The PSNGP contains all of the requirements applicable to ***dischargers***. In case of any conflict between the fact sheet and the PSNGP, the terms of the PSNGP govern.

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INTRODUCTION

The Federal ***Clean Water Act*** (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established ***water quality*** goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System permit program (NPDES permits), which is administered by the U.S. Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of Chapter 90.48 of the Revised Code of Washington (RCW), which defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing general permits (Chapter 173-226 of the Washington Administrative Code [WAC]), water quality criteria for surface waters (Chapters 173-201A WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require a permit to be issued before discharge of wastewater to ***waters of the state*** is allowed. The regulations also establish the basis for effluent limitations and other requirements, which are to be included in the permit. One of the requirements (WAC 173-226-110) for issuing a general permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. The regulations also require public notice of the draft permit for at least 30 days before the permit is issued (WAC 173-226-130). The fact sheet and draft permit are available for review (see *Appendix A – Public Involvement* of the fact sheet for more detail on the Public Notice procedures).

After the public comment period has closed, Ecology will summarize the substantive comments and prepare a response to each comment. The summary and response to comments will become part of the file on the permit. Parties submitting comments will receive a copy of Ecology's response. Comments and the resulting changes to the permit will be summarized in an appendix to this fact sheet, *Appendix C – Response to Comments*.

BACKGROUND INFORMATION

HISTORY

Following extensive, scientific investigations regarding existing dissolved oxygen (DO) impairments from excess nutrient loading to Puget Sound, Ecology issued a public notice of a Preliminary Determination to develop a Puget Sound Nutrient General Permit (PSNGP) on August 21, 2019. During the 60 day period which closed October 21, 2019, Ecology received public comments on whether the Agency should move forward with the development of a general permit to control nutrient discharges from existing municipal wastewater treatment plants (WWTPs or POTWs) in ***Washington Waters of the Salish Sea*** that contribute to impairments within the greater Puget Sound region.

Ecology received 49 comment letters during the Preliminary Determination period. Overall, comments received in support of the PSNGP carried a message that WWTPs should implement nutrient controls in a timely fashion, regardless of permitting approach. While not all comments were favorable to the GP approach, a theme of conditional support of a collaborative effort to reduce nutrients emerged.

After carefully considering comments received, Ecology announced a preliminary determination to develop a general permit for municipal treatment plants discharging to Puget Sound at the ***Puget Sound Nutrient Forum (PSNF)*** on January 30, 2020. As part of that announcement, Ecology also led a stakeholder engagement exercise to receive input on the type of collaborative approach the agency should use to develop the permit. Ecology proposed using an Advisory Committee and solicited feedback on the composition and roles of that committee during the January 2020 PSNF. After receiving that feedback, Ecology released a follow up online nomination survey for volunteers willing to represent the different regional interests on the PSNGP's Advisory Committee (AC).

In March 2020, Ecology convened a 14 person permit Advisory Committee representing regional treatment plants, state agencies (including Ecology), the EPA and the environmental community. Ecology invited Tribal involvement in the advisory committee and left a seat at the table for a representative. However, the Tribes preferred to engage directly with the Governor's office and through staff level meetings held by the Northwest Indian Fisheries Commission's Coordinated Tribal Water Quality Program. Table 1, below, shows the original AC members selected to help advise Ecology on conceptual permitting concepts and conditions.

Table 1. Original PSNGP Advisory Committee Members

Name	Affiliation	Role	Geography
Mark Sadler	City of Everett, Public Works	Operations Superintendent	North Central

Name	Affiliation	Role	Geography
Joe Grogan	Town of Coupeville	Utility Superintendent	North Central
Dan Thompson	City of Tacoma	Division Manager	South Central
Rebecca Singer	King County DNRP, Wastewater Treatment Division	Resource Recovery Manager	South Central
Patrick Kongslie	Pierce County Planning and Public Works –Sewer Division/PNCWA Olympia Section	Sewer Division Maintenance and Operations Manager	South Central
Wendy Steffensen	LOTT Clean Water Alliance	Environmental Project Manager	South Sound
Pete Tjemsland	City of Sequim	Utilities Manager and Operator	Strait of Juan de Fuca
Jeff Clarke	Washington Association of Sewer and Water Districts	Past President	Puget Sound Wide
Bruce Wishart	Puget Soundkeeper	Policy Lead	Puget Sound Wide
Mindy Roberts	Washington Environmental Council	Puget Sound Program Director	Puget Sound Wide
Jenny Wu	EPA	Engineer, Permit Writer	Puget Sound Wide
Valerie Smith	Department of Commerce	Senior Planner	Puget Sound Wide
Chip Anderson	Lummi Tribal Water and Sewer District	District Manager	North Sound

Name	Affiliation	Role	Geography
Tribe - Unfilled			

Ecology hosted virtual AC meetings monthly from March 2020 through October 2020. Each meeting worked towards producing a Final Recommendations document that captured agreements and dissenting opinions on each of the conceptual approaches discussed. In addition to AC meetings, different caucuses formed to discuss the permit concepts during separate meetings. The four separate caucus groups included: one for environmental groups, state agencies, federal agencies and utilities. The utility caucus provided Ecology with an alternative permitting proposal that spanned several permit cycles. Ecology did not use this proposal in developing the draft permit but appreciates the effort utilities participating in that caucus made to get their opinions to the agency. The primary reason Ecology did not use this proposal stems from the Agency's immediate need to address nutrients in ***domestic wastewater*** discharges, starting with the first permit cycle.

On January 27, 2021, Ecology released the preliminary draft of the PSNGP to the public and started a 47-day informal comment period that ended on March 15, 2021. Ecology received sixty-seven individual comment letters on the preliminary draft in addition to multiple copies of identical form letters from various action networks. The comments illustrated the different perspectives of the commenters, which included individuals, organizations, Tribes, municipalities and other interested parties. Ecology carefully reviewed the comments and feedback from the public and made revisions to the permitting concepts released in the preliminary draft. The revisions constitute the formal draft of the PSNGP.

Ecology released the formal draft of the Puget Sound Nutrient General Permit, the accompanying fact sheet providing the statement of basis, and the ***Notice of Intent*** (application) on June 16, 2021. This release starts the formal comment period that ends on August 2, 2021. The comment period includes two virtual public hearings. Please see Appendix A – Public Involvement Information for more information about the public hearings. Ecology will consider the comments made on the formal draft before making a permit issuance decision on the first general permit in late summer or fall 2021. A formal response to comments will accompany the final permit.

GENERAL PERMIT APPROACH

A general permit to address multiple point source discharges from municipal wastewater treatment plants in a specific geographic area is an appropriate permitting approach for the following reasons:

- A general permit is an efficient method to establish the essential regulatory requirements appropriate for controlling total inorganic nitrogen in municipal wastewater.

- A general permit allows Ecology to handle permit applications within the state of Washington more efficiently.

- A general permit is consistent with EPA's four-tier permitting strategy, the purpose of which is to use the flexibility provided by the Clean Water Act in designing a workable and reasonable permitting system.

In addition, critical benefits to a general permit for municipal dischargers include an equitable roll out of nutrient controls in the region and a shared basis for working together to develop treatment solutions that may ultimately include a water quality trading framework. Implementing nutrient controls through existing, individual NPDES permits would stagger the rollout across the region placing dischargers on different timelines and delaying improvements in water quality.

A general permit is designed to provide coverage for a group of related facilities or operations of a specific industry type or group of industries. It is appropriate when the discharge characteristics are sufficiently similar, and a standard set of permit requirements can effectively provide environmental protection and comply with ***water quality standards*** for discharges. Ecology determined that discharge of total inorganic nitrogen from municipal WWTPs is best controlled by coverage under a General Permit with the Preliminary Determination. All ***marine point sources*** proposed for coverage under this General Permit are located in the same geographic region (i.e., Washington waters of the Salish Sea). Discharges from these plants are similar in nature as they are all generated by the treatment of municipal wastewater. Therefore, this general permit will appropriately implement a similar application of narrative effluent limits and monitoring requirements for this class of point sources. If Ecology determines that pollutants from a specific ***facility*** are not managed or controlled by the general permit to protect state water quality standards, then Ecology may elect to use the individual permit as the preferred regulatory mechanism.

WASTEWATER CHARACTERIZATION AND SUBJECT DISCHARGERS

This draft general permit proposes to cover municipal WWTPs that own and operate secondary and advanced secondary wastewater treatment facilities as described in their individual NPDES permits. Municipal sewage includes wastes generated by residential and commercial buildings, institutions and some industries within a municipality's sewer shed. It contains nutrients (nitrogen and phosphorus), suspended solids, and bacteria in addition to having an oxygen demand that varies depending on the strength of the wastewater. Domestic wastewater may also contain toxic pollutants due to pass through from household chemicals, industrial sources or individual use of pharmaceuticals and personal care products. If not properly treated, these pollutants can enter the ***receiving water*** causing impacts to water quality. This permit authorizes the discharge of treated municipal effluent containing total inorganic nitrogen. Existing individual NPDES permits held by all ***Permittees*** contain requirements to restrict other pollutants found in the wastewater effluent.

The draft general permit supersedes effluent requirements related to total inorganic nitrogen in the individual NPDES permits with the exception of ammonia effluent limitations developed for control of ammonia toxicity.

Dischargers that must apply for coverage under this draft general permit are listed in Table 2, below. Ecology has prioritized permit reissuance schedules in the Northwest and Southwest Regions working towards minimizing the current permit backlog. Updating individual NPDES permits for Permittees proposed for coverage under the PSNGP is a priority for the agency.

Table 2. Proposed PSNGP Permittees

Wastewater Treatment Plant	Individual NPDES Permit Number	Individual Permit Issuance Date
Alderwood STP	WA0020826	11/27/2018
Anacortes WWTP	WA0020257	11/9/2017
Bainbridge Island WWTP	WA0020907	6/29/2017
Birch Bay Sewage Treatment Plant (STP)	WA0029556	1/29/2021
Boston Harbor STP	WA0040291	12/15/2011
Bremerton WWTP	WA0029289	10/30/2018
Chambers Creek WWTP	WA0039624	5/1/2008
Clallam Bay WWTP	WA0024431	11/19/2018
Clallam Bay Corrections Center WWTP	WA0039845	1/25/2017
Coupeville STP	WA0029378	6/19/2019
Eastsound Orcas Village WWTP	WA0030911	12/11/2015
Eastsound Sewer and Water District WWTP	WA0030571	6/29/2016
Edmonds STP	WA0024058	10/24/2014

Wastewater Treatment Plant	Individual NPDES Permit Number	Individual Permit Issuance Date
Everett STP	WA0024490	9/30/2015
Fisherman Bay STP	WA0030589	2/1/2017
Friday Harbor STP	WA0023582	8/21/2017
Gig Harbor WWTP	WA0023957	3/13/2015
Hartstene Pointe STP	WA0038377	12/31/2017
King County Brightwater WWTP	WA0032247	2/26/2018
King County South WWTP	WA0029581	7/1/2015
King County Vashon WWTP	WA0022527	1/16/2017
King County West Point WWTP	WA0029181	12/19/2014
Kitsap County Central Kitsap WWTP	WA0030520	6/29/2017
Kitsap County Kingston WWTP	WA0032077	9/30/2015
Kitsap County Manchester WWTP	WA0023701	1/19/2018
Kitsap County Sewer District #7 Water Reclamation Facility (WRF)	WA0030317	6/24/2016
La Conner STP	WA0022446	2/19/2019
Lake Stevens Sewer District WWTP	WA0020893	10/6/2017
Lakota WWTP	WA0022624	9/17/2018
Langley STP	WA0020702	7/30/2014
Lighthouse Point WRF/Blaine STP	WA0022641	6/25/2019

Wastewater Treatment Plant	Individual NPDES Permit Number	Individual Permit Issuance Date
LOTT Budd Inlet WRF	WA0037061	2/16/2018
Lynnwood STP	WA0024031	2/8/2019
Marysville STP	WA0022497	11/1/2017
McNeil Island Special Commitment Center WWTP	WA0040002	7/1/2016
Midway Sewer District WWTP	WA0020958	11/4/2015
Miller Creek WWTP	WA0022764	10/1/2018
Mt Vernon WWTP	WA0024074	1/31/2017
Mukilteo Water and Wastewater District WWTP	WA0023396	10/31/2018
Oak Harbor STP	WA0020567	4/27/2018
Penn Cove WWTP	WA0029386	12/5/2014
Port Angeles WWTP	WA0023973	1/7/2016
Port Orchard WWTP (South Kitsap WRF)	WA0020346	11/11/2018
Port Townsend STP	WA0037052	11/13/2015
Post Point WWTP (Bellingham STP)	WA0023744	6/19/2014
Redondo WWTP	WA0023451	9/26/2018
Rustlewood WWTP	WA0038075	10/8/2014
Salmon Creek WWTP	WA0022772	6/1/2018
Sekiu WWTP	WA0024449	9/4/2014

Wastewater Treatment Plant	Individual NPDES Permit Number	Individual Permit Issuance Date
Sequim WRF	WA0022349	3/18/2014
Shelton WWTP	WA0023345	3/14/2008
Skagit County Sewer District 2 Big Lake WWTP	WA0030597	1/29/2021
Snohomish WWTP	WA0029548	5/21/2018
Stanwood STP	WA0020290	9/23/2016
Tacoma Central No. 1 WWTP	WA0037087	10/6/2010
Tacoma North No. 3 WWTP	WA0037214	6/4/2009
Tamoshan STP	WA0037290	10/26/2017
WA Parks Larrabee WWTP	WA0023787	10/13/2016

SEPA COMPLIANCE

State law exempts the issuance, reissuance, or modification of a wastewater discharge permit for an existing discharge from the ***State Environmental Policy Act*** (SEPA) process as long as the permit contains conditions that are no less stringent than Federal and State rules and regulations (RCW 43.21C.0383). This exemption applies to the issuance of this general permit and to existing discharges, not to new discharges.

ADDITIONAL SEPA REVIEW FOR PERMITTEES

A modification of permit coverage for physical alterations, modifications, or additions to the wastewater treatment process that are substantially different from the original design and/or expands the existing treatment footprint requires SEPA compliance. Optimization does not require additional SEPA review. Additional SEPA review may be necessary if Ecology determines that the modification is outside of the scope of the initial SEPA evaluation conducted. WAC 197-11-880 allows for exemption from SEPA review for actions that must be undertaken to avoid an imminent threat to public health or safety, to prevent an imminent danger to public or private property, or to prevent an imminent threat of serious environmental degradation.

PERMIT LIMITS

Section 502(11) of the CWA defines "effluent limitation" as *any restriction on the quantity, rate, and concentration of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance*. Effluent limitations are among the permit conditions and limitations prescribed in NPDES permits issued under Section 402(a) of the Act, 33 U.S.C. §1342(a).

Federal and state regulations require that discharges from existing facilities must, at a minimum, meet technology-based effluent limitations reflecting, among other things, the technological capability of Permittees to control pollutants in their discharges that are economically achievable. Specifically, state laws (RCW 90.48.010, 90.52.040 and 90.54.020) require the use of "all known, available and reasonable methods of prevention, control and treatment" (***AKART***).

Water quality-based effluent limits (WQBELs) are required by CWA Section 301(b)(1)(C) and, in Washington State, are based on compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the Federal water quality criteria applicable to Washington (40 CFR Part 135.45). Ecology chooses the more stringent of these two limits (technology or water quality-based) for each of the parameters of concern when drafting NPDES permits. [CWA sections 301(a) and (b)].

Effluent limits in NPDES permits may be expressed as numeric or non-numeric discharge requirements. Under EPA's regulations, non-numeric effluent limits are authorized in lieu of numeric limits, where "[n]umeric effluent limitations are infeasible." [40 CFR 122.44(k)(3).] Courts have recognized that there are circumstances when numeric effluent limits are infeasible and have held that EPA may issue permits with conditions (for example, BMPs) designed to reduce the level of effluent discharges to acceptable levels:

> *Natural Res. Def. Council, Inc. v. EPA, 673 F.2d 400, 403 (D.C. Cir. 1982)* (noting that "*section 502(11)* defines 'effluent limitation' as *'any restriction' on the amounts of pollutants discharged, not just a numerical restriction*"; holding that section of CWA authorizing courts of appeals to review promulgation of "*any effluent limitation or other limitation*" did not confine the court's review to the EPA's establishment of numerical limitations on pollutant discharges, but instead authorized review of other limitations under the definition) (emphasis added).
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> In *Natural Res. Def. Council, Inc. v. Costle, 568 F.2d 1369 (D.C. Cir. 1977)*, the D.C. Circuit stressed that when numerical effluent limitations are infeasible, EPA may issue permits with conditions designed to reduce the level of effluent discharges to acceptable levels.

TECHNOLOGY-BASED LIMITATIONS

TECHNOLOGY-BASED EFFLUENT LIMITATIONS FOR DOMESTIC WASTEWATER FACILITES

Federal and state regulations define secondary treatment requirements for domestic wastewater treatment plants. These effluent limits are provided in 40 C.F.R. §133 (Federal) and in chapter 173-221 WAC (state).

Secondary treatment requirements are the minimum level of control that must be imposed in a permit for a publicly owned treatment work (POTW)(40 CFR § 125.3(a)). State domestic wastewater discharge standards based on secondary treatment in chapter 173-221 WAC include minimum effluent quality requirements for five-day biochemical oxygen demand (BOD_5), ***total suspended solids*** (TSS), pH and fecal coliform. The state regulation supplements 40 C.F.R. §133 and takes precedence over the federal regulation because it is more stringent in its application.

