UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

March 6, 2018

Ms. Jutta Schneider, Director
Water Planning Division
Virginia Department of Environmental Quality
1111 East Main Street, Suite 1400
Richmond, Virginia 23219

Dear Ms. Schneider:

The U.S. Environmental Protection Agency (EPA), Region III, has conducted a complete review of Virginia's 2016 Section 303(d) List, and supporting documentation and information. Based on this review, EPA has determined that Virginia's list of water quality limited segments still requiring Total Maximum Daily Loads, meets the requirements of Section 303(d) of the Clean Water Act and EPA's implementing regulations. Therefore, with this letter, EPA hereby approves Virginia's 2016 Section 303(d) List. The statutory and regulatory requirements, and EPA's review of Virginia's compliance with each requirement, are described in the enclosure.

EPA values the progress VADEQ has made on its commitments to develop methods to better evaluate algal impacts to the recreation use of Virginia's free-flowing waters and future monitoring and assessment commitments in the Shenandoah River basin. We commend you and your staff for the thorough work and effort in establishing the impaired waters list and in responding to the comments received.

If you have any questions regarding this decision, please feel free to contact me or have your staff contact Ms. Evelyn S. MacKnight, Associate Director, Office of Standards, Assessment, and TMDLs, at 215-814-5717, or macknight.evelyn@epa.gov.

Sincerely,

/s/

Catharine McManus, Acting Director
Water Protection Division

Enclosure

RATIONALE FOR APPROVAL OF VIRGINIA 2016 SECTION 303(D) LIST

I. Purpose

The purpose of this document is to describe the rationale for the U.S. Environmental Protection Agency's (EPA) approval of Virginia's 2016 Section 303(d) list, which was prepared and submitted by the Virginia Department of Environmental Quality (VADEQ). EPA has conducted a complete review of Virginia's 2016 Section 303(d) list and supporting documentation and information. Based on this review, EPA has determined that the Commonwealth's list of water quality-limited segments (WQLSs) still requiring Total Maximum Daily Loads (TMDLs) meets the requirements of Section 303(d) of the Clean Water Act (CWA or the Act) and EPA's implementing regulations.

II. Statutory and Regulatory Background

A. Identification of WQLSs for Inclusion on Section 303(d) List

Section 303(d)(1) of the CWA directs states to identify those waters within their jurisdiction for which effluent limitations required by section 301(b)(1)(A) and (B) are not stringent enough to implement any applicable water quality standard, and to establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters. The Section 303(d) listing requirement applies to waters impaired by point and/or nonpoint sources, pursuant to EPA's long-standing interpretation of Section 303(d).

EPA's implementing regulations require states to biennially submit a list identifying WQLS still requiring a TMDL. 40 CFR 130.7(b)(1). EPA regulations provide that states do not need to list waters where the following controls are adequate to implement applicable standards: (1) technology-based effluent limitations required by the Act, (2) more stringent effluent limitations required by State or local authority, or (3) other pollution control requirements required by state, local, or Federal authority (see 40 CFR 130.7(b)(1)).

B. Existing and Readily Available Water Quality-Related Data and Information

In developing Section 303(d) Lists, states are required to assemble and evaluate all existing and readily available water quality-related data and information, including: (1) waters identified as partially meeting or not meeting designated uses, or as threatened, in the state's most recent Section 305(b) report; (2) waters for which dilution calculations or predictive modeling indicate non-attainment of applicable standards; (3) waters for which water quality problems have been reported by governmental agencies, members of the public, or academic institutions; and (4) waters identified as impaired or threatened in any Section 319 nonpoint source

assessment submitted to EPA (see 40 CFR 130.7(b)(5)). EPA's 1991 Guidance for Water Quality-Based Decisions describes categories of water quality-related data and information that may be existing and readily available (see Guidance for Water Quality-Based Decisions: The TMDL Process, EPA Office of Water, 1991, Appendix C ("EPA's 1991 Guidance")). While states are required to evaluate all existing and readily available water quality-related data and information, states may make reasonable decisions whether and how particular data or information is used in determining whether to list particular waters.

