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Protection of Downstream Waters in Water Quality Standards: Frequently Asked Questions

DISCLAIMER

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The general description provided here may not apply to a particular situation based upon the circumstances. Interested parties are free to raise questions about the substance of these FAQs and the appropriateness of their application to a particular situation. The EPA retains the discretion to adopt approaches on a case-by-case basis that differ from those described in these FAQs where appropriate. These FAQs are a living document and may be revised periodically without public notice. The EPA welcomes public input on these FAQs at any time.

1. Why is it important that upstream designated uses and water quality criteria ensure the attainment and maintenance of downstream water quality standards?

Pursuant to sections 303 and 101(a) of the Clean Water Act ("CWA" or "the Act"), the federal regulation at 40 CFR 131.10(b) requires that "*In designating uses of a water body and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters.*" This provision requires states and authorized tribes (hereinafter "states/tribes") to consider and ensure the attainment and maintenance of downstream[1] water quality standards (WQS) during the establishment of designated uses and water quality criteria in upstream[2] waters. Adopting either narrative or numeric criteria to ensure the attainment and maintenance of downstream WQS (i.e., designated uses, criteria and antidegradation requirements) may likely be the preferred path for states/tribes to ensure consistency with 40 CFR 131.10(b). This is especially important if there

[1] The EPA interprets the term "downstream" to include both intra- and interstate waters, as well as waters that form a boundary between adjacent jurisdictions.

[2] Throughout these FAQs the EPA is using the term "upstream" to include "instream" when referring to the water body(ies) for which states/tribes are developing designated uses/water quality criteria that will ensure the attainment and maintenance of downstream WQS.

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are data or information suggesting that upstream designated uses and/or water quality criteria may not provide for the attainment and maintenance of downstream standards.

Designated uses and water quality criteria that ensure attainment and maintenance of downstream WQS may be important because they may help to avoid situations where downstream segments become impaired due, either in part or exclusively, to individual or multiple pollution sources located in upstream segments. Designated uses and water quality criteria that provide for the attainment and maintenance of downstream WQS may help support more equitable use of any assimilative capacity available to upstream and downstream pollution sources and/or jurisdictions and may facilitate restoration of the downstream waters. Ensuring the attainment and maintenance of downstream WQS during development of upstream designated uses and water quality criteria may also help limit and/or avoid resource-intensive water quality problems and/or legal challenges that can occur after adoption of uses and criteria that lack consideration of downstream waters' WQS. Furthermore, downstream protection consideration prevents the shifting of responsibility for pollution reductions from upstream sources and/or jurisdictions to downstream sources and/or jurisdictions. State/tribal uses and criteria that protect downstream waters may, among other things, increase the resiliency of the nation's waters to climate change and may help address environmental justice issues in urban waters. In addition, designated uses and criteria that ensure attainment and maintenance of downstream WQS facilitate consistent and efficient implementation and coordination of water quality-related management actions (e.g., water quality monitoring and assessment, development of Total Maximum Daily Loads (TMDLs) and other watershed-based restoration and protection plans, and National Pollutant Discharge Elimination System (NPDES) permitting and CWA Section 401 certifications).

Consistent with the disclaimer above, the EPA reiterates that these FAQs do not impose any additional requirements on states/tribes with regards to downstream protection beyond those requirements already identified in 40 CFR 131.10(b). States/tribes have discretion in choosing their preferred approach to downstream protection based on their individual circumstances, and these FAQs are not intended to limit a state's or tribe's discretion, provided their selected criteria approach is also consistent with 40 CFR 131.11. Furthermore, the EPA recognizes that states/tribes may not have the available resources to develop numeric criteria to protect downstream waters at this time or in the near future; therefore, these FAQs envision a hybrid approach where a state/tribe may adopt narrative criteria, numeric criteria or a combination of these criteria. In addition to the discussion of possible criteria development approaches discussed in response to Question 3, *"What are possible criteria development approaches for ensuring the attainment and maintenance of downstream WQS?,"* the EPA has developed a set of four customizable templates[3] for narrative downstream protection criteria to assist states/tribes with this effort. These templates may be used to develop a "broad narrative" that provides basic legal coverage under 40 CFR 131.10(b) (e.g., applies to all waters in the state/tribe) as well as a variety of "tailored narratives" that can be developed to address specific water bodies, pollutants, and/or water body types.

