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King County
Department of Natural Resources and Parks
King Street Center, KSC-NR-5700
201 South Jackson Street
Seattle, WA 98104-3855

March 15, 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 Preliminary Puget Sound Nutrients General Permit – Preliminary Draft (January 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's (Ecology) "*Puget Sound Nutrient General Permit – Preliminary Draft*" (PSNGP) for municipal wastewater treatment facilities that discharge directly to Puget Sound. We recognize that Ecology has a responsibility to develop a program and policies that will address the dissolved oxygen (DO) impairment concerns in sensitive areas of the Sound. However, we believe that it is premature to issue a general permit, as proposed, without a more comprehensive evaluation of other regulatory options and a more thorough review of the scientific analysis underpinning the current proposal.

There remains a considerable amount of scientific assessment and justification necessary to develop the Puget Sound Nutrient Management Plan and extensive work to be done to understand all the contributions to low dissolved oxygen conditions including nonpoint sources, and temperature, weather, and ocean conditions stemming from climate change. We believe that the current modeling used by Ecology may not adequately consider these other factors and may contain several methodological errors. We believe these issues could be resolved by further scientific evaluation. Such evaluation should also assess the trade-off from removing nitrogen from waste discharges and releasing it into the air where it can be a strong greenhouse gas. By first completing a comprehensive Puget Sound Nutrient Management Plan, we can be assured that the approach taken will achieve the desired environmental outcomes more quickly and cost effectively. The PSNGP must align with the best science for all nitrogen contributions to provide a sound basis for a general permit that aims to establish specific discharge standards for all municipal dischargers.

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King County has evaluated the potential costs to achieve the proposed regulations, and they could exceed $6 billion dollars to upgrade our three regional treatment plants. As the monthly sewer rate impacts would be substantial, it is imperative that the correct investments are being made. King County's current wholesale sewer rate is approximately $47 for a single-family residence. By 2030 this rate is expected to increase to $71 with a delayed timeline for completing required CSO reductions. If Ecology's general permit sets a course for nitrogen reduction at all our treatment plants in the subsequent decade, these monthly rates would rise to $203 per month under our current financing policies. These costs and rates will be much higher if the more stringent standards apply to West Point because we would need to build a new treatment plant in Seattle.

Ecology must also consider that we are at a point in time where our public infrastructure is aging, and we must make significant investments in order to maintain reliability and prepare for the impacts of climate change. Ecology must be transparent with the residents and businesses throughout the Puget Sound region by issuing regulations and a general permit that makes clear what these regulations will require, not just in the next five years, but in the long term, so that the impact of these decisions are known and factored into the long term needs of our infrastructure plans.

Finally, we recommend that Ecology also consider:

- Establishing a third-party independent panel of scientists and engineers to make recommendations on the effectiveness of alternatives and identifying solutions that would achieve the greatest water quality benefit for the investment,
- Enable other alternatives to be vetted (e.g., water quality trading and bubble permits) and
- Implement a robust engagement plan across Puget Sound to ensure residents and businesses are informed and have the opportunity to provide input.

We have attached more detailed comments on the Preliminary Draft and supplemental questions that were posed. Also attached is King County's recently completed nitrogen reduction assessment report, which documents some of the substantial technical constraints and resource investments that are associated with nutrient reduction options at the West Point, South Plant, and Brightwater facilities.

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Although Ecology is not required as part of this general permit process to look more broadly at other potential actions that may contribute more to the recovery of Puget Sound, the Orca and our salmon population, King County wants to work side by side with Ecology and others to prioritize and invest in the actions that will best achieve the outcomes we all seek.

Thank you again for the opportunity to comment on the preliminary draft PSNGP. If you have any questions, please do not hesitate to contact WTD Division Director, Mark Isaacson, at 206.477.4601 or Mark.Isaacson@kingcounty.gov, or me at 206.477.4550 or Christie.True@kingcounty.gov.

Sincerely,

DocuSigned by:
1BD15B1B73AE4A0...

Christie True
Director, DNRP

Attachments

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King County
Department of Natural Resources and Parks
King Street Center, KSC-NR-0700
201 South Jackson Street
Seattle, WA 98104-3855

March 15, 2021

King County Department of Natural Resources and Parks Detailed Comments on the "Puget Sound Nutrients General Permit – Preliminary Draft"

I. Introduction

II. Coverage Requirements

A. Considerations for evaluating coverage requirements

B. Coverage Proposal

- The Preliminary Draft PSNGP excludes Industrial WWTPs from coverage. The permit does not explicitly state that these are direct dischargers. Given that Industrial WWTPs are < 1% of nitrogen load, it is unclear if Ecology expects delegated pretreatment programs to establish local discharge limits for nitrogen for industrial users in the future. If so, what would the technical basis be? For those municipalities that are not delegated pretreatment programs, will Ecology work with and develop local limits for each of those entities? In the Draft Permit, Ecology has not been explicit with respect to indirect dischargers and whether or not they are excluded from coverage under the PSNGP.

