DRAFT

QUALITY ASSURANCE PROJECT PLAN

CHESAPEAKE BAY POINT-SOURCE DATA COLLECTION

Prepared for:

United States Environmental Protection Agency
Chesapeake Bay Program Office
410 Severn Avenue – Suite 112
Annapolis, MD 21403

Contract/WA/Grant No./Project Identifier: CB-97393901

Prepared by:

West Virginia Department of Environmental Protection
601 57th Street, SE
Charleston, WV 25304

November 5,
2015

SECTION A – PROJECT MANAGEMENT

A.1 Title of Plan and Approval

Quality Assurance Project Plan
Chesapeake Bay Point-
Source Data Collection

Prepared by:
WVDEP

_____ Date: 11/10/15
Jennifer Pauer, WVDEP - DWWM Project Manager

_____ Date: 11/10/15
Scott Mandirola, Director, WVDEP – DWWM

_____ Date: _____
Lucinda Power, US EPA CB Project Manager

_____ Date: _____
Rich Batiuk, US EPA CBPO QA Officer

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Attachment 2: Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements

Attachment 3: West Virginia Plan for Verification and Validation of Nutrient Reduction Strategies

Attachment 4: WVDEP Reporting Reference Manual

Attachment 5: WVDEP Water Compliance Inspection Report

A.3 Distribution List

This document and all supporting materials will be submitted to the following individuals. Distribution format will be electronic copies.

Lucinda Power, US EPA Project Manager
Chesapeake Bay Program Office
power.lucinda@epa.gov

Ning Zhou, Point Source Data Manager
Chesapeake Bay Program Office
zhou.ning@epa.gov

Jennifer Pauer, Watershed Basin Coordinator
WVDEP
jennifer.paeur@wv.gov

Terrie Sangid, Assistant Director – DWWM
WVDEP
terrie.l.sangid@wv.gov

A.4 Project/Task Organization

Table A.1 Roles & Responsibilities

Individual(s) Assigned	Responsible for:	Authorized to:
Program Support – Environmental Resources Specialist	• Compiles statewide DMR data for significant facilities into Excel report format • QA of the DMR data, calculates nitrogen speciation based on CB guidance • Updates facility information • Ensures appropriate defaults for non-significant facilities • Obtains CSO information and adds to report • Submission of final report • Reviews DMR QA work of team members	• Submit final point-source data report
Watershed Assessment Branch – Technical Analyst	• QA report before final submission, including a review of significant DMR data, non-significant defaults, and CSO data • Provides updated facility information	• Submit final point-source data report, if needed
Program Support – MicroComputer System Support Specialist	• Assists with QA of DMR data and facility research • Contacts facilities to obtain additional/corrected DMRs	• Submit final point-source data report, if needed
DWWM EE Inspectors	• Inspects facilities to ensure correct sampling and reporting • Initiates Enforcement Actions to obtain compliance, if necessary	• Issue Enforcement Actions
US EPA – Chesapeake Bay Program Office	• Reviews final report and works with WVDEP staff to resolve any issues	• Approve final submission