[3] http://water.epa.gov/scitech/swguidance/standards/narrative.cfm

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2. What should states/tribes consider regarding downstream protection when developing and adopting upstream designated uses and water quality criteria?

- **Use a watershed approach to develop WQS.**
  Early in the process of developing designated uses and/or water quality criteria, it is useful to take a step back and consider water quality at the United States Geological Service (USGS)-defined subwatershed (e.g., HUC 12) or broader geographic scale. Such an analysis could be as general or detailed as a state's or tribe's resources allow. Start by asking questions about what the most sensitive designated uses are within such a watershed, which uses are in place downstream, and what criteria are in place to protect those uses. Developing a designated use inventory and/or map[4] that identifies uses within a watershed may help in defining the scope of potential downstream vulnerabilities. States/tribes may already have developed advanced mapping tools that can be used in this effort. It may also be useful to consider whether the uses and criteria for the downstream receiving waters are adequate or if they need to be developed, revised or refined. In addition, consider other water bodies that may flow to downstream waters and may affect hydrologic flow and/or pollutant concentrations in these locations. Also, if dealing with a subwatershed, consider which upstream subwatershed might have the greatest potential to positively or negatively impact downstream water quality (e.g., based on land characteristics and use, proximity to sensitive downstream waters, water body characteristics, stressor source and distribution). Furthermore, understanding and considering the programmatic (e.g., point and nonpoint source, assessment, listing and TMDL) and jurisdictional issues at play and any solutions in place at the subwatershed or overall watershed levels may provide useful information and help to avoid potential future conflicts.

- **Communicate and coordinate early between jurisdictions, programs, and agencies regarding shared watersheds.**
  When a state/tribe is developing designated uses and water quality criteria that may affect the waters of another state or jurisdiction, early communication with the potentially affected jurisdiction(s) and with the EPA (as appropriate) is key to help define the scope of downstream protection issues and determine protective endpoints. States may also consider the administrative processes and procedures for setting WQS that are outlined in their regulations. Where possible, adjacent states/tribes may find it useful to develop WQS jointly for shared waters. States/tribes may consider creating a formal agreement (e.g., Memorandum of Understanding (MOU), joint powers agreement), developing partnerships (e.g., watershed commission), and/or including third party entities (possibly the EPA) to assist with cross-jurisdictional or cross-program communication and coordination. Also, the EPA/states/tribes may consider developing an electronic communications clearinghouse that can be used to coordinate complex issues with multiple stakeholders, as well as having periodic check-ins to ensure that appropriate actions are being taken and to determine if adjustments are needed.

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[4] One tool that can provide a starting point for this type of analysis is the National Atlas' Streamer, which can be used to trace downstream or upstream from any point on a stream or river: http://nationalatlas.gov/streamer/welcome.html

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To foster consistency and efficiencies across programs, state/tribal WQS programs may wish to find out how other programs such as their state's NPDES, assessment/listing, and TMDL programs may consider and protect downstream waters, and what information or direction those other programs need to effectively implement WQS—especially narrative criteria—to ensure protection of downstream waters.

- **First focus on downstream protection in priority situations.**
  When considering the development of uses and criteria that ensure the attainment and maintenance of downstream WQS, states/tribes may wish to first focus their efforts on situations where downstream impacts may be greatest to make the best use of available resources. Priority situations will likely vary from state to state or tribe to tribe, and may include those in which:
  - the pollutant accumulates over time in downstream waters (e.g., nitrogen or phosphorus); is persistent (i.e., resists degradation) in the environment (e.g., lead, mercury, arsenic, PCBs, dioxin); is bioaccumulative in aquatic life, wildlife, or humans (e.g., methylmercury); and/or transforms into a more toxic form downstream (e.g., some pesticide metabolites or disinfection byproducts);
  - downstream waters are protected by more stringent or additional criteria;
  - drinking water intakes exist downstream;
  - cumulative impacts are known to occur downstream;
  - environmental justice[5] issues are relevant (e.g., human subpopulations disproportionally at risk exist downstream);
  - sensitive or rare aquatic species (e.g., state- or federally-listed threatened or endangered species) and/or species with particular economic or social importance exist downstream;
  - contentious cross-jurisdictional issues related to downstream water quality exist and coordination may be called for;
  - waters with special use designations and/or protections exist downstream and/or upstream (e.g., headwaters, low order streams);
  - downstream waters are on a state's CWA section 303(d) list of impaired and threatened waters for the relevant pollutants; and/or
  - numeric criteria for the relevant pollutants have been adopted downstream.

