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

Mr. Scott Mandirola, Director
Division of Water and Waste Management
West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, West Virginia 25304-2345

MAY 17 2012

Dear Mr. Mandirola:

The U.S. Environmental Protection Agency (EPA), Region III, is pleased to approve the Total Maximum Daily Loads (TMDLs) developed for metals (dissolved aluminum total iron, and total selenium), pH, and fecal coliform in the selected streams of the Elk River watershed. The TMDLs were established to address impairments of water quality, as identified on West Virginia's 2010 Section 303(d) List. The West Virginia Department of Environmental Protection submitted the report, *Total Maximum Daily Loads for Selected Streams in the Elk River Watershed, West Virginia*, to EPA for review and approval on January 26, 2012. The TMDLs were established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act.

In accordance with Federal regulations at 40 CFR §130.7, a TMDL must comply with the following requirements: (1) be designed to attain and maintain applicable water quality standards; (2) include a total allowable loading, and as appropriate, wasteload allocations for point sources and load allocations for nonpoint sources; (3) consider the impacts of background pollutant contributions; (4) take critical stream conditions into account (the conditions when water quality is most likely to be violated); (5) consider seasonal variations; (6) include a margin of safety (which accounts for any uncertainties in the relationship between pollutant loads and instream water quality); and (7) be subject to public participation. The TMDLs for the selected streams of the Elk River watershed satisfy each of these requirements. In addition, the TMDLs considered reasonable assurance that the TMDL allocations assigned to the nonpoint sources can be reasonably met. A rationale of our approval is enclosed.

As you know, any new or revised National Pollutant Discharge Elimination System permits must be consistent with the assumptions and requirements of applicable TMDL wasteload allocations pursuant to 40 CFR §122.44(d)(1)(vii)(B). Please submit all such permits to EPA for review per EPA's letters dated October 1, 1998, and July 7, 2009.

If you have any questions regarding these TMDLs, please contact Ms. Helene Drago, TMDL Program Manager, at 215-814-5796.

Sincerely,

John M. Capacasa, Director
Water Protection Division

Enclosure

cc: Mr. John Wirts (WVDEP)
Mr. David Montali (WVDEP)

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1650 Arch Street
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Decision Rationale
Total Maximum Daily Load for Selected Streams in the Elk River Watershed, West Virginia

Jon M. Capacasa, Director
Water Protection Division

Date: 5.17.12

Decision Rationale
Total Maximum Daily Loads for Selected Streams in the
Elk River Watershed, West Virginia

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed for those waterbodies identified as impaired by a state where technology-based and other controls do not provide for the attainment of water quality standards. A TMDL is a determination of the amount of a pollutant from point, nonpoint, and natural background sources, including a margin of safety (MOS), which may be discharged to a water quality-limited waterbody.

This document will set forth the U.S. Environmental Protection Agency's (EPA) rationale for approving the TMDLs for metals (dissolved aluminum, total iron, and total selenium), pH, fecal coliform bacteria, and biological impairment in selected waterbodies of the Elk River watershed. The TMDLs were developed to address impairments of water quality as identified in West Virginia's 2010 Section 303(d) list of impaired waters. The West Virginia Department of Environmental Protection (WVDEP) submitted the report, *Total Maximum Daily Loads for Selected Streams in the Elk River Watershed, West Virginia*, to EPA on January 26, 2012. EPA's rationale is based on the determination that the TMDLs meet the following seven regulatory conditions pursuant to 40 CFR Part 130.

1. The TMDLs are designed to implement applicable water quality standards.
2. The TMDLs include a total allowable load as well as individual wasteload allocations (WLAs) and load allocations (LAs).
3. The TMDLs consider the impacts of background pollutant contributions.
4. The TMDLs consider critical environmental conditions.
5. The TMDLs consider seasonal environmental variations.
6. The TMDLs include a margin of safety.
7. The TMDLs have been subject to public participation.

In addition, these TMDLs considered reasonable assurance that the TMDL allocations assigned to nonpoint sources can be reasonably met.

From this point forward, all references in this rationale are found in West Virginia's TMDL Report, *Total Maximum Daily Loads for Selected Streams in the Elk Watershed, West Virginia*, unless otherwise noted.

II. Summary

Table 3-3 presents the waterbodies and impairments for which TMDLs have been developed in the Elk River watershed. WVDEP conducted extensive water quality monitoring throughout the Elk River watershed from July 2007 through June 2008. The results of this monitoring were used to confirm the impairments of waterbodies identified on previous

Section 303(d) lists and to identify other waterbodies that were not previously listed. West Virginia identified 214 waterbodies contained within 37 TMDL watersheds in the Elk River watershed as impaired due to exceedances of some combination of the numeric water quality criteria for fecal coliform bacteria, metals (total iron, dissolved aluminum, and total selenium), and pH. In addition, certain waters in the Elk River watershed were listed as biologically impaired based on the narrative water quality criteria of 47 CSR §2-3.2.i, which prohibits the presence of wastes in state waters that cause or contribute to significant adverse impacts on the chemical, physical, hydrologic, and biological components of aquatic ecosystems.

A stressor identification process was used to determine the pollutants for which TMDLs must be developed to address biological impairments in the Elk River watershed. Stressor identification entails reviewing available information, forming and analyzing possible stressor scenarios and implicating causative stressors. The primary data set used for the stressor identification was generated through pre-TMDL monitoring (Technical Report, Appendix I). In the Elk River watershed, the stressor identification confirmed aluminum toxicity, pH toxicity, organic enrichment, sedimentation, and ionic toxicity as sources of impairment in the Elk River watershed. TMDLs were established for the pollutants required to address the sources of impairment within the watershed.

Section 10 presents the TMDLs developed for the Elk River watershed. The TMDLs are also represented in Microsoft Excel spreadsheets (submitted by West Virginia via compact disc) that provide detailed source allocations associated with successful TMDL scenarios. A Technical Report was included by West Virginia to describe the detailed technical approaches used during TMDL development and to display the data upon which the TMDLs were based. West Virginia also provided an ArcView GIS project (and shapefiles) that explores the spatial relationships among the pollutant sources in the watershed. With the exception of selenium, the TMDLs in the Elk River watershed were presented as average daily loads because they were developed to meet TMDL endpoints under a range of conditions observed throughout the year. To appropriately address critical conditions, the TMDLs were developed using continuous simulation modeling over a period of several years that captured precipitation extremes, which inherently considers seasonal hydrologic and source loading variability. Because the selenium impairments have been attributed to point source discharges and low flow critical conditions, the TMDLs are presented as an equation for the maximum daily load that is variable with receiving stream flow.

Attachment 1 of this Decision Rationale presents the impaired waterbodies of the Elk River watershed.

III. Background

The Elk River watershed is located in central West Virginia (Figure 3-1) and encompasses nearly 1,532 square miles and flows from the outlet of the Sutton Dam to its confluence with the Kanawha River in Charleston. The watershed lies in portions of Kanawha, Roane, Clay, Braxton, Webster, and Nicholas Counties. The Elk River mainstem meanders north and south in a generally westward direction. The major tributaries within the watershed are the Big Sandy Creek, Little Sandy Creek, Buffalo Creek, and Birch River. Cities and towns in the vicinity of the area of study are Charleston, Clendenin, Clay, and Sutton. The dominant land use in the Elk River watershed is forest, which constitutes 85.0% of the total land use area. Other land use types in the watershed include grassland (1.9%), urban/residential (6.9%), and agriculture (1.2%) as shown in Table 3-1. The total population living in the watershed is estimated to be 35,000 people.