Figure 1: Program Support Organization Chart

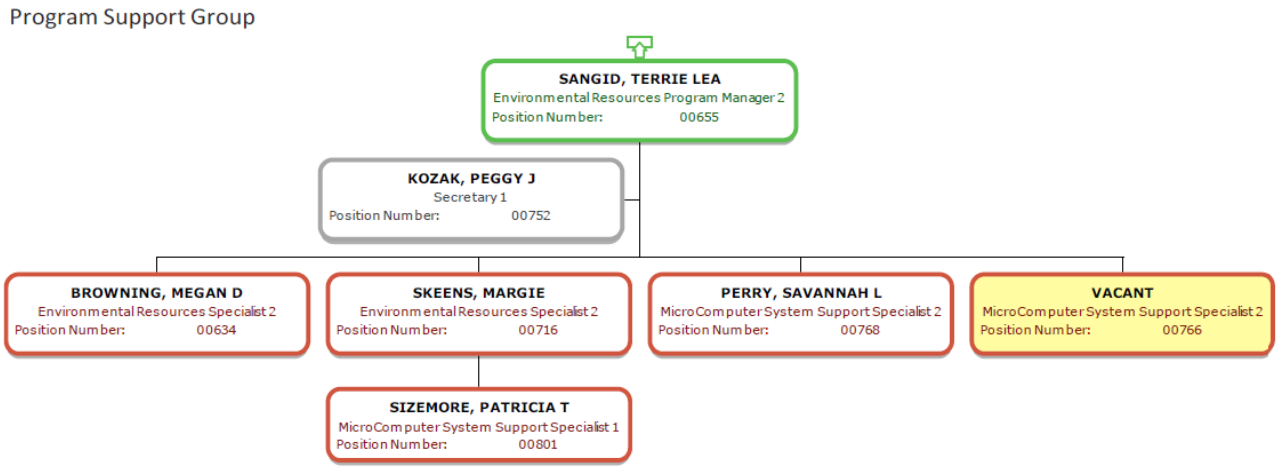


Figure 2: Watershed Assessment Branch Organization Chart

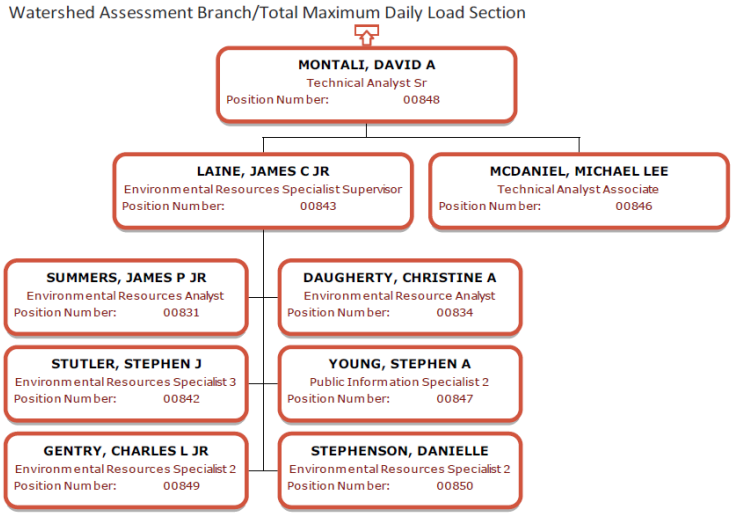
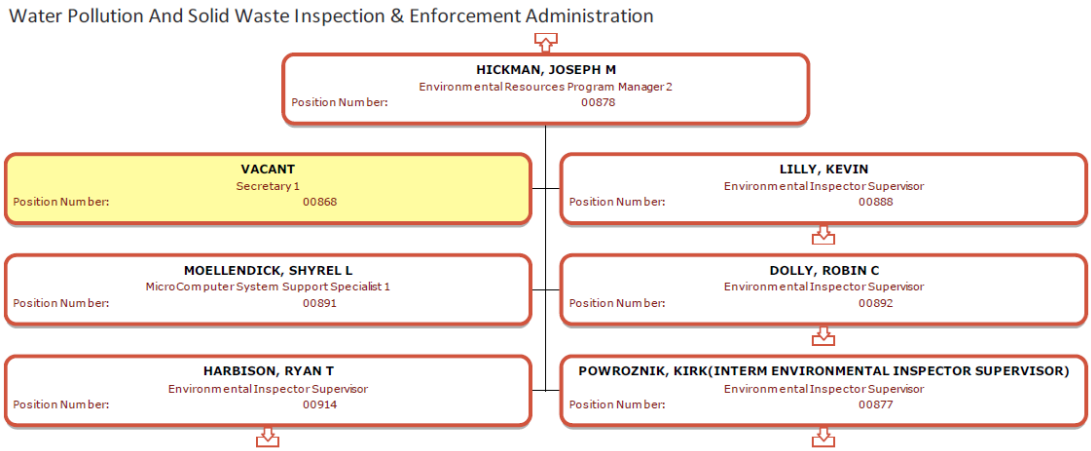


