# King County Department of Natural Resources and Parks

King County Department of Natural Resources and Parks is submitting comment for the Draft Puget Sound Nutrient General Permit. Thank you.

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**Department of**
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August 16, 2021

Attn: Eleanor Ott, PSNGP Permit Writer
Washington State Department of Ecology
Water Quality Program
P.O. Box 47600
Olympia, WA 98504-7600

Comment Letter in Response to the Draft Puget Sound Nutrients General Permit (June 16, 2021).

Dear Ms. Ott,

On behalf of the King County Department of Natural Resources and Parks (DNRP), thank you for the opportunity to comment on the Washington State Department of Ecology (Ecology) "*Draft Puget Sound Nutrient General Permit*" (PSNGP) for municipal wastewater treatment facilities that discharge directly to Puget Sound. We appreciate the additional time to complete these comments.

**King County shares Ecology's goal to protect and improve conditions across Puget Sound.** We are committed to using science to identify solutions to achieve the desired environmental outcomes for Puget Sound, as quickly and cost-effectively as possible. The processes to date and the PSNGP itself do not meet a high scientific standard, do not demonstrate the PSNGP will meet the desired outcome, and cannot be implemented quickly nor cost effectively. Additional work involving stakeholders from across the region must be done to inform and guide any new regulatory requirements.

Addressing marine water quality impairments in Puget Sound requires an integrated, ecosystem-based approach. By focusing only on nutrient reduction at wastewater treatment plants, as described in the PSNGP, we will not address the most critical water quality problems in Puget Sound such as loss of habitat, rising temperature, and contaminated stormwater. The requirements for new, large-scale infrastructure in the PSNGP will also likely take decades to build and will not yield the more immediate and meaningful results Puget Sound urgently needs.

**Reducing nutrients where it matters requires a comprehensive, validated assessment.** New regulations should be grounded in thoroughly evaluated science and confirmed by third-party independent scientific and engineering reviews. Puget Sound is a complex system with nutrient inputs from the ocean, land, and human sources. The assessment must take into consideration the impacts of climate change, which could drastically modify the conditions that we observe in Puget Sound today. This may be especially true in the shallow bays Ecology is hoping to improve with these regulations.

We acknowledge that wastewater treatment plants are one source of anthropogenic nitrogen, but Ecology has not validated that one standard applied across the Puget Sound will improve dissolved oxygen in the shallow bays. The most effective solutions will likely require a combination of point source reductions, and non-point source reductions such as filtering and reducing runoff from farmland and urban landscapes, ensuring septic systems are functioning effectively, restoring wetlands, protecting natural lands, promoting healthy forest soils that act as filters, and offering incentives to complement regulations.

**Investments need to achieve the desired outcomes and be affordable.** The facilities and services required by the PSNGP represent the single largest water quality investment King County will make over the next several decades. King County is currently planning to spend more than $9 billion dollars in the next decade to protect water quality, restore habitat, and recover salmon. Many of these investments are already underway. At the same time, King County's Clean Water Plan process is working to further define investments in the regional wastewater system for the decades ahead.

As proposed, this permit will cost King County ratepayers an additional $9 to 14 billion in 2020 dollars. King County's wholesale sewer rates are already forecasted to double (from $50 to $100 per month) in the next ten years to fund water quality investments and maintain and enhance our current system. The cost to implement the PSNGP would be added on top of those obligations. This will significantly increase sewer rates (potentially up to $250 per month), impacting homeowners, renters, and businesses, especially those people in overburdened communities who are already struggling from our region's high housing costs. We recognize our role in funding the wastewater system, but our ratepayers also need to know those investments will lead to measurable water quality improvements and be affordable.

**We need to get this right.** We ask that this permit process be paused so that Ecology can consider this input including analyzing the legal questions raised herein and by others. This includes whether a general permit is legally allowed when wastewater treatment facilities are already comprehensively regulated through individual permits. Also, before embarking on a regulatory effort of this magnitude, Ecology should first complete a Total Maximum Daily Load (TMDL) for Puget Sound with a focus on at-risk embayments, complete the Nutrient Management Plan, conduct additional outreach to affected agencies and communities, engage a diverse array of regional stakeholders, and analyze the effectiveness of alternatives.

Beyond statutory compliance, completing these necessary pre-requisites before establishing stringent single parameter-based effluent limits would have the added benefit of providing a more comprehensive analysis of needs for Puget Sound. Such a process would also develop comprehensive solutions for all pollutant sources that contribute to water quality impairments and provide an opportunity for innovative solutions such as water quality trading.
The TMDL process contemplated by section 303(d) of the Clean Water Act would enable Ecology to focus on the specific needs and circumstances of key impaired water bodies within Puget Sound, and to develop a tailored response to particular waterbodies with measurable and science-based outcomes. King County stands ready today to participate in and support these endeavors to ensure that they are completed with the necessary scientific rigor as quickly as possible.

We believe there are innovative solutions that combine rigorous science, performance metrics, and multiple strategies within a comprehensive regulatory framework, and we should identify and learn from successful examples elsewhere. An effort such as this could be led by a new consortium of regulators, utilities, tribes, scientists, and other interested stakeholders that would direct a robust monitoring program and identify early actions that could be implemented quickly while the more comprehensive process is underway.

We share your responsibility to protect and restore the near and long-term health of Puget Sound. Please find attached detailed comments on the PSNGP and associated Fact Sheet. If you have any questions, please contact Rebecca Singer at rebecca.singer@kingcounty.gov or 206-477-5600.

Sincerely,

DocuSigned by:
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Christie True
Director
King County Department of Natural Resources and Parks

Attachments; 1

# King County Comments on the Draft Puget Sound Nutrient General Permit and Fact Sheet

## Introduction

King County has prepared a summary of comments for the Draft Puget Sound Nutrient General Permit and the associated Fact Sheet. We offer specific comments on seven areas: 1) The science and model use; 2) operational considerations; 3) action levels and relationship to other permits, 4) costs and rates; 5) regulatory concerns associated with the use of a general permit and the need to complete a Total Maximum Daily Load; 6) nutrient reduction measures and source control; and 7) completing the Nutrient Management Plan and promoting innovation.

Find our detailed comments in the attached:

- Appendix A: King County Comments on the Draft Puget Sound Nutrient General Permit
- Appendix B: King County Comments on the Puget Sound Nutrient General Permit Fact Sheet

### Science and Model Use

King County asks Ecology to confirm if full implementation of this permit process will result in compliance with the Clean Water Act and Washington's Water Pollution Control Act, and in the long-term improvement of Puget Sound. We agree that the Salish Sea Model (SSM) is a useful tool for building on our understanding of the Puget Sound's complex ecosystem, but we question if it can be justifiably used as the sole regulatory basis for determining the nutrient load reductions from wastewater treatment plants needed to meet the 0.2 mg/L dissolved oxygen (DO) criterion. The SSM does not yet have the accuracy and reliability needed for this proposed regulatory application. Instead, the SSM is well-suited for its intended purpose—as an informational tool to simulate a complex ecosystem and to inform policy and regulatory discussions and planning. In its current state it may result in erroneous load allocations. In studying complex systems, scientists and policymakers usually rely on multiple models, intensive observational data, and collaborations to thoroughly vet the problem being solved and identify gaps in understanding the system. In this case, the proposed PSNGP relies upon a single model, with limited observational data, making those decisions more vulnerable to error.

The most recent Quality Assurance Project Plan (QAPP) for the Salish Sea Model states the data quality objective is to characterize and assess model performance, as compared to observations, so that policy and decision makers can take model uncertainty into account when using model output. However, the model uncertainty analysis included in the bounding scenarios underestimates the error associated with the DO depletion estimates that are used as the basis for this permit. Ecology should obtain external peer review on their estimates of model uncertainty for DO depletion. We propose Ecology: obtain external peer review on their estimates of model uncertainty for DO depletion; work with researchers, such as those at University of Washington (UW) and University of British Columbia (UBC), to develop multiple models of DO in Puget Sound; and like the Intergovernmental Panel on Climate Change (IPCC) work, improve the ability to evaluate model performance and identify alternative approaches to further model improvements.

At this time, there is not sufficient evidence that reducing nitrogen in wastewater effluent will be effective at increasing DO in impaired, sensitive areas of Puget Sound. There are other approaches that may be as effective or even more effective while also providing co-benefits for species of concern, such as salmon. Other estuaries in the US have engaged in a DO standard review processes and have set or are currently working on developing biologically relevant DO targets. This ensures the targets, goals, and ideally the outcomes have biological importance and are protective of the Puget Sound biota. We propose Ecology engage in standard review process to develop biologically relevant DO standards. This permit process could evaluate other approaches, focused directly on the sensitive areas in Puget Sound, that would achieve better water quality outcomes, faster and more affordably.

Puget Sound is a complex system that needs further study to gain a better understanding of the difference between natural conditions and anthropogenic alterations. While the questions and concerns with this draft PSNGP are evaluated and corrected, we ask that Ecology seek and evaluate alternative solutions that may provide realized water quality improvements in a shorter timeframe, such as site-specific, place-based water quality improvement projects.

We also have comments on changes made to the permit since the preliminary steps earlier in 2021, please explain why Ecology chose to categorize facilities as either dominant or small, and how a 100 lb. N/day cutoff is not an arbitrary standard without a relationship to water quality goals. Examining WWTPs by their total N load alone does not reflect the ecological impact of the loads. WWTP impacts on DO impaired areas likely range widely and may not relate to the load size, but rather the location and/or depth of the outfall and proximity to the impaired area.

In developing its regulations, Ecology should comprehensively address impacts beyond the biological ones including increased energy consumption and what happens to the nitrogen once it is removed from the wastewater effluent e.g. impacts from diverting nitrogen into the atmosphere as nitrous oxide, a potent greenhouse gas, thereby contributing to climate change.