The impaired streams that are the subject of this TMDL are included on West Virginia's 2010 Section 303(d) List. Documented impairments are related to numeric water quality criteria for total iron, dissolved aluminum, total selenium, pH, and fecal coliform bacteria. Certain waters are also biologically impaired based on the narrative water quality criterion of 47 CSR 2–3.2.i. West Virginia utilized a stressor identification process to determine the primary causes of biological impairment in the Elk River watershed. Stressor identification was followed by stream-specific determinations of the pollutants for which TMDLs must be developed.

Aluminum toxicity and pH toxicity stressors were identified in waters that had violations of the aluminum and pH criteria for protection of aquatic life. WVDEP determined that the implementation of those pollutant-specific TMDLs would address the biological impairment in those streams. For the organic enrichment impairment identified in the watershed, data indicated violations of the fecal coliform criteria. It was determined that the implementation of fecal coliform TMDLs would require the elimination of the majority of existing fecal coliform sources and thereby reduce the organic loading causing the biological impairment in the Elk River watershed. For the sediment impairment in the watershed, it was determined that the sediment load reductions necessary to achieve the water quality criteria for iron would exceed those needed to address the biological impairment for sediment. Therefore, iron TMDLs would be an appropriate surrogate for sediment TMDLs in the Elk River watershed.

In certain waters, the stressor identification process determined ionic stress to be a significant stressor. During the TMDL development period, there was insufficient information available regarding the causative pollutants and their associated impairment thresholds for TMDL development for this pollutant. WVDEP is deferring TMDL development for biological impairments caused by ionic stress and will retain those waters on the Section 303(d) list.

Sections 5, 6, 7, and 8 discuss the metals, pH, fecal coliform, and sediment source assessments in the Elk River watershed. The sources of metals and sediment in the watershed include: mining permits, non-mining permits such as process wastewater discharges and industrial stormwater discharges, Municipal Separate Storm Sewers (MS4s), construction stormwater permits, and unpermitted sources of mine drainage from abandoned mine lands (AMLs) and Surface Mining Control and Reclamation Act Bond forfeiture sites; as well as sediment sources including forestry, oil and gas, roads, agriculture, land disturbance activities, non-MS4 stormwater runoff, and streambank erosion. The pH sources in the watershed include AMLs, natural conditions in wetlands such as bogs and the associated lack of stream buffering capacity. The fecal coliform bacteria sources in the watershed include: wastewater treatment plants, combined sewer overflows (CSOs), MS4s, general sewage permits, unpermitted sources (including on-site treatment systems), stormwater runoff, agriculture, and natural background (wildlife). The Technical Report has expanded details of the source assessment in the Elk River watershed.

Computational Procedures

The Mining Data Analysis System (MDAS) was developed specifically for TMDL application in West Virginia to facilitate large scale, data intensive watershed modeling applications. The MDAS is a system designed to support TMDL development for areas affected by nonpoint and point sources. The MDAS component most critical to TMDL development is the dynamic watershed model because it provides the linkage between source contributions and instream response. The MDAS is used to simulate watershed hydrology and pollutant transport as well as stream hydraulics and instream water quality. It is capable of simulating different flow regimes and pollutant loading variations. MDAS was used to represent the source-response linkage in the Elk River watershed TMDL for dissolved aluminum, total iron, pH, sediment, selenium, and fecal coliform bacteria.

Configuration of the MDAS model involved subdividing the TMDL watershed into subwatershed modeling units connected by stream reaches (Figure 9-1). The 37 TMDL watersheds were broken into 440 separate sub-watershed units. The TMDL watershed was divided to allow for the evaluation of water quality and flow at pre-TMDL monitoring stations. The subdivision process also ensures a proper stream network configuration within the basin. The physical characteristics of the sub-watersheds, weather data, land use information, continuous discharges, and stream data were used as input for the MDAS model. Flow and water quality were continuously simulated into the model on an hourly time-step. Model setup consisted of configuring the MDAS model into four separate models for iron/sediment, aluminum/pH, selenium, and fecal coliform bacteria.

The calibrated model provides the basis for performing the allocation analysis. Hydrology and water quality calibration were performed in sequence because water quality modeling is dependent on an accurate hydrology simulation. Hydrology calibration was based on observed data from that station and the land uses present in the watersheds from January 1, 2003 to October 31, 2006. Key considerations for hydrology calibration included the overall water balance, the high- and low-flow distribution, storm flows, and seasonal variation. The hydrology was validated for the time period of January 1, 1999 to November 30, 2008. Final adjustments to model hydrology were based on flow measurements obtained during WVDEP's pre-TMDL monitoring in the Elk River watershed. A detailed description of the hydrology calibration and a summary of the results and validation are presented in the Technical Report to the TMDL.

After the model was configured and calibrated for hydrology, the next step was to perform water quality calibration for the subject pollutants. The goal of water quality calibration was to refine model parameter values to reflect the unique characteristics of the watershed so that model output would predict field conditions as closely as possible. Both spatial and temporal aspects were evaluated through the calibration process. The water quality was calibrated by comparing modeled versus observed pollutant concentrations. The water quality calibration consisted of executing the MDAS model, comparing the model results to available observations, and adjusting water quality parameters within reasonable ranges. Sediment calibration consisted of adjusting the soil erodibility and sediment transport parameters by land use, and the coefficient of scour for bank-erosion. Initial values for these parameters were based on available land use-specific storm-sampling monitoring data. Initial values were adjusted so that the model's suspended solids output closely matched observed instream data in watersheds with predominately one type of source.

Predicted instream concentrations were compared directly with the TMDL endpoints. This comparison allowed for the evaluation of the magnitude and frequency of exceedances under a range of hydrologic and environmental conditions. The MDAS model provided allocations for metals (iron, dissolved aluminum, and selenium), pH, and fecal coliform bacteria in the 214 impaired waterbodies of the Elk River watershed. The TMDLs are shown in Section 10 and are presented as average daily loads, in pounds per day (dissolved aluminum, iron, and pH), counts per day (fecal coliform), or flow in receiving stream in MGD x 0.005 mg/L x 8.34 (selenium). EPA has determined that these TMDLs are consistent with statutory and regulatory requirements and EPA's policy and guidance. EPA's rationale for establishing these TMDLs is set forth according to the regulatory requirements listed below.

