NORTHWEST ENVIRONMENTAL ADVOCATES

April 6, 2018

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Department of Ecology
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Re: **DRAFT Water Quality Policy 1-11, Chapter 1, Washington's Water Quality Assessment Listing Methodology to meet Clean Water Act Requirements**

Dear Susan:

Please consider the following comments by Northwest Environmental Advocates on the Department of Ecology's draft Listing Methodology. Ecology, DRAFT Water Quality Policy 1-11, Chapter 1, Washington's Water Quality Assessment Listing Methodology to meet Clean Water Act Requirements ("Draft Methodology").

I. COMMENTS ON THE METHODOLOGY

In addition to these comments, we incorporate by attachment as comments on this proposed listing methodology the following additional comments: (1) Letter from Nina Bell, NWEA, to Patrick Lizon, Ecology Re: *Washington's Draft Integrated Report and Section 303(d)(1) List of Impaired Waters* (May 15, 2015); and (2) Letter from Nina Bell, NWEA, to Patrick Lizon, Ecology Re: *Call-for-Data for "Next" Water Quality Assessment* (April 6, 2018).

II. COMMENTS ON PROPOSED CHANGES

Page 6 – **1C. Waterbody Segments and GIS Layers**

Ecology continues to use a gridded system for open waters with units of 2,460 by 3,660 feet with assessments of contaminated segments one quarter of that size. The Methodology does not explain the benefits and detriments of this entirely random system. Of the many reasons why this gridded system does not work, is the fact that using it does not serve the 303(d) program well. Many if not most of the designated and existing uses in Puget Sound move far beyond a single grid, so in the absence of Ecology's use of professional judgment to take data and information that apply in one unit and apply it to others all Ecology accomplishes by using these small units is to create the impression of little hotspots when, instead, the pollution is far more

widespread and the pollutants are affecting beneficial uses that are more widespread as well. This impression then creates a second impression that a Total Maximum Daily Load (TMDL) is not a worthwhile endeavor because the pollution is limited to such specific and isolated areas. This is, as Ecology well knows, not the case. While developing such TMDLs would be challenging, they are, in fact, much needed. In addition, the 303(d) list has significant ramifications for the issuance of NPDES permits under section 402 of the Clean Water Act. By restricting the geographic coverage of unsafe levels of pollution, Ecology assures that it will continue to issue the vast majority of permits without water quality-based effluent limits on the only sources of pollution that it regulates, thereby perpetuating pollution of the Sound. In proceeding without either TMDLs or effluent limits, Ecology is subverting the goals of the Clean Water Act and specific objectives of the applicable water quality standards.

Page 7 – **1D. Ensuring Data Credibility in the Assessment**

In this section, Ecology explains Washington's Water Quality Data Act. What Ecology omits from this section is an explanation of how Washington's statute conflicts with federal regulations and guidance pertaining to the 303(d) listing process. For example, Ecology's discussion of the Act pertains to ambient water quality samples yet data and information required to be evaluated for the 303(d) list goes well beyond such ambient data. 40 C.F.R. § 130.7(b)(3), (5). We are not suggesting that Ecology should use data that are not credible but, rather, that Washington's law is improperly constraining in determining what data and information are credible and therefore is inconsistent with federal law.

For example, Ecology paints itself into a corner when it finds that data are not usuable if "[t]he sample location information is not provided or is insufficient to accurately associate the data to an AU." Draft Methodology at 10. On this basis, Ecology could easily ignore, and in fact proposes to ignore, a significant amount of data. The fact that fish and marine mammals swim, for example, becomes a rationale for not using data that pertains directly to Washington's waters' failure to support these designated uses. Ecology cannot rationally suggest that toxics can be effectively sampled in the ambient water column, particularly when so many have criteria below detection and quantification limits, and eliminate consideration of tissue data.

Page 11 – **1E. Data and Information Submittals**

Ecology incorrectly limits the use of modeled data to those situations where "when the status of water quality is being determined in relation to natural conditions." Modeled data are also information upon which Ecology can determine, for example, that waters are threatened and therefore require listing. 40 C.F.R. § 130.7(b)(5)(i). Modeled data can also be used to determine that waters are impaired where sampling data are lacking. *Id*. § (b)(5)(ii).

Ecology is also not free to eliminate all data because the objective of the sampling was not for

the purpose of determining "the overall quality of the water." Draft Methodology at 11. Projects that have objectives of characterizing a localized condition, such as dilution calculations for regulatory mixing zones, are not *per se* data and information that should and cannot be used. In fact, the opposite is true. *See* 40 C.F.R. § 130.7(b)(5)(ii) (data and information regarding waters for which dilution calculations indicate nonattainment must be used). It is a conclusion without basis for Ecology to determine that all such data are unusuable because they "may not be representative of ambient water quality." In fact, Ecology must evaluate them to see if they are, or are not, sufficiently representative and its Methodology must explain why and when it will not use such data. *See* 40 C.F.R. § 130.7(b)(6)(i), (iii). Very few studies are intended specifically for the purpose of determining the overall quality of the water within a specified segment or assessment unit; Ecology is not free to disregard all other data and information.

