

**WV DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER & WASTE MANAGEMENT
NONPOINT PROGRAM**

**QUALITY ASSURANCE PROJECT PLAN FOR MONITORING
STREAMBANK EROSION**



WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Approval Sheet

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Teresa Koon, Assistant Deputy Director	Date
Pamela Russell, WV Conservation Agency Nonpoint Program Administrator	Date
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Section A1 – Distribution List

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

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Conservation Specialist – WVCA Field Offices

Section A2 – Project Task and Organization

This QAPP is intended to cover only the streambank assessments in West Virginia’s Nonpoint Program. This aspect of the Program is comprised of personnel from two agencies, the WVDEP and the WVCA.

Leo Essentier, US EPA Region Project Manager for West Virginia: The QAPP will be submitted for review and guiding through the US EPA approval process.

Teresa Koon, WVDEP’s Assistant Deputy Director: Responsible for the overall operation of all programs related to nonpoint source issues.

Tim Craddock, WVDEP’s Nonpoint Program Coordinator: Responsible for coordinating all activities funded by S319 grants. Data responsibilities include ensuring that all participating sub-grantees have a QAPP; environmental results from projects are based on quality monitoring and are properly reported.

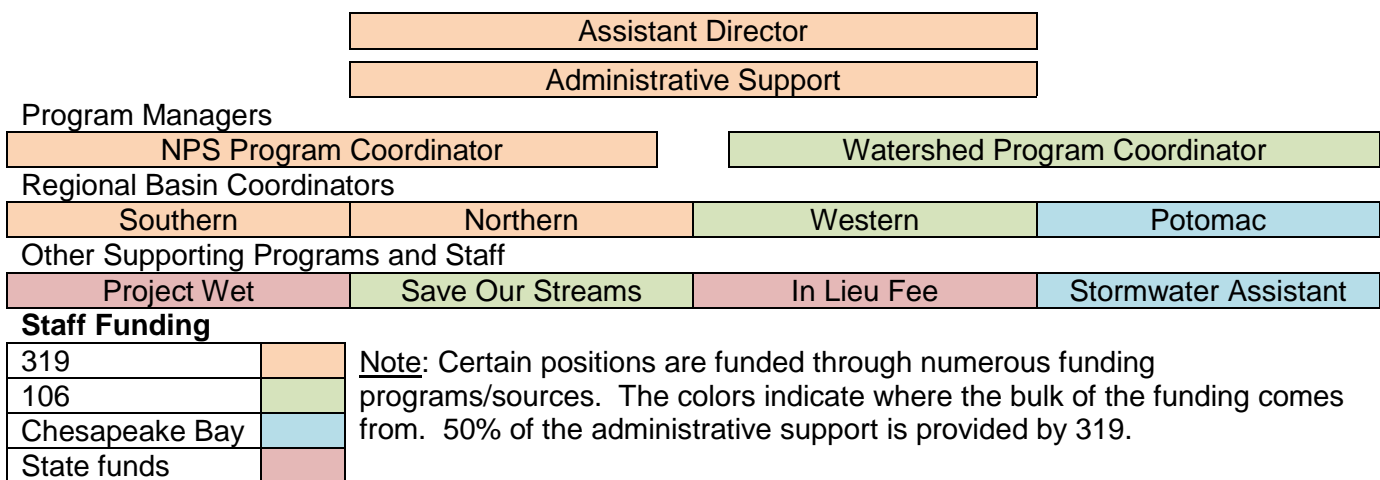
Basin Coordinators (BCs): BCs primary responsibilities are to organize, assist, implement and report on nonpoint AGO and incremental projects. BCs will be utilizing the monitoring protocols of this QAPP.

Volunteer Monitoring Coordinator: As the monitoring expert for the Nonpoint Program this person will serve as the Quality Assurance Officer for the Program.

Pam Russell is the administrator for the Nonpoint Program for the WVCA. She will be responsible for the distribution and adherence to the QAPP in the WVCA.

WVCA Conservation Specialists (CSs): CSs responsibilities involve project management for agriculture, construction and stream bank restoration. CSs will be utilizing the monitoring protocols of this QAPP.

