NORTHWEST ENVIRONMENTAL ADVOCATES

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Re: **Draft Hartstene Pointe Wastewater Treatment Plant**
National Pollutant Discharge Elimination System Permit No. WA0038377

Dear Ms. Cholski:

This letter constitutes the comments of Northwest Environmental Advocates (NWEA) on the proposed issuance of the draft National Pollutant Discharge Elimination System Permit No. WA0038377 for the Hartstene Pointe Wastewater Treatment Plant.

Although nitrogen and phosphorus end up in Puget Sound and its tributaries from diverse sources, such as stormwater and agricultural lands, municipal and industrial discharges are the primary source of anthropogenic nutrient inputs into the Sound. Thus, a critical component of Washington's effort to attain and maintain water quality standards in Puget Sound must be to impose tighter limits, under the Clean Water Act (CWA), on the amounts of nitrogen and phosphorus that sewage treatment facilities may discharge into rivers and the Sound. Although, as demonstrated in various fact sheets that accompany proposed NPDES permits, the Department of Ecology (Ecology) appears to believe that it can suspend the requirements of the CWA and the federal and state regulations that govern the issuance of NPDES permits on various grounds—such as there is no total maximum daily load (TMDL) that applies to these waters—that approach is contrary to law, as explained in the comments below. Ecology is prohibited from issuing NPDES permits that allow dischargers to cause or contribute to violations of water quality standards, the violations that have been measured, those that have been predicted to exist by Ecology models, and those that are threatened to develop as nutrient pollution increases and in combination with other factors and parameters, such as lowered flows and higher temperatures, create increasingly more widespread and deleterious effects on water quality and the beneficial uses that depend upon it.

Ecology seeks to have it all ways and in the process to do nothing to control a pollution problem that it both can mitigate and is required to mitigate. It fails to complete a TMDL, or even to commit to developing a TMDL, to address dissolved oxygen and other nutrient-driven impairments in Puget Sound and then it relies on its own regulatory failure to avoid controlling pollution in NPDES permits that its own studies demonstrate are causing the violations. Ecology informs the U.S. Environmental Protection Agency (EPA) that it will not adopt numeric nutrient criteria because it intends to rely, primarily, upon its existing water quality standards for dissolved oxygen to address the effects of excess nutrients, yet when confronted with that very

scenario in Puget Sound, it neither commits to developing a TMDL nor issues NPDES permits with nutrient limits, thereby putting the lie to its commitments. In short, Ecology is engaged in a shell game.

I. NPDES PERMITS ARE PROHIBITED FROM CAUSING OR CONTRIBUTING TO VIOLATIONS OF WATER QUALITY STANDARDS

A. Discharges are Prohibited from Causing or Contributing to Violations of Water Quality Standards; Reasonable Potential Findings Required

If the technology-based limits required by the statute and regulations are not sufficient to ensure that a discharge will not cause or contribute to violations of water quality standards, permits must include water quality-based effluent limits (WQBEL). 33 U.S.C. §§ 1311(b)(1)(C), 1342(a)(2) ("[T]here shall be achieved . . . any more stringent limitation, including those necessary to meet water quality standards . . . established pursuant to any State law or regulations [.]"); *see also, id.* §§ 1311(e), 1312(a), 1313(d)(1)(A), (d)(2), (e)(3)(A); 40 C.F.R. §§ 122.4(a), (d).[1] The agency issuing an NPDES permit "is under a specific obligation to require that level of effluent control which is needed to implement existing water quality standards without regard to the limits of practicability." S. Rep. No. 92-414, at 43 (1971). Because WQBELs are set irrespective of costs and technology availability, they further the technology-forcing policy of the CWA. *See NRDC v. U.S. E.P.A.*, 859 F.2d 156, 208 (D.C. Cir. 1987) ("A technology-based standard discards its fundamental premise when it ignores the limits inherent in the technology. By contrast, a water quality-based permit limit begins with the premise that a certain level of water quality will be maintained, come what may, and places upon the permittee the responsibility for realizing that goal."); *see also Riverkeeper, Inc. v. U.S. E.P.A.*, 475 F.3d 83, 108 (2d Cir. 2007) (Sotomayor, J.) (referencing the Act's "technology-forcing imperative"), *rev'd sub nom by Entergy Corp*, 556 U.S. 208.

WQBELs must be set at a level that achieves water quality standards developed by the states for waters within their boundaries. *See* 33 U.S.C. §§ 1313(a)(3), (c)(2)(a); 40 C.F.R. Part 131; *PUD No. 1 of Jefferson Cnty. v. Wash. Dept. of Ecology*, 511 U.S. 700, 704–707 (1994); WAC 173-220-130(1)(b)(i) and (iii), (2), (3)(b); *Port of Seattle v. Pollution Control*, 90 Pd.3d 659, 677 (Wash. 2004) ("NPDES permits may be issued only where the discharge in quesiton will comply with state water quality standards."); *Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1163 (9th Cir. 1999).

Such water quality standards consist of designated uses for waters and water quality criteria (both numeric and narrative) necessary to protect those uses. 33 U.S.C. § 1313(c)(2)(a); 40 C.F.R. §§ 131.10–.11. Under the CWA's "antidegradation policy," state standards must also protect existing uses of waters and prevent their further degradation. 40 C.F.R. § 131.12; *see also* WAC 173-201A-010(1)(a) ("All surface waters are protected by numeric and narrative criteria, designated uses, and an antidegradation policy.").

EPA's permitting regulations mirror the statutory requirement for WQBELs. 40 C.F.R. § 122.44(d). NPDES effluent limitations must control all pollutants that are or may be discharged at a level "which will cause, have the reasonable potential to cause, or contribute to an excursion

[1] The federal regulations are made applicable to states by 40 C.F.R. § 123.25(a).

above any State water quality standard, including State narrative criteria for water quality." 40 C.F.R. § 122.44(d)(1)(i). Accordingly, WQBELs in NPDES permits must be "derived from" and comply with all applicable water quality standards. 40 C.F.R. § 122.44(d)(1)(vii). WQBELs are typically expressed numerically, but when "numeric effluent limitations are infeasible," a permit may instead require "[b]est management practices (BMPs) to control or abate the discharge of pollutants." 40 C.F.R. § 122.44(k)(3). However, "[n]o permit may be issued: . . . [w]hen the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States." 40 C.F.R. § 122.4(d).

When EPA or states establish WQBELs, they must translate applicable water quality standards into permit limitations. *See Trustees for Alaska v. U.S. E.P.A.*, 749 F.2d 549, 556–57 (9th Cir. 1984) (holding that a permit must do more than merely incorporate state water quality standards—it must translate state water quality standards into the end-of-pipe effluent limitations necessary to achieve those standards). As the D.C. Circuit put it, "the rubber hits the road when the state-created standards are used as the basis for specific effluent limitations in NPDES permits." *American Paper Inst., Inc. v. U.S. E.P.A*, 996 F.2d 346, 350 (D.C. Cir. 1993). NPDES "permits authorizing the discharge of pollutants may issue only where such permits *ensure* that every dicharge of pollutants will comply with all applicable effluent limitations and standards[.]" *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486, 498 (2d Cir. 2005) (emphasis in original).

Although numeric criteria are easier to translate into a permit limitation, permit writers must also translate state narrative standards. *See id.* EPA regulations clearly specify that narrative criteria must be evaluated and must be met, and that limits must be established to ensure they are met. *See* 40 C.F.R. §§ 122.44(d)(1) (limits must be included to "[a]chieve water quality standards established under section 303 of the CWA, *including State narrative criteria* for water quality"); 122.44(d)(1)(i) (limitations must include all parameters "*including State narrative criteria* for water quality"); 122.44(d)(1)(ii) (reasonable potential must be evaluated for "in-stream excursion *above a narrative* or numeric criteria"); 122.44(d)(1)(v) (WET tests required where reasonable potential exists to cause or contribute to a narrative criterion excursion unless chemical-specific pollutants are "sufficient to attain and maintain applicable numeric and *narrative State water quality standards*"); 122.44(d)(1)(vi) (options for establishing limitations where reasonable potential exists for a discharge to cause or contribute to an excursion *above a narrative criterion*) (emphases added). As the court in *American Paper* found, when it upheld EPA's permitting regulations pertaining to narrative criteria, faced with the conundrum of narrative criteria "some permit writers threw up their hands and, *contrary to the Act*, simply ignored water quality standards including narrative criteria altogether when deciding upon permit limitations. *Id.* at 350 (emphasis added); *see also, id.* at 353, "[EPA's] initiative seems a preeminent example of gap-filling in the interest of a continuous and cohesive regulatory regime[.]").

EPA has explained that a WQBEL is "[a]n effluent limitation determined by selecting the most stringent of the effluent limits calculated using all applicable water quality criteria (e.g., aquatic life, human health, wildlife, translation of narrative criteria) for a specific point source to a specific receiving water." EPA, *NPDES Permit Writers' Manual*, Appendix A at A-17 (Sept. 2010) (hereinafter "EPA Manual").[2]

[2] *Available at* http://www.epa.gov/npdes/pubs/pwm_app-a.pdf .