## Operational Considerations

The Optimization implementation steps outlined in the draft PSNGP are not reasonable. Optimization requires time for process planning, engineering, staff training, quality controls, and process adaptation. When an optimization process has been identified for potential implementation, there are a series of evaluations to ensure treatment plants continue to operate effectively and minimize the likelihood of an unintended NPDES permit violation. Once implementation begins, the process must be incremental, allowing the system to come back into balance after each minor adjustment before making any further incremental changes. These optimization efforts can take one to six years, depending on the process and results. Also, real-world limitations can make it difficult or impossible to achieve anticipated results from *process modeling* (see comments on p.15 of the draft PSNGP). Given the year-to-year variability of influent characteristics, including nitrogen, a yearly evaluation provides useful data, but determining the effectiveness of optimization actions takes many years.

Additionally, the Nutrient Reduction Evaluations (NREs) and AKART Analyses required by the draft PSNGP are resource intensive and will take significant time to implement. With 58 facilities required to simultaneously address these requirements, there may not be enough consultants, engineers, and operators in this region to support all the permitted facilities within the same five-year period. These analyses would need to be completed while also executing optimization requirements, further constraining available resources.

## Action Levels and Relationship to other Permits

The action level thresholds for King County WWTPs are significantly lower than those calculated in the previous preliminary draft PSNGP. Based on the empirical data described in Appendix E of the Fact Sheet, the new action levels have been exceeded several times in recent years and could result in King County facilities being immediately out of compliance with the Permit, triggering immediate corrective actions. Specific additional comments include:

- Sampling and reporting for the PSNGP should be consistent with applicable NPDES permit requirements.
- There are potential risks associated with implementing the requirements of the PSNGP including violating existing NPDES permit best management practices, inequitable utility costs, and increases in greenhouse gas emissions.
- Data taken during the pandemic years should be excluded from analysis because the pandemic created substantial differences in the influent coming into the plants as well as recovered fees. It is unknown whether this would skew TIN analysis and/or economic evaluations in the next several years.

- The influent nitrogen reduction measures/source control program should be removed from the permit. Nutrient sources are largely undefined and there is limited industrial, commercial, and dense residential data to isolate sources/contributors.
- There is a lack of clarity around bubble-permitting in the draft PSNGP. The permit should be explicit about procedures for bubble permitting and what combination of steps across a jurisdiction's facilities would constitute compliance.

## Costs and Rates

Recent studies show, that to meet the proposed requirements, it would take additional years of research, design, construction, and commissioning to effectively meet the removal standard. To meet the proposed requirements at West Point would require reducing secondary treatment capacity by 50-75%, necessitating the construction of a fourth treatment plant to treat the flows that would no longer go to West Point. Capital costs for upgrading King County's three regional treatment plants to 3 mg/L and constructing a fourth treatment plant are estimated to be $9 to 14 billion (2020 dollars). These recent studies also suggest that the cost of implementing nitrogen removal for each King County treatment plant would increase operating costs by between $28-44 million per year, not including the cost to operate the new fourth regional treatment plant. The monitoring schedule and sampling requirements would increase costs for laboratory support by $800,000 to $1 million annually. This would lead to a significant rate increase to customers for years to come. Based on King County's recent rate analysis, meeting a 3 mg/L limit results in sewer rates increasing to as much as $250 per month or more.

The draft PSNGP states "…It [the NRE] shall present an alternative representing the greatest TIN reduction that is reasonably feasible" (p. 18, E.2). Ecology needs to define "reasonably feasible" for all the permitees and establish a cost threshold for affordable or too expensive. Given the capital and operational investments that the region is facing and the impact this will have to residents and businesses, we strongly recommend that an Economic Analysis be completed, and that "reasonably feasible" and other qualitative phrases be defined and put into the context of the region's ability to pay.

The reduction of TIN load to 10% with an eventual requirement of reducing to 3 mg/L may leave facilities with stranded assets. This is because we likely will need to install side-stream treatment as an initial response to the permit, improvements that may need to be abandoned as subsequent permit requirements must be met. Ecology's implementation of this permit should ensure infrastructure built to meet interim requirements has a useful life and does not have to be abandoned.

## Regulatory Concerns Associated with the Use of a General Permit

*Until a Total Maximum Daily Load Can Be Established, Controls on TIN Discharges Must Be Developed and Implemented Through Individual NPDES Permits*

Although the dissolved oxygen impairments that the PSNGP is intended to address occur in many areas of the Salish Sea, their magnitude, extent, duration, and causes are all highly local and specific. Until these issues can be comprehensively evaluated and addressed through a total maximum daily load (TMDL), a general permit such as the PSNGP cannot, either practically or legally, address these impairments. Until a TMDL can be developed and established, Ecology should continue to regulate the TIN and other nutrient contributions of the domestic wastewater treatment plants that would be regulated by the PSNGP through these plants' individual NPDES permits. The individual permits enable Ecology to consider facility-specific discharges and their effects on dissolved oxygen levels so that appropriately tailored analyses and controls on nutrients can be identified and implemented. The PSNGP is a blunt instrument that cannot account for these site-specific effects and is almost certain to require too much or too little of the dischargers that would be subject to it.

NPDES permits, including general permits, must include conditions "necessary to . . . [a]chieve water quality standards," and specifically they "must control all pollutants . . . which . . . are or may be discharged at a level which will cause, have

the reasonable potential to cause, or contribute to an excursion above any State water quality standard." 40 C.F.R. § 122.44(d)(1)(i); *see also* WAC 173-226-070(2). The proposed PSNGP does not and cannot meet this requirement. Each of the 58 facilities that would be subject to the PSNGP discharges wastewater containing different and variable amounts and concentrations of TIN at different locations throughout the Salish Sea. These locations have different and variable levels of dissolved oxygen and different and variable conditions, including depth, flow, and concentrations of TIN and other substances from other human and natural sources that may affect dissolved oxygen. The same restriction on TIN discharges may be unnecessary at one facility and insufficient at another for ensuring that the discharges do not cause or contribute to an excursion from the applicable dissolved oxygen standard. Indeed, the dissolved oxygen standard itself varies from 4.0 to 7.0 milligrams per liter (mg/L) at different locations throughout the Salish Sea.[1] *See* WAC 173-201A-210(1)(d), Table 1(d); WAC 173-201A-612, Table 612. Determining the TIN discharge limits that are "necessary to . . . achieve" the applicable dissolved oxygen standards, then, necessarily requires an individual evaluation of the discharges and circumstances of each individual discharger. Such an evaluation can occur in only two contexts: (1) the development of an individual NPDES permit and (2) the development of a TMDL for dissolved oxygen, which evaluates effects on dissolved oxygen from all sources and establishes appropriate wasteload and load allocations for all sources at levels that will provide reasonable assurance that the applicable standards will be achieved. See 33 U.S.C. § 1313(d); 40 C.F.R. § 130.7.

Pursuant to Subsection 303(d) of the Clean Water Act (CWA), Ecology has identified locations throughout the Salish Sea that are impaired by low dissolved oxygen levels that do not meet the applicable water quality criteria. See 33 U.S.C. § 1313(d)(1)(A). Having identified these impairments, Ecology is obliged by the CWA to develop a TMDL that (a) "establish[es] . . . the total maximum daily load" of pollutants contributing to these impairments "at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety." *See id.* § 1313(d)(1)(C); see also 40 C.F.R. § 130.7(c)(1). The TMDL must also include an allocation of portions of the established total maximum daily load to individual point source discharges in the form of a wasteload allocation (WLA). *See* 40 C.F.R. § 130.2(f), (h)-(i). Any NPDES permit must include discharge limits or other conditions that are consistent with the WLA. See 40 C.F.R. § 122.44(d)(1)(vii)(B).

Until Ecology can develop and obtain EPA approval of a TMDL for dissolved oxygen impairments in the Salish Sea that comprehensively determines the TIN or other discharge limits needed to achieve the applicable standards, any necessary TIN or other discharge limits to address these impairments must be developed on an individual basis through the modification or renewal of the individual NPDES discharge permits for each of the 58 facilities that would be subject to the PSNGP. This is the only way that Ecology can appropriately establish discharge conditions that will not, on the one hand, require potentially billions of dollars to construct and operate unnecessary wastewater treatment facilities and, on the other hand, ensure discharge conditions that are sufficiently stringent to ensure that the discharge does not cause or contribute to DO impairments. Where uniform water quality-based discharge limits are not appropriate for the sources covered by a general permit, the PSNGP cannot comply with EPA's and Ecology's NPDES permit regulations and is not allowed. *See* 40 C.F.R. § 122.28(a)(3); WAC 173-226-070(2).

*Improper Requirement for Coverage under the PSNGP*

The PSNGP would impermissibly require facilities whose discharges are already fully authorized by an individual NPDES permit to apply for and obtain coverage under the PSNGP. Both EPA's and Ecology's regulations provide that any discharger eligible for coverage under a general NPDES permit may be excluded from coverage under the general permit by obtaining an individual NPDES permit. *See* 40 C.F.R. § 122.28(b)(3)(iii); WAC 173-226-240(4). As discussed in the preceding section, any contribution of the 58 facilities that would be regulated by the PSNGP to DO impairments in the Salish Sea should be addressed through their individual NPDES permits, and it is inconsistent with EPA's and Ecology's regulations to require these facilities to apply for and obtain coverage under the PSNGP when their discharges are already fully authorized by their individual permits.

*Improper Simultaneous Regulation of the Same Discharges under Both the PSNGP and Individual NPDES Permits*

Similarly, both EPA's and Ecology's regulations prohibit regulating the same discharge under both a general and an individual NPDES permit. Indeed, when an individual permit is issued for a discharge, the regulations provide that the

coverage under the general permit is "automatically terminated." *See* 40 C.F.R. § 122.28(a)(1), (b)(2)(v), (b)(3)(iv); WAC 173-226-080(4); WAC 173-226-200(7). The reason for this prohibition is that dual permit coverage creates abundant opportunities for ambiguous, duplicative, or inconsistent permit requirements. Because discharges from the facilities that would be required to obtain coverage under the PSNGP are already authorized by an individual NPDES permit, Ecology cannot require coverage for the same discharges under the PSNGP.

