Comments and Agency Responses on the Draft 2016 Methods Document

Comments and Agency Responses on the Draft 2016 Methods Document (December 2015)

This constitutes the New Jersey Department of Environmental Protection's (Department) response to comments submitted during the public comment period for the document entitled "2016 Integrated Water Quality Monitoring and Assessment Methods" (Methods Document), December 2015, which was published on the Department's website at http://www.state.nj.us/dep/wms/bears/docs/2016_draft_methods.pdf on February 16, 2016. A public notice seeking comments on the draft 2016 Methods Document was also published in the New Jersey Register on that date. The draft 2016 Methods Document was also made available upon request. The following organizations (listed alphabetically) submitted written comments on the draft 2016 Methods Document:

1. Thomas Amidon, Kleinfelder (on behalf of Montgomery Township, Rockaway Valley Regional Sewerage Authority (RVRSA), Somerset Raritan Valley Sewerage Authority (SRVSA), and Stony Brook Regional Sewerage Authority (SBRSA)), Research Park, 321 Wall Street, Princeton, NJ 08540 (**K**)
2. Peggy Gallos, Association of Environmental Authorities, 2333 Whitehorse-Mercerville Road Suite 2 Mercerville, NJ 08619-1946 (**AEA**)
3. Brent Gaylord, U.S. Environmental Protection Agency, Region 2, 290 Broadway, New York, NY 10007 (**EPA**)
4. William Kibler, Raritan Headwaters Association, P.O. Box 273, Gladstone, NJ 07934 (**RHA**)
5. Jeff Tittel, Sierra Club, New Jersey Chapter, 145 West Hanover St., Trenton, NJ 08618 (**SC**)

The following is a summary of comments on the draft 2016 Methods Document, December 2015 and the Department's responses to those comments. The initials in parentheses at the end of each comment identify the corresponding commenter(s) from the list above.

General Comments

1. **Comment:** A thirty-day period in which to review and comment on the draft Methods Document is inadequate. DEP should have provided for a 90-day review period. DEP must ensure that the 2016 Integrated Water Quality Report process allows for adequate public review and comment, which means a minimum of 90 days to review the draft report when it is prepared. When the 2018 draft Methods Document is prepared, DEP should allow at least 90 for review and comment. (RHA)

   Response: The comment refers to both the draft Integrated Water Quality Assessment Methods (Methods Document) and the Integrated Water Quality Assessment Report (Integrated Report); however, the public review is limited to the draft 2016 Methods Document since the draft 2016 Integrated Report is not yet published. The Methods Document describes the data quality requirements and scientific methods used by the Department to evaluate surface water quality data and assess compliance with surface water quality standards and support of designated uses, as well as the rationale for placement of

pollutants and assessment units on the 2016 303(d) List of Water Quality Limited Waters (303(d) List) and the placement of assessment units and designated use assessment results on the 2016 Integrated List of Waters (Integrated List). The Methods Document, Integrated List and the 303(d) List are key components of the Integrated Report.

The Methods Document is revised by the Department as needed to refine data quality requirements, assessment methods, or to address new surface water quality standards or policies for each 303(d) listing cycle (i.e., every two years). There was only one substantive change made to the 2014 Methods Document for the 2016 cycle, which was explained in Section 1.2 "Summary of Major Changes from the 2014 Methods Document – Biological Assessments for Aquatic Life Designated Use": "Whereas the previous listing methodology only listed biological impairments when there were no other aquatic life based chemical/physical impairments in an AU, the new method lists all biological impairments on the 303(d) List regardless of other aquatic life based chemical/physical impairments." The Department does not agree that such a limited change to the Methods Document requires a 90-day review period.

2. **Comment**: New Jersey has not been doing what it should be to manage waterways using the most up-to-date science. The Drinking Water Quality Institute has not met for more than five years and New Jersey hasn't updated their Water Supply Master Plan for 20 years. When you don't do a proper characterization of our watersheds and waterways, then you can't meet the standards of the Clean Water Act to make all of our Rivers and Streams, swimmable, fishable and drinkable. By denying science and not using the right criteria, you're denying the change of the people of New Jersey to have clean water. (SC)

3. **Comment**: This report is only a snapshot of our water but does not include the impacts from current policy rollbacks. The weakening of regulations such as the Flood Hazard Rules and Water Quality Planning Rules will mean further impairments and more pollution in our waterways. The proposed Water Quality Planning Rules will allow for the extension of sewers and more development in environmentally sensitive areas. This will lead to impairment and water quality issues. The proposed Flood Hazard Rules will eliminate important buffers and critical headwater protections for C1 streams as well as Special Water Protection Areas (SWRPA). Eliminating buffers, especially the 300-foot ones on C1 streams, violates the anti-degradation criteria of the Clean Water Act because it will add more pollution to high quality streams. We should be strengthening our water protections across the state, not weakening them. (SC)

4. **Comment**: Many of our rivers, such as the Raritan, have yet to have an approved, let alone implemented, TMDL. High quality water conditions are getting worse. We believe that this violates the Surface Water Quality Standards. This is also a violation of the anti-backsliding criteria of the Clean Water Act. Today only 205 miles, or 2.5%, of New Jersey's stream segments meets all designated uses. When you look at the 958 watersheds, only 14, or 1.46% are designated to meet all uses. The only one watershed in the entire state to do so is the Flat Brook. The rest are segments of certain streams. The drop in the quality of our waterways is precipitous and indicative of continuing degradation. (SC)

Response to Comments 2 through 4: These comments are beyond the scope of the Methods Document. The Methods Document and Integrated Report are prepared to meet the federal Clean Water Act requirements of assessing the health of the State's waters, identifying waters that are impaired and the causes of impairment, and prioritizing impaired waters for development of Total Maximum Daily Loads (TMDLs) or other restoration measures. Implementation of water quality protection and restoration falls under the purview of other Department programs in accordance with other state and federal mandates, including sections of the Clean Water Act as well as the New Jersey Water Pollution Control Act and the New Jersey Water Quality Planning Act. A complete description of these programs and how they work together to meet federal and state goals of protecting, enhancing and restoring waters of the State is provided in the New Jersey Continuing Planning Process document, which is posted on the Department's website at http://www.nj.gov/dep/wrm/docs/cpp.pdf .

5. **Comment**: Section 1.2 on page 2 states: "The new method lists all biological impairments based on macroinvertebrate and fish data on the Integrated List and 303(d) List which would be represented by "Cause Unknown – Impaired Biota." Whereas the previous listing methodology only listed biological impairments when there was no other aquatic life based chemical/physical impairments in an AU, the new method lists all biological impairments on the 303(d) List regardless of other aquatic life based chemical/physical impairments." This is a sensible improvement, since it is not technically justified to assume that any impairment to the macroinvertebrate community is caused by the co-occurrence of a chemical impairment. (K)

   Response: The Department appreciates the commenter's support.

6. **Comment**: Changing the testing methodology makes it hard to compare the data from year to year. We have been able to chart the decline of our water quality over the past 40 years but these changes will make future data harder to compare. With this data, we were able to show that during the 1990's the sprawl line moved further west threatening the Highlands. Because of that we were able to secure more protections like Category one stream upgrades, stream buffers, and the Highlands Act. By changing these standards, we are rolling back protections. (SC)

7. **Comment**: We believe that the 2014 Integrated Report 303(d)/305(b) list does not truly represent the danger that New Jersey's waterways face from pollution. The drop in the quality of our waterways is precipitous and indicative of continuing degradation. We should not be delisting waterbodies that are still impaired due to a change in listing criteria. Now is not the time to be weakening standards for protecting our waterways and addressing the pollution that impacts them. We urge the DEP to reevaluate the criteria used for waterway assessment as a means to better reflect the quality of our waterways. (SC)

8. **Comment**: The commenter believes that the 2014 Integrated Water Quality Assessment 303(d) list does not properly reflect the conditions of New Jersey's waterways. In many parts of the state, water pollution is getting worse and water quality is deteriorating. By changing the criteria for listing waterways, this leads to a misrepresentation of the data and can be harmful to our waterways. Waterbodies were removed, not because they are no longer

impaired, but because the criteria changed. Changes include removing a waterway that a TMDL is being written for, even if it is not being implemented and excluding pollution from unknown and natural sources, such as arsenic. The commenter urges a reevaluation of methodology because the newest change in criteria does not give an accurate characterization of our waterways. This creates difficulties in protecting and managing our waterways. This is a major rollback to clean water protections and can have significant impacts on public health. (SC)

Response to Comments 6 through 8: Changes to the water quality standards included at N.J.A.C. 7:9B are based on the most up-to-date, scientific information and are accomplished through formal rulemaking. These changes must go through a formal public comment period as well as to EPA for approval (see EPA's website at http://water.epa.gov/scitech/swguidance/standards/cwa303faq.cfm). Once new/revised criteria are adopted, water quality data are re-assessed based on the adopted criteria. Waterbodies that meet the new criteria are not impaired and should not be included on the 303(d) list. Although it is recognized that the changes to standards can complicate the ability to detect trends, it is the Department's goal to determine water quality conditions as accurately and precisely as possible with current water quality data, information, tools, and standards.