B. Reasonable Potential Findings and Derivation of WQBEL

The first step in establishing a WQBEL is determining if one is required. 40 C.F.R. § 122.44(d)(1) ("Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines 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, including State narrative criteria for water quality."). Because one requirement in issuing a WQBEL is both to determine if the discharge, collectively with other sources of the same pollutant, are causing or contributing to violations of water quality standards, and to limit that discharge accordingly, the federal regulations require the permit writer to assess the role of other sources in causing the violation. *Id*. at § (d)(1)(ii) ("When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water."). If, having conducted this evaluation, the permit writer determines that a discharge "causes, has the reasonable potential to cause, or contributes to an instream excursion above the allowable above the allowable ambient concentration of a State numeric criteria within a State water quality standard for an individual pollutant, the permit must contain effluent limits for that pollutant." *Id.* at § (d)(1)(iii). Where a state finds a reasonable potential to cause or contribute to a violation of narrative criteria for which the state has no numeric criteria, the federal regulations establish methods for establishing effluent limits. *Id*. at § (d)(1)(vi)(A-C).

The matter of determining whether a discharge is causing or contributing to a violation of standards is not resolved by the permit writer's merely looking at the point of discharge and whether it is on the state's 303(d) list for a parameter or pollutant discharged or affected by a parameter or pollutant in the discharge.

First, there is a question of the nature of the parameter or pollutant discharged and how it is anticipated to affect water quality. Nitrogen discharges are among those pollutants that have a far-field effect, creating impacts on dissolved oxygen and algal growth—which can be both deleterious by itself and contribute to lowered dissolved oxygen—far away from the point of discharge. *See, e.g.*, EPA Manual at 176 ("Nutrients are another class of pollutants which would be examined for impacts at some point away from the discharge. The special concern is for those water bodies quiescent enough to produce strong algae blooms. The algae blooms create nuisance conditions, dissolved oxygen depletion, and toxicity problems (i.e., red tides or blue-green algae); *id*. at 198 ("[pollutants] such as BOD may not reach full effect on dissolved oxygen until several days travel time down-river.").

For pollutants such as nutrients, the Environmental Appeals Board (EAB) has held that:

> The plain language of the regulatory requirement (that a permit issuer determine whether a source has the "reasonable potential to cause or contribute" to an exceedance of a water quality standard) does not require a conclusive demonstration of "cause and effect." *See In re Upper Blackstone Water Pollution Abatement Dist*., NPDES Appeal Nos. 08-11 through 08-18 & 09-06, slip op. at 31-34 & n.29 (EAB May 28, 2010), 14 E.A.D. ___.

In re Town of Newmarket, NPDES Appeal No. 12-05, slip op. at 54 n.23 (EAB Dec. 2, 2013). In other words, the fact of a source's contributing to loading of a pollutant that has been identified to be causing a water quality impairment is sufficient to support a reasonable potential determination.

Second, there is a question as to whether a waterbody must actually be impaired in order for a discharge to present a reasonable potential to cause or contribute to violations of water quality standards. Again, the EAB provides assistance on the plain meaning of the permitting regulations and the policy rationale behind them:

> NPDES regulations do not support the City's contention that a permit authority must include effluent limits only for the pollutants discharged into receiving waters that are identified as impaired on the state's 303(d) list.
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> * * *
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> NPDES permitting under CWA section 301 applies to individual discharges and represents a more preventative component of the regulatory scheme [than 303(d)] in that, under section 301, no discharge is allowed except in accordance with a permit. Moreover, the CWA's implementing regulations require the Region to include effluent limits in discharge permits based on the reasonable potential of a discharge facility to cause or contribute to exceedances of water quality standards, even if the receiving water body is not yet on a state's 303(d) list. *See* 40 *C.F*.R. § 122.44(d)(1)(i). Although a 303(d) listing could presumably establish that water quality standards are being exceeded, necessitating an appropriate permit limit, the Region is not constrained from acting where a water body has not yet been placed on the 303(d) list. *Id.; see also In re Upper Blackstone Water Pollution Abatement Dist., 14* E.A.D. 577, 599 (EAB 2010) (explaining that the NPDES regulations require a "precautionary" approach to determining whether the permit must contain a water quality-based effluent limit for a particular pollutant), aff'd. 690 F.3d 9 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2382 (2013).

In re City of Taunton at 38-39.

Third, there is the question of whether a permit writer can simply not include an effluent limit because to do so is challenging. Clearly the statute and regulations demonstrate that the answer is "no." Federal courts agree. Just months ago, the Second Circuit cited with approval its decision in *Waterkeeper All., Inc. v. EPA*, 399 F.3d 486, 498 (2d Cir. 2005) for the proposition that "NPDES permits 'may issue only where such permits *ensure* that every discharge of pollutants will comply with all applicable effluent limitations and standards.'" *N.R.D.C. v. U.S. EPA* 808 F.3d 556, 578 (2d Cir. 2015) (emphasis in original). Moreover:

> Even if determining the proper standard is difficult, EPA cannot simply give up and refuse to issue more specific guidelines. *See Am. Paper Inst., Inc. v. EPA*, 996 F.2d 346, 350 (D.C. Cir. 1993) (articulating that, even if creating permit limits is difficult, permit writers cannot just "thr[o]w up their hands and, contrary to the Act, simply ignore[] water quality standards including narrative criteria altogether when deciding upon permit limitations"). Scientific uncertainty does not allow EPA to avoid responsibility for regulating discharges. *See Massachusetts v. EPA*, 549 U.S. 497, 534 (2007) ("EPA [cannot] avoid its statutory obligation by noting the uncertainty surrounding various features of

> climate change and concluding that it would therefore be better not to regulate at this time.").

Id.. The First Circuit and EAB have agreed that uncertainty does not excuse the permit writer from its obligation to set permit limits. *Upper Blackstone Water Pollution Abatement District v. U.S. EPA*, 690 F.3d 9 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2382 (2013); *In re City of Taunton* at 61-62.

Fourth, there is a question as to whether in the absence of a TMDL a permit must comply with the statute and regulations that require compliance with water quality standards. There is no question that it must; the lack of a TMDL is no defense for a failure to find reasonable potential and to establish a WQBEL. As the First Circuit has explained,

> TMDLs take time and resources to develop and have proven to be difficult to get just right; thus, under EPA regulations, permitting authorities must adopt interim measures to bring water bodies into compliance with water quality standards. *Id*. § 1313(e)(3); 40 C.F.R. § 122.44(d); *see also, e.g.*, 43 Fed. Reg. 60,662, 60,665 (Dec. 28, 1978) ("EPA recognizes that State development of TMDL's and wasteload allocations for all water quality limited segments will be a lengthy process. Water quality standards will continue to be enforced during this process. Development of TMDL's . . . is not a necessary prerequisite to adoption or enforcement of water quality standards . . . .").

Upper Blackstone Water Pollution Abatement District v. U.S. EPA, 690 F.3d 9 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2382 (2013) n 8. The First Circuit also explained that waiting for the completion of exhaustive studies is equally unacceptable:

> [N]either the CWA nor EPA regulations permit the EPA to delay issuance of a new permit indefinitely until better science can be developed, even where there is some uncertainty in the existing data. . . . The Act's goal of "eliminat[ing]" the discharge of pollutants by 1985 underscores the importance of making progress on the available data. 33 U.S.C. § 1251(a)(1).

Id. Likewise, the EAB recently held the same:

> Where TMDLs have not been established, water quality-based effluent limitations in NPDES permits must nonetheless comply with applicable water quality standards. In discussing the relationship between NPDES permitting and TMDLs, EPA has explained that the applicable NPDES rules require the permitting authority to establish necessary effluent limits, even if 303(d) listing determinations and subsequent TMDLs lag behind. 54 Fed. Reg. 23,868, 23,878, 23,879 (June 2, 1989); *see also In re Upper Blackstone Water Pollution Abatement Dist.*, 14 E.A.D. 577, 604-05 (EAB 2010) (expressly rejecting the idea that the permitting authority cannot proceed to determine permit effluent limits where a TMDL has yet to be established) , *aff'd*. 690 F.3d 9 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2382 (2013).

In re: City of Taunton Department of Public Works, NPDES Appeal No. 15-08, slip op. at 11 (EAB May 3, 2016); *see also id.* at 40-41 (citing, *inter alia*, 54 Fed. Reg. 23,868, 23,879 (June 2,

1989) (clarifying in the preamble to 40 C.F.R. § 122.44 that subsection (d)(1)(vii) "do[es] not allow the permitting authority to delay developing and issuing a permit if a wasteload allocation has not already been developed and approved"); *see also* Ecology, *Water Quality Program Permit Writer's Manual* (Jan. 2015) (hereinafter "Ecology Manual") at 193 ("In the absence of a basin TMDL and the resultant WLA, the permit writer must develop an individual WLA.").[3]

In its Permit Writer's Manual, Ecology misstates the law by creating an exemption that is not justified or supported by the statute, federal or state regulations, or case law:

> If the pollutant is a far-field pollutant, is present in the discharge and is the subject of a TMDL in progress, the permit writer may defer any water quality-based limits on the pollutant until the TMDL is completed and a WLA is assigned. When the WLA is assigned the permit writer may modify the permit or incorporate the WLA at the next reissuance, depending on timing.