1. The TMDLs are designed to implement the applicable water quality standards.

The applicable numeric water quality criteria for the Elk River watershed are shown in Table 2-1. The applicable designated uses in the watershed include: propagation and maintenance of aquatic life in warm water fisheries and trout waters, water contact recreation, and public water supply. In various streams in the Elk River watershed, warm water and trout water fishery aquatic life use impairments have been determined pursuant to exceedances of iron, dissolved aluminum, and/or pH numeric water quality criteria. Water contact recreation and/or public water supply use impairments have also been determined in various waters pursuant to exceedances of numeric water quality criteria for fecal coliform bacteria and total iron. The following table summarizes the applicable water quality criteria for this TMDL:

Water Quality Criterion	Designated Use	Criterion Value
Total Iron	Aquatic Life, warmwater fisheries	1.5 mg/L (4-day average)
Total Iron	Aquatic Life, troutwaters	1.0 mg/L (4-day average)
Dissolved Aluminum	Aquatic Life, warmwater fisheries	0.75 mg/L (1-hour average)
Dissolved Aluminum	Aquatic Life, troutwaters	0.087 mg/L (1-hour average)
Selenium	Aquatic Life	0.005 mg/L (4-day average)
pH	Aquatic Life	6.00 Standard Units (Minimum)
Fecal Coliform	Water Contact Recreation and Public Water Supply	200 counts / 100 mL (monthly geometric mean
Fecal Coliform	Water Contact Recreation and Public Water Supply	400 counts / 100 mL (Daily, 10% exceedance)

All West Virginia waters are also subject to the narrative criteria in Section 3 of the Standards. That section, titled *Conditions Not Allowed in State Waters*, contains various provisions relative to water quality. The TMDLs presented in Section 10 are based upon the water quality criteria that are currently effective. If the West Virginia Legislature adopts Water

Quality Standard revisions that alter the basis upon which the TMDLs are developed, then the TMDLs and allocations may be modified as warranted. Any future Water Quality Standard revision and/or TMDL Modification must receive EPA approval prior to implementation.

2. ***The TMDLs include a total allowable load as well as individual wasteload allocations and load allocations.***

A TMDL is the amount of a pollutant that can be assimilated by receiving waters while still achieving water quality standards. TMDLs can be expressed in terms of mass per time or by other appropriate measures. TMDLs are comprised of the sum of individual WLAs for point sources, LAs for nonpoint sources, and natural background levels. In addition, TMDLs must include an MOS, either implicitly or explicitly, that accounts for the uncertainty in the relationship between pollutant loads and the quality of the receiving stream. In the TMDLs developed for the Elk River watershed, a five percent explicit MOS was used to account for uncertainty in the pollutant loads developed for the metals (total iron and dissolved aluminum), pH, and fecal coliform bacteria impairments in the watershed. An explicit MOS was not included in selenium TMDLs because little modeling uncertainty exists. Non-attainment for selenium is directly related to point sources regulated by National Pollutant Discharge Elimination System (NPDES) permits and water quality will be met at all locations if point sources achieve the prescribed WLAs. Also, an explicit MOS was not applied for total iron TMDLs in certain sub-watersheds where mining point sources create an effluent dominated scenario and/or the regulated mining activity encompasses a large percentage of the watershed area. Within these scenarios, WLAs are established at the value of the iron criterion and little uncertainty is associated with the source-water quality linkage.

Total Iron TMDLs

WLAs were developed for all point sources permitted to discharge iron under an NPDES permit. Because of the established relationship between iron and total suspended solids (TSS), iron WLAs are also provided for facilities with stormwater discharges that are regulated under NPDES permits that contain TSS and/or iron effluent limitations or benchmarks values, MS4 facilities, and facilities registered under the General NPDES permit for construction stormwater. WLAs are provided for all existing outlets of NPDES permits for mining activities, except those where reclamation has progressed to the point where existing limitations are based upon the Post-Mining Area provisions of Subpart E of 40 CFR Part 434. Specific WLAs are not provided for "post-mining" outlets because programmatic reclamation was assumed to have returned disturbed areas to conditions that approach background.

There are 51 mining-related NPDES permits with 317 associated outlets in the metals impaired watersheds of the Elk River watershed. There are 45 modeled non-mining NPDES permits outlets in the metals impaired watersheds of the Elk River watershed. Forty of the non-mining permits regulate stormwater associated with industrial activity and implement stormwater benchmark values of 100 mg/L TSS and/or 1.0 mg/L total iron. Five additional outlets are associated with a groundwater remediation project registered under the Ground Water Remediation General NPDES Permit and are subject to an existing 1.2 mg/L monthly average total iron limitation. There are seven active construction sites with a total disturbed acreage of 318 acres registered under the Construction Stormwater General Permit in the metals impaired watersheds of the Elk River watershed. A complete list of the permits and outlets in the Elk River watershed is provided in Appendix G of the Technical Report.

Total iron LAs were allocated to the predominant nonpoint sources of iron in the watershed, including: loadings from AML, sediment contributions from barren lands, harvested forest, oil and gas operations, agricultural land uses, residential/urban/road land uses and streambank erosion; in addition to background sources, including loadings from undisturbed forest and grasslands.

Dissolved Aluminum and pH TMDLs

Source allocations were developed for all modeled subwatersheds contributing to the dissolved aluminum and/or pH impaired streams of the Elk River watershed. Sources of total iron were reduced prior to total aluminum reduction because existing instream iron concentrations can significantly reduce pH; and, consequently, increase dissolved aluminum concentrations. The dissolved aluminum and pH TMDL endpoints were not attained after source reductions to iron, therefore the total aluminum loading from AMLs was reduced in combination with acidity reduction (via alkalinity addition) to the extent necessary to attain the water quality criteria for both pH and dissolved aluminum. All sources were provided allocations in terms of the total aluminum loadings that are necessary to attain the dissolved aluminum water quality criteria. The reductions of total aluminum loading from land-based sources, coupled with the mitigation of acid precipitation impacts by alkalinity addition, are predicted to result in attainment of both dissolved aluminum and pH water quality criteria at all evaluated locations in the pH and dissolved aluminum impaired streams. The LAs of total aluminum and pH include: AML and sediment load contributions from barren land, forest, oil and gas operations, agriculture, undisturbed forest and grasslands, and urban land uses. The LAs also include a natural background of alkalinity from carbonate geologic formations.

Fecal Coliform Bacteria TMDLs

WLAs were developed for sewage treatment plant effluents, CSO discharges and MS4s, where applicable. In the Elk River watershed, there are three individually permitted publicly owned treatment works (POTW) that discharge treated effluent at three outlets. One additional privately owned sewage treatment plant operating under an individual NPDES permit discharges treated effluent at one outlet. These sources are regulated by NPDES permits that require effluent disinfection and compliance with strict fecal coliform effluent limitations (200 counts/100 ml (geometric mean monthly) and 400 counts/100 ml (maximum daily)).

The MS4s in the watershed are presented in Figure 5-3. The City of Charleston and the West Virginia Division of Highways (DOH) own and operate MS4s. MS4 source representation was based upon precipitation and runoff from land uses determined from the modified National Land Cover Database 2001 land use data, the jurisdictional boundary of the cities, and the transportation-related drainage area for which WVDOH has MS4 responsibility. The MS4s in the watershed will be subject to the requirements of general permit, WV0116025, which is based upon national guidance and proposes best management practices to be implemented. There are 11 CSO outlets in the Elk River watershed that are associated with POTWs operated by the Charleston Sanitary Board (5) and the Flatwoods-Canoe Run PSD (6).

General sewage permits are designed to cover like discharges from numerous individual owners and facilities throughout the state. General Permit WV0103110 regulates small, privately owned sewage treatment plants (package plants) that have a design flow of 50,000 gallons per day (gpd) or less. General Permit, WV0107000, regulates home aeration units (HAUs). HAUs are small sewage treatment plants primarily used by individual residences where site considerations preclude typical septic tank and leach field installation. Both general permits contain fecal coliform effluent limitations identical to those in individual NPDES permits for sewage treatment facilities. In the areas draining to streams for which fecal coliform TMDLs have been developed, 26 facilities are registered under the package plant general permit and 108 are registered under the HAU general permit.

