Quality Assurance Project Plan
for
Tracking, Verifying, and Reporting Implementation
of Conowingo WIP and Two-year Milestones

Prepared by
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Prepared for
Region 3 EPA Office
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Approvals Signature (required prior to project start):

_____ Date: _____ EPA
Project Manager/Officer

_____ Date: _____ EPA
QA Manager/Representative

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1.3 Distribution List (EPA QA/R-5 A3)

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1.4 Project Organization (EPA QA/R-5 A4)

Jeffrey Allenby, MEM, GISP, is the Conservancy's Director of Conservation Technology (10 years of experience in applications of GIS and remote sensing in land cover production, direct-detection methods for stream mapping, large landscape data processing, and contract oversight/management). Jeff will have overall responsibility for assigning appropriate personnel to complete the tasks included in this plan. He will ensure that the project budget is adhered to, and will communicate with the Program Manager on work accomplished in this plan and any problems or deviations that need to be resolved. He is also responsible for guiding the development of the BMP auditing process.

Susan Minnemeyer, MEM, is the Conservancy's Geospatial Program Manager. Susan has twenty years of experience managing geospatial projects and teams, with expertise in applications of GIS and remote sensing for land cover and land cover change analysis, forest monitoring and environmental restoration. Susan is responsible for managing budgets, tracking deliverables, and coordinating effort among the Conservation Technology Team of the CIC at the Conservancy. She will be responsible for Quality Assurance protocols on this project.

Katie Walker, is a Geospatial Analyst at the Conservancy, with over 5 years of experience in geospatial data and database management. She will be responsible for coordinating discussions with external organizations and drafting deliverables. She will work closely with Commons and CWP to facilitate the design and deployment of functionality in FieldDoc and support for any trainings or troubleshooting. She will also be responsible for the initial implementation of the auditing protocol. She reports directly to the Program Manager.

R. John Dawes, MS, is the Founder and Executive Director of Chesapeake Commons where he leads project strategy and oversight. John coordinates the design, development, and adoption of systems built by the Commons team and the organization's network of developers. He is responsible for developing and implementing updates to the FieldDoc platform in terms of WIP tracking, duplicative geospatial analytics, dashboard functionality, and auditing functionality. He is also responsible for working with the Conservancy to conduct outreach, training, and troubleshooting.

Bryan Seipp is the Watershed Manager at the Center for Watershed Protection (CWP) where he develops watershed plans and implements best management practices (BMPs). He has over 19 years of experience in watershed management and is leading work related to Conowingo Activity 1: Facilitate Development and Implementation of the Conowingo WIP and Associated Two-Year Milestones. Bryan will provide guidance to this team for seamless accountability between the WIP implementation and tracking/reporting. He is responsible for helping refine the initial requirements for tracking/verification, as well as the draft auditing framework, especially providing perspective from the WIP development and implementation process.

1.5 Problem Definition/Background (EPA QA/R-5 A5)

The Conowingo Watershed Implementation Plan (CWIP) adds an additional challenge to the tracking, monitoring and verification of Best Management Practices (BMPs) being implemented through the existing framework of jurisdictional Watershed Implementation Plans (WIP) to meet the Total Maximum Daily Load (TMDL) of pollutants under the Chesapeake Bay Watershed Agreement. For the first time, jurisdictions, states, and the Chesapeake Bay Program (CBP) must track efforts to mitigate sediment, nitrogen, and phosphorus pollution and identify practices and programs as part of the jurisdictions' WIPs or the CWIP and ensure there is no multiple counting.

The Conservancy and the Commons, with guidance from CWP, will address the unique challenge of addressing managing and tracking progress toward both jurisdiction specific WIPS and the CWIP by enhancing tracking, verification and monitoring tools within a system already in development for CBP to streamline the reporting of progress toward the CWIP to CBP. Together, this team will springboard off their current CBP grant, BMP Planning and Reporting: Scaling Precision Conservation in the Chesapeake Bay Watershed, to build enhancements to Chesapeake Commons' FieldDoc platform. These enhancements will be focused on making an easy-to-use interface that allows partners to attribute implementation towards either the CWIP or jurisdictions' WIPS and build in a number of semi-automated and automated checks to ensure projects are not being counted toward multiple WIPS simultaneously. The Conowingo framework will build trust and confidence in the BMPs being implemented not only for the Conowingo WIP but for jurisdictional WIPs as well. Managers will be able to clearly understand and communicate what BMPs have been implemented and where and to which WIP they are counted.