Figure 3: Water Pollution Environmental Enforcement Organization Chart - Supervisors



A.5 Problem Definition/Background

West Virginia's point-source data collection focuses on collecting data from permitted industrial and municipal facilities along the Chesapeake Bay watershed. The data is collected through each facility's submission of Discharge Monitoring Reports as required by their permit. Discharge Monitoring Reports (DMRs) are reports that provide analytical results of chemicals and nutrients being discharged by NPDES permitted facilities (point sources) into the waterways of West Virginia. The data undergoes rigorous quality assurance checks before being uploaded into WVDEP's Environmental Resources Information System (ERIS) and uploaded into US EPA's Integrated Compliance Information System (ICIS).

Additionally, Combined Sewer Overflows (CSOs) are present in the collection systems of four West Virginia Publicly Owned Treatment Works in the Potomac Basin and represented in the Chesapeake Bay Watershed Model. The Chesapeake Bay TMDL provides individual CSO wasteload allocations based upon 85% reduction of the loads represented in the Phase 5.3.2 model 2010NoAction scenario. Because of the episodic nature of overflows and lack of flow monitoring capability, measurement of actual CSO loadings is not practical. Under national and state CSO control policies, facilities are implementing long-term plans to ensure that CSOs do not cause or contribute to any violation of water quality standards. Interim goals of 85% CSO reduction and/or controls that result in less than six overflows per year are being pursued.

Annually, the data is compiled into a report to be used by the US EPA's Chesapeake Bay Program Office in Chesapeake Bay Watershed Model to assess reductions in nitrogen, phosphorous and sediment loadings to Chesapeake Bay and its tidal tributaries. Since the nature of this project relies on data collected and reported from outside sources, there are unique challenges to ensuring complete and accurate data. A quality assurance project plan to address the procedure for obtaining thorough, correct data was needed to ensure consistency from year to year.

A.6 Project/Task Description

Discharge samples are collected and analyzed by the permitted facilities or authorized contracted laboratories which are certified pursuant to 47 CSR 32, Environmental Laboratories Certification and Standard of Performance. The results are reported on Discharge Monitoring Reports to WVDEP utilizing the procedures outlined in WVDEP's Electronic Discharge Monitoring Reporting (eDMR) User's Guide (see Attachment 1).

The data is then compiled for the annual point-source data report in accordance with the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2) guidelines. This includes various nitrogen and phosphorous species, as well as total suspended solids and dissolved oxygen. The data collected for this project is from significant facilities with a design flow of 0.4 mgd or greater in the Chesapeake Bay watershed, and each annual report covers discharges occurring between the previous July through June period. The data from the DMRs is verified by WVDEP Program Support staff who contacts the facility if necessary to correct erroneous data. The draft report is also reviewed by a WVDEP Watershed Assessment Branch staff member who also helps provide default values for non-significant facilities in the watershed.

When all quality checks are complete, the data is formatted and submitted to US EPA's Chesapeake Bay Program Office by the deadline specified in the Chesapeake Bay Regulatory and

Accountability Grant (typically November 30th). Refer to the West Virginia Plan for Verification and Validation of Nutrient Reduction Strategies (Attachment 3) for more information.

A.7 Quality Objectives & Criteria

1) Accuracy Objectives (Qualitative)
    a. Compare expected numbers vs. actual counts using prior years' numbers
    b. Ensure there is no double counting of discharge data (ex. internal outlets or facility counted as a significant & non-significant)
    c. Ensure facility online/offline statuses are updated on the report

2) Completeness Objectives
    a. Ensure all DMRs for the annual reporting period are sent to WVDEP by July 20th
    b. Ensure all CSO reports for the annual reporting period are sent to WVDEP by July 20th
    c. Contact facility to obtain missing DMR data and have it sent in no later than September 30th

A.8 Special Training/Certification

n/a

A.9 Documents and Records

This QAPP is saved in a shared network folder and accessible by all WVDEP staff that work on the annual point-source progress report. It is updated as programmatic requirements or process changes occur.