Page 14 – **Information Submittals Based on Narrative Standards**

We are pleased to see that Ecology is finally acknowledging the role of narrative criteria and standards. Unfortunately, Ecology misconstrues the law by stating that,

> Narrative criteria may be used in conjunction with numeric criteria as described in the parameter sections. In addition, Part 2 includes specific assessment considerations based on the narrative standards for bioassessment (to protect benthic aquatic life), and toxics data (to protect for fish and shellfish harvesting).
>
> * * *
>
> In order to use information to make a Category 5 listing based on narrative criteria, the data submitter must provide information to show:
>
> - Documentation of a designated use impairment in the AU, **and**
> - Documentation that deleterious, chemical, or physical alterations are causing the designated use impairment in the same AU.
>
> For example, to create a 303(d) listing based on a study showing harm to wildlife from a specific toxin, the study would need to demonstrate that the toxin was causing adverse effects to wildlife, and demonstrate the source of the toxin to be a specific waterbody. The linkage between source, cause, and effects needs to be clearly documented in order to meet credible data requirements in Washington.

Draft Methodology at 14 (emphasis in original). This overly narrow approach to interpreting and applying Washington's narrative standards is simply incorrect.

First, documentation of deleterious alterations is a violation of the narrative criteria regardless of

whether it has also been demonstrated that the alterations have affected a designated use. Washington's narrative criteria preclude toxic and deleterious material concentrations that *"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) (emphasis added). This does not mean that Ecology has the luxury of waiting around until some scientists have proven beyond a reasonable doubt that, in fact, these concentrations have affected the beneficial uses but, rather, that the levels found have the potential to cause adverse effects. For this reason, in its example, Ecology is required to assess whether the levels of toxics[1] have *the potential* to cause adverse effects, not to wait to see if wildlife suffer reproductive failure before listing a waterbody as impaired. Or, in the case of the orcas, not wait until the entire endangered population of Southern Resident orcas is impaired by toxic chemicals released when their fat reserves metabolize because they are not able to find sufficient prey. Aesthetic values affected by, for example, algal blooms, which are themselves a documentation of a designated use impairment, do not also require documentation of the specific chemical, or physical alterations that underlie the impairment. *See* WAC 173-201A-260 (b) ("Aesthetic values must not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste[.]"). To require double the documentation is to negate the independent value of the designated uses that must be supported and the narrative criteria that must be met, thus violating EPA's rule of independent applicability and rendering much of Washington's water quality standards of no value.

Page 15 – **Additional Information on Data Submittals: Age of data considered in the WQA**

Ecology proposes that it will not use data older than ten years except when it seeks to delist segments based on determining purported natural conditions. There is no rationale presented to explain why there are two sets of rules, one for listing which is more restrictive and one for delisting that is less restrictive. Ecology also states that it will evaluate newly submitted data by adding it to previously assessed data only if those are less than ten years old. In doing so, Ecology also needs to look for trends to see if waters are threatened, as discussed above. In addition, there is nothing particularly scientific about combining data based on an arbitrary cut-off point that ends in a zero. If the more recent data demonstrate a clear impairment, say in the last three years, and averaging those data with data from the previous seven years results in a finding that there is no impairment, clearly the more recent data should be used without combining them. Given the infrequency of Ecology's 303(d) lists, it would be irresponsible to

[1] Note that "toxin" as used by Ecology is an incorrect use of the word. *See, e.g.,* Merriam-Webster dictionary (" Definition of toxin: a poisonous substance that is a specific product of the metabolic activities of a living organism[.]"), *available at* https://www.merriam-webster.com/dictionary/toxin.

ignore such a trend, one that would only likely worsen before Ecology got around to a new list. In the interim, the agency would not be taking steps to prevent its getting worse.

It is unclear what Ecology means by its statement that segments will be removed from the 303(d) list if "it is determined that the data the old listing was based on did not meet quality assurance requirements in place at the time of its collection." Is Ecology stating that it intends to review all existing listings based on this new method of assessment or just when polluters concerned about how listed segments may affect their discharges request this re-assessment? Ecology needs to not throw in a vague sentence about something that is potentially of such significance. In addition, if Ecology intends to do this, it must state its rationale and provide an explanation of how it will determine what "quality assurance requirements" were in place at the time of the data collection, and why it was able to use the data in the first place.

Page 15 – **Determining appropriate standards in brackish waters**

We agree that where information is not available to determine which criteria, as between fresh and marine waters, are not available, the more stringent of the two (or more) should apply. Ecology should also state here that where upstream waters are governed by downstream criteria and uses, those upstream data must be measured against the downstream criteria. For example, fresh waters immediately upstream of shellfish beds for which a more stringent bacteria criterion applies, must be evaluated as to their potential to impair the downstream criteria and uses. *See* WAC 173-201A-260(3)(b).

Page 17 – **1F. Category Descriptions**

Ecology appears to be ignoring EPA's guidance with regard to categories 2 and 3. While these waters are not technically on the 303(d) list, they do represent determinations that Ecology has made with regard to data and information that might otherwise result in a 303(d) listing. In addition, segments placed in these two categories suggest the need for gathering further information, if used properly to identify the state's impaired waters.

With regard to category 2, EPA's guidance states that:

> Segments should be placed in Category 2 if the state determines that available data and/or information indicate that some, but not all of the designated uses are supported. If the state has chosen to use the multi-category approach, segments reported in Category 2 may also be reported in Categories 3, 4, or 5 depending upon the results of the analysis of all available data and information on the other uses in the segment. However, if a single-category approach is used, Category 5 takes precedence over all other categories.

EPA, *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* (July 29, 2005) (hereinafter "EPA 2006 Guidance") at 53. EPA describes the use of category 3 as for

> identify[ing] those segments that are higher and lower priority for followup monitoring, and may do so using predicative tools such as probability surveys or landscape models. Category 3 provides states with the flexibility to monitor these segments in a manner consistent with their overall monitoring strategy and schedule.