In addition to requiring states to assemble and evaluate all existing and readily available water quality-related data and information, EPA regulations at 40 CFR 130.7(b)(6) require states to include, as part of their submissions to EPA, documentation to support decisions to list or not list waters. Such documentation must include the following information: (1) a description of the methodology used to develop the list; (2) a description of the data and information used to identify waters; (3) a rationale for any decision to not use existing and readily available data discussed in 130.7(b)(5); and (4) any other reasonable information requested by the Region.

C. Priority Ranking

EPA regulations also codify and interpret the requirement in Section 303(d)(1)(A) of the CWA that states establish a priority ranking for listed waters. The regulations at 40 CFR 130.7(b)(4) require states to prioritize waters on their Section 303(d) Lists for TMDL development, and to identify those WQLSs targeted for TMDL development in the next two years. In prioritizing, the regulations require that states must take into account the severity of the pollution and the uses to be made of such waters (See Section 303(d)(1)(A)). In accordance with EPA guidance, states may consider other factors relevant to prioritizing waters for TMDL development, including immediate programmatic needs, vulnerability of particular waters as aquatic habitats, recreational, economic, and aesthetic importance of particular waters, degree of public interest and support, and state or national policies and priorities. If an endangered species or a public water supply is affected by an impairment listing, that should be considered in scheduling TMDL development as expeditiously as possible. (See 57 FR 33040, 33045 (July 24, 1992), and EPA's 1991 Guidance).

III. Analysis of Virginia's Submission

VADEQ provided EPA with a copy of the draft 2016 Integrated Report, which included the draft 2016 Section 303(d) List, with a letter dated August 4, 2017, which was received on August 11, 2017. The draft 2016 Integrated Report was public noticed in the Virginia Register as being available for public comment from August 7, 2017, until September 6, 2017. A public webinar summarizing the findings of the report was held on August 24, 2017. An electronic copy of the report was made available on the VADEQ web page, and paper copies were available upon request. EPA provided comments to VADEQ on the draft 2016 Integrated Report, including the draft 303(d) list, on September 6, 2017. The Commonwealth amended its

2016 Integrated Report to address the public's and EPA's comments. VADEQ submitted the final 2016 Integrated Report with a letter dated January 29, 2018, which was received on February 5, 2018. VADEQ submitted a revised final 2016 303(d) List on February 22, 2018. This action approves Virginia's 2016 303(d) List as submitted on February 22, 2018.

Virginia developed an Integrated Report that identifies the assessment status of all of Virginia's waters combining CWA's Section 303(d) and 305(b) requirements. Virginia's Section 303(d) List is just one portion of Virginia's Integrated Report; Virginia's impaired waters list is comprised of seven subcategories. Category 5A of the Integrated Report contains those waters which are impaired for one or more designated uses by a pollutant(s) and require a TMDL. Category 5B of the Integrated Report identifies those waters which require a TMDL because they do not support the shellfish consumption use. Category 5C of the list contains those waters that are unable to attain their designated uses due to suspected natural conditions. These waters will be further studied to determine if a change in water quality standards would be appropriate to reflect the natural condition impacts. TMDLs are required on these waters unless standards are modified such that no TMDL is needed. Category 5D waters are those waters that have a TMDL developed to address an unattained specific pollutant and/or impairment, but other TMDLs are needed for additional pollutants and/or impairments. Category 5E of the list contains those waters that are impaired by individual point sources that are not expected to meet their compliance schedule by their next permit issuance or the reporting period. Category 5F of the list contains waters where the water quality standard is attained for a pollutant(s) with a TMDL, but the water remains impaired for additional pollutant(s) requiring TMDL development. Category 5M of the list are waters impaired due to atmospheric mercury.

