West Virginia

2012 Draft Section 303(d) List

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Listing Rationale Table of Contents

Overview

The federal Clean Water Act contains several sections requiring reporting on the quality of a state's waters. Section 305(b) requires a comprehensive biennial report and Section 303(d) requires, from time to time, a list of waters for which effluent limitations or other controls are not sufficient to meet water quality standards (impaired waters). West Virginia code Chapter 22, Article 11, Section 28 also requires a biennial report of the quality of the state's waters.

This document is intended to fulfill West Virginia's requirements for listing impaired waters under Section 303(d) of the Clean Water Act and the Water Quality Planning and Management Regulations, 40CFR130.7. In addition to the list of impaired waters, it explains the data evaluated in the preparation of the list and methodology used to identify impaired waterbodies. Information is also provided that allows the tracking of previously listed waters that are not contained on the 2012 list.

EPA recommends that states accomplish Clean Water Act Section 305(b) and 303(d) requirements in a single integrated report. DEP will prepare such a report (i.e the West Virginia 2012 Integrated Water Quality Monitoring and Assessment Report) after consideration of public comments on the Section 303(d) list of impaired waters. The format of the integrated report will categorize state waters as described below.

Water Categories
Category 1 - fully supporting all designated uses
Category 2 - fully supporting some designated uses, but no or insufficient information exists to assess the other designated uses
Category 3 - insufficient or no information exists to determine if any of the uses are being met
Category 4 - waters that are impaired or threatened but do not need a Total Maximum Daily Load (TMDL)
Category 4a - waters that already have an approved TMDL but are still not meeting standards
Category 4b - waters that have other control mechanisms in place which are reasonably expected to return the water to meeting designated uses
Category 4c - waters that have been determined to be impaired, but not by a pollutant
Category 5- waters that have been assessed as impaired and are expected to need a TMDL

303(d) Listing Process

To begin the 2012 Section 303(d) list development process, the DEP requested and assembled all readily available water quality data for West Virginia waters. Significant efforts were undertaken to obtain data from external sources as detailed in the Data Management section of this document. Data evaluation by the agency began in the fall of 2011. The DEP personnel possessing varying areas of expertise compared instream data to applicable water quality criteria and determined the impairment status of state waters.

The draft document is being advertised for public comment from May 11, 2012 through june 11, 2012. Notices of availability of the draft document are being placed in newspapers statewide including requests for public comment. The draft document is also being promoted via

e-mail and Internet. At the conclusion of the public comment period, the DEP will consider all comments and will make adjustments to the list where appropriate. The DEP will also prepare a "Responsiveness Summary" to address all issues raised pursuant to the draft document. The Responsiveness Summary will include a summary of comments received, and the DEP's responses to those comments. The DEP will submit its 2012 Section 303(d) List to EPA Region III for approval. The list will be a component of the Integrated Report submission described in the Overview.

West Virginia Water Quality Standards

Water quality standards are the backbone of the 303(d) and 305(b) processes of the federal Clean Water Act. Instream data are compared with water quality standards to determine the use attainment status of streams and lakes. In West Virginia, the water quality standards are codified as 47CSR2 – Legislative Rules of the Department of Environmental Protection – Requirements Governing Water Quality Standards, and at 60CSR5 – Legislative Rules of the Department of Environmental Protection – Antidegradation Implementation Procedures. Impairment assessments conducted for the 2012 cycle are based upon water quality standards that have received the EPA's approval and are currently considered effective for Clean Water Act purposes. In that regard, EPA has recently approved several changes to the West Virginia Water Quality Standards. Information regarding the approved changes can be found on the DEP's Web page at http://www.dep.wv.gov/wqs.

A waterbody is considered impaired if it violates water quality standards and does not meet its designated uses. Use attainment is determined by the comparison of the instream values of various water quality parameters to the numeric or narrative criteria specified for the designated use (See the Assessment Methodology section for more information on use attainment determination). Waterbodies that are impaired by a pollutant are placed on the 303(d) List and scheduled for TMDL development.

Some examples of designated uses are water contact recreation, propagation and maintenance of fish and other aquatic life, and public water supply. Designated uses are described in detail in Section 6.2 of 47CSR2 and are summarized in Table 1. Each of the designated uses has associated criteria that describe specific conditions that must be met to ensure that the water can support that use. For example, the "propagation and maintenance of fish and other aquatic life" use requires that the pH remain within the range of 6.0 to 9.0 standard units at all times. This is an example of a numeric criterion. Numeric criteria are provided in Appendix E of the water quality standards.

Numeric criteria consist of a concentration value, exposure duration and an allowable exceedance frequency. The water quality standards prescribe numeric criteria for the "propagation of fish and other aquatic life" use in two forms: acute criteria that are designed to prevent lethality, and chronic criteria that prevent retardation of growth and reproduction. The numeric criteria for acute aquatic life protection are specified as one-hour average concentrations that are not to be exceeded more than once in a three-year period. The criteria for chronic aquatic life protection are specified as four-day average concentrations that are not to be exceeded more than once in a three-year period. The exposure time criterion for human health protection is unspecified but there are no allowable exceedances.