C. Facilities excluded from Permit Coverage

- Section II.C (and Section 11.B) – Even though the excluded facilities are <1% of the total WWTP N load to Puget Sound, some discharge directly into embayments that are more impacted by nitrogen. Why would Ecology exclude these facilities? Any regional planning effort should require monitoring of all WWTP inputs, regardless of size, to effectively achieve the desired outcome.

D. Facilities with current limits

E. Coverage Mechanics

F. Permit Fees

III. Nutrient Action Levels

A. Why is a nutrient load trigger necessary?

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- King County agrees that it is infeasible to issue numeric WQBELs at this time in advance of the modeling and loading capacity allocation being completed. In describing next steps once the modeling for allocations is completed, there is a sentence that states, "Ecology will allocate the overall nutrient loading capacity amongst the wastewater discharges and watersheds." Does this mean that Ecology will allocate the loading capacity to "all point and nonpoint sources?" Ecology should complete the modeling before issuing the general permit so that it can provide clarity about the regulatory and scientific basis for the standards of effluent limits and include mechanisms in the permit to help facilitate future water quality training (WQT) activities such as bubble permitting.
- 40 CFR § 122.44(k) allows for BMPs in lieu of numeric TBELs/WQBELs when "numeric effluent limitations are infeasible." However, the "nutrient action levels" have the hallmarks of numeric effluent limits, including being defined both in terms of concentration and volume. Exceeding these limits also triggers the need to take action, just like any other numeric effluent limit. In this permit, Ecology is stating that numeric effluent limits are infeasible while also using numeric limits as the basis for required action.

B. How does the nutrient action level work with the optimization requirement?

- The "plan>do>check>act>evaluate" process for Tier 1 actions is implied as an expected continual process. This infers a pace and certainty of process, results, and action that are challenging to meet when we ultimately need to assert "compliance."
- The flexibility of the discharger-driven plan and action implementation could lead to subjective interpretations of compliance status and risks of 3rd party complaints.
- The last sentence of this paragraph states that, "any exceedance of either AL_0 or AL_1 will trigger further action as outlined in Sections V and VI of the preliminary draft proposal." The permit does not define "any exceedance" and, as such, might be misinterpreted as anything other than the exceedance of AL_0 or AL_1 by a WWTP's one-year cumulative annual total load.

C. Nutrient Action Level Calculation Methods

- There are several issues with the method used to implement the bootstrapping calculation.
    - The method assumes that the observations in the original data represent possible future observations. In other words, the data is assumed not to have a trend (is stationary). For WWTPs serving growing areas, the year-to-year increase in loadings can be significant when compared to the annual variation. Ignoring this trend penalizes such WWTPs by assuming older, lower load data is representative of future conditions. This results in the bootstrapping method underestimating current nutrient loads and underestimating the nutrient Action Levels.
    - The bootstrapping method assumes the data is from an independent and identically distributed population. This assumption is not true for nutrient loads from WWTPs. EPA's Technical Support Document (1991) discusses this: "in the case of the monthly average limit derivation, the assumption that observed

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pollutant levels are independent can be quite important. If the effluent levels are correlated, the actual monthly average limit can be substantially higher than that derived from the analysis based on the independence assumption. A major factor that determines whether effluent levels are highly correlated is the retention time of the wastewater treatment system. If the retention time is large relative to the time between effluent samples, then those samples will tend to be correlated with each other in most cases. In municipal systems, for example, the retention time is frequently a matter of days, and sampling is often conducted daily. The effluent levels, consequently, may be substantially correlated." This is equally true for an annual average limit such as the nutrient Action Levels. This results in the bootstrapping method underestimating the variation in nutrient loads and underestimating the nutrient Action Levels.

  - Beyond the correlation described above, nutrient loads and WWTP nutrient removal performance are dependent upon weather and climatic conditions. Assuming the last several years of data captures the range of weather and climatic conditions and represents possible future conditions is not true. This results in the bootstrapping method underestimating the likely future variation in nutrient loads and underestimating the nutrient Action Levels.

