

Response to Comments to Oregon's 2018 Draft Assessment Methodology

Submitted to: EPA Region 10

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Department of
Environmental
Quality

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restoring, maintaining and
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Table of Contents

Table of Contents.....	ii
1. Introduction.....	1
2. Comments received.....	3
2.1 General Comments.....	3
2.2 Assessment Units.....	5
2.3 Data Call.....	6
2.4 2012 Crosswalk.....	8
2.5 Reporting Categories.....	8
2.6 Listing and Delisting Decisions.....	9
2.6.1 Listing - General.....	9
2.6.2 Delisting – General.....	11
2.6.3 Binomial distribution.....	12
2.7 Parameter Specific Methods.....	13
2.7.1 Bacteria.....	13
2.7.2 Dissolved Oxygen.....	14
2.7.3 Temperature.....	14
2.7.4 Toxics.....	14
2.8 Methods to Assess Narrative Criteria.....	15
2.8.1 Aquatic Weeds and HABs.....	16
2.8.2 Biocriteria.....	17
2.8.3 Chlorophyll.....	21
2.8.4 Nutrients.....	21
2.8.5 Sediment.....	22
2.8.6 Turbidity.....	22
2.9 Antidegradation.....	24
2.10 Corrections and Clarifications.....	25
2.11 Comments out of Scope.....	25
Appendix A.....	27

1. Introduction

The federal Clean Water Act (CWA) Section 305(b) requires that states submit a biennial water quality inventory report in April of even numbered years. The report provides information on the water quality of all navigable state waters; the extent to which state waters provide for the protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife, and allow recreational activities in and the water; and how pollution control measures are leading to water quality standards being met.

The CWA Section 303(d) additionally requires that each state identify waters where existing pollution controls are not stringent enough to achieve state water quality standards, and establish a priority ranking of these waters. Section 303(d) requires states to develop Total Maximum Daily Loads (TMDLs) for the identified waters. TMDLs describe the amount of each pollutant a water body can receive and not violate water quality standards. States submit the list of waters needing TMDLs (303(d) list) to EPA and EPA either approves or disapproves the list within thirty days after the submission.

EPA regulations (40 CFR 130.7 and 40 CFR 130.8) specify the process for developing the 303(d) list and the content of the biennial water quality report. EPA guidance recommends that States submit an integrated report to satisfy 305(b) and 303(d) requirements. The integrated report presents the results of assessing available data to determine where water quality standards are met or not met, and identifies the pollutants causing water quality limitations or impairments.

EPA regulations require States describe the methodology, data, and information used to identify and list water quality limited segments requiring TMDLs. The assessment methodology contains the "decision rules" used to evaluate data and information. Oregon Administrative Rules (OAR 340-041-0046) also require the specific evaluation process be identified. Oregon Revised Statute (ORS 468B.039) which was adopted by the legislature in 2015, requires DEQ to: (1) solicit independent scientific and technical input on alternative assessment methodologies, including scientific peer review as appropriate; (2) provide adequate public notice and an opportunity for public comment on draft assessment methodologies; (3) provide an informational overview of the draft assessment methodologies before the Oregon Environmental Quality Commission (EQC); and (4) provide an opportunity for public comment on the draft assessment methodologies during the EQC meeting.

This document provides comments and comment responses on Oregon's Draft Methodology for Oregon's 2018 Water Quality Report and List of Water Quality Limited Waters, which describes how DEQ will develop Oregon's 2018 Integrated Report for Section 305(b) and 303(d). The methodology is consistent with the key elements of Oregon's water quality standards and is the framework DEQ uses to assess water quality conditions. The methodology builds on DEQ's protocols from previous 305(b)/303(d) assessments. The 303(d) list produced from the 2018 Integrated Report incorporates, updates, and supplements 303(d) lists from previous assessment years. After approval by EPA, it will become Oregon's effective 303(d) list. DEQ provided the methodology to assist the public in understanding how DEQ reviews data and information and reaches decisions leading to identification of water quality limited or impaired waters.

The goal of the Integrated Report is to provide information about the condition and quality of Oregon's surface waters. Using available data, information, and water quality standards, DEQ reaches conclusions about whether conditions support the beneficial uses designated for the water body and meet water quality standards applicable in the water. The conclusions are communicated by using a set of assessment status categories described in EPA guidance and commonly used by states completing 303(d) and 305(b) Integrated Reports.

EPA continues to recommend using five reporting categories to classify water quality status for Oregon waters. The categories represent varying levels of beneficial use support, ranging from Category 1, where

all designated uses for a water body are supported, to Category 5, where a water body is impaired and a TMDL is required to return the water to a condition where the water quality standards are met.

Category 1: All designated uses are supported. (Oregon does not use this category.)

Category 2: Available data and information indicate that some designated uses are supported and the water quality standard is attained.

Category 3: Insufficient data to determine whether a designated use is supported. Oregon further sub-classifies waters if warranted as:

3B: Insufficient Data; Exceedance: Insufficient to determine use support but some data indicate non-attainment of a criterion

3C: Insufficient Data; Potential Concern: Biocriteria PREDATOR scores deviate from reference conditions but are not classified as impaired.

3D: Insufficient Data; Not Technologically Feasible to Assess: Insufficient data to determine use support because numeric criteria are less than quantitation limits

Category 4: Data indicate that at least one designated use is not supported but a TMDL is not needed because:

4A: TMDLs that will result in attainment of water quality standards have been approved.

4B: Other pollution control requirements are expected to address pollutants and will result in attainment of water quality standards.

4C: Impairment caused by pollution, not by a pollutant (e.g., flow or lack of flow are not considered pollutants).

Category 5: Data indicate a designated use is not supported or a water quality standard is not attained and a TMDL is needed. This category constitutes the Section 303(d) list that EPA will approve or disapprove under the Clean Water Act.

The public comment period for the draft methodology was open from May 1, 2018 through 11:59pm Thursday, June 28, 2018. DEQ received 88 individual comments from twelve commenters. Opportunity for public comment on the draft methodology was also made available at the July 12 -13, 2018 EQC meeting which was held in Portland at TaborSpace, 5441 SE Belmont St, 97215, where public comments were received. The final methodology will be used to develop the 2018 Integrated Report for approval by EPA.

After the public comment period closed, DEQ reviewed the comments and made changes to the draft methodology as needed. DEQ will use the final methodology to prepare a 2018 Integrated Report. This document contains a summary of public comments and DEQ's response to those comments. The response to comments is organized based on similar topics. Comments were grouped together based on subject matter.

Several commenters expressed their appreciation and support for DEQ's improvements to the Integrated Report, including DEQ's analyses of technical and policy issues in methodology white papers, collaboration with the Integrated Report Work Group, and scientific peer-review process. Commenters acknowledged the substantive updates that DEQ incorporated into their Assessment Methodology document.

2. Comments received

2.1 General Comments

1. *Commenter (1) suggested that DEQ should adjust its methodology to account for potential changes in water quality conditions over time. Since DEQ will be evaluating data collected over a 10-year period, it would allow DEQ to evaluate and identify potential changes or trends in water quality across that time frame.*

DEQ has not conducted a statewide data call for water quality data from outside sources since 2009. As a result, DEQ will be considering a 10-year period as it evaluates data for the 2018 Integrated Report. In the preliminary review of assessment conclusions, DEQ will examine whether the impairment persists over the 10-year time frame or whether water quality has improved to attainment of its WQ criteria over that time frame. If DEQ has sufficient data indicating attainment or non-attainment based on the most recent years of data collection (i.e. > 3 years), DEQ will place more weight on recent data to determine the final assessment conclusion.

2. *Commenters (5) and (6) recommended that DEQ only use data associated with monitoring programs with objectives to characterize the water body. Commenters state that data collected as part of a short-term monitoring program such as a spill, cleanup or other special project should not be the sole basis of a Category 5 listing. DEQ should clearly state its intent in the Draft Methodology rather than leave it to the party submitting the data to make a determination regarding what constitutes data representative of ambient conditions.*

DEQ is required to assess all readily available data for the Integrated Report. Data that is collected outside of a routine monitoring program (i.e. spill, cleanup, etc.) will be reviewed for context in the IR assessment. DEQ will validate that data submitted through the data call meet data quality objectives and are appropriate to be used in a water body assessment.

3. *Commenters (5) and (6) suggested that DEQ should not list assessment units where there is no data to support a listing....DEQ should remove the listing of nearby waterbodies as an indicator of overwhelming evidence.*

DEQ does not intend to list water bodies where there is no data to support a listing. DEQ is still exploring the option to list “sandwich” Assessment Units as Category 3B for conservative pollutants for follow up monitoring. However, through the process of the 2012 crosswalk, for those waterbodies currently identified as Category 5, if new data on adjacent assessment units supports a continuation of the listing, than the segment will retain its Category 5 listing in 2018.

4. *Commenters (5) and (6) recommended DEQ include specific language in the Draft Methodology that recommends the use of concurrent data when they are available rather than default values in making listing and delisting decisions.*

DEQ agrees and will add additional language recommending the use of concurrent data where available.

5. *Commenter (8) noted that on Page 9, Table 3. Description of Category 2, Table 3 describes Category 2 as “[a]vailable data and information indicate that some designated uses are supported and the water quality standard is attained.” (Emphasis in original.) This description is misleading because it implies that some designated uses and water quality standards are not attained, whereas the category means only that the assessed water quality standard and uses are attained. Because the assessment categories are pollutant-specific, it would be clearer if Category 2 were described as “Available data and information indicate that the assessed designated use or water quality standard is attained.” If the current description*

is retained, it would be helpful to include in the table a clarifying statement, such as: “(This category applies only to the assessed designated use or water quality standard. Other designated uses or water quality standards may or may not be attained.)”

The description of Category 2 was taken directly from EPA. DEQ agrees that this language may be misinterpreted and will add additional clarifying language to the final methodology.

6. Commenter (8) requested clarification on Page 11, Application of freshwater and saltwater criteria. The second paragraph on page 11 describes EPA’s recommendations regarding where to apply saltwater and freshwater criteria, but it does not make clear whether DEQ agrees with the recommendation or, if so, why.

DEQ agrees with the EPA recommendations. This interpretation of where to apply saltwater and freshwater criteria has been used for several of the last assessment cycles.

7. Commenter (8) noted that on Page 17, Quantitation Limit (QL), the Draft Methodology uses the term “Quantitation Limit (QL)” to refer to the method reporting limit (MRL), method detection limit (MDL), and “any other reporting limit used by third parties.” Because the MRL and MDL have different meanings, the methodology should not use the terms interchangeably. Even though distinguishing the terms may add somewhat to the complexity of the methodology, doing so would reduce ambiguities and technical imprecision.

DEQ’s use of the term QL was intended to encapsulate a variety of lab reporting terms. DEQ will, however, provide some clarity to the use of the term for instances when the QL is less than the numeric criteria.

8. Commenter (10) indicated that “notwithstanding the clarity of the law, the Draft Methodology will result in few listings on the basis of impairment of designated uses. The Draft Methodology does not contain any section that describes how the state assesses the status of designated use support, particularly how DEQ uses data and information that are not water column data. Notably, the Draft Methodology includes a list of designated uses affected by each numeric criteria.”