- **Choose an approach to develop uses and criteria that ensures the attainment and maintenance of downstream WQS, and document the decision and corresponding analyses.**
  Depending on the situation, it may be appropriate to pursue adoption of a narrative or numeric criterion (or a combination) for downstream protection. In many situations, a narrative downstream protection criterion that provides general coverage could be sufficient. However, in some priority situations (see above for potential examples), states/tribes may wish to consider a more tailored and specific narrative criterion and/or a numeric criterion for specific water bodies or pollutants (for more information, see response to Question 3, *What are possible criteria development approaches for ensuring the attainment and maintenance*

[5] For more information visit the EPA's environmental justice website: http://www.epa.gov/compliance/ej/index.html.

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of downstream WQS?). In either case, share with the public a written summary and any related analyses of how attainment and maintenance of downstream WQS was considered during the development of upstream uses and/or criteria, including information supporting how the selected approach demonstrates that such protection is ensured. This summary should be included as supporting documentation for a state's WQS submission, in accordance with 40 CFR 131.5 and 131.6.

Similarly, in designating new or revised upstream uses (e.g., after removing a use consistent with a use attainability analysis, or UAA), the state/tribe should include information on the state's/tribe's consideration of the applicable downstream WQS. Specifically, when designating or revising upstream uses specified in CWA section 101(a)(2), or subcategories of such upstream uses, this information should include how the state's/tribe's new or revised upstream uses (and associated criteria) will continue to demonstrate protection of existing or designated uses of downstream waters. States/tribes must designate any new or revised upstream use taking into consideration the needs in the immediate water (i.e., the upstream water) as well as the WQS of the downstream waters.

However, 40 CFR 131.10(b) does not require a state/tribe to retain a use in an upstream segment that has been demonstrated through a use attainability analysis to be unattainable, solely to satisfy the requirement of 40 CFR 131.10(b). Where an upstream use is demonstrated to be unattainable because the water quality necessary to support the use cannot be achieved, then the attainable water quality and consequently the attainable use in the downstream segment may also be limited by the attainable water quality in the upstream segment, taking into consideration mitigating factors such as flow, dilution, and pollutant degradation. Where an upstream use is shown to be unattainable due to physical conditions, an attainable use may be established instead, but numeric or narrative criteria should also be established that provide for the attainment and maintenance of the (potentially more stringent) water quality standards assigned to downstream waters.

- **Consider the spatial extent of potential impacts on downstream WQS.** Downstream impacts of upstream uses and criteria should be considered as far downstream as adverse impacts are observed or expected to occur from upstream pollution (including hydrologic flow alteration[6]). Just how far downstream a loading of pollutants (or effects from hydrologic flows) could affect the attainment and maintenance of WQS depends on a number of variables, including the nature of the pollutants (e.g., fate and transport properties), upstream and downstream flow volumes, inputs from other sources/tributaries, and the distance/travel time to downstream water bodies with additional or more stringent criteria and/or uses requiring additional protection. Network[7] or fate-and-transport modeling can be useful for delineating the spatial extent of potential impacts. See response to Question

[6] EPA is including impacts from hydrologic flow alteration as states/tribes are increasingly choosing to adopt criteria for the protection of hydrologic flows. Thus, particularly where a state/tribe has approved hydrologic flow criteria in their WQS, EPA considers 40 CFR 131.10(b) to apply.

[7] A network model using the Strahler number is a simple approach (e.g., the point at which the flowing water body segment with a Strahler number n flows into another water body with a Strahler number n+2) that may be useful. (Strahler, A. N. (1957), "Quantitative analysis of watershed geomorphology", Transactions of the American Geophysical Union 38 (6): 913–920)

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3, *What are possible criteria development approaches for ensuring the attainment and maintenance of downstream WQS?* for more information regarding numeric and narrative approaches to the development of upstream criteria that are protective of downstream waters.

- **Consider antidegradation requirements of downstream waters during development of upstream designated uses and water quality criteria.**

  When developing or revising designated uses and/or water quality criteria, it is important to consider antidegradation requirements of downstream waters. Consideration of "Tier 1" requirements (i.e., protection of existing uses) in downstream waters is most pertinent when the existing use of a downstream water body is "higher" or "better" than its designated use. (For example, the designated use might be "limited aquatic life" but the existing use could be described as "full aquatic life," a use that might require more stringent criteria.) In such cases, it is important to consider the existing use downstream, in addition to the designated uses and water quality criteria. One way that protection of existing uses can be facilitated is by ensuring that the designated use is revised to reflect any higher or better existing use.