Since the promulgation of the rule, Ecology's permit writers have applied requirements in Chapter 173-221 WAC to all domestic WWTPs. When developing an NPDES permit, permit writers must consider technology-based limitations and also water-quality based effluent limitations and select the more stringent of the two (40 CFR §122.44(a)(1) and 125.3). Additional water quality based effluent limits (WQBEL) are developed when they are necessary to protect the receiving water.

Municipal Wastewater Discharges and AKART

While Ecology believes that the requirements in Chapter 173-221 WAC do constitute a level of treatment that is reasonable for domestic WWTPs, the concept of Washington's AKART rule for domestic WWTPs has started to evolve. This is primarily due to advancements in treatment technology that are capable of removing some pollutants at a higher level than traditional secondary treatment.

At the same time, DO deficits caused by nutrient pollution in surface waters across the state of Washington have become much more pervasive. While this comes from a combination of point and non-point sources, domestic WWTPs discharging at secondary treatment levels contribute to the nutrient over enrichment. This is because the conventional secondary treatment system design does not substantially remove enough nutrients (e.g., nitrogen and phosphorus) from the effluent to avoid over enrichment of the receiving water.

The prevalence of ***303(d)*** listings related to depleted dissolved oxygen levels from increased levels of nitrogen and phosphorus requires Ecology to reconsider the basis of AKART for domestic WWTPs. It is apparent that the agency must start to consider refining what constitutes AKART for this treatment category. The AKART provision needs evaluation on a case-by-case basis given its direct ties to economic impact. What constitutes AKART at one facility may be different at the next. This is especially true when considering the size differences between WWTPs, available space for expansion at the existing location, costs of

additional treatment processes, the rate payer base and any identified hardship that may exist due to the median household income in the community.

All POTWs proposed for coverage under this general permit currently discharge under the conditions of individual NPDES permits and are, at a minimum, required to meet TBELs as defined in 173-221 WAC. Ecology is not proposing additional TBELs as part of this general permit coverage. However, the proposed permit will require each facility to evaluate AKART for nitrogen removal and to submit a report documenting this evaluation to Ecology. Specific requirements for the analysis can be found later in this fact sheet in the Description of Special Conditions section and in Special Conditions S4.D and S5.D in the draft permit.

Non-Routine Discharges

Municipal wastewater discharges are fairly predictable in nature. This permit does not authorize non-routine or unanticipated discharges. Permittees must follow procedures listed in their individual permit in the event of a non-routine discharge.

SURFACE WATER QUALITY LIMITS

In order to protect existing water quality and preserve the designated ***beneficial uses*** of Washington's surface waters, WAC 173-201A-510 states that waste discharge permits shall be conditioned such that the discharge will not cause a violation of established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the ***designated uses*** of the surface waters of the state. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA), a WLA developed during a basin-wide ***total maximum daily loading*** study (TMDL) or on a WLA developed as part of an ***alternative restoration plan***.

NUMERIC CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numeric" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the maximum levels of pollutants allowed in receiving waters to be protective of aquatic life. Numeric criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in a discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a discharge permit.

NUMERIC CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The EPA has promulgated numeric water quality criteria for the protection of human health that are applicable to Washington State (40 CFR 131.45) in addition to human health criteria listed in Chapter 173-201A WAC. These criteria are designed to protect humans from cancer and other diseases, primarily from fish and shellfish consumption and drinking water from

surface waters. This proposed permit does not contain any numeric effluent limits for the protection of human health. Each POTW's individual NPDES permit contains a facility specific assessment of the facility's potential to violate human health criteria. Any necessary effluent limits for these pollutants are located in the Permittee's individual NPDES permit.

NARRATIVE CRITERIA

In addition to numeric criteria, "narrative" water quality criteria (WAC 173-201A-260) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh water and marine water in the state of Washington.

ANTIDEGRADATION

The purpose of Washington's ***Antidegradation*** Policy (WAC 173-201A-300-330; 2006) 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 pollutions. 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 a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

Ecology considered Tier I and Tier II in this permit and determined there are no discharges under this permit to formally designated "outstanding resource waters."

Ecology always considers Tier I when it issues a permit. Applying both technology based permit limits and water quality-based limits to point source discharges meets Tier 1 requirements and the fact sheet describes how this permit meets those requirements.

Tier II requirements for general permits are given in 173-201A-320(6) as follows:

(a) Individual activities covered under these general permits or programs will not require a Tier II analysis.

(b) The department will describe in writing how the general permit or control program meets the antidegradation requirements of this section.

(c) The department recognizes that many water quality protection programs and their associated control technologies are in a continual state of improvement and development. As a result, information regarding the existence, effectiveness, or costs of control practices for reducing pollution and meeting the water quality standards may be incomplete. In these instances, the antidegradation requirements of this section can be considered met for general permits and programs that have a formal process to select, develop, adopt, and refine control practices for protecting water quality and meeting the intent of this section. This adaptive process must:

(i) Ensure that information is developed and used expeditiously to revise permit or program requirements;

(ii) Review and refine management and control programs in cycles not to exceed five years or the period of permit reissuance; and

(iii) Include a plan that describes how information will be obtained and used to ensure full compliance with this chapter. The plan must be developed and documented in advance of permit or program approval under this section.

(7) All authorizations under this section must still comply with the provisions of Tier I (WAC 173-201A-310).

This fact sheet describes how the permit and control program meets the antidegradation requirement. Ecology used a formal process to develop the PSNGP and will do so every five years for reissuance. The process includes selecting, developing, adopting, and refining control practices to protect water quality and meet the intent of WAC 173-201A-320. All NPDES permits, including the PSNGP, are effective for a fixed term not to exceed five years (40 CFR §122.25). Each time Ecology reissues the PSNGP, the agency will evaluate the effluent limits and permit conditions to determine if the revised permit should incorporate additional or more stringent requirements. This evaluation includes a review of new data and input from the public.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the water body's ***critical condition***, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses. The factors include the flow and background level of toxic substances in the receiving water and the flow and concentration of toxic substances in the discharge.

Acute conditions are changes in the physical, chemical, or biological environment which are expected or demonstrated to result in injury or death to an organism as a result of short-term exposure to the substance or detrimental environmental condition.

Chronic conditions are changes in the physical, chemical, or biological environment which are expected or demonstrated to result in injury or death to an organism as a result of repeated or constant exposure over an extended period of time to a substance or detrimental environmental condition.

Ecology has not established a critical condition for the Puget Sound region at this time. Longer residence times occur in Puget Sound during summer months when ***watershed inflows*** subside. This period, which includes longer days and warmer temperatures generally create what Ecology considers a critical season. At present, Ecology is working to determine how to meet standards during all parts of the year everywhere within Puget Sound. The draft Nutrient Reduction Plan will address the definition of a critical condition for the receiving water. Narrative limits will apply for the entire first permit cycle and the critical condition for the receiving water will be considered as part of the second permit iteration.

MIXING ZONES

The Water Quality Standards allow Ecology to authorize ***mixing zones*** around a point of discharge in establishing surface water quality-based effluent limits. Ecology may authorize both "acute" and "chronic" mixing zones for pollutants as long as the discharge does not interfere with the designated uses of the receiving waterbody. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that meet AKART and in accordance with other mixing zone requirements of WAC 173-201A-400.

The proposed permit does not authorize mixing zones specific to total inorganic nitrogen. Since a general permit must apply to a number of different ***sites***, precise mixing zones and the resultant dilution are not applicable to facilities covered under a general permit.

Mixing zone authorizations in accordance with WAC 173-201A-400 can be found in the POTW's individual NPDES permit.

DESCRIPTION OF THE RECEIVING WATER

The draft general permit applies to POTWs directly discharging to Washington waters of the Salish Sea that cumulatively contribute to impairments within the greater Puget Sound region. Discharges will enter waters assigned designated uses intended to protect aquatic life and human health.

DESIGNATED USES AND SURFACE WATER QUALITY CRITERIA

Sections 173-201A-200 through -260 WAC define the applicable surface water quality criteria for protection of aquatic biota. These criteria were established to protect existing and potential uses of the surface waters of the state. Consideration was also given to both the natural water quality and its limitations. The surface water quality criteria are an important component of the state's Surface Water Quality Standards (Chapter 173-201A WAC).

Washington's marine aquatic life uses are broken into four primary categories created to provide protection for indigenous fish and non-fish aquatic species living in waters of the state. Aquatic life designations in Puget Sound span each of the categories given the complexity of the receiving water and its sensitive ecoregions.

- 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

- Excellent quality salmonid rearing and migration; 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.

- Good quality salmonid migration and rearing; 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.

- Fair quality salmonid and other fish migration

Each of these aquatic life designations has associated numeric criteria for temperature, dissolved oxygen, turbidity and pH. This draft permit specifically regulates total inorganic nitrogen due to its impact on DO. See individual NPDES permits and their accompanying fact sheets for discussions regarding how each discharge meets numeric criteria for other parameters.

Table 3, below shows the lowest 1-day minimum DO criteria for each of the marine aquatic life uses as presented in Table 210(1)(d), in Chapter 173-201A WAC. The standards also include a provision to account for natural conditions. "*When a water body's DO is lower than the criteria in Table 210(1)(d) (or within 0.2 mg/L of the criteria) and that condition is due to natural conditions, then human actions considered cumulatively may not cause the DO of that waterbody to decrease more than 0.2 mg/L* (Chapter 173-201A-210(1)(d)(i) WAC)."

Table 3. Marine Aquatic Life Uses and Corresponding DO Criteria

Designated Use	DO Criteria, 1 day min
Extraordinary Quality	7.0 mg/L
Excellent Quality	6.0 mg/L
Good Quality	5.0 mg/L
Fair Quality	4.0 mg/L

Ecology established marine DO standards at levels that support healthy and robust aquatic species and limit the cumulative impacts of human actions to prevent measurable depletion of DO from the natural condition. This draft permit supports the goals of the overall Puget Sound Nutrient Reduction Project by establishing requirements based on attaining the numeric marine DO criteria and minimizing cumulative human impacts.

Figure 1, shows where numeric water quality standards for DO apply for the Washington Waters of the Salish Sea, including Puget Sound.

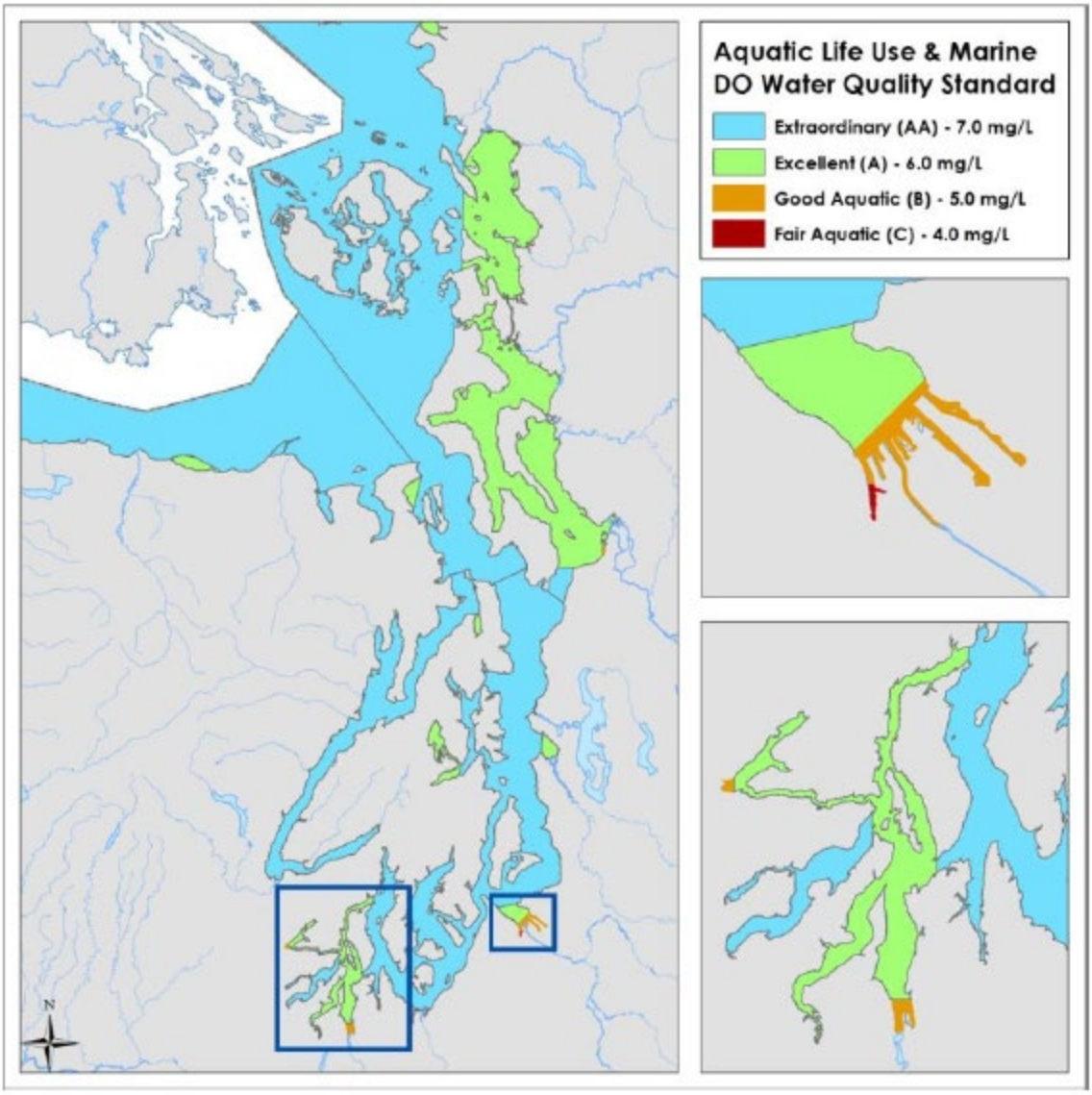

Figure 1. Dissolved Oxygen Standards in Puget Sound

Application of the numeric marine DO surface water quality criteria to a discharge requires site-specific analysis of the discharge and the receiving water. This analysis is part of the modeling work being completed by Ecology and will inform future numeric water quality based permit limits for nutrients that impact DO concentrations. See the Consideration of Narrative Water Quality Based Effluent Limits for Numeric Criteria section of this fact sheet for more information about narrative water quality effluent limits proposed for the first permit cycle.

HISTORY OF DISSOLVED OXYGEN IMPAIRMENTS AND INVESTIGATIONS

The 1996/1998 Water Quality Assessment included the first 303(d) DO listings for portions of Southern Puget Sound based on failure to meet the numeric portion of the DO standard. Following this initial listing, Ecology began to study how nutrients from both point and non-

point sources affected DO in the south sound region (Roberts, et al., 2008). Recent studies led Ecology to determine that anthropogenic (human) sources of nutrients lead to instances of low DO concentrations throughout Puget Sound (Khangaonkar et al., 2018, Pelletier et al., 2017, Ahmed et al., 2014, Roberts et al., 2014, Khangaonkar et al., 2012 b, Albertson et al., 2002) exacerbating those effects in areas that may have naturally occurring lower DO and creating additional conditions (areas or duration) where water quality standards are not met.

Newton and Van Voorhis (2002) documented that nitrogen is a limiting nutrient for Puget Sound. While other nutrients like carbon and phosphorus may drive some algal productivity, the available amount of nitrogen primarily controls the rate of algae and aquatic plant growth. The open ocean boundary will always deliver the highest nitrogen load to the ***Salish Sea***. The additional nitrogen load from human inputs, above the natural background, exacerbates the nutrient over- enrichment and leads to ***eutrophication***.

The Salish Sea's shallow bays and terminal inlets, like Budd Inlet in South Puget Sound, are the most sensitive to eutrophication due to diminished flushing rates when compared to other basins with higher rates of water exchange (Ahmed et al., 2017, Khangaonkar et al., 2012 b, Sutherland et al., 2011). Eutrophication will continue to worsen as the regional population increases if actions to reduce human nutrient sources from domestic wastewater, agricultural runoff and other land-use activities are not taken (Khangaonkar et al., 2019, Roberts et al., 2014). The SSM Year 1 Tech Memo (currently in publication) found that failure to address human nutrient loads from domestic WWTPs will increase both the number of days and the size of areas that do not meet the numeric DO standard in both high and low population estimates for 2040 (Ahmed et al., 2021). Figure 2, shows the percent increase from projected low and high flow estimates based on 2040 population.

Figure 2. Predicted increase in the DO noncompliant areas and days in Washington Waters of the Salish Sea from projected 2040 low and high WWTP flows.

These projections, on top of the existing DO impairments currently observed in Puget Sound, indicate a trajectory that will disrupt the already fragile ecosystem. After years of working to develop and understand the science, Ecology started the ***Puget Sound Nutrient Source Reduction Project (PSNSRP)*** in 2018. The PSNSRP aims to collaboratively address reducing point and nonpoint sources of nutrients in our region so that the DO water quality criteria and aquatic life designated uses are met by 2040.