- The methodologies used to calculate the baseline action level AL_0 for King County's West Point, South, Brightwater treatment plants appear to be different than the methodology described in this section and are not described elsewhere in the permit. The descriptions for the methodologies used to calculate action level AL_0 for West Point, South, and Brightwater treatment plants do not include the rationale for deviating from what the permit has outlined for methodologies.

- In the paragraphs describing the calculation methodology for the baseline action level AL_0, Ecology states that the intent of the calculation methodology is to create a 1% chance that a WWTP would exceed AL_0 in any given year by chance when behaving in a manner similar to its historical record. Ecology also provided a link to the calculation spreadsheet that was used to calculate AL_0 values listed in Table 4. After reviewing the spreadsheet, King County believes the techniques and the assumptions inherent to the calculations in the spreadsheet would result in a significantly higher chance than 1% of a WWTP exceeding AL_0 by chance in any given year (assuming no change in influent nitrogen). King County independently tested and confirmed this hypothesis by investigating the historical effluent TIN load data from two WWTPs (not owned by King County), and in fact, both treatment plants had a year where their effluent TIN load exceeded the baseline action level AL_0 in the past 5 years.

Calculating the baseline, AL0

Secondary Threshold, AL1

D. Facilities discharging less than 10 mg/L Total Inorganic Nitrogen

- A sentence in this section states that, "Ecology currently expects that the range of final effluent limits will vary between 10 and 3 mg/L TIN, with 3 mg/L being around the lower limit of current technology." The permit does not specify whether the

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referenced final effluent limits are year-round or seasonal. Similar comment throughout the permit document.

E. Calculated action load options by facility

- The permit is missing the option for regional interconnected wastewater networks with multiple treatment plants to have combined action limits AL_0 and AL_1 for all plants in the regional interconnected network (i.e., a bubble permit). A bubble permit for these systems would allow the flexibility of wastewater flows to be directed to WWTPs that remove more nitrogen than others, as well as to alternatively allow TIN reduction through additional optimization actions to occur at one facility to offset the excess at a plant that may be exceeding. A bubble permitting approach to facilities under the purview of one jurisdiction is consistent with Ecology's approach to maintain TIN loading to current levels without imposing excessive burden on dischargers prior to the WQBELs. This comment is made in recognition that wastewater flow transfers occur among the interconnected plants to accommodate flow, energy use, and operational performance, and thus a bubble permit approach to the total TIN inventory would facilitate better planning of optimization actions and necessary operational flexibility.
- Units for action limits AL_0 and AL_1 are missing in Table 4. King County understands these units to be annual TIN effluent loads in lb N/year.
- The action limit AL_1 value for King County Vashon WWTP, which consistently discharges less than 10 mg/L, is not calculated in accordance with the methodology described for facilities discharging less than 10 mg/L in section III.D.
- The equation in the first footnote in Table 4 is missing a factor of 365 to calculate a yearly load for AL_1.

IV. Monitoring and Reporting

A. Monitoring requirements

- This section requires treatment plants to use analytical methods approved under 40 CFR 136 for all permit required compliance monitoring. Table II in 40 CFR Part 136 does not identify a preservation time for composite samples but references a 15-minute time for grab samples. Composite sampling over 24 hours is typically done from 12am to 12am. Sample handling is typically done by trained lab specialists and cannot reasonably be done within 15-minutes (the timeframe for grab sample preservation) from the end of every composite sampling event for all of the analytes listed (TKN, TOC, NH3, NO2 and NO3) with the frequency described in the permit. Significantly more time for preserving samples is necessary to complete the monitoring requirements of this section given the frequency of sampling and the number of constituents that would be monitored.
- This section does not allow for continuous online analyzers to be used in lieu of sampling and lab analysis in the monitoring schedules in Tables 5-7, if the online analyzers are shown to provide reliable measurements through verification by duplicate sampling and lab analysis.

