Final Recommendations for Strengthening Verification of Best Management Practices Implemented in the Chesapeake Bay Watershed

Prepared by the Chesapeake Bay Program Partnership's
BMP Verification Review Panel
September 21, 2015

Chesapeake Bay Program
A Watershed Partnership

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Chesapeake Bay Program Partnership-

It has been my honor to serve as the chair of the 13 member independent Chesapeake Bay BMP Verification Review Panel to the Partnership for the past three years. Since receiving its charge from the Principals' Staff Committee in September 2012, the Panel has spent hundreds of hours striving to provide review, advice, and recommendations as the Partnership built its truly precedent setting basinwide BMP verification framework.

The charge to the Panel was well defined from the start:
- Provide advice, feedback, and recommendations to the Partnership as it develops its Verification Program;
- Review and provide feedback on the draft set of BMP verification principles;
- Work directly with the appropriate source sector/habitat restoration workgroups, providing advice, feedback, and recommendations during the development of their verification guidance;
- Use the verification principles and sector guidance documents as criteria for assessing the strengths and any possible vulnerabilities in the jurisdictions' draft verification programs; and
- Evaluate whether the level of verification rigor is consistent across source sectors and across all seven watershed jurisdictions.

What none of us recognized was the size and complexity of the challenge before us, working to build up a verification system, from the ground up across seven unique jurisdictions and six diverse source sectors. But we knew without working through this challenge there were clear ramifications for over 75,000 farmers, thousands of acres of managed forestlands, thousands of counties, cities, municipalities, towns, and townships, treatment facilities, construction sites, urban and suburban neighborhoods in terms of a lack of return on their investments of private and public resources on practices that were not functioning as designed and originally implemented.

Over the course of the past three years, the Panel has worked at all levels of the Partnership in ensuring there was an independent perspective provided as the Partnership built the basinwide verification framework. The Panel worked hand in hand with the partners at each stage, from crafting of the five solid BMP verification principles, through the six sector workgroups' development of their outstanding sets of BMP verification guidance, and ending with the in-depth reviews of the seven jurisdictions' draft comprehensive BMP verification program plans. Along the way, the Panel has provided extensive verbal and written input, recommendations, and advice for consideration by the Partnership and its individual partners.

With this final report, the Panel is providing each of the individual members' top five messages and recommendations coming from their collective work. Thank you for the foresight to embed an independent advisory body within the process of development of the basinwide verification framework and building and enhancing the jurisdictions' BMP verification programs. We believe the correct balance between BMP implementation and verification will be achieved when the public can understand and appreciate the investment made by states in an effort to improve their local water quality. The Partnership has constructed a verification framework which will continue to provide the example for others across the country and around the world to follow for decades to come.

Sincerely,

Dana York, Chair
CBP BMP Verification Review Panel

Chesapeake Bay Program Partnership's
BMP Verification Review Panel Members

Name	Affiliation
Dana York, Chair	Green Earth Connection
Curtis Dell	USDA Agriculture Research Service
Mike Gerel	Sustainable Northwest
Tim Gieseke	Ag Resource Strategies
Rebecca Hanmer	Retired Citizens Advisory Committee
Dianna Hogan	U.S. Geological Survey Eastern Geographic Science Center
Richard Klein*	Community and Environmental Defense Services
Andrew Sharpley*	University of Arkansas
Tom Simpson	Water Stewardship, Inc.
Gordon Smith*	Wildlife Works Carbon LLC
Rebecca Stack	District of Columbia Department of Energy and Environment
Robert Traver	Villanova University, Department of Civil and Environmental Engineering
Dan Zimmerman*	Warwick Township

* Panel member was unable to participate in the review of the seven watershed jurisdictions' draft July, 2015 BMP verification program plans due to time commitment conflicts.