Oregon’s water quality standards are developed to protect a variety of beneficial uses. Standards for specific pollutants or water conditions may protect both aquatic life and human uses of waters. DEQ’s approach is to assess water quality when data are available by applying criteria for pollutants or parameters and determining which beneficial uses are impacted. The table on pages 4 and 5 of the Draft Assessment Methodology identifies the linkages between specific parameters and the uses that are protected by parameter-specific criteria.

9. Commenter (10) reiterated that “The definition of “water quality limited segment” in EPA regulations includes waters not expected to meet applicable water quality standards, which EPA refers to as “threatened” waters. 40 C.F.R. § 130.2(j). EPA Guidance indicates that a water should be placed in Category 5 of the 303(d) list when “[a]vailable data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed.” 2006 Guidance at 47. EPA recommends that states consider segments as threatened “those segments that are currently attaining WQS, but are projected as the result of applying a valid statistical methodology to exceed WQS by the next listing cycle (every two years).”

DEQ uses data and information identifying waters that do not meet water quality standards to develop Oregon’s 303(d) list. DEQ does not currently identify water bodies as “threatened”.

Development of a statistical tool to identify water bodies as “threatened” may provide additional insight into the status of Oregon water bodies and may be prioritized for future iterations.

2.2 Assessment Units

10. *Commenter (1) requested DEQ include a full explanation of how assessment units may be divided in the methodology. The draft methodology notes that assessment units may be divided if through the assessment DEQ determines that there are "differences in watershed homogeneity." BES agrees that variability in waterbody or watershed characteristics may warrant the division of assessment units, however, the draft methodology does not provide sufficient detail describing how these divisions will be made, how the public will be able to review these divisions, or how the public may provide comments on the divisions. This information should be included in the draft methodology.*

The new watershed AUs are still considered preliminary until DEQ can ascertain the implications of the assessment conclusions after completing and reviewing the 2018 Integrated Report. Finalization of the Assessment Units remains an iterative process, and any splits or division of watershed AUs will be done on a consistent basis with environmentally relevant GIS layers. At this point in the process, DEQ can only anticipate these hypotheticals. Upon review of the draft assessment findings, DEQ will be better able to define a rationale for how and when assessment units may be split. Any issues that arise through the assessment process will be discussed with the Work Group. Any splits or divisions that may occur in the 2018 assessment will be available for comment during the public comment period. DEQ will continue to refine its methodology through successive assessments.

11. *Commenters (5) and (6) urged Oregon DEQ, Idaho DEQ and Washington State Department of Ecology to strive to ensure that the conclusions for the Columbia and Snake Rivers are similar, to the extent feasible. It makes little sense to the public and stakeholders when vastly different conclusions are reached by states that are charged with safeguarding the resource.*

DEQ agrees and will, to the extent possible, draw similar conclusions for shared interstate water bodies. Due to differences in data evaluated, applicable criteria and assessment methods, these conclusions may still differ. DEQ will provide documentation in its listing rationales for any listing discrepancies.

12. *Commenter (10) objected to DEQ's proposed approach to assessment units on the Columbia and Snake rivers. They indicated that "DEQ's proposed approach for Columbia River assessment units is a marked departure from decades of agency practice. Until recently, compared to Oregon, Ecology's assessment units on the Columbia River was significantly less protective of water quality. Specifically, Ecology's assessment units were consistently and notably smaller than Oregon's assessment units. The effect: less water quality protection and fewer 303(d) listings. Unlike Washington, Oregon employed a precautionary principle approach; the state reflected this policy choice in larger assessment units on the Columbia River, and other waterbodies throughout the state....By adopting Washington's assessment units for the Columbia, Oregon could provide—with no water-quality-based rationale—less water quality protection to the Columbia relative to other waterbodies in the state."*

DEQ disagrees with the premise that smaller assessment units results in less water quality protection. The Assessment Units for larger rivers were developed based on Strahler Stream Order and Hydrologic Unit Code (HUC) breaks. HUCs are a geographic area representing part of or all of a surface drainage basin, a combination of drainage basins, or a distinct hydrologic feature and are commonly referred to as watersheds. Smaller assessment units on the Columbia (8.6 miles on average) and Snake Rivers (19 miles on average) provide a more refined look at where impairments may occur along a larger river system. It does not result in a lessening of water quality protections. Rather than a blanket listing of the entire river which may result in an inefficient use of resources to address an impairment that does not exist in all reaches, the impairment may be more confined to a particular reach. Resources may then be targeted to specific areas of impairment.

2.3 Data Call

13. Commenter (10) indicated that DEQ's data call for data collected in calendar years 2008 through 2017 is purely arbitrary for several reasons. First, it is inconsistent with an evaluation of Tier I protections of the anti-degradation policy, a required evaluation that dates to November 28, 1975. 40 C.F.R. § 130.7(b)(3). Second, DEQ's failure to obtain "all readily available data and information" for past listings cannot be used today as a rationale for not using the data and information now. Third, DEQ's past practice of arbitrary data windows is not a rational basis to continue the practice.

The focus of the Integrated Report is to make a determination about the current status of the water bodies in Oregon. As such, DEQ's focus on a ten year data window provides the most current and relevant information about a waterbody. DEQ is focusing its pull of data to the 10 year data window, however, DEQ will consider all of the data it receives in its call for data and make a determination about whether this represents the current condition of the water bodies in question, and will utilize such data and information in making listing determinations as appropriate.

With regard to the commenters concern regarding antidegradation Tier I concerns, DEQ will assess the data received against all designated uses. In addition, if DEQ becomes aware of information suggesting that a use exists in a segment where it hadn't previously (e.g., an area previously closed to spawning where spawning now occurs), DEQ will assess water quality data against the relevant, applicable criteria associated with the beneficial use.

14. Commenter (10) suggested that DEQ's reliance on its "Call for Data" violates EPA regulations. "For the proposed 2018 list, DEQ solicited data from DEQ, DEQ's Volunteer Monitoring Program, the state's Water Quality Portal, NWIS (USGS), the Call for Data, Washington Department of Ecology (Columbia River data), and Oregon Public Health Advisories for Recreation. DEQ's solicitation list does not include data collected by: tribes, the U.S. Fish and Wildlife Service, the National Marine Fisheries Services, the Oregon Department of Fish and Wildlife, the Oregon Department of State Lands, Soil and Water Conservation Districts, academic institutions, the Lower Columbia River Estuary Partnership, the Columbia River Estuary Study Taskforce, and other organizations and institutions that routinely monitor or publish studies on water quality and designated uses in Oregon. By restricting its retrieval of data and information, DEQ incorrectly relied upon its "call for data" to meet the requirements for listing impaired waters."

DEQ notified local, state and federal agencies, watershed councils, soil and water conservation districts, tribes and members of the public through DEQ's GovDelivery notice (> 4000 people) regarding water quality assessments. DEQ staff reached out to entities through webinar and a presentation at the statewide OCEAN Connect conference.

DEQ believes these efforts are consistent with federal regulations and guidance. EPA guidance ¹states that "EPA regulations provide that states should actively solicit organizations and individuals[.]" The guidance explains that "EPA considers active solicitation as notifying local, state, and federal agencies, members of the public, and academic institutions that the state is seeking water quality related data and information . . . [and that] EPA recommends that states also request such data and information via letters sent to other state agencies, federal agencies and academic institutions that may have data/information."

DEQ is very interested in obtaining a robust data set from any individual or entity that has relevant water quality data and welcomes any suggestions for how to improve this process over time. DEQ is committed

¹ Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b), and 314 of the Clean Water Act: United States Environmental Protection Agency, (July 29, 2005). <https://www.epa.gov/sites/production/files/2015-10/documents/2006irg-report.pdf>

to continuing to work with entities involved in the collection of water quality data to submit data to DEQ during its data call and will continue to streamline its process for data compilation and assessment.

15. *Commenter (11) is concerned about the scope of water quality data that the Forest Service will be submitting to ODEQ during the current call for data. “Based on conversations with USFS hydrologists and regional representatives, such as Joy Archuleta (who is helping to coordinate the USFS’s data submission effort) it is our understanding that only the data within the USFS’s NRIS/AQS database will be submitted. Apparently, it is up to individual districts how much emphasis is given to ensuring that data not previously inputted into this NRIS/AQS database is entered before submission to ODEQ. While the USFS has told me that they have tried to encourage staff to regularly upload water quality data onto this database, we are extremely concerned about the high likelihood that much of the USFS’s water quality data, including temperature data, are not in the NRIS/AQS database and so will not ultimately be submitted to ODEQ as part of the current call for data.”*

DEQ is required under the CWA to solicit all readily available data (40 CFR §130.7 (b)(5)(iii)) “Waters for which water quality problems have been reported by local, state, or federal agencies; members of the public; or academic institutions. These organizations and groups should be actively solicited for research they may be conducting or reporting.” DEQ began its data solicitation on May 1st, 2018 and extended the submittal date to July 25, 2018. While DEQ is required to actively solicit data, third parties are not required to submit data. The USFS has made its best attempt, given the short notice, to submit all readily available data that has been validated to DEQ for the 2018 IR. Moving forward, DEQ intends to work with the USFS, through its MOU, to obtain data collected on either an annual or semi-annual basis.

16. *Commenter (11) stated their concern that ODEQ is not encouraging the USFS to submit their fine-sediment related data at this time (such as embeddedness data). Their understanding from the USFS is that there is not currently a mechanism for ODEQ to accept embeddedness data from the USFS. “Forest Plan standards on eastside National Forests call for equal to or less than 20% embeddedness in streambeds; this standard was developed to be protective of sensitive native aquatic species. While ODEQ focuses in general on turbidity as a measure of fine sediments, the USFS’s embeddedness standard seems to be in line with ODEQ’s stated criteria of “[t]he formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.” We request that USFS stream embeddedness data, as well as any turbidity or other sediment-related data, be accepted by ODEQ and that ODEQ encourages the USFS to submit this data.”*

DEQ has been working with the USFS to submit data for the 2018 IR. Due to the magnitude of data that is being submitted, and the short timeline, DEQ made the recommendation to the USFS that they prioritize their data submittal. Since DEQ lacks specific methodologies for sedimentation and turbidity, DEQ made the recommendation that the USFS prioritize temperature data submittal.

17. *Commenter (11) posed the question that “given that there is joint responsibility between the two agencies to ensure that monitoring is taking place on National Forests lands, does the ODEQ have authority to require the USFS to monitor stream temperature in certain situations, and for inclusion into the state’s Integrated Database?”*

DEQ recognizes the USFS as a designated management agency for nonpoint source control and implementation of State and Federal water quality rules and regulations on lands under their jurisdiction. In its MOU with DEQ, the USFS agreed to manage its lands to protect, restore and maintain water quality so that state and federal water quality standards and goals are met in accordance with all applicable laws and regulations. In addition, the service will develop and implement strategies such as best management practices to protect and restore water quality conditions when the USFS’s actions affect or have the potential to affect 303(d) listed waters. During the MOU renegotiations, DEQ intends to work with the USFS to include submittal of monitoring data as a requirement.