Regional Comprehensive Assessment

9. **Comment**: The new Regional Comprehensive Assessment described in Section 2, in which the Department will focus more intensive evaluation on the Raritan Water Region for the 2016 assessment, is ambitious and promising. The Barnegat Bay Ten-Point Action Plan provided a template for the Atlantic Coastal Region. No such plan is offered for the Raritan Water Region assessment. Will the Department be developing and implementing a Comprehensive Assessment Plan for the Raritan Water Region? (K)

   Response: The Department shifted to the Regional Comprehensive Assessment approach in the 2014 assessment cycle. The Department's prioritization of the Atlantic Coastal Region for the 2014 Integrated Report was based, in part, to take advantage of the significant efforts dedicated to the Barnegat Bay under Governor's Action Plan and the large amount of data generated by the intensive monitoring conducted by the Department and the Barnegat Bay Partnership. The Department's prioritization of the Raritan Water Region for the 2016 Integrated Report was similarly based on the efforts already underway and the data generated for development of the Raritan TMDL. Although the Barnegat Bay Action Plan can serve as a template for future approaches to restore, protect and maintain water quality in the other regions of the State, the Barnegat Bay is unique in being identified as statewide priority by the Governor and we do not expect the same level of resources to be available to replicate the Barnegat Bay Action Plan in every region. For the Raritan Region, the Department has initiated plans to collaborate with stakeholders within the region to synchronize strategies and efforts throughout the Raritan to effectively restore, protect, and maintain water quality.

10. **Comment**: Page 3: "Through this comprehensive assessment process, the Department aims to systematically enhance the process to identify water quality issues with improved

confidence in listing decisions, using robust datasets and multiple lines of evidence, in a selected water region each listing cycle." Has any decision been made on the *order* of the five regions that will be studied intensively, one region per two-year cycle? (EPA)

Response: Under the Regional Comprehensive Assessment approach, the Department will conduct a streamlined assessment of statewide water quality along with a more comprehensive, detailed assessment of water quality rotating through New Jersey's five water regions. The focus regions are listed in order in Section 2.0 of the Methods Document, i.e., Atlantic Coastal (2014), Raritan (2016), Lower Delaware (2018), Upper Delaware (2020) and Northeast (2022).

11. **Comment**: Although only one region will be studied intensively each cycle, monitoring will still be performed throughout the State (Page 6). Can it be assumed that the proportion of monitoring done by *NJDEP* will be minimal in AUs outside the selected region compared with its monitoring within the selected region? Will *any* monitoring be done by DEP outside the selected region? (EPA)

    Response: While the focus of the comprehensive assessment process is more in-depth analysis in the primary region, the Department is also working to general more robust data to inform that analysis. The Department will continue to maintain its existing statewide monitoring networks while employing intensive or targeted regional monitoring efforts in the primary region. Additionally, it is expected that our monitoring partners will continue their efforts within or outside of the primary region.

12. **Comment**: NJDEP operates several probability-based (statistical) monitoring networks. The use of these data in the assessment and reporting process should be discussed. The stream statistical network should have been sampled for the 5-year period that its design required. Areal estimates from state-wide probability networks also are useful to provide a statistical "reality check" of the percentages of impaired and not impaired waters derived from non-probability networks. (EPA)

    Response: As stated in the draft 2016 Methods Document, "The Department reviews all existing and readily available data in assessing water quality (see Section 3.0), which includes all data generated from the probability-based monitoring networks. The Department does not agree that the probability-based monitoring networks "provide a statistical 'reality check' of the percentages of impaired and not impaired waters derived from non-probability networks" since the two monitoring networks are designed to meet different objectives. USEPA guidance indicates that states should base their water quality assessment on the most robust dataset available and, in New Jersey, the data compiled for the integrated assessment is much more robust than that generated through the probabilistic network. In fact, USEPA developed the requirement for probabilistic network (also referred to as "statistical surveys") to provide an overall assessment of statewide water quality to supplement states that had inadequate monitoring resources to assess water quality with an acceptable degree of confidence in the results. New Jersey's various monitoring networks, as well as the data provided by our monitoring partners, provide a robust and comprehensive data set to evaluate the waters of the State with a high degree of confidence. Data from the probabilistic

monitoring networks are used to generate statistical estimates of statewide water quality conditions necessary to populate USEPA's statistical surveys of national water quality. Thus, the Department considers the statistical surveys to be supplemental to the integrated assessment process, rather than a "reality check" of our assessment results, and are not reported separately in accordance with USEPA requirements. The results of the statistical surveys for New Jersey waters can be found on the USEPA ATTAINS website at https://ofmpub.epa.gov/waters10/attains_state.control?p_state=NJ.

Use and Interpretation of Data

13. **Comment:** The Raritan Headwaters Association (RHA) - like its two predecessor organizations, the South Branch Watershed Association (SBWA) and the Upper Raritan Watershed Association (URA) - collects data from its stream monitoring sites annually. The draft 2016 Integrated Report will rely on data from 2010 to 2014. Will RHA (or, prior to 2011, SWA and URA) data from every year from 2010 to 2014 be used? If not, why not? The monitoring network established by RHA is extensive, currently including 62 monitoring sites. Will data from all RHA monitoring sites be used, or only select data? If only select data will be used, why? And what data will be excluded, if any? (RHA)

    Response: The Department has used the South Branch Watershed Association (SBWA) and the Upper Raritan Watershed Association (URA) macroinvertebrate data in prior Integrated Reports. For the 2016 Integrated Report, The Department will review all readily available data collected between January 1, 2010 and July 1, 2015 to ensure that they meet the data quality and other requirements specified in the Methods Document. We anticipate that the RHA macroinvertebrate data collected between 2010 and 2015 will meet these requirements and be used for the 2016 Integrated Report.

14. **Comment**: Section 3.1 of Methods states, "Accurate locational data are required to ensure comparison to appropriate Surface Water Quality Standards (SWQS), as well as confirming that sampling stations are located outside of regulatory mixing zones." What does "regulatory mixing zones" refer to? (EPA)

    Response: As defined at N.J.A.C. 7:9B-1.4, 'Regulatory mixing zones' are areas of surface water established for the purpose of initial mixing, dispersion, or dissipation of wastewater effluent at or near a discharge point. The SWQS allow water quality criteria to be exceeded within established regulatory mixing zones but require that criteria be met at the edge of the regulatory mixing zone (see N.J.A.C. 7:9B-1.5(h)); therefore, locational data are required to ensure that the criteria are being applied appropriately, as explained in the Methods Document.

15. **Comment**: Testing should be done below roadway crossings to determine the amount of runoff pollution that is impacting the stream. Testing above roadway crossings will exclude that data. Further, testing should not be done outside the mixing zone as this allows the discharge to fully merge into the main body, resulting in diluted readings. (SC)

Response: It is the objective of the Integrated Report to determine overall ambient water quality and the sampling methods suggested by the commenter would be more appropriate for trackdown studies and/or targeted monitoring to identify specific causes and sources of pollution. Also see response to Comment 14 to address monitoring at regulatory mixing zones.

16. **Comment**: Page 10, 1st paragraph: The volunteer monitoring data link takes reader to a page that hasn't been populated yet ("coming soon"). (EPA)

    Response: This statement has been corrected to refer to USEPA QAPPs for Citizen Science Projects at https://www.epa.gov/citizen-science/quality-assurance-project-plan-citizen-science-projects.