History of the Panel's Work with the Partnership

Panel's Face-to-Face Meetings and Conference Calls

October 12, 2012 Meeting via Conference Call
- Call was structured to provide the new Panel members with a background on the Chesapeake Bay Program Partnership and BMP Verification, review of the Panel's charge, operations, and schedule, and provide an introduction to the then draft BMP verification principles.
- Accessible at: http://www.chesapeakebay.net/calendar/event/18810/

December 6, 2012 Face-to-Face Meeting
- Meeting was to brief the Panel members on each of the sector workgroup's draft verification guidance protocols and to allow for discussion among the Panel members and six sector workgroup leads.
- Accessible at: http://www.chesapeakebay.net/calendar/event/18952/

June 19, 2013 Meeting via Conference Call
- Call was to provide Panel members with background on the most used and most effective BMPs within the Chesapeake Bay Watershed according to the jurisdictions Phase II WIPs. The Panel elected Dana York as the Chair.
- Accessible at: http://www.chesapeakebay.net/calendar/event/19542/

July 31, 2013 Meeting via Conference Call
- Call was to discuss challenges associated with transparency of agricultural practice data, the application of the 80th percent threshold for verification using an assessment tool, and the status of Maryland and Virginia's agriculture certainty programs.
- Accessible at: www.chesapeakebay.net/calendar/event/19543/

August 28-29, 2013 Face-to-Face Meeting
- The first day of the meeting was to discuss the addition of transparency as a verification principle, and to review the final draft sector verification guidance protocols. The second day focused on ways to ensure access to federal cost-share data, the partnership process for evaluation and oversight, and the BMP verification documentation expectations.
- Accessible at: www.chesapeakebay.net/calendar/event/20832/

October 31, 2013 Meeting via Conference Call
- Meeting was to work through and resolve any remaining questions or issues that remained following the Panel's August meeting.
- Accessible at: http://www.chesapeakebay.net/calendar/event/21023/

November 1, 2013 Meeting via Conference Call
- Call to finalize BMP Verification Program Design Matrix, general guidance for sector verification guidance protocols, and a proposed checklist for state verification protocol components.
- Accessible at: http://www.chesapeakebay.net/calendar/event/21024/

December 13, 2013 Meeting via Conference Call
- Meeting was to share the Panel's recommendations with the sector and habitat workgroups, and BMP Verification Committee and to provide them with the opportunity to ask questions and provide comments.
- Accessible at: http://www.chesapeakebay.net/calendar/event/21131/

April 1, 2014 Face-to-Face Meeting
- Meeting was to conduct a final review of the sector verification guidance protocols, and to review plans for implementing the BMP Verification Framework.
- Accessible at: http://www.chesapeakebay.net/calendar/event/21521

April 2, 2014 Face-to-Face Meeting
- Meeting was structured for the Panel and the BMP Verification Committee to conduct a systematic review and joint discussion of the 12 draft basinwide BMP verification framework components.
- Accessible at: http://www.chesapeakebay.net/calendar/event/21522

January 28, 2015 Meeting via Conference Call
- Call was to review the Panel's 2015 schedule and reach agreement on the process for reviewing the jurisdictions' draft verification program plans.
- Accessible at: http://www.chesapeakebay.net/calendar/event/22453/

July 30-31, 2015 Face-to-Face Meeting
- Meeting was to discuss Panel members' reviews of the jurisdictions draft verification program plans submitted on June 30 and to develop feedback and recommendations for the jurisdictions.
- Accessible at: http://www.chesapeakebay.net/calendar/event/23024/

July 31, 2015 Meeting via Conference Call
- Conference call with the Partnership's BMP Verification Committee to provide an early communication of the Panel's initial evaluation of the seven jurisdictions' draft BMP verification program plans.
- Accessible at: http://www.chesapeakebay.net/calendar/event/23024/

August 27-28, 2015 Face-to-Face Meeting
- Meeting was designed as a set of 7 one-on-one meetings with each of the jurisdictions to review the Panel's initial feedback and to discuss recommendations for the final verification program plan submissions.
- Accessible at: http://www.chesapeakebay.net/calendar/event/23025/

Panel's Written Reports to the Partnership

Summary of the CBP Partnership's BMP Verification Review Panel Feedback to the Six Sector Workgroups on their Verification Guidance Documents During the December 6, 2012 Panel Meeting
http://www.chesapeakebay.net/channel_files/18952/cbp_bmp_verification_review_panel_12_6_2012_meeting_summary-final.pdf

Summary of the CBP Partnership's BMP Verification Review Panel Feedback to the Six Sector Workgroups on their Verification Guidance Documents During the August 28, 2013 Panel Meeting
http://www.chesapeakebay.net/channel_files/20832/cbp_bmp_verification_review_panel_8_28-29_13_mtg_summary_final.pdf