Water quality criteria also can be written in a narrative form. Narrative criteria are contained in Section 3 of 47CSR2. More information regarding the use of narrative criteria is contained in Use Assessment Procedures.

Table 1 - West Virginia Water Use Categories

Category	Use Subcategory	Use Category	Description
A	Public Water	Human Health	Waters, which, after conventional treatment, are used for human consumption.
B1	Warm Water Fishery	Aquatic Life	Propagation and maintenance of fish and other aquatic life in streams or stream segments that contain populations composed of all warm water aquatic life.
B2	Trout Waters	Aquatic Life	Propagation and maintenance of fish and other aquatic life in streams or stream segments that sustain year-round trout populations. Excluded are those streams or stream segments which receive annual stockings of trout but which do not support year-round trout populations.
B4	Wetlands	Aquatic Life	Propagation and maintenance of fish and other aquatic life in wetlands. Wetlands generally include swamps, marshes, bogs and similar areas.
C	Water Contact Recreation	Human Health	Swimming, fishing, water skiing and certain types of pleasure boating such as sailing in very small craft and outboard motor boats.
D1	Irrigation	All Other	All stream segments used for irrigation.
D2	Livestock Watering	All Other	All stream segments used for livestock watering.
D3	Wildlife	All Other	All stream segments and wetlands used by wildlife.
E1	Water Transport	All Other	All stream segments modified for water transport and having permanently maintained navigation aides.
E2	Cooling Water	All Other	All stream segments having one or more users for industrial cooling.
E3	Power Production	All Other	All stream segments extending from a point 500 feet upstream from the intake to a point one-half mile below the wastewater discharge point.
E4	Industrial	All Other	All stream segments with one or more industrial users. It does not include water for cooling.

When more than one use exists, they shall be protected by criteria for the use category requiring the most stringent protection.

The DEP recently received approval from the EPA for changes in several water quality standards related to total iron, nutrients and chlorophyll-a. With respect to total iron, the recent approval revises the chronic aquatic life criterion for troutwaters from 0.5 mg/l to 1.0 mg/l. The DEP and EPA concluded that the revised value is protective of the troutwater use.

The new nutrient criteria include values for total phosphorus and chlorophyll-a for both cool and warm water lakes. The criteria are applied to an average of a minimum of four samples collected throughout the sampling period from May 1 to October 31. The warm water lakes criteria for total phosphorus and chlorophyll-a are 40 ug/l and 20 ug/l, respectively. Cool water lakes criteria for total phosphorus and chlorophyll-a are 30 ug/l and 10 ug/l respectively. However, the EPA's approval of these criteria differs from the original submission by West Virginia in one significant detail. The criteria approved by the West Virginia legislature and submitted by the DEP contained a clause stating a lake would not be considered impaired if the total phosphorus value exceeds the criterion unless the chlorophyll-a criterion was also exceeded. EPA's approval

would require a lake to be listed if either the phosphorus or chlorophyll-a criterion is exceeded. Until this discrepancy is resolved, impairment assessments for total phosphorus and chlorophyll-a data cannot be accomplished. All total phosphorus and chlorophyll-a data will be retained by the DEP for assessment in future listing cycles once the discrepancy is resolved.

Ohio River criteria

For the Ohio River, both the Ohio River Valley Water Sanitation Commission (ORSANCO) and West Virginia water quality criteria were considered, as agreed upon in the ORSANCO compact. Where both ORSANCO and West Virginia standards contain a criterion for a particular parameter, instream values were compared against the more stringent criterion. The DEP supports ORSANCO's efforts to promote consistent decisions by the various jurisdictions with authority to develop 305(b) reports and 303(d) lists for the Ohio River. In support of those efforts, West Virginia has and will continue to work with ORSANCO and the other member states through a workgroup charged with improving consistency of 305(b) reporting among compact states. ORSANCO standards may be reviewed at http://www.orsanco.org/standards.

Recently, ORSANCO notified its member states of a change in philosophy for assessing aquatic life standards for its biennial 305(b) report. In previous years ORSANCO has assessed water quality data along sections of the Ohio River bordering West Virginia based on the state's total iron numeric water quality standard. In 2012, ORSANCO's governing commission has instructed its personnel to use a weight of evidence approach when assessing all aquatic life standards. Alternatively, the EPA's Region III has stated for 303(d) listing purposes, it will only accept assessments based on a philosophy of the independent applicability. Therefore, West Virginia's 303(d) assessments for aquatic life will recognize violations based on either water quality or biological survey data. A review of the ORSANCO total iron water quality data revealed violation rates greater than 10 percent for several sections along the West Virgina border and, as such, the segments will be listed as impaired on West Virginia's 2012 303(d) list.