Id. at 196.[4] Similarly, the guidance states that if a TMDL has not been started yet, the permit writer may ask the question: "Can the effluent be treated or can the effluent or pollutant(s) be removed seasonally at a cost which is economically achievable or reasonable"? *Id*. at 197 fig. 23. This question and the options that flow from its answers are not supported in federal law. There is no provision for deferring needed WQBELs based on TMDLs' being in progress. In fact, delaying an effluent limit due to the time needed to develop a TMDL is parallel to allowing a compliance schedule to meet an effluent limit due to the time needed to develop a TMDL—an approach EPA has determined is prohibited.[5]

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[3] This statement is immediately contradicted on the next page in the Ecology Manual, which incorrectly asserts that a "basic principle" of permitting is that:

> A point source discharging to a water body with multiple sources (point and nonpoint) of impairment, which is a minor source of the impairment, and may gain relief from a TMDL is not required to have a final limitation as the numeric water quality criteria before a TMDL is completed.

Id. at 194. In fact, there is no such exemption for minor sources in the statute or the regulations nor is there any provision for a permit writer to determine whether a TMDL may provide "relief" to a discharger. Ecology cites no law to support its principle.

[4] *See also, id.* at 177 ("Suspected water quality problems due to nutrients are best handled by a TMDL process conducted by the EA Program.") While this may very well be true, if Ecology does not develop TMDLs its permit writers must still meet federal and state regulatory requirements when issuing NPDES permits.

[5] *See* Memorandum from James A. Hanlon, Director, Office of Wastewater Management, EPA, to Alexis Strauss, Director, Water Division, EPA Region 9 Re: Compliance Schedules for Water Quality-Based Effluent Limitations in NPDES Permits (May 10, 2007) at 3 ("A compliance schedule based solely on time needed to develop a Total Maximum Daily Load is not appropriate, consistent with EPA's letter of October 23, 2006 to Celeste Cantu, Executive Director of the California State Water Resources Control Board, in which EPA disapproved a provision of the Policy for Implementation of Toxic Standards for Inland Waters, Enclosed Bays,

Fifth, in the absence of a TMDL, is the permit writer obligated to assess the individual discharger's responsibility to cease contributing to violations of water quality standards? Not only do the federal regulations explain that the answer is clearly "yes," as discussed above, but so did the First Circuit:[6]

> The Act's TMDL and interim planning process both contemplate pollution control where multiple point sources cause or contribute to water quality standard violations. 33 U.S.C. § 1313(d), (e). Under earlier legislation, including the 1965 Federal Water Pollution Control Act, when a water body failed to meet its state-designated water quality standards, pollution limits could not be strengthened against any one polluter unless it could be shown that the polluter's discharge had caused the violation of quality standards. *See EPA v. California ex rel. State Water Res. Control Bd.*, 426 U.S. 200, 202-03 (1976). This standard was ill-suited to the multifarious nature of modern water pollution and prevented the imposition of effective controls. *Id.* In 1972, Congress declared that the system was "inadequate in every vital aspect," and had left the country's waterways "severely polluted" and "unfit for most purposes." S. Rep. No. 92-414, at 3674 (1971). The CWA rejected the earlier approach and, among other things, introduced individual pollution discharge limits for all point sources. 33 U.S.C. 1311(b). To maintain state water quality standards, the Act establishes the TMDL and continuing planning processes, which target pollution from multiple sources. *Id*. § 1313(d), (e). . . . We thus reject the notion that in order to strengthen the District's discharge limits, the EPA must show that the new limits, in and of themselves, will cure any water quality problems.

Upper Blackstone Water Pollution Abatement District v. U.S. EPA, 690 F.3d 9 (1st Cir. 2012), *cert. denied*, 133 S. Ct. 2382 (2013). The law clearly establishes that an NPDES permit may not be issued for discharges that may cause or contribute to violations of water quality standards. While "cause" may be considered to refer to the sole source of a violation, "contribute" sweeps all sources of a pollutant into the regulatory requirements. Federal regulations provide only very limited exceptions. For example, 40 C.F.R. 122.44(d)(1)(ii) requires that in determining reasonable potential a permit authority "use procedures which account for existing controls on point and nonpoint sources of pollution."

Last, there is a question related to whether the waterbody is impaired but is not currently listed

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and Estuaries for California.").

[6] Ecology has not even committed to using its modeling results for Puget Sound to develop a TMDL that would lead to wasteload allocations for dischargers such as this. *See, e.g.*, Ecology, *South Puget Sound Dissolved Oxygen Study Water Quality Model Calibration and Scenarios* (March 2014) at 22 ("Ecology may not conduct a TMDL if alternative management approaches are used to address violations."). The agency cannot simultaneously refuse to develop a TMDL and claim that it is waiting to complete a TMDL before it develops wasteload allocations for specific dischargers' NPDES permits.

on the state's EPA-approved 303(d) list.[7] The key here is impairment, not the technicality of 303(d) listing. *See In re: City of Taunton Department of Public Works*, at 38 ("NPDES regulations do not support the City's contention that a permit authority must include effluent limits only for the pollutants discharged into receiving waters that are identified as impaired on the state's 303(d) list."). Moreover, the finding of reasonable potential has repeatedly been deemed to be a low bar in order to ensure that NPDES permits protect water quality. EPA regulations require that NPDES limits "*must* control all pollutants" that "*may be* discharged at levels" that will cause or contribute to violations. 40 C.F.R. § 122.44(d)(1)(i) (emphasis added). The emphasis is regulation of discharges that *may* be a problem. As the EAB observed of EPA's action of issuing a permit with nutrient limits,

> the Region observed that "[e]ven if the evidence is unclear that a pollutant is currently causing an impairment, a limit may be required if the pollutant has the reasonable potential to cause, or contribute to an exceedance of a water quality standard (i.e., the permit limit may be preventative)." Response to Comments at 36. The Region also noted that "the pollutant need not be the sole cause of an impairment before an NPDES limit may be imposed; an effluent limit may still be required, if the pollutant 'contributes' to a violation." *Id*. (citing *In re Town of Newmarket*, NPDES Appeal No. 12-05, slip op. at 54 n.23 (EAB Dec. 2, 2013), 16 E.A.D. ___). Ultimately, the Region concluded that the City's discharges cause, have a reasonable potential to cause, or contribute to nitrogen-related water quality violations in the Taunton Estuary and Mount Hope Bay. . . . As such, CWA regulations required the Region to impose a nitrogen limit in the Permit. *See* 40 C.F.R. § 122.44(d)(1)(vi)[.]

In re City of Tauton at 37.

C. Applicable Water Quality Standards

Water quality standards are defined as the designated beneficial uses of a water body, in combination with the numeric and narrative criteria to protect those uses and an antidegradation policy. 40 C.F.R. § 131.6. The CWA requires numeric criteria adopted in water quality standards to protect the "most sensitive use." 40 C.F.R. § 131.11(a)(1).

However, since that is not always possible, the task of evaluating whether standards have been met also requires an assessment of the impacts to designated beneficial uses. In *PUD No. 1*

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[7] Ecology's Permit Writer's Manual incorrectly states the law in asserting two "basic principles." The first assertion is that "[a] water body listed on the 303(d) list is not a presumption of impairment unless the listed section is the point of discharge." *Id.* at 194. While this statement is less than clear, it appears to suggest that a discharge to a non-listed segment that flows into a downstream listed segment is not a discharge that contributes to a violation of water quality standards. This is incorrect. Washington's water quality standards require that "[u]pstream actions must be conducted in manners that meet downstream water body criteria." WAC173-201A-260(3)(b); *see also* 40 C.F.R. § 131.10(b) ("the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters.").

of Jefferson County v. Washington Department of Ecology, 114 S. Ct. 1900, 1912 (1994), the U.S. Supreme Court underscored the importance of protecting beneficial uses as a "complementary requirement" that "enables the States to ensure that each activity—even if not foreseen by the criteria—will be consistent with the specific uses and attributes of a particular body of water." The Supreme Court explained that numeric criteria "cannot reasonably be expected to anticipate all of the water quality issues arising from every activity which can affect the State's hundreds of individual water bodies." *Id*.[8] In short, a permitting agency cannot ignore the narrative criteria and use only numeric criteria where either numeric criteria do not exist or where the numeric criteria fall short of providing full support for designated uses.

Washington's water quality standards for marine waters including Puget Sound are intended to be "consistent with public health and public enjoyment of the waters and the propagation and protection of fish, shellfish, and wildlife, pursuant to the provisions of chapter 90.48 RCW." WAC 173-201A-010(1). As in federal law, Washington's regulations make the legal definition of a water quality standard very clear: "All surface waters are protected by numeric and narrative criteria, designated uses, and an antidegradation policy." WAC 173-201A-010(1)(a). In addition, the state rules clarify that:

> Compliance with the surface water quality standards of the state of Washington requires compliance with chapter 173-201A WAC, Water quality standards for

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[8] EPA regulations implementing section 303(d) of the CWA reflect the independent importance of each component of a state's water quality standards:

> For the purposes of listing waters under §130.7(b), the term "water quality standard applicable to such waters" and "applicable water quality standards" refer to those water quality standards established under section 303 of the Act, including numeric criteria, narrative criteria, waterbody uses, and antidegradation requirements.

40 C.F.R. § 130.7(b)(3). When EPA adopted these regulations it clearly stated the expectations it had of states:

> In today's final action the term "applicable standard" for the purposes of listing waters under section 303(d) is defined in § 130.7(b)(3) as those water quality standards established under section 303 of the Act, including numeric criteria, narrative criteria, waterbody uses and antidegradation requirements. In the case of a pollutant for which a numeric criterion has not been developed, a State should interpret its narrative criteria by applying a proposed state numeric criterion, an explicit State policy or regulation (such as applying a translator procedure developed pursuant to section 303(c)(2)(B) to derive numeric criteria for priority toxic pollutants), EPA national water quality criteria guidance developed under section 304(a) of the Act and supplemented with other relevant information, or by otherwise calculating on a case-by-case basis the ambient concentration of the pollutant that corresponds to attainment of the narrative criterion. Today's definition is consistent with EPA's Water Quality Standards regulation at 40 CFR part 131. EPA may disapprove a list that is based on a State interpretation of a narrative criterion that EPA finds unacceptable.