Figure 1. Nonpoint Program’s Organizational Chart



Section A3 – Project Definition and Background

West Virginia's Nonpoint Program (NP) funds projects that focus on preventing water pollution from diffuse sources such as erosion from runoff and eroding streambanks. In addition the NP funds projects that attempt to restore water quality to streams impaired by nonpoint source pollution. The NP receives funds from EPA in §319 and §106 grants for both staffing and projects. The goal of these projects is to achieve environmental improvements in the stream where the projects are being implemented. In order to evaluate the environmental results of any project monitoring is required.

Many projects focus fully or in part on stabilizing eroding streambanks. However obtaining quantifiable environmental results from streambank restoration projects has been difficult. There is a wide range of monitoring techniques to document erosion or sedimentation but often they focus on other activities such as agriculture or are intended to provide data for project design not environmental results. A monitoring protocol to address the data needs of the NP while considering the limited resources of the program was needed.

Intensive surveying techniques such as Rosgen's stream survey techniques are resource intensive and do not provide the types of sediment load reduction numbers needed to justify 319 and 106 project proposals. Utilizing sediment monitoring protocols such as pebble counts and stream bank profiles and combining with a habitat assessment for erosion potential and a photographic history will provide all the data necessary to assess stream bank restoration projects.

Section A4 – Project Description

The monitoring system is a combination of other proven techniques modified for the special requirements of the NP. This protocol is a combination of photo point documentation, a volume assessment of bank loss, pebble count and the bank erosion potential rating (BEPR)

- The **photo point documentation** provides visual evidence of improvements in stability and habitat. Photographs can be used to document the general condition of a stream reach over time. Also, photographs can be critical additions to reports or for public relations to promote natural stream bank stabilizations.
- The **volume assessment** gives the weight per year of sediment loss from streambank erosion. In order to obtain an adequate assessment of the erosion problem and sediment load estimate two bank profiles should be done prior to the project starting at least six months apart. The first assessment is the baseline and the second one will provide the difference from the baseline that when divided by the time frame will give the amount of soil loss.
- The **pebble count** will over time give a view of the changes in stream bottom composition. The composition of the streambed and banks is an important facet of stream character, influencing channel form and hydraulics, erosion rates, sediment supply, and other parameters. To track the changes in stream bottom composition each pebble count will calculate habitat percentages, the D50 and percentage of fine materials (sand and silt).
- Finally, the **bank erosion potential rating (BEPR)** is a subjective assessment based on critical habitat parameters of the risk of severe erosion from any bank. It is a useful tool for prioritizing sites for selection of project planning.

These four techniques will provide the data needed to develop proposals for funding and report on the environmental impact of the projects. Each can be done with a minimum of just two people and basic surveying equipment.

Section A5 – Quality Objectives and Criteria

The WVDEP and the WVCA have started focusing resources on the stabilization of stream banks and are involved in many projects across the state. Up until now most environmental baseline and results were based on models. The models available have limited use and may not accurately reflect the conditions in different regions of West Virginia. The objective of this monitoring protocol was to provide quality estimates of sediment loads and reductions and general habitat improvement.

The protocols were developed by a committee from the NP to match project data needs with proven field techniques for measuring bank profiles and erosion potential.

Section A6 – Specific Training and Certification

NP field personnel who will be monitoring stream bank erosion will take a training course specifically designed for these protocols and data management. The trainers have taken and passed at least a basic Rosgen course or equivalent to learn stream surveying techniques and hydrological principles. Trainers also will be required to take a workshop and be certified to Level 2 of the WV Save Our Streams Program.

Section A7 – Documents and Records

All signatory personnel will receive a paper copy of the QAPP after US EPA approval and persons listed in the distribution list who did not receive a paper copy will be sent by email an electronic copy. The coordinator of the NP will be responsible for ensuring that all appropriate personnel have the most current approved QAPP and [manual](#).

The [manual](#) will be distributed to all field personnel at the time of training. All field data recording forms will be distributed at the time of training and will be available on the program's space on WVDEP's shared drive. All non-DEP personnel trained in the protocol will receive disks with the forms in computer files to print as necessary.

The project managers where these protocols were employed will maintain all documents and records for a minimum of five years within the file for the project. All reports, results and other published records based on this data will be maintained by the NP coordinator within appropriate fiscal year and project files for a minimum of five years.