DATA MANAGEMENT

Assessed data

All readily available data was used during the evaluation process. In preparation for the development of this report, the agency sought water quality information from various state and federal agencies, colleges and universities, private individuals, businesses, organizations and others. News releases and public notices were published in state newspapers. Specific requests for data were made to state and federal agencies known by the DEP to be generators of water quality data. Table 2 identifies the entities that contributed water quality data. The DEP's staff reviewed data from external sources to ensure that collection and analytical methods, quality assurance and quality control and method detection levels were consistent with approved procedures. In addition, DEP has developed guidance for those wishing to submit data. The document contains a list of requirements for submitted data along with helpful internet links and a checklist for data submitters. The guide and additional information regarding data submissions can be found on DEP's Web site using the following link: http://www.dep.wv.gov/WWE/watershed/IR/Pages/303d_305b.aspx.

Assessment decisions are made using the most accurate and recent data available to the agency. For stream water quality assessments, the DEP generally used water quality data generated between July 2006 and June 2011. The use of data more than five years old is intentionally limited. In the absence of new information, previous assessments are carried forward even if the data becomes older than five years. Additionally, if a

water quality criteria change is approved which affects an older assessment, the new assessment will only reflect the current criteria. Waters are not deemed impaired based upon water quality data collected when stream flow conditions are less than 7Q10 flow (the seven consecutive day average low flow that recurs at a 10 year interval) or within regulatory mixing zones. Further, waters are not deemed impaired based upon "not-detected" analytical results from methodologies having detection limits that are not sensitive enough to confirm criteria compliance.

External data providers

Data submitted from sources outside of the Watershed Assessment Branch were considered in the development of this report. This also includes data from other DEP programs. Entities that provided information in response to the agency's request for data for the 2012 Section 303(d) list are shown in Table 2. External data received and qualified in the preparation of previous Section 303(d) lists and TMDL efforts were reconsidered in the 2012 review. Once data was submitted, the DEP performed the following:

- Determined quality and quantity
- Formatted data for evaluation
- Determined stream codes and mile points
- Used qualified data from external sources to make assessment decisions

Table 2 - Data providers for the 2012 303(d) list		
ARGUS Energy	National Park Service - U.S. Department of Interior	West Virginia Department of Environmental Protection - Nonpoint Source Program
Appalachian Mountain Advocates	Friends of Deckers Creek	Piney Creek Watershed Association
Department of Agriculture	Freshwater Institute	ORSANCO

USE ASSESSMENT PROCEDURES (303(d) Listing Methodology)

The primary focus of this report is to assess water quality information and determine if the designated uses of state waters are impaired. This section describes the various protocols used to determine use impairment.

Numeric water quality criteria

The decision methodology for numeric water quality criteria used in preparation of the draft 2012 Section 303(d) list are consistent with those used in 2010 listing cycle.

Typically, if an ample data set exists and exceedances of chronic aquatic life protection and/or human health protection criteria occur more than 10 percent of the time, the water is considered to be impaired. If the rate of exceedance demonstrated is less than or equal to 10 percent, then the water is considered to be meeting the designated use under evaluation. Ample data sets are defined as sets with 20 or more distinct observations. If fewer than 20 samples per station or representative area exist and three or more values exceed a criterion value, then the water also is considered to be impaired. For this scenario (three observed violations), if additional non-exceeding monitoring results were available that would increase the data set size to 20 observations, a greater than 10 percent exceedance frequency would still exist.

Under West Virginia Water Quality Standards, acute aquatic life protection criteria have associated exposure durations of one hour and may be exceeded once every three years. The normal practice of "grab-sampling" ambient waters is generally consistent with the one-hour exposure duration specified in the standards. Therefore, a direct application of the allowable exceedance frequency provided in the standards is made when assessing impairment relative to acute aquatic life protection criteria. If two or more exceedances of acute criteria are observed in any three-year period, the water is considered to be impaired.

If the data being evaluated is generated as part of a comprehensive network being monitored for a specific purpose, the data may be assigned a higher level of assessment quality, and the "10-percent rule" may be applied with confidence to data sets containing less than 20 observations per station. The primary example of an intensified monitoring program that generates higher assessment quality data is that which is conducted by the DEP to support TMDL development. The pre-TMDL monitoring format includes flow measurement and monthly water quality monitoring for one year at multiple locations throughout a watershed. Information is generated over a range of stream flow conditions and in all seasons. Habitat assessment and biological monitoring is performed in conjunction with water quality monitoring. The information generated under this format is among the most comprehensive available for assessing water quality. Upon conclusion of monitoring, it is then necessary for agency personnel to make a definitive judgment relative to impairment. In most instances, application of the "10-percent rule" to the pre-TMDL monitoring data sets result in the classification of waters as impaired if two or more exceedances of a criterion are demonstrated.