> surface waters of the state of Washington, chapter 173-204 WAC, Sediment management standards, and applicable federal rules.

WAC 173-201A-010(4). The designated uses for marine waters are set out at WAC 173-201A-612, Table 612.

> Currently applicable dissolved oxygen criteria applicable to Puget Sound waters are set out at WAC 173-201A-210(1)(d). In addition, the following standards apply:
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> Upstream actions must be conducted in manners that meet downstream water body criteria. Except where and to the extent described otherwise in this chapter, the criteria associated with the most upstream uses designated for a water body are to be applied to headwaters to protect nonfish aquatic species and the designated downstream uses.

WAC 173-201A-260(3)(b). The following narrative criterion also applies:

> Toxic, radioactive, or deleterious material concentrations must be below those which have the potential, either singularly or cumulatively, to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health[.]

WAC 173-201A-260(2)(a) (hereinafter "narrative criterion").

Finally, Washington's water quality standards contain an antidegradation policy, the purpose of which is to "[r]estore and maintain the highest possible quality of the surface waters of Washington" and "apply to human activities that are likely to have an impact on the water quality of a surface water." WAC 173-201A-300(2)(a), (c). To ensure this outcome, Tier I of the antidegradation policy "is used to ensure existing and designated uses are maintained and protected and applies to all waters and all sources of pollution." *Id*. (2)(e)(i). Tier I requires:

> (1) Existing and designated uses must be maintained and protected. No degradation may be allowed that would interfere with, or become injurious to, existing or designated uses, except as provided for in this chapter.
> (2) For waters that do not meet assigned criteria, or protect existing or designated uses, the department will take appropriate and definitive steps to bring the water quality back into compliance with the water quality standards.

WAC 173-201A-310. Federal regulations explain the meaning of "existing uses" that may not be designated uses: Tier I requires the maintenance and protection of "[e]xisting instream water uses and the level of water quality to protect the existing uses[.]" 40 C.F.R. § 131.12(a)(1). Existing uses are "those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards." 40 C.F.R. § 131.13(e).

II. THIS DISCHARGER CAUSES OR CONTRIBUTES TO VIOLATIONS OF WATER QUALITY STANDARDS

Discharges of nitrogen to Puget Sound, directly and indirectly via tributaries, are by definition causing or contributing to violations of water quality standards, at a minimum those of dissolved oxygen and the narrative criterion that prohibits deleterious material that causes adverse effects.

A. Dissolved Oxygen Violations in Puget Sound

Ecology has been studying and modeling dissolved oxygen levels in Puget Sound for many years and, therefore, many permit cycles. As of 2012, Washington's EPA-approved 303(d) list of impaired waters included 140 segments of Puget Sound impaired for dissolved oxygen, over 70 of which are in South and Central Puget Sound. *See* Ecology, *South Puget Sound Dissolved Oxygen Study Water Quality Model Calibration and Scenarios* (March 2014) (hereinafter "2014 DO Scenarios") at 35, 36.[9]

In the course of this process, Ecology has concluded that:

> Portions of South and Central Puget Sound are on the Clean Water Act Section 303(d) list of impaired waters because observed dissolved oxygen (DO) measurements do not meet the numeric criteria of the Washington State water quality standards. There are not violations across the entire South or Central Puget Sound. Human sources of nutrients can increase algae growth, which can decrease oxygen as the additional organic matter decays. Low oxygen can impair fish and other marine life.

Id. at 9. The model predicts an additional array of additional dissolved oxygen violations, based on decreases greater than 0.2 mg/L below predicted natural conditions, based on all current human sources as well as the increase in impairments that is associated with current NPDES permittees discharging at maximum allowable levels. *See id.* at 17, fig. ES-3.

Ecology's model predicts "minimum DO [that] naturally falls below the applicable numeric criterion throughout most of South and Central Puget Sound." *Id*. at 89. Levels of DO are predicted to be as low as 4.58 mg/L in waters for which the numeric criterion is set at 7 mg/L; 3.92 mg/L in waters for which the numeric criterion is set at 6 mg/L; and as low as 4.95 mg/L in waters for which the numeric criterion is set at 5 mg/L. While these predictions of natural conditions may be perceived as currently supplanting the numeric criteria and adding an additional increment of 0.2 depression to these predicted natural dissolved oxygen levels, even this result does not eliminate the anthropogenic effect on dissolved oxygen levels. *See id.* at 90, fig. 45.

Ecology has identified numerous segments of Case Inlet and Dana Passage for impairment of DO including the following listings: 10233, 10244, 42985, 42986, 42987, 42988, 42989, 42990,

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[9] An additional 555 segments are listed as having insufficient data on which to conclude impairment. *See* 2012 WQ Search Tool, Washington State Water Quality Assessment, 303(d)/305(b) Integrated Report, *available at* https://fortress.wa.gov/ecy/wats/approvedsearch.aspx.

43020, 40322, 66082, 66084, 66085, 66086, 66088. *See* 2014 DO Scenarios at 144 (App. A). Listing 43020 is immediately North of this source. The listing data states that "[t]his listing was reviewed by Department of Ecology Environmental Assessment Program staff, who concluded that these excursions cannot be attributed solely to natural conditions." Listing No. 43020.[10]

B. Narrative Criterion Violations In Puget Sound

Ecology has,

> frequently document[ed] extensive algal blooms, Noctiluca blooms, and jellyfish masses at the surface. Many of the phytoplankton blooms show high abundances of autotrophic flagellates. In contrast, depth-integrated algal biomass (chlorophyll a) shows a significant steady decline from 1999 to 2011. These seemingly opposing observations - high algal biomass and Noctiluca at the surface and decreasing biomass below the surface - could be clues to a shifting food-web structure and nutrient fluxes in Puget Sound.

Laura Friedenberg, *et al., Increasing nutrients, changes in algal biomass, and large Noctiluca blooms in Puget Sound: Is eutrophication fueling the microbial food web?*, Publication No. 13-03-019 (April 2013) (citations omitted) (hereinafter "Friendenberg Publication").

1. *Algal Growth Causes Deleterious Conditions*

Excess nutrients cause algal blooms, particularly in combination with warm temperatures and sunlight. *See, e.g., Harmful algal blooms in Puget Sound.*[11] These harmful algal blooms in Puget Sound may have been increasing over the last two decades. *See, e.g.*, Harmful Algal Blooms, Encyclopedia of Puget Sound, Puget Sound Institute, University of Washington.[12] Among the findings by Ecology are the following:

- Although ocean boundary conditions significantly drive water quality in Puget Sound macro-nutrients have continued to steadily increase independent of ocean variability.
- Changes in the silicate to dissolved inorganic nitrogen (Si:DIN) ratio are considered a sign of human nutrient inputs.
- A decline in the Si:DIN ratio paired with the measured increase in nitrate will increasingly favor the growth of non-silicified phytoplankton species such as the dinoflagellate Noctiluca.
- Over the last two years, the Department of Ecology's Eyes Over Puget Sound reports (EOPS) have documented extensive near-surface blooms of Noctiluca and other dinoflagellates in Puget Sound.

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[10] *Available at* https://fortress.wa.gov/ecy/wats/UIEpaSearch/ViewApprovedListing.aspx?LISTING_ID=43020.

[11] *Available at* https://www.eopugetsound.org/articles/harmful-algal-blooms-puget-sound.

[12] *Available at* https://www.eopugetsound.org/science-review/section-3-harmful-algal-blooms.

- Noctiluca is frequently associated with eutrophication of coastal environments.
- Noctiluca blooms reduce chlorophyll a concentrations in the water column. The impact of Noctiluca grazing on phytoplankton biomass appears in Ecology's Victoria Clipper ferry transect data.
- Despite large, frequent surface blooms of dinoflagellates, chlorophyll a concentrations have significantly declined and sub-surface clarity has significantly increased.
- Changes in the lower food web structure may have much larger implications for ecosystem functioning.

See Friedenberg Publication.

Ecology's models also predict algal blooms:

> The April model predictions include algal blooms in Sinclair Inlet, Oakland Bay, and Totten Inlet. EOPS [Eyes Over Puget Sound] aerial photos show a red phytoplankton bloom in Sinclair Inlet, brown algal bloom in Oakland Bay, and red-brown bloom in Totten Inlet. The June model predictions include algal blooms in Port Madison (Central Puget Sound), Filucy Bay (near McNeil Island), and Henderson Inlet. EOPS aerial photos show a Noctiluca (a dinoflagellate) bloom in Port Madison accumulating at surface in filaments following large eddies, phytoplankton bloom in Filucy Bay across from McNeil Island in colors of green and brown, and green and red phytoplankton bloom in Henderson Inlet. The EOPS photos represent ground truth of algal blooms in these two periods as predicted by the model.

2014 DO Scenarios at 76.

There is ample evidence that algal blooms in Puget Sound are caused, in part, by anthropogenic nutrient contributions, a violation of the narrative criterion.