Fecal coliform LAs were assigned to: pasture/cropland, on-site sewage systems, including failing septic systems and straight pipes, residential loading associated with urban/residential runoff from non-MS4 areas, and background loadings associated with wildlife sources. Failing on-site sewage systems are a significant source of fecal coliform bacteria in the Elk River watershed. There are 16,564 homes in the watershed that are not served by a centralized collection and treatment system. To calculate failing sewage systems, the TMDL watershed was divided into four septic failure zones, and septic failure zones were delineated by soil characteristics.

Selenium TMDLs

Selenium is a naturally occurring element that is found in Cretaceous marine sedimentary rocks, coal, and other fossil fuel deposits. In West Virginia, elevated selenium concentrations have been documented in the discharges associated with mining of the Allegheny and Upper Kanawha Formations of the Middle Pennsylvanian. The selenium TMDLs are based upon the assimilative capacity of the receiving streams at the predicted 7-day, 10-year (7Q10) low flow. Loading contributions were reduced from applicable sources in impaired headwaters until criteria were attained at the subwatershed outlet. The loading contributions of unimpaired headwaters and the reduced loadings for impaired headwaters were then routed through downstream waterbodies. Using this method, contributions from all sources were weighted equitably and ensured cumulative load endpoints were met at the most downstream subwatershed for each impaired stream. The derived wasteload allocations ensure attainment of the chronic aquatic life criterion at all subwatershed pour points at critical low flow conditions. The level of control necessary to achieve criteria during low flow conditions is also protective during higher flow periods when increased dilution is available.

Nonpoint sources associated with surface disturbances (i.e., barren areas, unpaved roads, harvested forest, and oil and gas well operations) were considered to be negligible sources of selenium because these land disturbances typically do not disturb subsurface strata that contain selenium.

3. The TMDLs consider the impacts of background pollutant contributions.

The TMDL considers the impact of background pollutant contributions by considering loadings from background sources like forest and wildlife. MDAS also considers background pollutant contributions by modeling all land uses.

4. The TMDLs consider critical environmental conditions.

According to EPA's regulation 40 CFR §130.7 (c)(1), TMDLs are required to take into account critical conditions for stream flow, loading, and water quality parameters. The intent of this requirement is to ensure that the water quality of the impaired waterbody is protected during times when it is most vulnerable.

Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards. Critical conditions for waters impacted by land-based sources generally occur during periods of wet weather and high surface runoff. In contrast, critical conditions for non-land-based point source dominated systems generally occur during low flow and low dilution conditions.

Both high-flow and low-flow periods were taken into account during TMDL development for the Elk River watershed by using a long period of weather data that represented wet, dry, and average flow periods.

5. The TMDLs consider seasonal environmental variations.

Seasonal variations were considered in the formulation of the MDAS modeling analysis, as follows: continuous simulation (modeling over a period of several years that captured precipitation extremes) inherently considered seasonal hydrological and source loading variability; additionally, the metals and fecal coliform concentrations were simulated on a daily time-step by MDAS and were compared with TMDL endpoints.

6. The TMDLs include a Margin of Safety.

The CWA and Federal regulations require TMDLs to include an MOS to take into account any lack of knowledge concerning the relationship between effluent limitations and water quality. EPA guidance suggests two approaches to satisfy the MOS requirement. First, it can be met implicitly by using conservative model assumptions to develop the allocations. Alternately, it can be met explicitly by allocating a portion of the allowable load to the MOS. In the TMDLs developed for the Elk River watershed, an explicit MOS of five percent was included to counter uncertainty in the modeling process, except for the selenium TMDLs and certain total iron TMDLs. An explicit margin of safety was not included in the selenium TMDLs because little modeling uncertainty exists. Similarly, an explicit margin of safety was not applied for total iron TMDLs in certain subwatersheds where mining point sources create an effluent dominated scenario and/or the regulated mining activity encompasses a large percentage of the watershed area. Within these scenarios, WLAs are established at the value of the iron criterion and little uncertainty is associated with the source/water quality linkage.

7. The TMDLs have been subject to public participation.

West Virginia held public meetings for the draft TMDLs in the Elk River watershed on May 30, 2007, and October 27, 2010, at Elkview Middle School. The May 30, 2007, meeting occurred prior to pre-TMDL stream monitoring and pollutant source tracking and included a general TMDL overview and a presentation of planned monitoring and data gathering activities. The October 27, 2010, meeting occurred prior to allocation of pollutant loads and provided a description of the status of TMDL development. Another public meeting was held on September 27, 2011, to present the draft TMDLs at Elkview Middle School. The availability of the draft TMDLs were advertised in local newspapers between September 12, 2011, and September 14, 2011. Interested parties were invited to submit comments on the draft TMDLs during the public comment period, which began on September 12, 2011, and ended on October 14, 2011.

IV. Discussion of Reasonable Assurance

Reasonable assurance for maintenance and improvement of water quality in the Elk River watershed rests primarily with two programs: the NPDES permitting program and the West Virginia Watershed Network. The NPDES permitting program is implemented by WVDEP to control point source discharges. The West Virginia Watershed Network is a cooperative nonpoint source control effort involving many state and federal agencies, whose task is the protection and/or restoration of water quality.

WVDEP's Division of Water and Waste Management (DWWM) is responsible for issuing non-mining permits with the State. WVDEP's Division of Mining and Reclamation developed NPDES permits for mining activities. As part of the permit review process, permit writers have the responsibility to incorporate the required TMDL WLAs into new or reissued permits. The permits will contain self-monitoring and reporting requirements that are periodically reviewed by WVDEP. WVDEP also inspects treatment facilities and independently monitors NPDES discharges. The combination of these efforts will ensure implementation of the TMDL WLAs. New facilities will be permitted in accordance with future growth provisions described in Section 11.

The Watershed Management Framework coordinates efforts of state and federal agencies with the goal of developing and implementing watershed management strategies through a cooperative, long-range planning effort. The principal area of focus of watershed management through the Framework process is correcting problems related to nonpoint source pollution. Network partners have placed a greater emphasis on identification and correction of nonpoint source pollution. The combined resources of the partners are used to address all different types of nonpoint source pollution through both public education and on-the-ground projects.

All nonpoint source restoration projects should include a monitoring component specifically designed to document resultant local improvements in water quality. These data may also be used to predict expected pollutant reductions from similar future projects:

Public Sewer Projects

Within WVDEP's DWWM, the Engineering and Permitting Branch's Engineering Section will be charged with the responsibility of evaluating sewer projects and providing funding. For information on upcoming projects, a list of funded and pending water and wastewater projects in West Virginia can be found at http://www.wvinfrastructure.com/projects/index.php.

AML Projects

Within WVDEP, the Office of Abandoned Mine Lands and Reclamation manages the reclamation of lands and waters affected by mining prior to the passage of the Surface Mining Control and Reclamation Act in 1977. Funding for reclamation activities is derived from fees placed on coal mines, which are placed in a fund to distribute to state and federal agencies. In AML impacted areas, funds will be used to maximize restoration in fisheries.