17. **Comment**: Section 3.2, page 10 – "Antidegradation Policy" states that, "Designated uses shall be maintained or, as soon as technically and economically feasible, be supported wherever these uses are not precluded by natural conditions." How are technical and economical feasibilities determined? (EPA)

    Response: This statement in Section 3.2 refers to the Antidegradation Policy established in the Surface Water Quality Standards (SWQS) rules at N.J.A.C. 7:9B-1.5(d)1. Additional information about this antidegradation policy is available on the Department's website at http://www.state.nj.us/dep/wms/bears/antidegradation.htm and in the SWQS (see http://www.nj.gov/dep/rules/rules/njac7_9b.pdf). The Department's Division of Water Quality uses the technical and economical feasibilities determination outlined in the EPA's 1995 Interim Economic Guidance for WQS, https://www.epa.gov/sites/production/files/2016-03/documents/econworkbook-complete.pdf

18. **Comment**: Page 10 states, "Lists of Water Quality Limited Waters (303(d) Lists) are required to include all "threatened and impaired" waters. "Threatened waters" are waters that currently meet water quality standards but are likely to exceed standards by the time the next 303(d) List is generated." Is it correct to say that a "threatened" water body is one where the anti-degradation policy is soon to be violated? (EPA)

    Response: No, "Threatened waters" are defined in the Methods Document as "waters that currently meet water quality standards but are likely to exceed standards by the time the next 303(d) List is generated. This definition is based on USEPA guidance, which recommends listing waters as threatened if "… analysis demonstrates a declining trend in a specific water quality criteria (WQC), and the projected trend will result in a failure to meet a criterion by the date of the next list…" Waters are identified as "threatened" through the assessment of ambient water quality data over time and then placed on the 303(d) List where long-term declining trends indicate an exceedance of water quality criteria within the next two years whereas the antidegradation policy is applied when evaluating the potential impact on designated uses from new activities, such as new or expanded discharges from wastewater treatment facilities, which may be denied or otherwise precluded based on the projection that the designated use will be impaired by the activity.

Assessing threatened waters requires sufficient existing and readily available data and information on adverse declining trends to predict future water quality. This means a dataset must be sufficiently robust to support the evaluation of short-and long-term statistical trends. The Department maintains a series of long-term monitoring locations, which support statistical trends assessments developed by the USGS. Assessments to determine if waters are threatened are conducted by the Department wherever sufficient data and trends assessments are available to make such predictions. To date, there has been insufficient data to support an assessment of any waters of the State as "threatened"; however, the Department is developing an assessment tool to help detect trends that may support listing waters as threatened on future 303(d) Lists.

19. **Comment:** The proposed section of Sublist 1, called "Stressed" was not included in the Methods Document. Did NJDEP decide to not add this to the methods for the 2016 reporting cycle?

    Response: The Department considered proposing a "Stressed" subpart of Sublist 1 for waters that show declining water quality but are not expected to exceed applicable water quality criteria in the next listing cycle. This concept was discussed with USEPA; however, we did not include it in the draft 2016 Methods. The Department will continue to explore this option and may propose it in a future Methods Document.

Narrative Water Quality Criteria: Toxics

20. **Comment**: Section 3.2, page 11 – "Narrative Water Quality Criteria" – According to the second narrative criteria for toxics, "Toxic substances shall not be present in concentrations that cause acute or chronic toxicity to aquatic biota, or bioaccumulate within the organism to concentrations that exert a toxic effect on that organism or render it unfit for human consumption." In addition to fish, should this statement be applicable to other aquatic organisms used as a food source (shellfish, crabs ….)? Is there a potential for these other species to contain enough toxic substances to be a cause of concern? (EPA)

21. **Comment**: Section 6.0, page 26 – Table 6.0: "Minimum suite of parameters needed to determine use is fully supporting" – should potential for toxics be monitored for shellfish consumption in addition to monitoring for pathogens? (EPA)

    Response to 20 and 21: The narrative criteria for toxics does apply to other aquatic organisms besides fish such as shellfish and crabs. As explained in Section 6.4 of the Methods Document, the Department determines shellfish classifications based on sampling data and assessment procedures based on the National Shellfish Sanitation Program (NSSP), which establishes sampling and storage methods and acceptable thresholds for counts of fecal coliform bacteria in molluscan shellfish. However, toxins can prohibit shellfish harvesting if tissue data from molluscan shellfish verify violations of FDA criteria. From 2005 to 2009, the Department conducted a shellfish study for metals, pesticides and PAHs (not published) that showed no violations of FDA criteria for human consumption. This study covered the marine waters in the state at 125 monitoring locations and included oysters and hard clams It is believed that because of the very low lipid content in shellfish, metals and toxics do not

tend to bioaccumulate. It was recommended that future routine sampling include metals and the Department has identified it as a data gap. For the Fish Consumption Advisory Program, the Department verifies metal and toxic levels in both fish and crabs to determine consumption advisories. These advisories can be found at http://www.state.nj.us/dep/dsr/njmainfish.htm.

Narrative Water Quality Criteria: Nutrients

22. **Comment**: Page 11 of the Methods Document states: "To assess attainment of narrative criteria, which are qualitative in nature, the Department has identified assessment approaches, also known as 'translators', to quantitatively interpret narrative criteria. New Jersey's SWQS contain narrative criteria for toxics, biological assessment, nutrients, and natural conditions." While "translators" are provided for toxics and biological assessment, the Methods Document does not include any translator section for narrative nutrient criteria. Assessment of Nutrient Impacts (Section 4.4) was added to the Methods Document in 2010, utilized during the 2010 and 2012 assessment cycles, and proposed for use again in 2014 before being removed from the final version. Since 2002, the Department has made substantial technical improvements to the manner in which it applies its nutrient criteria, and to the criteria themselves, as documented in the Department's *Technical Manual for Phosphorus Evaluations* (2008); Passaic River Basin and Raritan River Basin TMDLs; Proposed SWQS Amendments, December 21, 2009; Adoption of SWQS Amendments, December 21, 2010; 2010 Methods Document; *Nutrient Criteria Enhancement Plan – 2010 Progress Report*; and *NJ Nutrient Criteria Enhancement Plan*, 2013.

    The removal of the Assessment of Nutrient Impacts reverses more than a decade of progress the Department has made in enhancing the application of its nutrient criteria. The Department leaves itself with no mechanism to evaluate whether the instream total phosphorus (TP) criterion applies to a given waterbody. A translator for narrative nutrient criteria is critical because the numerical nutrient criteria are conditional, and in fact do not apply if narrative criteria are satisfied. Given all that has been learned from more than a decade of phosphorus evaluation studies and nutrient TMDL studies, it is premature and lacking in scientific basis to designate a waterbody as impaired for aquatic life based solely on instream TP concentration, without any other indication of impairment. The commenters believe sufficient diurnal DO data exists to identify locations where the instream TP criterion does not apply and to provide a more realistic assessment of waters that may be impaired by nutrients. The Department should improve the nutrient impact assessment translator rather than eliminating it. This is a subject about which the NJDEP's Science Advisory Board and its Nutrient Work Group Committee could provide useful advice to the Department. (K, AEA)

23. **Comment**: Section 3.2, page 11 – Nutrients are listed as one of the narrative water quality criteria, applicable to all waters of the state. While other narrative parameters are being discussed in the document, there is no section addressing the assessment of nutrients in this draft document. (EPA)

24. **Comment**: Throughout New Jersey, many important waterbodies and streams are impaired by nutrients such as nitrogen and phosphorus. For example, at least 65% of our waterways are impaired for phosphorus. Since we don't have enough testing, that number could be much higher. These waters suffer eutrophication because of too many nutrients. This causes algae blooms and oxygen reduction causing hypoxia. This can lead to fish kills and a decrease in biodiversity. (SC)

    Response to Comments 22 through 24: The method for assessing impacts of nutrients on water quality and identifying where the aquatic life use was impaired due to nutrients, Section 4.4 Assessment of Nutrient Impacts was first introduced in the 2010 Methods Document. However, in attempting to implement this new method over the subsequent assessment cycles, the Department determined that sufficient information was rarely available to apply this method. The Department also concluded that the nutrient assessment methodology within the context of the Integrated Report assessment process represented an over-simplification of highly complex processes. Furthermore, both the Department and USEPA determined that this methodology was not adequately protective of downstream receiving waters exposed to long-term nutrient enrichment.

    The Department has since concluded that the in-depth analysis required to assess nutrient impacts on a specific waterbody cannot be conducted as part of a statewide or regional water quality assessment but rather should be conducted as part of the TMDL process. A waterbody- or watershed-specific TMDL study would generate sufficient data and targeted analysis to evaluate impacts on an extended time-series (accounting for various flow/temperature scenarios) through modeling. The removal of Section 4.4 (Assessment of Nutrient Impacts) from the Methods Document is consistent with the Department's current approach to determining nutrient impacts through water quality modeling, sampling and detailed analysis conducted for TMDL development, which will enable an improved understanding of nutrient impacts on water quality in specific waterbodies. The Department has established nutrient TMDLs for the non-tidal portions of the Passaic River Basin and the Raritan River Basin, as well as numerous rivers and lakes throughout the State (see "Table of New Jersey TMDLs and Approval Status" on the Department's website at http://www.state.nj.us/dep/wms/bears/tmdls.html).