2. *Jellyfish Cause Deleterious Conditions*

Poor water quality is also associated with increases in jellyfish that are associated with declines in fish. *See* Greene C, Kuehne L, Rice C, Fresh K, Penttila D *Forty years of change in forage fish and jellyfish abundance across greater Puget Sound, Washington (USA): anthropogenic and climate associations*, Mar Ecol Prog Ser 525:153-170 (2015).[13] This study involved a 40-year evaluation of jellyfish and forage fish abundance in Puget Sound that found trends in abundance of all forage species in four subbasins of the Sound. The historically-dominant forage fishes (Pacific herring and surf smelt) have declined in surface waters in two subbasins (Central and South Puget Sound) by up to two orders of magnitude. While two other species of forage fish (Pacific sand lance and three-spine stickleback) increased in all four of the subbasins, jellyfish-dominated catches increased three- to nine-fold in Central and South Puget Sound, and abundance positively tracked human population density across all basins. The strongest predictors of forage fish declines were human population density and commercial harvest. Forage fish support salmonids, sea birds, and marine mammals; jellyfish do not. This trend in relative declines/abundance may explain plummeting populations higher in the food chain, such

[13] *Available at* http://www.int-res.com/abstracts/meps/v525/p153-170/

as Chinook salmon and orca whales. Regardless, the abundance of jellyfish is itself a violation of the narrative criterion. Ecology's failure to consider the narrative criteria, antidegradation policy, and designated uses when developing its 303(d) list cannot excuse its permit writers' failure to establish permits that comply with all aspects of water quality standards.

C. Human Nutrient Sources Are Causing and Contributing to Violations of Water Quality Standards in Puget Sound

Ecology has concluded that nitrogen is causing the violations of dissolved oxygen in Puget Sound. See, e.g., 2014 DO Scenarios at 13. It has also concluded that "[t]he dominant human sources are through marine point source discharges of treated municipal wastewater. Watershed inflows, which include both natural and human components, deliver nitrogen to the surface waters of South and Central Puget Sound." *Id*. at 13-14; *see also* Ecology, *Puget Sound and the Straits Dissolved Oxygen Assessment Impacts of Current and Future Human Nitrogen Sources and Climate Change through 2070* (March 2014) (hereinafter "Future Impacts") at 7 ("Human nitrogen contributions from the U.S. and Canada to the Salish Sea have the greatest impacts on DO in portions of South and Central Puget Sound. Marine point sources cause greater decreases in DO than watershed inflows now and into the future."). By 2014, Ecology had also concluded that:

> Wastewater treatment plants deliver 3,250 kilograms/day (kg/d) of total nitrogen (TN) to South Puget Sound and 24,740 kg TN /d to Central Puget Sound. Watersheds deliver 2,410 kg TN/d to South Puget Sound and 2,910 kg TN/d to Central Puget Sound. Natural sources within the watersheds deliver 1,510 kg TN/d to South Puget Sound and 2,530 kg TN/d to Central Puget Sound. Atmospheric deposition to the marine water surface discharges an additional 360 kg TN/d. Comparing the natural and anthropogenic loads from sources within the South and Central Puget Sound, anthropogenic sources contribute about 6 times the nutrient loading compared to natural loads. External anthropogenic load entering the Edmonds open boundary from north is relatively high at approximately 40,000 kg TN /d.

Id. at 15. As a result of modeling, Ecology concluded that

> Compared with natural conditions, current human nutrient loads to South and Central Puget Sound (both internal and external to model domain) cause >0.2 mg/L decreases in daily minimum oxygen concentrations in portions of Totten, Eld, Budd, Carr, and Case inlets of South Puget Sound (Figure ES-3a). We also found violations in East Passage in Central Puget Sound.

Id. at 16. In addition, Ecology determined that:

> If marine point sources (internal to model domain) discharged at their maximum permitted loads every day of the year, maximum loads would cause >0.2 mg/L depletions in more regions of the South Sound inlets and in a large portion of Central Puget Sound[.]

Id. at 18. And the agency found that "marine point sources alone cause >0.2 mg/L depletion in more regions than human sources in watershed inflows alone." *Id*. (citations omitted).

Other findings of the report include the following:

- A 25% reduction would eliminate nearly all of the violations in East Passage and Case Inlet, and would reduce the magnitude and extent of violations in the other South Puget Sound inlets.
- A 50% reduction would further decrease the maximum depletion, and a 75% reduction would eliminate all violations except in Eld Inlet, where the maximum violation would be 0.24 mg/L.
- Central Puget Sound sources influence at least East Passage, Carr, and Case Inlets.
- South Puget Sound sources decrease oxygen in Carr, Case, Totten, Eld, and Budd Inlets.
- Central Puget Sound sources may decrease oxygen in Totten, Eld, and Budd inlets but the proportion of Central Puget Sound sources reaching South Puget Sound has not yet been determined.
- Results indicate that current sources violate the standards
- Results indicate that marine point sources have a greater impact than human sources within watersheds
- South Puget Sound sources have the largest impact on finger inlets.
- There is a possible under-estimation of violations due to possible over-prediction of DO (though not statistically significant) in the bottom layers of shallow inlets.
- Human sources decrease DO by up to 0.38 mg/L below natural conditions. Violations occur for up to 13 weeks.
- In the spring, chlorophyll a levels reflect strong algae growth, particularly in the shallow regions of South and Central Puget Sound.
- East Passage also exhibits strong algae growth, potentially spurred by vertical mixing near the Tacoma Narrows sill. Surface DO levels increase while DIN decreases during high algae growth.

See, id. at 20-21.

D. Continued Nutrient Discharges, in Combination with Other Circumstances, Will Result in Water Quality's Becoming Worse in the Future

Ecology has pointed out that "nutrient concentrations in Puget Sound have significantly increased and nutrient ratios have steadily changed over the last 13 years despite the strong influence of the ocean on Puget Sound water quality." Friedenberg Publication (citations omitted). Ecology's modeling has demonstrated that this trend will continue into the future. The model was run using the maximum permitted loads, resulting in predicted oxygen depletions above the currently-allowable 0.2 mg/L level in Oakland Bay, Totten Inlet, Eld Inlet, Budd Inlet, Case Inlet, and Carr Inlet in the South Puget Sound and Colvos Passage and the region between Tacoma and Seattle in the Central Puget Sound. *See* 2014 DO Scenarios at 100.

In addition, Ecology looked at how future nutrient contributions could worsen dissolved oxygen declines in Puget Sound in combination with population increases, ocean conditions, and climate change. Its report concluded that,

> Human nitrogen contributions from the U.S. and Canada to the Salish Sea have the greatest impacts on DO in portions of South and Central Puget Sound. Marine point sources cause greater decreases in DO than watershed inflows now and into the future. Both loads will increase as a result of future population growth and

> land use change. Most of the Salish Sea reflects a relatively low impact from human sources of nitrogen. However, future human nutrient contributions could worsen DO declines in regions of Puget Sound.

Future Impacts at 7. Ecology noted that Pacific Ocean trends, climate change, and sediment-water interactions would further decrease DO.

III. THIS PROPOSED PERMIT FAILS TO MEET LEGAL REQUIREMENTS

The facts set out above demonstrate that all current point source discharges of nitrogen to Puget Sound, including Hartstene Pointe are causing or contributing to violations of water quality standards in Puget Sound. The exact location of the point of any given discharge and its impairment status on the EPA-approved 303(d) list is irrelevant to this conclusion for several reasons. First, Ecology has carved the South Puget Sound up into hundreds or thousands of segments or grid cells[14] and it does not and cannot expend the resources to obtain data for that number of small areas of Puget Sound. It cannot carve a waterbody into minute pieces for modeling or 303(d) listing purposes and then point to the absence of data for all the pieces as a rationale to avoid regulation. Second, as discussed above, the effects of nutrients including nitrogen do not occur at the point of discharge but, rather, in combination with other sources and other parameters wherever the circulation of water takes it. These far-field effects are not linked to effects at the precise point of discharge and therefore the analysis for the permit cannot be done on that basis alone. Third, Ecology has already made the necessary findings that require regulation of this nitrogen discharge. Ecology has already determined that Puget Sound is riddled with impairments for numeric dissolved oxygen criteria; it has ignored applicable narrative criteria. Ecology has already determined that marine point sources are the largest contributor to violations of dissolved oxygen standards. And Ecology has already determined that even massive reductions in anthropogenic sources of nitrogen from these very marine point sources are required in order to meet the standards throughout the Sound. In contrast, Ecology has concluded that no changes need be made in its evaluation or in the content of the permit for this source. As Ecology points out, it last issued a permit to this facility on April 1, 2011 and this permit "does not include any significant changes." Fact Sheet at 1. Ecology is incorrect that it can continue to study the problems in Puget Sound, conclude that marine point sources are the primary cause of those problems, and then continue to issue NPDES permits to those very sources as if nothing has changed.

A. The Discharge Causes or Contributes to Violations of Water Quality Standards and Therefore a WQBEL is Required for Nutrients

As set out in EPA's permitting guidance, there are four steps in the standards-to-permits process:

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[14] Ecology has carved the Puget Sound into an unknown number of waterbody segments, with each grid cell sized at approximately 2,460 feet by 3,660 feet. *See* Ecology, *Water Quality Program Policy, Assessment of Water Quality for the Clean Water Act Section 303(d) and 305(b) Integrated Report* (July 2012) at 5. For purposes of modeling, Ecology has divided the South Sound into 2,623 grid cells, each 500 meters square, up to Edmonds. See, e.g., Ecology, South Puget Sound Dissolved Oxygen StudyCirculation Modeling Overview (Oct. 28, 2009), *available at* http://www.ecy.wa.gov/puget_sound/docs/102809_SPSDOS_hydromodel presentation.pdf at 9.