2.4 2012 Crosswalk

18. *Commenter (1) noted that the current description of the crosswalk between the 2012 and 2018 listings does not fully describe how past and current listings will be reconciled, nor will it be sufficient for DEQ to delist waterbodies, as intended. A complete crosswalk between the 2012 listings and the 2018 assessment results would be necessary for DEQ to delist any waterbody.*

DEQ intends to geospatially compare current approved 303(d) listings with the results of its 2018 assessment. Where impairment decisions do not align, DEQ will review the 2018 data submittal with the data that was used as the basis for the listing and make an assessment determination. Since this is a unique and one-time process, details of the crosswalk and anticipated scenarios are purely hypothetical at the time DEQ published the draft methodology and thus, were not included. DEQ will work out the details of the process as it begins evaluating data and will bring key crosswalk issues to the Work Group for discussion and input. DEQ will document the steps taken in its review, so that its decisions are clearly and transparently laid out.

19. *Commenters (5) and (6) recommended that DEQ should review all 2012 Integrated Report Category 5 listings based on the following: use of consistent approaches specified in the Draft Methodology including minimum number of samples, exceedance criteria, etc., use of current criteria in instances where criteria have changed since the preparation of the 2012 Integrated Report, use of the appropriate speciation for metals (if data are available) in instances where criteria have been revised to dissolved, and use of appropriate decision making tools for chromium and arsenic listings, as specified in the Draft Methodology.*

DEQ intends to review all Category 5 listings where data are submitted through its data call. DEQ does not currently have the resources and capacity to review previously assessed data for 2012. Since DEQ has not completed a comprehensive statewide call for water quality data from outside sources since 2009, DEQ will be assessing data in the ten year data window from January 1, 2008 to December 31, 2017. DEQ encourages third parties who think a listing may have been made in error in 2012 or may reach a different conclusion based on revisions to the Assessment Methodology, to submit the data as part of the 2018 data call.

2.5 Reporting Categories

20. *Commenter (2) noted that low stream flows may either cause or exacerbate water quality problems and should be considered in this assessment.*

The 1-in-3-year exceedance frequency as a component of water quality criteria is a return interval intended to provide a level of protection equivalent to a 7Q10 design flow condition. The 7Q10 is a common flow flow statistic for defining low flows as the lowest average instream flow over a period of one week with a recurrence interval of 10 years. DEQ agrees that reduced stream flows may contribute to water quality problems; however, determining the source of the water quality problem is not the role of the assessment. Assessment's role is to determine whether or not a water body would be considered to be impaired based on the comparison of data to current applicable WQ criteria. Determination of the source of the problem would be the role of either the TMDL group or through stressor identification. Anyone who has specific examples, with corresponding data that indicated that a water body might be impacted by flow modification, is encouraged to submit this through the data call.

21. *Commenter (3) requested inclusion of a flow-listing methodology to facilitate the listing of waterways as impaired due to altered flow under Category 4C.*

DEQ understands that flow alteration can impact water bodies in detrimental ways. Historically DEQ assigned waters it determined were impaired due to flow modification to Category 5. However, EPA disapproved of these listings on the grounds that flow modification is not a pollutant regulated under the Clean Water Act. These segments were moved to Category 4C. If flow modification contributes to the cause of a water quality violation by a regulated pollutant, flow targets or goals can be set as part of the TMDL addressing that pollutant. At this time, anyone who believes that a water body may be impacted due to flow modification may submit data and evidence identifying the pollutants and beneficial uses affected and it will be assessed in the Integrated Report.

22. *Commenter (10) requested DEQ provide additional details to inform how the agency would determine the appropriate circumstances to downgrade a Category 5 to a Category 4B listing. Commenters request that DEQ revise the Draft Methodology to provide the criteria DEQ would use to determine if a Category 4B downgrade is warranted and lawful. In addition, DEQ should clarify its interpretation of “reasonable period of time” to prevent improper use of Category 4B.*

DEQ intends to follow EPA’s 2006 Reporting Guidance for identifying waterbodies that may be categorized as Category 4B in the Integrated Report. DEQ would be reviewing proposed Category 4B determinations for: (1) The identification of segment(s) and statement of problem causing the impairment(s); (2) Description of the pollution controls and how they will achieve WQS, including a description of the pollutant loads needed to meet WQS and a description of the requirements under which the controls will be implemented; (3) An estimate or projection of the time when WQS will be met; (4) Schedule for implementing pollution controls; (5) Monitoring plan to track effectiveness of pollution controls; and (6) Commitment to revise pollution controls, as necessary. Further, any such use would, at a minimum, be subject to public comment and EPA review and approval since it would be a revision to Oregon’s Category 5 waters.

2.6 Listing and Delisting Decisions

2.6.1 Listing - General

23. *Commenter (1) noted that the Listing - Statistical Methods on page 14 includes only values for chronic toxic criteria. Values should also be included for acute toxic criteria.*

DEQ agrees and will include acute toxics criteria.

24. *Commenters (4), (5) and (6) suggested that DEQ should require a minimum sample size to place a water body on the 303(d) list for both toxics and conventional parameters.*

EPA guidance and precedent is clear that states do not have discretion to not list when there is evidence of impairment. For this reason, DEQ will continue to list waters as impaired based on two or more sample excursions for sample sizes less than 18. Applying the binomial method to reduce error and provide greater certainty in listing decisions based on larger data sets will provide incentive for the submission of larger data sets by many stakeholders. Larger data sets will allow for more accurate characterization of the condition of waters within the state.

However, where larger data sets are not available, DEQ will list a water body as impaired where data demonstrate sufficient exceedances of a criterion, regardless of sample size. For example, 2 exceedances in 5 samples are necessary to determine that a waterbody is impaired for toxics. Where a waterbody has at least 2 exceedances, regardless of the total number of samples, there is no need to collect the full 5 samples to pass the methodology’s exceedance threshold. As another example, for a given waterbody where two out of three samples exceed the water quality criteria, if two additional non-exceeding samples were collected (to meet a minimum sample size of five), it would still be considered impaired because

two out of five samples would exceed the criteria. There is no need to wait for an additional two samples to determine impairment.

25. Commenter (4) requested that DEQ use a 10% exceedance threshold to place water bodies on the 303(d) list for toxics.

DEQ has proposed a 5% exceedance frequency for toxic pollutants based on EPA's 2002 CALM guidance which provides statistical guidelines for documenting data quality objectives for attainment decisions. The 5% exceedance frequency was also reviewed by a scientific peer review panel and found to be appropriate. A 10% exceedance frequency is supported by EPA for conventional pollutants. As stated in the draft methodology on Page 14, DEQ will list a water body as impaired for toxic parameters using the binomial distribution if the proportion of samples that exceed the criteria > 5% at a 90% confidence level. Using this example, for a sample size of 20, 3 exceedances are required to place a water body on the 303(d) list.

27. Commenters (5), (6), (8) and (12) noted that Category 5 listings should not be based solely on estimated values (i.e. levels below the quantitation level).

Category 5 listings will not be based solely on estimated values when quantitation limits are < criteria. Where criteria are < quantitation limits, any measurable detection indicates impairment. The total number of criteria exceedances will be based on measured data above minimum quantitation levels.

28. Commenters (8) and (12) stated that on Page 18, Overwhelming evidence, The Draft Methodology is ambiguous with respect to whether the overwhelming evidence factors listed in Table 7 would in themselves provide grounds for listing a waterbody in Category 5. Although these are reasonable factors to consider, they should not be the sole basis for a listing decision. For example, a single measurement that exceeds an acute criterion by more than a factor of 2 might, with other evidence, provide a basis for placing a waterbody in Category 5, but it should not be the sole basis. The Draft Methodology should clarify that the Table 7 factors are just that—factors—and are not sufficient in themselves to place an assessment unit in Category 5.

The overwhelming evidence factors listed on page 18 of the Assessment Methodology are intended to note additional things DEQ may consider when data sets are small, but where there is actual measured data. DEQ does not view those factors as sufficient by themselves to place an assessment unit in Category 5.

29. Commenter (8) noted that Information regarding the basis for listing decisions, although outside the scope of the Draft Methodology, will be important for DEQ to make readily available the data and rationales for each listing decision, and particularly for Category 5 listings. They further noted that currently, it is often difficult or impossible to ascertain this information. This lack of information precludes not only an evaluation of the listing decision itself but also an assessment of the relevance of the listing decision to discharge permits and other regulatory determinations.

Information regarding the basis for listing decisions will be made available through EPA's ATTAINS system. Data used for listing decisions will also be made available through DEQ's publically accessible database AWQMS.

30. Commenter (10) supports DEQ's inclusion of the "overwhelming evidence" concept in the Draft Methodology (See Draft Methodology page 18). However, Commenter requests that DEQ clarify why the standard is "overwhelming" as opposed to "substantial" evidence. Past assessment methodologies lacked the "overwhelming evidence" pathway to listing and, as a result, waters that violated water quality standards (i.e., narrative criteria, the antidegradation policy, designated uses, and numeric criteria) failed to land on the 303(d) list. Overall, DEQ's "overwhelming evidence" approach is a welcome change in the state's assessment methodology and implements the Clean Water Act's primary

objective to restore and maintain the integrity of the nation's waters. However, Commenter requests additional explanation from the agency to understand the regulatory bar DEQ intends to create with this new, evidence-based approach to listing.

EPA includes the concept of “overwhelming evidence” in their 2002 Consolidated Assessment and Listing Methodology (CALM) guidance. The CALM guidance states that “An assessment methodology should take into account the balance between desired data requirements and the practical realities affecting the availability of information and the strength of the available evidence....Generally, decisions should be based on very small data sets only when there is overwhelming evidence for impairment.” The legal definition of substantial evidence means “more than a mere scintilla. It means such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.” In the context of the draft assessment methodology, the concepts are the same.

2.6.2 Delisting – General

31. Commenter (1) stated that the necessary sample collection period to support the Delisting - Statistical Method is unclear. The method described on page 22 states that “waters shall be considered for delisting if a minimum number of additional samples have been collected since the last date of the samples which resulted in an impairment listing.” As written, it is unclear whether DEQ intends to use the date of the last individual sample that exceeded the applicable criterion or the date of the last sample included in dataset evaluated as part previous assessment where a sufficient number of excursions occurred to warrant listing, regardless of whether the oldest sample in the dataset exceeded the criterion. This clarification is important given the large timeframe DEQ will be evaluating (2008-2017) and the potential for DEQ to receive older data.

DEQ will clarify the delisting method in the methodology by specifying within the current assessment period. In the case of 2018, the assessment period would be the ten-year period of record between January 1, 2008 and December 31, 2017. In future iterations of the Integrated Report, the assessment window will likely be smaller. DEQ’s intent is to utilize the binomial method to assess the data that is provided for the assessment. If the data for the assessment unit indicate attainment using this approach, the AU will be delisted.

32. Commenters (4), (5) and (6) suggested there should be parity in the decision to list or delist. DEQ should require the same minimum dataset for both 303(d) listing and delisting decisions.

The approach to list a water body should be the same approach to delist a water body, however there is a higher bar required for removing water bodies from the impaired waters list. In this case, DEQ’s preferred statistical method for conventional and toxic pollutants is the binomial test. Human health criteria, which apply over a much longer duration of exposure would use a geometric mean.