The Salish Sea Model (SSM)

As previously discussed, nitrogen is the limiting nutrient driving eutrophication and DO impairment within inlets and embayments in Washington's portion of the Salish Sea. In addition to nitrogen, discharges of organic carbon into marine waters may also directly reduce DO from aerobic bacteria decomposition. Without numeric surface water quality standards for nitrogen or organic carbon, Ecology uses DO as the indicator pollutant to monitor the deleterious effects of excess nitrogen and organic carbon loading in marine waters. Ecology used water quality monitoring data to identify waters on the 303(d) list, but separating the impairment due to

cumulative human nutrient loads requires use of a mechanistic model to determine impacts to marine water quality in a complex system like the Salish Sea.

Originally developed as the Puget Sound Model (PSM), the state of the art ***Salish Sea Model*** (SSM) developed by Pacific Northwest National Labs (PNNL) in collaboration with Ecology has become the computer modeling tool used by Ecology to evaluate the physical, chemical and biological relationships within the Salish Sea. This modeling tool provides Ecology with the ability to predict compliance with marine water quality standards and evaluate nutrient (nitrogen and organic carbon) reduction options for improving and restoring Washington waters of the Salish Sea to meet water quality goals (McCarthy, 2018, Ahmed, et. al, 2019). Over its various development phases, the SSM has endured extensive internal and external peer reviews and constitutes the best available science for regulatory decisions made by Ecology.

On March 9, 2021, Ben Cope (2021) from EPA Region 10 discussed regulatory models with the Puget Sound Nutrient Forum (PSNF) and more specifically, the application of the SSM for regulatory purposes. According to EPA, mechanistic models have a history of being used for regulatory decision making as they provide the scientific basis for quantifying impacts from pollution sources upon source identification. Use of a mechanistic model also allows for the evaluation of different outcomes based on different pollutant reduction alternatives. Models also enable scientists to make predictions of future conditions and system changes such as impacts from increased populations or climate.

A well-developed model is one that has thorough documentation through both development and application. This includes making sure that all data review processes, equations and assumptions are clearly identified. Input data also needs to be comprehensive in nature for all sources being evaluated. Peer review and public review are very important steps when using a model for regulatory purposes. These review processes work to increase transparency about the model's limitations and identify any uncertainty that may result from its application. A summary of the model development and application approach, with its inherent transparency and peer review phases is described below.

During the first phase of model development, Ecology convened a technical advisory committee (TAC) comprised of representatives from interested groups and agencies including NOAA, USGS, EPA, King County, People for Puget Sound, and University of Washington. The TAC participated in a series of events, including a workshop. Appendix A of the first QAPP (2009) for this effort contains details about what was covered on the November 4, 2008 TAC workshop, which, along with recommendations from PNNL, set the direction for the long-term project. In 2010, TAC members offered peer review comments about a November 2009 report which provided details about the first version of the intermediate scale model. In addition, EPA contracted with Tetra Tech as an independent third party to peer review the intermediate scale hydrodynamic version of the model. In 2012, Khangaonkar et al., 2012 a,b published a report and an article in a scientific, peer reviewed journal focused on the water quality calibration of the intermediate scale model. At this point, the project team acknowledged that incorporation of a dynamic

sediment diagenesis module would result in a more robust modeling system. The project team also decided to incorporate prediction capability for carbonate system parameters. In 2014, QAPPs were developed for that purpose, and feedback was solicited from internal and external regional scientists. In 2017, the project team completed incorporation of sediment diagenesis and the carbonate system module (Pelletier et al., 2017, Khangaonkar et al., 2018). Additionally, PNNL began work on expanding the model domain. Altogether, over twenty reports (in some instances externally reviewed as well as internally reviewed) and independently peer reviewed scientific papers have been published that cover all the updates to the modeling system that is now the intermediate scale model SSM that Ecology applies.

Following standard practices and methods, Ecology has traditionally used mechanistic models for TMDL development linking point and non-point nutrient sources to both DO and ***pH*** impacts in receiving waters. Model results form the basis of ***wasteload allocations*** and ***load allocations*** for point and non-point sources in the TMDL which, in turn, inform water quality based effluent limits for point sources. The SSM is a typical regulatory model in that sense and has gone through several development steps since starting out as the PSM. What sets the SSM apart from the other regulatory models used by Ecology is the large scale and complexity of the waterbody lending its name to the tool. Models this size are not typical; however, according to EPA, they have been used in regulatory decision making for other large, complex bodies of water with DO impairments like the Chesapeake Bay. As described above, multiple SSM-related publications have documented the complexities, refinements, predictive skill and assumptions of the SSM and its improvements since its early days as the PSM.

EPA also addressed model uncertainties and acceptance in detail during the presentation to the PSNF (Cope, 2021). All water quality models have inherent levels of uncertainty. While the goal is to strive for a model's output to match observations there will always be some amount of model error. Matching patterns of freshwater input volume, vertical mixing and interbasin mixing is one way to understand the scale of the model error when comparing results to observations. It is important to note that no numeric state or federal guidelines exist for "acceptable" model error. EPA does have general guidelines for what constitutes a quality model for decision making in their *Guidance on the Development, Evaluation, and Application of Environmental Models* (CREM, 2009). Ultimately, the regulatory agency has the authority to determine what constitutes the best available science for decision making purposes. Ecology has determined that the SSM constitutes the best available science for determining the suite of point and non-point source reductions necessary to meet numeric water quality standards for DO. External opportunities to comment on and review the application of the SSM and the overall Puget Sound Nutrient Source Reduction Project occur in a separate process from the development of the draft PSNGP.

Documenting Reasonable Potential

Ecology documented review of the calibration, sensitivity analyses, and precision of the SSM in the Puget Sound Nutrient Source Reduction Project Volume 1: Model Updates and Bounding Scenarios ("Bounding Scenarios"), a report developed by the Environmental Assessment

Program. The goals of the modeling project were 1) to run the SSM with enhancements and updates while checking the calibration of the model and 2) use the calibrated model to run and evaluate the bounding scenarios to inform the overall nutrient reduction strategy for Washington waters of the Salish Sea (Ahmed et al., 2019). At a high level, the Bounding Scenarios report evaluated the regional impacts of cumulative human nutrient sources on DO concentrations both over time and space/area for the 2006, 2008, and 2014 model years, as well as the model predicted changes due to improved treatment at domestic WWTPs.

The results from the Bounding Scenarios report led Ecology to make the ***reasonable potential*** determination for domestic WWTPs discharging directly to the Washington waters of the Salish Sea. Specifically, the following key findings from the Bounding Scenarios report led Ecology to make this determination:

1. The estimated breakdown of the land-based inflows for dissolved inorganic nitrogen (DIN), on an annual basis, is the following: marine domestic point sources (WWTPs) contribute around 30,540 kg/day compared to rivers which contribute around 25,240 kg/day. WWTPs are the dominant land-based dissolved inorganic nitrogen (DIN) source during the low flow (summer) months.
2. Consistent with the findings from Mohamedali, et.al (2011), WWTPs contribute a much larger proportion (92%) of the anthropogenic DIN loads to Washington waters of the Salish Sea during the low flow season.
3. In addition to localized impacts from direct discharges, excess nutrients discharged from these domestic WWTPs in one location cumulatively contribute to DO impairments in other locations due to the water exchange that occurs between basins.

When a permitting authority makes the determination that a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the numeric water quality standards for an individual pollutant, the permit must contain an effluent limit for that parameter (40 CFR § 122.44(d)(1)(iii)). Ecology determined for the first permit control of total inorganic nitrogen is an appropriate first step to address nutrient pollution from domestic WWTPs as inorganic nitrogen (the sum of nitrate-nitrite and ammonia) is the form of nitrogen more available for algal growth driving eutrophication and the existing DO impairments. For purposes of this permit, Ecology will use TIN as a conservative measure of DIN as the SSM did not use a ratio, or other method, to calculate an assumed dissolved component from existing TIN discharge monitoring report (DMR) data. Future permit cycles may include effluent limitations for other nutrient parameters (e.g., carbon) when modeling results show that additional reductions are necessary to meet DO standards in the receiving water.

Modeling work continues with the SSM in order to determine the scale of reductions necessary to meet numeric water quality standards for DO. As of Spring 2021, Year 1 Optimization scenarios are still being analyzed. In addition to the need to offset nutrient loads from population growth mentioned previously in this fact sheet, early results indicate greater need for water quality improvement from annual point source load reductions and also confirm the

need for watershed reductions to attain standards. Ecology will review these results internally prior to sharing results at the PSNF. When the analysis is complete, Year 1 results will help to scope further refinements for the Year 2 optimization scenarios with the PSNF.

Ecology plans to use the Year 2 optimization scenarios to evaluate targets for individual basin load reductions, watershed inflow load reductions and point source wasteload allocations for different basins. These Year 2 scenarios will constitute the basis from which numeric WQBELs will be developed. Ecology will combine both the Year 1 and 2 optimization results into a Volume 2 SSM Report which will go through an external review process. Following that review, Ecology will use the draft Puget Sound Nutrient Reduction Plan (NRP) to assign the applicable allocations, possibly at the basin level. See the Puget Sound Nutrient Reduction Project webpage (https://ecology.wa.gov/Water-Shorelines/Puget-Sound/Helping-Puget-Sound/Reducing-Puget-Sound-nutrients/Puget-Sound-Nutrient-Reduction-Project) for more information and an opportunity to receive updates on the project.

Puget Sound Nutrient Reduction Plan

The 2014 Water Quality Assessment found 136 impaired area 303(d) listings for DO in the Salish Sea and 331 Category 2 listings indicating waters of concern. With at least 10 years dedicated to the technical work and development of water quality models, Ecology has reached the point where the science clearly demonstrates that cumulative point and nonpoint sources deplete DO resulting in nonattainment of standards within Washington waters of the Salish Sea. In a traditional approach, Ecology would develop a formal Total Maximum Daily Load (TMDL) to address the impairments. Instead, Ecology elected to develop the Puget Sound Nutrient Reduction Plan (NRP) to comprehensively address reduction for all human nutrient sources to our valuable receiving water. The benefits of this alternative restoration plan approach include achieving cleaner water more quickly than a traditional TMDL and improved opportunities for stakeholder input throughout the document development.

Participants in the PSNF provided feedback in 2020 on a draft outline of high-level elements that Ecology intends to include in the NRP. Ecology will use the NRP to explain why nutrient reduction is vital to improving water quality and protecting the designated uses detailed in Chapter 173-201A-210 and this fact sheet. In addition to documenting Puget Sound's nitrogen loading capacity and both the point source and watershed inflow nutrient reduction targets, the publication will detail the strategy for addressing watershed point and nonpoint sources to meet watershed nutrient reduction targets. It will also describe the effectiveness monitoring and adaptive management approaches that Ecology will use to iteratively meet these reduction targets and develop a watershed nutrient reduction strategy. The rationale for all regulatory decisions contained in the NRP must also be included.

Ecology will consult the PSNF for feedback and input on parts of the NRP, especially as it pertains to the watershed reduction strategy. Once drafted, the NRP will also go through an extensive public review and comment period. Ecology will also invite Tribal consultation. Visit the Puget Sound Nutrient Reduction Project's Webpage (https://ecology.wa.gov/Water-Shorelines/Puget-Sound/Helping-Puget-Sound/Reducing-Puget-Sound-nutrients/Puget-Sound-

Nutrient-Reduction-Project) for the most up to date information on this plan and other collaborative efforts.

AUTHORITY TO INCLUDE NON-NUMERIC WATER QUALITY-BASED LIMITS

Under EPA's regulations, non-numeric effluent limits are authorized in lieu of numeric limits, where "[n]umeric effluent limitations are infeasible." 40 CFR 122.44(k)(3). As far back as 1977, courts have recognized that there are circumstances when numeric effluent limitations are infeasible and have held that EPA may issue permits with conditions (e.g., Best Management Practices or "BMPs") designed to reduce the level of effluent discharges to acceptable levels. Natural Res. Def. Council, Inc. v. Costle, 568 F.2d 1369 (D.C.Cir.1977).

Through the Agency's NPDES permit regulations, EPA interpreted the CWA to allow BMPs to take the place of numeric effluent limitations under certain circumstances. 40 C.F.R. §122.44(k), entitled "Establishing limitations, standards, and other permit conditions (applicable to State NPDES programs ...)," provides that permits may include BMPs to control or abate the discharge of pollutants when: (1) "[a]uthorized under section 402(p) of the CWA for the control of stormwater discharges"; or (2) "[n]umeric effluent limitations are infeasible." 40 C.F.R. § 122.44(k).

More recently, the U.S. Court of Appeals for the Sixth Circuit also held that the CWA does not require the EPA to set numeric limits where such limits are infeasible. Citizens Coal Council v. United States Environmental Protection Agency, 447 F3d 879, 895-96 (6th Cir. 2006). The Citizens Coal court cited to Waterkeeper Alliance, Inc. v. EPA, 399 F.3d 486, 502 (2d Cir. 2005), stating "site-specific BMPs are effluent limitations under the CWA." "In sum, the EPA's inclusion of numeric and non-numeric limitations in the guideline for the coal remining subcategory was a reasonable exercise of its authority under the CWA."

Additionally, the Sixth Circuit cited to Natural Res. Def. Council, Inc. v. EPA, 673 F.2d 400, 403 (D.C.Cir.1982) noting that "section 502(11) [of the CWA] defines 'effluent limitation' as '*any* restriction' on the amounts of pollutants discharged, not just a numerical restriction."

EPA has substantial discretion to impose non-quantitative permit requirements pursuant to Section 402(a)(1)), especially when the use of numeric limits is infeasible. See *NRDC* v. *EPA,* 822 F.2d 104, 122-24 (D.C. Cir. 1987) and 40 CFR 122.44(k)(3).

RATIONALE FOR NON-NUMERIC WATER QUALITY-BASED EFFLUENT LIMITS

As discussed in this fact sheet Ecology's application of the Salish Sea Model (SSM) has shown that nutrients, particularly inorganic nitrogen, discharged from domestic wastewater treatment plants contribute to low dissolved oxygen concentrations in Puget Sound that do not meet state water quality criteria. As previously stated, the "Bounding Scenarios" report confirmed that circulation within the inner basins of Puget Sound distributes pollutant throughout the waters in the Puget Sound region. The circulation patterns showed how discharges in one basin can

affect the water quality in other basins. Thus, all wastewater discharges to the greater Puget Sound area containing nitrogen cumulatively contribute to existing DO impairments meeting the threshold for reasonable potential under 40 C.F.R. 122.44(d)(1)(iii).

When Ecology establishes reasonable potential for a discharge or group of discharges to violate surface water quality standards, the agency must implement a water quality based effluent limit (WQBEL) for that pollutant. While Ecology has enough information to determine reasonable potential exists, additional modeling work is still necessary to establish numeric WQBELs. Traditional effluent limit calculation tools for point sources are not appropriate in this instance for two reasons. First, these tools are based on limiting toxic pollutants that typically have more acute toxicity than nutrients and criteria with 1-day and 4-day averaging periods (durations). Comparatively, nutrients have much longer averaging periods on the order of weeks to months or longer (EPA, 2004). Second, Washington State uses numeric criteria for DO. The cause of depressed DO requires modeling to determine levels of nutrients that will not cause a violation of the DO criteria as allowed in 40 C.F.R. 122.44(d)(vi)(c). In a receiving water as complex as Puget Sound, the modeling work necessary to develop numeric WQBELs for each discharge is comprehensive and requires extensive internal and external review.

In accordance with 40 C.F.R. 122.44(k)(3), ***best management practices (BMPs)*** are appropriate to control or abate the discharge of pollutants when numeric effluent limits are infeasible. This permit through its requirements for ***optimization*** of current treatment processes to abate nutrient loads through the permit term, the use of an ***action level*** and treatment performance metrics serve as an indicator for optimization success, the requirement for dominant loaders to pursue additional nutrient reduction actions if the action level is exceeded, and early planning constitute a suite of BMPs that meet the intent of the federal regulation for this first permit cycle.

Ecology continues to review model results from the first year of optimization scenarios and scope future model runs through the Puget Sound Nutrient Forum. Additional model runs will be defined in 2021 to further quantify far and near field effects of wastewater discharges to marine waters along with the anthropogenic nutrient loads from Puget Sound watershed. Once Ecology can establish a nutrient loading capacity that meets DO criteria in the marine waters of Puget Sound, allocations that will lead to numeric WQBELs can be established. The NRP will include draft allocations for point sources and watershed inflows. After internal and external review, the allocations will be finalized and numeric WQBELs will no longer be infeasible. It is anticipated that for the second iteration of this permit the approach will shift to working towards compliance with those numeric limits.

CONSIDERATION OF NARRATIVE SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

As previously stated, 40 CFR §122.44 requires the permit to contain effluent limits to control all pollutants or pollutant 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 water quality standard.

Ecology documented reasonable potential with the determination that domestic wastewater discharges may cause or contribute to a violation of surface water quality standards for dissolved oxygen. Therefore, the draft permit includes BMP based, narrative water quality-based effluent limits to control discharges as necessary to meet applicable water quality standards for DO as allowed under 40 CFR § 122.44(k).

Ecology proposes two sets of narrative limits for two categories of dischargers. Proposed narrative limits for all plants require Permittees to actively reduce their contribution as much as possible during the permit term. However, the group of Permittees that constitute the dominant TIN load into Puget Sound must do more than the Permittees with the smallest TIN loads. Ecology determined that the dominant loads from eligible Permittees constitute approximately 99% of the total domestic point source load discharged to Puget Sound. TIN loads exceeding 100 lbs/day qualify as dominant loads.