Id. In contrast, Ecology states that "Category 2 applies when credible data create concerns of possible impact to designated uses, but fall short of demonstrating that there is a persistent problem." Draft Methodology at 17. Ecology concludes that the purpose of this category is "to help Ecology and the public be aware of, track, and investigate these water quality concerns." Ecology describes category 3 as:

> When there are insufficient data available to evaluate if a water quality standard is being met, the AU will be placed in the Insufficient Data category. AUs without any data are considered by default to be in Category 3. Category 3 listing information will be maintained in Ecology's WQA database for potential future use.

Id. at 18. In other words, EPA states that category 3 is for identifying waters where data and information suggest the possibility of an impairment but more monitoring is required and, in fact, urges states to use this list actively to set priorities for further data collection. Ecology, however, states that it's simply a dumping ground for "insufficient data," in fact the "default" for all waters without any data at all. There is no discussion of using category 3 placement as a source of monitoring priorities.

EPA describes category 2 as a location for the state to identify those pollutant parameters for which a segment is attaining uses/criteria if the segment is also not attaining other uses/criteria. Ecology describes its category 2 more as EPA's category 3, a source of future monitoring priorities.

Finally, Ecology claims that category 4C is where "[t]he impairment is not known to be caused by a pollutant, and therefore a TMDL is not appropriate to address the impairment (Category 4c)." Draft Methodology at 18. Again, this is a direct repudiation of EPA's guidance, which states clearly that,

> Segments should be placed in Category 4c when the states demonstrates that the failure to meet an applicable water quality standard is not caused by a pollutant,

> but instead is caused by other types of pollution. . . . States should schedule these segments for monitoring to confirm that there continues to be no pollutant associated with the failure to meet the water quality standard and to support water quality management actions necessary to address the cause(s) of the impairment. Examples of circumstances where an impaired segment may be placed in Category 4c include segments impaired solely due to lack of adequate flow or to stream channelization.

EPA 2006 Guidance at 56. The distinction is this: EPA states that where an impairment exists and the state has demonstrated that it is not caused by a pollutant, the state may place the segment into Category 4C. Ecology, in contrast, states that the burden is for someone to demonstrate the impairment is caused by a pollutant, not that a pollutant is the assumed cause of the impairment.

Page 18 – **Category 4A: Has a TMDL Approved by EPA**

Ecology is correct to state that "[w]hen Ecology determines that a TMDL is not being successfully implemented, the AUs within the TMDL will be placed back in Category 5." Draft Methodology at 19. *See* 40 C.F.R. § 130.7(b)(1). But Ecology incorrectly concludes that,

> Data generated during the development of a TMDL should not be used for the WQA until the dataset is complete for the TMDL. This avoids conducting an assessment of incomplete datasets. Monitoring data submitted independent of the TMDL study that is within a TMDL boundary needs to also be considered within the context of the TMDL.

Draft Methodology at 19. This approach may have some superficial appeal to Ecology when it is in the middle of data gathering. However, the fact is that Ecology sometimes, even often, takes a very long time between gathering data and developing a TMDL that it submits to EPA; the state is not free to disregard the data that have been collected during that period whether it is Ecology's data or from other sources. (Example: Budd Inlet.) Ecology proposes to disregard them all. There is no particular distinction between gathering data for a TMDL and gathering it for some other purpose; in either case the data are readily available and pertinent. Very few studies are ever really complete; they all represent a snapshot in time and place that is inadequate compared to the ideal. Moreover, Ecology could suppress data on the basis that it might eventually develop a TMDL while not committing to actually develop at TMDL, and it could start a TMDL that it or EPA may never complete. (Examples: Puget Sound, Columbia River.) As Ecology knows, not only has the agency has engaged in all of these scenarios but it has also not provided a rational basis for suppressing data that it considers "incomplete." Finally, Ecology's inability to complete 303(d) lists on a timely basis, consistent with federal regulations, militates against putting aside data because it—and others—are in the middle of collecting data.

Page 20 – **Category 4B. Has a Pollution Control Program in Place that is being Actively Implemented**

Ecology describes the category 4B as: "The waterbody does not require a TMDL because the pollution control program is designed to meet water quality standards in a reasonable amount of time and is being actively implemented." Draft Methodology at 20. EPA's guidance addresses what constitutes a "reasonable period of time":

> EPA expects that segments impaired by a pollutant but not listed under section 303(d) based on the implementation of existing control requirements will attain WQSs within a reasonable period of time. What constitutes a "reasonable time" will vary depending on factors such as the initial severity of the impairment, the cause of the impairment (e.g., point source discharges, in place sediment fluxes, atmospheric deposition, nonpoint source runoff), riparian condition, channel condition, the nature and behavior of the specific pollutant (e.g., conservative, reactive), the size and complexity of the segment (a simple first-order stream, a large thermally-stratified lake, a density-stratified estuary, and tidallyinfluenced coastal segment), the nature of the control action, cost, public interest, etc. States should consider such factors and provide, as stated in Section IV.G.2.A. above, a time estimate by which the controls will result in WQS attainment, including an explanation of the basis for their conclusion. EPA will evaluate on a case-specific basis whether the estimated time for WQS attainment is reasonable.

EPA 2006 Guidance at 56. Ecology's draft methodology does not shed further light on how Ecology will determine these time periods, despite the fact that the category 4B listing is a method of avoiding category 5 listings and TMDLs. Ecology just muddies the waters when it states that it considers a timeframe reasonable if "it is similar to the timeframe that would likely be developed under a TMDL." Draft Methodology at 22. On what basis does Ecology assess timeframes for TMDL implementation, if at all? The methodology is not helpful if it remains this vague. Moreover, in this methodology, Ecology should commit to posting 4B determinations and EPA findings on its website for public review and accountability.