*Improper Modification of the Individual NPDES Permits*

In addition, because the PSNGP regulates the same discharges authorized by the 58 facilities' individual NPDES permits, the PSNGP would modify the requirements of the individual permits without following the modification procedures required by EPA's and Ecology's rules. Individual permits can only be modified for one of the causes specified in 40 C.F.R. § 122.62(a). None of these causes is identified in the PSNGP as a reason for modifying the requirements of the individual permit. Moreover, even if such a cause were identified, Ecology has not followed the required modification procedures, including preparing draft permits addressing the individual permit modifications and providing public notice and an opportunity for comment for each individual permit. *See id.* § 122.62; WAC 173-220-150(1)(d), -190(1), (3). As to King County's facilities, in particular, Ecology has not made a determination that discharges from the facilities are causing or contributing to a DO impairment in the Salish Sea, despite the PSNGP's stated purpose being to address such impairments. Nor has new information specific to King County's facilities been identified that would justify modifying the facilities' individual NPDES permits in advance of their renewal. *Cf.* 40 C.F.R. § 122.62(a)(2) (authorizing modification based on "new information" "only if the information was not available at the time of permit issuance . . . and would have justified the application of different permit conditions at the time of issuance"). Moreover, even if there were individual cause for modifying the permits for King County's facilities, Ecology has not prepared a draft modification for the individual permit or provided public notice and an opportunity to comment on it. The PSNGP, which has no findings or provisions specific to King County's facilities apart from the draft action levels, is not sufficient.

*Improper Rulemaking Without Following Required Rulemaking Procedures*

RCW 34.05.015(16) defines a "rule" as "any agency order, directive, or regulation of general applicability . . . the violation of which subjects a person to a penalty or administrative sanction." By contrast, a "license" is a "permit . . . or similar form of authorization required by law." RCW 34.05.015(9)(a). Rules must be adopted in accordance with the procedures set forth in RCW 34.05.310 to 34.05.395, including detailed requirements for public notice and opportunities for public comment and hearings. Additional requirements apply to "significant legislative rules" adopted by Ecology that "adopts substantive provisions of law pursuant to delegated legislative authority." *See* RCW 34.05.328(5)(c)(iii).

The PSNGP, although styled as a general permit for 58 named facilities, is a rule because it would be a regulation of general applicability for domestic wastewater facilities discharging to the Salish Sea, the violation of which would subject these facilities to penalties and administrative sanctions. Moreover, it is not a "license" because it does not authorize any activities. All the activities regulated by the PSNGP are already fully authorized by individual NPDES permits. Indeed, were any of the facilities covered by the PSNGP to lose coverage under their individual permits, they could not legally discharge the TIN regulated by the PSNGP. The PSNGP does not authorize any activities; it only imposes additional requirements on already authorized activities. Because it has not been developed and will not be promulgated through the required rulemaking procedures, the PSNGP will not be valid if adopted.

For all these reasons, King County urges Ecology not to adopt the PSNGP and instead to continue regulating nutrient discharges from the County's facilities through their individual NPDES permits. This will enable Ecology to develop appropriate nutrient controls based on the individual facility's specific discharges and circumstances pending Ecology's development and establishment of a TMDL for DO that comprehensively evaluates the nutrient controls needed to achieve the applicable DO criteria.

## Nutrient Reduction Measures and Source Control

There are significant considerations regarding the influent nitrogen reduction measures/source control program in S4.C.3. Development of an ongoing program to provide source control with nitrogen reduction measures represents a

new requirement that requires a major resource commitment and may not provide an overall benefit. Developing TIN reducing strategies for dense residential, industrial, and commercial buildings requires significant changes to land use regulations and, building codes, which often fall outside of a wastewater utility's authority. If wastewater treatment facilities are asked to reduce nitrogen in the influent as a nutrient reduction measure, management of these systems in a manner that is protective of human health and the environment becomes the responsibility of residents and businesses that are not currently accustomed to managing their own wastewater.

Industrial and commercial sources are unlikely to be major contributors of TIN. Additionally, nutrient sources are largely undefined and there is not enough data to isolate sources/contributors. This likely holds true for multi-family/dense residential developments where the only solution may be small, decentralized treatment facilities that will have to be permitted and monitored by state and local agencies.

The source control program would appear to require treatment plants to prohibit or significantly reduce septage intake. However, treating septage at centralized plants is an important service for protecting public and environmental health. There are limited management options for septage haulers and restricting septage is in direct conflict with protecting Puget Sound from failing or inadequate septic systems.

### Complete the Nutrient Management Plan and promote innovation

Requiring additional nitrogen removal actions beyond the current practicable performance, in advance of Ecology completing the Nutrient Management Plan and comprehensive Salish Sea Model analyses is premature. A more thorough plan, in the form of the TMDL required by the Clean Water Act, would determine the allowable loading allocations for all sources and, identify justifiable reduction targets supported by legally defensible and facility-specific reviews. We also support further work on more flexible options such as water quality trading and more information on alternative compliance approaches could help bring about better results faster by allowing agencies to cooperate across jurisdictional lines. Innovative approaches like water quality trading require more clarity around discharge limits and explicit language about eligibility. To support innovation, the PSNGP should include placeholder language that allows near-term flexibility to lay the groundwork for water quality trading, prior to the next permit cycle.

If Ecology continues to include an AKART analysis as a component of the Nutrient Reduction Evaluation it should be done after Ecology's completion of modeling and determination of source load nitrogen allocations for Puget Sound, key technical and economic information, as well as critical assumptions regarding scheduling and other constraints. A missing required component of a Nutrient Reduction Evaluation (NRE) for each treatment plant is the analysis of the reduction in rated hydraulic and treatment capacity for regulated parameters in the existing individual NPDES permits that will occur as a result of nitrogen reduction upgrades, and the corresponding facility improvements necessary to expand the facility for the current approved design capacity.

## Final Comments

King County urges Ecology to delay issuance of this permit to improve the data and modeling underpinning this permit and consider other mechanisms and approaches that could result in measurable and observable improvements to the shallow bays of Puget Sound faster and more cost effectively,

It is imperative that a broader cross section of interests in Puget Sound be involved in a process that meets scientific scrutiny, cross-jurisdictional collaboration, and innovation. Uncertainty remains regarding whether or not the processes and limits contained in this permit will meet Ecology's long-term intentions for nitrogen reductions and subsequent ecosystem improvements.

# Appendix A: King County's Detailed Comments on the Draft Puget Sound Nutrient General Permit

| Pg. | Permit Language | King County Comments |
|---|---|---|
| 7 | S1.A This Puget Sound Nutrient General Permit (PSNGP) applies to the 58 publicly owned domestic wastewater treatment plants (WWTPs or POTWs) discharging into Washington Waters of the Salish Sea, except for federal and Tribal lands and waters as specified in Special Condition S1.D | Describe Ecology's expectations for delegated pretreatment programs to establish local discharge limits for nitrogen for industrial users (see our comment under S4.C.3). |
| 7 | S1 Table 3 | Include the outfall depths for each discharger.<br><br>The size of nitrogen load does not correlate with the impact of the load. Explain the scientific or biological relevance to support the 100lb/day cutoff for dominant vs small loads. |
| 10 | S2 | Draft timeline is insufficient. Permitees cannot develop, design, budget, purchase, and construct any process and/or equipment to meet the required permit (Facility specific and Bubble) cycle. Permit should provide sufficient time for each utility's required budgeting, purchasing, designing, and constructing processes which are governed by state law. |
| 11 | S2.D | Section D's numbering of paragraphs should restart at 1. [Formatting error] |
| 11 | S3.A Discharges must not cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), sediment management standards (Chapter 173- 204 WAC)… | Please define 'contribute to' and how it will be determined. The only way to determine a violation of the 0.2 mg/L dissolved oxygen (DO) anthropogenic standard is to use a model and the SSM does not have the accuracy to determine a 0.2 mg/L decrease in DO due to the various model uncertainties. |
| 12 | S4.A Each Permittee listed in Table 5 must comply with the facility specific or bubbled action levels and narrative effluent limits listed in Table 4, which constitute the suite of best management practices (BMPs) required for a water quality based effluent limit under 40 CFR 122.44(k). | As written facilities that are listed in Table 6 for bubble Action Limits will also be required to comply with Table 5, facility specific Action Limits. These are conflicting requirements.<br><br>As written, this condition effectively establishes a numeric effluent limit since the action levels are calculated as the annual nitrogen mass discharge for each covered facility based on current performance data. |
| 12 | S4 | Define optimization and how facilities can meet this requirement on an annual basis. |
| 12 | S4.B If the action level listed in Table 5 or the bubbled action levels listed for single jurisdictions in Table 6 are exceeded, the Permittee is required to employ corrective actions identified in S4.D. | Provide the requirements of a bubble permit. As written facilities eligible for bubble permitting will be required to meet facility specific Action Limits in addition to the bubble Action Limits. This conflict with King County's understanding of a bubble permit. |
| 13 | S4.B If the action level listed in Table 5 or the bubbled action levels listed for single jurisdictions in Table 6 are exceeded, the Permittee is required to employ corrective actions identified in S4.D. The annual Action Level is the sum of monthly nutrient loads measured over one year. This total | Change "sum of monthly nutrient loads" to "sum of monthly TIN loads over one calendar year" to be consistent with the permit that deals only with TIN and not all nutrients, and that it applies to a calendar 12 months. |