The annual progress report is also saved on a shared network folder available to WVDEP Program Support staff since they are responsible for its creation and completion. The data is exported from ERIS into an Excel worksheet which is saved in the folder. The data is then imported into an Access database and is queried and cross-tabbed, then only the relevant information is exported to a new Excel worksheet. The worksheet format is what is ultimately submitted to the Chesapeake Bay Program Office and it automatically makes a backup of each version as it is modified, with a date included in the file name to easily keep track.

All of the versions for a report year are kept in a folder with the year number. The yearly folders are kept in one overall Chesapeake Bay Point Source folder, along with reference information including the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2). The data will be kept indefinitely.

SECTION B – DATA GENERATION & AQCUISITION

B.1 Sampling Process Design (Experimental Design)

n/a

B.2 Sampling Methods

n/a

B.3 Sampling Handling & Custody

n/a

B.4 Analytical Methods

n/a

B.5 Quality Control

n/a

B.6 Instrument/Equipment Testing, Inspection, and Maintenance

n/a

B.7 Instrument/Equipment Calibration and Frequency

n/a

B.8 Inspection/Acceptance of Supplies & Consumables

n/a

B.9 Data Acquisition Requirements for Non-Direct Measurements

Point-source data is obtained through the compilation of electronic DMRs submitted to WVDEP through the Electronic Submission System. The data must undergo electronic validations in order to be deemed acceptable, where it is then scrutinized by WVDEP staff. Limitations of the data include human error by the facility when entering the data that may not be caught during review if it still falls within the expected values. Additionally, sampling errors could occur that result in inaccurate measurements.

B.10 Data Management

DMR data is required to be kept on file by the facility for at least three years following the date of the report. However, WVDEP's Electronic Submission System keeps electronic DMRs in the system indefinitely that can be retrieved anytime for verification purposes.

The ERIS database is used to house the DMR data at the state level, and Microsoft Access and Excel are required to select the appropriate data and create the report in its final format to be used by US EPA as outlined in the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2).

SECTION C – ASSESSMENT AND OVERSIGHT

C.1 Assessments and Response Actions

1. Perform routine surveillance of DMR data completeness through monthly Entry Rate reports to ensure data is obtained and downloaded in a timely manner. A success is considered a 95% or greater Entry Rate in the month following the DMR due date, with missing DMRs obtained afterwards through facility contact. Serious cases will be referred to enforcement staff to take appropriate enforcement actions to obtain compliance, if necessary.