Page 23 – **Category 4C. Impaired by a Non-Pollutant**

Ecology incorrectly includes as "non-pollutants" "invasive exotic species." Invasive species are legally pollutants. *See, e.g., Natural Resources Defense Council v. U.S. E.P.A.,* 808 F.3d 556, 564 (2015) ("Because invasive species are a nonconventional pollutant from an existing source, ballast water discharges are subject to BAT.").

Ecology should make clear here that a finding of "degraded biological integrity, when a pollutant does not contribute to the impairment" is not a default but a finding that, in fact, one or more

pollutants or water quality parameters have not contributed to the impairment.

Page 26 – **Requests for Reconsideration of Listing Decisions**

Ecology proposes that it may "reassess" and presumably move waters that have been assessed. It states that these "changes" may not be available until the next public review. It is unclear what this means. Is this a suggestion that Ecology will make the changes but will not make them public or request EPA approval? Will these changes be reflected in the on-line data base? How are these changes valid for purposes of the Clean Water Act if they have not been subject to public review and EPA has not approved them? While Ecology states that its correction of errors "does not apply to requests to change a WQA decision based on new data prior to the next WQA cycle nor to disagreements with Ecology's judgment in making a WQA decision," this section does not explicitly apply only to "errors," suggesting that changes can and will be made because a party has demonstrated that a listing is "inappropriate." This section needs to be rewritten for clarity and if it does include the potential for changes between formal listings, Ecology needs to make clear that the agency will add waters just as much as it will move them off the 303(d) list.

Page 27 – **1H. Prioritizing TMDLs**

Ecology fails to include risks to threatened and endangered species as among the priorities for TMDL development. In fact, it has specifically deleted this from its past guidance. It should go without saying that this fact shows just how committed Ecology is to protecting species on the brink of extinction: not at all.

Page 28 – **PART 2: Specific Assessment Considerations for Water Quality Criteria**

We urge Ecology to add to this list so that there are clear methods of using all required parts of its water quality standards, *see* 40 C.F.R. § 130.7(b)(3), and all of its criteria, including narrative criteria, *id*.

Page 29 – **2A. Bacteria**

Ecology states that it may define specified critical periods or seasons based on when "bacteria levels are more prone to exceed criteria." Draft Methodology at 29. It should also define critical periods or seasons, when necessary to protect specific beneficial uses. We do not agree that Ecology can put aside "incomplete" data until its next listing process. Ecology has a terrible track record on issuing timely assessments and, as such, has no basis for ignoring any data if it shows that a waterbody is impaired.

It is incorrect policy, as Ecology proposes, to always "remove data from the evaluation whenever

it is known to be from monitoring designed to target high bacteria levels." Draft Methodology at 30. If, for example, the monitoring is targeted to specified critical periods or seasons when bacteria are more prone to exceed criteria, that is by definition both consistent with Ecology listing policy, as cited above, and inconsistent with this aspect of the policy. Such monitoring is, in fact, designed to target high bacteria levels, which is appropriate because it is assessing support of the beneficial use the standards are intended to protect. The same would be true of any monitoring intended to ensure the protection of beneficial uses, as a likely method of using limited monitoring resources. This is not to say that in some instances, Ecology's professional judgment will be that the data do not reflect the waterbody as a whole or reflect specific instances (e.g., spills) that should not be captured in category 5. But this should be spelled out in the methodology and the purpose of such a policy explained. For example, if data are from a one-time sewage spill or from swimmers in a confined beach area, the policy could be to determine that these are not sources that would benefit from development of a TMDL. But this type of exception requires careful explanation as compared with Ecology's 'throw-the-baby-out-with-the-bathwater' approach. The way that Ecology has approached this issue could preclude any regular testing outside discharge pipes, regular combined sewer overflows, data collection during high flows, data collection near dairy farms, data collection of stormwater discharges at high flows, yet all of these examples are of data that would demonstrate a regular failure to meet the water quality standards and protect the beneficial uses.

Page 32 – **Category Determinations Based on Agency Health Advisories**

Where there are disparities between the Washington Department of Health and Ecology, the most stringent approach should be used to generate the 303(d) list. That is, if the WDOH concludes that there is an impairment, Ecology should accept that result. This may, or may not, be what Ecology is saying in its obscurely written methodology.

Page 32 – **2B. Benthic Biological Indicators**

Ecology notes that EPA's "guidance stipulates that states should identify AUs in Category 5 using bioassessment data even if the specific pollutant causing the impairment has not been identified." Nonetheless, Ecology proceeds to propose its own guidance that contradicts EPA:

> Bioassessment data based on the B-IBI model will be used to determine if the bioassessment scores are indicative of water quality and/or habitat degradation, and if so will be placed in Category 5 as "Degraded Biological Community-cause unknown." *Category 5 listings based on B-IBI data will not result in permit limitations or wasteload allocations because a pollutant has not been identified. A stressor identification analysis will first need to occur in order to identify pollutants or habitat impairments that are causing the community to be degraded.*

Id. at 34-35 (emphasis added). Ecology cannot use this guidance to change its EPA-approved water quality standards. For example, WAC 173-201A-260, cited as the applicable criterion for bioassessment data, states that "[t]oxic, 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). Nothing in this water quality standard indicates that it is not applicable to permitting actions. In fact, a permit writer is required to ensure that a permit meets this and every other applicable water quality standard and to identify any pollutants causing violations to which a source is causing or contributing. *See, e.g.*, 40 C.F.R. §§ 122.4, 122.44(d).