(1) determine applicable water quality standards; (2) characterize effluent and receiving water; (3) determine the need for WQBELs; and (4) calculate WQBELs. *See* EPA Manual at 6-2. The applicable water quality standards have been set out above. *See also id.* at 6-3 ("Water quality standards comprise three parts: Designated uses. Numeric and/or narrative water quality criteria. Antidegradation policy."). In its guidance, EPA points out that:

> In addition to criteria for individual pollutants or pollutant parameters, many states include in their water quality standards criteria for dissolved oxygen. Often, criteria for dissolved oxygen are addressed by modeling and limiting discharges of oxygen-demanding pollutants such as biochemical oxygen demand (BOD), chemical oxygen demand (COD), and nutrients (phosphorus and nitrogen).

Id. at 6-6. Using dissolved oxygen criteria describes Washington's purported approach to nutrients.[15] The EPA guidance also repeats a simple statement of the law: "As previously noted, CWA section 301(b)(1)(C) requires NPDES permits to establish effluent limitations as necessary to meet water quality standards." *Id*. at 11. Note, there are no exceptions.

The federal guidance itself does not cover nutrients and far-field effects of oxygen-demanding pollutants because as non-conservative pollutants "the effects of biological activity and reaction chemistry should be modeled, in addition to the effects of dilution, to assess possible impacts on the receiving water." *Id*. at 24; 6-26 ("It is important for permit writers to remember that, in some situations, the selected steady-state model could be more complex than the simple mass-balance equation shown. For example, there could be other pollutant sources along the stream segment; the pollutant might not be conservative (e.g., BOD); or the parameter to be modeled might be affected by multiple pollutants (e.g., dissolved oxygen affected by BOD and nutrients).").[16]

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[15] Ecology claims it need not establish numeric nutrient criteria because,

> Due to a lack of data in estuaries and the known highly complex relationship between nutrients and trophic health in marine systems, statewide criteria were not recommended for marine waters. Ecology has chosen an alternative pathway for the control of nutrient concentrations in marine systems that relies on other indicators and triggers for trophic health, and more water body specific modeling to select nutrient threshold values.
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> * * *
>
> A primary driver in marine waters for setting the agency's priorities is the failure to comply with dissolved oxygen criteria. Paramount to this issue is the role that is played by excessive nutrient contributions from tributaries and point sources in these waters. Several large sectors of Puget Sound have been modeled to date with the focus on where problems with dissolved oxygen and excess algal production have been found to exist.

Ecology, *Nutrient Criteria Development in Washington State* (April 2004) at 37.

[16] See, for example, EPA Region 5's explanation on how to follow the federal regulations in issuing permits for nutrient discharges:

WQBELs are required to ensure that permits that allow discharges of nutrients to Puget Sound do not contribute nutrients that cause or contribute to violations of water quality standards in part because EPA has repeatedly rejected petitions seeking to amend the definition of secondary treatment to include removal of nutrients. EPA has denied these petitions based explicitly on its belief that WQBELs would be established to address nutrients in individual permits. *See, e.g.*, *Maier v. EPA*, 114 F.3d 1032, 1036 (10th Cir. 1997) ("The EPA maintained that [nitrogen oxygen demand (NOD)] would be better dealt with on a case-by-case basis in NPDES permitting. The EPA therefore characterized NOD controls as a form of "advance treatment" to be imposed by permit where necessary. The EPA also noted that total impact on dissolved oxygen level (ultimate BOD) is to be considered in the NPDES permitting process.") (internal citations omitted). The basis for EPA's position is that,

> The CWA requires application of effluent limitations for nutrients that are met by using advanced treatment where necessary to meet applicable water quality standards. . . . Specifically, where secondary treatment is insufficient to protect the quality of the receiving waterbody, POTWs must meet any more stringent water quality-based effluent limits derived to achieve water quality standards.
>
> The EPA's long-held view, consistent with the requirements of the CWA, is that given the site-specific variation in technological feasibility and costs of nutrient treatment systems, as well as how aquatic ecosystems respond to nutrient additions, POTW nutrient discharges are best addressed through water quality-based permitting.
>
> * * *
>
> In many areas water quality-based permit limits can prevent or correct nutrient-related impairments more effectively than national technology-based nutrient limits due to site-specific variability of waterbody response to nutrients.

Letter from Michael H. Shapiro, Deputy Assistant Administrator, Office of Water, EPA, to Ann Alexander, NRDC (Dec. 14, 2012) at 6. In fact, the Tenth Circuit Court of Appeals asserted that

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> EPA expects that Illinois EPA will follow 40 CFR § 122.44(d) when it develops permits for nutrient discharges. Specifically, Illinois EPA must: (1) determine whether nutrient discharges will cause, have a reasonable potential to cause, or contribute to an excursion beyond the criteria [in state water quality standards] in proximate and downstream waters; and (2) set nutrient effluent limitations which are derived from and comply with [state water quality standards], as applicable, when it makes an affirmative determination. In addition, Illinois EPA must: (1) determine whether nutrients, either alone or in combination with carbonaceous biochemical oxygen demand (CBOD) and ammonia, will cause, have a reasonable potential to cause, or contribute to an excursion beyond the criteria [at state water quality standards] in proximate and downstream waters; and (2) set nutrient effluent limitations which, either alone or in combination with limits on CBOD, ammonia, and/or dissolved oxygen, are derived from and comply with [state water quality standards] when it makes an affirmative determination.

Letter from Tinka G. Hyde, Director, Water Division, Region 5, EPA to Marcia Willhite, Illinois Environmental Protection Agency (Jan. 21, 2011) at 2 (citations omitted).

"the EPA and the States approved to administer the NPDES permit program *routinely impose NOD and nutrient limitations on POTWs* on a case-by-case basis by permit." *Maier* at 1043 (emphasis added), *see also id.* at 1044 ("Congress has, in this closely related statutory section, provided for water quality-based permitting as a gap-filling measure [that] gives strong support to the EPA's exercise of delegated authority to fill the gap where it has concluded that NOD should not be part of standard secondary treatment."); 1045 ("[it] is being dealt with —by permit."). As a consequence, Ecology cannot look to the technology-based limits established by EPA to provide assurance that this discharge will not cause or contribute to violations of water quality standards pertaining to nitrogen-driven oxygen demand. And, it cannot avoid the WQBELs that are a required part of the permitting process upon which EPA and the federal courts are relying for nutrient controls. It must deal with the problem by permit.

However, this permit contains no effluent limits for nitrogen in any form because it contains limis for only: BOD_5, total suspended solids, total residual chlorine, pH, and fecal coliform bacteria. *See* Draft Permit at 5. Therefore, there is no WQBEL that is intended to ensure that the discharge does not cause or contribute to violations of dissolved oxygen standards or the narrative criterion by discharges of nitrogenous oxygen-demanding materials.

B. The Permit Fails to Assess Reasonable Potential for this Discharge to Cause or Contribute to Violations of Water Quality Standards and to Establish Required Effluent Limits

Municipal sewage treatment plant permits have technology-based limits on BOD_5 or $CBOD_5$, sometimes water quality-based limits for the same, and sometimes water quality-based limits on ammonia. None of these individually or together are sufficient to control nitrogen inputs to Puget Sound from this source, which has only a technology-based BOD_5 limit. Ecology was required to assess whether this source has the reasonable potential to cause or contribute to violations of water quality standards in any waterbody to which its pollutants discharge.

This discharger is a known source of nitrogen. The fact sheet notes that the total nitrate+nitrite concentration in its discharge is 2.3 mg/L and total ammonia is 1.5 mg/L. Draft Fact Sheet at 7. The fact sheet omits Ecology's findings that the source discharges dissolved inorganic nitrogen (DIN) at loading rates of 1.07 kg/d summer season and at 2.23 kg/d annually. *See* Ecology, *Puget Sound Dissolved Oxygen Model: Nutrient Load Summary for 1999-2008* (Nov. 2011) at 121 (App. E). As demonstrated above, given that this discharger is a known source of nitrogen to Puget Sound, and therefore it is contributing to violations of water quality standards, the permit is required to also contain water quality-based effluent limits for total nitrogen.[17]

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[17] Writing of Kentucky's failure to use available information as the basis for WQBELs, EPA supports our reading of its regulations:

> KDOW [the state agency] states that it had insufficient data to conduct the RPA for these pollutants and, therefore, is requiring five quarters of effluent monitoring for these pollutants, coupled with in-stream chemical and biological monitoring.
>
> * * *
>
> KDOW does not consider available, valid, and representative data showing that the proposed discharges have the reasonable potential to cause or contribute to

However, the Fact Sheet demonstrates that Ecology did not assess whether this discharge has the reasonable potential to cause or contribute to violations of water quality standards, and did not use procedures to account for existing controls on point and nonpoint sources of nutrients and parameters affecting dissolved oxygen and the narrative criterion as required by federal regulations. The result of this analytical failure is Ecology's failure to have established limits that ensure that this discharge does not cause or contribute to violations of water quality standards and to ensure that the level of water quality achieved by the limitations that it placed on this discharge are derived from and comply with all applicable water quality standards, in violation of the CWA and federal and state regulations set out above.