All Permittees must monitor their influent and effluent, optimize existing treatment and begin planning for the future. Dominant loaders also have a facility specific action level that represents the current discharge condition and drives corrective actions when the level is exceeded for two consecutive years or three times during the permit term. If the dominant loader triggers the corrective action, they must reduce their effluent load by 10%. If a jurisdiction with a bubbled action level triggers a corrective action, the 10% reduction applies to the bubbled total. Unless the corrective action selected by the Permittee includes a design previously approved by Ecology, qualifying Permittees must submit an abbreviated engineering report or a technical memo signed and stamped by a professional engineer detailing the proposed solution with the Annual Report submittal following the initial action level exceedance.

Ecology proposes to implement a less aggressive approach for the Permittees with the smallest TIN loads given that they collectively represent approximately 1% of the domestic point source anthropogenic load. Ecology calculated average daily TIN loads for Permittees using 2019 DMR data to determine the categorization. This approach differs from what Ecology proposed in the Preliminary Draft. The Preliminary Draft included a more universal approach for all Permittees with no consideration of requirements based on TIN load magnitudes. While the smallest loaders must still work to reduce their effluent TIN loads, the proposed requirements in the draft permit now better reflect their minimal contribution to the existing impairments.

This proposed general permit supplements the individual NDPES permits held by the dischargers proposed for coverage. The individual NPDES permits supply the technology-based and water quality-based effluent limits as well as requirements for controlling other pollutants in the facility's discharge. Ecology anticipates that implementing the optimization requirements in the draft permit and the application of adaptive management through the BMP approach will result in wastewater discharges that minimize cumulative contributions to violations of the state's Surface Water Quality Standards (Chapter 173-201A WAC) during the permit term. Numeric limits remain infeasible because modeling is not yet complete. Therefore, the draft permit includes narrative water quality-based effluent limits (WQBELs) to control discharges as

necessary to meet applicable water quality standards for DO. The provisions of S3 Compliance with Standards, provisions of S4 and S5 Requirements for Permittees (Dominant and Small), S6 Monitoring Schedules and Sampling Requirements, and S7 Discharges to 303(d) or TMDL Water Bodies constitute the narrative WQBELs in the draft permit.

Condition S3. Compliance with Standards

Condition S3 prohibits discharges that cause or contribute to violations of Surface Water Quality Standards (Chapter 173-201A WAC), Sediment Management Standards (Chapter 173-204 WAC), and human health-based criteria in the Federal water quality criteria applicable to Washington (40 CFR §135.45).

Each Permittee must control its discharge as necessary to meet applicable water quality standards. Ecology considers compliance with the narrative conditions in the draft permit (e.g., action levels, optimization, planning, monitoring, and any necessary corrective actions) as adequate control necessary for dischargers to meet applicable water quality standards during the permit term.

The Permittee must take corrective action if they become aware, or if Ecology issues a determination through a notice of non-compliance, that the discharge causes or contributes to a water quality standards exceedance. In addition, Ecology may require additional monitoring at any time during the permit term if information suggests that the discharge lacks the controls necessary to meet applicable water quality standards.

Condition S4. Requirements for WWTPs with Dominant TIN Loads

Authorized Discharges – Discharges conditionally authorized by the permit include wastewater discharges from POTWs constituting greater than 99% of the current domestic point source anthropogenic TIN load to Washington Waters of the Salish Sea.

Domestic Wastewater Discharges constituting the largest TIN loads – The narrative water quality-based limits for domestic wastewater discharges includes a suite of BMPs required over the duration of the permit term. These BMPs include:

- monthly monitoring requirements;
- a numeric action level for total inorganic nitrogen (lbs/year) that require implementation of treatment optimization to stay under the action level;
- an annual Nitrogen Optimization Plan; and,
- early planning through the Nutrient Reduction Evaluation that includes an AKART analysis and evaluating alternatives to meeting 3 mg/L TIN (or the equivalent load) both annually and seasonally.

The suite of BMPs that constitute narrative WQBELs are unique to this permit term. They require the permittee to document and assess the adaptive management procedures used to

reduce nutrients in their effluent. The TIN action level is used in the draft general permit as this is the primary pollutant of concern as identified through investigations into existing DO impairments in the greater Puget Sound area. All domestic wastewater discharges contain inorganic nitrogen with human urine being the primary source.

Condition S5. Requirements for WWTPs with Small TIN Loads

Authorized Discharges – Discharges conditionally authorized by the permit include wastewater discharges from POTWs constituting less than 1% of the current domestic point source anthropogenic TIN load to Washington Waters of the Salish Sea.

Domestic Wastewater Discharges with the Smallest TIN loads– The narrative water quality-based limits for domestic wastewater discharges includes a suite of BMPs required over the duration of the permit term. These BMPs include:

- monthly monitoring requirements;
- treatment optimization requiring submittal of an optimization report; and,
- an AKART analysis specific to nitrogen removal.

The suite of BMPs that constitute narrative WQBELs are unique to this category of discharger during the permit term. They require the permittee to document, quantify, and analyze the adaptive management procedures used to reduce nutrients in their effluent.

Condition S6 Monitoring Schedules and Sampling Requirements

Ecology has included monitoring requirements as part of the narrative water quality based effluent limits for Permittees listed in Conditions S4 and S5. Required influent and effluent monitoring will inform the adaptive management component of the draft permit and support the optimization requirements for all Permittees.

Condition S7 Discharges to 303(d) or TMDL Water Bodies

Ecology cannot allow a new discharge to a listed waterbody (issuance of permit is prohibited) if the discharge will cause or contribute to a violation of water quality standards. Ecology may allow a new discharge if it meets the applicable water quality criteria. The applicable federal regulation is 122.4(i) Sec. 122.4 Prohibitions. *No permit may be issued: i) To a new source or a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards.*

The draft PSNGP establishes narrative water quality-based numeric effluent limits for domestic WWTPs as identified in S4 and S5. These limits will also apply to any discharges to certain waters that are listed as impaired under Section 303(d) of the Clean Water Act. Numeric effluent limits will replace these narrative effluent limits after establishing a facility specific compliance period once Ecology completes the alternative restoration plan (e.g., Nutrient Reduction Plan) or EPA approves a TMDL.

All references and permit requirements associated with Section 303(d) of the Clean Water Act pertain to the most current EPA-approved 303(d) listing of impaired waters that exists when a complete application for coverage is submitted to Ecology. Ecology has determined that domestic WWTPs have the potential to cause or contribute to violations of water quality standards in waterbodies that are 303(d) listed for DO, and must comply with the narrative effluent limit(s) in S4 and S5 of the permit.

SEDIMENT QUALITY

Ecology has promulgated Sediment Management Standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that Ecology may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400). The permit requires adaptive management to limit discharge of total inorganic nitrogen. This general permit contains no requirements for protecting sediment quality. Impacts to sediments are assessed during the development of the individual permits currently held by all POTWs proposed for coverage under this general permit. Specific facility requirements for meeting sediment management standards can be found in the POTW's individual NPDES permit.

GROUND WATER QUALITY LIMITATIONS

Ecology has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by Ecology prohibit violations of those standards (WAC 173-200-100). This permit does not authorize any discharges to groundwater.

ANTI-BACKSLIDING

NPDES permits may not be reissued, renewed, or modified with less stringent limitations or conditions than those defined in a previous permits unless the changes comply with anti-backsliding requirements in 40 CFR 122.44(l)(1-2). Technology based effluent limits, water quality based effluent limits, and applications of best professional judgement are subject to anti-backsliding provisions.

DESCRIPTION OF SPECIAL CONDITIONS

This section follows the structure of the draft Puget Sound Nutrient General Permit (PSNGP), but does not restate language used in the permit. The information presented below is intended to help the public understand the intent and basis of the draft permit.

S1. PERMIT COVERAGE

A. Coverage Area and Eligible Discharges. The PSNGP is a regional permit. It provides permit coverage for discharges of domestic wastewater from publicly owned treatment works (POTWs) known to contain inorganic nitrogen within Washington's waters of the Salish Sea, excluding federal land, tribal land and certain tribal waters.

A definition of "Permittee" is not provided in chapter 90.48 RCW, 173-220, or 173-226 WAC, nor is one provided in 40 CFR 122 (EPA NPDES Permit Program) or State NPDES Permit Programs. Based upon the usage of Permittee in federal and Washington State law, Ecology takes the term "Permittee" to mean the person or entity that discharges or controls the discharge of pollutants to waters of the state and holds permit coverage allowing that specific discharge. For the Puget Sound Nutrient General Permit, Ecology is clarifying that the permit may be held by Washington State municipalities who currently hold an individual NPDES permit and are represented as a discrete, domestic point source in the Salish Sea Model (SSM).

This PSNGP identifies the municipal POTWs that must seek permit coverage. "POTW" is defined as a sewage treatment plant that is owned and usually operated by a local government agency designed to treat domestic sewage.

This PSNGP addresses discharges from POTWs into Puget Sound's marine and estuarine waters that are known to contain inorganic nitrogen. Permittees are divided into two categories. While the type of discharge is the same amongst the domestic dischargers, the current TIN loads vary widely. This permit mandates more stringent requirements for the dominant loaders (those constituting 99% of the current domestic point source TIN load) due to their contribution to the existing nitrogen over enrichment. Smaller plants, those that discharge less than 1% of the TIN load must also work towards reducing nitrogen in their discharge; however, requirements for these facilities take into account the scale of their contribution. Categories for domestic WWTPs that must apply for coverage under the draft permit are identified using (D) and (S) for dominant and small TIN loads in draft permit section S1.A, Table 3. Ecology determined these categories by ranking cumulative average daily TIN loads for each of the 58 WWTPs using 2019 DMR data. See Appendix D in this fact sheet for the cumulative ranking results.

B. Limits on Coverage. This section identifies the types of discharges that are not authorized by the permit. These include discharges from:

1. WWTPs that are federally owned or operated, or located on tribal land, or discharge to tribal waters with EPA approved water quality standards.

2. Privately owned WWTPs currently permitted by Ecology with an individual NPDES permit.

3. POTWs located in tributary watersheds feeding Puget Sound

4. Industrial WWTPs discharging to Puget Sound.

Ecology does not have authority to write NPDES permits for federal and tribal facilities. EPA is the responsible permitting authority for these plants in Washington State. Conditions for nutrient controls will be implemented for these facilities through the 401 Water Quality Certification process.

In 2000, Ecology modified the Washington Administrative Code that provides terms and conditions for NPDES permits, Chapter 173-220-150(4). This rule change requires permits for domestic wastewater facilities be issued only to public entities after the modification date. Private facilities excluded from coverage under the PSNGP all have individual NPDES permits issued prior to the rule change. These plants must incorporate into a public entity such as a sewer district in the event of a treatment process change or expansion. Because Ecology does not issue new NPDES permits to private entities any longer, these private plants are excluded from coverage under the PSNGP. Nutrient controls will be implemented at the time of individual permit reissuance for these private treatment plants. Ecology has developed a permit issuance schedule for these plants prioritizing those that discharge to more sensitive ecoregions of Puget Sound.

Twenty-six (26) POTWs discharge to rivers that feed into Puget Sound at locations currently outside of the SSM grid. Ecology accounts for the nutrients from these plants as part of the aggregated watershed loads in the model. Determining the impact of these discharges on Puget Sound dissolved oxygen requires additional modeling tools. Ecology plans to develop these additional watershed modeling tools during the first PSNGP five year term. Coverage may expand to include these facilities during the second permit term. Some of these POTWs have wasteload allocations for nutrients based on DO TMDLs in their respective watersheds. Any future general permit coverage would take into account these EPA approved wasteload allocations.

Ecology must limit coverage general permit to a similar category of discharges. Industrial treatment plant discharges have a different characterization than domestic sewage. They primarily discharge carbon, not nitrogen. Ecology plans to implement nutrient controls for industrial treatment plants through the individual permitting process.

Ecology has not included a termination condition in the draft permit because each Permittee currently has an active individual NPDES permit. Termination of coverage under the draft general permit can only occur if the Permittee removes all discharges from Washington waters of the Salish Sea by redirecting treated effluent to ground (as authorized under a State Waste Discharge Permit) or any other means subject to Ecology's approval.

S2. APPLICATION FOR COVERAGE

A. Obtaining Permit Coverage. In accordance with WAC 173-226-200, each eligible POTW must submit a complete permit application to obtain coverage under the Puget Sound Nutrient

General Permit. Applicants must submit the Notice of Intent (NOI) no later than 90 days after the issuance date of the general permit.

B. How to Apply for Permit Coverage. Each Permittee must submit an electronic NOI through the Water Quality Permitting Portal unless the Permittee has an electronic reporting waiver.

Applicants must satisfy the public notice requirements of WAC 173-226-130(5). This permit applies to existing facilities, only. Therefore, no public notice is required for coverage under this permit.

C. When Permit Coverage is Effective. Ecology will respond to the permit applicant in writing. If the NOI is incomplete or more information is needed Ecology will notify the applicant in writing and identify the issues that must be resolved before a decision on permit coverage can be reached.

If Ecology approves the application, permit coverage in an ***active status*** under the general permit will begin on the date specified in the permit coverage letter.

D. Modification of Permit Coverage. If the Permittee requests a modification in coverage a completed Modification of Coverage form must be submitted to Ecology at least 60 days prior to the needed modification. Examples of when a Permittee needs a coverage modification include any adjustments to an action level or a reduction in monitoring. Changes to treatment processes resulting from optimization do not require a modification of permit coverage. Treatment alterations resulting from a corrective action or facility upgrade may require coverage modification if treatment processes are substantially altered. Ecology will evaluate coverage modifications for these situations on a case-by-case basis. Public notice requirements under WAC 173-226-130(5) must be completed as part of this modification request. SEPA may be required if the modification requested is related to a major process upgrade.

S3. COMPLIANCE WITH STANDARDS

Condition S3 of the permit is covered in this fact sheet under Consideration of Surface Water Quality-Based Limits for Numeric Criteria, above.

S4. REQUIREMENTS FOR WWTPS WITH DOMINANT TIN LOADS

The discharge limits in S4 are described above in *Rationale for Narrative Water Quality-Based Effluent Limitations* and *Consideration of Narrative Water Quality-Based Limits for Numeric Criteria.*

ACTION LEVEL CALCULATION

This draft permit proposes a total inorganic nitrogen action level for each of the permittees listed in Condition S4, which constitute 99% of the current domestic point source anthropogenic load. The action level, AL_0, forms the baseline value representing current TIN

loading and drives treatment optimization requirements. Ecology developed a calculation tool for AL_o that uses a non-parametric method called "bootstrapping" to calculate the annual load from facility data that represents a load that would only have a 1% chance of exceeding if the loads are consistent with existing loading. Bootstrapping is a statistical test that uses random sampling with replacement meant to mimic the sampling process ("Bootstrapping(statistics)," 2021). As opposed to parametric methods that make assumptions about an underlying distribution of a data set to determine future observations, the bootstrapping method assumes the original data set represents possible future observations in the absence of changing conditions.

Confidence intervals for simulated means using the bootstrapping method can be derived by first randomly selecting values from the original observation data (with each selected value being returned to the original set for potential reselection) in order to create a new "bootstrapped" sample of observations. The mean of each resampled data set is then determined and those means create a probability distribution. Ecology calculated AL_o using the 99% upper confidence level (UCL) from the probability distribution of means. Members of the Environmental Caucus expressed a desire for Ecology to use the 95% UCL from the same probability distribution of means for the AL_o calculation. However, use of the 95% UCL actually results in a 23% chance of at least one exceedance over the permit term. The 99% UCL more accurately represents the discharge condition at each of the qualifying facilities and is sufficient to drive meaningful nutrient reduction progress during the permit term. While Ecology is confident that this 99% UCL bootstrapping calculation represents a 1% chance of exceedance for a given year, it does not take into account inter-annual variability related to cool and wet weather. For this reason, permittees must exceed the action level two consecutive years before triggering the corrective action requirement discussed below. Permittees with a "bubbled" action level will trigger the corrective action requirement when the cumulative annual loads for all applicable plants exceeds the value in draft Condition S4.A. Bubbled action levels sum the individual action levels for each WWTP owned and operated by the same ***jurisdiction***. Ecology will evaluate the combined, reported annual TIN loads for each WWTP included in the bubbled action level at the end of each 12 month monitoring period. If the loading from the applicable WWTPs exceeds the bubbled action level, the corrective action requirement applies.

Ecology strived to accurately represent existing discharges with the action level calculation. Where possible Ecology used at least 3 years of data (36 data points) in the AL_0 calculation. More data was used if it was available and representative. TIN loads were calculated using day of flow measurements paired with single sample ammonia and nitrate/nitrite concentrations. Where ammonia and nitrate/nitrite were not measured on the same day, the missing concentration was extrapolated from the most representative measurement. Periodic samples are assumed to represent the month or quarter in which a sample was taken. If there are multiple samples in a period, new data replaces old as best representation for subsequent days in the period. Most Permittees had monthly data available for these individual load calculations. Some Permittees had only quarterly data which required extrapolation to better represent the variability. The representative concentration was paired with the first flow

measurement in the months not sampled to estimate load variation over the course of the quarter.