For Activity 3, the Conservancy will be working with Chesapeake Commons and the Center for Watershed Protection. Founded as a mission-driven, non-profit organization, Chesapeake Commons (Commons) works to empower environmentally focused organizations and individuals with the technology they need to restore the Chesapeake Bay watershed and the broader environment. Our unique network of environmentally-focused software engineers, data scientists, and analysts work to build platforms and information products that restore water quality and engage citizen-driven restoration of the watershed. Commons provides robust digital services that actively engage and educate a diverse group of constituents in critical monitoring and restoration efforts.

The Center for Watershed Protection's (CWP) mission is to protect and restore streams, rivers, lakes, wetlands and bays. Their experienced staff of scientists, planners and environmental professionals are the technical experts who help municipalities, advocates, policymakers and citizens get clean water projects in the ground. Founded in 1992, the Center began as a nonprofit organization dedicated to research and education on watersheds. With an initial focus on protecting urban streams from the impacts of land development, the organization has grown over the years to become a national leader on stormwater management and watershed planning.

All three organizations have been developing and piloting new techniques and technologies to help identify where Best Management Practices could be located to maximize water quality benefits, quantify

the nutrient and sediment reduction benefits of proposed projects, and track implementation over time. These efforts have been conducted throughout the Chesapeake Bay watershed and Delaware River Basin. A core focus of this project will be bringing together best practices to facilitate the tracking, verification, and reporting of activities being conducted by local jurisdictions, counties, and states to simultaneously implement the Conowingo and local Watershed Implementation Plans. Through this project, partners will work to increase accountability and ensure a seamless process of tracking progress toward the Conowingo WIP.

1.6 Project/Task Description and Schedule (EPA QA/R-5 A6)

If there is a possibility of delays in the above deliverables, the Conservancy is responsible for notifying the Chesapeake Bay Program office as soon as possible. The reason for the delay and the updated date of delivery will be included in the notice. In addition, if the delay will affect any of the other deliverables, it shall be noted. Should anything come up that would create long-term delays that would affect the deliverable timelines, a compromise between CBP and the Conservancy will be addressed in the semi-annual reports.

Refine Tracking and Verification Requirements (December 2019)
Conservancy, CWP, and Commons staff will work with CBP staff and CWIP Steering Committee members to determine the requirements for a framework that will help track progress towards the CWIP and CWIP Milestone action plans and increase accountability within a system that will need to simultaneously track activity that could be associated with either the CWIP or a jurisdictional WIP. This process will ensure that the tracking and verification system developed for the Conowingo WIP meets CBP verification and reporting requirements and addresses the concerns of the Steering Committee.

Write a Quality Assurance Project Plan (QAPP) (December 2019)
This document will detail the proposed work plan and general approach for the 6-year project. Specific information in the QAPP will include a project management plan, including personnel working on the project and organizational information; a BMP Verification Program Plan detailing how BMP data will be collected and submitted annually to the CBP office; information about proposed methods, literature supporting the chosen methods, and how the source data will be collected; a plan for how we will ensure all activities are completed correctly; and a plan for how we intend to review and interpret the data before it is incorporated into secondary analyses.

Develop FieldDoc functionality to track individual projects towards either the Conowingo WIP or jurisdictions' WIPS (December 2019)
Building on existing infrastructure upgrades to FieldDoc, new functionality will be made available to all projects within the Chesapeake Bay Watershed to allow users to specify whether a project should be tracked as part of the Conowingo WIP or jurisdictions' WIPs. This capability will be a critical first step at accurately tracking Conowingo WIP implementation and progress towards the CWIP and 2-year Milestones.

Create draft audit framework for review by CWIP steering committee members and CBP Staff (December 2019).
Conservancy, CWP, and Commons staff will draft a proposed audit framework that will be used to ensure that projects being tracked towards the Conowingo WIP are being implemented and do not overlap with other BMPs being tracked for jurisdictions' WIPs. This draft will help CBP staff and CWIP steering committee members understand how an automated and semi-automated series of audit steps can increase accountability and lower verification costs. The draft framework will be developed to be compatible with existing CBP verification requirements.