Summary of the CBP Partnership's BMP Verification Review Panel Feedback on the Draft Basinwide BMP Verification Framework During the August 29, 2013 Panel Meeting
http://www.chesapeakebay.net/channel_files/20832/cbp_bmp_verification_review_panel_8_28-29_13_mtg_summary_final.pdf

Chesapeake Bay Program Partnership BMP Verification Review Panel's Guidance and Recommendations to the Six Source Sector Workgroups, the CBP BMP Verification Committee, and the Seven Watershed Jurisdictions—November 19, 2013
http://www.chesapeakebay.net/channel_files/21511/cbp_bmp_verif_review_panel_recommendations_11_19_2013.pdf

Summary of the CBP Partnership's BMP Verification Review Panel Feedback to the Six Sector Workgroups on their Verification Guidance Documents During the April 1, 2014 Panel Meeting
http://www.chesapeakebay.net/channel_files/21521/summary_cbp_verification_review_panel_april_1-2_meeting_final.pdf

Compilation of Written Comments Received from CBP Partnership BMP Verification Review Panel Members and BMP Verification Committee Members on the February 12, 2014 Draft Basinwide BMP Verification Framework Document—April 2, 2014
http://www.chesapeakebay.net/channel_files/21522/compilation_of_comments_on_feb_2014_draft_framework.pdf

Initial Feedback on Jurisdictions' Draft BMP Verification Program Plans—August 7, 2015
http://www.chesapeakebay.net/channel_files/23024/cbp_bmp_review_panel_evaluation_of_jurisdictions_draft_verification_plans_8_7_2015_.pdf

Final Feedback on Jurisdictions' Draft BMP Verification Program Plans—September 4, 2015
http://www.chesapeakebay.net/channel_files/23025/cbp_bmp_review_panel_final_evaluation_of_jurisdictions_draft_verification_plans-september_4.pdf

**Panel Members' Top Five Messages and Recommendations
to the Chesapeake Bay Program Partnership**

Dana York, Chair

1. State Verification Protocols must have the: <u>Right</u> amount of <u>Rigor</u> to <u>Reliably</u> <u>Report</u> BMP's within the <u>Reality</u> of <u>Resources.</u> (6 R's)

2. Verification not only helps us determine the correct land coverage by BMP's, but also helps us substantiate the efforts made by the implementers.

3. We will never be able to successfully determine outcomes if we can't accurately account for inputs.

4. The correct balance between BMP implementation and verification has been achieved when the public can understand and appreciate the investment made by states in an effort to improve their local water quality.

5. Verification can help us validate where BMP's are working, where they are having the greatest impact and where we need to change our course, thus identifying the most effective use of our resources.

Curtis Dell

1. Continued efforts to educate the public, local governments and community organizations about the importance of verifying and reporting non-cost shared and non-regulated BMPs are needed.

2. Further development and evaluation of methods to assess and verify annual agricultural BMPs and assessment of ongoing pilot projects is needed.

3. Further development of methods to verify landowner reported practices, especially management plans, is needed.

4. Greater harmonization of data exchange among government agencies, both federal and state, will facilitate BMP verification.

5. Sector workgroups, where applicable, need to set allowable confidence levels for planning statistical subsampling programs.

Mike Gerel

1. People clean the Bay, not models. Verification must ultimately be about people actually looking at practices to ensure they are working.

2. Verification data aggregated at the County-level will not meet the verification principles unless a state or third party can authenticate data at the site-level.

3. Statistics will play a role in verification; more work is needed to identify the basic tenets that will ensure useful data.

4. Adequate flexibility and funds must be provided for jurisdictions to innovate and pilot new ideas that work best for their circumstances.

5. The Bay jurisdiction staff I have met over the last 20 years have the commitment and expertise to finish building the world's first large watershed restoration verification program.

Tim Gieseke

1. Value (monetary or otherwise) must be made available at all stakeholders' steps involved in providing BMP Verification data to ensure consistent flow of accurate data.

2. Connections between the "Sustainability Sector Silos" of corporations, utilities, governments and NGOs must be developed to ensure long-term, cost-effective collection and processing of BMP Verification data, as "sustainability" has moved beyond just government objectives.

3. A BMP Verification process must be integral with the daily/seasonal/yearly activities and objectives of the landscape (agriculture/urban) managers.

4. BMP Verification should evolve toward BMS Verification (Best Management Systems) to capture the seasonal and yearly output and outcomes of a field/farm/urban/forest/wetland area.