Attachment 1

Impaired Waterbodies Addressed in the Elk River Watershed TMDL

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Elk River	WV-KE	WVKE
Magazine Branch	WV-KE-1	WVKE-1
Coopers Creek	WV-KE-10	WVKE-7
Big Otter Creek	WV-KE-108	WVKE-64
Otterlick Run	WV-KE-108-B	WVKE-64-B
Rush Fork	WV-KE-108-D	WVKE-64-C
Moore Fork	WV-KE-108-G	WVKE-64-D
Wilson Fork	WV-KE-108-G-1	WVKE-64-D-1
Boggs Fork	WV-KE-108-J	WVKE-64-E
Little Coopers Creek	WV-KE-10-A	WVKE-7-0.5A
Mile Fork	WV-KE-10-C	WVKE-7-A
Halls Fork	WV-KE-10-D	WVKE-7-A.5
Fourmile Fork	WV-KE-10-G	WVKE-7-C
Kaufman Branch	WV-KE-10-K	WVKE-7-E
Groves Creek	WV-KE-118	WVKE-69
O'Brion Creek	WV-KE-119	WVKE-70
Road Fork	WV-KE-119-A	WVKE-70-A
Indian Creek	WV-KE-12	WVKE-8
Duck Creek	WV-KE-124	WVKE-72
Tate Creek	WV-KE-125	WVKE-73
Laurel Fork	WV-KE-125-B	WVKE-73-A
Strange Creek	WV-KE-127	WVKE-74
Big Fork	WV-KE-127-E	WVKE-74-B-1
Trace Fork	WV-KE-127-N	WVKE-74-E
Dille Run	WV-KE-127-S	WVKE-74-H
Little Sandy Creek	WV-KE-13	WVKE-9
Birch River	WV-KE-131	WVKE-76
Anthony Creek	WV-KE-131-AC	WVKE-76-N
Poplar Creek	WV-KE-131-AE	WVKE-76-O
Skyles Creek	WV-KE-131-AL	WVKE-76-P
Leatherwood Run	WV-KE-131-B	WVKE-76-A
Jacks Run	WV-KE-131-BH	WVKE-76-W
Meadow Fork	WV-KE-131-BJ	WVKE-76-Y
Back Fork	WV-KE-131-BK	WVKE-76-X

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Diatter Run	WV-KE-131-E	WVKE-76-B
Middle Run	WV-KE-131-F	WVKE-76-C
Long Run	WV-KE-131-I	WVKE-76-D
Little Birch River	WV-KE-131-M	WVKE-76-E
Twolick Run	WV-KE-131-M-10	WVKE-76-E-6
Seng Run	WV-KE-131-M-10-B	WVKE-76-E-6-A
Carpenter Fork	WV-KE-131-M-13	WVKE-76-E-7
Polemic Run	WV-KE-131-M-2	WVKE-76-E-2
Right Fork/Little Birch River	WV-KE-131-M-23	WVKE-76-E-9
Laurel Run	WV-KE-131-M-5	WVKE-76-E-3
Bear Run	WV-KE-131-M-6	WVKE-76-E-4
Windy Run	WV-KE-131-M-7	WVKE-76-E-5
Lower Mill Creek	WV-KE-131-U	WVKE-76-J
Powell Creek	WV-KE-131-Y	WVKE-76-L
Tug Fork	WV-KE-131-Y-8	WVKE-76-L-5
Mill Creek	WV-KE-131-Z	WVKE-76-M
Upper Mill Creek	WV-KE-138	WVKE-78
Lick Branch	WV-KE-13-D	WVKE-9-A
Wills Creek	WV-KE-13-F	WVKE-9-B
Big Fork	WV-KE-13-F-2	WVKE-9-B-1
Aarons Fork	WV-KE-13-G	WVKE-9-C
Bullskin Branch	WV-KE-13-I	WVKE-9-E
Wolfpen Branch	WV-KE-13-J	WVKE-9-F
Ruffner Branch	WV-KE-13-L	WVKE-9-G
Poca Fork	WV-KE-13-O	WVKE-9-I
Patterson Fork	WV-KE-13-O-1	WVKE-9-I-1
Canterbury Hollow	WV-KE-13-O-1-B	WVKE-9-I-1-B
Jakes Run	WV-KE-13-P	WVKE-9-J
Big Fork	WV-KE-13-S	WVKE-9-K
Rucker Fork	WV-KE-13-V	WVKE-9-N
Hurricane Branch	WV-KE-13-X	WVKE-9-P
Trail Branch	WV-KE-13-X-1	WVKE-9-P-1
Pinch Creek	WV-KE-14	WVKE-10
Lower Rockcamp Run	WV-KE-143	WVKE-80
Rockcamp Run	WV-KE-148	WVKE-82
Sugar Creek	WV-KE-149	WVKE-83
Little Otter Creek	WV-KE-151	WVKE-84
Brushy Branch	WV-KE-151-A	WVKE-84-A-1
Rush Fork	WV-KE-151-A-1	WVKE-84-A
Cutlips Fork	WV-KE-151-D	WVKE-84-B

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Bear Run	WV-KE-153	WVKE-84.5
Buffalo Creek	WV-KE-158	WVKE-86
Granny Creek	WV-KE-159	WVKE-87
Brush Fork	WV-KE-159-B	WVKE-87-A
Laurel Fork	WV-KE-159-D	WVKE-87-B
UNT/Granny Creek RM 4.16	WV-KE-159-E	WVKE-87-C
Old Woman Run	WV-KE-161	WVKE-88
Buckeye Creek	WV-KE-162	WVKE-89
Narrow Branch	WV-KE-17	WVKE-13
Blue Creek	WV-KE-18	WVKE-14
Spruce Fork	WV-KE-18-AE	WVKE-14-T
Lower Threemile Fork	WV-KE-18-B	WVKE-14-B
Upper Threemile Fork	WV-KE-18-C	WVKE-14-C
Laurel Fork	WV-KE-18-J	WVKE-14-F
Slack Branch	WV-KE-18-K	WVKE-14-G
Right Fork/Slack Branch	WV-KE-18-K-1	WVKE-14-G-1
Whiteoak Fork	WV-KE-18-K-2	WVKE-14-G-2
UNT/Whiteoak Fork RM 1.33	WV-KE-18-K-2-B	WVKE-14-G-2-B
Pigeonroost Fork	WV-KE-18-K-4	WVKE-14-G-3
Jims Fork	WV-KE-18-K-5	WVKE-14-G-4
Sandlick Branch	WV-KE-18-N	WVKE-14-I
Joes Hollow	WV-KE-18-Q	WVKE-14-K
Shirkey Branch	WV-KE-18-R	WVKE-14-L
Morris Fork	WV-KE-18-S	WVKE-14-M
Mudlick Branch	WV-KE-18-S-2	WVKE-14-M-2
Hidden Hollow	WV-KE-18-S-4	WVKE-14-M-4
Fivemile Fork	WV-KE-18-S-5	WVKE-14-M-5
Rockcamp Fork	WV-KE-18-T	WVKE-14-N
Middle Fork/Blue Creek	WV-KE-18-V	WVKE-14-O
Turner Fork	WV-KE-18-V-4	WVKE-14-O-1
Pond Fork	WV-KE-18-V-6	WVKE-14-O-2
Falling Rock Creek	WV-KE-25	WVKE-19
UNT/Falling Rock Creek RM 7.04	WV-KE-25-J	WVKE-19-C.8
Johnson Fork	WV-KE-25-P	WVKE-19-F
Horse Fork	WV-KE-25-Q	WVKE-19-G
Petes Fork	WV-KE-25-T	WVKE-19-H
Jordan Creek	WV-KE-26	WVKE-20
Leatherwood Creek	WV-KE-27	WVKE-21
Left Fork/Leatherwood Creek	WV-KE-27-B	WVKE-21-B