    The Department's strategy to address the nutrient issue is provided in the 2013 New Jersey Nutrient Criteria Enhancement Plan (NCEP) where a detailed description for enhancing the existing nutrient criteria for freshwaters and developing new nutrient criteria for coastal waters through an assessment of the complex relationships. Nutrient criteria, which may include numeric criteria and numeric translators of narrative criteria, will be developed to address existing and future nutrient-related impairment in New Jersey waters. The 2013 NCEP is located on the Department's website at http://www.state.nj.us/dep/wms/bears/nutrient_criteria.htm.

Narrative Water Quality Criteria: Natural Conditions

25. **Comment**: On page 6, the Department commits to a number of steps in order to ensure "data quality and relevance to increase confidence in assessment decisions." Among these steps,

the Methods Document states that the Department will "identify where water quality is due to natural conditions." Despite this assurance, no methodology for making this determination is provided. Without a methodology to account for natural occurrence, the Methods Document will result in a significant number of false positive assessments of impaired waters for arsenic, pH, dissolved oxygen, and temperature. (K)

26. **Comment**: While the Methods Document sets forth steps designed to "… identify where water quality is due to natural conditions," (Page 6) the Methods Document lacks any methodology for determining that a pollutant is due to naturally occurring conditions. Without a methodology to account for natural occurrences of pollutants, utilization of the Methods Document will result in a significant number of waters being designated as impaired, when these waters merely reflect natural conditions. Parameters typically subject to being misidentified as "impairments" from sources, that are actually an artifact of naturally occurring conditions, are arsenic; pH; dissolved oxygen; and temperature. (AEA)

27. **Comment**: Section 3.2, page 10 – "Antidegradation Policy" states that, "Designated uses shall be maintained or, as soon as technically and economically feasible, be supported wherever these uses are not precluded by natural conditions." Is there a mechanism in place to determine "natural conditions"? (EPA)

28. **Comment**: Given the likelihood that criteria excursions for low pH, low dissolved oxygen, arsenic, and temperature might be due to natural conditions, the Department should utilize List 3 (Insufficient Data) for assessment of these parameters until a determination of natural condition can be made. (K)

29. **Comment**: Low dissolved oxygen is often naturally occurring due to mucky stream bottoms in sediment accumulation areas as well as natural wetland complexes; the lower Millstone River provides an example of the former, while the wetland complexes in the upper Passaic River basin (i.e., Great Swamp, Troy Brook meadows, Pine Brook meadows, and the Great Piece meadows) provide examples of the latter. The Methods Document provides no means of assessing whether a low dissolved oxygen occurrence is naturally occurring or not. (K)

30. **Comment**: In the case of temperature, many of the temperature "impairments" may actually reflect natural conditions, as acknowledged by the Department in its draft 2014 Integrated Report. We recommend the Department include temperature impairments in segments without any thermal discharge on List 3 until an in-depth analysis of natural conditions is performed. (K)

Response to Comments 25 through 30: The Surface Water Quality Standards (SWQS) at N.J.A.C 7:9B-1.5(c) state, "Natural water quality shall be used in place of the promulgated water quality criteria of N.J.A.C. 7:9B-1.14 for all water quality characteristics that do not meet the promulgated water quality criteria as a result of natural causes." Section 3.2 of the Methods Document provides examples of "natural causes" (i.e., natural conditions) as locations where underlying conditions (e.g., geology, hydrology) influence the water chemistry and there are no anthropogenic sources or potential anthropogenic sources are determined not to be sources of the pollutant in question. The Methods Document also

explains that data which do not meet applicable SWQS criteria potentially due to natural conditions will be carefully evaluated and any excursions attributed to natural conditions will be documented. This evaluation has been conducted on a case-by-case basis based on the weight of evidence and best professional judgment. The Department takes a conservative approach when determining if natural conditions are the cause of suspected impairment. Conclusive data and information must verify that anthropogenic sources are not contributing to or causing the impairment of a waterbody. If any anthropogenic sources impact a waterbody, then the Department must have data confirming that the pollutant of concern is solely contributed by a natural source(s). If data is not available to conclude a criteria exceedance is natural, the Department will continue to place the impairment on the 303(d) List. Assessment units cannot be placed on Sublist 3 when there is sufficient data available to determine non-support of a designed use – even if uncertainty exists regarding the source or cause of the use impairment. Pollutants that exceed the applicable water quality criteria must be placed on Sublist 5/303(d) List unless there is sufficient information to determine conclusively that the source of the pollutant and/or the cause of the impairment is "natural conditions", as explained above. The Integrated Report will include documentation of all "Decisions to Not List Assessment Unit/Pollutant Combinations on the 303(d) List of Water Quality Limited Waters" based on natural conditions in Appendix D.

The Department's water quality assessment and comprehensive assessment process frequently attempts to discriminate between natural and anthropogenic causes of impairment. Both natural and anthropogenic sources could lead to DO, temperature, pH, and arsenic criteria exceedances in a waterbody. Therefore, a full assessment of natural causes may not be possible without additional TMDL or Watershed Restoration Plan evaluations. USEPA guidance establishes a very high threshold for confirming naturally occurring causes of impairment, including ambient water quality data, effluent data from any NJPDES-permitted facilities, and nonpoint anthropogenic source impacts within the assessment unit. Thus, there are many cases were the Department suspects naturally occurring causes to be the source of use impairment but is unable to support delisting the pollutant without additional sampling and/or further detailed analysis. The Department may reevaluate such assessments based on additional data or more detailed analysis conducted through a TMDL or Watershed Restoration Plan when it is developed to address the impairment.

31. **Comment**: Limestone geology is being used inappropriately to delist contaminated waterbodies in Warren County. (SC)

    Response: The results of a thorough analysis of streams in Warren County showed that only one watershed with pH levels that exceed the criteria and was not listed because of natural conditions is Dunnfield Creek. This watershed is a fully forested watershed without any anthropogenic sources that would cause high pH levels. It is underlain by limestone geology that the Department has deemed as the sole source for the high pH levels. Biological indices also confirm aquatic life use is fully supporting with excellent to good conditions. Dunnfield Creek is one of 5 watersheds in the state identified as a reference site with near pristine conditions.

32. **Comment**: While the issue of false positive assessment of pH impairments was partially addressed by the revised pH criteria for freshwaters in the Atlantic Coast, Lower Delaware,

and Lower Raritan regions, there remain many impairment designations based on low pH that are very likely naturally occurring. Areas of the Lower Raritan exhibit naturally occurring pH levels well below the minimum 4.5 s.u., such as Pine Brook and Barclays Brook in the Matchaponix Brook watershed. Data were collected by Kleinfelder (and its predecessor Omni Environmental) on behalf of Western Monmouth Utilities Authority (*Pine Brook / Matchaponix Brook Phosphorus Evaluation Study*, 2005) and the NJDEP (*The Raritan River Basin TMDL: Phase I Data Summary and Analysis Report*, 2005); both studies identified the low pH as naturally occurring based on its occurrence at headwater locations throughout the watershed. Although the Millstone River lies within the Upper Raritan and is not assigned the lower pH criteria range that is assigned to the Lower Raritan watersheds, the headwaters of the Millstone River are underlain by many of the same formations that result in low pH conditions in the Matchaponix watershed. In fact, the Millstone River basin exhibits pH levels below 6.5 s.u. at many locations and under a variety of conditions. Any impairment designations based on low pH, particularly in the Millstone River Basin, should be carefully evaluated to determine whether they are merely reflective of natural conditions. (K)

Response: It is known that the headwaters of the Millstone have a lower pH range and therefore are assigned the South Jersey pH criteria of 4.5 to 7.5. This natural condition can impact the watersheds downstream in the Millstone River where pH criteria is 6.5 to 8.5. The complicated situation in the Millstone River is that there are numerous anthropogenic sources that may impact pH such as wastewater treatment point sources, urban development, agricultural activities, high nutrient loads, quarry activity, and riparian buffer degradation. These activities make it very difficult to determine natural conditions as the cause of pH violations. It is expected that most anthropogenic activities would cause pH to increase therefore the Department will review all pH violations of the low criteria very carefully. If low pH exceedances can be attributed to natural conditions, these decisions will be fully explained in Appendix D: Decisions to Not List Assessment Unit/Pollutant Combinations on the 303(d) List of Water Quality Limited Waters. See also response to Comments 25 through 29.