We believe that Ecology's proposal to average all bioassessment scores in a single year together may be a mistake and that while this could be the default, Ecology should also use its professional judgment where there are indications this would alter the results incorrectly. For example, if data are collected in late October after considerable rains, these data could be used to negate completely reliable data from low flow conditions. Ecology also states that "[d]ata from the most recent two years of data collection are required to determine if the biological community of an AU is degraded." *Id*. at 36. Ecology's proposal to not list on the basis of one year's data has no basis in science. Likewise, if there are two years of data showing a bioassessment impairment followed by two assessments done at the very end of the season when rains have mitigated some results, Ecology should use its professional judgment about the impairment.

In addition, Ecology is requiring additional indices (e.g., Hilsenhoff biotic index, a fine sediment index, metals tolerance index, thermal indicator index) in addition to B-IBI scores in order to find an impairment and list a segment on the 303(d) list. Ecology has not provided a justification for not using B-IBI scores without this additional check. Ecology merely states its purpose is

> not to identify a probable pollutant, but to provide higher confidence that a pollutant impairment is occurring. Although these indices do not cover all possible pollutants that may be present, impairment by additional pollutants is likely to be captured in the scores of one or more of the above indices since the taxa that are harmed by sediment, metals, temperature and/or organic enrichment are often harmed by other pollutants.

Draft Methodology at 37. This is disingenuous. It is clear that Ecology's intent is not to "provide higher confidence" of a pollutant but to circumvent EPA's policy of requiring listing on the basis of bioassessment even if a pollutant has yet to have been identified. Again, Ecology has not demonstrated that bioassessments are not reliable, which is the only basis for requiring an additional measurement. If bioassessments are not, in fact, reliable, then Ecology should refuse to use them (and EPA can add them to the state's 303(d) list).

Page 40 – **2C. Dissolved Oxygen**

Ecology has added an increment of impairment to its otherwise applicable water quality standards. Specficially, Ecology proposes to change the water quality standards through its listing process as described here:

> The estimated instrument accuracy in measuring ambient DO is ±0.2mg/L. DO values that exceed a criterion magnitude by more than 0.2 mg/L are more likely to accurately indicate a criterion exceedance. Ecology will not count a DO value from a time series dataset as an exceedance when it exceeds the criterion by 0.2mg/L or less. Since discrete data is unlikely to capture the daily extreme values, an exceedance is likely to be greater than what is actually observed. Therefore, it is not necessary to account for instrument accuracy with discrete DO data and the 0.2mg/L margin of error will not be applied to such values.

Draft Methodology at 41. The regulations establish Washington's dissolved oxygen standard. WAC 173-201A-200(1)(d) (parallel standards apply to marine waters). These criteria are specified numbers, approved by EPA as protective of the designated uses. *Id*. Table 200(1)(d). The standard specifies the frequency level. *Id.* § (1)(d)(iii). It specifies that where a level of dissolved oxygen is below the numeric criteria and that condition is determined to be natural, the criterion operates as to allow human actions to decrease the natural condition up to 0.2 mg/l. *Id*. § (1)(d)(i), (ii). The standard does not, however, include an increment of lower dissolved oxygen that accounts for equipment accuracy, a level that the standards specify is sufficient to cover the entire human contribution to lowered dissolved oxygen where natural conditions are below acceptable levels for the support of aquatic life. Moreover, Ecology's proposal to add this increment of lowered protection is, presumably, in addition to the increment that is provided for human contributions under purportedly natural circumstances, resulting in an increment of 0.4 mg/l drop in dissolved oxygen before Ecology will determine that the standard has been violated.

In addition, Ecology does not address those situations where 303(d) listings are not based on ambient data but, rather, projections of dissolved oxygen levels, for example through modeling, which are required for listing. *See* 40 C.F.R. § 130.7(b)(5)(ii). The methodology should make clear that Ecology does not intend to double the drop in dissolved oxygen from those predictions in order to make a finding that a waterboy is impaired or threatened. In addition to the reasons provided above, this makes sense because instrument accuracy does not come into play in model results, which routinely generate results that are in fractions of that accuracy, results that Ecology uses in regulatory matters such as wasteload allocations.

We support the provision that allows for Ecology to list a waterbody for dissolved oxygen violations where large deviations from the least stringent criteria are measured in any single day for the reason Ecology explains, the measurement itself provides confidence. We do not support

the need for two years or more data when discrete data are being used. Ecology is already planning on using the hypergeometric test to ensure confidence in the results; that alone provides the "pattern of altered DO" if the data demonstrate an exceedance of the test.

Finally, Ecology states that it will not list waters not meeting dissolved oxygen criteria at higher elevations where those waters are meeting temperature criteria. We understand that Ecology is attempting to eliminate those places where physically levels of dissolved oxygen cannot remain in the water. However, there is a misplaced logic here. In order that numeric temperature criteria are met at the lowest (and likely warmest) downstream location to which they apply, the actual temperature of waters upstream must be cooler and sometimes considerably cooler than the numeric temperature criteria themselves. As EPA explained in its regional temperature guidance,

> Because streams generally warm progressively in the downstream direction, waters upstream of that point will generally need to be cooler in order to ensure that the criterion is met downstream. Thus, a waterbody that meets a criterion at the furthest downstream extent of use will in many cases provide water cooler than the criterion at the upstream extent of the use. EPA took this into consideration when it formulated its numeric criteria recommendations.