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|---|---|---|
| | will be evaluated once per year and described in the Annual Report. | |
| 13 | S4.B Table 5 | The Action Levels do not represent the 99-percentile values described in the fact sheet. Empirically, each of BW, SP, WP has exceeded the Action Level for at least one year within the timeframe used to calculate the Action Level (South Plant twice). It appears there is a 1/3 chance of exceeding the Action Level in any year. As the action level needs to be exceeded in two consecutive years, there is a 10% chance for exceeding each two-year period, or approximately a 40% chance over this 5-year permit. The values in Table 5 for King County facilities are also significantly lower than those listed in the preliminary draft. Therefore, these action limits could result in an immediate exceedance at the King County facilities.<br><br>We are unable to reproduce these Action Levels using the TIN trigger calculator linked in the Fact Sheet (page 41). Please modify the TIN trigger calculator to allow the loads and conditions for each Facility to be reviewed.<br><br>If utilities chose to use a bubble permit, then each individual treatment plant should no longer be constrained by the Action Level, TIN lbs./year values listed in Table 5. |
| 13 | S4.B Table 5 and 6 | Superscripts used in the Wastewater Treatment Plant columns of these tables are not defined anywhere. Assume they are meant to designate treatment plants that could fall under a bubble permit, but this is not explicitly stated. |
| 14 | S4.C Each Permittee listed in Table 5 shall develop, implement, and maintain a Nitrogen Optimization Plan to evaluate operational strategies for maximizing nitrogen removal from the existing treatment plant to stay below the calculated action level. | Those electing a Bubbled Action Level permit should not be required to submit Nitrogen Optimization Plans for each facility per reporting period but for their combined system. |
| 14 | S4.C Documentation of Nitrogen Optimization Plan implementation must be submitted annually through the Annual Report (S9- Reporting Requirements). See Appendix C for Annual Report questions that satisfy the Nitrogen Optimization Plan requirements | Nitrogen Optimization Plan and Report: the timelines for developing the plan and implementing actions throughout this condition are infeasible. Following state procurement laws and timelines needed for equipment procurement and contracting will require lead times for even small capital projects that may result in noncompliance.<br>Identify compliance repercussions if facilities cannot meet annual reporting requirements<br><br>The plan could be better named Nitrogen Removal Optimization Plan (NROP). Or, given that the currently named NOP is specifically driven by the requirement to stay below the action level, this plan would be better titled "Action Limit Compliance Plan". With the primary goal of staying in compliance with the action limit. Optimization may not be required if treatment performance is achieving the action level. |

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| 15 | S4.C.1.a Process modeling. Develop and maintain a process model (or other equivalent treatment evaluation method) of the existing treatment plant for purposes of evaluating optimization approaches. Use the model to: | No guidance is given for incorporating equipment being out of service for summertime scheduled maintenance and capital project implementation into the process model. Modeling should at a minimum be done with redundant units out of service. |
| 15 | S4.C.1.a.i Evaluate current (pre-optimization) process performance to determine the existing empirical TIN removal rate for the WWTP | There should be a standardized method/equation to measure a POTW's nitrogen removal performance; no calculation is provided in the draft. Such a calculation must consider that influent organic nitrogen can be converted to TIN via the treatment plant, especially via anaerobic sludge digestion. Thus, using influent TIN to "evaluate" a POTW's ability to remove nitrogen would be inaccurate, e.g., %TIN Removal = [(Influent TIN lbs. – Effluent TIN lbs.)/(Effluent TIN lbs.) * 100]. Any evaluation of the POTW's ability to remove nitrogen and thus, lower the effluent TIN load, should be based on the total influent nitrogen load (TKN+NO2+NO3), and not on influent inorganic nitrogen load (NH3+NO2+NO3). |
| 15 | S4.C.1.b Identify and evaluate optimization strategies. Determine the optimization goal(s) for the WWTP. Apply the assessment approach to document the optimization strategies capable of achieving the optimization goal for each WWTP owned and operated by the Permittee. | Please explain how optimization requirement fit into orange book requirements and which takes priority. |
| 15 | S4.C.1.b The Permittee may exclude any optimization strategy considered but found to exceed a reasonable implementation cost or timeframe that exceeds one year. | Trials of any process changes can take up to one year. Therefore, implementing any optimization strategy would occur only on an annual basis.<br><br>"Reasonable" as it applies to implementation costs is not defined anywhere in the permit.<br><br>Please outline Ecology's expectations when all optimization strategies identified in S4.C.1.b are found to exceed a reasonable implementation cost, or the timeframe exceeds one year. |
| 15 | S4.C.1.c Initial Selection. By May 1, 2022, select at least one optimization strategy for implementation.<br><br>Document the expected % TIN removal for the initial optimization strategy prior to implementation.<br><br>Identify a performance metric to evaluate results. TIN % removal, or a calculated reduction in effluent load or concentration may be used as a performance metric. | Selecting at least one optimization strategy by May 1, 2022 is unreasonable. Permitees should be allowed at least 12 months (ideally 18-24 months) from the effective date of the permit for conducting the process modeling, identifying, and evaluating optimization strategies, and the initial selection of strategies.<br><br>The permit should include providing an assessment of process risks associated with implementing the strategy and criteria for ceasing operation.<br><br>Propose adding review/approval by Ecology prior to Implementation.<br><br>If a TIN removal rate is established through modeling, it would not be empirical. Empirical removal rates for current |

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| | | process performance should be based on measured facility data. |
| 15 | S4.C.2 All Permittees in Table 5 must document implementation of the selected optimization strategy (from S4.C.1.c) | Provide guidance when all optimization strategies identified in S4.C.1.c have TIN removals that are not expected to be statistically discernable from the baseline. |
| 16 | S4.C.2.b Load Evaluation. By March 31 each year beginning in 2023 each Permittee shall review effluent data collected during the previous calendar year to determine whether TIN loads are increasing | Given the year-to-year variability of N, a yearly evaluation provides useful data but may not be appropriate to calculate the effectiveness of optimization actions. Additionally, there will be a considerable uncertainty of being able to effectively implement and complete all elements of this provision and assert compliance each year, and thus it poses a substantial risk of exposure to third party complaints. There would be considerably greater regulatory certainty if the permittee could provide a single report at year 3 or 4 in the permit cycle documenting the observations, performance, and adjustments to any actions.<br><br>Extend the deadline for the annual reports to June 30 of each year to provide sufficient time to gather, process, evaluate, and document all the information required in the annual report. March 31 is unrealistic. |
| 17 | S4.C.3 Permittees in Table 5 must develop an ongoing program to reduce influent TIN loads from septage handling practices, commercial, dense residential and industrial sources and submit documentation with the Annual Report. | This strategy would appear to create multiple small treatment facilities. If Ecology plans to delegate this task to the Utilities, that will require a whole new delegated program unless Ecology will be the regulator of these new facilities.<br>▪ If this necessitates changes to regulations pertaining to land use and development King County has limited jurisdiction in its wastewater service area.<br>▪ Both requirements would substantially change the costs for septage haulers and developers.<br><br>The introduction requires an ongoing program to be developed to reduce nitrogen, yet the bullets do not include any implementation or cost-effectiveness guidelines. Nutrient sources are largely undefined, and there isn't much industrial data to isolate sources/contributors, and industrial sources are unlikely to be major contributors of TIN. Therefore, development of an ongoing commercial and industrial program to provide source control with nitrogen reduction measures is a major resource commitment with anticipated marginal benefit compared to domestic and other non-controllable sources.<br><br>Ecology needs to be explicate regarding the intent of septage management at WWTPs. Ecology must consider the ramifications to these businesses and whether or not it could result in less septic system maintenance. Hauling septage farther away to treatment plants or facilities not covered by the General Nutrient Permit. Cleaning and |

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| | | removal of septage from septic tanks helps to ensure proper function and is protective of the environment. The Department of Health (DOH) manages septage haulers. Please provide the DOH guidance to Ecology regarding environmental, public health and financial risks to septage haulers and septic systems if WWTP are unable to provide treatment.<br>SP currently receives septage (29 MG in 2020) from 149 customers with a total of 329 trucks that use the SP Septage disposal site for disposing septage, portable toilet waste, vactor waste (just the decant), and reuse water with little or no recourse for disposal.<br><br>Define "dense residential". Developing TIN reducing strategies for dense residential and commercial buildings requires changes to land use regulations and building codes which falls outside of King County's authority. |
| 17 | S4.C.3.a Review non-residential sources of nitrogen and identify any possible pretreatment opportunities. | Provide a threshold minimum of nitrogen source to consider in this review. |
| 17 | S.4.D Permittees in Table 5 must evaluate whether or not they exceeded the facility specific action level and, if they did, implement corrective actions. | The fact sheet indicates that it will take several permit cycles to achieve final effluent limits (page 48) but the permit action limits and corrective actions will be enforced up to the date on which a facility institutes nitrogen removal upgrades to meet final effluent limits (possibly for 15 years or more). A facility may be in the process of implementing nitrogen removal upgrades to meet final effluent limits when it exceeds its action limit two years in a row, thereby triggering upgrades for 10% nitrogen removal. |
| 17 | S4.D.1.a Determine when the exceedance occurred and number of days the Permittee discharged above the action level. | There isn't a monthly or daily limit. The limit is based upon a yearly value. Thus, we cannot determine when exceedances occurred or the number of days it was exceeded. Also, the discharges will vary seasonally, so some months with higher TIN discharges will be offset with other months with lower TIN discharges. |
| 17 | S4.D.1.b Select an additional optimization strategy from the list developed in S4.C.1.b to be implemented during the next reporting period. | This requirement counteracts other statements that say all implementation decisions should be based on the technology and economic feasibility considerations throughout the permit cycle.<br><br>Additionally, this provision does not allow for justification from the permittee to exclude implementation of additional optimization in the following year if the exceedance of the action level is clearly demonstrable as being due to an unusual circumstance, such as upset affecting the performance of the initial optimization action(s), or extreme weather-related effects beyond the expected performance of the optimization action(s) such as cold weather that is known to affect denitrification cycles in particular. |
| 17 | S4.D.1.c With the next Annual Report, submit for review a proposed approach to reduce the most | Requiring additional nitrogen removal actions beyond the current feasible performance, in advance of Ecology |