Additionally, the DEP does not interpret the impacts of a single pollution event as representative of current conditions if it is believed that the problem has been addressed. Similarly, the DEP does not intend to interpret the results of clustered monitoring of a single event as being

Table 3 - Decision criteria summary for numeric water quality criteria

Water Quality Criteria	Impairment Thresholds	Exceptions
Acute Aquatic Life Protection (Use Category B)	The water is impaired if two exceedances of acute aquatic life protection numeric criteria occur within any three-year period.	If, in the most recent three-year period, no exceedances of criteria are evidenced and at least 12 monitoring results are available, then the water may not be considered impaired.
Chronic Aquatic Life Protection (Use Category B) Human Health Protection (Use Categories A and C)	The water is impaired if a greater than 10% frequency of exceedance is demonstrated in an ample dataset (20 or more available observations). The water is impaired if three (3) exceedances of criteria occur with less than 20 available monitoring results. The water is impaired if a greater than 10% frequency of exceedance is demonstrated with less than 20 available observations, if the data being evaluated is of high assessment quality (two or more violations)	If, for waters with regularly scheduled monitoring, in the most recent two-year period, no exceedances of criteria are evidenced and at least eight observations are available, then the water may not be considered impaired.

representative of water quality conditions for longer time periods. Datasets are screened for excessive clustering of monitoring, in space or time, to avoid misinterpretation.

Table 3 summarizes the criteria used to make 303(d) impairment decisions relative to numeric water quality criteria period.

Segmentation of streams

The majority of newly listed streams were identified as impaired for their entire length. Segmentation occurred only in in limited situations involving streams with impoundments or alternative designated uses, or when knowledge of a specifc pollutant source allowed clear distinction of impaired and unimpaired segments or streams with multiple monitoring locations with different results.

Segmentation based upon the limited amount of water quality monitoring data that is usually available may not accurately portray the extent of impairment and may contradict the ultimate findings of the TMDL that the listing mandates. The DEP believes the TMDL development process, which links extensive water quality monitoring with pollutant sources through computer modeling, provides the best assessment of criterion attainment and the most accurate identification of the watershed sources for which pollutant reductions are necessary. TMDL modeling predicts water quality over a wide range of climatic and stream flow conditions, incorporates the specific exposure duration and exceedance frequency terms of water quality criteria and prescribes pollutants allocations that will result in attainment of criteria in all stream segments.

Evaluation of fecal coliform numeric criteria

Fecal coliform assessments were based on the previously described decision criteria for numeric water quality criteria. Given the complexity of this particular criteria, most assessments are performed by comparing observations to the "maximum daily" criterion value of 400 counts/100ml. Evaluation of the monthly geometric mean fecal coliform criterion (200 counts/100ml) occurs only where five or more individual sample results are available within a calendar month.

Numeric fecal coliform water quality criteria are applicable to the Water Contact Recreation and Public Water Supply designated uses. Section 8.13 of Appendix E of the West Virginia Water Quality Standards states:
Maximum allowable level of fecal coliform content for Primary Contact Recreation shall not exceed 200/100ml as a monthly geometric mean based on not less than five samples per month; nor to exceed 400/100ml in more than 10 percent of all samples taken during the month.

A practical difficulty exists in accurate assessment of criteria compliance due to the resource commitment that would be necessary to perform monitoring at a sufficient frequency to make determinations using the geometric mean criteria, since the monthly geometric mean criterion is conditioned upon the availability of at least five distinct sample results in a month. The "maximum daily" criterion (i.e. 400/100ml is more than 10%) is not conditioned by a minimum sample set requirement, but practical use of the apparent 10 percent exceedance allowance would involve at least 10 samples per month.

The most frequent and regular fecal coliform water quality monitoring conducted by the Watershed Assessment Section is once per month. That monitoring frequency precludes assessment of the monthly geometric mean criterion and hampers accurate assessment of the maximum daily criterion. Due to limited resources, more frequent fecal coliform monitoring could only be accomplished by significantly reducing the number

of West Virginia streams and/or stations where water quality assessments are performed. The DEP does not consider that to be a reasonable alternative.

The DEP uses the following protocols when making assessments relative to fecal coliform numeric criteria:

- No assessments are based upon the monthly geometric mean criterion (200 counts/100ml) unless an available data set includes monitoring at five per month or greater frequency. When data sets are available, the listing decision criteria for numeric water quality criteria are applied, considering each monthly geometric mean as an available monitoring result.
- The listing decision criteria are applied to the maximum daily criterion (400 counts/100ml) and available individual monitoring results, but without the monthly prejudice. For example, if twice per month monitoring is conducted for a year and two results in two separate months are greater than 400, the stream would not be listed (2/24 - 8.3 percent rate of exceedance). If five samples per month monitoring is conducted for one year and four daily results greater than 400 are measured in four different months, the stream would not be listed (4/60 – 6.7 percent rate of exceedance), provided that the monthly geometric means were below the 200 counts/100 ml criteria.

The decision criteria does not provide for 303(d) listing of waters with severely limited data sets and exceedance (i.e., one sample in a five-year period > 400 counts/100ml). Such waters would be classified as having insufficient data available for use assessment. The DEP will target these "fecal one-hit" waters for additional monitoring by incorporating them into the pre-TMDL monitoring plans at the next opportunity for TMDL development in their watershed. Where the intensified pre-TMDL monitoring (monthly sampling for one year) indicates impairment, TMDL development will be immediately initiated, even though the water may not be included on the 303(d) list.