Narrative Water Quality Criteria: Arsenic

33. **Comment**: Arsenic was the predominant (82%) cause of water supply use impairment designations in the Draft 2014 303(d) List. The reason is that the human health criterion is 0.017 µg/L, well below levels of analytical detection, while arsenic is found at levels well in excess of the 0.017 µg/L criterion at many locations throughout the state. The Methods Document attempts to address this issue through the creation of a new sublist 5A for waters where, "Designated use is not supporting due to arsenic which is present at levels below that determined to be attributable to naturally occurring geology/soil." Unfortunately, the effort falls short for various reasons: 1) Only watersheds in the Inner and Outer Coastal Plains were assessed for whether the arsenic concentration is due to natural occurrence; 2) The range of arsenic concentrations considered natural (0.24-0.70 µg/L) is much too narrow for surface waters in New Jersey; and 3) The research referenced in the Methods Document provides many examples of total arsenic levels observed in the range of 1-4 µg/L and this is due to natural geologic sources. It is possible that dissolved carbon, some of which may be

anthropogenic in origin, may release additional natural arsenic into surface waters. Finally, legacy sources of arsenic from historic agricultural pesticide application may also impact arsenic concentrations in some surface waters. Given the uncertainties with regard to natural occurrence of arsenic, we recommend that the Department apply the drinking water MCL of 5 µg/L for arsenic as a basis for impairment designation. (K, AEA)

34. **Comment**: Sublist 5A does not belong under Sublist 5 at all. Sublist 5 is reserved for impaired waters, and exceedance of criteria due to natural occurrence is not impairment (N.J.A.C. 7:9B-1.5(c)1). This issue matters because wastewater treatment plants could end up having end-of-pipe limits for arsenic imposed because they discharge to a receiving water that is inappropriately designated as "impaired." Until the Department improves its methodology for assessing arsenic concentrations relative to natural levels, waters with arsenic concentrations above the 0.017 µg/L criterion should be assigned to List 3 (insufficient data) so that inappropriate effluent limits are not imposed on wastewater dischargers to these waters. We suggest a sublist category of 3A for waters with arsenic concentrations that might be due to natural conditions. (K)

Response to Comments 33 and 34: Section 303(d) of the federal Clean Water Act requires states to identify water quality-limited waters that require development of TMDLs because they are not meeting applicable Surface Water Quality Standards (SWQS). The promulgated SWQS for arsenic is 0.017 µg/L (see N.J.A.C. 7:9B-1.14(f)7). This standard was derived based on the potential risk to human health from exposure to arsenic in drinking water; however, in accordance with the federal Clean Water Act and the New Jersey Water Pollution Control Act, this standard is applied to ambient water quality – without consideration of cost or availability of treatment technology. The maximum contaminant level (MCL) for arsenic was also derived based on the potential risk to human health from exposure to arsenic in drinking water; however, in accordance with the federal and state Safe Drinking Water Act, the final MCL is less stringent than the health-based MCL and is based on the availability of treatment technology as well as the federally promulgated MCL for arsenic. Therefore, the Department cannot assess arsenic based on compliance with the arsenic MCL and must assess arsenic based on the promulgated SWQS of 0.017 µg/L until/unless the arsenic SWQS is amended.

USEPA's national policy does not allow human health-based criteria to be modified based on natural conditions. Currently, USEPA Region 2 is working with the Department to explore an alternative approach (other than TMDLs) to address water quality impairments caused by naturally-occurring arsenic while USEPA develops national guidance or standards for arsenic. This alternative approach would include issuance and implementation of long-term variances to the Water Quality Standards for arsenic, pursuant to the recently adopted amendments to the federal WQS rules (see 40 CFR 131). Since USEPA has the final authority to approve, remand or disapprove state 303(d) Lists under the Section 303(d) of the federal Clean Water Act, the Department cannot simply "refuse to accept EPA's policy", as suggested by some of the commenters, without risking USEPA disapproval or remand of the 2014 303(d) List and the potential withholding of funds authorized under New Jersey's Performance Partnership Agreement with USEPA Region 2. For the time being, the Department has created a new subpart of Sublist 5 for AUs that are impaired by arsenic that

is naturally occurring. AUs on Sublist 5A are considered a very low priority for TMDL development and are instead intended to be addressed by an alternative approach such as the variances mentioned earlier.

35. **Comment**: Waterbodies impacted by naturally occurring toxins should also be counted as impaired. Arsenic in our waterways will go unreported under this loophole even though this naturally-occurring toxin is also the result of human actions such as pesticide use or industrial operations. Although natural, arsenic is worse in areas of overdevelopment as high nitrate levels push the arsenic out of the soil. (SC)

36. **Comment:** The draft 2014 Integrated Report identifies arsenic as a significant cause of impairment and a primary cause of water bodies not meeting the water supply designated use (draft 2014 Integrated Report, at pages iv, 12, and 21-22). The Report ascribes this arsenic "to naturally-occurring concentrations of arsenic" (draft 2014 Integrated Report at page iv). Although there have been studies to determine a range of naturally occurring arsenic from geology and soil in the Inner and Outer Coastal plains, the Methods Document does not provide a range of parameters for "naturally occurring" levels of arsenic in the Piedmont and Highlands. How are TMDLs being addressed for arsenic in the Highlands and Piedmont? (RHA)

37. **Comment:** Recent reports suggest that historical use of arsenical pesticides may be a significant contributor of arsenic in surface water, especially outside the Piedmont physiographic region (see, "Distribution of Arsenic in the Environment in New Jersey", Vowinkel, et al.). How does DEP determine whether arsenic in surface water is naturally occurring or from anthropogenic sources? (RHA)

38. **Comment:** Even if arsenic is naturally present in the bedrock and soils that does not mean that the concentrations in ground and surface water do not change due to potential changes in chemistry from anthropogenic activities, especially urbanization or changing agricultural practices. Our long-term data on ground water in the Piedmont suggest that arsenic concentrations are increasing. Although naturally-occurring deposits of arsenic may be contributing to arsenic impairments, an increase in arsenic concentrations would not be explained by "natural causes". Has DEP examined potential mechanisms causing arsenic to be mobilized from deposits in the Piedmont or Highlands? If so, what were the findings? Does increasing rate of release of arsenic due to human influences constitute a "naturally occurring" source of arsenic by current NJDEP definitions? (RHA)

39. **Comment:** Appendix F: Private Well Testing Act Results identifies arsenic as a significant contaminant for drinking water wells. As in the main body of the Report, DEP here identifies arsenic as a "naturally occurring contaminant" (Appendix F, at page 1). Has DEP examined long-term trends in arsenic concentrations in ground water? If concentrations of arsenic are increasing over time, has DEP identified the mechanism(s) causing additional mobilization of arsenic from rock? Has DEP studied arsenic as a significant contaminant in regions other than just the Piedmont? (RHA)

Response to Comments 35 through 39: The Department recognizes the impacts that arsenic has had on surface and ground water quality and has completed studies contracted with the USGS to determine natural levels of arsenic in the Coastal Plain. These studies have concluded that although arsenic is found naturally in the ground and surface water, anthropogenic sources have increased levels in many areas. Additionally, the Department hopes to continue further studies involving the other regions of the state including the important topics suggested by the commenters. Although the Integrated Report has shown the number of impairments has increased over the years it may not be indicative of a trend but the result of improved laboratory detection at lower concentrations that exceed the criteria of 0.017 µg/l and the increased sampling for arsenic throughout the state. In situations where it is verified that the anti-degradation standards are being violated, the Department will take enforcement action. See Response to Comments 33 and 34 for other actions the Department is implementing to address arsenic.

Evaluation of Data at the Station Level

40. **Comment**: Page 12: Shouldn't the required sample size be related to the length of the stream within the assessment unit and not fixed at a certain value? (EPA)

    Response: The Department is building confidence in the assessment process by increasing the number of samples required to more accurately characterize overall water quality conditions. More robust data sets are necessary to capturing natural variability, seasonal changes, varying hydrologic conditions, underlying natural conditions and the effects of anthropogenic activities. The required sample size is based on increasing temporal coverage to capture more events that characterize water quality and does not relate to stream length or size.

41. **Comment**: Page 13 states: "The target sample size for pathogens remains as 5 samples over a 30-day period, to calculate a geomean, over at least a 2-year period." It is not clear to me what this means. How can five samples within 30 days be "over a 2-year period?" (K)

    Response: The current methods requires 5 samples over a 30-day period to calculate a geomean. The geomean must be done once a year during the swimming season for 2 years to meet the requirements for the target sample size. The years are not required to be consecutive.