  When states/tribes located upstream are evaluating their own antidegradation requirements for high quality waters, they should also consider the attainment and maintenance of the antidegradation requirements of states/tribes located downstream. Where downstream high quality waters ("Tier 2") and/or "Outstanding National Resource Waters" ("Tier 3") exist, this will likely call for coordination between upstream and downstream states/tribes to ensure that high quality downstream waters are appropriately protected.

3. What are possible criteria development approaches for ensuring the attainment and maintenance of downstream WQS?

Adoption of narrative criteria or numeric criteria (or both) that are protective of downstream waters are viable options under 40 CFR 131.10(b). States/tribes have discretion in choosing their preferred approach. The EPA expects that many states/tribes will consider using a combination of narrative and numeric criteria depending on their circumstances.

In some situations, a broad narrative criterion approach may be advantageous, as such an approach is quickly and easily developed and provides basic legal coverage for a variety of water bodies and pollutants or hydrological flow alteration. Narrative criteria approaches are adaptive, allowing for protection of downstream WQS in a changing environment where loads (either pollutant concentrations or hydrologic flows or both) from different sources may change over time. States/tribes may also wish to consider a more tailored narrative criteria approach that is specific to their unique circumstances (e.g., for certain water body types or certain pollutants). A state/tribe could have several tailored narratives that, for example, include a narrative criterion for streams to protect downstream lakes or a narrative criterion that is specific to recreational criteria where the downstream jurisdiction has adopted more stringent criteria. Tailored narratives may include more details to guide implementation programs, such as including language on whether the state/tribe intends to protect downstream waters through utilizing mass balance or modeling approaches or describing the spatial extent to be covered by the provision.

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The EPA's narrative downstream protection criteria templates[8] may be used to assist states/tribes in developing either broad and/or tailored narratives. However, it is important to note that a broad narrative criterion approach (and to a lesser extent, a tailored narrative criteria approach) does not obviate the need to interpret the narrative standard quantitatively in permits or TMDLs, as such an approach does not provide the same degree of specificity regarding specific endpoints as compared to a numeric criteria approach.

Numeric criteria approaches to downstream protection are more straightforward in terms of implementation in permits, assessment of waters, and TMDLs and will likely reduce workload on these programs. However, numeric criteria tend to be more data- and analysis-intensive to develop and would thus likely impose an additional workload on state and tribal WQS programs. Also, numeric approaches may need to be developed on a specific spatial scale (e.g., ecoregional, watershed-specific, site-specific). Additionally, the EPA recognizes that it may be resource intensive for upstream states/tribes to develop numeric criteria to ensure attainment and maintenance of all downstream WQS. As stated above, states/tribes have discretion in how to address 40 CFR 131.10(b), including the option to adopt a broad narrative downstream protection criterion, possibly in combination with one or more tailored narrative and/or numeric criteria that are specific to the unique circumstances of the pollutant and/or water body.

Where feasible, states/tribes are encouraged to adopt numeric criteria to protect downstream waters for accumulative pollutants (e.g., nutrients, bioaccumulative toxics).

Although the criteria approaches described below are not exhaustive, states may consider and use one or more of the following approaches to ensure attainment and maintenance of downstream WQS[9].

a. NARRATIVE APPROACH

- **Adoption of one or more narrative upstream criteria that are protective of downstream waters, pursuant to which assessment can be performed and control actions can be developed to ensure the attainment and maintenance of the WQS applicable to downstream waters**.
  Under this approach, one or more narrative upstream criteria can be written to reflect a quality of water that ensures the attainment and maintenance of downstream WQS. Such criteria(on) should provide a strong basis for implementation via water quality management actions (e.g., in NPDES permitting, Section 401 certification, TMDL programs, and Section 305(b)/303(d) assessment/listing programs). A broad narrative criterion may be a good option for providing basic legal coverage for downstream waters, and/or for situations where states/tribes are planning to embark on development of numeric criteria for downstream protection and need coverage in the interim. Additionally, a more tailored or customized (set of) narrative criterion(a) may be useful when site-specific or site-dependent criteria are in place, or unique water bodies or special circumstances exist downstream. Again, a narrative criterion should facilitate the establishment of effluent limitations, assessment and listing of

[8] http://water.epa.gov/scitech/swguidance/standards/narrative.cfm

[9] As a reminder, regardless of the approach(es) selected by a state/tribe, the EPA notes that to be effective for CWA purposes, criteria must be adopted pursuant to state law and approved by the EPA.