Narrative water quality criteria – biological impairment data

Passage of Senate Bill 562 in the 2012 regular legislative session requires DEP to develop and secure legislative approval of new rules to interpret the narrative criterion for biological impairment found in 47 CSR 2-3.2.i. A copy of the legislation may be viewed at http://www.legis.state.wv.us/Bill_Text_HTML/2012_SESSIONS/RS/pdf_bills/SB562%20SUB1%20enr%20PRINTED.pdf. In response to the legislation, DEP is not adding new biological impairments to the 2012 Section 303(d) list. Previously listed impairments are being retained. When new rules become effective, delisting without TMDL development may occur if the application of the assessment methodology demonstrates a non-impaired condition. The following section describes the methodology historically used by DEP to assess the narrative criterion at 47 CSR 2-3.2.i. Once developed, the revised assessment methodology called for in SB 562 will be made available for public review as part of the legislative rule making process.

West Virginia Stream Condition Index or WVSCI

The WVSCI consists of six benthic community metrics combined into a single multimetric index. The WVSCI was developed by Tetra Tech Inc. (2000) using DEP and EPA data collected from riffle habitats in wadeable streams.

In general terms, all metric values were converted to a standard 0 (worst) to 100 (best) point scale. The six standardized metric scores were then averaged for each benthic sample site to come up with a final index score ranging from 0.0 to 100.0. Using the distribution of scores from all sites that are considered reference sites, an impairment threshold of 68.0 was established. If a stream site received a WVSCI score greater than 68.0, it was considered to be unimpaired.

To address the potential variability associated with a number of factors (collector, micro-habitat, subsampling, etc.) a precision estimate was determined by analysis of duplicate biomonitoring data. The precision estimate (7.4 WVSCI points) was subtracted from the impairment threshold to define a "gray zone" of WVSCI scores between 60.6 and 68.0 for which adverse impact to biological integrity is less than certain.

WVSCI Scoring Criteria
> 68.0 Unimpaired
≥ 60.6 to 68 "Gray Zone"
< 60.6 Impaired

The effective use of limited TMDL development and implementation resources requires the avoidance of impairment misclassifications. Although the true WVSCI impairment threshold is 68.0, DEP identified biological impairment in the 303(d) listing process only in response to WVSCI scores less than 60.6, so as to allow the highest degree of confidence in the validity of the listed biological impairments.

The narrative water quality criterion of 47CSR2 – 3.2.i. prohibits the presence of wastes in state waters that cause or contribute to significant adverse impact to the chemical, physical, hydrologic and biological components of aquatic ecosystems. Streams are listed as biologically impaired based on a survey of their benthic macroinvertebrate community. Benthic macroinvertebrate communities are rated using a multimetric index developed for use in wadeable streams of West Virginia. The West Virginia Stream Condition Index (WVSCI) is composed of six metrics that were selected to maximize discrimination between streams with known impairments and reference streams. Streams with WVSCI scores of less than 60.6 are considered biologically impaired and included on the 303(d) List. Benthic macroinvertebrates are collected with a 500 µm mesh rectangular dip net. The kick sample is collected from the 1.0 m2 area of substrate. Identifications are completed for a 200-organism subsample. The WVSCI was developed from data using these methods. Streams are listed as being biologically impaired only if the data was comparable (e.g., collected utilizing the same methods used to develop the WVSCI, adequate flow in riffle/run habitat, and within the current index period).

Most streams with low biological scores are listed as having an unknown source/cause of impairment on the 303(d) List and most are listed, by default, for their entire length. It is doubtful that the entire length of every stream is impaired, but without further data, the exact length of impairment is unknown. Each listed stream will be revisited prior to TMDL development. The additional assessments performed in the pre-TMDL monitoring effort will better define the impaired length. The causative stressor(s) of the impairment and the contributing sources of pollution also will be identified during the TMDL development process. If the stressor identification process demonstrates that the biological impairment is not caused by a pollutant, then no TMDL will be developed.

Narrative water quality criteria – fish consumption advisories

The narrative water quality criterion of 47CSR2 – 3.2.e prohibits the presence of materials in concentrations that are harmful, hazardous or toxic to man, animal or aquatic life in state waters. Fish consumption advisories are used to inform the public about potential health risks associated with eating fish from West Virginia's streams. The DEP, Division of Natural Resources, and the Bureau for Public Health have collaborated on fish contamination issues since the 1980s; however, an executive order by the governor in 2000 mandated a formal collaborative process to issue fish consumption advisories. Fish consumption advisories are developed and issued in accordance with an interagency agreement. In the absence of specific body-burden criteria, the presence of contaminants in fish tissue from commonly consumed species in amounts equivalent to a two meal per month advisory is considered sufficient evidence of impairment.

Risk-based principles are used to determine whether fish consumption advisories are necessary. These advisories are used as a public education tool to help citizens make informed decisions about eating fish caught in state streams. The risk-based approach estimates the probability of adverse health effects and provides a statement on the health risk facing the angler and high-risk groups including women of childbearing age and children. West Virginia's fish consumption advisories include guidelines on the number of meals to eat and information on proper fish preparation to further minimize risk.