42. **Comment**: The definition of "Excursions" on page 13 does not define "natural conditions" or "transient conditions" in sufficient detail to be meaningful for assessment. How exactly will the Department determine whether a particular excursion is due to natural or transient conditions? Transient conditions are defined on page 13 as "water quality conditions that occur at very low frequencies over very brief timeframes and, as such, neither impair the designated use of the waterbody nor represent overall water quality conditions." This is an excellent definition, but a methodology is not presented to determine when such transient conditions occur. Without the methodology, how will the Department determine whether an excursion is transient? (K)

Response: The methodology for determining a transient condition is unique for each pollutant and situation. Because there are many ways to determine transient conditions, the Methods Document does not include a set methodology. For example, total dissolved solids excursions have occurred during or after winter storms caused by salt application to the roads. Water quality data showing sporadic exceedances of TDS or Chlorides was compared to data obtained from the National Weather Service and the State Climatologist showing the timing, duration and extent of major winter storm events. If non-compliance with applicable SWQS occurred only just before, during or just after a documented winter storm event while other available data showed compliance with the SWQS, the non-compliant events were considered to be excursions rather than exceedances of the SWQS. Examples of other transient events include severe flooding, droughts, toxic spills or other activities causing temporary water quality impacts that are not associated with impairment of the applicable designated use. All transient excursions must be fully explained in Appendix D: 2014 Decisions to Not List Causes on the 2014 303(d) List/Sublist 5 (Waters Not Listed, with Reasons and Explanations) to justify not listing on the 303(d) List.

43. **Comment**: Analytical Uncertainty on page 14 focuses only on instrument uncertainty, which is relevant for in-situ measurements using a handheld instrument. What about laboratory measurements? Uncertainty regarding laboratory analytes is generally captured in a quantitation limit; we recommend therefore that the Department define the margin of error for laboratory analytes to be the criterion plus or minus the quantitation limit. (K)

    Response: The Department does consider the precision and accuracy of laboratory methods for analytical uncertainty and has indicated it in the Methods Document Section 4.1, Analytical Uncertainty. The description of the instrument uncertainty in the section was only an example situation. The Department does apply standard quality assurance protocols during the assessment process, in accordance with the Department's Quality Management Plan (see http://www.nj.gov/dep/enforcement/oqa/qap.html).

44. **Comment**: Page 15, Continuous Monitoring: This section appears to focus on stationary continuous monitoring but data obtained from mobile continuous monitoring, such as conducted by the NJDEP ocean glider, should be discussed. Progress on incorporation of the ocean glider data into NJ's water quality assessment process should be included. (EPA)

    Response: To study the ocean waters, the Department purchased and deployed a Slocum Glider during the summer of 2011. The Slocum Glider is fitted with continuous monitors to measure water quality conditions for water temperature, salinity, dissolved oxygen, CDOM and depth. It has been deployed on a routine basis, running from Sandy Hook to Cape May, multiple times each summer since 2011, and provides a 3-D view of the water column. In 2013, a chlorophyll a sensor was added. The Department's Science Advisory Board (SAB) was tasked to suggest ways of assessing and interpreting glider data. The SAB recommended development of spatial decorrelation models to separate the temporal and spatial components of the glider data in addition to data from deployment of fixed-location sensors. More recently, the Department has received assistance from USEPA to interpret the glider data. The glider data is displayed on the Rutgers University website (https://marine.rutgers.edu/cool/auvs/index.php?year=2016). Since the Department has not

yet established a scientific method for analyzing this data as part of the assessment process, it would not be appropriate to include it under the "Continuous Monitoring" section of the Methods Document at this time

Biological Data

45. **Comment**: Section 4.3, pages 17 – Biological Data" - Benthic Macroinvertebrate and Fin Fish Data are being used for the assessment of freshwater streams. In addition, the Benthic Index of Biotic Integrity was also developed for the NY/NJ Harbor Estuary. The document states that, "Additionally, the Department is carrying out research on developing macroinvertebrate indices for estuary and ocean waters." What is the tentative timeframe for completion of this work? Also, how is the aquatic life use presently being assessed in the state's lakes (in addition to "in-lake chemistry data")? (EPA)

46. **Comment**: Page 17, last paragraph on page, Benthic Macroinvertebrate Data: The 2012 Integrated Report (IR) described work to develop an ocean benthic index. The status of this effort should be updated and its assessment application should be included in the Methods document. (EPA)

    Response to Comments 45 and 46: The Draft 2016 Methods Document has been revised to include two new biological indices that were still under development when the December 2015 draft was published. The revised Draft 2016 Methods Document is being published on March 20, 2017 to afford the public the opportunity to review and comment on these two new indices. Specifically, a new benthic macroinvertebrate index for marine waters (Multivariable AZTI Marine Biotic Index or "M-AMBI") was added to Section 4.3 – Biological Data and will be used to assess biological conditions in saline waters of the Barnegat Bay and support of the General Aquatic Life Use in Barnegat Bay. In addition, a new index of biotic integrity (Headwaters Index of Biotic Integrity or "HIBI") will be used to assess biological conditions in small headwater streams in Northern New Jersey, which will monitor the assemblage of fish as well as crayfish, salamanders and frogs to assess the General Aquatic Life Use in small headwater streams (less than 4 square miles) in northern New Jersey. An ocean macroinvertebrate index, in contrast, has not yet been validated and will require additional monitoring data that encompasses a full disturbance gradient. In order to finalize the ocean index, the Department expects to work with EPA's Office of Research and Development to explore options to validate the index. For lakes, currently there is no biological index therefore only chemical and physical data are used to determine aquatic life use.

47. **Comment**: Page 17, Benthic Macroinvertebrate Data: The reference given for the REMAP BIBI shows how the index was applied to 1998 NY/NJ Harbor data. It appears from the text that a reference was needed for the development of the index. That can be found in Appendix C at https://archive.epa.gov/emap/archive-emap/web/html/nynjharbor.html. (EPA)

    Response: The cited reference was added to the 2016 Methods Document.

Evaluating Data from Multiple Stations within an Assessment Unit

48. **Comment**: The section on Assessing Lake Data on page 25 states that in-lake chemistry data should be collected just below the surface, defined as "a one-meter depth if the lake is sufficiently deep." Given that the vast majority of lakes in New Jersey are less than 6 feet deep, I suggest this definition: "one foot to one meter, depending on the depth of the lake." Also, to clarify intent, I suggest adding "within the epilimnion if vertically stratified" after "collected just below the surface." (K)

    Response: The Draft 2016 Methods Document has been revised to clarify the Department's lake sampling protocol, as follows: "Lakes are assessed based upon in-lake chemistry data collected just below the lake surface. Lakes with a depth of 2 or more meters in depth are sampled at a depth of 1 meter. Lakes with a depth of less than 2 meters are sampled at mid-depth."

Designated Use Assessment Methods

49. **Comment:** Exceedance of human health criteria alone should not automatically result in an impairment designation for freshwaters based solely upon the policy that all waters of the State are drinkable, fishable and swimmable. This goal is not intended to apply to waters that cannot, due to natural conditions, attain these uses. Water supply use attainment assessment should only be evaluated with respect to water with existing or planned water supply intakes. Further, since potable water is, by definition, water supplied after conventional filtration treatment (N.J.A.C. 7:9B-1.12(c)4), elements with a significant particulate fraction, such as arsenic, will be reduced by conventional filtration treatment, and therefore should be evaluated accordingly. (AEA, K)

    Response: The Surface Water Quality Standards (SWQS) rules, N.J.A.C. 7:9B, establish the designated uses and associated criteria, including human health criteria, necessary to fully support designated uses. The Methods Document explains the processes used to evaluate water quality data and other information necessary to determine if ambient water quality complies with the applicable water quality criteria and supports the applicable designated uses for all waters of the State. The SWQS rules at N.J.A.C. 7:9B-1.5(a)3 require that "…all fresh waters be protected as potential sources of public water supply. Therefore, … pollutants shall be regulated to attain compliance with the Surface Water Quality Standards human health criteria outside of regulatory mixing zones". Limiting the assessment of water supply use support to only those waters with "existing or planned water supply intakes", as suggested by the commenters, cannot be accomplished through changes to the Methods Document and would require, instead, the promulgation of amendments to the SWQS through rulemaking. Additionally, conventional filtration treatment capability to remove arsenic is not accepted as a means to treat for elevated total and dissolved arsenic levels**.** Conventional treatment is defined in the Surface Water Quality Standards (SWQS) rules at N.J.A.C. 7:9B-1.12 (b)3 as, "… a series of processes including filtration, flocculation, coagulation, and sedimentation, resulting in substantial particulate removal but no consistent removal of chemical constituent(s) or disinfection." Only additional treatment technologies

such as reverse osmosis, ion exchange, and adsorptive media have proven through studies and application to be effective means to remove arsenic from the water column.