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impaired waters, and development of TMDLs, and ensure consideration of the antidegradation requirements of downstream waters. Therefore, states/tribes should consider customizing their narrative downstream protection criteria so that such criteria, and any associated translators or policies, include directions on the following:

- Applicable pollutant parameters, downstream water bodies, and/or conditions (e.g., hydrological, seasonal, or ecological conditions);
- A discussion of what are (or how to identify) the applicable stream segment endpoint(s) for permit writers to use in developing permit limits, or how such endpoints are determined;
- The use of water quality modeling to derive effluent limits in permits that ensure compliance with WQS in downstream waters; and
- Accounting for other pollutant sources when determining effluent limits, e.g., by 1) utilizing watershed models that can account for multiple pollutant sources, including nonpoint sources, and/or 2) retaining assimilative capacity for other sources downstream by using a limited percentage of the receiving water body flow.

States/tribes should also ensure that any mixing zone policy is not inconsistent with such narrative criteria[10].

b. NUMERIC APPROACHES[11]

Some of these numeric approaches are good candidates to pair with a broad narrative downstream protection criterion so that far-field downstream effects can be addressed more directly where appropriate.

- **Consider whether upstream uses are protective of downstream uses, and where appropriate, revise upstream uses and/or put in place numeric criteria to provide for the attainment of downstream uses.**
  This approach would entail identifying sensitive downstream water bodies or water body types protected by more stringent or additional numeric WQS, and considering what upstream use and/or numeric criteria would provide for the attainment and maintenance of that downstream use. There may be situations where this approach to developing numeric criteria is not appropriate, e.g., where different natural aquatic habitats lend themselves to different use designations. Upstream criteria more stringent than the criteria downstream may need to be considered when the pollutants to which they apply are accumulative (e.g., nutrients, bioaccumulative toxics).

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[10] The EPA notes that it reads the phrase "In designating uses of a water body and the appropriate criteria for those uses" in 40 CFR 131.10(b) to include mixing zone provisions as such provisions are considered general policies under 40 CFR 131.13 that are reviewed by the EPA for consistency with 40 CFR 131.11, the EPA's water quality standards implementing regulations for water quality criteria.

[11] The EPA notes that where numeric approaches rely on the use of models to establish a numeric downstream protection criterion, it is possible that if a TMDL is ultimately developed for such a water body using different or more complex modeling, there may be a need to reconcile or revisit the numeric downstream protection criterion for that water body based on the updated modeling to ensure that it remains consistent with 40 CFR 131.10(b).

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- **Establish downstream protection values at strategic locations (e.g., according to prioritization considerations under Question 2) using water quality modeling applications.**
  Watershed and water quality modeling can be used to determine numeric criteria that the EPA refers to as downstream protection values, or DPVs. DPVs are numeric water quality criteria (with magnitude, duration, and frequency), developed in tandem with upstream criteria and designated uses, which are derived to ensure attainment and maintenance of downstream WQS. States/tribes may choose to establish DPVs at strategic locations, such as the mouths of specific tributaries to estuaries, lakes or rivers, or other locations where numeric water quality criteria may be key to efficiently protecting downstream water quality through effective management decisions upstream (e.g., derivation of effluent limitations, via modeling, to prevent exceedance of the DPV).

  An example of this approach can be found in the DPVs for nutrients that the EPA developed for Florida streams that protect downstream lakes from the associated effects resulting from eutrophication[12]. The pour point to a more sensitive downstream water body is a natural choice for a location at which to measure water quality, and all contributions from the stream network above this point in a watershed may affect the water quality at the pour point. DPVs may also be established in upstream locations to represent sub-allocations of the total allowable loading or concentration. Such sub-allocations may be useful where there are differences in hydrological conditions and/or pollutant sources in different parts of the watershed.