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- This section indicates that monitoring in the schedules proposed in Tables 5-7 begin one month after the effective date of the proposed general permit. One month is a very short timeframe to get such significant changes in place for a WWTP or utility of any size, and the effective date of the proposed general permit is not known.
- Language in Table 5 under Wastewater Influent requires large WWTPS to, "sample the wastewater entering the headworks of the treatment plant excluding any side-stream returns from inside the plant." All of King County's large WWTPs (West Point, South and Brightwater) can have side-stream returns into the influent wastewater stream under typical or specific operating conditions. The scope of work to permanently exclude side-stream returns from the raw sewage sampling at King County's large WWTPs would be significant and costly, and may not be feasible.
- The requirement to test influent wastewater for TKN, NH3, NO2, and NO3 appears to be for purposes of quantifying the total influent nitrogen mass and to calculate the percent total nitrogen removal. Quantifying the influent total nitrogen load and calculating percent nitrogen removal only requires the analysis of TKN, NO2 and NO3; it does not require the analysis of NH3.
- Requiring testing for BOD and CBOD is an extra burden, especially when the TBOD requirement in the NPDES permit is based on standard 30/45 mg/L permit limits. Ecology has previously been willing to switch to 25/40 CBOD effluent and 85% CBOD requirements in NPDES permits instead of the 30/45 TBOD effluent permit limits and 85% TBOD removal requirement resulting in a reduced analytical and reporting burden for those plants with CBOD effluent permit limits under the PSNGP.
- Footnotes b and g for Table 5 require samples to be collected four times during each calendar week on a rotational basis. Requiring a rotational schedule instead of a fixed schedule means a greater level of coordination and burden on utilities. It is highly likely that a sample will be collected out of rotation resulting in a violation of the permit requirements.
- Footnotes b for Table 5 require samples to be collected four times during each calendar week on a rotational basis through the days of the week, except weekends and holidays. If weekends are excluded from the data collection, the data set may be non-representative of loadings into and out of a WWTP. Populations served by the wastewater system and other loads, septage receiving for example, may change on the weekends.

B. Reporting and recording requirements

- There is not an established start and end date of the annual TIN load calculations in this section.
- The last sentence of this section states, "Ecology proposes modifying, as necessary, duplicative nutrient monitoring requirements in individual permits prior to or during normal reissuance schedules for expired permits after the proposed general permit is issued and effective." Modifying the NPDES DMR and annual reporting to remove nitrogen data collection as soon as possible would reduce additional burdens on utilities under the permit.

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V. Optimization and Additional Actions

A. Optimization Framework

- The first two sentences in the third paragraph describe the five steps of the optimization investigation as occurring on an annual basis and over a single year. This infers a pace and certainty of process, results, and action that are challenging to meet when we ultimately need to assert "compliance."

- This section refers to "low cost" optimization solutions several times. It also identifies that Ecology cannot specify a single low-cost threshold because of the variety of WWTPs covered by the PSNGP. While it is clear a common absolute cost cannot be established for all WWTPs, the PSNGP is missing any reference to normalized metrics to establish a low-cost threshold such as a maximum percent of a WWTP's budget as Ecology suggested in the Advisory Committee meetings, or the unit removal cost metric used in such studies as that completed for the Bay Area Clean Water Association.

B. Optimization and Additional Tiered Actions

- Developing a Nutrient Optimization Plan is a significant effort in Year 1. However, this plan should rationally be completed before selecting and implementing any optimization actions to reduce TIN loadings. Therefore, assessing whether a WWTP exceeds its AL_0 in Year 1 would not provide adequate time to complete the Nutrient Optimization Plan and implement optimization actions.

- The fourth paragraph of this section states, "Tier 2 actions are triggered when a permittee exceeds AL_0..." It's conceivable that the AL_0 (or even AL_1) could be exceeded prior to fully investigating and implementing Tier 1 optimization actions. Thus, as written, this condition would compel the discharger to immediately pursue Tier 2 actions prior to first analyzing whether Tier 1 actions could reduce TIN loadings sufficiently to meet the AL_0.

- In the first paragraph, a sentence states that, "…dischargers must evaluate their ability to implement items in the list below (and also other strategies not listed) for effluent TIN reduction." What is meant by "other strategies not listed?" Is this in reference to other strategies that permittees develop through their own optimization planning?

- This section includes a list of Tier 1 optimization actions. Some of the optimization actions would not be able to be implemented by a WWTP or would not be technically or economically feasible. For example, if a WWTP has no side-stream return, the side-stream return controls cannot be improved. Also, some feasible optimization actions may be most appropriately implemented independently or sequentially as opposed to all at the same time. This section of the permit is missing language that WWTPs would not have to implement all of the optimization actions in the list in this section if they are not applicable or feasible and that not all Tier 1 actions listed that are feasible would need to be implemented simultaneously if there is a valid reason to implement some or all of them independently or in a sequential manner.

- The fourth paragraph of this section states that engineering reports may be needed for Tier 2 actions. The items list would appear to trigger General Condition S.5 for said

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approvals under our NPDES permits. How is compliance with General Condition S.5 achieved while conducting a program of optimization actions? What Ecology office would oversee the discharger's review and approval process? Moreover, significant planning and commitment of resources are necessary to prepare engineering reports. How will this work with the expected annual submittals of optimization plans articulated in the PSNGP?