50. **Comment**: Table 6.1: "Aquatic Life Use Assessment Results" – in cases where biology is impaired and chemical data show exceedances, both aquatic life uses are "not supporting". Why is biological impairment represented by "cause unknown – impaired biota" if the chemical parameters exceeding criteria are identified as a cause? (EPA)

    Response: The proposed change to the listing methodology for biological assessment results will identify causes of impairment for waters not supporting the aquatic life use by listing both biological and chemical impairments. The new methodology would return all biological impairments based on macroinvertebrate and fish data to the 303(d) List which would be represented by "Cause Unknown – Impaired Biota". There are many factors that can impact biological communities such as habitat degradation, flow alterations, and water quality pollutants. It is not considered scientifically sound to assume that the chemical pollutant listed on the 303(d) List as the sole cause of the aquatic life use impairment if biology is impaired. This action aims to identify the known causes of aquatic life non-attainment and to clarify that other sources may be impacting the biota. In order to successfully remediate the biological impairments, the Department can then implement TMDLs, Watershed Restoration Plans, and/or source track down studies to identify the sources, develop the proper management strategy, and implement the most effective restoration actions.

51. **Comment**: Section 6.1 should include a brief paragraph summarizing how the assessment of aquatic life use is presently done for lakes, estuaries (other than NJ-NY Harbor) and marine waters. (EPA)

    Response: The Department agrees with this comment and the Draft 2016 Methods Document was revised to include the following under Section 6.1:

    > The aquatic life use is assessed based on a combination of biological indicators (see Section 4.3), along with a broad suite of biologically-relevant physical/chemical data (e.g., nutrients, dissolved oxygen, pH, temperature, toxic pollutants, turbidity, TSS). Non-tidal freshwaters are assessed by using metrics developed for benthic macroinvertebrate data, in conjunction with Fin Fish Index of Biotic Integrity (FIBI) data. In estuarine waters, benthic macroinvertebrates indices have been developed only for the New York/New Jersey Harbor and the Barnegat Bay Estuary. The descriptive and regulatory thresholds for these biological metrics are provided in Section 4.3. The Department is in the process of developing a biotic index for the near shore ocean waters and other estuarine waters. Freshwater lakes only use biologically-relevant chemical parameters.

52. **Comment**: Monitoring for the Drinking Water Supply designated use: It's interesting that *E. coli* is not one of the parameters that is associated with the designated use (Appendix A). Is there any particular reason why it's not? (EPA)

Response: Under the water quality assessment process, nitrate is the minimum parameter required to conclude that an assessment unit is "fully supporting" the water supply designated use. This does not mean that other parameters are not assessed. If nitrate and/or other parameters associated with the water supply use (see Appendix A) show exceedances of the applicable water quality criteria, then the water supply use would be assessed as "not supporting" and those parameters would be placed on the 303(d) List. If there is not enough nitrate data to assess support of the water supply use, then the water supply use is assessed as "insufficient information" and placed on Sublist 3 even if other parameters associated with the water supply meet the applicable criteria.

53. **Comment**: If nitrate is the only parameter required to determine whether the water is or is not supportive of drinking water use, what incentive is there to monitor for anything else? But suppose someone *did* monitor for a whole suite of VOCs, heavy metals and other parameters under the drinking water use column in Appendix A and found some MCL exceedances—and suppose nitrate did *not* exceed the MCL. Would the water be considered *supportive* of the drinking water use? If several parameters *and* nitrate exceeded MCLs, it would be helpful if DEP had a designation category of "VERY non-supportive of drinking water." (EPA)

    Response: Nitrate is the minimum suite of parameters required to conclude that an assessment unit is "fully supporting" a designated use. If nitrate does not have sufficient data then the designated use would be "insufficient data" even if all other parameters associated with water supply were fully supporting. If other parameters are sampled that show exceedances of the water quality criteria then the designated use would be "not supporting." If nitrate and/or other parameters were exceeding their criteria then all of the pollutants would be listed on the 303(d) List.

Integrated Listing Guidance

54. **Comment:** When preparing the 303(d) list of Water Quality Limited Waters, it would be helpful to group listed waters by Watershed Management Area (WMA) and list those waters alphabetically within each WMA. The draft 2014 List of Water Quality Limited Waters is difficult to search and use effectively because it includes every listed water in the state alphabetically. (RHA)

55. **Comment:** When drafting the 303(d) List of Water Quality Limited Waters, it would be helpful to address all designated uses for each water body. For example, the current Appendix B for the draft 2014 Integrated Report often addresses a single designated use for which a water is listed. From that list it is not clear whether the water meets all other applicable designated use, or other designated uses were not assessed, or there was insufficient data to assess other uses. Adding a column for each designated use and indicating in that column whether that water body met or failed to meet that designation, and why, would make a water's status more clear. (RHA)

    Response to 54 and 55: The files in the Integrated Report are provided in Excel format so that users can organize, sort, and merge the data according to the user needs. However,

assessment results are reported in accordance with the corresponding USEPA guidance and recommended format, which has changed over the years. This format is expected to change again for either the 2016 or the 2018 Integrated Report to conform with the redesigned Assessment and Total Maximum Daily Load Tracking and Implementation System (ATTAINS) platform, once it has been fully implemented by USEPA.

56. **Comment**: Where such monitoring clearly shows an impairment, that assessment unit will be placed on the 303(d) list. On that 303(d) list, will the assessment unit that is *outside* the selected region be differentiated in some way from AUs that are within that region--perhaps with an asterisk or with a different font? (EPA)

    Response: The Integrated Report does not distinguish assessment units on the 303(d) List based on the selected region for the respective cycles. If needed, the WMA number can be filtered to identify listings within or outside the selected region. Additionally, the listing date indicates during which Integrated Report cycle a listing was placed on the 303(d) List to determine if it is a historical listing.

57. **Comment**: We suggest the Department create a Sublist 4P for impairment due to pathogen indicators, which are better managed through track-down studies than TMDLs. (K)

    Response: The Department continues to conduct track down studies to determine the sources of pathogen contamination. However, since the studies only identify potential sources and do not have any requirement or regulatory ability to impose reductions, these impairments will still require TMDLs, other regulatory enforcement, or watershed based plans for restoration of water quality and will remain on the 303(d) List without a sublist designation until water quality standards are met, in accordance with Section 303(d) of the federal CWA.

58. **Comment**: Waterways with unknown sources of pollution must continue to be included on the impaired list. Local residents and recreational users will continue to be impacted by the pollution and should be notified the waterbody is impaired. This is alarming as the Integrated Report found one of the top three sources of pollution in our waterways is nonpoint source pollution. For example, the Elizabeth River is the most polluted river for nonpoint source pollution in the country and it has been delisted. (SC)

    Response: All waterbodies impaired by pollutants are placed on the 303(d) List regardless of sources and causes. If a TMDL is developed and approved, the listings are placed on Sublist 4A but are still considered as "not supporting" until water quality data confirms that the water quality criteria are not exceeded. Although there were no delistings for the Elizabeth River in the 2014 Integrated Report, previous delistings for fecal coliform were based on the development of a TMDL. Several AUs containing the Elizabeth R remain on the 2014 Sublist 4A because water quality is still impaired by bacterial quality; however, fecal coliform was changed to *E. Coli* to reflect the change to the Surface Water Quality Standards N.J.A.C 7:9B-1.14(d).

59. **Comment**: The methodology used to sample the dissolved oxygen levels in the Barnegat Bay was flawed. The DEP should relist the northern half of Bay for being impaired for dissolved oxygen based on previous data and the previous 2010 listing for dissolved oxygen. The southern half of the Bay is in serious decline as well. The findings of the Rutgers Institute of Marine and Coastal Sciences (IMCS) on the declining ecological indicators in the Barnegat Bay should be used to declare the entire Bay as impaired on the 303(d) list and begin the TMDL process. This Rutgers report contains the needed data to justify such an impairment designation for the Bay. (SC)

Response: The Department recognizes that observed effects in the Bay, such as seagrass declines, algal blooms, high macroalgal densities, shellfish declines, and sea nettle population rises are well documented; however, current research does not conclusively establish that these observed effects are caused by nutrient over-enrichment rather than other causes or sources. In addition to nutrients, such as nitrogen, other stressors that can cause similar effects include reduced light penetration from boat traffic, circulation patterns, temperature and salinity levels, sediment contamination, over-harvesting of shellfish, and habitat changes. Although excessive nitrogen has been reported throughout the media as the cause for Barnegat Bay's degraded condition, no scientific studies have concluded that nitrogen is the only cause for current conditions in the Bay.