Among comments received by VADEQ during the public comment period, one commenter asserted that certain tidal segments of the portion of the Chesapeake Bay and its tidal tributaries located in Virginia require a "local" TMDL and therefore should be returned to Category 5A. VADEQ in its response to comment correctly notes that the only water quality limited segments moved from Part 5A to Part 4A of the Integrated Report are those tidal portions of the Chesapeake Bay and its tidal tributaries for which TMDLs were prepared as part of the Chesapeake Bay TMDLs in 2010. The Chesapeake Bay TMDLs were established at a level to attain and maintain water quality standards applicable to those tidal segments with endpoints developed for nitrogen, phosphorus and sediment. Accordingly, VADEQ appropriately reclassified those tidal segments from Part 5A to Part 4A. To the extent the commenter believes that the Bay TMDLs are not set at a level to attain and maintain water quality standards applicable to the tidal segments for which they were established, those concerns are not properly addressed through the Section 303(d) list. With respect to non-tidal waters that may flow to the tidal segments, VADEQ notes that it does not assume that the Chesapeake Bay TMDLs are set at a level to attain and maintain applicable water quality standards in non-tidal waters and that, to the extent non-tidal waters are impaired by nutrients and/or sediment, those non-tidal waters remain in Part 5A and TMDLs will be established for those non-tidal waters.

EPA has reviewed Virginia's 2016 submission, and has concluded that the Commonwealth identified the waters on its 2016 Section 303(d) list submission in compliance with Section 303(d) of the Act and 40 CFR §130.7.

A. Existing and Readily Available Water Quality Related Data and Information

In preparing its 2016 Section 303(d) List, Virginia assembled all existing and readily available data documenting water quality conditions in Virginia through December 31, 2014. The list was a result of the combined efforts of many state agencies. The Virginia Department of Conservation and Recreation (VADCR) was responsible for the assessment and analysis of nonpoint source information. The Virginia Department of Health (VADH) provided other water quality health-related information regarding shellfish and fish tissue impairments. Water quality assessments were conducted by staff in each of VADEQ's regional offices. This was done through the use of data collected by the regional ambient water quality monitoring program and regional biologists. Monitoring data was also provided to VADEQ by the United States Geological Survey (USGS), United States Forest Service (USFS), Tennessee Valley Authority (TVA), the EPA Chesapeake Bay Program, and various citizen monitoring groups.

B. Description of Virginia's methodology used to develop this list (CFR 130.7 (b)(6)(i))

Virginia defines waters as impaired when they do not support, or only partially support, any of their designated uses. The five designated uses are aquatic life, fish consumption, shellfish consumption, recreation, and drinking water. Use attainment is determined by comparison of field measured or projected values of various water quality parameters to applicable numeric or narrative criteria. The processes for using existing and readily available water quality-related data and information are described in Virginia's *Water Quality Assessment Guidance Manual for 2016 305(b)/303(d) Integrated Water Quality Report*, which describes the Commonwealth's assessment methodologies and its use of data. Virginia held a public comment period to allow public review and comment of the 2016 assessment guidance manual prior to finalization. EPA reviewed this guidance and provided feedback to Virginia prior to release of the Integrated Report.

C. Description of the data and information used to identify waters not supporting or partially supporting their designated uses, including a description of the data and information used by the state as required by Section 130.7 (b)(5).

1. Section 130.7(b)(5)(i), Waters identified by the state in its most recent Section 305(b) report as "partially meeting" or not meeting designated uses or as "threatened."

Virginia's 2016 Section 303(d) List was combined with the 305(b) Report to form what is referred to as the Integrated Report. Therefore, the 305(b) Report is no longer a stand-alone document and the data that would have gone into the development of such a "stand alone" report was used in the production of the Integrated Report. In Virginia, the biennial water quality assessment is conducted by VADEQ with the assistance of VADCR. The Integrated Report incorporates the data and evaluations from other agencies such as the USGS, TVA, USFS, and various citizen groups within the state. Virginia's Integrated Report compartmentalized the waters of Virginia into five distinct categories. Waters are defined as: Category 1: Supporting of All Uses; Category 2: Supporting of All Uses for Which Assessment Occurred; Category 3: Lacking Data for a Determination; Category 4: Impaired but not Requiring a TMDL; or, Category 5: Impaired and Requiring a TMDL. Many of these five categories were further sub-categorized by Virginia.

Waters in any of the sections in Category 5: Impaired and Requiring a TMDL, are those which are placed on Virginia's 2016 Section 303(d) List. These waters are found as not attaining one or more designated uses. Details on determination of non-attainment for the designated use categories is provided in Virginia's *Water Quality Assessment Guidance Manual for 2016 305(b)/303(d) Integrated Water Quality Report*. Virginia's 2016 Section 303(d) list further refines the impaired Category 5 waters identified in the Integrated Report into the seven sub-categories described above.