STREAM NAME	WEST VIRGINIA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Big Sandy Creek	WV-KE-29	WVKE-23
Left Hand Creek	WV-KE-29-G	WVKE-23-D
Gabes Creek	WV-KE-29-G-3	WVKE-23-D-2
Hurricane Creek	WV-KE-29-G-4	WVKE-23-D-3
Cottontree Run	WV-KE-29-G-5	WVKE-23-D-4
Hardcamp Run	WV-KE-29-G-5-C	WVKE-23-D-4-A
Coleman Run	WV-KE-29-G-9	WVKE-23-D-6
Little Blue Creek	WV-KE-29-I	WVKE-23-F
Pigeon Run	WV-KE-29-O	WVKE-23-J
Little Pigeon Run	WV-KE-29-P	WVKE-23-K
Left Hand Run	WV-KE-29-Q	WVKE-23-L
Little Lefthand Run	WV-KE-29-Q-1	WVKE-23-L-1
Ashleycamp Run	WV-KE-29-Q-6	WVKE-23-L-4
Two Run	WV-KE-29-S	WVKE-23-M
Granny Creek	WV-KE-29-U	WVKE-23-N
Right Fork/Granny Creek	WV-KE-29-U-7	WVKE-23-N-2
Dog Creek	WV-KE-29-V	WVKE-23-O
Right Fork/Big Sandy Creek	WV-KE-29-Y	WVKE-23-P
Cookman Fork	WV-KE-29-Y-7	WVKE-23-P-2
Summers Fork	WV-KE-29-Y-7-A	WVKE-23-P-2-A
Middle Fork/Big Sandy Creek	WV-KE-29-Z	WVKE-23-Q
Hollywood Run	WV-KE-29-Z-1	WVKE-23-Q-0.5
Trace Fork	WV-KE-29-Z-1-B	WVKE-23-Q-0.5-A
Left Fork/Hollywood Run	WV-KE-29-Z-1-C	WVKE-23-Q-0.5-B
Elk Twomile Creek	WV-KE-3	WVKE-2
Morris Creek	WV-KE-34	WVKE-26
Left Fork/Morris Creek	WV-KE-34-A	WVKE-26-A
Queen Shoals Creek	WV-KE-37	WVKE-27
Left Fork/Queen Shoals Creek	WV-KE-37-A	WVKE-27-A
Baker Fork	WV-KE-3-B	WVKE-2-A
Valley Grove Branch	WV-KE-3-D	WVKE-2-B
UNT/Elk Twomile Creek RM 6.36	WV-KE-3-F	WVKE-2-D
Green Bottom	WV-KE-3-G	WVKE-2-E
Newhouse Branch	WV-KE-4	WVKE-3
Porter Creek	WV-KE-44	WVKE-30
UNT/Porter Creek RM 5.49	WV-KE-44-M	WVKE-30-L
Upper King Shoals Run	WV-KE-52	WVKE-32
Camp Creek	WV-KE-56	WVKE-34
Coonskin Branch	WV-KE-6	WVKE-4

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Laurel Creek	WV-KE-62	WVKE-37
Laurel Fork	WV-KE-62-F	WVKE-37-B
Horner Fork	WV-KE-62-G	WVKE-37-C
Reed Fork	WV-KE-62-G-2	WVKE-37-C-1
Summers Fork	WV-KE-62-I	WVKE-37-D
Hansford Fork	WV-KE-62-O	WVKE-37-E
Valley Fork	WV-KE-62-P	WVKE-37-F
Upper Birch Run	WV-KE-66	WVKE-39
Little Sycamore Creek	WV-KE-68	WVKE-40
Wade Fork	WV-KE-68-A	WVKE-40-A
Sycamore Creek	WV-KE-70	WVKE-41
Adonijah Fork	WV-KE-70-K	WVKE-41-B
Right Fork/Sycamore Creek	WV-KE-70-M	WVKE-41-C
Grassy Fork	WV-KE-70-M-2	WVKE-41-C-1
Little Beechy Creek	WV-KE-74	WVKE-42
Blue Knob Creek	WV-KE-77	WVKE-43
UNT/Elk River RM 48.53	WV-KE-78	WVKE-43.5
Middle Creek	WV-KE-82	WVKE-45
Lick Branch	WV-KE-82-F	WVKE-45-B
Leatherwood Creek	WV-KE-83	WVKE-46
Cove Hollow	WV-KE-83-B	WVKE-46-A
Right Fork/Leatherwood Creek	WV-KE-83-H	WVKE-46-C
Road Fork	WV-KE-83-N	WVKE-46-D
Buffalo Creek	WV-KE-89	WVKE-50
Dille Run	WV-KE-89-AD	WVKE-50-S
Pheasant Run	WV-KE-89-AE	WVKE-50-T
Lilly Fork	WV-KE-89-C	WVKE-50-B
Beech Fork	WV-KE-89-C-19	WVKE-50-B-8
Big Branch	WV-KE-89-C-8	WVKE-50-B-3
Sand Fork	WV-KE-89-L	WVKE-50-F
Hickory Fork	WV-KE-89-N	WVKE-50-H
Dog Run	WV-KE-89-N-1	WVKE-50-H-1
Wallowhole Fork	WV-KE-89-N-2	WVKE-50-H-2
Rockcamp Run	WV-KE-89-O	WVKE-50-I
Flat Fork	WV-KE-89-O-4	WVKE-50-I-1
Hickory Fork	WV-KE-89-O-9	WVKE-50-I-3
Whetstone Creek	WV-KE-89-S	WVKE-50-M
Robinson Fork	WV-KE-89-V	WVKE-50-O
Road Fork	WV-KE-89-V-1	WVKE-50-O-1
Taylor Creek	WV-KE-89-Z	WVKE-50-P

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Turkey Creek	WV-KE-89-Z-3	WVKE-50-P-1
Mill Creek	WV-KE-9	WVKE-6
Little Laurel Run	WV-KE-98	WVKE-57
Ninemile Creek	WV-KL-12	WVK-9
UNT/ Ninemile Creek RM 0.27	WV-KL-12-A	
Upper Ninemile Creek	WV-KL-12-B	WVK-9-A
Middle Ninemile Creek	WV-KL-12-D	WVK-9-B
UNT/Ninemile Creek RM 3.25	WV-KL-12-E	WVK-9-C
Cooper Fork	WV-KL-15-C	WVK-10-A
UNT/Cooper Fork RM 1.41	WV-KL-15-C-1	WVK-10-A-1
UNT/UNT RM 0.39/Cooper Fork RM 1.41	WV-KL-15-C-1-A	
UNT/Cooper Fork RM 3.40	WV-KL-15-C-6	
Pond Branch	WV-KL-17	WVK-11
UNT/Pond Branch RM 1.4	WV-KL-17-A	WVK-11-0.5A
UNT/Pond Branch RM 1.88	WV-KL-17-B	
Thirteenmile Creek	WV-KL-19	WVK-12
Long Hollow	WV-KL-19-AC	WVK-12-K
Little Spruce Run	WV-KL-19-AF	WVK-12-L
Peppermint Creek	WV-KL-19-AM	WVK-12-M
Rocky Fork	WV-KL-19-D	WVK-12-A
UNT/Rocky Fork RM 0.69	WV-KL-19-D-1	
Tom Allen Creek	WV-KL-19-F	WVK-12-B
Buzzard Creek	WV-KL-19-H	WVK-12-D
Mudlick Fork	WV-KL-19-M	WVK-12-E
Bailey Branch	WV-KL-19-M-15	WVK-12-E-3
Sapsucker Run	WV-KL-19-M-8	WVK-12-E-1
Beech Fork	WV-KL-19-M-9	WVK-12-E-2
Poplar Fork	WV-KL-19-N	WVK-12-F
UNT/Poplar Fork RM 4.81	WV-KL-19-N-6	
UNT/Thirteenmile Creek RM 15.64	WV-KL-19-O	
UNT/Thirteenmile Creek RM 15.82	WV-KL-19-P	
Yeager Fork	WV-KL-19-R	WVK-12-G
Baker Branch	WV-KL-19-X	WVK-12-H
Spruce Run	WV-KL-19-Z	WVK-12-I
Little Sixteenmile Creek	WV-KL-20	WVK-13
Shady Fork	WV-KL-20-D	WVK-13-A
Sixteenmile Creek	WV-KL-22	WVK-14
Slaty Hollow	WV-KL-22-A	WVK-14-0.2A