EPA, *EPA Region 10 Guidance For Pacific Northwest State and Tribal Temperature Water Quality Standards* (April 2003) at 22. For this reason, it is not sufficient for Ecology to simply apply the numeric criterion high in the watershed as the basis for concluding that under no circumstances could the dissolved oxygen criterion be met. Rather, it must make apply its professional judgment to what the temperature would have to be in order that the downstream temperature criterion would be met at the furthest downstream extent of the use. If it cannot do that, it must use the dissolved oxygen criteria as they are written and save the analysis of its practicality for a time when it begins to contemplate developing a TMDL.

With regard to the hypergeometric test proposed by Ecology, there is no explanation of how this works with seasonality to provide appropriate results. For example, it appears that if data were collected every day of the year, a waterbody could not be listed as failing the test unless 19 or more days exceeded the numeric criteria. But, hypothetically, if 18 days exceeded the numeric criteria all in one season of that year, that should be enough for Ecology to determine with high confidence that violations of the standard are likely to impair aquatic uses such that the waterbody should be listed. We believe that Ecology needs to address this issue of seasonality/critical periods to ensure that the results of what are essentially seasonal standards are not diluted by a sheer abundance of data.

Comments pertaining to freshwater are applicable to marine waters.

Page 45 – **2D. pH**

Ecology has added an impermissible test to its finding exceedances from pH criteria:

> The estimated instrument accuracy in measuring ambient pH is ±0.2 pH standard units. pH values that depart from the criteria range by more than 0.2 units are more likely to accurately indicate an exceedance from the criteria. Ecology will not include a pH value from a time series dataset in the count of exceedances when it exceeds the applicable criteria range by 0.2 units or less. Since discrete data values are unlikely to capture the daily extreme values, an exceedance is likely to be greater than what is actually observed. Therefore, it is not necessary to account for instrument accuracy with discrete pH data and the 0.2 unit margin of error will not be applied to such values.

Id. at 45. See discussion above under dissolved oxygen. Here, Ecology makes no reference to the language of its standard, which provides that pH must be within a specified numeric range and, in addition, limits the "human-caused variation" of pH within that range to 0.2 units. *See* WAC 173-201A-200(1)(g), Table 200(1)(g). The standard does not allow for an exceedance of the range, either up or down, from the specified numeric criteria; instead, it explicitly states that "pH shall be within the range[.]" *Id*. In addition, the methodology does not discuss how Ecology applies the variation limitation within the range that is an explicit part of the standards.

With regard to the requirement that the hypergeometric test must be failed over two years minimum if discrete data are used, please see our comments on DO above. The use of the hypergeometric test provides the confidence level that is needed. Please also see comments above pertaining to seasonality.

Comments pertaining to freshwater are applicable to marine waters.

Page 51 – **2F. Temperature**

As with DO and pH, Ecology has added an impermissible test to its finding exceedances from temperature criteria:

> The estimated instrument accuracy for measuring ambient temperature is ±0.2ºC. Temperature values that exceed a criterion magnitude by more than 0.2ºC are more likely to accurately indicate a true criterion exceedance. When using time series data to evaluate compliance with 7-DADMax and 1-DMax criteria, Ecology will include a value in the count of exceedances when it exceeds the applicable criterion by more than 0.2ºC. Since discrete data is unlikely to capture the daily maximum temperature, an exceedance is likely to be greater than what is

> actually observed. Therefore, it is not necessary to account for instrument accuracy with discrete temperature data and the 0.2ºC margin of error will not be applied to such values.

Draft Methodology at 51. Ecology's standards allow for an increment of human warming where waters exceed numeric criteria due to natural conditions. *See* WAC 173-201A-200(1)(c)(i), (v). There are other limitations beyond the numeric criteria established by the temperature standards that limit human warming. *Id*. § (1)(c)(ii). But there is no provision that allows for an additional increment based on instrument accuracy.

EPA found that "an increase on the order of 0.25°C *for all sources cumulatively (at the point of maximum impact)* above fully protective numeric criteria or natural background temperatures would not impair the designated uses, and therefore might be regarded as de minimis." EPA, EPA Region 10 Guidance For Pacific Northwest State and Tribal Temperature Water Quality Standards (April 2003) at 21 (emphasis added). Ecology is now proposing to alter its numeric temperature criteria by adding an increment of 0.2º C to all of its numeric criteria, which is not an EPA-approved change to the water quality standards. In addition, this increment is proposed to be added to evaluations of compliance with the 7-DADM metric, which itself is an averaging of the three days before and the three days after each date. *See* Draft Methodology at 51. Given that these data are averaged, adding an increment to account for instrument error makes no sense.

We note that here, unlike with dissolved oxygen and pH, Ecology proposes to include a focus on critical seasons such that "exceedances of the criteria on more than 5% of the days in the summer season indicates that the criteria are not persistently met and therefore the aquatic life use is impaired," *id*. at 52, and "with supplemental spawning period criteria, the hypergeometric test will be adjusted to the number of days associated with the length of a supplemental spawning period that applies to a given AU," *id*. at 53.

Ecology's requirement of two years' data is not consistent with the effect of temperatures on the beneficial uses. For example, hot water in the Columbia River killed far more than half of sockeye in the summer of 2016. *See, e.g.,* The Oregonian, *Hot water kills half of Columbia River sockeye salmon* (July 27, 2016), *available at* http://www.oregonlive.com/environment/index.ssf/2015/07/hot_water_killing_half_of_colu.html (last accessed April 5, 2018). Even if in the next year the river temperatures had dropped, the exceedance had a significant effect on the population that did not need to be replicated a second year in order to count as a violation of water quality standards.