Ecology verified whether enough data for each facility exists to make a reasonable representation of the unmeasured data by using the shape of the cumulative distribution functions (CDF) as a check. The CDF plot for bootstrapped averages appears as a smooth line if the observations cover the full range of possible results. Bumpy curves or steep slopes in the CDF indicate an insufficient amount of data or data that does not accurately represent the discharge condition. All facilities listed in S4 had a sufficient amount of DMR data for the action level calculation except for Blaine's Lighthouse Point WRF. This facility specific action level is based on a shorter period than other facilities due to COVID related closures which impacted the availability of representative data. See Appendix E for calculation information related to the data range used for each S4 permittee's AL_o.

This action level calculation serves as Ecology's best representation of each Permittee's existing discharge condition given the DMR data available. Sampling requirements in Condition S6 will increase the sampling density for all Permittees. In some cases, this increased sampling density may result in a better effluent characterization which could impact the estimate of existing loads. Permittees may request an action level reassessment after completing one year of sampling. In order for Ecology to accept this request to reassess the action level, Permittees must show that the overall loading to the facility has not increased by providing an influent BOD_5 load comparison. Ecology cannot reassess the action level if influent loads increased during the first year of the draft general permit. Any recalculated action levels would be implemented through a permit coverage modification (see draft Condition S2.D for more details about the coverage modification).

DRAFT CONDITION S4.C NITROGEN OPTIMIZATION PLAN

The draft permit requires optimization of existing treatment processes as a best management practice (BMP) to stay below the facility specific nutrient action level and to reduce nitrogen to the greatest extent possible during the permit term. Optimization, as required by this permit, is the suite of activities or a single activity that result in improved nitrogen removal at an existing treatment plant, regardless of the treatment type. It does not include activities that result in costly upgrades or large capital infrastructure improvements. Optimization serves as the mechanism to bridge the period between this first permit issuance and compliance with final, numeric WQBELs, which Ecology will calculate after completing the modeling to support the NRP.

For the largest loaders, submittal of the annual Nitrogen Optimization Plan (NOP) via the Annual Report requirement constitutes a portion of the narrative WQBEL for this 5 year permit term as it represents an adaptively managed BMP. All Permittees specified in Special Condition S4 must develop, implement, and maintain a NOP for purposes of maximizing removal of nitrogen. The NOP must be submitted to Ecology via the Annual Report requirement.

Permittees must begin to identify optimization strategies starting upon the effective date of the PSNGP, following receipt of the coverage letter from Ecology with implementation occurring as soon as possible during permit year 1. In the Annual Report, Permittees must document optimization opportunities at their WWTP, implementation process, the success of the implemented strategy compared to expected performance, any necessary refinements to improve performance, and the application of adaptive management. Permittees must use monitoring data collected under this permit in addition to process modeling to quantify and evaluate results. A number of different optimization strategies exist and Ecology understands implementation opportunities will vary across all POTWs that must seek coverage under the propose permit. Ecology expects that the year round quantifiable BMP requirement to optimize treatment will assist Permittees listed in S4 in keeping annual TIN effluent loads as low as possible.

Optimization Approaches

The preliminary draft permit released by Ecology in January 2021 contained different tiers of actions for optimizing biological treatment to remove nitrogen. This permit does not differentiate between the tiers of optimization requirements leaving the Permittee to determine what strategies are best suited for reducing nitrogen with the existing treatment process. The following categories of optimization strategies are meant to help be a guide for Permittees to improve biological nitrogen removal but in no way are they exhaustive. Permittees can implement optimization strategies not listed in this fact sheet provided they document the selection process in the Annual Report. As previously stated, optimization should not result in major capital improvements at each Permittee's WWTP (although, some implementation costs are expected).

Permittees may exclude optimization strategies that exceed a reasonable implementation cost or timeframe. Any impacts resulting in exclusion must be documented in the Annual Report per condition S4.C.1.b. Ecology attempted to collect feedback on what Permittees would evaluate when making decisions about applicable optimization approaches and their financial impact during the preliminary draft stage. No clear response emerged from the comments received on that permit draft. If excluding a viable optimization strategy due to financial reasons, Permittees must provide the anticipated implementation cost and describe the justification for why they cannot cover and/or absorb that cost. Justifications may include immediate impacts to operational, equipment or capital budgets and an explanation of why the jurisdiction cannot make accommodations to cover these costs through future budgeting adjustments. When excluding a strategy due to the implementation timeframe, include documentation that how long procurement and installation will take to occur and any other pertinent information.

EPA's *Case Studies on Implementing Low-Cost Modifications to Improve Nutrient Reduction at Wastewater Treatment Plants* (2015) is a resource recommended for optimizing activated sludge plants. The following optimization strategies reflect the document's suggestions for

improving nitrogen removal at WWTPs. Plants that do not use an activated sludge process are encouraged to focus more on influent load reductions and effluent management alternatives.

Process Control Modifications

Process control optimization strategies include the various operational approaches used to control the treatment process and respond to changing operational conditions. Many different factors can affect process performance. Permittees shall consider modifications to the solids retention time, mixed liquor suspended solids concentrations and F/M ratios. Improved flow equalization, changes to internal recycle rates, side stream return flow controls, online analyzers (e.g., oxidation reduction potential, DO, etc.), improved process control monitoring, primary sludge fermentation, and sequencing batch reactor cycle modifications are all examples of process control optimization actions. Septage receiving and handling modifications can also be implemented to help regulate influent loads at the WWTP Many of these process control changes can be made using existing infrastructure helping to keep implementation costs low.

Aeration Modifications

Removing nitrogen biologically requires maintaining specific biological populations that have variable needs for oxic (nitrification) and anoxic (denitrification) conditions. Modification of aeration controls through diffuser improvement, DO probe settings, blower motor variable frequency drive settings, and improved air valve actuation settings are examples of optimization through aeration modifications. Mixer modifications to prevent entraining oxygen in an anoxic zone are another example of this optimization strategy.

Configuration Changes

Altering the way wastewater flows through the treatment plant is a physical way to alter a process configuration, which has the potential to reduce nitrogen. These can include adding baffles for creation of anoxic zones, step feeding influent to encourage consistent F/M ratios, additional recycle piping, use of gates or channel changes, or plug flow conversions to create aerobic and anoxic zones. These can be similar to process control modifications; however, configuration changes can be costly and generally require investment in some new infrastructure or equipment. Therefore, Ecology recommends investigation of configuration changes only if the POTW can implement the optimization strategy with existing infrastructure and minimal procurement of equipment.

Chemical Addition

Chemical addition may be necessary to help drive biological nitrification and denitrification. Alkalinity and carbon are the two parameters that can improve a treatment plant's ability remove nitrogen. Alkalinity feeds can help improve nitrification if background alkalinity concentrations are low and unable to maintain the pH range necessary for biological nitrification. Supplemental carbon may be necessary to drive denitrification if there is an

insufficient carbon source from influent soluble BOD. Chemical feed systems to regulate delivery of supplemental alkalinity or carbon will require an investment from the Permittee as will the purchase of the chemicals themselves. Ecology recommends chemical addition as an optimization strategy only after working to improve other treatment process performance through control and configuration strategies. This strategy is also most applicable to POTWs originally designed for nitrification/denitrification where operators cannot achieve adequate treatment efficiency.

Effluent Management

Changes in effluent management to reduce nitrogen loads to the water environment can occur several different ways. Primarily, this approach redirects effluent from reaching surface water through increasing the volume of reclaimed water produced (if previously permitted for reclaimed water production), discharge to a polishing wetland, or other alternate disposal methods where the effluent can be discharged to ground. Groundwater Quality Standards in Chapter 173-216 WAC include criteria for total nitrogen (TN) at 10 mg/L. Most Permittees subject to draft permit condition S4 discharge well above 10 mg/L TN. This criteria may preclude use of discharge to ground as an optimization strategy; however, it shall be considered as part of the Nutrient Reduction Evaluation. Ecology recommends effluent management strategies apply to Permittees that already produce reclaimed water or have approved alternate disposal methods due to the complexity and implementation costs that accompany this approach.

Nitrogen Optimization Report Requirements

Ecology understands that there may be many different approaches to optimization and does not want Permittees to focus reporting on daily process microadjustments. Rather, the Annual Report documenting optimization must focus on the one or two primary strategies implemented at the treatment plant over the 12 month reporting period. The adaptive management process begins with the requirement to conduct an existing treatment performance assessment after permit coverage notification. Submittal of the electronic Annual Report (Special Condition S9) through the WQWebPortal satisfies the Nitrogen Optimization Plan requirement. See Appendix C in the draft permit for Annual Report Questions that document optimization for dominant loaders.

Draft Condition S4.C.1 Treatment Process Performance Assessment

First, Permittees must conduct a process evaluation to establish current treatment performance and the existing TIN removal rates. This process evaluation may be conducted through process modeling or an equivalent analysis. This initial assessment is required to help Permittees evaluate viable optimization approaches at the WWTP prior to implementation. Initially, each Permittee must also develop an optimization goal and determine the three most viable optimization strategies capable of achieving the goal. The goal may simply be to stay under the action level. Other goal examples include meeting a specific TIN concentration target

or improving treatment process efficiencies. After initial selection, Permittees must maintain a prioritized list of optimization strategies at all times and update that list as part of the Annual Report requirement.

Prior to implementing the preferred optimization strategy, Permittees must develop an anticipated performance metric. Ecology suggests using % removal for this performance metric; however, Permittees may propose a different criteria and detail the approach in the Annual Report. The performance metric must provide the Permittee with the ability to compare expected vs. actual treatment improvement from optimization.

Draft Condition S4.C.2 Optimization Implementation

Permittees must also document how they implemented the preferred optimization strategy including costs, the time required for full implementation, the start date of the preferred strategy, unanticipated challenges, and impacts to the overall treatment performance as a result of any process changes.

Permittees will document the annual average TIN concentrations and loads from the reporting period in the Annual Report in addition to the TIN removal rate observed (or other performance metric if identified by the Permittee). The observed results must be compared to the performance metric developed in condition S4.C.1.c. These results inform the adaptive management required at the WWTP. While permit required monitoring must be used to track optimization progress, Permittees may need to use internal process control sampling locations in addition to influent and effluent monitoring. Laboratory accreditation is not required for process control monitoring and should not be reported on DMRs.

The facility specific action level represents the current discharge condition at each of the treatment plants. Ecology intends for the implemented optimization strategies to help each Permittee stay below their facility specific action level. This prevents additional nitrogen loading into Puget Sound during the period while Ecology completes modeling necessary to determine numeric WQBELs. Permittees can maintain the optimization strategy implemented provided they met the self-identified performance metric and stayed below the action level. Adaptive management is required if Permittee stayed below the action level but did not meet the performance metric. In this case, the Permittee can refine the implementation of the selected alternative or, they can elect to pursue a different optimization strategy for the next 12-month period. Exceeding the facility specific action level requires the Permittee to execute a corrective action to reduce the effluent nutrient load per S4.D.

Draft Condition S4.C.3 Influent Nitrogen Reduction Measures/Source Control

In addition to identifying opportunities to reduce effluent TIN loads through optimization, Permittees must also develop a program to reduce influent TIN loads. Permittees must review non-residential sources of nitrogen, septage handling practices (if applicable) and any opportunities for pre-treatment. Elimination of RV and boat pump out services are not applicable to this condition. However, Permittees may investigate changes to wastestream

management practices related to RV and boat pump out services. Given that the primary source of nitrogen in domestic wastewater is from urine, influent reduction opportunities may be limited. Therefore, in addition to reviewing pre-treatment opportunities, Permittees must also begin to identify different approaches for reducing TIN from new dense residential development and commercial buildings.

Draft Condition S4.D Action Level Exceedance Corrective Actions

The existing ***303(d)*** listings for DO throughout Puget Sound requires Ecology to prevent additional pollutant loadings that create the impairment. An action level compliance assessment occurs at every 12-month interval following the permit effective date. Ecology will use the monitoring data required under this permit and submitted via WQWebDMR to determine whether the Permittee exceeded the action level over the previous 12-month period. Permittees must also document action level exceedances in their Annual Report. Following documentation of the first exceedance, Permittees must begin to develop a strategy for reducing their effluent load by 10%. The most recent documented annual average load must be the basis for the 10% reduction. This level of reduction is consistent with the need to offset increased loads due to population growth while Ecology works to determine final effluent limits for the regional permittees. For Permittees with "bubbled" action levels, Ecology will evaluate exceedances using the cumulative TIN load totals from each WWTP owned and operated by the Permittee. If a corrective action is triggered for a jurisdiction with a bubbled action level, the Permittee must apply the 10% reduction to the bubbled total.

Strategies considered for reducing loading must include increasing production volumes of reclaimed water (if applicable to the facility), implementing side stream treatment for a portion of return flows from solids treatment, reducing influent nitrogen loads, alternative effluent disposal options and any other intermediate treatment alternative which results in decreased nitrogen loads into Puget Sound prior to major facility upgrades. Water quality offsets under Chapter WAC 173-201A-450 cannot be used for this purpose as final, numeric WQBELs have not been established.

The proposed approach to reduce effluent loads will be due in conjunction with the next annual report, 12 months after self-reporting the first action level exceedance. Permittees must submit a proposal to reduce the TIN load that addresses how to meet this 10% reduction requirement within the 1st and 2nd permit cycles (5-10 years). This proposal may need meet requirements for an engineering report (Chapter 173-240-040 WAC). An engineering report would be required for side stream treatment design and other major treatment process additions. An engineering report is not required for solutions that have been previously approved by Ecology but not yet constructed, influent load reduction, increased reclaimed water production (for a previously identified beneficial use), or other alternatives that do not result in a major process addition or change.

A second, consecutive action level exceedance requires the Permittee to immediately begin implementation of the proposal to reduce effluent loading by 10% upon Ecology's approval. The two consecutive year exceedance requirement results from acknowledgement that the

action level calculation does not include a provision to account for inter annual weather variability. When a second exceedance falls in the last year of the permit, the Permittee must still implement the preferred alternative as this requirement will bridge the period between this first permit cycle and the end of a compliance schedule for meeting final WQBELs, once established. An update to the WWTP's Operation and Maintenance manual must be provided to Ecology no later than 30 days after implementation so that facility records are kept current. Non-consecutive exceedances do not require immediate corrective action. Rather, Permittees must submit the plan for reduction by the date specified in S4.D and then implemented following a third action level exceedance during the permit term.

An action level exceedance does not constitute a permit violation provided the Permittee follows through with the corrective action requirements and satisfies the other narrative effluent limits listed in Special Condition S4.A in the draft permit, including the Annual Report requirement documenting optimization.

Annual Reporting

Ecology has developed an electronic annual report to standardize the optimization reporting requirements for Permittees. The Annual Report submittal will describe the well-documented approach the Permittee used to select and evaluate the effectiveness of the optimization strategy including a comparison of actual vs. anticipated results and the adaptive management necessary to stay below the WWTP's action level. Questions for Permittees can be found in Appendix C of the permit. Ecology encourages Permittees to begin the Annual Report several weeks ahead of the March 31st submittal date to allow plenty of time for adequate completion.

Draft Condition S4.E Nutrient Reduction Evaluation

Ecology considers planning for meeting future water quality based effluent limitations to be a BMP and part of the narrative effluent limit for this permit cycle. Compliance with this narrative limit requires submittal of the Nutrient Reduction Evaluation (NRE) by the date listed in the draft permit. LOTT does not need to complete the NRE requirement described in Condition S4.E. This treatment plant already has an effluent limit below 3 mg/L TIN in their individual NPDES permit for TIN during the critical season of April through October. In addition, the Budd Inlet TMDL, scheduled for completion in early 2022, will require compliance with the individual facility wasteload allocation upon EPA approval. No additional planning for LOTT WWTP is required at this time.

The treatment infrastructure improvements necessary to achieve final effluent limits capable of protecting water quality will require a stepwise process over several 5 year permit cycles. This is due to the time required for alternative selection, engineering design, and construction of new treatment processes in addition to financial planning. Completion of a planning exercise during this first permit term is necessary to minimize the time required to ultimately achieve final numeric effluent limits once developed.

Ecology intends to provide flexibility and incentives to address nutrients comprehensively on a watershed scale. Water quality trading as allowed under Chapter 173-201A-450 WAC will likely be part of the final solution upon establishment of numeric WQBELs for each Permittee. The NRE may include a water quality offset framework as part of the required alternatives analysis. However, Ecology must approve any formal water quality-trading framework in consultation with Tribes who have an interest in its development.

As proposed with the January 2021 preliminary draft, the NRE must consider different final treatment concentration targets for TIN. Ecology expects final numeric effluent limits for domestic WWTPs in the region to be a mix of technology and water quality based limits. Therefore, all plants subject to permit condition S4 must consider two treatment thresholds in the NRE. Unlike the preliminary draft, Ecology is not providing the upper level effluent limitation for this analysis. Permittees must determine the upper limit, analogous to a technology based effluent limitation, through the identification of AKART for nitrogen removal at their WWTP. Permittees must also assess treatment alternatives capable of meeting 3 mg/L TIN (or the equivalent load) on average, annually and seasonally, which represent possible future water quality based-effluent limits.

This planning document also requires an assessment of current treatment technology including site specific flows, loads, and population growth projections within the sewer service area for a 20 year planning period. Site-specific constraints and other treatment implementation challenges must be part of the analysis. Ecology will review and approve this plan. This report must be prepared for each WWTP specified under draft permit special condition S4. Entities that own and operate more than one WWTP may submit one comprehensive plan to satisfy this permit condition. Permittees that would like to work together may also submit a combined report that satisfies all requirements in draft condition S4.E.