- This section does not indicate whether one of the Tier 3 actions could be completed in lieu of implementing Tier 2 actions.
- Many of the Tier 2 actions listed in this section could be significant capital projects for a WWTP and the capital projects could take significant time to implement (contracting, design, equipment lead time, construction, startup, optimize, etc.). The difference between action limits AL_0 and AL_1 isn't very much (5%) and wouldn't provide much time for a facility to act to implement the Tier 2 upgrades once the action limit AL_0 was exceeded. A WWTP could be put in a situation where it is implementing a costly Tier 2 upgrade and then exceeding action limit AL_1 thus pushing it into taking Tier 3 actions.
- These sections (V.B., V.C.) define what happens if a treatment plant exceeds action levels AL_0 and AL_1. What tier of optimization actions need to be taken if a treatment plant exceeds action level AL_0 one year and then falls below action level AL_0 in a subsequent year, or similarly if a treatment plant exceeds action level AL_1 one year and then falls below action level AL_1 in a subsequent year? Both of these scenarios could occur if Tier 1 and/or Tier 2 actions take enough time to implement or to optimize operations to achieve the intended results.
- Ecology states that "successful optimization implementation requires the collection and analysis of sufficient influent and effluent data" but then requires "Tier 1 [optimization] action starting in year 1." How will these two requirements work in parallel?
- Tier 3 actions "need to meaningfully advance the facility toward future nutrient reduction and bridge the period between this first permit cycle and the achievement of final numeric water quality based effluent limits." However, without knowing what the final WQBELs will be, regulated facilities that exceed AL_1 are forced to commit potentially significant resources in order to drive towards an unknown target. Ecology must take into consideration the potential that facilities will accrue sunk costs that do not achieve ultimate nutrient limits and if those sunk costs will be accounted for in future permit iterations.

C. Requirements if unable to stay below action levels

- It is unclear how completing a Tier 3 action will impact implementation schedules for WQBELs and/or side-stream treatment in the second term of the general permit. For example, if a plant chooses to evaluate and initiate design of side stream treatment as a Tier 3 action, will that plant need to implement side-stream treatment prior to the enforcement of WQBELs in the second permit cycle? Or as another example, will a plant that develops nutrient reduction evaluations early (the third action listed) have less time to comply with WQBELs than a plant that is not required to take a Tier 3 action? In other words, will the allowable compliance schedules and associated interim milestones for

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meeting WQBELs be developed independently when the WQBELs are adopted in a future permit cycle?

- There do not appear to be any incentives to implementing actions beyond Tier 3. For example, if a plant evaluates, designs, and implements side-stream treatment early, might they get a benefit by having a longer time to implement WQBELs in the second round of the general permit?
- It is unclear whether actions can be added to the Tier 3 list at the permittee's request and with the permitter's approval after the permit is issued.
- The second Tier 3 action listed states, "Evaluation of viable treatment process upgrades to achieve low nitrogen concentrations through formal pilot testing, followed by implementation." It is unclear that "followed by implementation" refers to implementation of the pilot testing and not to the implementation of the piloted process upgrade at full-scale.
- The third Tier 3 action listed refers to, "…the nutrient reduction evaluation for achieving effluent concentration bookends of 10 mg/L and 3 mg/L." The evaluation of bookend concentrations would not necessarily facilitate advancement for a facility if the equivalent concentration in the WQBELs is somewhere in between the book end concentrations. For example, if the equivalent concentration in the final WQBELs is 6 mg/L, neither the evaluation for the 10 mg/L concentration nor that for the 3 mg/L concentration will necessarily apply for the 6 mg/L concentration. Through previous analyses, King County has verified that evaluations can differ significantly for even 3 and 8 mg/L effluent concentrations.

D. Components of an annual nitrogen optimization plan

- If a WWTP implements optimization actions prior to the release of the PSNGP are they allowed to be documented and included in the nutrient optimization plans?
- The second to last bullet in the list of steps for the Nitrogen Optimization Plan refers to, "…commercial and residential users." It is unclear if "users" is referring to "sources," and whether "industrial" sources would be part of this list.
- The Nutrient Optimization Plan Components list under item b requires the measurement and reporting of TIN influent loads and TIN percent removal. Measuring influent TIN loads and percent TIN removal has limited value to understanding the performance of many plants, and especially plants with anaerobic digesters. This is because the anaerobic digestion process will convert organic nitrogen over to ammonia nitrogen. The ammonia from the digesters will be returned to the liquid portion of the treatment plant (e.g., via dewatering centrate or filtrate). If the secondary biological process does partial or no nitrogen removal, the effluent TIN will in fact be higher than the influent TIN. There's also the complication that the dewatering process may not operate some days and can process more biosolids some days than others. Thus, the dewatering operations can have a large impact on the amount of TIN that could make it into the effluent. This is true even if the secondary process is doing better than modest nitrogen removal. Measuring performance by percent total-N removed instead of percent TIN removed would avoid

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some or most of these issues. This would also make the measurement of influent NH3 monitoring superfluous since it would not be needed to calculate influent total-N (this can be calculated from influent TKN and NO2 and NO3).