C. The Proposed Permit Fails to Evaluate the Discharge of Nutrients to Puget Sound on an Appropriate Basis and the Establishment of BOD_5 Limits is Both Inappropriate and Inadequate

Ecology explains how it should evaluate the reasonable potential for this discharge to cause or contribute to violations of water quality standards:

> Pollutants in an effluent may affect the aquatic environment near the point of discharge (near-field) or at a considerable distance from the point of discharge (far-field). . . . a pollutant such as BOD_5 is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

> violations of WQS. Given the existence of information indicating that reasonable potential exists, KDOW's proposal to conduct the RPA during the permit term does not comply with the CWA and its implementing regulations, which require that the permit contain WQBELs for all discharges that have reasonable potential to cause or contribute to a violation of WQS (40 CFR § 122.44(d)(1)(iii, iv, vi)).
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> * * *
>
> KDOW can characterize the effluent using data from similar dicharges . . . or other sources of information about the likely composition of the effluent. KDOW could have independently sought to obtain such data or rejected the application as not sufficient and required additional data from the applicant.
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> * * *
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> Given the existence of information indicating that reasonable potential does exist, KDOW's approach of deferring an RPA to the middle of the permit term is inadequate.

Letter from James D. Giattina, Director, Water Protection Division, Region 4, EPA to Sandy Gruzesky, Kentucky Department for Environmental Protection, Re: Notice of Specific Objection – Xinergy Corporation (KY0108014) (Oct. 22, 2010) (hereinafter Gruzesky Letter) at 3 – 4. Unlike in the Kentucky example, Ecology does not even acknowledge its obligation to conduct a reasonable potential analysis on nitrogenous oxygen demand pollutants contributing to violations of water quality standards and it ignores, entirely, the data that it does have and the modeling that it has completed. As EPA points out in this letter, there is a distinction between a situation where there is no information whatsoever and where there is sufficient information to connect the content of the effluent and the quality of the receiving water. *See, id.* at 4, fn. 6.

Fact Sheet at 21. Yet, on the very next page of the fact sheet, the agency states that: "Ecology determined the impacts of dissolved oxygen deficiency, pH, fecal coliform, chlorine, ammonia, and temperature as described below, using the dilution factors in the above table." *Id*. at 22, tbl 10. Ecology cannot acknowledge the truth that dilution is an inappropriate method by which it can analysis the far-field effects of the discharge on water quality and then choose to only use that very same method. To do so flies in the face of logic. In addition, to fail to evaluate the effects of the discharge on dissolved oxygen beyond an initial dilution analysis is to fail to conduct the very investigation that Ecology acknowledges is required, consistent with EPA guidance, and required by regulations.

Instead, Ecology comments that:

> Natural decomposition of organic material in wastewater effluent impacts dissolved oxygen in the receiving water at distances far outside of the regulated mixing zone. BOD_5 of an effluent sample indicates the amount of biodegradable material in the wastewater and estimates the magnitude of oxygen consumption the wastewater will generate in the receiving water. The amount of ammonia-based nitrogen in the wastewater also provides an indication of oxygen demand potential in the receiving water.
>
> With technology-based limits, this discharge results in a small amount of BOD_5 relative to the large amount of dilution in the receiving water at critical conditions. Technology-based limits will ensure that dissolved oxygen criteria are met in the receiving water.

Fact Sheet at 22. Ecology is correct that the BOD_5 effluent sample indicates some of the oxygen consumption the wastewater will generate in the receiving water. Ecology is incorrect in suggesting that it will account for the entire magnitude of that effect, as required. Establishing limits based on BOD_5 ignores the separate effects of carbonaceous oxygen demand and nitrogenous oxygen demand on Puget Sound waters. (As discussed above, Ecology's entire modeling exercise for the Sound has been based on seeking to limit the nitrogenous oxygen demand.) The carbonaceous effect is of concern for its water quality effects in any waterbody in the relatively near term after discharge because CBOD reaches its equilibrium or maximum effect exerted on dissolved oxygen in a shorter period of time than nitrogenous oxygen demand. It also exerts an overall lower effect. On the other hand, nitrogenous oxygen demand, which is key to assessing ultimate or total BOD—the combination of both—takes a longer period of time and exerts a higher maximum negative effect on oxygen levels in the shorter- to mid-term directly and in the longer term indirectly by stimulating the growth of algae that, upon its death and decay, exerts an even more significant oxygen demand than the original waste material of the discharge. Limitations on NOD are of particular concern to the longer term effects of nitrogen on dissolved oxygen throughout Puget Sound that Ecology has demonstrated conclusively are caused, in large part, by municipal sewage discharges of dissolved inorganic nitrogen. While the BOD_5 limit may include a small fraction of NOD, it by no means limits ultimate NOD, and it is unclear how much NOD it does limit because the fact sheet does not discuss it nor provide any evidence that Ecology knows.

While Ecology's statement that knowing how much ammonia is contained in the wastewater "provides an indication of oxygen demand potential in the receiving water," it falls far short of an analysis of whether there is reasonable potential for the discharge to cause or contribute to

violations of nitrogen-driven oxygen depletions.[18] Ecology then goes on to discuss the technology-based BOD_5 limit on the basis of dilution and claim that that alone results in meeting the dissolved oxygen criteria.[19] But the dilution-based evaluation begs the very point that Ecology itself has made, namely that nutrients including nitrogen that have oxygen-demanding effects must be evaluated in the "water at distances far outside of the regulated mixing zone." For this reason, not only is a mixing zone an inappropriate construct with which to evaluate the discharge's impacts to dissolved oxygen levels in the receiving water when the issue is total loading, but Ecology's focus on the water quality of the immediate area of the outfall is also incorrect, as discussed above. *See* Fact Sheet at 21 ("Ecology has not documented any water quality impairments *in the receiving water in the vicinity of the outfall*.") (emphasis added); at 9 (Ecology evaluated the discharge on the basis of the Case Inlet – S. Heron Island data station, CSE001, using a value of 7.6 mg/L of dissolved oxygen.).

In addition, requiring only a limit for BOD_5 rather than $CBOD_5$ creates the potential for the permit's limit on oxygen-demanding material to include some (or none), but by no means all, of its NOD, thereby obscuring the actual carbonaceous limit that the permit has established. To the extent that Ecology is seeking to understand the nitrogenous oxygen demand in this discharge, it would need to use $CBOD_5$ test results with ammonia samples, not the BOD_5 test in combination with ammonia samples. And it would need the Ultimate BOD test results as well, which are a combination of Ultimate CBOD and Ultimate NOD in order to establish limits based on nitrogen.

Although Ecology references the importance of knowing the ammonia-based nitrogen effect on dissolved oxygen, the fact sheet merely mentions this and does not discuss it further, thereby leaving the public in the dark and failing to justify the absence of a nitrogen limit. This vague observation does not explain whether use of the BOD_5 limit instead of $CBOD_5$ is, in fact, appropriate for this discharge, a question that can only be answered by knowing how much ammonia is being removed. If a facility uses BOD_5, they would likely seek to avoid all nitrification and therefore would discharge as much of wastewater's ammonia as much as possible and therefore nearly all of the NOD. Without an ammonia or NBOD limit, neither of which is in this permit, nothing prevents that outcome. The $CBOD_5$ test, if it were used here, would suppress and therefore not count the NBOD in the facility's effort to meet its carbonaceous limits, with the result that the operator could not worry about the levels of NBOD in the effluent and, as a consequence, let the plant operate in a mode that allows for passive, unintentional, ammonia removal. Use of the BOD_5 limit here prevents even that outcome, not that we are suggesting it is sufficient to meet permitting requirements. Thus, the fact sheet fails to inform the public sufficiently so that it can comment on this critical effluent limit. It is not even possible to tell if the permit writer has information upon which to draw conclusions about

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[18] The fact sheet contains only observations about why an ammonia limit is not required based on ammonia's toxicity to aquatic life. *See* Fact Sheet at 23.

[19] As Ecology's guidance points out that "[n]otably, unless Ecology identified a problem in receiving water quality, a facility has no obligation to remove nitrogenous oxygen-demanding substances from its wastewater. USEPA's longstanding 30 mg/L BOD_5 effluent limit was not intended to force removal of nitrogenous pollutants. It was intended for carbonaceous pollutants. The newer federal rule and Chapter 173-221 WAC clarify that intent, and eliminate the need for facilities to remove these nitrogenous pollutants." Ecology Manual at 148.

how much of the BOD is carbonaceous and how much is ammonia-based nitrogenous effects or if this is all merely guess work.

In any event, the BOD_5 effluent limit certainly does not provide any limits on the ammonia-nitrogen oxygen demand created by the discharge that is causing or contributing to violations of water quality standards in Puget Sound. The BOD_5 test and limit simply do not provide any useful information on either the total NOD or Ultimate BOD, nor any limit on either. As Ecology's guidance states,

> unless Ecology identified a problem in receiving water quality, a facility has no obligation to remove nitrogenous oxygen-demanding substances from its wastewater. USEPA's longstanding 30 mg/L BOD_5 effluent limit was not intended to force removal of nitrogenous pollutants. It was intended for carbonaceous pollutants. The newer federal rule and Chapter 173-221 WAC clarify that intent, and eliminate the need for facilities to remove these nitrogenous pollutants.