The Department has sponsored studies of the Barnegat Bay that will help us better understand the physical, chemical, and biological processes in the estuary in order to understand the role played by nutrients and other factors in manifesting the observed conditions in the Bay. These studies will investigate various biotic trophic levels and communities for condition and relationship to stressors, including diatoms, phytoplankton, zooplankton, benthic organisms, clams, crabs, and fish. There are also studies underway to evaluate the possible causes for increased abundance of sea nettles, the role of marshes and wetlands, and the effect of conservation zones. **More details about these and other studies in the Barnegat Bay sponsored by the Department can be found on the Department's website at** http://www.nj.gov/dep/barnegatbay/plan-research.htm. Through these studies, the Department is working to develop thresholds and indicators for various biological communities as well as establishing cause/response relationships so that the means to interpret and apply the narrative nutrient criteria in estuarine waters can be determined. The Department is also conducting comprehensive monitoring and modeling work, which will be used to establish linkages between pollutant loadings, water quality, and biotic community response, using information from the research projects, where feasible. More details about this work can be found on the Department's website at http://www.nj.gov/dep/barnegatbay/plan-wqstandards.htm. The Department will continue to integrate the information acquired from the biologic community studies along with monitoring and modeling work to assess the degree to which the Bay meets numeric and narrative water quality criteria and supports designated uses.

As stated above, studies are currently underway that should verify correlations between suspected sources and observed conditions and help us understand the various stressors and their relative importance in to water quality in the Bay. The Department's work to understand the causes of observed conditions is important so that the most effective

restoration actions can be implemented. Nevertheless, the Department is not waiting until nutrient thresholds, biological indexes and cause/response relationships are established to begin working on improving conditions in Barnegat Bay. Actions that will advance the overall objective of restoring the Bay have already been undertaken. These include establishing a statewide fertilizer law, retrofitting stormwater basins to promote recharge and reduce nutrients, and acquiring open space. The Water Quality Monitoring Project for Barnegat Bay will be used to develop and calibrate a model that can then be used to simulate future conditions. Once the model is available, the Department will be able to evaluate various actions and, if the cause/response relationships are clearly defined, we should be able to determine the success of the selected actions.

Sublist 3 Insufficient Data

60. **Comment:** It is unclear whether insufficient data is an acceptable rationale for delisting a previously listed water. Once a water is listed as impaired or not meeting a designated use, DEP should be required to provide data that demonstrate the water is no longer impaired or meets all designated uses before delisting it. (RHA)

61. **Comment**: Waterways must not be delisted based on a lack of updated information, especially if the waterway was listed as impaired in the past. We already have one third fewer monitoring stations then we are supposed to have and now this will be used as an excuse to exclude waterways. Also testing standards must not be weakened by allowing data to be rounded down and including the margin of error so that streams exceeding limits would not be listed. (SC)

Response for Comments 60 and 61: As stated in Section 4.1 of the 2016 Methods Document, "If current data are not sufficient for an assessment decision, past assessments are considered valid until new data show that conditions have changed." Additionally, the Department's approach to accurately reflect water quality conditions incorporates a margin of error based on instrument and/or laboratory uncertainties as well as including the standard practice of rounding significant digits based on the water quality criteria. However, there are occasions were an original listing decision was incorrect and/or based on data that were insufficient or inaccurate to support a listing decision under current methods. USEPA guidance allows delistings in such situations, in which case the AU/pollutant combination is placed on Sublist 3. This can only occur if insufficient data is available for all parameters necessary to assess the designated use.

An example of such delisting for insufficient information occurred in the 2014 Integrated List where 37 AUs were proposed for delisting from Sublist 4A for insufficient fecal coliform data based on administrative corrections. In the early 2000's, when TMDLs were developed to address fecal coliform on the 303(d) List, the Department's practice was to place all AUs upstream of an impaired AU on Sublist 4A although some AUs had no fecal coliform data and were not covered by the downstream fecal coliform TMDL. This practice has since been refined to list only AUs with sufficient data to confirm impairment and to only place such AUs on Sublist 4A when they are explicitly covered by a USEPA-approved TMDL. Since there were insufficient or no data to confirm fecal coliform impairment in

these AUs and they were not covered by a USEPA-approved TMDL, these AU/pollutant combinations were removed from Sublist 4A and moved to Sublist 3. These AUs have also been prioritized for future sampling to generate sufficient data to determine compliance with the applicable pathogenic criteria and assess support of recreational use. Any AU/pollutant combinations that were covered by a USEPA-approved TMDL remain on Sublist 4A of the 2014 Integrated List.

62. **Comment:** What steps is the Department taking to close data gaps by collecting data in AUs with insufficient information? Does the Department anticipate increased federal or state funding and support for citizen science initiatives to collet water quality data? (RHA)

    Response: Previous Integrated Reports contained a chapter on Next Steps that discussed future needs and actions to support water quality monitoring and assessment, including strategies to fill data gaps such as waters on Sublist 3 of the Integrated List. Such strategies are being incorporated into the Department's pending update to the Long Term Monitoring and Assessment Strategy prepared pursuant to CWA Section 106(e)(1) and in accordance with USEPA in its "Elements of a State Water Monitoring and Assessment Program" (March 2003). Funding and support for citizen science initiatives is beyond the scope of the Methods and Integrated Reports.

Sublist 5R Restoration Plans

63. **Comment:** Sublist 5R and any other alternative approach to addressing impaired water bodies are not appropriate or adequate substitutes for developing and implementing TMDLs. Alternative approaches to improving water quality, including 319(h) funded projects, best management practices, and other strategies, may be incorporated in TMDLs but do not negate DEP's obligation to prepare and implement TMDLs and monitor their effectiveness. (RHA)

64. **Comment**: Sublist 5R should be moved to 4R, since the impairment is being addressed through a watershed plan (a mechanism other than a TMDL). (K)

    Response for Comment 63 and 64: The Department acknowledges the comment that impairments listed on Sublist 5R do not negate the obligation to develop and implement TMDLs if Watershed Based Plans are not effective. However, because these impairments were identified in locations where the sources are nonpoint or stormwater in nature and non-regulatory measures are the primary means available to reduce the loads, the Department will opt to pursue restoration and stewardship actions directly as the preferred path to reduce loads and attain water quality standards. This approach is consistent with current USEPA listing guidance.

Sublist 5L Legacy Pollutants

65. **Comment**: The Department's designations of sublists 5L ("Legacy" impairment) and 5R (NPS impairment addressed by a Plan) make a great deal of sense, and prevent the

Department from having to develop TMDLs that may not be the most appropriate management solution. (K)

Response: The Department appreciates the commenters' support.

66. **Comment**: Sublist 5L should be moved to 4L, since the Department is relying on mechanisms other than TMDLs, namely site remediation plans and pollutant minimization plans. (K)

Response: Impairments on Sublist 5L are banned from production or use and the causes are historical in nature. The main mechanisms for reduction are follow-through on site remediation plans, development/implementation of pollutant minimization plans for incidental introduction into regulated discharges and natural attenuation. However, under USEPA listing guidance, these mechanisms are not sufficient for placement on Sublist 4 rather than Sublist 5.

67. **Comment**: Waters high in arsenic concentration that can be attributed to historical pesticide application should be included on sublist 5L, which we recommend be moved to 4L. (K)

Response: Since arsenic is not banned from production or use, the placement on Sublist 5L is not appropriate. See Comment #65 for moving to Sublist 4L.

Agency-Initiated Changes

1. A new biological index to determine aquatic life use in Barnegat Bay was added to Section 4.3 – Biological Data. The addition of the Barnegat Bay Benthic Macroinvertebrate Index describes the newly developed biological index and its part of the Department's on-going efforts to develop biological indices for estuary and ocean waters. The index is based on the Multivariable AZTI Marine Biotic Index (M-AMBI) to assess the health of the benthic community in the Barnegat Bay.

2. A new biological index to determine aquatic life use in freshwater streams was added to Section 4.3 – Fin Fish Data. The new index, the Headwaters Index of Biotic Integrity (HIBI), was developed to assess streams less than 4 square miles in watershed area within the northern ecoregions. This new index monitors the assemblage of fish as well as crayfish, salamanders and frogs to assess aquatic life use in small headwater streams.

3. An addition to Section 6.3 – Fish Consumption Use Assessment Method, explains the current practice of the use of migratory fish for use attainment decisions. If the migratory range of a species is known to extend beyond the state's jurisdictional waters, such as bluefish and striped bass, then fish tissue data will not be used for fish consumption use decisions in view of the migratory nature of these fish, the distances they travel, and because it has not known where along the eastern seaboard these fish acquired the contaminants. However, they will continue to be used for fish consumption advisories.