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
UNT/Sixteenmile Creek RM 8.16	WV-KL-22-L	WVK-14-A.5
Eighteenmile Creek	WV-KL-27	WVK-16
Sulug Branch	WV-KL-27-AA	WVK-16-L
Cherry Fork	WV-KL-27-AB	WVK-16-M
Stumpy Run	WV-KL-27-AB-3	WVK-16-M-1
Painters Branch	WV-KL-27-AB-4	WVK-16-M-2
Sigman Fork	WV-KL-27-AB-6	WVK-16-M-3
Clendenin Creek	WV-KL-27-AF	WVK-16-O
Harris Branch	WV-KL-27-AH	WVK-16-Q
Buckelew Hollow	WV-KL-27-AK	WVK-16-R
Cottrell Run	WV-KL-27-AL	WVK-16-S
UNT/Eighteenmile Creek RM 2.84	WV-KL-27-D	
Otter Branch	WV-KL-27-E	WVK-16-0.5A
Jakes Run	WV-KL-27-H	WVK-16-B
Isaacs Branch	WV-KL-27-K	WVK-16-C
Lukes Branch	WV-KL-27-L	WVK-16-D
Dads Branch	WV-KL-27-M	WVK-16-E
Bear Branch	WV-KL-27-N	WVK-16-F
Turkey Branch	WV-KL-27-P	WVK-16-G
Left Fork/Turkey Branch	WV-KL-27-P-3	WVK-16-G-1
Buffalo Branch	WV-KL-27-S	WVK-16-I
Right Fork/Eighteenmile Creek	WV-KL-27-X	WVK-16-J
Slab Hollow	WV-KL-27-X-3	WVK-16-J-1
Bucklick Creek	WV-KL-27-X-7	WVK-16-J-2
Saltlick Creek	WV-KL-27-X-8	WVK-16-J-3
Spring Valley Branch	WV-KL-27-Y	WVK-16-K
Five And Twenty Mile Creek	WV-KL-35	WVK-19
Honeycutt Run	WV-KL-35-A	WVK-19-A
Stave Branch	WV-KL-35-B	WVK-19-A.5
Evans Creek	WV-KL-35-E	WVK-19-B
Barnett Branch	WV-KL-35-E-1	WVK-19-B-1
UNT/Evans Creek RM 1.92	WV-KL-35-E-4	
UNT/Evans Creek RM 2.30	WV-KL-35-E-5	
UNT/Five And Twenty Mile Creek RM 7.41	WV-KL-35-H	WVK-19-D
UNT/Little Buffalo Creek RM 1.17	WV-KL-40-A	WVK-20-A
UNT/UNT RM 0.44/Little Buffalo Creek RM 1.17	WV-KL-40-A-1	WVK-20-A-1

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Hurricane Creek	WV-KL-42	WVK-22
Trace Fork	WV-KL-42-AC	WVK-22-G
Buffs Branch	WV-KL-42-AF	WVK-22-H
Joes Branch	WV-KL-42-AL	WVK-22-I
Rider Creek	WV-KL-42-AO	WVK-22-J
Sams Fork	WV-KL-42-AQ	WVK-22-K
UNT/Hurricane Creek RM 1.64	WV-KL-42-D	
Poplar Fork	WV-KL-42-I	WVK-22-B
Long Branch	WV-KL-42-I-10	WVK-22-B-3
Rockstep Run	WV-KL-42-I-10-C	WVK-22-B-3-A
UNT/Long Branch RM 1.25	WV-KL-42-I-10-D	
Crooked Creek	WV-KL-42-I-16	WVK-22-B-5
UNT/Crooked Creek RM 0.72	WV-KL-42-I-16-B	WVK-22-B-5-B
UNT/Poplar Fork RM 9.86	WV-KL-42-I-17	
Sugar Branch	WV-KL-42-I-3	WVK-22-B-1
Cow Creek	WV-KL-42-I-4	WVK-22-B-2
UNT/Cow Creek RM 2.33	WV-KL-42-I-4-F	
UNT/Poplar Fork RM 3.78	WV-KL-42-I-5	
Lick Branch	WV-KL-42-I-9	
Sleepy Creek	WV-KL-42-N	WVK-22-C
Trace Creek	WV-KL-42-N-2	WVK-22-C-2
Mill Creek	WV-KL-42-U	WVK-22-F
Tackett Branch	WV-KL-42-U-1	WVK-22-F-1
UNT/Mill Creek RM 1.02	WV-KL-42-U-2	
Little Hurricane Creek	WV-KL-46	WVK-24
Long Branch	WV-KL-46-A	WVK-24-A
UNT/Little Hurricane Creek RM 1.35	WV-KL-46-B	
Harmon Branch	WV-KL-46-D	WVK-24-B
Morrison Fork	WV-KL-46-E	WVK-24-C
Lick Run	WV-KL-46-I	WVK-24-D
Threemile Creek (South)	WV-KL-5	WVK-4
Farley Creek	WV-KL-54	WVK-27
Bills Creek	WV-KL-56	WVK-28
UNT/Bills Creek RM 0.81	WV-KL-56-A	
Pocatalico River	WV-KL-57	WVKP
Grapevine Creek	WV-KL-57-AA	WVKP-16
Right Fork	WV-KL-57-AA-2	WVKP-16-A
Boardtree Run	WV-KL-57-AA-4	WVKP-16-B
Pocatalico Creek	WV-KL-57-AD	WVKP-17