Ecology Manual at 148. That is exactly the problem this permit is required to remedy with a WQBEL for nitrogenous pollutants. Yet Ecology has not demonstrated any rationale that is consistent with the CWA and state and federal regulations for not analyzing the potential for this discharge, including its nitrogenous oxygen-demanding content, to cause or contribute to far-field violations of water quality standards and for not establishing a WQBEL to prevent that effect.

D. The Proposed Permit Fails to Comply with 40 C.F.R. § 122.44(d)(1)(ii)

EPA regulations require the permit to, *inter alia*, "use procedures which account for existing controls on point and nonpoint sources of pollution." 40 C.F.R. § 122.44(d)(1)(ii). Although the draft fact sheet states that the source "discharges to Case Inlet where there are "[s]ignificant nearby non-point sources of pollutants [that] include storm water and septic systems," neither the fact sheet nor the permit demonstrate that existing controls, or lack thereof, on these "significant" sources have been taken into account, as required, in determining whether the discharge has the reasonable potential to cause or contribute to violations of numeric or narrative criteria. *See* Fact Sheet at 5.

With regard to nitrogenous oxygen-demanding materials, which this permit does not evaluate, the permit writer must take into account the existing lack of controls on nonpoint sources such as on-site septic systems, which contain no nitrogen controls, and the existing lack of controls on permitted discharges from municipal sewage systems of which we believe only a single one that discharges to Puget Sound contains WQBELs for NOD (the LOTT facility). Ecology's failure to account for these non-existing pollution controls on point and nonpoint sources renders its draft permit inconsistent with federal regulations and the CWA.

E. The Proposed Permit May be Derived on an Illegal Basis

Ecology claims to meet the requirements of federal and state law but notes that:

> Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at

> the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Fact Sheet at 11. Three of these rationales—whether a pollutant is treatable, whether a pollutant is controllable at the source, and whether a pollutant is listed in regulation— are not a legal basis upon which Ecology can avoid establishing a WQBEL if one is otherwise warranted. Ecology cites no legal basis for this conclusion and does not explain which, if any, of these rationales have been used to not establish a WQBEL for this permit. Therefore the public cannot discern whether this comment demonstrates the permit is illegal as proposed.

F. The Proposed Permit Fails to Evaluate Whether the Discharge Will Cause or Contribute to Violations of Narrative Criteria

Ecology cites the narrative criteria and that they protect the designated uses of all marine waters. *See* Fact Sheet at 13. Ecology then asserts that it "must consider the narrative criteria," and that it "considers narrative criteria" but it never explains how it conducted this consideration and what the results were, thereby not revealing any analysis to the public. *Id*. at 21. Even more oddly, Ecology mixes the technology-based evaluation with the narrative criteria requirements of the water quality-based evaluation thus:

> Ecology considers narrative criteria when it evaluates the characteristics of the wastewater and when it implements AKART as described above in the technology-based limits section. When Ecology determines if a facility is meeting AKART it considers the pollutants in the wastewater and the adequacy of the treatment to prevent the violation of narrative criteria.

Id. Not only does this not explain anything to the reading public, it conflates the two separate analyses,[20] thereby giving itself an explanation—albeit a totally irrational one—for not actually evaluating whether the discharge meets narrative water quality criteria. Regardless of any AKART examination, Ecology is required to evaluate whether the discharge has a reasonable potential to cause or contribute to violations of narrative criteria and to establish WQBELs if it does as set out in the federal regulations discussed above. There is no evidence that Ecology made this examination therefore the public can only conclude that it did not. There is no reference to the procedures established in 40 C.F.R. § 122.44(d)(1)(vi). In addition, as this discharge is one of many such discharges that contribute to violations of the narrative criterion in the waters of the Sound, and the fact sheet is silent on the question of whether Ecology took existing controls on point and nonpoint sources into account, the proposed issuance of this permit is contrary to law.[21]

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[20] NWEA is aware that in order to justify the use of a mixing zone, the source must meet AKART first.

[21] For example, EPA has emphasized the federal regulation's requirement to ensure compliance with narrative criteria in its review of state-issued permits. *See, e.g.*, Gruzesky Letter at 2 ("NPDES regulations at 40 CFR 122.44(d)(1)(vi) are clear that NPDES permits must contain provisions implementing narrative WQS, and the RPA that must be completed for numeric WQS, must also be completed for narrative standards.").

G. Permit Violates Tier I of the Antidegradation Policy Contained in Washington's Water Quality Standards

As explained above, Washington's water quality standards contain Tier I requirements to protect existing and designated uses. Puget Sound water quality is impaired, failing to fully support existing and designated uses. Such water quality is prohibited. WAC 173-201A-310(1). Moreover, Ecology is required to "take appropriate and definitive steps to bring the water quality back into compliance with the water quality standards." *Id*. (2). The appropriate steps are, among other actions, to comply with the CWA and federal and state regulations that require a WQBEL that is sufficient to ensure the discharge does not cause or contribute to violations of water quality standards. Ecology's failure to include such WQBELs in this permit for NOD is a violation of Tier I of the antidegradation policy.

H. Monitoring Requirements are Inadequate

For purposes of permit renewal, the draft permit requires annual samples of Total Kjeldahl Nitrogen (TKN) and Nitrate plus Nitrite. The annual samples of TKN and Nitrate plus Nitrite have the result of obtaining annual samples for total nitrogen but this is not helpful when Ecology is attempting to evaluate the seasonal loading and seasonal effects of nitrogen on Puget Sound water quality. Therefore, this is not an adequate sampling requirement. Moreover, as effluent limits are required for nitrogenous oxygen demand, monitoring requirements must mirror those permit limits.

I. Fact Sheet Fails to Meet Federal Requirements

Ecology's assertion that this fact sheet complies with WAC 173-220-060 is simply not true, as demonstrated in the above comments. *See* Fact Sheet at 1. In addition, the fact sheet fails to meet the requirements of WAC 173-220-060(c)(iii), (e), as demonstrated above.

Conclusion

Ecology's website states the case that underlies our comments on this draft permit simply and clearly:

> The study found that low oxygen concentrations naturally occur through much of South and Central Puget Sound. However, human contributions from marine point sources and within watershed inflows decrease oxygen as much as 0.2 to 0.4 mg/L below natural conditions in portions of Totten, Eld, Budd, Carr, and Case Inlets, and East Passage in Central Puget Sound.
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> * * *
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> Fish need oxygen: In areas with low levels of dissolved oxygen, fish and other marine life become stressed and die or are forced to flee their habitat. There are many areas in Puget Sound with very low levels of dissolved oxygen.
>
> Nitrogen is the main pollutant that causes low dissolved oxygen levels: Discharges from wastewater treatment plants, septic systems and other sources add nitrogen to Puget Sound. Excess nitrogen causes excess algae growth. As the algae dies and decays, they rob the water of dissolved oxygen. *Once released*

> *into Puget Sound, nitrogen moves around. Nitrogen discharged at one spot may cause low dissolved oxygen levels many miles away.*[22]

Ecology cannot have it both ways. It cannot acknowledge what is commonly known and scientifically proven and at the same time issue NPDES permits with blinders on, as if it were utterly ignorant of these facts. The Clean Water Act and its implementing regulations prohibit such actions.

We look forward to hearing that Ecology intends to issue a permit for this source that complies with federal and state requirements.

Sincerely,

Nina Bell
Executive Director

Attachments: Memorandum from James A. Hanlon, Director, Office of Wastewater Management, EPA, to Alexis Strauss, Director, Water Division, EPA Region 9 Re: Compliance Schedules for Water Quality-Based Effluent Limitations in NPDES Permits (May 10, 2007)

Ecology, *South Puget Sound Dissolved Oxygen Study Water Quality Model Calibration and Scenarios* (March 2014)

Laura Friedenberg, *et al., Increasing nutrients, changes in algal biomass, and large Noctiluca blooms in Puget Sound: Is eutrophication fueling the microbial food web?*, Publication No. 13-03-019 (April 2013)

Harmful algal blooms in Puget Sound.

Harmful Algal Blooms, Encyclopedia of Puget Sound

Ecology, Listing No. 43020

Greene C, Kuehne L, Rice C, Fresh K, Penttila D *Forty years of change in forage fish and jellyfish abundance across greater Puget Sound, Washington (USA): anthropogenic and climate associations*, Mar Ecol Prog Ser 525:153-170 (2015)

Ecology, *Puget Sound and the Straits Dissolved Oxygen Assessment Impacts of Current and Future Human Nitrogen Sources and Climate Change through 2070* (March 2014)

Ecology, *Nutrient Criteria Development in Washington State* (April 2004)

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[22] http://www.ecy.wa.gov/puget_sound/dissolved_oxygen_study.html (emphasis added).

Letter from Tinka G. Hyde, Director, Water Division, Region 5, EPA to Marcia Willhite, Illinois Environmental Protection Agency (Jan. 21, 2011)

Letter from Michael H. Shapiro, Deputy Assistant Administrator, Office of Water, EPA, to Ann Alexander, NRDC (Dec. 14, 2012)

Ecology, *Puget Sound Dissolved Oxygen Model: Nutrient Load Summary for 1999-2008* (Nov. 2011)

Letter from James D. Giattina, Director, Water Protection Division, Region 4, EPA to Sandy Gruzesky, Kentucky Department for Environmental Protection, Re: Notice of Specific Objection – Xinergy Corporation (KY0108014) (Oct. 22, 2010)