Waterbody-specific fish consumption advisories exist for 13 state streams and five lakes for a variety of fish species and contaminants. Additionally, there is a general statewide advisory that recommends limiting the consumption of certain sport-caught fish from all West Virginia waters in relation to low-level mercury and/or polychlorinated biphenyl (PCB) contamination. The statewide advisory provides species-specific recommendations ranging from one meal per week to one meal per month. The following webpage contains the 2012 West Virginia fish consumption advisories: *http://www.wvdhhr.org/fish/Current_Advisories.asp#sect2.*

West Virginia water quality standards also contain a numeric body-burden criterion for methylmercury in fish tissue for protection of public water supply and water contact recreation designated uses. The criterion states "The total organism body burden of any aquatic species shall not exceed 0.5 µg/g as methylmercury". Therefore, the DEP must apply the criteria to all aquatic species rather than just the commonly consumed fish species.

In the 2010 listing cycle, the DEP delisted many previous mercury impairments because they were based upon total mercury rather than methylmercury fish tissue concentrations and upon fillet rather than whole body samples. 2012 mercury listings adhere to the specific conditions of the criterion (whole-body, methylmercury, species-specific).

In the interim period between the 2010 and 2012 lists, the DEP accomplished whole-body methylmercury sampling of fish from eight of 14 waters for which mercury impairments were delisted in 2010. The new data was assessed in the preparation of the 2012 list. Monitoring is planned to sample the remaining waters in time for assessment in the 2014 cycle.

For the mainstem Ohio River, the applicable ORSANCO body-burden criterion is 0.3 µg/g. As with previous 303(d) lists, DEP has deferred to ORSANCO's assessment results for mercury listing purposes. ORSANCO's assessment methodology can be found at http://www.orsanco.org/biennial-assessment-of-ohio-river-water-quality-conditions-305b.

Narrative Water Quality criteria - Greenbrier River Algae

In the past, the DEP has received a number of reports of excessive algal growth along certain sections of the Greenbrier River which made fishing and swimming in these areas nearly impossible during portions of the summer season. In order to address this loss of recreational use, the DEP began evaluating algal growth on the Greenbrier River in 2007 to determine both the extent of impact and the sources of pollution which were contributing to these conditions.

The initial investigation documented conditions in the mainstem of the Greenbrier River. Thick algal mats and/or large areas of attached filamentous algae growth occurred over approximately 50 miles of the river, at times stretching from bank to bank. Similar conditions occurred in 2008. During both 2007 and 2008, public water suppliers drawing river water from affected areas received complaints of odor in their drinking water requiring initiation of additional treatment measures.

In 2009, DEP personnel performed intensive water quality sampling along the Greenbrier River as the algae began to bloom. In-stream grab samples were analyzed for total and dissolved phosphorus, total nitrogen, alkalinity, hardness, and other parameters. Both the chemical and physical conditions in the Greenbrier River – including hardness, alkalinity, temperature, clarity, substrate and the elevated levels of nitrogen and phosphorus– proved to be ideal for growth of filamentous algae. The written report *Assessment of Filamentous Algae in the Greenbrier River and Other West Virginia Streams* summarizing the investigation is available on the DEP's Web site.

At the time of initial investigation, West Virginia did not have numeric water quality criteria for phosphorus in flowing rivers. However, seasonal non-attainment of designated uses (public water supply and contact recreation) had been documented due to excessive algal growth which has been attributed to anthropogenic phosphorous inputs. Based on these findings, the DEP assessed the Greenbrier River as impaired from its mouth upstream to mile point 102.7 (confluence of Beaver Creek) in the 2010 303(d) list.

The existence of prohibited algal blooms continued to be documented in the summers of 2010 and 2011. Additionally, a recent change in the language of the state water quality standards contained in section 3.2.g specifically prohibits algae blooms which impair or interfere with the designated uses of affected waters. Therefore, the Greenbrier River continues to be listed as impaired from its mouth to mile point 102.7 (confluence of Beaver Creek).

Narrative Water Quality criteria – Algal blooms in South Branch Potomac River and Cacapon River

Over the past three years, DEP evaluated algal growth in the South Branch Potomac River and the Cacapon River to determine the magnitude and extent of impacts to the designated uses of those waters. The evaluation documented seasonal non-attainment of designated uses due to excessive algal growth in segments of both rivers.

Section 3.2.g of West Virginia Water Quality Standards specifically prohibits algae blooms which may impair or interfere with the designated uses of affected waters and section 3.2.h prohibits conditions that require an unreasonable degree of treatment for the production of potable water by modern water treatment processes as commonly employed.

In the South Branch Potomac River between Moorefield and Romney and in the Cacapon River between Wardensville and Forks of Cacapon, algae were observed in amounts that may interfere with the water contact recreation designated use. At various locations within those reaches, algae covered the entire stream substrate and/or formed mats that covered large portions of the stream. Additionally, the City of Romney advised DEP that algal-related taste and odor in their finished drinking water required activated charcoal addition to control. That condition impairs/ interferes with the public water supply designated use.