The current body of knowledge regarding nutrient treatment technologies continues to evolve as researchers develop and study new microbial populations and advanced treatment processes. Section G1-5.4 of the *Criteria for Sewage Works Design* (Ecology, 2019) contains information for permittees when selecting a new or developmental treatment technology as a preferred treatment alternative. Permittees interested in evaluating a non-traditional treatment approach shall work closely with the Ecology permit manager for their individual permit early on in the scoping phase to ensure development of an appropriate pilot study that satisfies the Agency's needs for future plan approval. Ecology recommends that permittees also work with any interested third parties during scoping, project development and pilot testing. This increases situational awareness and provides an avenue for information sharing, which may help decrease risk when exploring efficacy of a new or developmental technology. Ecology encourages creative approaches to reducing nutrient loads in Puget Sound and understands the Agency will need to support any permittee that elects to pursue innovative solutions that have not yet seen full-scale implementation in the state.

Treatment Technology Analysis

First, the Permittee must conduct an AKART analysis to determine a reasonable level of treatment for nitrogen removal. The term "reasonable", in the context of AKART directly relates to affordability of an engineered treatment solution. AKART reflects the level of treatment most suited to a technology based effluent limitation.

As discussed earlier in this fact sheet, Ecology's AKART approach for nutrient removal, specifically nitrogen removal for the Puget Sound area, continues to evolve. All treatment plants must meet AKART under 90.48.010 RCW. Secondary standards in Chapter 173-221 WAC do not include nutrient requirements. All plants when initially designed and constructed met the secondary treatment regulation; however, a site-specific evaluation is now required in light of the existing DO impairments related to nutrient over enrichment in Puget Sound.

In addition to making an AKART determination, which will represent a technology based approach for controlling nitrogen, the NRE must evaluate treatment alternatives for meeting the lower limit of technology for nitrogen removal both year round and seasonally. This lower limit of technology, which Ecology estimates to be approximately 3 mg/L TIN, reflects modeling scenarios and represents a concentration Permittees may expect if required to meet a WQBEL. Early Year 1 modeling results currently in publication indicate that some treatment plants will need to meet this level of treatment to protect the receiving water. Alternative effluent management options (e.g., disposal to ground, identification of reclaimed water beneficial uses) can be considered for this alternative. As with the AKART determination, this treatment assessment must include an economic evaluation for each technology considered.

Economic Evaluation

In order to satisfy this permit condition, Permittees must develop capital, operation and maintenance costs, and net present value estimates using real discount rates in the most recent Appendix C of The White House's Office of Management and Budget Circular No. A-94 for each treatment alternative evaluated for meeting AKART and 3 mg/L TIN (or the equivalent load) on average both annually and seasonally. A cost per pound of nitrogen removed for each treatment technology is also required. The *Permit Writers Manual* (2018) contains limited guidance on how to conduct an economic evaluation for deriving effluent limits when applying AKART in Chapter 4, Section 3.12. Permit conditions to develop associated costs for proposed treatment alternatives reflect this guidance.

Permittees must also provide details regarding the basis for the current utility rate structure used to support the existing level of wastewater treatment provided to the service area. In the review of the current rate structure, Permittees need to indicate how allocations of direct costs for operation and capital expenditures are recovered from payment of utility fees, how often the rate structure is reviewed to ensure financial solvency, and the last time wastewater rates were either increased or decreased and the impetus for that change. In addition, impacts to the current rate structure for each treatment technology evaluated must be provided.

Environmental Justice Review

Ensuring environmental justice (EJ) is a priority in Washington State (SB5141 Final Bill Report) and Ecology is committed to making decisions that do not place disproportionate burdens on ***overburdened communities*** and vulnerable populations. Permittees must conduct a demographic analysis using the best available population data (such as US Census data, EPA's EJSCREEN, or DOH's WTN) within their sewer service area to identify communities color, low income populations, Tribes, and indigenous populations. And, after this analysis, Permittees must conduct an affordability assessment to identify whether wastewater utility rate increases would disproportionately impact populations with environmental justice considerations. Ecology recommends using EPA's *Financial Capability Assessment for Clean Water Act Obligations* (2021) when looking at options for assessing financial capabilities to implement requirements under the Clean Water Act.

Opportunities to set alternative wastewater rates must also be considered as part of the planning requirement in the draft permit. Permittees must propose how an alternative rate structure can be used to prevent the low-income communities identified in the initial screening from being adversely affected by rate changes. This can include an evaluation of a tiered rate structure to offset adverse effects to the lowest income populations within the sewer service area or other innovative rate structure measures (e.g., fixed vs. variable charges, efficiency oriented rate design, or usage based rates) that ensure affordability when adopting a new rate structure to support treatment upgrades. Identification of overburdened communities and barriers to affordability do not absolve jurisdictions from upgrading treatment processes to meet water quality standards. Jurisdictions must develop a solution that accommodates the need to protect the receiving water while also providing a level of service to all residents within their community. Lastly, the EJ Review must include any positive community effects that may be the result of treatment improvements identified as the preferred alternatives; these may include positive impacts to fishing and harvesting through preservation of Tribal Treaty rights, enhanced opportunities for recreation, and other improvements that may result from decreased nitrogen loads into Puget Sound.

S5. REQUIREMENTS FOR WWTPS WITH SMALL TIN LOADS

The discharge limits in S5 are described above in Rationale for Narrative Water Quality-Based Effluent Limitations and Consideration of Narrative Water Quality-Based Limits for Numeric Criteria.

Condition S5 in the draft permit pertains only the WWTPs that constitute the minority of the domestic point source nutrient load to Puget Sound. The treatment plants that are in this category are generally smaller than the largest loaders and/or have more advanced treatment in place which drives down their effluent nutrient load.

Ecology received comments on the preliminary draft permit regarding revising requirements for these WWTPs. As a result, Ecology reconsidered the approach for these plants. While the

narrative limit approach is the same for these facilities, the BMPs which constitute a narrative water quality based effluent limit under 40 CFR 122.44(k) are slightly different. Overall, Ecology found that these plants have limited capacity to implement the same BMPs as the dominant loaders. And, given the magnitude of the TIN effluent load in relation to the plants in Condition S4, Ecology determined that the requirements in the draft permit for plants in Condition S5 could be implemented at a different pace while making incremental progress in TIN load reductions.

MONITORING

Permittees subject to requirements under S5 have a monitoring schedule listed in S6.B that more accurately reflects the size of plants in this category. Monitoring frequency is limited to 1-2 times per month, depending on the parameter. Compliance with the monitoring portion of the narrative limit requires timely submittal of each discharge monitoring report.

NUTRIENT OPTIMIZATION PLAN

Permittees subject to requirements under S5 must submit the once per permit cycle Nitrogen Optimization Plan to Ecology through the electronic report requirement in S9.D by March 31, 2026. Compliance with this narrative limit requires timely submittal of a complete report. Ecology encourages Permittees to begin the electronic optimization reporting several weeks ahead of the March 31st submittal date to allow plenty of time for adequate completion. See the Optimization Approaches section under S4 of this fact sheet for suggestions of different optimization strategies available for Permittees. Permittees may work together to satisfy this requirement; however, each Permittee must complete the one-time report documenting individual facility progress through Ecology's WQWebPortal.

Action levels are not part of the narrative effluent limit for Permittees in Condition S5; therefore, there are no corrective actions for this group of Permittees. As a group, they constitute less than 1% of the cumulative domestic point source TIN load into Puget Sound. Permittees must still review their existing treatment performance, select a suite of optimization strategies for their facility, set a performance goal, implement the strategy and evaluate the implementation and document any adaptive management used to refine implementation.

AKART ANALYSIS

Permittees subject to draft permit condition S5 must complete an engineering analysis to determine what constitutes all known and reasonable treatment (AKART) for nitrogen removal at their treatment facility. Compliance with this narrative limit requires submittal of the AKART analysis by the date listed in the draft permit. Permittees may elect to complete this planning task together or separately. If electing to work together, one document may be submitted by the date listed in the permit. Also, a jointly developed document must address AKART treatment alternatives for each type of treatment plant owned and operated by Permittees working together to satisfy this permit condition.

Each of these treatment plants has an approved engineering report for their existing level of treatment, which currently meets secondary treatment requirements under Chapter 173-221 WAC. Ecology's *Permit Writer's Manual* (2018) states that AKART is "a technology based approach to limiting pollutants from wastewater discharges which requires an engineering judgement and an economic judgement."

As previously stated, Ecology expects that domestic point sources subject to coverage under this permit will be required to meet a range of final effluent TIN concentrations. While some S5 permittees may need to meet a stringent effluent concentration to address a localized impact directly associated with a specific discharge most will need to implement a less rigorous treatment technology that still goes beyond secondary requirements listed in Chapter 173-221 WAC. At this time, Ecology does not know which S5 Permittees will have to meet the lower effluent limit, which is why this grouping will be held to an AKART analysis in the draft permit, only.

This AKART analysis must include a review of current treatment technologies at the WWTP, including influent volumes and regional growth trends for the next 20 years. Alternatives for reducing effluent TIN loads must be assessed as part of this analysis. Ecology has not provided an effluent treatment target because each discharger must make the determination regarding what constitutes a 'reasonable' level of treatment for nitrogen removal.

Permittees may use elements from a previously approved planning document to satisfy this permit condition. A technical memo that references applicable sections of a previously approved document and also provides the other required plan elements may be submitted to Ecology in this instance. See the Environmental Justice Review section in this fact sheet for a description of how to meet the EJ requirements for the AKART Analysis.

S6. MONITORING REQUIREMENTS

The monitoring approach outlined in S6 is consistent with the monitoring, recording, and reporting requirements of WAC 173-220-210 and 40 CFR 122.41 and includes consideration of the certainty, risk, cost, and the objectives of the permit. Certainty provides a level of confidence that the data are representative of the pollutants in the discharge. The risk is an assessment of the environmental impacts of pollutants. The monitoring cost considers all associated monitoring expenses, such as time to sample, expense of sampling and analysis, any accreditation expenses, training and equipment requirements. The objectives define the purpose of the sampling which are to track optimization progress and better quantify total inorganic nitrogen (TIN) loads to Puget Sound.

The monitoring frequency established in this permit is consistent with WAC 173-220-210(1)(b) and 40 CFR § 122.48(b). Ecology set sampling frequencies to characterize the nature of the discharge reasonably using recommendations from the Advisory Committee convened in March 2020. Sampling frequencies based on facility size have changed from what Ecology proposed in the preliminary draft. Ecology reduced the number of monitoring categories from three to two

and reduced the required sampling based on feedback from commenters. The revised monitoring schedules will adequately characterize the discharge from both categories of WWTPs covered by the draft permit.

WASTEWATER SAMPLING REQUIREMENTS

Conditions S6.A. and S6.B. requires representative sampling of influent and effluent and authorizes sampling at locations currently defined in the permittee's individual NPDES permit to satisfy this requirement. The frequency of the analysis is broken down into different categories based on plant's size. A primary factor influencing this facility size based monitoring approach were the recommendations from the PSNGP Advisory Committee. The monitoring requirements in the draft permit gives Ecology the ability to assess the characteristics of the facility's effluent and the effectiveness of select nutrient reduction activities identified in the Nutrient Optimization Plan. If the permittee does not have an effluent flow meter, report flows following the same method used for individual permit reporting.

In addition to volumetric flow so that each Permittee can calculate loading, the draft permit contains requirements for influent and effluent monitoring of five core parameters. These include: 5-day carbonaceous biochemical oxygen demand ($CBOD_5$), total ammonia, nitrate-nitrite, total Kjeldahl nitrogen (TKN) and total organic carbon.

$CBOD_5$, a subset of BOD_5, measures the amount of dissolved oxygen required for biological oxidation of carbon compounds in a wastewater sample. Unlike BOD_5, the $CBOD_5$ analysis excludes the oxygen demand for nitrogen species and is more appropriate where plants have an incomplete conversion of ammonia to nitrate. When coupled with the BOD_5 monitoring requirement in permittee's individual NPDES permits, this parameter provides a more complete picture of the treatment performance and carbon removal. Permittees can use BOD_5 and $CBOD_5$ to track operation efficiencies by calculating percent removal using influent and effluent concentrations. This parameter can be used for optimization reporting and in future SSM scenarios.

Total ammonia the sum of ammonia (NH_3) and ammonium (NH_4^+) is the most common form of inorganic nitrogen in raw domestic wastewater. Raw domestic wastewater predominately contains ammonia due to the presence of urine. Most treatment plants oxidize ammonia into nitrate through the addition of oxygen.

Nitrate plus Nitrite when added to total ammonia yields total inorganic nitrogen (TIN), the parameter subject to regulation in the draft permit. The treatment process oxidizes inorganic nitrogen from ammonia to nitrite and nitrate, and reduces inorganic nitrogen from nitrate to nitrite, ammonia, or nitrogen gas. The treatment system biota converts inorganic nitrogen into organic nitrogen. Settled solids retain the biota in the treatment system. Wasting sludge removes settled solids with organic nitrogen from the treatment system. TIN in the effluent represents readily available nutrient that the treatment system has removed. Very little nitrate + nitrite is found in wastewater influent which is why the draft permit proposes a reduced

influent monitoring frequency. Plants must use influent and effluent TIN concentrations to help support optimization and influent source reduction. Cumulative TIN loading must also be calculated on a running monthly basis for all permittees. Dominant loaders must use this cumulative TIN load as part of the annual action level assessment in the Nitrogen Optimization Plan requirement (See draft Condition S4.C).

Total Kjeldahl Nitrogen (TKN) is an important parameter for understating nitrification efficiency and provides Permittees with the ability to evaluate the biological treatment system. Comprised of ammonia plus total ***organic nitrogen***, TKN allows the amount of organic nitrogen in a wastewater sample to be quantified. Generally, the secondary treatment process converts most of the dissolved organic nitrogen to ammonia where it is available to the biota of the treatment system. Settling removes most of the particulate organic carbon. This parameter is also valuable to Ecology for use in SSM scenarios as little to no organic nitrogen data exists for most permittees. Ecology proposes infrequent (1/month) influent and effluent TKN monitoring for all permittees in the draft permit.

Total organic carbon (TOC) provides Ecology with the ability to quantify the amount of organic, carbon containing pollution discharged from each WWTP. The Environmental Assessment Program has identified carbon as a secondary nutrient driving eutrophication in the Salish Sea. Currently, Ecology has no data on TOC from the domestic WWTPs proposed for coverage under the draft permit. Ecology intends this once per month effluent monitoring to supplement model inputs and to develop correlations with BOD_5/$CBOD_5$. SSM scenarios utilize BOD as a surrogate for available carbon. Measurements of TOC will help to refine the relationship between BOD/CBOD and available carbon.

ANALYTICAL METHODS AND QUANTITATION LEVELS

Historically, the method detection limit (MDL) was used to determine compliance as all data at or above the MDL were considered adequate for assessing compliance and supporting environmental actions. The MDL, however, is the level at which a chemical's presence or absence can be detected, and provided limited information with regard to actual concentration. Ecology uses the term "quantitation level" as equivalent to the term "minimum level of quantitation (ML)" which is used by EPA. The ML is defined by EPA as the lowest concentration of an analyte that can be measured with a defined level of confidence. This may also be called the reporting level by some laboratories. Based on Ecology's *Permit Writers Manual* (2018), the draft PSNGP defines the quantitation level as the lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that all method-specified sample, weights, volumes, and clean up procedures have been employed.

All NPDES permits require that EPA approved analytical procedures listed in 40 C.F.R. § 136 be used for permit limit compliance sampling and analysis. Permittees must also comply with the NPDES *Use of Sufficiently Sensitive Test methods for Permit application and Reporting Rule* (Federal Register 49001). This requirement mandates that when an EPA-approved method exists, the most sensitive method must be used when quantifying the pollutant in a discharge.

The draft permit requires specific analytical methods and establishes quantitation levels, consistent with Ecology's *Permit Writer's Manual.* If an alternate analytical method from 40 CFR § 136 is sufficient to produce measurable results from the sample, the Permittee may use that method for analysis. If a facility uses a contract laboratory to monitor wastewater, it must ensure that the laboratory uses the method and meets or exceeds the method detection levels required by the permit. The permit describes what to do in certain situations when the laboratory encounters matrix effects. When a facility uses an alternative method as allowed by the permit, it must report the test method and quantitation level (QL) on the discharge monitoring report.

Condition S6.C requires documentation of both influent and effluent sampling to track nutrient loads entering Washington waters of the Salish Sea and quantify results of optimization. The draft PSNGP specifies routine sampling and analysis requirements to provide Ecology with continued, representative information on the pollutants of concern in the domestic wastewater discharges.

Where the monitoring requirements of the draft permit overlap with the monitoring requirements in the individual permit, the same analytical result may be applied to both permits if the Permittee elects to use the influent and effluent monitoring locations identified in the individual permit.

Condition S6.D requires the Permittees to maintain flow measurement calibration at the frequency established by the manufacturer. Permittees must maintain calibration to ensure effluent loading nutrient load calculations are as accurate as possible.

Condition S6. E. Ecology requires facility to use a laboratory registered or accredited under provision of Chapter 173-50 WAC, Accreditation of Environmental Parameters, to prepare all monitoring data.