Delisting a waterbody requires a reversal of the null hypothesis used to place a water body on the list. The null hypothesis for delisting decisions is that the waterbody is not attaining the standard. A higher burden of evidence is required to show the waterbody is in fact attaining, since it was previously shown to be exceeding the standard. The greater risk in delisting is in making a type-II, or false-negative error, incorrectly rejecting the null hypotheses that the waterbody is exceeding the standard, and delisting a water body when it should continue to be considered impaired. The additional burden of proof also prevents water bodies from bouncing back and forth on the list during each Integrated Report cycle.

33. Commenters (8) and (12) noted that on Pages 19-24, Delisting, the Draft Methodology states that waterbodies will be delisted “if there is information to show that the Category 5: 303(d) status was assigned in error” or, if water quality standards have changed, data “submitted through the current assessment process” is consistent with the new standards. These statements suggest that—in the absence of new data—Category 5 listings would continue even if the original data would not have resulted in a Category 5 listing if it were evaluated under current water quality standards or current listing criteria.

Due to the scope of revisions that were implemented for the 2018 Integrated Report, DEQ does not have the resources to review all previous Category 5 listings against current criteria and methodologies. If additional data are submitted, DEQ will review and revise its assessment results to accurately reflect current standards and methodologies. DEQ encourages third parties to re-submit data for Category 5 listings they feel may be inaccurate during the open data call.

34. *Commenter (10) requested that the Draft Methodology clarify that DEQ will not delist, either by submittal to the U.S. Environmental Protection Agency (EPA) or by ignoring 303(d) listings in NPDES permits or 401 certifications, waterbody segments on an ad hoc basis between assessment cycles. The Draft Methodology, consistent with the law, appears to shut down the possibility of DEQ granting such a request to delist, on a case-by-case basis, between assessment cycles. Commenters request additional clarity in the Draft Methodology to ensure DEQ's NPDES permit and 401 certification staff have clear direction on the agency's policy on inter-assessment-cycle, case-by-case delistings; such listings are not allowed.*

DEQ does not delist waterbody segments between assessment cycles. If during the evaluation of ambient data during permit development or through 401 certification, DEQ determines that available data indicate that a waterbody is not impaired (e.g., either through an error in previous data analysis, revised criteria, would demonstrate attainment, etc.) and has assimilative capacity for a given parameter, then they may proceed with determining the appropriate effluent limits that ensures the permit requirements comply with all applicable state and federal requirements. The listing will be re-evaluated with the data available for that particular waterbody at the time of the next Integrated Report to determine whether or not data exists to officially delist the segment.

2.6.3 Binomial distribution

35. *Commenter (1) recommended DEQ retain the > 1 sample in 3 years listing approach when the sample size is not met.*

The use of the binomial approach incorporates the > 1 in 3-year exceedance frequency across the entire data set. Where sample sizes are not met, DEQ will retain the > 1 sample in 3 years exceedance frequency. For sample sizes less than 19 for toxics, and less than 12 for conventional parameters, two exceedances of a criteria would be enough evidence to list a water body as impaired.

36. *Commenter (1) suggested DEQ should consider use of a hierarchical model, such as a generalized linear mixed effect model (GLMM) that would allow DEQ to use unbalanced datasets in a way that would be much less dependent on the sampling design and not bias impairment decisions on Assessment Units with multiple sampling stations. The commenter recommends that if DEQ retains the binomial distribution, it should consider an alternative that would allow for the information from individual sites to be preserved. They further suggest that DEQ should report the exceedance rate and sample sizes from each of the sampling locations within the assessment unit. This information would allow the public to identify if the assessment conclusion is being driven by one site or if it is persistent across the assessment unit.*

DEQ is not aware of any states currently applying a generalized linear model to 303(d) assessment, and the method does not appear to have been reviewed in any EPA guidance. Just as the binomial method represented an improvement over earlier absolute threshold and raw score assessment methods that is now gaining wider adoption, the GLMM may be a refinement to the statistical assessment methodology that DEQ may consider in the future. In the interim, DEQ will include in its rationale for listing, a list of the sample stations that were assessed and the number of exceedances at each sample location.

37. *Commenter (7) advised that use of the binomial is appropriate for conventional pollutants, but for toxics, greater than one exceedance in three years should result in an impairment listing.*

Application of the binomial test for the evaluation of both acute and chronic toxic substances is a method that was developed by EPA and remains consistent with EPA guidance. The method as described in DEQ's methodology was selected to provide a comparable level of protection to 1-exceedance-in-3-years in the condition that sample sizes are large. Eight other states use the binomial approach in their latest approved 303(d) lists for the assessment of toxic substances: California, Florida, Iowa, Kansas, Nebraska, Nevada, North Carolina, and Texas. Four additional states apply an alternate statistical procedure to assess toxic substances: Colorado, Montana, New Hampshire, and Pennsylvania².

38. *Commenter (7) does not recommend use of the binomial for toxics as a blanket methodology across state waters. If site-specific conditions warrant a site-specific methodology, DEQ could detail those circumstances, but without such case-by-case considerations, EPA recommends the not more than one exceedance in three years approach.*

DEQ's listing methodology for the binomial approach applies the statistical test on a site-specific basis to sites with large or long-term data sets where a minimum confidence level of 90% is achievable. Sites with less than n=18 samples are listed on the basis of more than 1 exceedance for toxic substances.

2.7 Parameter Specific Methods

2.7.1 Bacteria

39. *Commenter (1) recommended that DEQ retain the past assessment method which lists a waterbody as Category 5 when more than 10% of the samples exceed the 406 organisms/100 mL threshold, with a minimum of at least two exceedances.*

DEQ agrees with the commenter. A 10% exceedance frequency of the 406 organisms/100 mL threshold will be retained in the *E. Coli* methodology.

40. *Commenter (8) noted that on pages 32-33, Bacteria, the bacteria listing criteria include the term "and/or." The commenter feels that this term is inherently ambiguous and should be replaced by either "and" or "or," as appropriate.*

DEQ agrees that the "and/or" term is ambiguous and will replace the "and/or" term with a single term.

41. *Commenter (10) suggested that DEQ's requirement for multiple samples to evaluate compliance with the EPA-promulgated Enterococci criteria is incorrect where there is a single sample criterion (Draft Methodology at 32-33).*

DEQ's draft Methodology reflects the updated Enterococci criteria (approved and effective as of November 2017). There is no longer a single sample maximum for Enterococci in the revised criteria. The revised criteria, OAR 340-041-009 (1)(b)(B) states that "Not more than ten percent of the samples may exceed 130 organisms per 100 mL" consistent with the procedures outlined in EPA's 2012 Recreational Water Quality Criteria³. EPA's recreational criteria recommendations contained both a geometric mean and a statistical threshold value that together indicate whether the water quality is protective of the designated use of primary contact recreation.

42. *Commenter (10) stated that DEQ fails to provide a rationale for its determination that beach advisories issued by the Oregon Beach Monitoring Program—not including precautionary advisories—would only merit a Category 3B: Insufficient Data – Potential Concern" assessment. Id. at 33. The commenter believes that DEQ does not have the discretion to ignore such advisories if they are based on sound information, such as a "sewage spill," Likewise, where DEQ has information that "heavy*

² See Appendix 1 for additional information

³ EPA's Recreational Water Quality Criteria, 2012. Office of Water 820-F-12-058

rainfall” or “flooding” will, in fact, result in violations, it does not have the discretion to ignore the advisories. Again, beneficial use support is as much a part of the legal definition of a water quality standard as the numeric criteria.

ORS 340-041-0009(2) stipulates that a minimum of five samples in a 90-day period is required for determining exceedance of the criteria in sections (1)(a)(A) and (1)(b)(A) and (B). The occasion of any single OHA advisory in the absence of this minimum number of samples does not constitute evidence of impairment of the beneficial use of water contact recreation. The intent of OHA health advisories is to communicate potential health risks to the public using the most conservative approach. DEQ’s methodology considers the issuance of an OHA advisory, in the absence of sufficient bacteriological data to determine whether there is violation of the standard, as an additional line of evidence in evaluating beneficial use support. This evidence is used to place waters in an elevated category of potential concern and to prioritize the site for follow-up monitoring to conclusively determine whether the criteria are being met.

2.7.2 Dissolved Oxygen

43. Commenter (8) identified on Pages 47-48, Dissolved oxygen, the dissolved oxygen listing criteria includes the inherently ambiguous term “and/or.” Moreover, the percent saturation criteria are relevant only when the applicable concentration criteria are not met. See OAR 340-041-0016. The commenter notes that if the dissolved oxygen concentration is higher than the applicable concentration criterion, the dissolved oxygen standard is met, regardless of the percent saturation. They further reiterated that only if “conditions of barometric pressure, altitude, and temperature preclude attainment” of the concentration criterion does the alternative saturation criterion become relevant. See OAR 340-041-0016(1)(b)(2).

DEQ agrees with this interpretation of the standard and will remove the “or” in the methodology text to address the ambiguity

2.7.3 Temperature

44. Commenters (5) and (6) remarked that for continuous temperature data, the Draft Methodology notes that two instances where the seven-day-average daily maximum temperature exceeds the applicable criteria would result in a Category 5 listing. The commenters note that it is not clear why two instances are deemed adequate for Category 5 temperature listings. The Draft Methodology should include justification regarding this approach.

In order for daily stream temperatures to cause the 7-day average of daily maximum temperature (7-DADM) that the criteria are based on to exceed the numeric temperature criteria thresholds, daily stream temperatures would have to be exceeding the criteria thresholds for an extended period of time or by a large magnitude. Because the 7-day average daily maximum already allows for short-term or minor exceedances of daily stream temperatures that protected fish species are able to tolerate, any daily temperatures sufficient to cause the exceedance of the 7-day average daily maximum metric is an indication of potential impairment. DEQ regularly uses two instances of exceedance to list in Category 5 when the exceedance frequency is expressed as no more than once; one instance to demonstrate an exceedance with a second to confirm the persistence or occurrence of the exceedance in the waterbody.

2.7.4 Toxics

45. Commenter (8) requested clarification on the default hardness values on Page 64, Table 18; Page 67, Table 19. Commenter noted that the sources of the default hardness values in Table 18 are not stated. In addition, it is not clear why the default hardness values in Table 18 are more appropriate than the default hardness values for cadmium set forth in Table 19 for the same ecoregions. “More generally, the

methodology should expressly allow the use of more representative default hardness values than those stated in the tables when measured hardness data is not available.”

DEQ has prepared a white paper explaining the derivation of default hardness values it has determined are sufficiently protective and representative for different ecoregions of the state. This whitepaper was not completed at the time of public comment for the Methodology Document. There will be additional opportunity to provide comments on DEQ’s final selection of default hardness values and their application during the public comment period for the draft list of impaired waters.

46. Commenter (10) states that “the Draft Methodology’s limit on using data on toxics, considering only water column values and not tissue residue or sediment values, is inconsistent with: providing the protection allegedly established by the numeric criteria; the requirement to fully support designated uses, the requirement to protect existing uses under Tier I of the antidegradation policy, and the requirement to fully implement Oregon’s narrative criterion that protects uses from toxic substances, discussed supra.”