- **Use water quality modeling approaches to determine what upstream criteria ensure the attainment and maintenance of the WQS in downstream waters.**
  Numeric water quality criteria that are protective of downstream waters can foster clear and effective cross-program and cross-jurisdictional communication, consistency, and efficiencies. When developing upstream criteria that are protective of more sensitive or at-risk downstream waters, this option would entail first identifying one or more of the following:
    - Downstream water bodies subject to more stringent or additional WQS;
    - Downstream water bodies in which specific pollutants will accumulate or transform; and
    - The relevant standard(s) of those waters in a downstream state, tribe, or territory.

  Once downstream water bodies are identified, watershed and/or water quality modeling (using modeling applications such as WASP[13], AQUATOX[14], BASINS[15] and BATHTUB[16]) can be performed to determine upstream criteria that will provide for the attainment and maintenance of the downstream WQS. When determining whether and how to model the

[12] U.S. EPA 2010, EPA-HQ-OW-2009_0596; FRL-9228-7, Signed Nov. 14, 2010; and 40 CFR 131.43(c)(2)(ii)
[13] http://www.epa.gov/athens/wwqtsc/html/wasp.html
[14] http://water.epa.gov/scitech/datait/models/aquatox/index.cfm
[15] http://water.epa.gov/scitech/datait/models/basins/index.cfm
[16] Walker, W. W. Jr., 1996, Simplified Procedures for Eutrophication Assessment and Prediction: User Manual," Vicksburg, MS: U.S. Army Corps of Engineer Waterways Experiment Station, Instructional Report W-96-2 (updated April 1999).

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downstream levels and effects of a pollutant, some technical considerations include: the type of pollutant, chemical/physical/biological effects of the pollutant, fate and transport/in-stream processes, seasonality, sources of dilution, and synergistic or cumulative effects with other sources/tributaries.

If use of a water quality modeling application is infeasible, it can be useful to develop a simple mass balance model by mapping the streams within the watershed being considered. To help determine what upstream criteria will be protective of downstream standards, consider using field data (or data from national databases such as the EPA's Water Quality Portal[17] and NPDAT[18]) or estimates (e.g., from NHDPlus Version 2[19], Manning equation, other applicable equations, etc.) of flow volume and velocities, monitoring data on pollutant concentrations, and available information on fate and transport characteristics (e.g., decay factors or attenuation coefficients).

- **Use other approaches to develop numeric criteria that are protective of downstream uses, where data or resources are insufficient to support water quality modeling.** If sufficient data or resources are not available, approaches that do not require water quality modeling can be used to develop criteria that are protective of downstream uses. These approaches are:
    - Use the criterion of the downstream water body as the criterion applicable at the pour point of the upstream tributary into the downstream water body.
    - Use regression or other statistical methods to relate downstream pollutant concentrations to upstream pollutant concentrations and determine the upstream concentration protective of the downstream WQS.
    - Derive a reference condition-based criterion by using stream loads or concentrations that are spatially linked to and temporally coincident with the downstream water body during periods when that downstream water body is attaining its designated use or water quality goal (e.g., existing water quality).

An example of the third approach can be found in the Delaware River Basin Commission's (DRBC's) Special Protection Waters Program. In that program, to prevent degradation of existing water quality in the Delaware River Basin, DRBC characterized the existing water quality at 'control points' on select tributaries near their pour points to the Delaware River (called Boundary Control Points, or BCPs) and on the Delaware River itself (Interstate Control Points, or ICPs)[20]. The BCPs represent water quality from tributary watersheds and the ICPs integrate information on the water quality of their cumulative upstream tributary drainage. This design facilitates the calculation of permit limits, via modeling, that protect receiving water quality as well as the quality of downstream sections of the Delaware River. Segmentation of the Delaware River basin into manageable, site-specific control points also aids the design of monitoring plans to evaluate the effectiveness of controls.

[17] http://www.waterqualitydata.us/
[18] http://www2.epa.gov/nutrient-policy-data/nitrogen-and-phosphorus-pollution-data-access-tool
[19] http://www.horizon-systems.com/nhdplus/NHDPlusV2_home.php
[20] http://www.state.nj.us/drbc/library/documents/LDeligibilitySPWfinal-rpt.pdf

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4. What other flexibilities, tools, and approaches are available for states/tribes to consider?