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| | recent calculated annual effluent nitrogen load by at least 10%. This must be an abbreviated engineering report or technical memo, unless Ecology has previously approved a design document with the proposed solution. The proposed approach must utilize solutions that can be implemented within five years. This may include influent load reduction strategies identified in S4.C.3.<br><br>S4.D.1.d If a Permittee exceeds an action level two years in a row, or for a third year during the permit term, the Permittee must begin to reduce nitrogen loads by implementing the proposed approach submitted per S4.D.1.c | completing its comprehensive Salish Sea Model analyses and TMDL allocations for all sources, is not justified because the stated 10% reduction target establishes an arbitrary numerical effluent limit. Any requirement to achieve additional nitrogen reductions below practicable optimization levels, by definition, would likely require investment of substantial resources in assets, or stranded assets, that may be unwarranted and would occur before other potentially more flexible options such as trading or offsets could be developed.<br><br>It would not be possible for King County to reduce nitrogen loads by greater than 10 percent within a five-year cycle given the needs for planning, engineering, and construction while continuing to operate in a manner that meets all other treatment requirements.<br><br>In 2020, King County complete a nitrogen removal study. The purpose of the Nitrogen Removal Study was to provide WTD with an updated conceptual understanding of appropriate nitrogen removal alternatives, feasibility, and planning-level costs for WTD's regional treatment plants. The study assessed and screened nitrogen removal technologies at current rated capacities. It investigated several scenarios with a range of hypothetical permitted effluent limits, including those being explored by Ecology, to develop planning-level information. The cost estimates (2020 dollars) ranged from $50 to $500 million for side stream treatment. Please see the King County Nitrogen Removal Study for more information.<br><br>It seems unreasonable to require a facility to plan to reduce effluent nitrogen by 10% if it has only exceeded the action limit by a small amount (e.g., 0.1%). It would be reasonable for a facility to add modifications that would reduce TIN discharges equivalent to or greater than the highest action limit exceedance for the two or three years. |
| 18 | S4.E.1 All permittees in Table 5 except for LOTT must prepare and submit an approvable Nutrient Reduction Evaluation (NRE) to Ecology for review by December 31, 2025. Permittees with multiple plants may submit a combined report. | Define "approvable".<br><br>A missing required component of an NRE for each treatment plant is the analysis of the reduction in rated hydraulic and treatment capacity for regulated parameters in the existing individual NPDES permits that will occur as a result of nitrogen reduction upgrades and the corresponding facility improvements necessary to expand the facility for the current approved design capacity.<br><br>The Nutrient Reduction Evaluation as drafted does not include an analysis and/or alternatives comparison for |

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| | | greenhouse gas emission or energy increases from nitrogen removal technologies. Nitrogen removal technology has the potential to greatly increase greenhouse gas emissions and energy use from wastewater treatment facilities and any evaluation should include future impacts to a facility's greenhouse gas emissions and energy use. |
| 18 | S4.E.2 The NRE must include an all known and reasonable treatment (AKART) analysis in accordance with RCW 90.48.010 for purposes of evaluating reasonable treatment alternatives capable of reducing total inorganic nitrogen (TIN). It shall present an alternative representing the greatest TIN reduction that is reasonably feasible. | Define "reasonably feasible". Please provide more information on the procedure that should be used for the NRE including the elements listed on pages 18-20.<br><br>The requirement to conduct an AKART analysis as a component of the NRE should not be done in advance of Ecology's completion of modeling and determination of source load nitrogen allocations for Puget Sound, key technical and economic information, as well as critical assumptions regarding scheduling and other constraints, will be unknowable. |
| 18 | S4.E.3 In addition, the NRE must assess other site-specific main stream treatment plant upgrades, side stream treatment opportunities, alternative effluent management options (e.g., disposal to ground, reclaimed water beneficial uses), the viability of satellite treatment, and other nutrient reduction opportunities that could achieve a final effluent concentration of 3 mg/L TIN (or equivalent load reduction) on both an annual average and seasonal average basis. | Define "seasonal". |
| 18 | S4.E.4 The analysis must be sufficiently complete that an engineering report may be developed for the preferred AKART alternative as well as the preferred alternatives to reach 3 mg/L TIN annually and seasonally, without substantial alterations of concept or basic considerations. | To provide this level of assurance, a detailed alternatives analysis would need to be completed. For the capital input to the rate model, we assumed that this would require a level of effort equal to 1% of the cost of the nutrient reduction projects and a duration of 4 years.<br><br>An engineering report may ultimately conclude a different preferred alternative from that identified in the Nutrient Reduction Evaluation. |
| 19 | S4.E.5.b.iii.2 Identification and screening of potential treatment technologies for meeting two different levels of treatment: 3 mg/L TIN (or equivalent load), as an annual average and seasonal average. | Achieving 3 mg/L TIN on an annual average basis would require significantly more infrastructure, capital costs, and O&M costs when compared to achieving 3 mg/L on a seasonal average basis. Ecology has shown that conditions of low DO in Puget Sound largely occur during the summer months which occur during the "seasonal" timeframe. Provide evidence that the benefits to DO in Puget Sound justify the additional capital and O&M costs of achieving 3 mg/L TIN on an annual average basis when compared to achieving 3 mg/L TIN on a seasonal basis. |
| 19 | S4.E.5.c.iii.1 How utilities allocate and recover costs from customers | King County WTD is a wholesale service provider. WTD maintains contracts for wholesale service with Local Service Agencies (LSAs) that have a direct account and billing relationship and allocate and recover costs from customers. WTD customers are cities and Districts that contract to |

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| | | convey flows from their customers to the WTD regional system for treatment. While WTD assesses how increases to the wholesale charges to the LSAs could impact the eventual ratepayer WTD does not have a customer relationship with individual households, businesses, and institutions in charging the sewer service. Cost allocation, rate structure, and rate increases vary by each of the 34 LSAs based on local collection system costs, customer base size and type, and other factors such as system age and historical investment. |
| 19 | S4.E.5.c.iv Provide impact to current rate structure for each alternative assessed | This section likely intends to refer to "rate levels" rather than "rate structures." The industry recognizes rate structure as the components of how rates are charged such as fixed charges, volume charges, seasonal rates, inclining block rates. Large capital investments to respond to the permit aren't likely to specifically generate rate structure review. Rather, they will be highly impactful to the revenue requirement which drives rate levels, i.e. percentage increases applied to the existing rate structure.<br><br>The economic evaluation required will be based on highly uncertain cost assumptions since limited engineering will have been completed to support the analysis. A new cost estimating classification (pre-class 5 or class 10) has been developed that includes uncertainty bounds of -50% to +300% for these types of planning estimates. Permitees should include the uncertainty ranges in their economic analysis and reporting. |
| 20 | S4.E.5.d.ii Include an affordability assessment to identify how much overburdened communities identified in S4.E.5.d.i can afford to pay for the wastewater utility. | The assessment of "can afford to pay" is highly subjective. Identifying how much overburdened communities can pay will vary significantly among the communities, even within a single community, and is an outcome that cannot be expressed as a single threshold.<br><br>The EPA released updated Financial Capability Assessment Guidance in 2021 that seeks to broaden the approach to the benchmarking metrics used for consent decree long term control plan schedules. The EPA guidance has historically been a reference point for those looking to develop an affordability threshold.<br><br>Per the 2021 updated guidance document, "in the mid-1990s EPA developed the 1% and 2% Residential Indicator benchmarks after conducting an analysis of the costs of wastewater services as a percentage of household income using EPA's Municipality's Ability to Pay Model (MABEL) database. The analysis also examined the National Wastewater User Fee Study of the Construction Grants program database, which captured the annual residential expenditures as a percentage of median household income. |

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| | | The 2% benchmark was calculated to be two standard deviations above the average expenditure per household."<br><br>There has been general consensus that the 1997 FCA guidance that informs the benchmark commonly used for median household income is insufficient in that it does not measure at lower income levels where there are economically vulnerable ratepayers, in addition to the threshold measure being based off of aged (1990) data sources.<br><br>The latest on this topic can be found in recent publications from Dr. Janice A. Beecher, Institute of Public Utilities Michigan State University, and Dr. Manuel Teodoro Robert M. La Follette School of Public Affairs University of Wisconsin – Madison. |
| 20 | S4.E.5.d.iii Propose alternative rate structures or measures that can be taken to prevent adverse effects of rate increases on populations with economic hardship identified in S4.E.5.d.i. | WTD does not set the rate structures for rate payers within the WTD service area. See comments on "1. How utilities allocate and recover costs from customers." for context. Customer Assistance Programs (CAPs) are in place in most of the 34 LSAs that maintain the retail relationship and set rates for the households, businesses, and institutions in the WTD service area. Unfortunately, many CAPs have low participation rates. See https://mannyteodoro.com/?p=1856 March 2021 publication from Dr. Teodoro on the statistics on how low and reasons for low participation. Additionally, overburdened populations include households in apartments and other multifamily units that pay utility costs to a landlord who maintains the utility account. A few large cities, including the City of Seattle are offering water and sewer bill assistance to this set of industry termed "hard to reach" customers who make up a substantial portion of lower income households. The innovative approach utilizes the local energy utility provider (Seattle City Light) that maintains accounts and bills multiunit housing at the unit level. Water and sewer bill discounts are credited on the energy bill.<br><br>Regardless of innovative approaches, even the LIHEAP CAP that reaches multiunit customers directly has a 16% participation rate. There is no existing industry approach that "can be taken to prevent adverse effects of rate increases on populations with economic hardship." Both reach and the expected scale of the capital investments required under this permit make it very difficult to develop and implement an approach that protects economically vulnerable communities. |
| 22 | S5.B Each Permittee listed in Table 8 must develop, implement, and maintain a Nitrogen Optimization Plan to evaluate and implement | This statement can be interpreted as an overriding requirement for the optimization plan, and thus is inconsistent with S5.B.1(iv) that allows strategies to be |