Due to the scope of improvement efforts undertaken by DEQ for the 2018 IR, DEQ was unable to include a method for assessing fish tissue and/or sediment contamination by toxic substances. DEQ intends to pursue development of a methodology in future IR improvement efforts.

47. Commenter (10) suggested that DEQ’s reliance on fish consumption advisories issued by the Oregon Health Authority—which uses different fish consumption levels to assess the safety of fish consumption than the state’s human health criteria—cannot substitute for the requirement to assess compliance with water quality standards.

DEQ will be setting priorities for evaluating narrative standards in future Integrated Reports. Developing a method would require a significant amount of resources, since it is not a direct interpretation of water quality standards, and may be undertaken for future Integrated Reports. Use of fish tissue data may be subject to the overwhelming evidence methodology.

48. Commenter (10) further advised, the Draft Methodology must discuss how the agency will treat wildlife studies that demonstrate that levels of toxics are causing adverse effects to health and propagation, reproductivity of species such as mink, otter, eagles, falcons, and other piscivorous birds and mammals.

DEQ will review all studies, reports and/or data that are submitted during the data call period and will use its best professional judgement to determine whether enough evidence exists to conclude that a specific water body’s use is not supported, and it is in fact impaired.

49. Commenter (10) further noted that DEQ’s 2012 study comparing toxicity in fish tissue and water column samples demonstrates the problem with Oregon’s 303(d) listing methodology. In 2012, DEQ found that while water column samples from the mid-Columbia River were generally within acceptable levels for toxics, toxics were present in fish tissue at well above the acceptable levels to protect human health.

Although water column samples from the mid-Columbia River are generally within acceptable levels for toxics, the Columbia River (in the example presented) was previously listed as impaired for DDE, PCBs and PAHs based on fish consumption recommendations from both Oregon and Washington. As a result, the toxics present in fish tissue as referenced in DEQ’s report will be addressed through the TMDL process.

2.8 Methods to Assess Narrative Criteria

50. Commenter (10) suggested the Draft Methodology fails to make 303(d) listings based on waters’ noncompliance with narrative criteria.... “Narrative criteria are part of the water quality standards

against which DEQ is obligated to compare data and information in developing its 303(d) list of impaired waters. While the Draft Methodology mentions narrative criteria, very little of DEQ's assessment addresses these criteria."

DEQ does in fact use narrative criteria to inform its 303(d) listing determinations. Narrative criteria in Oregon's water quality standards protect general conditions in Oregon waters, but do not explicitly state how to measure or evaluate those conditions as numeric criteria do. DEQ must develop protocols to implement the narrative criteria and to date has done so for a limited number of narrative criteria. DEQ has developed several assessment protocols that apply narrative criteria in conjunction with available numeric criteria for related pollutants that are protective of beneficial uses or that TMDLs will target. See 2018 Methodology protocols for biocriteria, harmful algae blooms, use of beach advisories due to bacteria levels, turbidity impacts to drinking water, and use of fish consumption advisories due to toxic substance levels in fish. These protocols make use of robust scientific methods and information from other regulatory agencies such as the Oregon Health Authority that issues several types of health advisories. DEQ has developed an assessment protocol to apply the narrative biocriteria criteria using a benchmark developed from years of available research and sampling data that inform DEQ's understanding of healthy macroinvertebrate communities in Oregon's waters.

As resources allow and scientific methods support, DEQ will continue to review data and information to develop additional benchmarks and methodologies to implement the narrative criteria.

2.8.1 Aquatic Weeds and HABs

51. Commenter (1) noted that impairment determinations for aquatic weeds will be based on "documented reports of excessive growths of invasive, non-native aquatic plants." The commenter believes the current methodology does not sufficiently define the quality and source of documentation DEQ will use to determine impairment due to aquatic weeds. Anecdotal evidence or informational websites should not qualify as quality data to support an impairment decision. Commenter suggests DEQ should include additional information describing the data quality that will be used to assess aquatic weeds.

DEQ agrees that the aquatic weeds methodology is in need of refinement to include more specific methodologies for the determination of "excessive growth". Due to the scope of the improvements in 2018, this method did not get updated. For the 2018 assessment, supporting information (e.g. date, time, geographic coordinates, picture, etc.) must also be submitted in order to support a Category 5 listing for Aquatic Weeds. DEQ intends to revise this methodology in future Integrated Reports.

52. Commenters (5) and (6) noted that the implications of Category 5 listings for biocriteria and for aquatic weeds/harmful algal blooms on the NPDES permit program are not discussed in the Draft Methodology. Commenters advise DEQ should clearly note in the methodology, or alternatively in an NPDES permit program document, that DEQ will be evaluating the underlying pollutants associated with these listings and these listings by themselves do not impact the NPDES permit program.

DEQ does not view the Assessment Methodology as the venue for indicating how the NPDES permit program will address Category 5 listings. The Integrated Report Improvement group will coordinate with permit staff and other programs as appropriate to develop a document that identifies the implications for various WQ programs for Category 5 impairment listings.

53. Commenter (7) would like the impact of harmful algal blooms (HABS) on drinking water to be considered in greater detail. Commenter recommends that on page 28, for (3) under HABS, additional language such as, "or measured in finished drinking water above the drinking water advisory guidelines...." would be useful.

DEQ will add additional language to the harmful algal bloom methodology regarding other designated uses affected by HABs, in addition to recreation.

54. Commenter (7) requested clarification on the HABs methodology, for (2) vs (3) – is the requirement for listing that both (2) and (3) must be met? Commenter noted that “the state only issues an advisory when toxins or cell counts are above guidelines. The cell counts are not listed in the table, so is DEQ intending to differentiate between toxin guidelines and cell count guidelines instead? This may be addressed under Category 3B, but could benefit from some clarification.”

The requirement for listing is that either an advisory has reoccurred for two or more HABs seasons or an advisory only occurred once but has cyanotoxin values above OHA guidelines for water contact recreation. Public health advisories may be issued using any of the four methods: visible scum with documentation and testing, combined cell count of toxigenic species, individual cell count of toxigenic species or toxin testing. Reoccurring advisories that were based on any of the first three methods is equivalent to a single advisory with toxin values above OHA recreational guidelines. DEQ will clarify in the final methodology.

55. Commenter (8) requested clarification on Page 28, Aquatic Weeds and Algae methodology. The commenter noted that “Category 5 listing criteria for algae are unclear with respect to whether a total phosphate (as phosphorus) concentration in excess of 50 micrograms per liter is in itself a sufficient basis for a Category 5 listing, or whether there must also be documented evidence that algae are causing an exceedance of another standard or impairment of a designated use.” The commenter advises that because there is no water quality standard for phosphates, the phosphate concentration alone should not be a sufficient basis for a Category 5 listing, but there should also be documented evidence of a use impairment or other water quality impairment.

For a category 5 listing of aquatic weed or algae, there must be documented evidence that algae, including periphyton (attached algae) or phytoplankton (floating algae), is causing an impairment of a beneficial use. This can include evidence that algae growth is contributing to violation of another water quality standard such as pH, chlorophyll-a, or dissolved oxygen.

DEQ does not have a water quality standard for phosphates or nutrients at this time. DEQ agrees that a phosphate benchmark concentration should not be a sufficient basis for a Category 5 determination unless there is evidence that the phosphate is a cause or contributor to a violation of a parameter for which there is a standard, such as excessive algae growth, pH, chlorophyll-a, or dissolved oxygen.

56. Commenter (10) asserted that “the sheer lack of 303(d) listings, when compared to well-known attributes of Oregon’s waters demonstrates that DEQ has failed to obtain all readily available data and information on aquatic weeds and algae.” The commenter goes on to state that the pollutant “aquatic weeds” is stated to include “excessive growths of invasive, non-native aquatic plants that dominate the assemblage in a water body” yet a query of the database for all waters on the 303(d) list, categories 4 and 5, yields: few health advisories issued by the Oregon Harmful Algal Bloom Surveillance program and the U.S. Forest Service for cyanobacteria; and a short list of waters adversely affected by invasive plants.

In this assessment cycle, DEQ will be reviewing aquatic weeds data submitted and verified through Oregon’s Invasive Species Hotline and any data submitted to us through third parties. Clear and convincing evidence must exist that the weeds do in fact, “dominate the assemblage in a water body”.

2.8.2 Biocriteria

57. Commenter (1) cautioned that the methodology for biocriteria and the application of the PREDATOR model explicitly specifies that the reference conditions only apply to wadeable systems and samples collected from riffle habitats. The commenter noted DEQ should ensure that the biocriteria assessment

benchmarks are only applied to samples from the appropriate systems. To ensure that the assessment approach is properly applied, DEQ should require that any biological data submissions include information about the stream system (including wadeability) and the habitat from which the sample was collected so that DEQ can determine if the sample should be included in the assessment.

Since the data call went out concurrently with the draft methodology, it is too late for this assessment to require stream system information. If there is any doubt as to the suitability of the stream system, DEQ will review assessment determinations prior to publication of its draft list to ensure that any submitted data are from wadeable streams. DEQ may require stream system information in its next Integrated Report.

58. Commenter (8) noted that the Category 5 PREDATOR score listing criteria for Biocriteria expressed in Tables 13 and 14 on Pages 35-41, is intended to be mandatory. That is, if the PREDATOR score for an assessment unit meets the listing criteria, DEQ will on that basis alone include the assessment unit in Category 5. Although DEQ must necessarily interpret the meaning of the narrative biocriterion in making a listing decision, any adoption of a specific numeric value for the biocriterion by DEQ is inconsistent with ORS 468B.048(1), which assigns authority for adopting water quality standards to the Environmental Quality Commission through rulemaking. The commenter suggests the listing criteria should make clear that DEQ may consider other evidence in conjunction with the PREDATOR score when making a listing decision. Moreover, because of the limited availability of reference site data, relying exclusively on PREDATOR scores for any specific waterbody—for which the available reference data may not be comparable—may not be appropriate.

DEQ intends to use O/E information to determine whether a waterbody fully supports its aquatic life use (assuming the data meets all of the required data quality objectives). DEQ has also communicated that other data or interpretations may be submitted and would be accepted upon review by DEQ staff for appropriateness/scientific rigor. The listing criteria states DEQ may consider, in some circumstances, other data or interpretations of the same data using alternative metrics/indexes, etc. as overwhelming evidence of impairment. Through continued improvements to the Integrated Report DEQ will continue to look at O/E and other metrics/indexes for listing.

59. Commenters (9) and (12) requested that DEQ remove the biocriteria thresholds until such time as the agency (a) validates the PREDATOR models using a test data set, (b) confirms the underlying reference sites exhibit consistent characteristics over time, and (c) confirms that the reference sites underpinning PREDATOR accurately describe natural conditions, including naturally-disturbed conditions.

The predictive functions built into the models are designed to deal effectively with a spatially unbalanced reference population. Despite this predictive function, a few of the ecoregions have small sample sizes. Reducing the sample size further by pulling aside even a small number of sites from these ecoregions would potentially reduce representation of these sites enough to reduce the accuracy of predictions in these regions. Given these limitations, it is acceptable practice to forego model validation. With this consideration in mind, DEQ did not reserve validation datasets for validation of either model. DEQ intends to update its O/E model with additional reference site information and validate its O/E model for future Integrated Reports. Until such tasks are completed, DEQ must assess impairment of the biological community with the PREDATOR model.