The DEP has determined the South Branch Potomac River to be impaired due to algal blooms from MP 23.7 (confluence with Johns Run) to MP 58 (confluence with South Fork) and the Cacapon River from MP 39 (confluence with North River) to MP 76 (Route 259 Bridge near Wardensville).

Total Maximum Daily Load (TMDL) Development Process

From 1997 until 2003, EPA Region III developed West Virginia TMDLs under the settlement of a 1995 lawsuit, Ohio Valley Environmental Coalition, Inc., West Virginia Highlands Conservancy, et. al. v. Browner, et. al. The lawsuit resulted in a consent decree between the plaintiffs and the EPA that specified TMDL development requirements and compliance dates. While the EPA was working on developing TMDLs, the DEP concentrated on building its own TMDL program. With the help of the TMDL stakeholder committee, the agency secured funding from the state legislature and created the TMDL section within the Division of Water and Waste Management.

The TMDL section is committed to implementing a TMDL process that reflects the requirements of TMDL regulations, provides for the achievement of water quality standards, and ensures that ample stakeholder participation is achieved in the development and implementation of TMDLs. The DWWM's approach to TMDL development allows 48 months to develop a TMDL from start to finish. This approach enables the agency to carry out an extensive data generation and gathering effort to produce scientifically defensible TMDLs, and allows ample time for modeling, report drafting and frequent public participation opportunities.

The DEP TMDLs are developed according to the Watershed Management Framework cycle. The framework divides the state into 32 major watersheds and operates on a five year, five-step process. The watersheds are divided into five hydrologic groups (A - E). Watersheds within each group are considered for TMDL development every five years. A map depicting the 32 watersheds and hydrologic groupings is found on page 14. The TMDL process begins in the first year of the cycle with pre-TMDL sampling and public meetings in the affected watersheds. The data is compiled and TMDL development begins in year two of the cycle. In the third year, TMDL development continues and the TMDL is drafted. The TMDL is finalized in the fourth year. In the fifth year of the cycle, TMDL implementation is initiated through the NPDES permitting process and efforts toward limiting nonpoint source loading. Throughout the TMDL development process, there are numerous opportunities for public participation and input.

Table 4 - West Virginia TMDL development progress

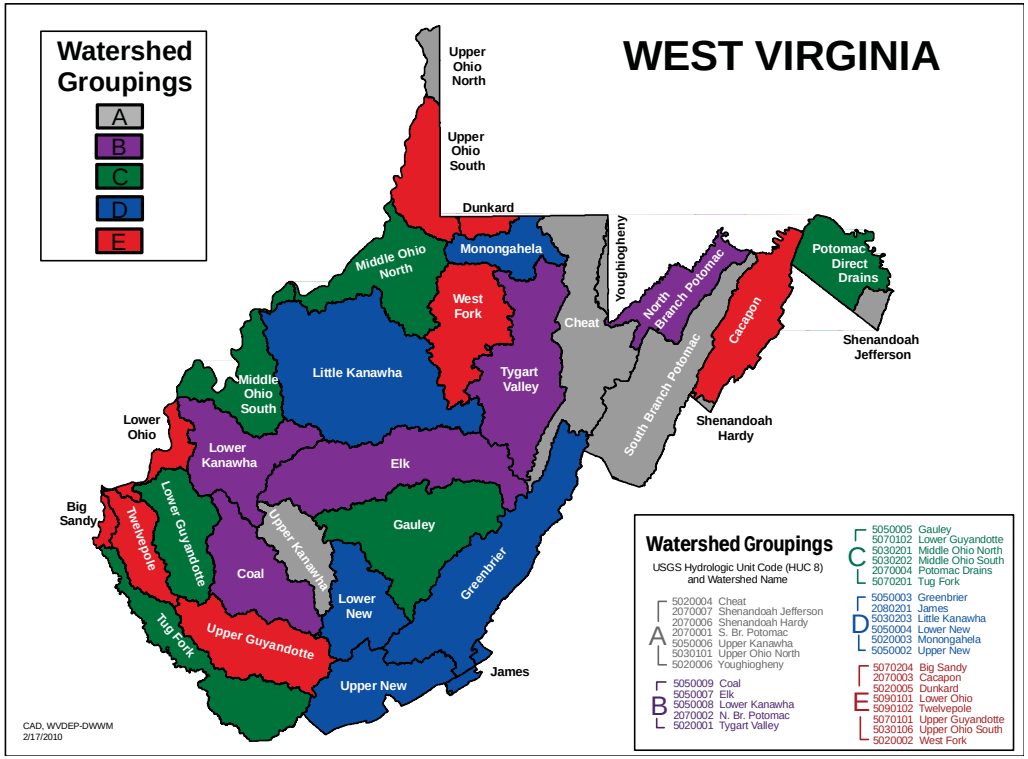
Hydrologic Group	Watersheds	Progress
A2	Cheat	U.S. EPA approved in 2010
B2	North Branch of the Potomac	U.S. EPA approved in 2011
	Lower Kanawha Elk	Submit draft report in 2012
C2	Middle Ohio North Middle Ohio South	In development. Draft TMDL in 2012
D2	Monongahela	In model development. Draft TMDL in 2013
E2	West Fork	Pre-TMDL sampling complete. Draft TMDL in 2014
A3	Upper Kanawha Upper Ohio North South Branch of the Potomac Shenandoah (Hardy)	Pre-TMDL monitoring and source characterization ongoing. (July 2011 - June 2012).