The 2007 Methods Update Rule (MUR) provided some flexibility to modify EPA approved method listed in 40 CFR § 136.6. This portion of the rule describes potentially allowable method modifications and requirements that analysts need to meet to use methods that incorporate some of these modifications for NPDES compliance monitoring without prior EPA approval. EPA no longer accepts applications for approval of methods that fall within the flexibilities promulgated with the 40 CFR 136.6 rule revision. According to EPA, "any method that relies on the same underlying chemistry and determinative techniques as other methods approved at 40 CFR § 136 for measurement of a given parameters is acceptable for use in NDPES compliance monitoring provided that the requirements for establishing equivalent performance documentation specified at 40 C.F.R. § 136.6 are met." Often these are referred to as EPA-Equivalent methods. Permittees must receive accreditation for these EPA equivalent methods in order to use them for monitoring and reporting required by this permit. Use of these methods for internal process control information does not require accreditation.

Condition S6.E allows for the Permittee to request a reduction of the sampling frequency after (12) months of monitoring. Permittees must submit a written request to Ecology outlining

which monitoring parameters they propose to reduce and the basis for that reduction. Ecology will look at the DMR data submitted from the beginning of the permit term to the data of the request. Ecology will grant the request only if the DMR data appear representative, consistent, and the Permittee has demonstrated that the distribution of concentrations will not change with a lower sampling frequency. Parameters with highly variable results will not be subject for reduction. If granted, Ecology will address the Permittee's monitoring change through a coverage modification rather than modifying the permit. Permittees must follow public notice requirements described in S2.D at least 60 days prior to the intended reduction effective date.

S7. DISCHARGES TO 303(D) OR TMDL WATERBODIES

The basis for the non-numeric water quality based effluent limitation approach for all Permittees is covered under *Authority to Include Non-Numeric Water Quality Based Limits.*

If EPA approves an applicable Total Maximum Daily Load (TMDL) for WWTPs owned and operated by a Permittee covered by the general permit, Ecology will address any permit requirements related to the approved TMDL in the Permittee's individual permit or through a permit modification.

S8. SOLID AND LIQUID WASTE DISPOSAL

This section is intended to ensure that handling and disposal of solid or liquid wastes do not result in a violation of applicable water quality regulations (40 CFR 122.44(k)(2), 40 CFR 125.3(g), and RCW 90.48.080., and WAC 173-216-110(1)(f)).

This permit does not require the development of a solid waste control plan nor does it authorize discharge of leachate from solid waste material.

S9. REPORTING AND RECORDKEEPING REQUIREMENTS

The reporting and recordkeeping requirements of Special Conditions S9 are based on Ecology's authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges. Reporting of monitoring results are specified in 40 CFR 122.44(i)(3 and 4) and WAC 173-226-090(3). Discharge Monitoring Reports must be submitted to Ecology even if there was no discharge. Recordkeeping requirements in the draft permit are specified in 40 CFR 122.41(j)(2) and WAC 173-220-210(2)(b). The requirements of Condition S9 will assure that Ecology records are maintained and demonstrate compliance with sampling requirements by the facility.

DRAFT CONDITION S9.C ANNUAL REPORT FOR DOMINANT LOADERS

Ecology proposes Permittees subject to condition S4 submit an Annual Report documenting optimization and adaptive management for the 2022-2027 Permit term, which is a report for

the previous calendar year to be submitted by March 31, annually. The first year Annual Report due by March 31, 2023 will cover the period from January 1, 2022 – December 31, 2022. Submittal of the Annual Report will occur through Ecology's WQWebPortal. Permittees will report on optimization strategies, treatment performance assessments and adaptive management implemented at the WWTP during each reporting period. Questions for the Annual Report pertaining to dominant loaders will document the Nitrogen Optimization Plan requirements and can be found in Appendix C of the draft permit.

DRAFT CONDITION S9.D SINGLE REPORT FOR SMALL LOADERS

Ecology proposes Permittees subject to condition S5 submit a single report documenting optimization and adaptive management for the 2022-2027 Permit term. This Report due by March 31, 2026 will cover the period from January 1, 2022 – December 31, 2025. Submittal of the Report will occur through Ecology's WQWebPortal. Permittees will report on optimization strategies, treatment performance assessments and adaptive management implemented at the WWTP during each reporting period. Draft questions for the Single Report pertaining to smallest loaders will document the Nitrogen Optimization Plan requirements and can be found in Appendix D of the draft permit.

S10. PERMIT FEES

RCW 90.48.465 requires Ecology to recover the cost of the water quality permit program. Wastewater fees are established through a rule development process that includes the input of stakeholders, interested parties, and an advisory committee and includes an outreach process. Any new fee proposal will provide public comment opportunity in amending the existing fee regulation (Chapter 173-224 WAC).

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all NPDES permits issued by Ecology.

CONDITION G1 requires discharges and activities authorized by the draft permit to be consistent with the terms and conditions of the permit in accordance with 40 CFR 122.41.

CONDITION G2 requires responsible officials or their designated representatives to sign submittals to Ecology in accordance with 40 CFR 122.22, 40 CFR 122.22(d), WAC 173-220-210(3)(b), and WAC 173-220-040(5).

CONDITION G3 requires the Permittee to allow Ecology to access the facility and conduct inspections of the facility and records related to the permit in accordance with 40 CFR 122.41(i), RCW 90.48.090, and WAC 173-220-150(1)(e).

CONDITION G4 identifies conditions that may result in modifying or revoking the general permit in accordance with 40 CFR 122.62, 40 CFR 124.5, and WAC 173-226-230.

CONDITION G5 identifies conditions for revoking coverage under the general permit in accordance with 40 CFR 122.62, 40 CFR 124.5, WAC 173-226-240, WAC 173-220-150(1)(d), and WAC 173-220-190.

CONDITION G6 requires the Permittee to notify Ecology when facility changes may require modification or revocation of permit coverage in accordance with 40 CFR 122.62(a), 40 CFR 122.41(l), and WAC 173-220-150(1)(b).

CONDITION G7 prohibits the Permittee from using the permit as a basis for violating any laws, statutes or regulations in accordance with 40 CFR 122.5(c).

CONDITION G8 requires the Permittee to reapply for coverage 180 days prior to the expiration date of this general permit in accordance with 40 CFR 122.21(d), 40 CFR 122.41(b), and WAC 183-220-180(2).

CONDITION G9 identifies the requirements for transfer of permit coverage in accordance with 40 CFR 122.41(l)(3) and WAC 173-220-200. When control or ownership of the facility from which the authorize discharge emanates changes, the new ***owner*** must obtain permit coverage, either through a transfer of permit coverage per Condition G9, or by applying for the permit per Condition S2.

CONDITION G10 prohibits the reintroduction of removed substances back into the effluent in accordance with 40 CFR 125.3(g), RCW 90.48.010, RCW 90.48.080, WAC 173-220-130, and WAC 173-201A-240.

CONDITION G11 requires Permittees to submit additional information or records to Ecology when necessary in accordance with 40 CFR 122.41(h).

CONDITION G12 incorporates all other requirements of 40 CFR 122.41 and 122.42 by reference.

CONDITION G13 notifies the Permittee that additional monitoring requirements may be established by Ecology in accordance with 40 CFR 122.41(h).

CONDITION G14 describes the penalties for violating permit conditions in accordance with 40 CFR 122.41(a)(2).

CONDITION G15 provides the regulatory context and definition of "***Upset"*** in accordance with 40 CFR 122.41(n).

CONDITION G16 specifies that the permit does not convey property rights in accordance with 40 CFR 122.41(g).

CONDITION G17 requires the Permittee to comply with all conditions of the permit in accordance with 40 CFR 122.41(a).

CONDITION G18 requires the Permittee to comply with more stringent toxic effluent standards or prohibitions established under Section 307(a) of the Clean Water Act in accordance with 40 CFR 122.41(a)(1), WAC 173-220-120(5), and WAC 173-201A-240.

CONDITION G19 describes the penalties associated with falsifying or tampering with monitoring devices or methods in accordance with 40 CFR 122.41(j)(5).

CONDITION G20 requires Permittees to report planned changes in accordance with 40 CFR 122.41(l)(1).

CONDITION G21 requires Permittees to report any relevant information omitted from the permit application in accordance with 40 CFR 122.41(l)(8).

CONDITION G22 requires Permittees to report anticipated non-compliances in accordance with 40 CFR 122.41(l)(2).

CONDITION G23 defines appeal options for the terms and conditions of the general permit and of coverage under the permit by an individual discharger in accordance with RCW 43.21B and WAC 173-226-190.

CONDITION G24 invokes severability of permit provisions in accordance with RCW 90.48.904.

CONDITION G25 prohibits ***bypass*** unless certain conditions exist in accordance with 40 CFR 122.41(m).

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

Ecology may modify the PSNGP to impose numerical limitations, if necessary to meet water quality standards for surface waters based on new information obtained from sources such effluent monitoring and model scenario results.

Ecology may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

The draft PSNGP meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. Ecology proposes that this permit be issued for five (5) years.

ECONOMIC IMPACT ANALYSIS

In accordance with WAC 173-226-120, Ecology did not prepare an economic impact analysis for the draft general permit as the permit does not propose to directly cover small business.

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Significant agency actions from Ecology's Water Quality Program prepared after June 12, 2014 must follow requirements in RCW 34.05.272 and categorize all references used during development. A bracketed number indicating the source category follows each individual reference. Document categories are as follows:

1. Peer review is overseen by an independent third party.
2. Review is by staff internal to Department of Ecology.
3. Review is by persons that are external to and selected by the Department of Ecology.
4. Documented open public review process that is not limited to invited organizations or individuals.
5. Federal and state statutes.
6. Court and hearings board decisions.
7. Federal and state administrative rules and regulations
8. Policy and regulatory documents adopted by ***local governments***.
9. Data from primary research, monitoring activities, or other sources, but that has not been incorporated as part of documents reviewed under other processes.
10. Records of best professional judgment of Department of Ecology employees or other individuals.
11. Sources of information that do not fit into one of the other categories listed.

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Natural Resources Defense Council, Inc. v. Douglas M. Costle, 568 F.2d 1369 (D.C. Cir. 1977*)* [6]

Natural Resources Defense Council, Inc. v. EPA, 673 F.2d 400, 403 (D.C. Cir. 1982) [6]

Natural Resources Defense Council, Inc v. EPA, 822 F.2d 104, 122-24 (D.C. Cir. 1987) [6]

Waterkeeper Alliance, Inc. v. U.S.E.P.A, 399 F.3d 486 (2d Cir. 2005) [6]

Citizens Coal Council v. U.S.E.P.A, 447 F.3d 879 (6th Cir. 2006) [6]

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40 CFR 122: EPA Administered Permit Programs: The National Pollutant Discharge Elimination System [7]

40 CFR 122.21: Application for a Permit[7]

40 CFR 122.41: Conditions Applicable to all Permits [7]

40 CFR 122.44: Establishing limitations, standards, and other permit conditions [7]

40 CFR 122.48: Requirements for recording and reporting of monitoring results [7]

40 CFR 122.62: Modification or revocation and reissuance of permits [7]

40 CFR 125.3: Technology-based treatment requirements in permits [7]

40 CFR 131.45: Revision of Certain Federal Water Quality Criteria Applicable to Washington [7]

40 CFR 136: Guidelines Establishing Test Procedures for the Analysis of Pollutants [7]

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Chapter 34.05 RCW: Administrative Procedures Act [7]

Chapter 43.21B RCW: Environmental and Land Use Hearings Office – PCHB [7]

Chapter 43.21C RCW: State environmental policy [7]

Chapter 90.48 RCW: Water Pollution Control [7]

Chapter 90.52 RCW: Pollution Disclosure Act of 1971 [7]

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Chapter 173-50 WAC: Accreditation of Environmental Laboratories [5]

Chapter 173-200 WAC: Water Quality Standards for Groundwaters of the State of Washington [5]

Chapter 173-201A WAC: Water Quality Standards for Surface Waters of the State of Washington[5]

Chapter 173-204 WAC: Sediment Management Standards [5]

Chapter 173-216 WAC: State Waste Discharge Permit Program [5]

Chapter 173-220 WAC: National Pollutant Discharge Elimination System Permit Program [5]

Chapter 173-221 WAC: Discharge Standards and Effluent Limitations for Domestic Wastewater Facilities [5]

Chapter 173-224 WAC: Water Quality Permit Fees [5]

Chapter 173-226 WAC: Waste Discharge General Permit Program [5]

Chapter 173-240 WAC: Submission of Plans and Reports for Construction of Wastewater Facilities [5]

Chapter 197-11-855 WAC: SEPA Rules for the Department of Ecology [5]

Chapter 371-08 WAC: Pollution Control Hearings Board – Practices and Procedure [5]

APPENDIX A - PUBLIC INVOLVEMENT INFORMATION

Ecology has tentatively determined to issue the Puget Sound Nutrient General Permit for municipal wastewater discharges as identified in Special Condition S1, Permit Coverage.

Ecology publishes a Public Notice of Draft (PNOD) to inform the public that the draft permit and fact sheet are available for review and comment. Ecology will publish the PNOD on June 16, 2021, in the Washington State Register and on the Ecology web site (below). The PNOD informs the public that the draft permit and fact sheet are available for review and comment.

Ecology will also mail or email the notice to those identified as interested parties.

Copies of the draft general permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at Ecology's regional offices listed below or may be obtained from Ecology's website or by contacting Ecology by mail, phone, fax or email:

Internet: https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Nutrient-Permit

Contact Ecology:
Eleanor Ott
Department of Ecology
PO Box 47600
Olympia, WA 98504-7600
Telephone: (360) 407-6433 (office)
FAX: (360) 407-6426
E-mail: eleanor.ott@ecy.wa.gov

Southwest Regional Office

Water Quality Program
300 Desmond Drive
Lacey, Washington 98503
Phone: (360) 407-6300

Northwest Regional Office

Water Quality Program
3190 - 160th Avenue SE
Bellevue, Washington 98008
Phone: (425) 649-7000

Ecology will accept written comments on the draft Puget Sound Nutrient General Permit, Fact Sheet, and related documents from June 16, 2021 through August 2, 2021 (midnight); written comments must be postmarked or e-mailed no later than midnight August 2, 2021. Comments should reference specific permit conditions or text or when possible, and may address the following topics:

- Technical issues.
- Accuracy and completeness of information.

- The scope of proposed coverage.
- Adequacy of environmental protection and permit conditions.
- Any other concern that would result from issuance of the draft permit.

Ecology prefers comments be submitted by the eComment form located at:

https://wq.ecology.commentinput.com/?id=QFkVE

Written comments must be postmarked no later than midnight on August 2, 2021. Submit written comments to:

Eleanor Ott

Water Quality Program

Department of Ecology

PO Box 47600

Olympia, WA 98504-7600

eleanor.ott@ecy.wa.gov

Ecology will also conduct workshops and public hearings to provide an opportunity for interested parties to give formal oral testimony and comments on the draft permit. The public hearing will immediately follow the public workshop:

Tuesday, July 20, 2021 9:30 AM
Webinar* Join the webinar at
https://watech.webex.com/watech/onstage/g.php?MTID=e8eac5891993f6c06ee701b3dbf290f49

Wednesday, July 21, 2021 5:30 PM
Webinar* Join the webinar at
https://watech.webex.com/watech/onstage/g.php?MTID=e52cb968b9cc7ab3e15aa9f4f269e1ba2

*Both workshops and hearings will be offered via webinar where individuals may view the presentation and provide testimony via computer or mobile device.

Public notice regarding the hearing will be circulated at least thirty (30) days in advance of the hearings. Persons expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Further information may be obtained by contacting Eleanor Ott at Ecology, by phone at (360) 280-5624, by email at eleanor.ott@ecy.wa.gov, or by writing to Ecology's Olympia address listed above.

APPENDIX B - GLOSSARY

303(d) – Section 303(d) of the federal Clean Water Act requires states to develop a list of polluted waterbodies every two years. For each of those waterbodies, the law requires states to develop Total Maximum Daily Loads (TMDLs). A TMDL is the amount of pollutant loading that can occur in a given waterbody (river, marine water, wetland, stream, or lake) and still meet water quality standards.

40 CFR – Title 40 of the Code of Federal Regulations, which is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government.

Action Level– An indicator value used to determine the effectiveness of best management practices at a WWTPs. Action levels are not water quality criteria or effluent limits by themselves but indicators of treatment optimization.

Active status - Refers to the permit coverage status when a Notice of Intent form has been submitted to and approved by Ecology.

AKART – An acronym for "all known, available, and reasonable methods of prevention, control, and treatment" AKART represents the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants and controlling pollution associated with a discharge. Described in chapters 90.48 and 90.54 RCW and chapter 173-201A, 173-204, 173-216, 173-220, and 173-221 WAC.

Alternative Restoration Plan – A near-term plan, or description of actions, with a schedule and milestones, that is more immediately beneficial or practicable to achieving water quality standards.

Antidegradation – The antidegradation policy of the state of Washington as generally guided by Chapters 90.48 and 90.54 RCW is applicable to any person's new or increased activity.

Beneficial Use – Identified uses of waters of the state shall include uses for domestic water, irrigation, fish, shellfish, game, and other aquatic life, municipal, recreation, industrial water, generation of electric power, and navigation.

Best Management Practices (BMPs) – Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs also include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Bypass – The intentional diversion of waste streams from any portion of a treatment facility.