Section B1 – Sampling Process Design

The objectives of monitoring stream banks are to provide an assessment of the areas at greatest risk for erosion and then measure the amount of soil loss from the bank. These serve both the project planning and project assessment phases of stream bank restoration or stabilization projects. Sampling sites are located based on the location of project sites.

Project sites are individually selected based on a variety of variable factors. Often the site is selected based on a request for assistance by a landowner. When landowner requests are not the determining criteria for selecting a

project site, a systematic approach to assessing sites is used. The need for stream bank stabilization may occur because of a watershed wide effort to restore hydrological, biological or chemical functions of the stream.

In a watershed restoration process selecting suitable projects sites is needed. Field personnel will divide the stream into segments and walk each segment to visually assess potential project sites. Potential sites are marked on a map and field personnel will assess each site for a Bank BEPR. The BEPR is used to set priority sites which will receive more intensive monitoring. Each selected project site will be monitored by a bank pinning survey and a pebble count.

Section B2 – Sampling Methods

The sampling method is described in detail in the operations manual. All field personnel will be trained in accordance with this QAPP and supplied with standard equipment described in the manual. The field person responsible for the project or watershed will coordinate the monitoring. Support will come from the NP personnel in the WVDEP and the WVCA. The support of multiple trained personnel will reduce any potential for error.

Section B3 – Sample Handling and Custody

These monitoring protocols do not require the collection, handling or analysis of any water samples.

Section B4 – Analytical Methods

The process of recording the measurements and analyzing the results is specified and shown by example for each method in the manual.

Section B5 – Quality Control

All equipment used to assess stream banks will be standard throughout the program. Most are common ordinary tools with the exception of the surveyors' rod, which will be provided by the central office, as needed. The critical quality control area will be in the reading and recording of measurements for both the bank profile and the pebble count. The reader will shout out the measurement to be recorded. The support personnel in the team will be responsible for quality checking the reader's measurement. The team will also assist the holder of the survey rod in setting the rod vertically. The recorder will repeat the measurement so the team can ensure that what is being recorded is correct.

After recording the bank profile measurements the recorder can plot the measurements on the grid (Appendix A). Any number that is wrong will create an anomaly in the bank profile. For a more exact examination after the survey the measurements can be plotted in a spreadsheet and graphed. If errors are discovered, then additional surveys will be required.

The BPER is a subjective assessment based on the professional judgment of the person making the assessment. The form provides guidance in making the determinations and scoring. During training all personnel will conduct the exercise and compare assessments and discuss differences. The objective is to have all trained personnel conducting this assessment in a consistent manner.

Section B6 – Equipment Testing, Inspection and Maintenance

Equipment will be cleaned and maintained in good working order by the project field person. Any tape measure or surveyor's rod where numbers are hard to read or kinks and other obstructions occur will be replaced. Inspections will be done prior to the use for an assessment and prior to equipment storage after the assessment.

Sand cards used in pebble counts will be replaced if they show excessive wear or after being used in 20 assessments. Each field person will be issued a sand card and will be responsible for maintenance, inspection and tracking the usage.

Section B7 – Equipment Calibration and Frequency

There is no equipment that requires calibration.

Section B8 – Acceptance of Supplies

No replaceable supplies are required for this method.

Section B9 – Non-direct Measurements

The use of topographical maps will be necessary for locating sites.

Section B10 – Data Management

Data is collected on a project specific basis for the purpose of determining environmental results for each project. Each procedure in this monitoring process has its own data sheet. For the recording of data in determining streambank profile, the form can be found in the [manual](#). The field measurements are recorded on this form and given to the project manager. The project manager is then responsible for taking the field measurements off the cross sectional measurements form and filling in the load reductions form.

Pebble count measurements are taken in the field and given to the project manager. The project manager is responsible for determining the results from those measurements. The same is true for the BRPR. The project manager will keep the original data sheets in the project file and send copies to the NP Coordinator or the Watershed Basin Coordinator depending on which program is funding the project. Those copies will be kept on file in the project file in the central headquarters of WVDEP.