STREAM NAME	WEST VIRGINIA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Dog Fork	WV-KL-57-AD-10	WVKP-17-F
Gays Branch	WV-KL-57-AD-14	WVKP-17-J
Middle Fork/Pocatalico Creek	WV-KL-57-AD-2	WVKP-17-B
Sugar Creek	WV-KL-57-AD-2-H	WVKP-17-B-4
First Creek	WV-KL-57-AD-2-K	WVKP-17-B-5
Laurel Fork	WV-KL-57-AD-2-P	WVKP-17-B-8
Allen Fork	WV-KL-57-AD-3	WVKP-17-C
Trace Fork	WV-KL-57-AD-3-B	WVKP-17-C-1
Dudden Fork	WV-KL-57-AD-9	WVKP-17-E
Raccoon Creek	WV-KL-57-AL	WVKP-20
Leatherwood Creek	WV-KL-57-AO	WVKP-22
Hicumbottom Run	WV-KL-57-AP	WVKP-23
Goose Creek	WV-KL-57-AR	WVKP-25
Camp Creek	WV-KL-57-AT	WVKP-26
Allen Creek	WV-KL-57-AU	WVKP-27
Green Creek	WV-KL-57-AV	WVKP-28
Coleman Fork	WV-KL-57-AV-3	WVKP-28-A
Left Fork/Green Creek	WV-KL-57-AV-4	WVKP-28-B
Rush Fork	WV-KL-57-AV-6	WVKP-28-C
Straight Creek	WV-KL-57-AX	WVKP-29
White Oak Run	WV-KL-57-AZ	WVKP-30
Red Oak Run	WV-KL-57-BB	WVKP-31
Wolf Creek	WV-KL-57-BE	WVKP-32
Flat Fork	WV-KL-57-BH	WVKP-33
Trace Fork	WV-KL-57-BH-1	WVKP-33-A
Cabbage Fork	WV-KL-57-BH-13	WVKP-33-G
Wolfpen Run	WV-KL-57-BH-13-A	WVKP-33-G-1
Higby Run	WV-KL-57-BH-3	WVKP-33-B
Payne Hollow	WV-KL-57-BH-3-A	WVKP-33-B-1
Cox Fork	WV-KL-57-BH-8	WVKP-33-E
Wolfcamp Run	WV-KL-57-BH-8-B	WVKP-33-E-1
Coon Creek	WV-KL-57-BH-8-D	WVKP-33-E-2
Rock Creek	WV-KL-57-BK	WVKP-35
Big Creek	WV-KL-57-BN	WVKP-36
McKown Creek	WV-KL-57-BQ	WVKP-37
Left Hand Run	WV-KL-57-BQ-3	WVKP-37-B
Johnson Creek	WV-KL-57-BT	WVKP-38
Jackson Fork	WV-KL-57-BT-10	
Greathouse Hollow	WV-KL-57-BT-4	WVKP-38-0.8A
Pad Fork	WV-KL-57-BT-6	WVKP-38-B

STREAM NAME	WEST VIRGINIA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Big Lick Run	WV-KL-57-BU	WVKP-39
Silcott Fork	WV-KL-57-BU-2	WVKP-39-A
UNT/Silcott Fork RM 1.96	WV-KL-57-BU-2-B	
Bear Fork	WV-KL-57-BU-4	WVKP-39-C
Round Knob Run	WV-KL-57-BV	WVKP-40
Rush Creek	WV-KL-57-BX	WVKP-41
Slab Fork	WV-KL-57-BX-1	WVKP-41-A
Laurel Fork	WV-KL-57-CD	WVKP-43
Flat Fork	WV-KL-57-CF	WVKP-44
Claybank Branch	WV-KL-57-F	WVKP-1.8
UNT/Pocatalico River RM 8.52	WV-KL-57-I	WVKP-2.5
Kelly Creek	WV-KL-57-J	WVKP-3
Harmond Creek	WV-KL-57-K	WVKP-4
UNT/Harmond Creek RM 1.00	WV-KL-57-K-2	WVKP-4-B
Rocky Fork	WV-KL-57-L	WVKP-5
Lick Branch	WV-KL-57-L-1	WVKP-5-0.5A
UNT/Rocky Fork RM 4.32	WV-KL-57-L-10	WVKP-5-B.5
Howard Fork	WV-KL-57-L-14	WVKP-5-C
Fisher Branch	WV-KL-57-L-3	WVKP-5-A
Wolfpen Run	WV-KL-57-L-4	WVKP-5-B
Martin Branch	WV-KL-57-N	WVKP-7
Schoolhouse Branch	WV-KL-57-O	WVKP-8
Campbells Branch	WV-KL-57-P	WVKP-8.5
Kelly Creek	WV-KL-57-Q	WVKP-9
UNT/Kelly Creek RM 0.51	WV-KL-57-Q-1	WVKP-9-0.5A
Spring Branch	WV-KL-57-Q-2	WVKP-9-A
Frog Creek	WV-KL-57-R	WVKP-10
Grasslick Run	WV-KL-57-R-8	WVKP-10-C
Tanner Fork	WV-KL-57-R-9	WVKP-10-D
Derrick Creek	WV-KL-57-U	WVKP-12
UNT/Pocatalico River RM 23.03	WV-KL-57-X	
Threemile Creek (North)	WV-KL-6	WVK-5
Armour Creek	WV-KL-60	WVK-30
Blakes Creek	WV-KL-60-C	WVK-30-A
UNT/Armour Creek RM 3.25	WV-KL-60-D	
UNT/Armour Creek RM 3.54	WV-KL-60-E	
Scary Creek	WV-KL-63	WVK-32
UNT/Scary Creek RM 0.14	WV-KL-63-A	WVK-32-0.1A
Rockstep Run	WV-KL-63-C	WVK-32-A
UNT/Rockstep Run RM 0.82	WV-KL-63-C-2	

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
UNT/Scary Creek RM 2.13	WV-KL-63-E	WVK-32-B
UNT/UNT RM 0.33/Scary Creek RM 2.13	WV-KL-63-E-1	WVK-32-B-1
UNT/Scary Creek RM 3.84	WV-KL-63-H	
Gallatin Branch	WV-KL-64	WVK-33
UNT/Gallatin Branch RM 0.47	WV-KL-64-A	
UNT/Threemile Creek RM 2.61	WV-KL-6-B	
UNT/Threemile Creek RM 7.11	WV-KL-6-F	
UNT/Threemile Creek RM 8.65	WV-KL-6-H	
Fivemile Creek	WV-KL-7	WVK-6
Davis Creek	WV-KL-74	WVK-39
Ward Hollow	WV-KL-74-B	WVK-39-A
Trace Fork	WV-KL-74-C	WVK-39-B
Mudsuck Branch	WV-KL-74-C-2	WVK-39-B-1
Pot Branch	WV-KL-74-C-4	WVK-39-B-2
Sugarcamp Creek	WV-KL-74-D	WVK-39-C
Dry Branch	WV-KL-74-E	WVK-39-D
Middle Fork/Davis Creek	WV-KL-74-F	WVK-39-E
Long Branch	WV-KL-74-F-2	WVK-39-E-1
Rays Branch	WV-KL-74-G	WVK-39-F
Kirby Hollow	WV-KL-74-K	WVK-39-I
Coal Hollow	WV-KL-74-L	WVK-39-J
Cane Fork	WV-KL-74-N	WVK-39-L
UNT/Cane Fork RM 0.83	WV-KL-74-N-1	
Kanawha Fork	WV-KL-74-O	WVK-39-M
Middlelick Branch	WV-KL-74-O-1	WVK-39-M-1
Hoffman Hollow	WV-KL-74-O-1-A	WVK-39-M-1-A
Joplin Branch	WV-KL-77	WVK-42
Little Fivemile Creek	WV-KL-7-A	WVK-6-A
UNT/Fivemile Creek RM 2.40	WV-KL-7-B	
Lower Fivemile Creek	WV-KL-7-C	WVK-6-C
Upper Fivemile Creek	WV-KL-7-D	WVK-6-B