2. Section 130.7(b) (5) (ii) Waters for which dilution calculations or predictive models indicate non-attainment of applicable water quality standards.

Most of the waters listed on Virginia's 2016 Section 303(d) List were listed based on monitoring data. However, waters listed on Part 5E of the 2016 Section 303(d) List were listed based on permit information, i.e. predictive modeling information. These facilities have compliance schedules for water quality-based effluent limits that extend beyond the listing cycle. These facilities are expected to attain their final effluent limits which will allow for the attainment of water quality standards.

3. Section 130.7(b) (5) (iii), Waters for which water quality problems have been reported by local, state, or Federal agencies; members of the public; or academic institutions.

Several waters were placed on Virginia's Section 303(d) List as a result of data collected by agencies and groups other than VADEQ:

- Federal agencies included the TVA, USGS, USFS, NPS, and the Chesapeake Bay Program;
- State agencies included VADCR and VADH; and
- Several citizen-generated data sets were evaluated for purposes of the report and list.

For a discussion of the information submitted by the Potomac/Shenandoah Riverkeeper, see Section III.J. below.

4. Section 130.7(b)(5)(iv), Waters identified by the State as impaired or threatened in a non-point assessment submitted to EPA under section 319 or in any updates of the assessment.

VADEQ also considered Virginia's 2016 Non-Point Source (NPS) Assessment and Prioritization Study, which identified potential pollutant loadings, water quality impairments, and biological health impacts. The main focus in the Integrated Report was to determine the potential nutrient and sediment loadings associated with the land uses of a watershed. These waters were then segmented so that a summation of total impaired length per watershed could be derived. Watersheds were then prioritized based on potential pollutant loadings, water quality impairments, measures of biological health, and NPS reduction activities. Virginia utilized available nonpoint source information and listed waters with nonpoint sources causing or expected to cause impairment, consistent with Section 303(d) and EPA guidance.

5. Other data and information used to identify waters (besides items 1-4 discussed above).

VADEQ considered other data in addition to the categories of existing and readily available data and information listed in the EPA regulations and set out above. As mentioned in Section III.C.3, several federal and state agencies as well as citizen groups provided data to VADEQ which was used in the formation of Virginia's 2016 Integrated Report and Section 303(d) List.

D. A rationale for any decision to not use any existing and readily available data and information for any one of the categories of waters as described in Sections 130.7(b)(5) and 130.7(b)(6)(iii)

While states are required to evaluate all existing and readily available water quality-related data and information, states may make reasonable decisions whether and how particular data or information is used in determining whether to list particular waters. 40 C.F.R. § 130.7(b)(6)(iii). Virginia has formalized the Commonwealth's assessment process through its *Water Quality Assessment Guidance Manual for 2016 305(b)/303(d) Integrated Water Quality Report* (*"Virginia 2016 Assessment Guidance"),* which describes how citizen and non-VADEQ data is evaluated and used by VADEQ for purposes of the IR and the Section 303(d) list. As a general matter, citizen-generated data that does not meet Level III criteria described in the *"Virginia 2016 Assessment Guidance"* is not utilized by Virginia to identify impairments for purposes of Section 303(d), but is still assembled and evaluated (i.e. considered) and may be used for other parts of the IR.

E. Any other reasonable information requested by the Regional Administrator described in Section 130.7(b) (6) (iv).

During the review of Virginia's 2016 Section 303(d) List, EPA Region III staff requested and received additional information from Virginia.

- **Justification for the de-listed segments.** Virginia delisted several waters that were previously listed on their 2014 Section 303(d) List. Virginia provided EPA with supplemental data and information on these waters as was done for past assessments. A short justification for delisting was also submitted for EPA Region III's review. EPA agrees with VADEQ's delisting determinations.

- **Clarification of changes to previously listed waters.** EPA Region III requested that Virginia provide the old segment identification numbers for waters that were previously listed. EPA made this request in order to track waters from previous Section 303(d) Lists to the 2016 Section 303(d) List. EPA also requested clarification on the listing category for several formerly impaired waters. EPA appreciates the clarifications provided by VADEQ.