At the appropriate reporting time the results from this monitoring will be included in project reports to the appropriate Program Coordinator. The results will be included in any required reports to US EPA and entered into GRTS. The keeping of this data in an electronic format will occur on the NP Projects spreadsheet kept on a WVDEP's shared drive in the Nonpoint Source folder. All members of the NP within WVDEP have access to this spreadsheet and Basin Coordinators will be encouraged to enter data for projects in their regions. Ultimately the NP Coordinator is responsible for insuring the load reductions are entered into the spreadsheet.

Section C1 – Assessment

The Nonpoint Program conducts assessments of its monitoring activities to assure the requirements of the QAPP are being implemented. The assessments are discussed below:

- Field surveillance of all quality control and assurance procedures are done on a continuous basis during actual data collection. The trained field staff conducts this assessment.
- WVDEP's NP staff and managers will review field monitoring methodology, data, equipment and efficiency at quarterly staff meetings. Revisions or corrections to any aspect of the monitoring protocols will be discussed and implemented.
- The Program Managers will conduct semiannual reviews of data and project specific monitoring efforts. They will be responsible for instituting and necessary revisions.
- The Program Managers will conduct an annual review of data management and make any corrections necessary.

Section C2 – Reports

Much of the reporting requirements were described in Section B10. It is the responsibility of the project managers to report the data and results to the appropriate program coordinator dependent on the funding source. The program coordinator then includes these results in required semiannual and annual reports. For S319 funded projects the results will be reported to EPA in appropriate reports and into the Grant Reporting and Tracking System (GRTS). This information will be available upon request to everyone. Specific reporting responsibilities are shown in Table 1.

Table 1. Reporting

Report	Responsible party	Report received by
Projects	Basin Coordinators	Nonpoint Program Manager
§ 319 Semi-annual	Nonpoint Program Manager	U.S. EPA
§ 319 Annual	Nonpoint Program Manager	U.S. EPA
GRTS updates	Nonpoint Program Manager	U.S. EPA
Stream Partners	Basin Coordinators	Watershed Basin Coordinator
§ 106 Semi-annual	Watershed Basin Coordinator	U.S. EPA
Chesapeake Bay semi-annual	Potomac Basin Coordinator	Chesapeake Bay Program

Section D1 – Data Review, Verification and Validation

Data review and verification is performed in-house to ensure that the data are obtained according to protocol and have been received, recorded and processed correctly. The data gathering, checking and reporting process has already been described in sections B10, C1 and C2.

Section D2 – Verification and Validation Methods

The procedures for data collection and reporting have been outlined in previous sections. The initial data verification occurs during collection by the monitoring team (Section B5). Validation occurs when copies of the data sheets and results are sent to the appropriate program coordinator. The results are conveyed through the various reports outlined in Sections B10 and C2.

Section D3 – Reconciliation with Users

The primary users for data collected by this method are West Virginia's NP and the US EPA. The type of data required is determined by the US EPA through the guideline for the §319 grant program. US EPA requires that all data collected be done through an approved QAPP. All sediment data needs to be expressed in tons/year and reported in GRTS on a semi-annual basis. Reporting to US EPA is conducted through reporting measures already described. Data reconciliation for US EPA requirements is implemented through policy statements and published guidelines for the §319 grant program.

Section E1 – References and Additional Information

1. Designing your monitoring strategy
<http://www.state.nj.us/dep/wms/bwqsa/vm/docs/designingyourstrategy.pdf>
2. Massachusetts's Waterwatch Partnership QAPP Guidance
<http://water.epa.gov/type/rsl/-monitoring/qappcovr.cfm>
3. Quality Management Tools: QA Project Plans
<http://www.epa.gov/QUALITY/qapps.html>
4. US EPA's Requirements for Quality Assurance Plans
<http://www.epa.gov/quality/qs-docs/r5-final.pdf>
5. Volunteer Monitor's Guide to Quality Assurance Project Plans
<http://water.epa.gov/type/rsl/monitoring/qappcovr.cfm>
6. WV Save Our Streams Guide to Study Designs and QAPPs
<http://www.dep.wv.gov/WWE/getinvolved/sos/Pages/Studydesign.aspx>
7. WV Nonpoint Program's Streambank Monitoring Manual
<http://www.dep.wv.gov/WWE/Programs/nonptsource/Pages/SBMPs.aspx>