60. Commenter (9) suggested that because the PREDATOR models have not been validated using a test dataset, we cannot know the degree to which the model is predictive, or the level of uncertainty around predictions. They further suggest that in this context, whether a 20% change from expected conditions is a reasonable threshold cannot be evaluated because it is not known how the models perform under scrutiny. Without completing this work, DEQ risks highly arbitrary results.

The predictive functions built into the models are designed to deal effectively with a spatially unbalanced reference population. Despite this predictive function, a few of the ecoregions have small sample sizes. Reducing the sample size further by pulling aside even a small number of sites from these ecoregions would potentially reduce representation of these sites enough to reduce the accuracy of predictions in these regions. Given these limitations, it is acceptable practice to forego model validation. With this consideration in mind, DEQ did not reserve validation datasets for validation of either model. DEQ intends to validate its O/E model for future Integrated Reports. Until such tasks are completed, DEQ must assess impairment of the biological community with the PREDATOR model.

61. *Commenter (9) remarked that DEQ has not evaluated the variation in reference stream assemblages by re-visiting reference sites to determine whether the sampling results are consistent over time (both within and across years). They contend that without validating the model, and without assessing variability in reference conditions, DEQ cannot know the likelihood that the bioassessment classification is wrong.*

DEQ recognizes that temporal variation of O/E scores is an important component of assessment methods. In 2015 DEQ instituted a Reference Trend network of twelve reference sites across the state, spread equally among ecoregions, and sampled annually. DEQ anticipates being able to more effectively characterize the variability in O/E in future Integrated Reports.

62. *Commenter (10) noted that they generally support DEQ's proposed methodology for Biocriteria assessment, which represents a notable improvement over the 2012 methodology. In particular, Commenters strongly agree with DEQ that in addition to the PREDATOR model (which DEQ recognizes is appropriate for "for assessing biological integrity in smaller, wadeable streams and rivers"), "other approaches may be appropriate for specific cases and data sets." Draft Methodology at 38. The commenter goes on to say that for the first time, DEQ explicitly acknowledges that studies looking at "upstream-downstream changes in macroinvertebrate community composition and function" are appropriate for assessing non-wadeable rivers and point-source impacts.*

Comment noted.

63. *Commenter (10) urged DEQ to expand the section of the Biocriteria methodology which acknowledges other approaches may be used for assessment. Commenter suggestions included: "(1) identifying which particular "other methodologies" DEQ will consider, in addition to its reliance on the PREDATOR model; and (2) clarifying that these "other methodologies" (including an assessment of the "upstream-downstream changes in macroinvertebrate community composition and function") may be used even for perennial, wadeable streams."*

DEQ intends to leave this section of the methodology intact since it is difficult to predict what type of information it may receive as part of the Call for Data. Specifying methodologies may inadvertently exclude data or information demonstrating impairment. DEQ agrees that these alternative methodologies may be used on all stream and river types, including perennial and wadeable streams

64. *Commenter (10) indicated that in at least two other respects, however, the proposed methodology for biocriterion assessment is flawed. "First, for perennial, wadeable streams, DEQ proposes to use a series of impairment "threshold values" for listing purposes that reflect a percentage of taxa loss as (theoretically) compared to a reference site using DEQ's PREDATOR model..... The threshold values DEQ proposes to use, even assuming they are statistically valid assessments of "impairment" in the ecological sense, do not correlate to the language of the biocriterion itself. Oregon's biocriterion requires waters of the state to "be of sufficient quality to support aquatic species without detrimental changes in the resident biological communities" and further defines the phrase "without detrimental changes in the resident biological communities" as "no loss of ecological integrity when compared to natural conditions at an appropriate reference site or region." OAR 340-041-0001(75), 340-041-0011*

(emphasis added). In other words, 14% or even 8% taxa loss would clearly be a “loss of ecological integrity” as defined in the biocriterion, but under the DEQ’s proposed methodology such a stream would not be listed as impaired. Thus, it follows that any loss of ecological integrity as compared to a valid reference site should result in a Category 5 listing.”

DEQ’s comparisons to natural conditions (or as close as possible) and reference sites, which is the crux of a determination of impairment, relies on the definition of "loss of ecological integrity". The definition of ecological integrity is not simple and does not have a singular agreed upon definition within the ecological scientific community. There is general agreement however, that it means that a system maintains a high level of diversity, ecological functions, and ecological processes that are naturally occurring for that ecosystem. O/E focuses on the diversity part of the equation based on the premise that if a relatively high biodiversity is maintained, and a group of taxa that are similar to other environmentally similar least disturbed locations, that ecological integrity will be maintained. Other indices such as IBIs/MMIs may include metrics which cover functions, structure, and processes, as well as diversity, but that does not mean they are necessarily better at detecting impairment.

The commenter implies that any O/E less than 1.0 would represent a loss of ecological integrity, which simply is not the case. The modeling of expected taxa is not perfect, nor is the sampling of observed taxa; both of which constitute potential errors in O/E calculations. To adjust for this DEQ allows for a range of taxa loss, based on the distributive properties of the reference population. The idea of ranges of conditions is standard practice in ecological assessment and is equivalent to "normal" or "healthy" ranges in the health sciences (e.g., normal blood pressure, normal heart rate, normal blood sugar levels, etc.). Through continued improvements to the biocriteria methodology that were identified in the peer review process DEQ continues to seek a better understanding of how directly O/E relates to, or conveys ecological integrity.

65. Commenter (10) also suggested that DEQ’s proposed biocriteria threshold values are arbitrary. The commenter noted that what they could conclude from the record, DEQ appears to follow what other states have done, without performing its own data collection and analysis to support any particular threshold values. The commenter believes that DEQ should lower the threshold values to ensure that the values protect the most sensitive aquatic species and adequately account for scientific uncertainty, model error, etc.

DEQ’s biocriteria thresholds are based on a standardized approach, employed across the country (and world). DEQ consulted the literature and reviewed methods other states and EPA use for biological assessments. The final decision was based on a desire to balance Type I and Type II errors. Final thresholds were selected that would protect, maintain, and restore water quality. Arbitrarily adjusting thresholds may or may not be an improvement on protection or limiting uncertainty in impairment decisions.

DEQ is currently exploring the linkage of biocriteria thresholds to measures of ecological functions and processes and intends to incorporate its results into future Integrated Reports. These linkages include understanding what ecological functions and processes are lost at a proposed threshold. (e.g. declines in overall diversity, total richness, evenness; increases in dominance, tolerant taxa)

66. Commenter (10) agreed with DEQ that it may use “numeric benchmarks to evaluate the integrity of aquatic biological communities.” Draft Methodology at 35. However, the commenter asserts that by its terms, the biocriterion also applies more broadly to any waters identified as having “detrimental changes in the resident biological communities.” As a narrative criterion, DEQ may not limit its application to numeric evaluations of data. The commenter refers to previous comments concerning Aquatic Weeds and Algae where there are no data to compare to a numeric benchmark. The commenter goes on to state that DEQ’s use of this methodology in past assessments revealed that DEQ used a small set of data in lieu of all readily available data and information and a narrow interpretation of its narrative criterion.

See response to **Comment 2.8.1 (56)**

67. *Commenter 12 agreed with Commenter 9 that neither the biocriteria nor the turbidity methodology should be included in the draft report due to significant questions about their scientific veracity. The turbidity model needs to be properly validated, and its uncertainty identified, before it can be considered accurate. Within this model, DEQ must also account for and evaluate the variation in its reference streams by revisiting its reference sites seasonally and over a number of years, and ensuring that it chose reference sites for natural conditions that accurately reflected the landscapes we live in today. Without this validation, the model cannot be deemed accurate enough to use for listing decisions. We request that DEQ remove biocriteria thresholds until the agency completes the validation requested above.*

DEQ is unclear about what turbidity model OFB is referring. Turbidity listings are based on conditions that disrupt the potability of drinking water (raw water concentrations > 5 NTU).

With regards to biocriteria, refer to **Comments 2.8.2 (60) and 2.8.2 (61)**.

2.8.3 Chlorophyll

68. *Commenters (5) and (6) noted the implication of a chlorophyll a listing is not clear. The commenter suggests that if Category 5 listings are included for chlorophyll a, DEQ should note in the methodology, or alternatively in an NPDES permit program document, that these listings by themselves do not impact the NPDES permit program.*

DEQ does not view the Assessment Methodology as the venue for indicating how the NPDES permit program will address Category 5 listings. The Integrated Report Improvement group will coordinate with permit staff and other programs as appropriate to develop a document that identifies the implication for various WQ programs for Category 5 impairment listings.

69. *Commenter (8) noted that the Chlorophyll-a values on page 42 of the Draft Methodology are action levels, not water quality standards. Under OAR 340-041-0019(2), if these action levels are exceeded, DEQ must determine whether beneficial uses are impaired and, if so, obtain Environmental Quality Commission approval of any control strategy for addressing the impairment. The commenter suggested, for these reasons, it is not appropriate to include waterbodies in Category 5 based solely on chlorophyll-a concentrations.*

Chlorophyll-a criteria have historically been used to identify water bodies that may be impaired for nuisance phytoplankton growth. If these action levels are exceeded, DEQ contends that OAR 340-041-0019(2), allows studies to be conducted, as are necessary, “to describe present water quality; determine the impacts on beneficial uses; determine the probable causes of the exceedance and beneficial use impact; and develop a proposed control strategy for attaining compliance where technically and economically practicable”. This does not preclude DEQ from placing these water bodies in Category 5 in the interim.

2.8.4 Nutrients

70. *Commenter (7) urged DEQ to develop interpretations for its narrative standards, particularly nutrients.*

Due to the scope of the improvement efforts undertaken for the 2018 Integrated Report, an assessment methodology for nutrients was not undertaken at this time. DEQ will conduct a prioritization exercise that includes EPA and interested stakeholders regarding a methodology for nutrients and/or other narrative standards for future Integrated Reports. At this time, if a stakeholder or member of the public believes that a water body may be impacted due to excessive nutrients, they may submit data and evidence identifying the use impairment and it will be assessed for the current Integrated Report.

71. Commenter (7) noted that for footnote 21, EPA has 304(a) recommendations/guidance for phosphorus and nitrogen, and that information could be included in the methodology. The commenter also remarked that Oregon recently completed an NSTEPS project aimed at restoring wadeable streams (translations for narrative nutrient thresholds). The commenter encourages the state to include this source of state-specific analysis in their listing methodology, noting it is important to mention nitrogen in the context of HABs in particular, as control of TN and TP can be important.

Due to the breadth of revisions that were undertaken for the 2018 Integrated Report, NSTEPS nutrient thresholds were not included in the 2018 Assessment Methodology. At this time, if a stakeholder or member of the public believes that a water body may be impacted due to excessive nutrients, they may submit data and evidence identifying the use impairment and it will be assessed for the current Integrated Report.