Since its inception, DEP's TMDL section pursued timely development of TMDLs for the waters and impairments identified in the consent decree between EPA and the Ohio Valley Environmental Coalition, et. al. The TMDLs developed and approved in the Dunkard Creek, Upper Ohio River South, Youghiogheny, and Camp Creek/Twelvepole Creek watersheds in 2009 fully accomplished EPA's commitments under the consent decree.

The 303(d) list identifies and prioritizes the waters and impairments for which future TMDLs will be developed by specifying the year in the "Projected TMDL Year" column. The impaired waters intended for TMDL development in 2012, 2013 and 2014 are known and identified. For other waters and impairments, where the timing of TMDL development is less certain, the "Projected TMDL Year" is identified as the most future year when opportunity exists per the DEP's plans to develop TMDLs in concert with the Watershed Management Framework.

At any point in time, DEP personnel are working on TMDLs in each of the five hydrologic groups (A-E). Each set of TMDLs moves through several stages of development prior to finalization and the EPA's approval. Table 4 shows the state's TMDL development progress.

The DEP's Web site contains all approved TMDL documents and the draft TMDL documents currently out for public comment. These documents can be found at http://www.dep.wv.gov/WWE/watershed/TMDL/Pages/default.aspx.



List Format Description

The format of the 2012 Section 303(d) list is organized around the Watershed Management Framework. The five hydrologic groups (A-E) of the framework provide the skeleton. Within each hydrologic group, watersheds are arranged alphabetically and impaired waters are sorted by stream code in their appropriate watershed. The information that follows each impaired stream includes the stream code, the affected water quality criterion, the general source of the impairment (where known), the impaired length (or, by default, the entire length), the planned or last possible timing of TMDL development and whether or not the impairment was on the 2010 list. The cause of impairment is often unknown or uncertain at the time of listing and is so indicated on the list. The scheduling of TMDL development is discussed in detail in Total Maximum Daily Load (TMDL) Development Process section. A West Virginia Watershed Management Framework map is provided to assist navigation within the list. A key is also provided to aid in the interpretation of presented information.

List Supplements Overview

Six supplements are provided that contain additional information. The six supplements are entitled: "Previously Listed Waters – No TMDL Developed," "Previously Listed Waters – TMDL Developed," "Water Quality Improvements Being Implemented – Below Listing Criteria," "Impaired Waters – No TMDL Needed," "Total Aluminum TMDLs Developed" and "New Listings for 2012."

Supplemental Table A - Previously Listed Waters – No TMDL Developed

Previously listed waters from the 2010 list that are not on the 2012 list are included in this supplement if a TMDL has not been developed, and these waters have been reevaluated and determined not to be impaired. Causes for revision of the impairment status include recent water quality data demonstrating an improved water quality condition, revision to the water quality criteria associated with the previous listing, documentation that the water was previously listed in error or a modification of the listing methodology.

Supplemental Table B - Previously Listed Waters - TMDL Developed

TMDLs have been developed for many previously listed waters. TMDL development allows the removal of an impaired water from the 303(d)

list. In the suggested format of the Integrated Report, such waters are to be classified in Category 4A and clearly distinguished from Category 5 and the 303(d) list. Waters included in Category 4A have TMDLs developed, but water quality improvements are not yet complete and/or documented. The waters identified in Supplement B will match those of Category 4A of the Integrated Report.

Supplemental Table C - Water Quality Improvements

The goal of TMDLs and stream restoration projects is to bring the stream back to the point where it meets its designated uses and the associated water quality criteria. Supplement C includes a listing of streams with improved water quality. In the Integrated Report, the waters in Supplement C are to be included in Category 1 (meeting all uses), provided that impairments for other uses/pollutants are not evidenced.

Supplemental Table D - Impaired Waters - No TMDL Development Needed

This table lists impaired waters for which either other control mechanisms are in place to control pollutants or the water is not impaired by a pollutant (i.e., flow alterations caused by mining). These are the same waters contained in the Integrated Report's Category 4b and 4c, respectively.

Supplemental Table E – Outdated Total Aluminum

Supplemental Table E - Total Aluminum TMDLs identify waters for which aluminum TMDLs were developed based upon water quality criteria that are no longer effective. After the subject TMDLs were developed, EPA approved revisions to West Virginia water quality standards that changed the aluminum numeric water quality criteria from total to dissolved form. This table is included to document the development of the obsolete TMDLs and to distinguish them from the effective TMDLs identified in Supplemental Table B. Once these streams are assessed for dissolved aluminum, they will be removed from Table E.

Supplemental Table F – New Listings for 2012

This table is a list of impaired waters that were not previously included on the 2010 Section 303(d) list.

Responsiveness Summary (Reserved)

EPA Approval: Resultant Refinements (Reserved)

west virginia
department of environmental protection