Clean Water Act (CWA) – The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Critical Condition – The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Designated Uses – Those uses specified in this chapter for each water body or segment regardless of whether or not the uses are currently attained.

Discharge – The release of treated wastewater from a treatment plant outfall.

Discharger – An owner or operator of any facility or activity subject to regulation under Chapter 90.48 RCW or the Federal Clean Water Act.

Director – The Director of the Washington Department of Ecology or his/her authorized representative.

Dissolved Oxygen (DO) – A measure of how much free, non-compounded oxygen is present in water and available to living aquatic organisms.

Domestic Wastewater (Also municipal wastewater) - means water carrying human wastes, including kitchen, bath, and laundry wastes from residences, buildings, industrial establishments, or other places, together with such ground water infiltration or surface waters as may be present.

Ecology – The Washington State Department of Ecology

Eutrophication – excessive richness of nutrient in a body of water, frequently due to human sources which cause a dense growth of plant life and death of animal life from lack of oxygen

Facility – A wastewater treatment plant or publicly owned treatment work.

General Permit – A permit which covers multiple dischargers of a point source category within a designated geographical area, in lieu of individual permits being issued to each discharger.

Greater Puget Sound Region – The term to describe the marine area where human nutrient loads, from Washington Waters of the Salish Sea, contribute to waters not meeting marine DO standards. The GPS region include the Northern Bays (Bellingham, Samish, and Padilla Bays) as well as Puget Sound Proper, which are the marine waters south of the entrance of Admiralty Inlet (Whidbey Basin, Main Basin, South Sound, and Hood Canal). Regional human nutrient loads discharged directly to the Strait of Juan de Fuca and Strait of Georgia contribute to impairments in GPS (Ahmed et al., 2019).

Ground Water – A saturated zone or stratum beneath the land surface or a surface water body.

Impaired Waters (also **303(d) listed waters** or **impairments) –** Listed waters refers to the specific segment of a waterbody listed as not meeting water quality criteria by the State as required under Section 303(d) of the Clean Water Act. The most current list of impaired waters is the applicable list.

Jurisdiction – A political unit such as a city, town or county; incorporated for local self-government.

Load Allocation - The portion of a receiving water's loading capacity that is allocated to one of its existing or future non-point sources of pollution.

Local Government – Any county, city, or town having its own government for local affairs.

Marine Point Source – Point sources (see "point source" definition below) that discharge specifically to, or in close proximity to, marine waters. Marine point sources are included as inputs into the Salish Sea Model and are "Permittees."

Mixing Zone – An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the state from point sources.

Notice of Intent (NOI) means the application for, or a request for coverage under this General Permit pursuant to WAC 173-226-200.

Noncompliance – The inability to comply with any of the terms and conditions of the permit which causes a threat to human health or the environment.

Operator – Any individual who performs routine duties, onsite at a wastewater treatment plant that affect plant performance or effluent quality.

Operator in Responsible Charge – The individual who is designated by the owner as the person routinely onsite and in direct charge of the overall operation and maintenance of a wastewater treatment plant.

Optimization (also treatment optimization) – A best management practice (BMP) resulting in the refinement of WWTP operations that lead to improved effluent water quality and/or treatment efficiencies.

Organic Nitrogen – Nitrogen chemically bound I organic molecules, such as proteins, amines, and amino acids. Can be measured as part of the Total Kjeldahl Nitrogen analysis.

Overburdened Communities – A geographic area where vulnerable populations face combined, multiple environmental harms and health impacts, and includes, but is not limited to, highly impacted communities as defined in RCW 19.405.020.

Owner – A town or city, a county, a sewer district, board of public utilities, association, municipality or other public body.

Permit – An authorization, license, or equivalent control document issued by the director.

Permittee – An entity that receives notice of coverage under this general permit.

pH – The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral. Large variations above or below this value are considered harmful to most aquatic life.

Point Source – Any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, and container from which pollutants are or may be discharged to surface waters of the state. This term does not include return flows from irrigated agriculture.

Pollutant - Means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, domestic sewage sludge (biosolids), munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste. This term does not include sewage from vessels within the meaning of section 312 of the CWA, nor does it include dredged or fill material discharged in accordance with a permit issued under section 404 of the CWA.

Pollution – The contamination or other alteration of the physical, chemical, or biological properties of waters of the state; including change in temperature, taste, color, turbidity, or odor of the waters; or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the State as will or is likely to create a nuisance or render such waters harmful, detrimental or injurious to the public health, safety or welfare; or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or to livestock, wild animals, birds, fish or other aquatic life.

Publicly Owned Treatment Work (POTW) – A sewage treatment plant that is owned and usually operated by a municipality or other public agency.

Puget Sound Nutrient Forum (PSNF) – Formed by Ecology in 2017 as a large public advisory group to support the Puget Sound Nutrient Source Reduction Project and discuss, learn, and provide input on how to reduce human sources of nutrients enters the greater Puget Sound region.

Puget Sound Nutrient Source Reduction Project (PSNSRP)– A collaborative effort with Puget Sound communities and stakeholder to address human sources of nutrients.

Reasonable potential – The likelihood of a pollutant to cause or contribute to an excursion of a water quality standard.

Receiving Water – The waterbody at the point of discharge.

Salish Sea – Puget Sound, Strait of Georgia, and Strait of Juan de Fuca, including their connecting channels and adjoining waters.

Salish Sea Model (SSM) (also *model*) **–** A predictive costal ocean model for estuarine research, restoration planning, water-quality management, and climate change response assessment developed by PNNL in conjunction with Ecology.

SEPA (State Environmental Policy Act) - The Washington State Law, RCW 43.21C.020, intended to prevent or eliminate damage to the environment.

Site – The land area where any "facility" is physically located.

Surface Waters of the State (also surface water) **–** Lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Technology-based Effluent Limit (TBEL)– A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Daily Maximum Load (TMDL) – A calculation of the maximum amount of a pollutant that a waterbody can receive and still meet State water quality standards, a TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources.

Total Inorganic Nitrogen (TIN) – The sum of ammonia, nitrate and nitrite. It includes dissolved and particulate fractions.

Total Kjeldahl Nitrogen (TKN) – The combined amount of organic and ammonia nitrogen.

Total Organic Carbon (TOC) – The amount of carbon bound in organic compounds in a sample. Because all organic compounds have carbon as the common element, total organic carbon measurements provide a fundamental means of assessing the degree of organic pollution.

Total Suspended Solids (TSS) – An analytical laboratory measurement of the concentration of solids suspended in water.

Upset – An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

USEPA (also EPA) – United States Environmental Protection Agency.

Washington Waters of the Salish Sea – Areas of the Salish Sea subject to Washington State's Water Pollution Control Act (Chapter 90.48 RCW).

Wasteload Allocation (WLA) – The portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality based effluent limitation (40 CFR 130.2(h)).

Watershed inflow – A freshwater pathway that delivers nutrients and drains watershed areas and represent the delivery of flow and nutrient inputs into the Salish Sea Model. In the

model, these estimates are for the mouth of each river, stream or watershed and represent loading at the point at which the freshwater inflow enters the Salish Sea. These estimates include but do not distinguish between various upstream point and nonpoint sources in the watersheds that contribute to loading at the mouth.

Water Quality – The chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose.

Water Quality-based Effluent Limit (WQBEL) – A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into receiving water.

Water quality standards – The state of Washington's water quality standards for surface waters of the state, which are codified in chapter 173-201A WAC or ground waters of the state, which are codified in chapter 173-200 WAC.

Waters of the State – Those waters as defined as "waters of the United States" in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and "waters of the state" as defined in Chapter 90.48 RCW which include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters and all other surface waters and water courses within the jurisdiction of the state of Washington.

APPENDIX C – RESPONSE TO COMMENTS

This Response to Comments addresses comments received on the formal draft of the Puget Sound Nutrient General Permit and addresses changes made to the formal draft based upon comments received. It is included as Appendix C to the Fact Sheet for the Puget Sound Nutrient General Permit and will be published as a separate document on the permit webpage.

The public comment period for this permit began on June 16, 2021 and lasted until 11:59 p.m. of August 2, 2021, as noted in Appendix A.

APPENDIX D – PERMITTEE CATEGORY DETERMINATION

Ecology used single sample 2019 DMR data to determine the average daily load for each Permittee subject to coverage under the proposed permit. This exercise determined whether Permittees qualify as either a dominant or a small TIN loader based on the TIN loading magnitude relative to all Permittees subject to permit coverage. Dominant loaders equate to approximately 99% of the total TIN load from domestic WWTPs and are subject to draft permit condition S4. Permittees under 100 lbs/day equate to approximately 1% of the total TIN load from domestic WWTPs and are subject to draft permit condition S5.

Wastewater Treatment Plant	Individual NPDES Permit Number	2019 Nutrient Loading, Lbs/Day	Cumulative Nutrient Loading, Lbs/day	% of Total Cumulative Load
Metro West Point	WA0029181	18,290	18,290	25.6%
King County South Treatment Plant	WA0029581	17,075	35,365	49.6%
Tacoma Central No. 1	WA0037087	6,058	41,423	58.1%
Chambers Creek WWTP	WA0039624	5,027	46,450	65.1%
King County Brightwater WWTP	WA0032247	4,982	51,432	72.1%
Everett STP	WA0024490	3,636	55,068	77.2%
Post Point Plant (Bellingham)	WA0023744	2,351	57,419	80.5%
Marysville City Public Works	WA0022497	1,362	58,781	82.4%
Lakota WWTP, Lakehaven Utility District	WA0022624	1,291	60,072	84.2%
Bremerton STP	WA0029289	1,095	61,167	85.8%

Wastewater Treatment Plant	Individual NPDES Permit Number	2019 Nutrient Loading, Lbs/Day	Cumulative Nutrient Loading, Lbs/day	% of Total Cumulative Load
Tacoma North No. 3	WA0037214	933	62,100	87.1%
Lynnwood City WWTP	WA0024031	879	62,979	88.3%
Midway Sewer District	WA0020958	877	63,856	89.5%
Mt Vernon WWTP	WA0024074	875	64,731	90.8%
Edmonds STP	WA0024058	864	65,595	92.0%
Miller Creek WWTP	WA0022764	616	66,211	92.8%
LOTT WWTF	WA0037061	601	66,812	93.7%
Port Orchard WWTP	WA0020346	506	67,318	94.4%
Blaine STP Lighthouse Point [1]	WA0022641	502	67,820	95.1%
Central Kitsap Treatment Facility	WA0030520	474	I 68,294	95.8%
Salmon Creek WWTP	WA0022772	467	68,761	96.4%
Port Angeles STP	WA0023973	466	69,227	97.1%
Redondo WWTP	WA0023451	440	69,667	97.7%
Anacortes WWTP	WA0020257	373	70,040	98.2%
Lake Stevens Sewer District WWTP	WA0020893	309	70,349	98.6%
Snohomish STP	WA0029548	185	70,534	98.9%

Wastewater Treatment Plant	Individual NPDES Permit Number	2019 Nutrient Loading, Lbs/Day	Cumulative Nutrient Loading, Lbs/day	% of Total Cumulative Load
Birch Bay STP	WA0029556	169	70,703	99.1%
Alderwood WWTP	WA0020826	96	70,799	99.3%
Oak Harbor STP	WA0020567	84	70,883	99.4%
Gig Harbor STP	WA0023957	71	70,954	99.5%
La Conner STP	WA0022446	55	71,009	99.6%
Shelton City WWTP	WA0023345	45	71,054	99.6%
Port Townsend City WWTP	WA0037052	38	71,092	99.7%
Eastsound Sewer And Water District WWTP	WA0030571	26	71,118	99.7%
Kitsap County Manchester	WA0023701	24	71,142	99.8%
Stanwood STP	WA0020290	20	71,162	99.8%
Coupeville Town STP	WA0029378	19	71,180	99.8%
Kitsap County Sewer Dist 7	WA0030317	18	71,198	99.8%
Mukilteo WWTP	WA0023396	17	71,215	99.9%
Sequim STP	WA0022349	15	71,230	99.9%
Friday Harbor STP	WA0023582	13	71,243	99.9%

Wastewater Treatment Plant	Individual NPDES Permit Number	2019 Nutrient Loading, Lbs/Day	Cumulative Nutrient Loading, Lbs/day	% of Total Cumulative Load
WA Doc McNeil Island STP	WA0040002	10	71,253	99.9%
Bainbridge Island City Of Bainbridge	WA0020907	10	71,263	99.9%
WA Doc Clallam Bay Corrections Center Cc	WA0039845	9	71,272	99.9%
Boston Harbor STP	WA0040291	7	71,279	100.0%
Langley STP	WA0020702	7	71,286	100.0%
Skagit Co. #2, Big Lake	WA0030597	6	71,292	100.0%
Tamoshan STP	WA0037290	5	71,297	100.0%
Penn Cove WWTP	WA0029386	4	71,301	100.0%
Sekiu STP	WA0024449	4	71,305	100.0%
Kingston WWTP Kitsap County	WA0032077	3	71,308	100.0%
Hartstene Pointe STP	WA0038377	2	71,310	100.0%
Vashon STP	WA0022527	2	71,312	100.0%
Fisherman Bay STP	WA0030589	1	71,313	100.0%
WA Parks Larrabee State Park	WA0023787	0.3	71,313	100.0%
Clallam Bay STP	WA0024431	-	71,313	100.0%

Wastewater Treatment Plant	Individual NPDES Permit Number	2019 Nutrient Loading, Lbs/Day	Cumulative Nutrient Loading, Lbs/day	% of Total Cumulative Load
Eastsound Orcas Village WWTP	WA0030911	-	71,313	100.0%
Rustlewood STP	WA0038075	-	71,313	100.0%

[1] The Lighthouse Point WRF DMR data included nutrients starting in mid-2019 so Ecology used part of 2020 data to allow evaluation of a full year.

APPENDIX E – DATA USED IN ACTION LEVEL CALCULATIONS

Ecology used all representative DMR data available for individual WWTPs subject to coverage under the proposed permit to determine the facility specific action level. Revisions to action levels between the preliminary draft and the formal draft reflect the reviews conducted by each WWTP and their permit manager.

Wastewater Treatment Plant	Action Level, TIN lbs/year	Data Range Used in Calculation	Notes
Anacortes WWTP	163,000	1/1/16-3/31/19	
Birch Bay Sewage Treatment Plant (STP)	64,600	1/4/17-1/1/20	
Blaine STP (Lighthouse Point WRF)	18,200	7/2/2019 – 6/2/2020	2020 data included to complete 12 months
Bremerton WWTP	577,000	12/1/18-12/31/19	
Kitsap County Central Kitsap WWTP	250,000	8/1/17-12/31/19	
Chambers Creek WWTP	1,880,000	10/1/13-3/31/18	Data after 3/2018 excluded due to pilot testing at facility
Edmonds STP	419,000	6/1/2014-3/1/2020	Data range to capture historic variability, excluding flow from 2020 pandemic with outlier removed and missing value added per

Wastewater Treatment Plant	Action Level, TIN lbs/year	Data Range Used in Calculation	Notes
			City comments dated 3/15/21
Everett STP	1,530,000	11/1/15-3/1/20	Bootstrap set 2nd season Jul-Oct to prevent oversampling of seasonal monitoring data that had been collected at a higher frequency.
King County Brightwater WWTP	1,810,000	10/1/17-9/30/20	Date range with complete single sample data available in PARIS. Range provides 152 data points for all parameters.
King County South WWTP	7,340,000	10/1/17-9/30/20	Limited to most recent 36 months due to abundance of available data. Range provides 355 data points for ammonia and 268 data points for nitrate/nitrite.
King County West Point WWTP	6,670,000	10/1/17-9/30/20	Limited to most recent 36 months due to abundance of available data

Wastewater Treatment Plant	Action Level, TIN lbs/year	Data Range Used in Calculation	Notes
			and known treatment plant issues in early 2017. Range provides 136 data points for ammonia and 36 data points for nitrate/nitrite.
Lake Stevens Sewer District WWTP	118,000	1/5/16-11/3/20	
Lakota WWTP	583,000	1/1/17-10/31/20	
LOTT Budd Inlet WWTF	243,000	1/1/18-12/31/20	
Lynnwood STP	341,000	11/1/13-3/1/20	Data range to capture historic variability
Marysville STP	577,000	1/1/15-10/20/20	
Midway Sewer District WWTP	601,400	1/1/16-2/1/20	Did not include 2020 data due to unrepresentative airport flows during pandemic. Adjusted load to account for grab sampling method; Dual sample and reevaluate 1 year from effective.

Wastewater Treatment Plant	Action Level, TIN lbs/year	Data Range Used in Calculation	Notes
Miller Creek WWTP	289,900	10/22/13-10/13/20	
Mt Vernon WWTP	380,000	1/1/17-2/29/20	
Port Angeles WWTP	170,000	1/4/16-10/26/20	
Port Orchard WWTP (South Kitsap WRF)	208,000	1/1/17-12/31/19	
Post Point WWTP (Bellingham STP)	969,000	1/02/17-3/2/20	Normalized to end of March 2020
Redondo WWTP	241,000	8/1/13-10/31/20	
Salmon Creek WWTP	195,000	4/8/13-10/13/20	
Snohomish STP	78,900	7/1/13-9/30/20	Use all data to capture historic variability
Tacoma Central No. 1 WWTP	2,410,000	8/1/14-10/31/20	
Tacoma North No. 3 WWTP	336,000	9/1/14-10/31/20	