2.8.5 Sediment

72. Commenter (7) would like to see a commitment from DEQ as to when work on a numeric benchmark for sedimentation will be completed.

Due to the scope of the improvement efforts undertaken for the 2018 Integrated Report, an assessment methodology for sedimentation was not undertaken at this time. DEQ may consider development of a methodology in future Integrated Reports. At this time, if stakeholders believe that a water body may be impacted due to excessive sedimentation, they may submit data and evidence identifying the use impairment and it will be assessed in the current Integrated Report.

2.8.6 Turbidity

73. Commenters (5) and (6) suggested the implications of turbidity listings on municipal wastewater NPDES permits should be discussed in the Draft Methodology or in NPDES permit program documents. The commenter also suggested that DEQ should note that the TSS limitations in municipal wastewater NPDES permits are adequate to address turbidity listings in a waterbody.

DEQ does not feel that the Assessment Methodology is the venue for indicating how the NPDES permit program will address a Category 5 listing for turbidity. The Integrated Report Improvement group intends to work on a document that identifies the implication for various WQ programs for Category 5 impairment listings. If the NPDES permit program determined that creation of a guidance document would be beneficial, the WQ Assessment program would coordinate with permit staff on creation of the document.

74. Commenter (9) suggested that in its 2010 methodology, DEQ crafted a numeric listing threshold for turbidity without any public process that provides a stream will be designated as “Category 5: Water Quality Limited” if it experiences greater than 45 days at or over 5 NTU. They reiterate that this language appears nowhere in Oregon rule or statute. Instead, it appears to be DEQ’s interpretation of Oregon’s statewide narrative criterion disallowing “conditions that . . . affect the potability of drinking water” OAR 340-041-0007(10). The commenter further noted the “the threshold DEQ selects, and the mechanism for impairment (without any reference to natural baseline), is arbitrary and unmoored from any scientific or policy rationale.”

The 2010 assessment applied Oregon’s narrative criterion OAR 340-041-0007(10) that establishes the statewide goal of protecting the potability of drinking water.

For the 2010 assessment, DEQ reviewed information provided by Public Water System (PWS) operators for various drinking water systems in Oregon. DEQ reviewed the information to determine the number of shutdowns related to turbidity levels that exceeded the system’s operating capacity and treatment technology, preventing the PWS from providing drinking water from the surface water source. The

threshold DEQ selected, 5 NTU, is the level of turbidity that prevents adequate treatment of source water by public water systems that use certain types of standard treatment technology (e.g. slow sand filtration, pressure sand filtration or membrane filtration) or many drinking water treatment systems, according to operators and drinking water engineers. PWS operators may have means to manage water supplies and continue to provide water for a stretch of days before their reserves are depleted or their treatment capacity is overwhelmed.

The water body is only listed as impaired if the operator indicates that high turbidity days (days with turbidity ≥ 5 NTU) are causing operational difficulty (e.g. increased treatment cost, unable to use source water, shut downs, use of alternative water sources, increased staff time and more downtime for backwashing filters) AND source water data validate this impairment. The data are considered to validate an impairment if more than 45 non-consecutive high turbidity days per year occur for any year for which data are available.

Based on DEQ's review of information, DEQ believes there is substantial evidence that elevated turbidity levels create conditions that adversely affects the potability of drinking water for public water supply systems that use certain types of standard drinking water treatment technology. DEQ believes that it is reasonable to list waterbodies as impaired for OAR 340-041-0007(10) using this approach.

75. Commenter (10) remarked that DEQ has failed to include violations of the narrative turbidity criterion based on impairment to uses. Commenters noted several instances in the 2012 Integrated Report where commenters felt that DEQ failed to assign Category 5 listings based on the 2012 turbidity methodology. "For example, Commenters noted that DEQ's database demonstrated the City of Clatskanie reported that in Roaring Creek there were "frequent high turbidity events causing temporary shutdowns" but because there were no turbidity monitoring data available, the water was listed as Category 3B: Potential concern instead of Category 5...." Commenters asserted that DEQ should revise the Draft Methodology to assess compliance with the narrative turbidity criterion.

DEQ will assess turbidity data for impairment of beneficial uses. The example given regarding the City of Clatskanie's "frequent high turbidity events" lacks context or water quality data. Without water quality data, it is difficult for DEQ to conclude that a water body is in fact, impaired.

76. Commenter (10) stated there was no reason why an impairment must exist at least one-eighth of the year (45 days) to be considered sufficient for listing.

DEQ recognizes that turbidity in surface water is variable and responds to weather and rainfall conditions as well as human disturbance activities that increase erosion of fine and coarse sediments from land into surface waters within watersheds. Previous data collected by PWSs focuses on the in-stream quality of water in their water sources and does not include comprehensive studies to monitor and analyze all variables and trends that might be related to source water turbidity measurements. In order to allow some buffer for potential, but unquantified, natural system variability, DEQ used a value of 45 high turbidity days in any year of record to indicate impairment to the drinking water beneficial use.

77. Commenter (10) also noted that many small public drinking water systems do not have the resources to monitor source water data day after day when they are experiencing the impairment and it is causing operational difficulties.

The time and cost required for monitoring turbidity are minimal (cost of calibration solutions) once the equipment is purchased, which PWSs should already possess. Without measured turbidity values, it is difficult to verify the magnitude and extent of the elevated turbidity levels in a specific water body.

78. Commenter (10) also suggested that the policy of independent applicability means that an impairment based on lack of full support of designated uses is sufficient without also using any numeric criteria that may apply to the water quality problem.

DEQ has made concerted efforts to incorporate EPA's independent applicability policy. Specifically, EPA's Consolidated and Listing Methodology document states that the intent of independent applicability "is to protect against dismissing valuable information when evaluating aquatic life use attainment, particularly in detecting impairment and is based on the premise that any valid, representative dataset indicating an actual or projected water quality impairment should not be ignored when one is determining the appropriate action to be taken." EPA also recognized that there are circumstances when conflicting results should be investigated further before the attainment or nonattainment decision is made. One example may be when states obtain multiple datasets of varying quality, which may influence the reliability of the assessment results. In the case of turbidity, measured turbidity values may be given more weight than a general report of frequent turbidity events, and the water body may be placed in Category 3 until more data can be collected.

79. Commenter (10) reiterated that by not listing waters where use impairment is demonstrated but data are not available, DEQ withholds the regulatory actions that could and should restore water quality to natural turbidity levels. The commenter suggests that in doing so, DEQ puts the cost of drinking water treatment on small municipal systems that can ill afford it and allows the sources of disturbance to externalize their pollution impacts.

Given the absence of data, it is difficult for DEQ to conclude that a designated use is not supported and a water body is impaired for a specific parameter.

80. Commenter (12) stated that DEQ's turbidity threshold is unsupported by science. They go on to say that in its 2010 methodology, DEQ advanced a new numeric listing threshold for turbidity that is not directly found in any water quality standard. DEQ's chosen threshold for turbidity impairment, with no way to determine natural baseline for turbidity, is outside the agency's discretion and not supported by science. Indeed, this is particularly true given that the chosen threshold is not one that impairs the potability of drinking water, which is the only state standard this threshold appears to be based on. The commenter requested that DEQ remove its turbidity threshold from the methodology and delist any streams listed under this methodology.

DEQ has the authority to assess compliance with narrative standards through its Assessment Methodology. Due to the breadth of improvements to the 2018 Integrated Report, refinement of the turbidity methodology did not fall within scope of the improvements. DEQ may choose to review this methodology and provide revisions in upcoming Integrated Report cycles.

2.9 Antidegradation

81. Commenter (10) suggested the Draft Methodology fails to make 303(d) listings based on waters' noncompliance with antidegradation policies and requirements—all of which are essential and required components of water quality standards.

Oregon's antidegradation policy is established in OAR 340-041-0004 and approved by EPA as part of Oregon's water quality standards. Oregon's antidegradation policy is implemented through DEQ's actions that preserve and protect existing uses, at a minimum; high quality waters that attain water quality standards; and all designated outstanding resource waters. DEQ applies the antidegradation policy primarily when issuing wastewater discharge permits or water quality certifications. DEQ's Integrated Report classifies waters where data show standards are currently being met as Category 2: Attaining and this information is available to inform DEQ decisions to preserve and protect that water quality.

In contrast, DEQ's actions to identify impaired waters for addition to the 303(d) list are aimed at identifying waters that do not meet applicable water quality criteria and require further actions to restore those waters. DEQ identifies waters that currently do not meet water quality standards and need TMDLs

to control discharges to prevent further degradation and restore impaired water. DEQ is open to considering additional ways to implement antidegradation in the 303(d) listing process if EPA develops guidance on how to align the antidegradation policy with the listing process where the focus is to identify waters that are degraded and impaired.

2.10 Corrections and Clarifications

82. Commenters (1), (5), (6) and (8) noted that the listing and delisting methods included in Table 4 are incorrect. Commenters noted the "Listing" and "Delisting" columns included in Table 4 (Listing and Delisting Methods for Numeric Criteria) on page 14 appear to be reversed, as they do not reflect the requirements described in the text and should be corrected.

The "Listing" and "Delisting" columns on Page 14 are reversed and will be corrected in the final document.

83. Commenter (1) pointed out that the Listing - Statistical Methods on page 14 includes only values for chronic toxic criteria. Values should also be included for acute toxic criteria.

Inclusion of this requirement was an unintentional oversight. It will be removed in the final methodology.

84. Commenter (1) noted that Category 3D: Insufficient Data; Not Technologically Feasible to Assess is not included in the flow chart on page 10. Commenter stated this category should be included in the flow chart to illustrate when this category will be used by DEQ.

Category 3D: Insufficient Data; Not Technologically Feasible to Assess will be included in the flow chart on Page 10.

2.11 Comments out of Scope

85. Commenter (11) pointed out that Forest Service has a legal responsibility to uphold state water quality standards on the federal lands they manage. Their directives include adhering to 'adaptive management' practices. We are very concerned that the USFS is not upholding water quality standards and not adequately tracking or sharing the results of their water quality monitoring with the public or ODEQ, and that they have failed to create a framework for adaptive management.

DEQ believes this comment is out of scope of the draft methodology.

86. Commenter 11 indicated that based on conversations with the Forest Service, we are concerned that the USFS is increasingly attempting to substitute shade data in place of stream temperature data, and sometimes use the availability of data for percent of shade as justification for not monitoring water temperature.

DEQ believes this comment is out of scope of the draft methodology. DEQ does not have a method to assess shade as a surrogate for water quality temperature data. DEQ encourages parties to collect water temperature data for its Integrated Report assessment.

87. Commenter (11) continues to be extremely concerned about the cumulative impacts of timber sales, roads, and livestock grazing on streams and water quality on public lands. In addition to our concerns detailed above, we are also very concerned that once a stream is included on the 303d list or has its TMDL approved, insufficient oversight or focus on restoration of water quality on public federal lands is a widespread problem.

DEQ believes this comment is out of scope of the draft methodology.