F. Identification of the pollutants causing or expected to cause a violation of the applicable water quality standards described in Section 130.7(b) (4).

Virginia identified the pollutants that were causing or expected to cause a violation of the applicable water quality standards for every listed segment where the identity of the pollutant was known. Virginia included those pollutants for which a numeric water quality criterion was violated, such as *E. coli*. For WQLSs identified on Virginia's 2016 Section 303(d) list as violating Virginia's narrative water quality criteria as applied to aquatic life, the impairing pollutant frequently is unknown because the impairment is identified by a direct measure of the biological community. Therefore, the Section 303(d) list identifies many WQLSs based upon failure to achieve the narrative water quality criteria as applied to aquatic life without identifying the cause of the impairment. VADEQ anticipates that the cause(s) of biological impairments in these situations will be determined during TMDL development through a stressor identification which are posted to VADEQ's website at: http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLDevelopment/StressorAnalysisReports.aspx.

G. Priority Ranking and Targeting

Virginia's 2016 Section 303(d) List addresses the priority ranking requirement by designating waters as high, medium, or low priority for TMDL development. Specifically, on its 2016 303(d) List, Virginia identified TMDL development priorities as:

- H (High): waterbody is a priority under the 303(d) Program Vision and will be addressed with a TMDL or alternative plan by 2022;
- M (Medium): waterbody is not a priority under the 303(d) Program Vision but may be addressed with a TMDL or alternative plan by 2022; or
- L (Low): waterbody is not prioritized under the 303(d) Program Vision and will be addressed with a TMDL or alternative plan after 2022.

Virginia also indicated on the priority ranking which waterbodies were scheduled for TMDL or alternative restoration plan development within the next two years by including the notation "2yr." VADEQ utilizes various mechanisms to schedule the development of TMDLs, consistent with EPA guidance, which allows for states to use additional criteria to prioritize its Section 303(d) list (see EPA, April 1991).

EPA agrees that, as to the WQLSs included on the 2016 Section 303(d) list, VADEQ satisfied the requirement to submit a priority ranking

H. Public Participation

The draft 2016 Integrated Report was public noticed in the Virginia Register as being available for public comment from August 7, 2017, until September 6, 2017. A public webinar summarizing the findings of the report was held on August 24, 2017. An electronic copy of the report was made available on the VADEQ web page and paper copies were available upon request. EPA provided comments to VADEQ on the draft 2016 Integrated Report on September 6, 2017. The Commonwealth amended its 2016 Integrated Report to address the public's and EPA's comments. VADEQ submitted the final 2016 Integrated Report to EPA for review and approval with a letter dated January 29, 2018, which was received on February 5, 2018. VADEQ submitted a revised final 2016 303(d) List on February 22, 2018. This action approves Virginia's 2016 303(d) List as submitted on February 22, 2018.

I. Coordination with the U.S. Fish and Wildlife Service

EPA notified the Virginia Field Office of the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, by letters to each agency dated August 10, 2017, of the availability of Virginia's 2016 draft Integrated Report. EPA provided notification as an informal coordination and invited the resource agencies' comments. No comments were received from either agency.

J. Shenandoah River

As VADEQ noted in Chapter 4.3 of the 2016 IR narrative, Virginia previously evaluated citizen complaints and information received in 2012 and 2014 related to algal growth in the Shenandoah River. In response to these submissions and in light of the nature of the applicable

water quality standard and the information provided, VADEQ classified five river segments (seven assessment units) as Category 3C for the recreational use (having an observed effect) in both the 2014 and 2016 IRs and decided to collect additional information before making a use attainment decision. After considering the complexity and the subjective nature of the applicable water quality standard and the variability and limitations of the available data associated with algae cover, EPA found VADEQ's decision to collect additional data before making attainment decisions reasonable and deferred to it.