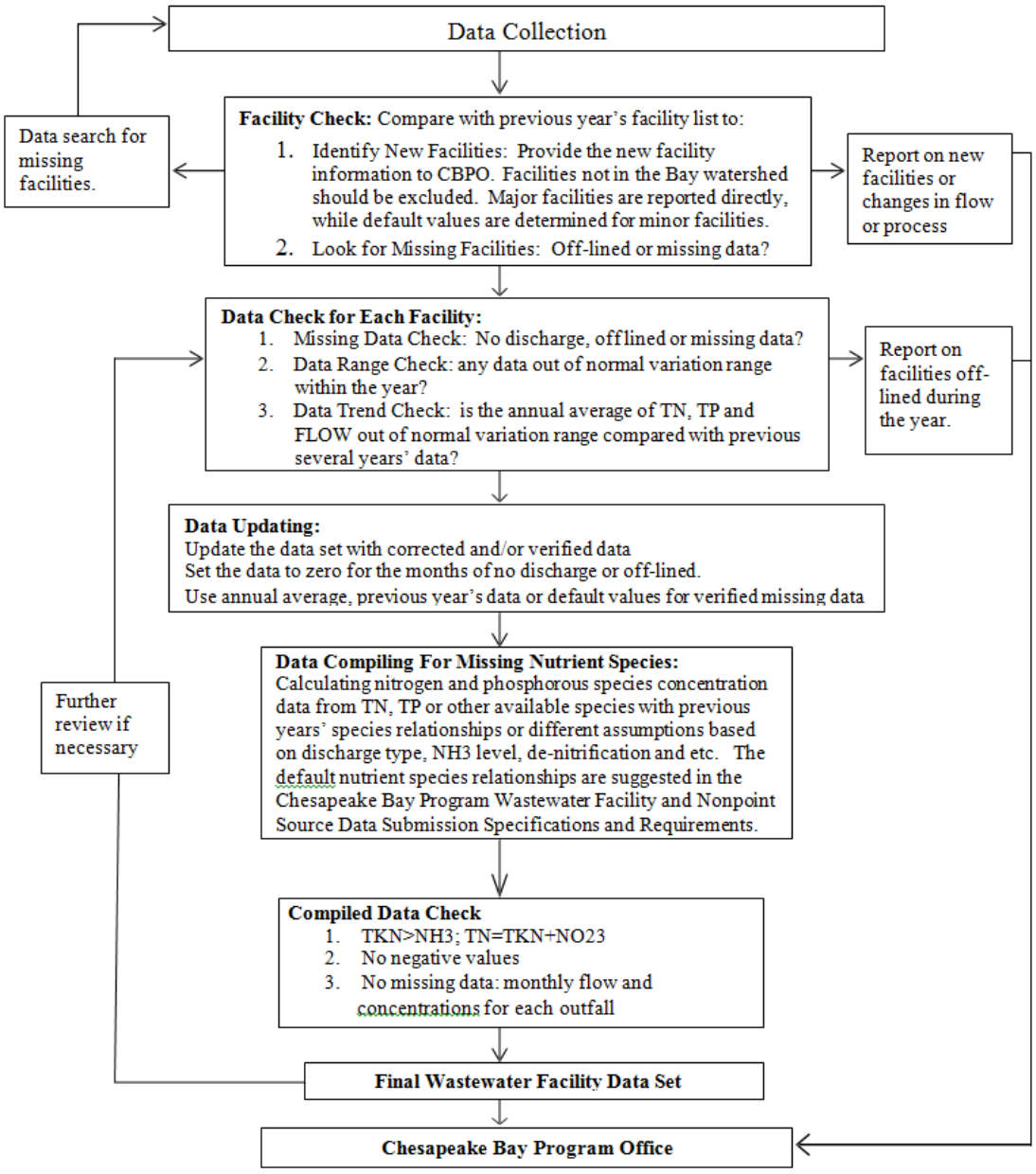
2. Perform annual review of submitted CSO data to ensure completeness, with missing reports obtained afterwards through facility contact. Serious cases will be referred to enforcement staff to take appropriate enforcement actions to obtain compliance, if necessary.

3. WVDEP participates in Chesapeake Bay meetings and conferences to discuss data collection efforts as they occur. Any data issues that arise are discussed until a solution is determined. If programmatic changes occur that impact data collection or verification, WVDEP will adjust data management and analysis methods as appropriate to meet Chesapeake Bay Program Office requirements. This QAPP will be revised to reflect any changes that occur.