88. Commenter (11) noted that, as stated in the 2014 Final Oregon Nonpoint Source Management Program Plan, the Memorandum of Understanding between the USFS and ODEQ holds both agencies to protecting stream water quality and beneficial uses (such as salmonid spawning, rearing, and/or migration)..... We cannot stress enough that the USFS and ODEQ must, in order to achieve these goals, uphold water quality standards, and meet their legal responsibilities: 1) ensure that the USFS submit all relevant temperature and sediment related water quality data 2) increase water quality monitoring efforts, particularly in key or priority watersheds and in a targeted manner in relation to USFS land management activities (such as logging, especially within streamside RHCAs) 3) put in place and implement adaptive management--i.e., collect data on how USFS actions are actually affecting water quality, and then with public and ODEQ/multiagency cooperation and oversight, adapt their activities so that widespread water quality degradation does not continue to occur across the landscape.

DEQ believes this comment is out of scope of the draft methodology. DEQ will continue to work with the USFS with the objective of obtaining all USFS water quality data for assessment in its Integrated Report. It is out of the scope of the draft methodology to increase the USFS water quality monitoring efforts and implement adaptive management strategies.

Appendix A

Comments received from USEPA Region 10 suggested DEQ will not interpret toxics Water Quality Criteria consistent with the expressed frequency of the criteria. EPA does not recommend the application of the binomial hypothesis test for the assessment of toxic substance criteria on the basis that:

The 2002 CALM guidance which outlines the binomial hypothesis test assessment procedure is not applicable because it is superseded by subsequent guidance.

EPA's Office of Water recommends only listing for toxic substances if >1 sample exceeds the criteria in a 3 year period.

The binomial hypothesis test is not appropriate for assessing toxic substances.

DEQ does not agree with EPA's characterization of the 2002 and 2004 Guidance, and EPA's assertion that the binomial hypothesis test is not applicable to assessment of toxic substances. DEQ believes its toxics assessment method is consistent with established EPA assessment procedures and, as outlined in the 2002 CALM document, determines attainment of criteria at a level consistent with a 1 in 3 year exceedance frequency suitable for assessment of toxic substances.

Assertion 1: The 2002 CALM document is superseded by the 2004 Guidance

In the comments provided, EPA cited the *Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act* Section III (F)⁴ which was a supplemental guidance document released subsequent to the 2002 EPA Consolidated and Listing Methodology (CALM) document.

The introduction to the memorandum states:

"The Integrated Report is intended to satisfy the listing requirements of Section 303(d) and the reporting requirements of Sections 305(b) and 314 of the Clean Water Act (CWA). This guidance replaces and supercedes the following documents:

Guidance for 1994 Section 303(d) Lists - Geoffrey H. Grubbs, November 26, 1993;

National Clarifying Guidance for 1998 State and Territory Section 303(d) Listing

Decisions - Robert H. Wayland III, August 27, 1997;

EPA Review of 2000 Section 303(d) Lists - Robert H. Wayland III, April 28, 2000;

2002 Integrated Water Quality Monitoring and Assessment Report Guidance - Robert H.

Wayland III - November 19, 2001; and

Clarification of the Use of Biological Data and Information in the 2002 Integrated Water

Quality Monitoring and Assessment Report Guidance."

The memorandum to the 2004 Guidance does not, however, state that it supersedes the 2002 CALM document. In fact, the *Guidance for the 2004 Assessment* Section III (F) 1 explicitly discusses Appendix

⁴ EPA, 2003. *Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act*. July 21, 2003. Watershed Branch Assessment and Watershed Protection Division, Office of Wetlands, Oceans, and Watersheds, Office of Water, United States Environmental Protection Agency

C and D of the 2002 CALM document, which clarifies selection of null hypotheses and confidence intervals for the binomial hypothesis test.

Furthermore, the Guidance for the 2004 Assessment does not constitute legally binding policy:

“The statutory provisions in Sections 303(d) and 305(b) and EPA regulations described in this document contain legally binding requirements. This document does not substitute for those statutory provisions or regulations, nor is it a regulation itself. Thus, it does not impose legally binding requirements on EPA, states, or territories and may not apply to a particular situation based upon the circumstances. EPA, state, and territorial decision makers have the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. EPA may revise this guidance in the future, as appropriate.”⁵

Assertion 2: Toxic substances must be listed if >1 sample exceeds the criteria in a 3 year period.

The intent of the passage quoted in EPA’s comment from Section III (F) of the 2004 guidance addresses EPA’s recommendation for states to apply a 1 in 3 year exceedance frequency in the case where ‘a State has failed to include, for a criterion aimed at protecting aquatic life, a “frequency” component’⁶ in their water quality standards. It does not preclude states from adopting a statistical-based methodology to assess whether data indicates the waterbody is meeting or exceeding a 1 in 3 year frequency of exceedance on average. The quoted passage continues:

“If a State has articulated in its methodology a procedure for taking into consideration such site-specific factors, use of a more frequent return interval on a particular water, or type of water, could be acceptable. (Assuming, of course, that the procedure was scientifically valid, was properly applied, and is consistent with the State’s WQS.)”⁷

The binomial hypothesis test is a scientifically valid procedure, which, as formulated in DEQ’s 2018 Assessment Methodology, provides a statistical test describing data quality objectives for determining attainment that is equivalent to a 1 in 3 year exceedance frequency on average⁸ in site-specific cases where large and long-term datasets are available for the waterbody.

Assertion 3: The binomial hypothesis test is not appropriate for assessing toxic substances.

Section II (H) of the 2004 Guidance specifically discusses considerations for states to justify use of statistical procedures to assess criteria, including toxic substances:

“The State’s methodology and documentation should specifically describe its method and supporting rationale for identifying potential violations of numeric and narrative criteria. If the State applies excursion frequencies or thresholds as listing decision criteria, the submittal should describe a reasonable rationale for the selected approach, showing they are consistent with applicable WQSs. If the State applies different decision rules for different types of pollutants (e.g., toxic, conventional, and non-conventional pollutants) and types of standards (e.g., acute and chronic standards for aquatic life or to protect human health), the State should provide a reasonable rationale supporting the choice of different approaches for different standards.”

DEQ’s Draft Methodology, accompanying technical white paper, and independent peer review of the proposed method fully evaluated the analytical basis and assumptions for listing waterbodies according to the binomial hypothesis test. The accompanying documentation provides a reasonable rationale

⁵ Ibid. p. 2 paragraph 2.

⁶ Ibid. Section III (F) p.26, paragraph 6

⁷ Ibid. Section III (F) p. 27, paragraph 5

⁸ EPA, 2002. EPA, 2002. Consolidated Assessment and Listing Methodology (CALM). Toward a Compendium of Best Practices, First Edition. United States Environmental Protection Agency. July 2002 Section 4–6.

supporting DEQ’s adoption of a statistical listing methodology for assessing data against the aquatic life toxics criteria.

Currently, eight states apply a binomial hypothesis test specifically to the assessment of toxic substances in their most recent Integrated Report methods, and have had 303(d) lists approved following these methods (Table 1).

Table 1. States applying binomial statistical method to assess attainment of standards for toxic substances	
State	Summary of Assessment Method
California	<ul style="list-style-type: none"> • Binomial distribution with an effect size of 15% and a balanced 80% confidence level for acute and chronic toxics • Listing Null Hypothesis: Actual exceedance proportion \leq 3 percent • Listing Alternate Hypothesis: Actual exceedance proportion $>$ 18 percent
Florida	<ul style="list-style-type: none"> • Binomial distribution with a \geq10% critical exceedance rate • with a minimum of an 80 percent confidence level using a binomial distribution • minimal sample size of 10 samples
Iowa	<ul style="list-style-type: none"> • Binomial distribution with a $>$10% critical exceedance rate and 90% confidence for conventional pollutant criteria • Raw score with $>$10% critical exceedance for chronic toxic substances criteria • 1-in-3-years of 2 sample critical exceedance for acute toxic substances criteria
Kansas	<ul style="list-style-type: none"> • Pre-screen potential impairments for $>$ 1-in-3-year excursion of acute aquatic life • Screen for a raw score 10% critical exceedance of chronic aquatic life • For those sites that fail the screening, apply a binomial distribution of a 10% critical exceedance with a 90% confidence interval to determine impairment
Nebraska	<ul style="list-style-type: none"> • Binomial method with $>$10% critical exceedance rate and 90% confidence for both acute and chronic criteria
Nevada	<ul style="list-style-type: none"> • Binomial method with $>$10% critical exceedance rate at 90% confidence • Minimum number of 3 samples needed to make an impairment determination
North Carolina	<ul style="list-style-type: none"> • Binomial distribution with a critical exceedance $>$ 10% of samples and 90% confidence • Minimal sample size $>$9
Texas	<ul style="list-style-type: none"> • Binomial method with a 10% critical exceedance rate and 80% confidence • Confidence varies by sample size • Accepts up to \sim40% type-I and type -II error rate • Minimal sample size of 10

In summary, DEQ intends to apply the binomial distribution to assess toxic substances for its 2018 Integrated Report. Implementation of a statistical method of assessment will increase confidence in decisions that may be based on limited information. Use of the binomial method for assessment of toxic substances should lead to more accurate and defensible conclusions about actual conditions in a water body. DEQ’s listing methodology for the binomial approach will apply the statistical test on a site-

specific basis to sites with large or long-term data sets where a minimum confidence level of 90% is achievable. Sites with less than eighteen samples will be listed on the basis of more than 1 exceedance for toxic substances.

State Assessment Methodology Documents

1. California Water Boards Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List. 2004.
https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2015/020315_8_amendment_clean_version.pdf
2. Florida DEP, Chapter 62-303, Identification of Impaired Waters, 2016.
<https://www.flrules.org/gateway/readFile.asp?sid=0&tid=0&cno=62-303&caid=1086320&type=4&file=62-303.doc>
3. Iowa Methodology for Iowa's 2016 Water Quality Assessment, Listing, and Reporting Pursuant to Sections 305(b) and 303(d) of the Federal Clean Water Act. March 28, 2017.
<http://www.iowadnr.gov/Portals/idnr/uploads/watermonitoring/impairedwaters/2016%20Iowa%20Draft%20Methodology.pdf?ver=2017-04-11-134154-320>
4. Kansas Methodology for the Evaluation And Development of the 2016 Section 303(D) List Of Impaired Water Bodies For Kansas. February 18, 2016.
http://www.kdheks.gov/tmdl/2016/2016_303_d_Methodology_Feb-18-2016_Final.pdf
5. Nebraska Methodologies for Waterbody Assessments and Development of the 2016 Integrated Report for Nebraska. July, 2015.
<http://deq.ne.gov/Publica.nsf/xsp/.ibmmodes/domino/OpenAttachment/Publica.nsf/53AA14CA60E0CE1486257FA1006655A8/Attach/2016%20IR%20Assessment%20Methodology.pdf>
6. Nevada 2014 Water Quality Integrated Report.
http://ndep.nv.gov/bwqp/file/IR2014_Report.pdf
7. North Carolina 2016 303(d) Listing Methodology.
<https://ncdenr.s3.amazonaws.com/s3fs-public/Water%20Quality/Planning/TMDL/303d/2016/2016%20Listing%20Methodology%20approved%20by%20EMC%20May%202015.pdf>
8. Texas 2014 Guidance for Assessing and Reporting Surface Water Quality in Texas. June, 2015.
https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/14txir/2014_guidance.pdf