VADEQ decided additional information submitted by the Shenandoah Riverkeeper in 2016 (consisting of the same information as submitted in connection with the 2014 303(d) list and nine additional photographs) is not inconsistent with its decision to classify five Shenandoah River segments in Category 3C and collect additional information and supports VADEQ's commitments to develop a field method for collecting algae data and collecting additional data on which to base an assessment determination and impairment threshold. The Commonwealth has made commitments to develop a field methodology to estimate filamentous algal growth in flowing waters and to develop a numeric impairment threshold to be used in attainment decisions related to the impacts to algal growth on recreational uses. These commitments were affirmed in an April 18, 2016 letter to EPA.

Consistent with its commitments, VADEQ began developing a field method for estimating filamentous algae growth in May 2016, which continued into 2017. Initial efforts focused on the five Shenandoah River segments added to IR Category 3C in the 2014 IR.[1] VADEQ staff tested three different field methods for estimating algae cover to determine which method provided the greatest agreement amongst field staff. VADEQ staff also began collecting chlorophyll-a and ash free dry mass data to estimate algal densities on the bottom of the river. Results of Shenandoah algae monitoring have been shared by VADEQ with the public via an agency Shenandoah River algae webpage (http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/WaterQualityAssessments/ShenandoahAlgae.aspx), and presented to the public during a public webinar in December 2016 and the Environment Virginia Conference in April 2017.

After considering the Shenandoah Riverkeeper's submissions and algae monitoring results from the 2016 season, VADEQ determined additional data collection was needed before making recreational use attainment decisions in the Shenandoah River segments listed in IR Category 3C. In addition, the data collected in 2016-2017 is outside the period of record identified by VADEQ (ending December 31, 2014) for data to be used in the 2016 303(d) List. In order to facilitate preparation and completion of the 303(d) List, States have discretion

[1] In recognition of the public concern about algal growth in the Shenandoah River, the initial field work has prioritized the five Category 3C segments. However, the methodology and attainment thresholds, once completed, will be applicable to all free-flowing waters in the Commonwealth including the rest of the Shenandoah River.

to set a reasonable cut-off date ending the time period for which the Section 303(d) list describes water quality conditions. Such data describing water quality conditions after that date would be used during the next list cycle. EPA anticipates VADEQ's 2016 Shenandoah algae monitoring data will be used for attainment decisions in connection with Virginia's 2018 303(d) list and with the commitments affirmed in an April 18, 2016 letter to EPA.

Consistent with the Commonwealth's commitments noted above, VADEQ outlined additional goals related to Shenandoah River algae in IR Chapter 4.3. The goals include:

- Further define sampling intervals.
- Propose numeric impairment threshold and assessment methods in VADEQ's *Draft 2018 Water Quality Assessment Guidance Manual.*
- Hold a public webinar to present updated finding and recommendations.
- Incorporate any attainment decisions for Shenandoah River segments presently on Category 3C in Virginia's 2018 IR.
- Work with local citizen monitoring groups to determine meaningful and discrete way in which they can assist with algae efforts.

VADEQ provided a summary of progress to date on the development of monitoring methods and assessment thresholds for use in attainment decisions in its *Draft 2018 Water Quality Assessment Guidance Manual* (assessment methodology), which was released by VADEQ for public comment on March 5, 2018. The summary included a description of the data collected and monitoring methods used during the 2017 field season, along with specific monitoring considerations for public comment. In addition, the assessment methodology included considerations for assessment metrics, frequency, duration, process, and a range of numeric thresholds used in other states and in scientific literature for filamentous algae that constitute a "nuisance" condition or impairment. VADEQ also discusses in the assessment methodology potential roles for citizen groups in the algal monitoring program. The 2018 assessment methodology is made available for public review and comment prior to being finalized for use for the 2018 IR.

For the foregoing reasons, EPA finds VADEQ's decision to collect additional data before making attainment decisions for the 2016 Section 303(d) list regarding the impacts of algae on the recreation use in the Shenandoah River watershed to be reasonable. EPA acknowledges the efforts put forth by VADEQ staff thus far towards meeting algae-related commitments. EPA expects that VADEQ will finalize both the algae field methodology and impairment threshold after weighing public comments received on the *Draft 2018 Water Quality Assessment Guidance Manual*. For the 2018 IR, EPA also anticipates VADEQ will make attainment decisions related to algal impacts to recreational uses for the five Shenandoah River segments (seven assessment units) currently in Category 3C.