4. WVDEP Program Support staff creates a draft annual report in August and analyzes and evaluates data for accuracy and completeness as outlined by the Chesapeake Bay Phase 5 Community Watershed Model, the WVDEP Reporting Reference Manual (see Attachment 4), and in the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2). First, the data is reviewed to determine if there is missing information from their DMRs. If so, the facility is contacted in order to obtain the information. If no analytical data is available for Nitrogen and Phosphorous derivatives, values are calculated using formulas specified in the guidance documents or by averaging the values reported in other months. The data is scrutinized by multiple staff members to ensure nothing is missed, and is considered a success if all fields have been verified and have a value for the model. The data is then scrutinized to look for anomalies by comparing each reported value for the month to each other. Next, DEP staff calculates annual pounds and compares the value to past years' values to observe any trends and ensure the value is within reason. For new facilities, additional information has to be reported including latitude and longitude and the date the facility began discharging. Once submitted, US EPA staff will notify WVDEP if data needs adjusted, and WVDEP will submit a corrected report if required.

5. WVDEP Laboratory Certification staff performs assessments of laboratories that collect and/or test water samples reported on DMRs. This is done through Technical Systems Audits that assess sampling and analytical quality control procedures, and can include onsite evaluations, equipment calibration, personnel qualification reviews, recordkeeping reviews, data validations and management reviews, and reviews of field and laboratory activity reports. See the WVDEP Quality Management Plan for additional information.

Figure 4: Wastewater Facility Nutrient Data Processing Diagram



C.2 Reports to Management

No standardized reports are sent to management during the process, but management often checks on the status of the project informally and problems are addressed or followed up on as needed.

SECTION D – DATA VALIDATION AND USABILITY

D.1 Data Review, Verification, and Validation

DMR data can be rejected in ESS, ERIS or ICIS if it does not pass automated validations put in place to ensure accurate and complete data. Data is then reviewed by DEP staff members following instructions outlined in the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2) including ways to calculate data not required by the DMRs. WVDEP looks for outlying values by comparing monthly data values, as well as compares the annual loads of nitrogen and phosphorous to the loads of previous years to ensure the variations are within reason. Any suspicious values are identified and the facility is contacted in order to verify, obtaining laboratory reports when possible.

D.2 Verification and Validation Methods

One of the primary mechanisms for verifying compliance is the self-monitoring requirements included in the NPDES permits issued to significant facilities. Permits require regular and frequent submission of effluent analytical data to WVDEP to verify compliance with effluent limitations via monthly Discharge Monitoring Reports (DMRs). Permits also contain procedures for facilities to calculate monthly loads by averaging nutrient results and coupling those with measured total monthly flow. Generally, 1/week nitrogen and phosphorus composite sampling and continuous flow measurement are required. These self-reported data are maintained in a database by WVDEP staff and are the intended basis for annual progress reporting. The eDMR system has numerous data validations built directly into the interface that prevent facilities from submitting certain types of erroneous data, such as detecting improper units or reporting frequencies. Facilities cannot submit their eDMR until the errors have been addressed, thus all data received should have a very high standard of completeness and accuracy prior to review by WVDEP Program Support staff.

Trained WVDEP Division of Water and Waste staff performs regular assessments of the data received from the facilities. During these reviews WVDEP staff looks for and attempts to rectify any anomalies in the data (ex. incorrect reporting units, incorrect load calculations, etc.). Prior to submitting the annual point-source progress report, WVDEP staff performs a QA/QC review in accordance with the recommended methods described in the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements guidance document (Attachment 2), and will contact facility to rectify any issues.

Another quality assurance measure performed by WVDEP staff occurs when data is translated from the state database (ERIS) to US EPA's Integrated Compliance Information System (ICIS) in batch, using the Central Data Exchange. Batch Transaction Summary Reports from ICIS are run and checked by Program Support staff members to rectify any errors that occurred during translation. Additionally, Program Support staff completes the ICIS Quarterly Non-Compliance Reports (QNCRs). The QNCRs show DMR data that violates the permit limits and conditions as well as any facilities that failed to submit a scheduled eDMR during the quarter. Staff assesses the validity of the violations by comparing the DMR data provided by the facility against the data in ICIS and the requirements of their permit, and contacts the facility to obtain corrected reports as needed.