Update FieldDoc's geospatial analysis capabilities to highlight potentially duplicate projects (March 2019)
FieldDoc is already being used to facilitate BMP planning and tracking throughout the Chesapeake Bay watershed and has recently adopted more site-specific tracking of project footprints as part of a separate cooperative agreement. Importantly, FieldDoc has the ability to track specific project locations, as submitted by implementation partners, without making this information publically accessible to protect privacy. To automate the identification of potentially problematic project proposals, new functionality will be integrated that will run a spatial check as a background process on all new projects to ensure that they a) do not match the project parameters of another project and b) are not overlapping with any existing project footprints or within a specified distance of other projects. For projects that do not have a specific project location, a suite of project parameters, such as county and cost or acreage of implementation, will be compared to other projects in the database to flag projects that are potentially being counted multiple times as it is unlikely to two projects will have identical parameters.

Create Final Audit Framework for approval by CWIP steering committee members and CBP Staff (March 2020)
After incorporating feedback from the CWIP steering committee members and CBP staff on the draft framework, project partners will create a final audit framework that will be presented to and adopted by CWIP steering committee members and CBP staff. The Final Audit Framework will determine the specific elements developed in later steps as the framework is implemented.

Deploy Conowingo WIP dashboard in FieldDoc to track progress towards 2-year Milestones developed as part of Activity 1 (June 2020)
As the draft Conowingo WIP is finalized by the project team from Activity 1, the overall CWIP and 2-year Milestone goals will be incorporated into a dedicated Conowingo WIP dashboard in FieldDoc that will allow CBP staff, Conowingo WIP Steering Committee members, and any other relevant partners to see how progress towards the CWIP and CWIP milestones are occurring in real-time. This dashboard will incorporate the final CWIP's CAST scenario as practice-specific "goals" and will track implementation toward each goal in real time as projects are implemented and submitted through the FieldDoc platform. FieldDoc is already building connections to other repositories of data, such as PracticeKeeper and the BMP warehouse in Pennsylvania to associate projects tracked through other platforms into the overall progress towards the CWIP and milestones.

Develop Level 1 Audit capabilities for automated project review (Oct 2020)
To facilitate an increased level of accountability with regard to the implementation of the CWIP and jurisdictions' WIPs, new functionality will be developed that creates a spatial review of photos uploaded by project partners to ensure projects have been implemented as claimed. This protocol will leverage EXIF data, information about where and when a photo was taken that is included in most smartphone pictures, to track time, location and bearing of uploaded photos. This information can then be used for verification as part of an audit process.

Conduct outreach & training for users on the new tracking tools (Oct 2020)
Project partners and CBP will engage stakeholders through their existing network of local, state and regional contacts to explain how to use the tool enhancements and ensure they meet user needs; review the tools and beta test them once available; and refine the tools and processes after a period of deployment. The team will also develop a set of online tutorials to be housed in an online user library to allow users to maximize FieldDoc's capabilities.

Implement Final Audit Protocol (Years 2-6)
Conservancy staff will implement the Final Audit Protocol, once it has been approved and all additional functionality enhancements have been integrated. While the overall methodology will be confirmed as part of the Year 1 work plan, the protocol may include a combination of spot checking 5-10% of projects through a visual inspection of submitted photos, a manual review of project documentation and site characteristics to ensure a project has been completed as claimed for projects that are ambiguous, or a field inspection to ensure that a project has been completed as claimed.

Assess User Feedback and make adjustments to platform capabilities (Years 2-6)
Conservancy and Commons staff will conduct an annual survey, combined with regular feedback provided by users, to determine enhancements that could be incorporated to improve user experience or the overall functionality of the platform. Once enhancements have been identified, they will be proposed to CBP staff for adoption and implemented.

Provide technical support and troubleshooting (Years 2-6)
Dedicated Conservancy and/or Commons staff will be available to end users to provide support on the functioning of the platform and to troubleshoot any issues that may arise. In addition to being an on-call staff resource, staff will also work to update and create new training materials and user guides to aid end users in the nuances of the platform.

Provide annual report to CBPO (December 1 of each year)
The Conservancy will provide to CBPO staff an annual report detailing nutrient and sediment pollutant load reducing practices that have been implemented as a result of the Conowingo WIP and two-year milestones by December 1 of each year, using CBP partnership-approved protocols.