Page 58 – **2H. Toxics-Aquatic Life Criteria**

Despite Ecology's referencing narrative standards at the outset of the guidance on using aquatic life toxics criteria, the text relates solely to comparisons of ambient water quality data to the numeric criteria. *See, e.g*, (unit of measure's referencing "water column data," at 58; Category 5 determinations' referencing "pollutant in the water column" at 60). The only other measure is the use of bioassay tests. *Id*. at 60.

There is no reference to how Ecology will—or if it will—evaluate aquatic life protection where numeric criteria have not been adopted for specific parameters, when Washington's numeric criteria are outdated (e.g., copper), and where contamination is found in media other than the ambient water column (i.e., tissue of the species themselves, their prey, semi-permeable membrane devices). As we have explained previously, as well as in our cover letter on submission of data and information, this is a gross misinterpretation of Washington's water quality standards and EPA regulations pertaining to the 303(d) program. See also discussion immediately below regarding Ecology's refusal to use data on anadromous fish which we incorporate by reference here.

Page 63 – **2I. Toxics-Human Health Criteria**

Ecology is evidently working hard to prevent its new human health criteria for toxics from being used. There are numerous problems with its proposal.

First, Ecology states that "[s]amples from anadromous fish will not be used to place freshwaters in Category 5." This is an incorrect understanding of how fish reflect water quality. For example, in EPA's Columbia River Basin Dioxin TMDL, EPA relied on fish tissue. EPA, *Final TMDL for Dioxin Discharges to the Columbia Basin* at 2-1. The tissue samples came from a variety of sources including the Northwest Pulp and Paper Association's Columbia River Fish Study prepared by Beak Consultants (1989). *See id.* at 2-2. This latter study was on edible fillets of anadromous species yet when adjusted for lipid content, it demonstrated fidelity with the resident fish samples.

There are many other examples of how anadromous fish are a scientifically sound measure of poor water quality which pertain to both human consumption as well as to the support of the fish use itself. For example, the National Marine Fisheries Service and the University of Washington found cocaine, hormones, and prescription medication in juvenile chinook salmon and other fish collected in Puget Sound. Meador, J.P., A. Yeh, G. Young, and E.P. Gallagher, 2016. *Contaminants of emerging concern in a large temperate estuary*. Environmental Pollution, 213: 254-267. Various studies have demonstrated the effects—male fish producing eggs and female proteins and the resultant effects on fish populations—including in Puget Sound. *See* Kidd, K.A., P.J. Blanchfield, K.H. Mills, V.P. Palace, R.E. Evans, J.M. Lazorchak, and R.W. Flick.

2007. *Collapse of a fish population after exposure to a synthetic estrogen*. PNAS 104(21): 8897-8901; Peck, K.A., D.P. Lomax, O.P. Olson, S.Y. Sol, P. Swanson, and L.L. Johnson. 2011. *Development of an enzymelinked immunosorbent assay for quantifying vitellogenin in Pacific salmon and assessment of field exposure to environmental estrogens*. Environmental Toxicology and Chemistry, 30 (2): 477-486. Native chinook salmon often do not swim to the open ocean, instead living their entire life cycle in Puget Sound and the Salish Sea. Their exposure to toxics results in their containing up to three to five times as many contaminants as salmon that spend most of their adult lives in the ocean. *See* O'Neill, S.M. and J.E. West. 2009. *Marine distribution, life history traits, and the accumulation of polychlorinated biphenyls (PCBs) in Chinook salmon from Puget Sound, Washington*. Trans Am Fish Soc. 138:616-632; Mongillo, T. M., G. M. Ylitalo, L. D. Rhodes, S. M. O'Neill, D. P. Noren, and M. B. Hanson. 2016. *Exposure to a mixture of toxic chemicals: Implications for the health of endangered Southern Resident killer whales*. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-135, doi:10.7289/ V5/TM-NWFSC-135. The survival rate of juvenile chinook salmon in polluted estuaries is 45 percent lower than those in clean estuaries. Meador, J.P. 2014. *Do chemically contaminated estuaries in Puget Sound (Washington, USA) affect the survival rate of hatchery-reared Chinook salmon*? Can. J. Fish. Aquat. Sci. 71(1): 162-180. Additional studies by the Northwest Fisheries Science Center show that juvenile chinook salmon in the sound are exposed to toxics at concentrations known to cause immune dysfunction and impair growth. Johnson, L.L., G.M. Ylitalo, M.R. Arkoosh, A.N. Kagley, C. Stafford, J.L. Bolton, J. Buzitis, B.F. Anulacion, and T.K. Collier. 2007. *Contaminant exposure in outmigrant juvenile salmon from Pacific Northwest estuaries of the United States*. Environ. Monit. Assess. 124(1-3): 167-194; Meador, J.P., G.M. Ylitalo, F.C. Sommers, and D.T. Boyd. 2010. *Bioaccumulation of polychlorinated biphenyls in juvenile chinook salmon (Oncorhynchus tshawytscha) outmigrating through a contaminated urban estuary: dynamics and application*. Ecotoxicology 19(1): 141-152; Olson, O.P., L. Johnson, G. Ylitalo, C. Rice, J. Cordell, T. Collier, and J. Steger. 2008. *Fish habitat use and chemical exposure at restoration sites in Commencement Bay, Washington*. NOAA Technical Memorandum NMFS-NWFSC-88; Sloan, C., B. Anulacion, J. Bolton, D. Boyd, O. Olson, S. Sol, G. Ylitalo, and L. Johnson. 2010. *Polybrominated diphenyl ethers in outmigrant Juvenile Chinook salmon from the lower Columbia River and estuary and Puget Sound, Washington*. Arch. Environ. Contam. Toxicol. 58(2): 403-414; Stehr, C.M., D.W. Brown, T. Hom, B.F. Anulacion, W.L. Reichert, and others. 2000. *Exposure of juvenile chinook and chum salmon to chemical contaminants in the Hylebos Waterway of Commencement Bay, Tacoma, Washington*. Journal of Aquatic Ecosystem Stress and Recovery, 7: 215-227.