For CSO data, the West Virginia Watershed Implementation Plan (WIP) prescribes a simple

approach to tracking and reporting progress with CSO wasteload allocations that recognizes CSO control policy protocols as well as the impracticalities of CSO load monitoring. Reporting is based upon an assumption that control achieving six or less overflow events per year is commensurate with an 85% reduction of CSO load. Facilities that report six or less overflows per year are reported at the facility's wasteload allocation, zero loads are reported if a facility reports zero overflows, and 2010NoAction loads are reported if more than six overflows are reported. West Virginia tracks CSO events reported in the quarterly and annual reports required by NPDES permits. Reporting is aligned with CBP progress reporting periods and adheres to the protocol prescribed in the WIP.

In addition to the self-monitoring and reporting mechanisms, WVDEP independently assesses/compels compliance with permits through inspections and the use of enforcement actions in response to noncompliance. The number, type, and frequency of inspections performed conform to the guidance provided by the USEPA's Compliance Monitoring Strategy (CMS). For Major facilities covered in this point-source data report, the inspection frequency is at least one comprehensive inspection every two years, or once every three years if using the Inspection Targeting Model and the facility is in compliance. Systematic escalation of enforcement is pursued to resolve noncompliant facilities in the shortest time possible. Each inspection covers numerous topics that directly impact the quality of DMR data received by WVDEP including permit reporting requirements (including DMRs), flow measurements, laboratory certification, and sampling practices (see Attachment 5).

Table 1. Wastewater sector verification strategy from the West Virginia Plan for Verification and Validation of Nutrient Reduction Strategies

Program Component	Program Elements	Wastewater treatment plant data verification
i. BMP Verification	1. What was the driver for BMP installation?	Permit
	2. How many BMPs will be inspected?	For all significant facilities, DMR self-monitoring submissions are reviewed and field inspections are performed
	3. How is inspection frequency and location determined?	DMRs and CSO reports are reviewed upon receipt and comprehensively at annual progress submission intervals; Inspection frequency in accordance with USEPA Compliance Monitoring Strategy
	4. How often are BMPs/groups of BMPs inspected?	Inspection frequency in accordance with USEPA Compliance Monitoring Strategy
	5. What is the method of inspection?	DMR review, database review and field inspections
	6. Who will conduct the inspection and is he/she certified/trained?	WVDEP trained permit and enforcement staff
	7. What needs to be recorded for each inspection?	See attached inspection form (Attachment 5)
	8. Is execution of the inspection process documented in and checked against an updated quality assurance (QA) plan?	Yes.
	9. How is collected data recorded?	DMR data is submitted through an online form and maintained in a database. Online form guidance is included in Attachment 1. Permittees currently submit hard copy CSO reports.
	10. At what resolution are results reported to EPA and/or the public?	Site-level
ii. BMP Validation	11. What is the QA/QC process to prevent double-counting or counting of BMPs no longer in place?	Only active facilities are reported; permit database allows activity tracking
	12. What is the method used to validate state's ability to collect and report correct data?	Annual review of data collected for all facilities.
	13. If data is provided by external independent party or industry, what method is used to provide adequate QA for acceptance by the Chesapeake Bay Program?	All DMR data is submitted by the permittee under a statement certifying that the data is true and accurate. Analytical laboratories must also be certified to perform permit self-monitoring analyses
	14. Who conducts data validation?	WVDEP
iii. BMP Performance	15. What is the process to collect data to assess BMP performance and confirm consistency with the Chesapeake Bay Program's approved BMP efficiencies?	Effluent limitations, self-monitoring and reporting under NPDES permit requirements that are consistent with the TMDL wasteload allocations.
	16. Who collects BMP effectiveness data?	WVDEP

D.3 Reconciliation with User Requirements

The final report should always be submitted in such a way to be completely in line with User Requirements since it is formatted, compiled, analyzed and calculated as outlined by the Chesapeake Bay Program Wastewater Facility and Nonpoint Source Data Submission Specifications and Requirements (Attachment 2).