5. Create a single platform to support the interaction/interfacing of public and private stakeholder groups and individuals to collect/compile landscape data. Relying on the accounting and governance strategies of seven sovereign jurisdictions greatly increases the risk for error, less transparency, causes divergence in process over time and increased costs.

Rebecca Hanmer

1. Improving BMP verification is really important for the credibility and effectiveness of the Chesapeake Bay Program Partnership.

2. Verification is not just a QA/QC data exercise; it should contribute strongly to improving practices.

3. To improve practices, verification needs to be carried out in conjunction with on-the-ground assessment and technical assistance as much as possible, especially in non-regulatory sectors such as agriculture and forestry.

4. Not everything can be improved at once, so jurisdictions should focus on how priority BMPs are working in practice while the Partnership employs a systematic approach to such BMPs.

5. Jurisdictions should use verification links to improve competency and connection with local actors.

Dianna Hogan

1. It is difficult to encourage innovation in the use of BMPs from overworked jurisdictions, but this is key.

2. The whole point of this exercise was to help jurisdictions verify what they have, and how well BMPs are working. It is disappointing when the details of that process sometimes obfuscate this overall (hopefully shared) goal.

3. Outreach, public communication, and education on what BMPs do and why they are important needs to expand.

4. Not to be repetitive, but we got stuck on statistics - perhaps could have been brought in earlier as a clearly stated part of the development of the sector guidance (bring the statisticians in at that point). At this point, communication between statisticians and jurisdictions is a concern and we have jurisdictions developing programs without good guidance.

5. The need to bring in so many opinions and checks on this process creates a large workload and delays – but it's all about credibility and is essential. I wanted to recognize that throughout this process there has been amazing support, information, and communication between CBP and the Panel.

Tom Simpson

1. Assuring transparent and accurate (BMP meets definition) verification was, and remains, critical to achieving true long-term improvements in water quality and establishing public trust.

2. The panel process was a learning, evolving activity for the Panel, CBPO and jurisdictions. It appears a unique effort. Documentation and sharing of the process, successes and challenges with other federal agencies, states, NGOs, etc. focused on water quality or other environmental efforts where implementation uncertainty exists, is very important and extends the benefits from the major work effort by the panel, states and EPA.

3. More work is needed on "random" statistical methods to verify that implementation across the entire population of claimed practices is accurate within scientifically acceptable probabilities. As results are applied to the entire "implemented population", a random/probabilistic approach appears more appropriate than evaluating risk-based subgroups within the population.

4. The process documented the lack of adequate post-implementation verification for most practices in most states and high reliance on agency "in-same office" or owner self-certification.

5. The Panel could not assess verification methods for individual BMPs to determine if they meet CBP definitions and are operated and maintained as defined and differences between state verification protocols and actual local verification (sampling randomness, in-field assessment methods, etc.). EPA or a contracted _independent_ third party (preferred if possible due to EPA workload and clearer lack of conflict) should conduct assessments of individual BMP verification protocols, sampling approach and local sample selection and actual verification method.

Rebecca Stack

1. I hope the jurisdictions take advantage of the structure this exercise provides to develop programs that evaluate BMP functionality, going beyond evidence of installation and persistence.

2. In that same vein, I hope jurisdictions will use this exercise to identify programmatic and funding needs to develop robust functional verification programs.

3. A driving force behind this work is the principal of transparency, I hope jurisdictions produce verification program reports that are not overly dense, obscure, and jargon filled, but are digestible by the average citizen.

4. Statistical sampling is a valid approach to verifying large populations, I hope the jurisdictions have adequate expert support to determine defensible sample sizes and confidence intervals.

5. Each jurisdiction's report should explain the use of statistics in a way the general public can digest.

Robert Traver

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1. The confusion regarding the role and linkage of inspections and statistics need to be resolved.

2. Statistics used to evaluate the program performance are valuable and appropriate, however they need to be linked to an action.

3. To enable our ability to meet the Chesapeake Bay TMDL, the stormwater BMP inspections need to be designed to increase our knowledge of BMP longevity and design, and the abilities to Design, Maintain and Inspect BMP's.

4. Specifically none of the plans include any inspection past volume to enable us to further relate total suspended sediment (TSS), nitrogen, and phosphorus performance to volume removal or BMP design.

5. We need to encourage innovation by allowing and crediting experimental BMP design.