- **When protection of downstream WQS results in more stringent upstream criteria values, variances can be one mechanism for attaining protective criteria over time.** The federal WQS regulation at 40 CFR 131.13 authorizes states, at their discretion, to "include in their [s]tate standards, policies generally affecting their application and implementation, such as mixing zones, low flows and *variances*. Such policies are subject to EPA review and approval." (emphasis added). The EPA describes a variance as a time-limited change to designated use and criteria that targets a specific pollutant(s), source(s), and water body(ies) and/or water body segment(s)[21]. Variances are different from revisions to designated uses in that variances are time-limited and intended to provide time for states, dischargers, and/or other stakeholders to implement adaptive management approaches to improve water quality and ultimately attain the designated use[22].

  As discussed in the response to Question 2, 40 CFR 131.10(b) does not require a state/tribe to retain a use in an upstream segment that has been demonstrated through a use attainability analysis to be unattainable, solely to satisfy the requirement of 40 CFR 131.10(b). Where an upstream use is demonstrated to be unattainable because the water quality necessary to support the use cannot be achieved, then the attainable water quality and consequently the attainable use in the downstream segment may also be limited by the attainable water quality in the upstream segment, taking into consideration mitigating factors such as flow, dilution, and pollutant degradation. Where an upstream use is shown to be unattainable due to physical conditions, an attainable use may be established instead, but numeric or narrative criteria should also be established that provide for the attainment and maintenance of the (potentially more stringent) water quality standards assigned to downstream waters.

  By design, a variance reflects the highest attainable uses and associated criteria[23]. The EPA recognizes that the water quality associated with the highest attainable use and criteria may still cause or contribute to an impact downstream during the time period of the variance. However, since a variance establishes a timing mechanism to ensure feasible progress is made to improve water quality towards meeting the underlying designated use and criteria, a variance is expected to only result in improving water quality over time and lessening any adverse impact to downstream water quality standards.

- **Use existing TMDLs on downstream waters to help determine what pollutant concentrations in upstream waters are expected to provide for the attainment and maintenance of downstream WQS.**

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[21] For additional information on WQS variances, also see *Discharger-Specific Variances on a Broader Scale: Developing Credible Rationales for Variances that Apply to Multiple Dischargers* (March 2013, EPA-820-F-13-012, http://water.epa.gov/scitech/swguidance/standards/library/) and the EPA's *Water Quality Standards Handbook* at http://www.epa.gov/wqshandbook as well as the background discussion on variances in the Water Quality Standards Regulatory Clarifications Proposed Rule (78 FR 54518, September 4, 2013) at http://www.gpo.gov/fdsys/pkg/FR-2013-09-04/pdf/2013-21140.pdf (see pp. 54531-54536).

[22] 78 FR 54531 (September 4, 2013).

[23] 78 FR 54533 (September 4, 2013).

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Ideally, downstream protection should be addressed in WQS prior to a TMDL being developed. However, if an established TMDL has already identified the pollutant loading rates not to be exceeded in a particular upstream water body segment or tributary in order for a downstream water body to attain WQS, this can provide useful information when considering what uses and criteria in upstream waters will provide for the attainment and maintenance of the WQS of downstream waters. States/tribes may also develop a TMDL-like analysis for an unimpaired segment. Such analyses are not subject to EPA approval or disapproval[24].

- **For current WQS, it may be useful to analyze trends in water quality in order to identify situations where adjustments to uses and/or criteria of upstream waters may be necessary to prevent future impairment of downstream water bodies exhibiting adverse trends in pollutant concentrations or hydrologic flows.**
  If water quality in downstream waters is trending over time towards a level of pollutants (or hydrologic flows) that may lead to exceedance of the applicable pollutant criteria in the future, this information can be used to preemptively identify pollutant sources (or sources of changes in hydrologic flows) and determine if one or more upstream criteria needs to be made more stringent to prevent impairment of the downstream water body(ies).

- **Consider stream order as a basis for protecting downstream WQS.**
  Protecting and restoring headwaters and lower order streams can help maintain and/or improve downstream water quality. Water quality managers may want to consider stream order as one factor in prioritizing their resources and deciding where and when to focus their efforts.

[24] Clean Water Act section 303(d)(3) provides "For the specific purpose of developing information, each State shall identify all waters within its boundaries which it has not identified under paragraph 1(A) and 1(B) of this subsection and estimate for such waters the total maximum daily load with seasonal variations and margins of safety, for those pollutants which the Administrator identifies under section [304(a)(2)] as suitable for such calculation and for thermal discharges, at a level that would assure protection and propagation of a balanced indigenous population of fish, shellfish, and wildlife."

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