- Permittees must develop and submit an annual optimization plan, which is supposed to include specific reduction goals and an implementation plan to achieve those goals. Without a better sense of the ultimate effluent limits these reduction goals are likely to be conservative and potentially even counterproductive.
- There is redundancy in the required components of the Optimization Plan and the monthly DMRs.

E. State Review and Acceptance of Optimization Plans

F. Conventional Limit Exceedances due to Optimization Exercises or Pilot Testing

- In the first paragraph of this section, the term "intermittent" is used when referring to exceedances of individual permit limits and is not defined.
- In the first paragraph of this section, the last sentence indicates that, "Ecology must be notified of any formal pilot testing prior to initiation." Does this refer to any formal pilot testing (not just to that for the Tier 3 action describing pilot testing) and full-scale operational trials?

VI. Planning Requirements

A. Planning introduction

- "Ecology intends to provide flexibility and incentives for communities to address nutrients collaboratively to encourage outside of the box solutions." The preliminary permit includes no mechanisms for collaborative compliance strategies, even at facilities with common ownership and in proximity to one another and constrains potential strategies to those traditional approaches that can be implemented at the facility.

B. Proposed Nutrient Reduction Evaluation Requirement

- The concept of a Nutrient Reduction Evaluation Report appears to require Permittees to propose and evaluate potentially aggressive reduction approaches without knowing what the future permit requirements will be. Permittees should have a standard they are expected to meet and be required to submit plan to meet the standard. This is an example of why it is premature for Ecology to issue this general permit.
- The Report "is not intended to be an engineering report" but it will nevertheless "require the seal of a registered professional engineer". Can Ecology explain this apparent inconsistency?
- Ecology justifies the need for a general permit on the basis of its conclusion that: "The Salish Sea Model (Ahmed et al, 2019) *has shown* that nutrient discharges from domestic wastewater treatment plants contribute to the low dissolved oxygen levels, below state water quality criteria, in Puget Sound." The County shares many of the concerns raised by others regarding this conclusion. Significantly, the opinion regarding use of the Salish

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Sea Model presented by Drs. Gordon W. Holtgrieve and Mark Scheuerell concluded that failure to account adequately for uncertainty levels in the model's analysis leads "to a general overconfidence that nutrients are in fact a meaningful problem in the Puget Sound." [See Opinion on Puget Sound Nutrient Source Reduction Project Dissolved Oxygen Modeling and Bounding Scenarios (Ahmed et al. 2019), March 27, 2020]. To the extent that the analysis does not accurately describe the human impact on dissolved oxygen concentration in the Sound, a general permit or any condition in a general permit that is justified by this analysis would not be supportable. Ecology should address the methodological problems instead of proceeding with the issuance of the preliminary draft general permit.

- Additionally, the legal pre-requisites for a General Permit have not been met. Under both federal regulations, 40 C.F.R. § 122.28(a)(2)(i)(A)–(E) and Washington State regulations, WAC 173-226-050, Ecology is authorized to issue general NPDES permits only where the category of dischargers meet all of the following requirements: (i) Involve the same or substantially similar types of operations; (ii) Discharge the same or substantially similar types of wastes [or engage in the same types of … disposal practices]; (iii) Require the same or substantially similar effluent limitations or operating conditions, and require similar monitoring; and (iv) In the opinion of the director are more appropriately controlled under a general permit than under individual permits.

- The sewage treatment plants proposed to be covered by the proposed general permit do not meet all of these criteria. While all sewage treatment plants may discharge the same type of waste, they do not involve the same or substantially similar types of operations. There is nothing to suggest that all of these sources will "[r]equire the same effluent limitations, [or] operating conditions [or] require the same or similar monitoring. 40 C.F.R. § 122.28(a)(2)(i)(D). There is no evidence to suggest that even if they were to be put into different categories, "the sources in that specific category or subcategory shall be subject to the same water quality-based effluent limitations," 40 C.F.R. § 122.28(a)(3). A general permit is not appropriate.