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| | operational strategies for maximizing nitrogen removal from the existing treatment plant during the permit term. | excluded for "reasonable implementation cost or timeframe" constraints. |
| 23 | S5.B.1.a.iv The Permittee may exclude from the initial selection any optimization strategy considered but found to exceed a reasonable implementation cost or timeframe that exceeds one year. | Define "reasonable implementation cost." |
| 24 | S5.C All Permittees in Table 8 must prepare and submit an approvable all known and reasonable treatment (AKART) analysis to Ecology in accordance with RCW 90.48.010 for purposes of evaluating reasonable treatment alternatives capable of DRAFT Puget Sound Nutrient General Permit Page 25 reducing total inorganic nitrogen (TIN). Permittees must submit this report by December 31, 2025. | As written, S5.C does not specify any level of nitrogen reduction target with which to evaluate and conduct the planning, engineering, and economic analyses needed for an AKART analysis. Such a requirement with no defined performance objectives puts the permittee at a significant risk of non-compliance subject to the interpretation of any party. |
| 25 | S5.C.3.a.ii Wastewater Characterization - Current influent and effluent quality. | Provide an acceptable process for Utilities to evaluate and report their influent/effluent quality. |
| 26 | S5.C.3.e Selection of most reasonable treatment alternative. | Define "most reasonable". |
| 26 | S6.A. Table 9 Total Ammonia's Laboratory Quantitation Level is 0.02 mg/L. | To remain consistent with NPDES permit's Appendix A, change this value to 0.3 mg/L based upon the capability of the methodology. |
| 27 | S6.A. Table 10 Total Ammonia's Laboratory Quantitation Level is 0.02 mg/L. | To remain consistent with NPDES permit's Appendix A, change this value to 0.3 mg/L based upon the capability of the methodology. |
| 27 | S6.A Table 10 Parameter Nitrate plus Nitrite Nitrogen | SM4500-NO3- E/F/H is the only Nitrate plus Nitrite Nitrogen method listed in the table. Nitrate method Hach 10206 is equivalent to SM4500-NO3-E & Nitrite method SM4500-NO2-B-2011. This method is frequently used for this analysis and is allowed as an equivalent method by EPA. |
| 28 | S6.A Table 10 Parameter Average Monthly Total Inorganic Nitrogen. | The calculation for Average Monthly Total Inorganic Nitrogen produces a monthly totalized value and not an average value (lbs./day). |
| 28 | S6.A Table 10 Parameter Annual Total Inorganic Nitrogen. | Since this parameter is an accumulation of the monthly lbs., and is to be calculated every month, it may be more appropriate to title this "Cumulative Annual Total Inorganic Nitrogen – year to date" |
| 29 | S6.A Table 11 Calculations. | How should non-detects (values less than a quantitation limit) be used in calculations?<br><br>Footnote f – specify value to be used if either concentration is <RDL.<br><br>Footnotes f-I – the calculation methodology here is not the same as utilized in determining the Action Levels |
| 29 | S6.A Table 11 Footnote j or other equivalent EPA-approved method with the same or lower quantitation level. | Change to: Or other equivalent EPA-approved method with the same or lower quantitation level; or a method with a |

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| | | greater lower quantitation level that provides detectable results. |
| 29 | S6.A Table 11 Footnote k If the permittee is unable to obtain the required QL due to matrix effects, the Permittee must report the matrix-specific method detection level (MDL) and QL on the DMR. | Change to: If the permittee is unable to obtain the required QL due to matrix effects and the result is a non-detect value, the Permittee must report the matrix-specific method detection level (MDL) and QL on the DMR. |
| 29 | S6.B Table 12 Total Ammonia's Laboratory Quantitation Level is 0.02 mg/L. | To remain consistent with NPDES permit's Appendix A, change this value to 0.3 mg/L based upon the capability of the methodology. |
| 29 | S6.B Table 12 Parameter Nitrate plus Nitrite Nitrogen | SM4500-NO3- E/F/H is the only Nitrate plus Nitrite Nitrogen method listed in the table. Nitrate method Hach 10206 is equivalent to SM4500-NO3-E & Nitrite method SM4500-NO2-B-2011. This is another method frequently used for this analysis and is allowed as an equivalent method by EPA. |
| 30 | S6.B Table 13 Total Ammonia's Laboratory Quantitation Level is 0.02 mg/L. | To remain consistent with NPDES permit's Appendix A, change this value to 0.3 mg/L based upon the capability of the methodology. |
| 30 | S6.B Table 13 Nitrate plus Nitrite Nitrogen | SM4500-NO3- E/F/H is the only Nitrate plus Nitrite Nitrogen method listed in the table. Nitrate method Hach 10206 is equivalent to SM4500-NO3-E & Nitrite method SM4500-NO2-B-2011. This is another method frequently used for this analysis and is allowed as an equivalent method by EPA. |
| 31 | S6.B Table 14 Calculations. | How should non-detects (values less than a quantitation limit) be used in calculations? |
| 31 | S6.B Table 14 Footnote j or other equivalent EPA-approved method with the same or lower quantitation level. | Change to: Or other equivalent EPA-approved method with the same or lower quantitation level; or a method with a greater lower quantitation level that provides detectable results. |
| 32 | S6.B Table 14 Footnote k If the permittee is unable to obtain the required QL due to matrix effects, the Permittee must report the matrix-specific method detection level (MDL) and QL on the DMR. | Change to: If the permittee is unable to obtain the required QL due to matrix effects and the result is a non-detect value, the Permittee must report the matrix-specific method detection level (MDL) and QL on the DMR. |
| 32 | S6.D.6 Maintain calibration records for at least three years.<br><br>S9.E (page 36) The Permittee must retain records of all monitoring information (field notes, sampling results, etc.), optimization documents submitted with the annual or one-time report, and any other documentation of compliance with permit requirements for a minimum of five years following the termination of permit coverage. Such information must include all calibration and maintenance records, and records of all data used to complete the application for this permit. This period of retention must be extended during the course of any unresolved litigation regarding | These timeframes are inconsistent with each other. |

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| | the discharge of pollutants by the Permittee or when requested by Ecology. | |
| 36 | S9.F.3 Submit a written report to Ecology within five (5) days of the time the Permittee becomes aware of a reportable event. | Much of the information that would be contained in the written report will likely have been provided to Ecology prior to the report via the within-24 hours ERTS report and subsequent discussions with Ecology staff.<br><br>Define a reportable event", parameters for the definition and timing. |
| 42 | G13 Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification. | Provide the rationale and under what circumstances Ecology may require additional monitoring and how Ecology define these. |
| 48 | Alternative Restoration Plan means 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. | This is listed in Appendix A but is not included elsewhere in the permit. |
| 49 | Optimization (also treatment optimization) means a best management practice (BMP) resulting in the refinement of WWTP operations that lead to improved effluent water quality and/or treatment efficiencies. | This is not the same working definition as the accompanying Fact Sheet (page 42) and does not say that Optimization in the context of this permit is referring to the maximization of nitrogen removal. |
| 52 | Appendix B NOP, NRE | These do not appear in the definitions. |
| 55 | Appendix D.5 Total Inorganic Nitrogen (TIN) means the sum of ammonia, nitrate, and nitrite. It includes dissolved and particulate fractions. | King County is concerned that some of the referenced methods in Tables 9, 10, 12, and 13 are per the method performed on filtered fractions of the matrix. This is due to constraints of the instrumentation as well as to minimize interferences. These measurements would better be characterized as Dissolved Inorganic Nitrogen (DIN).<br><br>Please confirm that with this definition there is no difference between DIN and TIN. |

# Appendix B: King County's Comments on the Draft Puget Sound Nutrient General Permit Fact Sheet

| Pg. | Factsheet Language | King County Comments |
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| 9 | 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. | Although extensive work has been done to develop the Salish Sea Model, there has not been extensive scientific study of real-world conditions in areas that have DO impairments according to the numeric criteria and the underlying cause(s) of the impairment.<br><br>For example, the Puget Sound Partnership's Vital Signs program reported that low dissolved oxygen, corresponding to unusually warm water did not result in observed fish kills. Further, DO levels were not uniformly low, but rather varied from below to above normal across parts of the Sound. Specifically, "Dissolved oxygen levels in many parts of Puget Sound were lower on average in 2019 compared to the baseline (1999–2008) conditions, continuing a six-year declining oxygen trend. The trend corresponds with anomalously warm waters (warmer water holds less oxygen). In contrast to this broader trend, certain areas (Central Basin, Quartermaster Harbor, and Bellingham Bay) reported normal to above normal oxygen – likely due to short-term effects of phytoplankton blooms or water circulation. Low oxygen waters may stress or kill fish, shellfish, and other underwater animals. In 2019, hypoxia (low oxygen) persisted from July to November in South Hood Canal, where low-oxygen areas are common at certain times of the year; luckily, no fish kills were reported. (From: Puget Sound Marine Water Quality Vital Sign, Updated 5/6/2021. https://vitalsigns.pugetsoundinfo.wa.gov/VitalSign/Detail/10) |
| 11 | 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 PSNGP but appreciates the effort utilities participating in | Much of this Final Recommendation document was not incorporated in this permit including the referenced text from pg. 11. Ecology's Advisory Committee process was both compressed in time and did not result in a permit that took the Utilities' concerns sufficiently into account. |