1.7 Quality Objectives and Criteria for Measurement Data (EPA QA/R-5 A7)

The team will work with CBP staff and the Conowingo Watershed Implementation Plan (CWIP) Steering Committee to ensure that the tracking and verification system meets CBP verification and reporting requirements. The detailed requirements will depend on the individual best management practices that are identified in the CWIP, but will also follow CBP standards for verification.

1.7.1 Objectives and Project Decisions

This project seeks to develop a semi-automated tracking and reporting system for CWIP activities. It will incorporate auditing capacity to avoid duplicative reporting and provide accountability for project verification. Ultimately, the system will be integrated with jurisdictional reporting to track progress towards meeting the Chesapeake Bay TMDL.

1.7.2 Action Limits/Levels

This project will be tracking implementation of BMPs towards the CWIP, with the goal of capturing projects that achieve at least 6 million pounds of nitrogen reductions and at least 0.26 million pounds of phosphorous reductions.

1.8 Documents and Records (EPA QA/R-5 A9)

The Conservancy's Program Manager will share the current version of the QAPP with all project staff and partners, including any revisions or updates that occur, via shared file storage and email. The Conservancy will be responsible for organizing semi-annual reports as described in the project timeline above. Each annual report will contain an update of outlined project activities, as well as any lessons learned in the course of project activities.

Data packages for this project will include annual reports with BMP implementation data for practices tracked towards the CWIP. These reports will be made according to the requirements from CBP – including exporting data into standard NEIEN templates. The data will then be passed to jurisdictions for final reporting through their NEIEN nodes.

2.0 PRODUCT GENERATION

2.1 Quality Control Requirements (EPA QA/R-5 B5)

One of the deliverables of this project is the creation and implementation of an auditing protocol for the data collected through FieldDoc to track BMP implementation towards the CWIP. This framework will be verified and approved by CBP and the CWIP Steering Committee.

2.2 Data Acquisition Requirements (Non-Direct Measurement) (EPA QA/R-5 B9)

The project team will be collecting information from a variety of organizations completing practices that will be tracked towards the CWIP. This information will be entered into FieldDoc from practitioners throughout the CWIP Steering Committee approved geography. In implementing the auditing framework, the project team will follow accepted protocols for randomized selection of practices to audit. The data will then be used to report progress towards CWIP goals.

2.3 Data Management (EPA QA/R-5 B10)

In conjunction with CBP and the CWIP Steering Committee, the project team will determine the best protocol for data storage and hosting for BMP data. Initially, the data is being hosted and stored through Commons' FieldDoc database, with a weekly cloud-based back up. The Executive Director of Commons will be responsible for ensuring data backups are functioning properly.

Commented [KW1]: Is weekly necessary? And how long does that information need to be stored? If we are sending data to the jurisdictions for final reporting… are they responsible for long-term storage?

Data will be reported annually through NEIEN for the duration of the CWIP implementation, either direct through a node or passed through the state jurisdictions. These reports will align with state and federal reporting standard, as needed for the final reporting process determined by CBP. The Geospatial Program Manager at CC will be responsible for ensuring that the practices are reported properly on an annual basis.

The project team is developing and implementing an auditing protocol to verify data entry and remove duplicative projects. This framework will be reviewed and approved by CBP and the CWIP Steering Committee before implementation. The Director of Conservation Technology at CC will be responsible for implementing the auditing protocol.

3.0 ASSESSMENT AND OVERSIGHT

3.1 Reports to Management (EPA QA/R-5 C2)

Conservancy staff will complete semi-annual progress reports that will detail project activities for each six-month period, including progress toward completing timeline objectives and a roadmap for the upcoming period. These reports will be drafted by the Conservancy and delivered to the Project Officer, Lucinda Power. Any feedback on progress will be noted and responded to as soon as the workplan allows.

4.0 DATA REVIEW AND USABILITY

4.1 Data Review, Verification, and Validation Requirements (EPA QA/R-5 D1)

Data verification requirements will be gathered to draft the auditing framework, to be approved by CBP and the CWIP Steering Committee.

4.2 Verification and Validation Methods (EPA QA/R-5 D2)

Data verification will be covered in the auditing framework, to be approved by CBP and the CWIP Steering Committee.