C. Regional Approach for Advanced and Emerging Technology Assessment

- In the last paragraph, a sentence states that, "any regional investigation conducted in the greater Puget Sound area would need to build on the findings from studies conducted in these other locations (e.g., San Francisco Bay) and consider the ancillary benefits from advanced treatment processes as detailed in Ecology's soon to be published February 2021 Contaminants of Emerging Concern and Wastewater Treatment Technologies report." Ecology could be clearer about why and how a regional study would need to build on previous studies.

- Will participation in a regional study (C.1) be sufficient to satisfy the Nutrient Reduction Evaluation requirement? The discussion of the two options does not clearly define the difference between the C.1 and C.2 approaches. Rather, they seem to have a lot of commonalities. What are the specific differences between the two options in terms of approach, subject matter, and outcomes? What constitutes success for either of the approaches when the necessary effluence limits are not known?

C.1. Regional Study for Nutrient Reduction Evaluation

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C.2. Regional Collaboration for Technology Exploration

- Throughout this section, reference is made to advancement in technology for nutrient removal, but for the purposes of developing watershed-based solutions and water quality trading. Why would a collaborative investigation into nutrient removal technology be required for a water quality trading system?

D. Alternatives to the proposed evaluation requirement for WWTPs discharging less than 10 mg/L

- The last sentence of this section states that a WWTP, "…must complete a Tier 3 action as detailed in the Optimization preliminary draft proposal within 12 months." This timeframe (12 months) seems too short to complete a Tier 3 action, particularly since the second option provides 18 months to complete a NRE report.

E. Planning Requirements following exceedance of Action Level

VII. References

Appendix A: Action Level Flow Chart

Appendix B: Example Optimization Worksheet

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King County Department of Natural Resources and Parks Responses to Ecology's Supplemental Questions on the "Puget Sound Nutrients General Permit – Preliminary Draft"

Calculation Methods

1. **Do reviewers have feedback on whether the 95% UCL or 99% UCL is more appropriate for AL0? Ecology has considered both and would like additional input. P. 9**

- Using a 95% UCL would result in a discharger having a 23% chance of exceeding AL_0 solely due to random chance over the expected 5-year permit term.
- Using a 99% UCL would result in a discharger having a 5% chance of exceeding AL_0 solely due to random chance over the expected 5-year permit term.

2. **Do reviewers agree with the approach proposed for calculating AL1 for facilities that have historically been able to maintain their annual average TIN effluent concentration below 10 mg/L? P. 10**

- Support using 10 mg/L * 85% of the design flow for calculating action limit AL_1.
- It does not seem necessary to carve out an exception for these facilities. Although they are already removing nutrients, Ecology has taken the position that the tiers of actions based on the Action Levels are necessary to protect water quality. Exempting some facilities even though they trigger the generally applicable Action Levels could be seen as evidence that these requirements are not anticipated to generate any environmental benefit.

Optimization

1. **Do reviewers have suggestions on what information permittees use to justify their decision-making process when conducting financial and technical analyses to select (or eliminate) optimization strategies?**

- The following are some of the criteria we may use in a sequential and narrowing decision making processes to select (or eliminate) optimization strategies (not necessarily in this order):
    - **Feasibility**. Is the optimization strategy technically feasible- including how it may impact overall treatment plant process?
    - **Capital and operating costs**. How will costs be financed and how will they impact affordability?
    - **Schedule**. Can the optimization strategy be implemented in a timeframe that is within the first permit cycle or before other actions are taken for final WQBELs?

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- **Maintenance and reliability**. Can the optimization strategy be implemented without foregoing scheduled maintenance or other capital project work which could result in lower equipment and treatment process reliability, redundancy, or capacity?
- **Stranded assets**. Will the optimization strategy result in infrastructure investments that cannot subsequently be used to meet the final WQBELs?
- **GHG emissions**. Will the optimization strategy result in potentially higher N2O emissions, electricity use, or chemical use?

2. **Are there any additional Tier 1 optimization actions that should be included in this document? P. 20**

- The permit should recognize existing voluntary actions that reduce nitrogen (e.g., reclaimed water, seasonal nitrification at South Plant) and explicitly allow their inclusion as Tier 1 activities.