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| | 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. | |
| 12 | 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. | Define "strength of the wastewater". |
| 12 | 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 statement is outside the scope of this permit. It implies the expectation that existing treatment should be removing these pollutants and implies that nutrient treatment will have additional benefits by removing CECs, but limited research has been conducted and is therefore uncertain. |
| 16 | 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 | While it is unknown the full scale of facility modifications across Puget Sound that will be required by this first permit, this likely understates the collective impact of construction and air impacts the general permit could trigger across the Sound. |
| 16 | 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. | Invoking this SEPA exemption appears to be significant departure from the intent of this section of the WAC. The failure to conduct an adequate (or any) environmental review of this proposed regulation leaves Ecology singularly focused on the issue of nutrients and nutrient impacts without considering a myriad of other environmental considerations that would come into play in an adequate SEPA review. That includes impacts from the construction of a new facility, air impacts from pollutants released from the removal of nutrients, the impacts of climate change on the effectiveness of the permit strategy, rate impacts (through an analysis of impacts on housing) and socioeconomic impacts (including impacts to environmental justice communities). Given the significant impacts anticipated to flow from this proposal, we believe a push for a full SEPA EIS as part of this permitting effort is appropriate. |
| 17 | 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 | AKART is a complex process requiring professional judgement calls from both the engineering and economic disciplines. It is premature to require an AKART analysis until the waste load allocations and WQBELs are established. Assessing economic and engineering considerations on a facility-by-facility basis is a necessary part of the nutrient optimization plan but it shouldn't |

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| | 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).<br><br>Under EPA's regulations, non-numeric effluent limits are authorized in lieu of numeric limits, where "numeric effluent limitations are infeasible." | be an AKART analysis until permitees have a more definite sense of what the actual target will be.<br><br>The requirement to do a 10% nutrient reduction if the Action Level is exceeded appears to be arbitrary and functions as a de facto numeric limit without following the technical rigor required to establish numeric limits. Ecology must align the general permit actions in the first cycle with the rationale listed in the Fact Sheet that states it is premature to establish WQBELs prior to development of the Nutrient Reduction plan and TMDL. |
| 18 | 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. | We request more information on what is meant by the phrase "started to evolve". If there is technology for nutrient removal that King County and others are not aware of, we request that such information be provided so we can evaluate it for effectiveness, cost, and feasibility. |
| 18 | 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. | We request more information such as locations, dates and data to substantiate the statement "DO deficits caused by nutrient pollution in surface waters across the state of Washington have become much more pervasive" specifically as it relates to marine waters within the Greater Puget Sound Region. |
| 18 | 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. | King County requests Ecology to define "over enrichment" and provide the field observations that must exist to support this statement, as it pertains to DO measurements in the Salish Sea. I If 'over enrichment' intended to be synonymous with exceeding the 0.2 mg/L anthropogenic threshold, please provide access to the observations or other evidence of nutrient over enrichment within the Greater Puget Sound Region. |
| 18 | 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. | We request to see Ecology's analysis of King County's 303(d) listings. In addition to wastewater plants, provide other causes Ecology has explored in terms of depleted DO levels and 303(d) listings.<br><br>Please provide the documentation that 303(d) DO listings are due to increased nutrients. The 303(d) list reflects where sampling occurs, and prior DO listings were based on the numeric criteria. The current draft 303(d) list for marine waters |

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| | | used, in part, the Salish Sea Model output to determine listings based on the 0.2 mg/L anthropogenic standard. The model is not sufficiently accurate nor sensitive enough to make these determinations.<br><br>Ecology should refine what constitutes AKART" before issuing this permit. There are many substantial unknowns that permitees and Ecology should analyze, discuss, and agree upon before the permit is issued and certainly before an AKART analysis is begun |
| 18 | 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. | Ecology must define this process and include how affordability should be factored in across a wide range of geography, jurisdictional size, rate base, current rates, and projected rate trends that are increasing to keep up with system maintenance and other regulatory requirements. |
| 20 | ANTIDEGRADATION | If Ecology believes it has information that shows King County discharges are measurably degrading Salish Sea water quality, we would like to see or have access to Ecology's models that demonstrate that a reduction in nitrogen will demonstrably increase DO in relevant parts of the Salish Sea. This would be useful information to share with stakeholders and ratepayers |
| 20 | Narrative criteria protect the specific beneficial uses of all fresh water and marine water in the state of Washington. | On page 23, we have questions about the following statement: "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 water body to decrease more than 0.2 mg/L." Please explain the biological relevance or other rationale for this as a criterion. |
| 22 | Ecology has not established a critical condition for the Puget Sound region at this time. | If there is no critical condition at this time, is it premature to issue the permit at this time. |
| 22 | 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. | There is more work to be done in understanding the ecology of Puget Sound and the varying ecosystems throughout. Not all parts of Puget Sound will meet a set standard year-round, even if all WWTP nitrogen loads were removed from the system. A TMDL address this. |
| 22 | 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 | The Salish Sea is not a homogenous system, and there are many factors that play into DO levels. This is why we need a TMDL. Ecology acknowledges that every outfall has unique flow characteristics that play an essential role in determining effects on water quality which should drive Ecology to regulate using |

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| | applicable to facilities covered under a general permit. | individual permits reflecting the specific needs for each location with a DO impairment problem instead of a general permit. |
| 23 | Each of these aquatic life designations has associated numeric criteria for temperature, dissolved oxygen, turbidity, and pH. This PSNGP 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. | To protect and restore Puget Sound and its shallow bays Ecology should assess all the factors that impact DO. The fact sheet should comprehensively address Ecology's rationale or justification for focusing solely on TIN when there are many factors, some far more pertinent depending upon the specific area of the Salish Sea. |
| 23 | 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). | The identification of 0.2 mg/L as the maximum allowable human-caused decline in DO concentrations when the criteria are not met does not appear to be based on any quantified relationship between DO variability and change in the Salish Sea and the health of aquatic organisms. This standard was established in 1967 as 0.2 mg/L was the smallest amount that could be measured in the laboratory at that time, but it has no biological relevance. As such it is unclear to what degree, or whether, meeting this condition would improve the health of aquatic organisms. This is especially true given the fact that native aquatic species are adapted to an extremely wide range of natural variability of DO concentrations by location, depth, season, and time in the Salish Sea and naturally vary how they use the waters by location, depth, season, and time of day. We believe establishing standards that account for this variability and are linked to the health of aquatic species (as opposed to laboratory observational capabilities) is critical to justify the actions proposed in this permit. This approach has been used in other estuaries in the United States and warrants the completion of a TMDL.<br><br>Ecology's fact sheet ignores the next 2 paragraphs in the WAC ((173-201A-210(1)(d)(ii) and (iii)) giving guidance on where to take and how to interpret DO measurements: "(ii) Concentrations of D.O. are not to fall below the criteria in the table at a probability frequency of more than once every ten years on average. (iii) D.O. measurements should be taken to represent the dominant aquatic habitat of the monitoring site. This typically means samples should not be taken from shallow stagnant backwater areas, within isolated thermal refuges, at the surface, or at the water's edge." |
| 24 | Table 3 | The Dissolved Oxygen criteria, expressed as 1-day minimums, were not developed using robust knowledge of natural DO variability in the Salish Sea and do not account for the fact that DO concentrations do not meet these criteria at many locations, depths, and times under natural conditions. As such we request Ecology include in its fact sheet the information that confirms that the DO criteria were set at levels that support healthy and robust aquatic species as stated. |

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| 24 | This PSNGP 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. | Regulations should not be based on accomplishing both criteria, the model predicts that even if all WWTPs turned off their discharges, the numeric DO criteria would still not be attained in some areas. |
| 25 | 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. | King County requests the completion of a TMDL prior to the issuance of this permit.<br><br>Please provide a WAC reference that states that discharges and numeric DO criteria are applied in this manner.<br><br>The Salish Sea Model is not accurate or sensitive enough to be applied for this purpose. |
| 26 | 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. | King County requests Ecology provide the recent studies and the analysis leading to these conclusions.<br><br>This could be interpreted to mean all of Puget Sound has “low” DO at times, which is untrue. |
| 26 | 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**. | As written, this indicates natural background is nutrient over-enriched. “The additional nitrogen load from human inputs, above the natural background, exacerbates the nutrient over-enrichment and leads to **eutrophication”** is a statement that should be supported by scientific analysis. Please provide that analysis for review by permitees. |
| 26 | 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 fact sheet should also state there are other factors that limit aquatic plant growth. Light has been considered a primary limitation of Puget Sound phytoplankton production which is related to variation in stratification strength. |

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| 26 | The additional nitrogen load from human inputs, above the natural background, exacerbates the nutrient over- enrichment and leads to eutrophication.<br><br>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 current condition of eutrophication has not been established to our knowledge. If such studies, exist, please provide them for review. |
| 26 | 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). | This is based on the 0.2 mg/L anthropogenic standard, and the Salish Sea Model is not accurate or sensitive enough for this purpose. Tarang Khangaonkar stated that the area where hypoxic conditions (<2.0 mg/L) are expected to increase to ~16% by 2095 are in Hood Canal, three bays within the Whidbey Basin, and the Strait of Juan de Fuca, but very few other areas within the Salish Sea.<br><br>If "currently in publication" means it's not available yet to evaluate, then King County would like to see this document including all associated peer review documents. |
| 27 | Figure 2 | Please give us any peer review of the model that led to this chart.<br><br>Figure 2 may be misleading as the absolute area and number of noncompliant days may be relatively small initially, with transition of model cells to >0.2 mg/L decline creating the large relative changes under the 2040 High WWTP Flows scenario. |
| 27 | 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. | Existing scientific information clearly shows that Puget Sound DO has not been (and will not be) meeting absolute DO criteria due to natural conditions in many places (ocean DO/production/circulation; e.g., seasonal hypoxia has occurred in Hood Canal for at least past ~700 years). |
| 27 | 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. | There are likely other more dominant causes of eutrophication and DO impairment beyond nitrogen and organic carbon in each area. The regulations should target the causes of harm in each specific area. |
| 27 | Ecology uses DO as the indicator pollutant to monitor the deleterious effects of excess nitrogen and organic carbon loading in marine waters. | DO is the indicator of whether the designated beneficial use is supported (i.e., presumably fish and other aerobic organisms) rather than a "pollutant". |
| 28 | This modeling tool provides Ecology with the ability to predict compliance with marine water quality standards and evaluate nutrient | King County requests all internal and external peer reviews to be assured that the model was peer reviewed to accurately predict DO changes at 0.2 mg/L increments, that the mathematical |