Roughly one-third of Puget Sound salmon sampled by the Washington Department of Fish and Wildlife showed contamination at levels known to cause health and developmental problems. Because juvenile chinook salmon in Puget Sound are at a particularly high risk from pollution, researchers believe that toxic contamination may be a leading determining factor in the mortality of these salmon. O'Neil, S.M., A.J. Carey, J.A. Lanksbury, L.A. Niewolny, G. Ylitalo, L. Johnson, and J.E. West. 2015. *Toxic contaminants in juvenile Chinook salmon (Oncorhynchus*

tshawytscha) migrating through estuary, nearshore and offshore habitat of Puget Sound. Report FPT 16-02. Juvenile coho salmon exposed to copper lost their sense of smell and the ability to detect nearby predators. McIntyre, J.K., D.H. Baldwin, D.A. Beauchamp, and N.L. Scholz. 2012. *Low-level copper exposures increase the visibility and vulnerability of juvenile Coho salmon to cutthroat trout predators*. Ecological Applications, 22: 1460-1471. Researchers have also documented annual rates of coho salmon pre-spawn mortality observed over multiple years across several contaminated drainages, ranging from approximately 20 percent to 90 percent of the total fall run within a given watershed as compared to rates from clean streams that are less than 1 percent. Scholz, N.L., M. S. Myers, S.G. McCarthy, J.S. Labenia, J.K. McIntyre, G.M. Ylitalo, L.D. Rhodes, C.A. Laetz, C.M. Stehr, B.L. French, B. McMillan, D. Wilson, L. Reed, and others. 2011. *Recurrent die-offs of adult Coho salmon returning to spawn in Puget Sound lowland urban streams.* PLoS ONE 6(12): E28013. Finally, a recent paper assessed juvenile Chinook in Puget Sound estuaries that demonstrate a possible contaminant-induced starvation from contaminants of emerging concern. James P. Meador, Andrew Yeh, Evan P. Gallagher. 2018. *Adverse metabolic effects in fish exposed to contaminants of emerging concern in the field and laboratory*. Environmental Pollution 236 (2018) 850-861.

Second, Ecology appears to eliminate from consideration data collected via semipermeable membrane devices (SPMD) in favor of only water column data and tissue data (although there are references to the SPMDs listed). *See Draft Methodology* at 63. SPMDs are a scientifically accurate way of measuring toxics in water. *See, e.g.*, Ecology, *Concentrations of 303(d) Listed Pesticides, PCBs, and PAHs Measured with Passive Samplers Deployed in the Lower Columbia River* (March 2005) ("Semipermeable membrane devices were used to monitor chlorinated pesticides, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs) in the Lower Columbia River below Bonneville Dam during 2003-2004. Washington and Oregon have placed the river on the federal Clean Water Act Section 303(d) list because fish and/or water samples have exceeded human health criteria for some of these compounds. . . . *Results showed that human health criteria were commonly exceeded for dieldrin and PCBs, less frequently exceeded for DDT compounds, and not exceeded for PAHs. . . . . PCBs exceeded human health criteria* at Bonneville Dam due to upstream sources[.]") (emphasis added). As Ecology knows, the value of SPMDs is that "water column concentrations were expected to be low, a passive sampling technique employing a semipermeable membrane device (SPMD) was used to concentrate and quantify the chemicals of interest." *Id*. at 1; *see also id.* at 32 – 45.

Third, Ecology seems to think that it can ignore certain criteria, namely for arsenic and dioxin. It cannot. It is not clear what Ecology means when it states: "Evaluating arsenic at carcinogenic effect levels must occur using the approach to directly evaluate attainment of human health criteria." *Draft Methodology* at 74. There is nothing in the water quality standards that allows Ecology to ignore the applicable criteria and, instead, use drinking water exposure concentrations "that are rooted in the human health criteria equations[.]" *Id.* at 70. There are two arsenic criteria promulgated to protect human health in Washington, one of which is for

"water and organisms." Ecology is not free to tease apart the equation that generated the 0.018 ug/l water plus organisms National Toxics Rule criterion in order to determine a new criterion to apply to ambient levels of arsenic. It certainly is not free to use the Safe Drinking Water Act (SDWA) MCL of 10 ug/l value because that value includes the cost of treatment, an element of analysis allowed under the SDWA but not under the Clean Water Act. Yet that is what Ecology proposes to do. *Id*. at 74.

III. COMMENTS ON METHODOLOGY MISSING

As we explain in the cover letter to submissions of publications with data and information pertaining to violations of narrative criteria, beneficial use support, and antidegradation, Ecology needs to add a substantial section to its listing methodology on how it assembles the data.

Sincerely,

Nina Bell
Executive Director

cc: Dave Croxton, EPA

Attachments:

Letter from Nina Bell, NWEA, to Patrick Lizon, Ecology Re: *Washington's Draft Integrated Report and Section 303(d)(1) List of Impaired Waters* (May 15, 2015)

Letter from Nina Bell, NWEA, to Patrick Lizon, Ecology Re: *Call-for-Data for "Next" Water Quality Assessment* (April 6, 23018) (attachments to this letter provided by email)

Ecology, *Concentrations of 303(d) Listed Pesticides, PCBs, and PAHs Measured with Passive Samplers Deployed in the Lower Columbia River* (March 2005)