3. **Are there any additional Tier 2 optimization actions that should be included in this document? P.21**

- Potential optimization actions:
  - Potential for no feasible alternatives available
  - Include actions from Tier 1 to be continued as Tier 2 actions
  - Allow a Tier 3 action to be taken in lieu of Tier 2 actions if the permittee so chooses
  - Aeration control strategies such as ammonia-based controls or ammonia vs nitrate controls
  - Trialing simultaneous nitrification-denitrification (SND)
  - Re-rate internal components to increase capacity as it benefits the ability to optimize nitrogen removal
  - Describing pre-digestion of primary sludge as fermentation of primary sludge

4. **Are the tiers broken out appropriately? P. 21**

- Generally, the actions within the tiers seem to be of consistent scale. Actions that may be of greater scale within a tier may include the following:
  - Flow equalization and side-stream return equalization could potentially be Tier 2 actions if significant piping or pumping modifications are required.

5. **Ecology is soliciting input on what types of Tier 3 actions plants must take to achieve further nutrient reduction, sooner, if they exceed their second action level trigger. Should these actions vary by facility size? P. 22**

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- This is premature. A requirement to implement any "Tier 3" actions cannot be supported unless or until proper modeling is completed.

6. **Do reviewers have feedback on Ecology's proposed use of a standardized form for the annual optimization report? P. 22**

- Some of the required components of the Optimization Plan are well suited to a standardized form (e.g., design criteria, monitoring data), but a fair amount of the requirements will be unique. Further, some of the required information seems redundant since it will already be in the monthly DMRs.

Planning

1. **Do reviewers have examples of information from an existing, unrelated planning process that could meaningfully apply to meet this nutrient reduction evaluation requirement? P. 26**

- In 2020, King County completed a Nitrogen Removal Study, which covered many of the requirements listed in the nutrient reduction evaluation requirement. For King County's three regional treatment plants, the Nitrogen Removal Study includes:
    - Technologies screened for applicability at West Point, South, and Brightwater treatment facilities.
    - Development of scenarios for nitrogen removal, providing target effluent concentrations and removal periods (i.e. seasonal, year-round)
    - Technology combination, taking combinations of the screened technologies to achieve targets identified in scenario development to create alternatives for each plant
    - Site-specific analysis, including process modeling, conceptual site layouts, capital and O&M costs, life cycle costs, treatment performance, biosolids production, and greenhouse gas emissions
    - This study took about 2 years to complete with a cost of approximately $1M using a consultant and in-house team. King County will supply Ecology with the final version of this study.

2. **Aside from treatment solutions, do reviewers have feedback on types of questions a regional study could answer? How could a regional study like this be used to develop and/or support a nutrient trading framework? P. 27**

- A comprehensive regional study would outline the potential nitrogen removals rates and associated costs for WWTPs, other direct dischargers, and non-point source discharges into Puget Sound on a common basis.

3. **Do reviewers prefer one approach to a regional study over the other? Ecology is soliciting specific feedback on how to develop permit requirements for a regional**

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study that advances understanding of treatment upgrades by building on existing bodies of knowledge related to nutrient treatment processes. P. 27

- One of the suggested regional study requirements, the technology information sharing (VII.C.2), does not fit as a part of a permit process.

4. **Do reviewers have feedback on whether a regional study should be limited to WWTPs < 10 MGD so that larger facilities can conduct their own evaluation? Or, should Ecology provide minimum elements that must be satisfied leaving participation up to each discharger? P. 27**

- A regional study needs to be inclusive of all potential sources and conditions contributing to low dissolved oxygen.

5. **Do reviewers have feedback on the proposed timeframes for this evaluation? P. 28**

- Through previous analyses, solutions for nitrogen removal can differ significantly for even 3 and 8 mg/L effluent concentrations. Additional planning and analysis would be necessary prior to a project moving on to pre-design, design, and construction for any limit in between the bookends studied in the evaluation.

6. **Is there interest in folding this type of treatment technology information sharing into an existing stakeholder process? P. 28**

- Yes, there is value in an information sharing and an education forum, but the technology information sharing (VII.C.2) does not need to be a part of a permit process.

7. **Do reviewers have suggestions or ideas for other Tier 3 actions that Ecology should consider? Should plants be able to identify different Tier 3 actions during the permit term provided Ecology pre-approval? P. 29**

- This is premature. A requirement to implement any "Tier 3" actions cannot be supported unless or until proper modeling is completed.
- Furthermore, Tier 3 actions should not be required prior to the setting of water quality based effluent limits. Through previous analyses, we have verified that evaluations can differ significantly for even 3 and 8 mg/L effluent concentrations. Additional planning and analysis would be necessary prior to a project moving on to pre-design, design, and construction for any limit in between the bookends studied in the evaluation.
- Ecology should consider a nutrient trading framework, bubble permitting, nutrient reduction outside of the treatment plant boundary and other factors impacting dissolved oxygen in the Puget Sound