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| | (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. | limitations and error analysis associated with the model were defined, and there was a determination that the model is accurate enough for regulatory compliance uses. |
| 28 | 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. | This statement implies the SSM has been subject to critical peer review from independent reviewers, but as other observers have pointed out, many participants have been confounded by a conflict of interest. We believe an independent third-party review would add credibility, especially as the SSM has not had extensive peer-review for the current use to determine areas with a 0.2 mg/L change from natural conditions. |
| 28 | 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). | The SSM cannot accurately predict compliance with the 0.2 mg/L anthropogenic DO standard. The complexity of factors influencing DO makes the model uncertainty much higher than 0.2 mg/L. Ecology has not addressed the comments and concerns submitted by King County and others about the model's ability to be used in this manner. |
| 28 | 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…A summary of the model development and application approach, with its inherent transparency and peer review phases is described below…. 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 PSNGP. | Please see previous comments about the limitations of the SSM for regulatory purposes. Given the statement that the SSM is the "best available science" for use in regulating nitrogen discharge, it would seem appropriate that comments about the SSM can be made as a part of this process and not separately. If the SSM is not ready for comment, then we ask whether it should be used as the tool to drive this regulatory requirement. |
| 28 | 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. | In other areas, such as Chesapeake Bay, where models have been used for regulatory purposes, **multiple models** have been used simultaneously to assess output against biologically relevant standards/targets and not a small 0.2 mg/L increment. We ask Ecology to comment on the risk of uncertainty associated with using a single model. |

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| 29 | 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 has not been used to determine allocations for point sources in the same way as TMDL development models. We ask Ecology to explain in its fact sheet why a TMDL is not being pursued in this case. |
| 29 | 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. | We note the following from EPA's guidance.<br><br>CREM, 2009. Executive Summary, pg. vii: "This guidance recommends best practices to help determine when a model, despite its uncertainties, can be appropriately used to inform a decision. Specifically, it recommends that model developers and users: (a) subject their model to credible, objective peer review; (b) assess the quality of the data they use; (c) corroborate their model by evaluating the degree to which it corresponds to the system being modeled; and (d) perform sensitivity and uncertainty analyses.<br><br>Please provide an accounting of the review detailed above that the SSM has been subject to and the results of that review.<br>To our understanding, there has been no peer review on the use of the model for this specific regulatory application. Sensitivity and uncertainty analysis are incomplete. The Bounding scenario's report describes one additional run with a different set of parameters. This run was not used to determine DO depletion, so there appears to be no sensitivity or uncertainty analysis relating to DO depletion. Additionally, the uncertainty analysis section in the bounding scenarios report appears to contain mathematical errors. |
| 30 | 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.<br>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. | Land based DIN loads also contribute to exceedances of the DO standard. These exceedances must be addressed in the Puget Sound Nutrient Management Plan prior to the issuance of this permit. |
| 32 | 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 | Determining a 'threshold for reasonable potential' is a complex process under the CWA. Please provide the background analysis that substantiates the statement. We would like to see the analysis that links complex circulation patterns to a cumulative impact. |

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| | threshold for reasonable potential under 40 C.F.R. 122.44(d)(1)(iii). | |
| 32 | 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. | Please be clear throughout this document which standard is being referenced, as the 5.0 and 7.0 mg/L standards are for the protection of aquatic life while the 0.2 mg/L standard has no biological relevance. |
| 33 | 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.<br><br>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 believes that additional modeling work and extensive internal and external review are necessary, therefore, Ecology's work is unfinished and the WQBELs should be determined before a general or treatment plant specific permit is issued. |
| 33 | 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 | Ecology needs to acknowledge that attempting to operate a treatment plant (designed for BOD/TSS removal) for nitrogen removal means that WWTPs will potentially risk violating existing NPDES permit BMPs. |

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| | requirements for **optimization** of current treatment processes to abate nutrient loads through the permit term... | |
| 33 | 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. | Ecology's work is unfinished and the WQBELs should be determined before a general or treatment plant specific permit is issued. |
| 34 | 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... | King County requests this data be included in the fact sheet or the reference be made available. |
| 34 | 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. | It may be that some smaller treatment plants contribute more to the impairment of shallow embayments due to their locations and outfall depth. This goes against the purpose of what the permit is trying to accomplish, increased DO in impaired shallow embayments. |
| 34 | Numeric limits remain infeasible because modeling is not yet complete. Therefore, the PSNGP includes narrative water quality-based effluent limits (WQBELs) to control discharges as necessary to meet applicable water quality standards for DO. | Where are DO standards not being met should have a direct connection to individual treatment plants.<br><br>Again, the modeling work should be finished before issuing this permit. |

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| 36 | 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. | Please include the investigations or reference them in the fact sheet. |
| 37 | NPDES permits may not be reissued, renewed, or modified with less stringent limitations or conditions than those defined in a previous permit 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. | Requiring utilities to do AKART prior to the establishment of numeric WQBELs creates risk of triggering anti-backsliding provisions. |
| 38 | 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. | As a general statement this could be misleading because it may imply that those contributing 99% of the load also contribute to 99% of the exceedances which has not been established by data or modeling |
| 42 | The PSNGP 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. | Ecology may have misjudged the resources and costs associated with optimization. A better explanation of what is meant by optimization may reduce concerns.<br><br>The application of BMPs for nitrogen removal to a BOD/TSS removal treatment plant can potentially risk violating plant existing NPDES permit conditions. |
| 43 | 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). | We note that there are individual risks associated with application of strategies based on individual treatment plant design.<br><br>The time required to implement optimization strategy should also be included in discussion (installation, commissioning, and biological process acclimation). |

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| 43 | Permittees may exclude optimization strategies that exceed a reasonable implementation cost or timeframe. | We appreciate the intent behind this statement, and we request an elaboration of this phrase: “exceed a reasonable implementation cost.” |
| 43 | 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. | A majority of the wastewater treatment plants in these EPA studies were either already configured for nitrogen removal or nitrification. The remaining facilities were either sequencing batch reactors (or converted to a sequencing batch reactor) or oxidation ditches. The wastewater treatment plant types in these studies do not apply to most (or possibly any) of the dominant load facilities described in Table 5 of the draft PSNGP. In addition, the predominant approach to optimization described in this study was to utilize excess reactor or aeration capacity to nitrify. Many of the dominant loaders may not have excess reactor or aeration capacity. |
| 44 | Configuration Changes<br><br>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. | While we appreciate the intent behind this, we note that all suggested approaches (process control, aeration modifications, etc.) would require some level capital investments and subsequent operational changes and costs. |
| 45 | Ecology understands that there may be many different approaches to optimization and does not want Permittees to focus reporting on daily process micro adjustments. 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. | A 12-month reporting period is not enough time to test, plan, adjust, evaluate, report, and start over. This would require a large number of new staffing and other resources. We request that Ecology seek comment from permitees regarding the typical operations of a treatment plant and what a realistic schedule for reporting might be. |
| 47 | The existing **303(d)** listings for DO throughout Puget Sound requires Ecology to prevent additional pollutant loadings that create the impairment. | King County is concerned that Ecology has not assessed the causal factors for each DO impairment. |
| 47 | Draft Condition S4.D Action Level Exceedance Corrective Actions<br><br>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. | Timeframes on this section appear to be unrealistic. Provide the timeframe for the WQBELs. |
| 49 | This planning document also requires an assessment of current treatment technology including site specific flows, loads, and | WWTPs need assurance the Ecology will have the resources to review/evaluate/approve these plans for dozens of treatment jurisdictions and plants all being submitted at the same time. |

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| | 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. | |
| 50 | 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. | We request more information on how "reasonable" will be determined in the context of affordability. |
| 51 | Environmental Justice Review I. Opportunities to set alternative wastewater rates must also be considered as part of the planning requirement in the PSNGP. 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. | See comments on Permit Draft S4.E.5.c.iii-S4.E.5.d.iii in Appendix A. |
| 55 | 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. | We suggest that Ecology be open to any EPA approved method that yields a detectable result above its lower level of quantitation or Minimum Level. It may seem counterintuitive, but occasionally a more sensitive method will yield a less accurate value because lower-level methods are often created for "cleaner" matrices. Requiring mercury by CVAF for influent analysis is less accurate than analyzing mercury by CVAA for instance; even though CVAA has an order of magnitude higher QL. |
| 55 | The Environmental Assessment Program has identified carbon as a secondary nutrient driving eutrophication in the Salish Sea. | Please provide documentation that supports this statement. Our understanding is that Carbon limitation is not relevant in this system and does not drive eutrophication. |
| 61 | 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.<br><br>See Page 46, PSNGP Draft S4.C.3: 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 waste stream management practices related to RV and boat pump out services. Given that the | Any pretreatment program required for Industrial/commercial discharges or limiting septage haulers from disposing at a wastewater treatment facility will come with an economic cost. Small businesses will be affected by any requirement for WWTPs to decrease the influent nitrogen. In addition, sewer rates for individual households, multifamily developments, small businesses, commercial uses, and others will be affected by the costs associated with compliance. An economic analysis would help all parties understand how the costs are related to the projected benefits. |

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| | 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. | |
| 78 | Ecology used single sample 2019 DMR data to determine the average daily load for each Permittee subject to coverage under the proposed permit. | 2019 was an atypical year in terms of precipitation seasonal patterns. Please explain why a single year was chosen rather than a multi-year average. |
| 78 | Appendix D table “2019 Nutrient Loading, Lbs./Day” | Should be TIN loading, Lbs./Day. |
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