Biennial Strategy Review System: Logic Table and Work Plan

Instructions: The following Logic Table should be used to articulate, document, and examine the reasoning behind your work toward an Outcome. Your reasoning—or logic—should be based on the Partnership's adaptive management decision framework. This table allows you to indicate the status of your management actions and denote which actions have or will play the biggest role in making progress.

Some Management Strategies and Work Plans will not immediately or easily fit into this analytical format. However, **all GITs should complete columns one through four** to bring consistency to and heighten the utility of these guiding documents. The remaining columns are recommended for those who are able to complete them. If you have any questions as you are completing this table, please contact SRS Team Coordinator Laura Free (free.laura@epa.gov).

The instructions below should be used to complete the table. An example table is available on the GIT 6 webpage under "Projects and Resources".

1. For the first round of strategic review (2017-2018): Use your existing Work Plan actions to complete the **Work Plan Actions** section first. Make sure to number each of the actions under a high-level Management Approach, as these numbers will provide a link between the work plan and the logic table above it. Use color to indicate the status of your actions: a green row indicates an action has been completed or is moving forward as planned; a yellow row indicates an action has encountered minor obstacles; and a red row indicates an action has not been taken or has encountered a serious barrier.
2. **Required:** In the column labeled **Factor**, list the significant factors (both positive and negative) that will or could affect your progress toward an Outcome. The most effective method to ensure logic flow is to list all your factors and then complete each row for each factor. Consult our Guide to Influencing Factors (Appendix B of the Quarterly Progress Meeting Guide on the GIT 6 webpage under "Projects and Resources") to ensure your list is reasonably comprehensive and has considered human and natural systems. Include any factors that were not mentioned in your original Management Strategy or Work Plan but should be addressed in any revised course of action. If an unmanageable factor significantly impacts your outcome (e.g., climate change), you might choose to list it here and describe how you are tracking (but not managing) that factor.
3. **Required:** In the column labeled **Current Efforts**, use keywords to describe existing programs or current efforts that other organizations are taking that happen to support your work to manage an influencing factor but would take place even without the influence or coordination of the Chesapeake Bay Program. You may also include current efforts by the Chesapeake Bay Program. Many of these current efforts may already be identified in your Management Strategy; you may choose to link the keywords used in this table to your Management Strategy document for additional context. You may also choose to include some of these efforts as actions in your work plan; if you do, please include the action's number and hyperlink.
4. **Required:** In the column labeled **Gap**, list any existing gap(s) left by those programs that may already be in place to address an influencing factor. These gaps should help determine the actions that should be taken by the Chesapeake Bay Program through the collective efforts of Goal Implementation Teams, Workgroups, and internal support teams like STAR, or the actions that should be taken by individual partners to support our collective work (e.g., a presentation of scientific findings by a federal agency to a Chesapeake Bay Program workgroup). These gaps may already be listed in your Management Strategy.
5. **Required:** In the column labeled **Actions**, list the number that corresponds to the action(s) you are taking to fill identified gaps in managing influencing factors. Include on a separate line those approaches and/or actions that may not be linked to an influencing factor. To help identify the action number, you may also include a few key words. Emphasize critical actions in **bold**.
6. **Optional:** In the column labeled **Metric**, describe any metric(s) or observation(s) that will be used to determine whether your management actions have achieved the intended result.
7. **Optional:** In the column labeled **Expected Response and Application**, briefly describe the expected effects and future application of your management actions. Include the timing and magnitude of any expected changes, whether these changes have occurred, and how these changes will influence your next steps
8. **Optional:** In the column labeled **Learn/Adapt**, describe what you learned from taking an action and how this lesson will impact your work plan or Management Strategy going forward.

2017 and 2025 WIP Outcomes and Water Quality Standards Attainment and Monitoring Outcome Logic Table and Work Plan

Primary Users: Goal Implementation Teams, Workgroups, and Management Board | Secondary Audience: Interested Internal or External Parties
Primary Purpose: To assist partners in thinking through the relationships between their actions and specific factors, existing programs and gaps (either new or identified in their Management Strategies) and to help workgroups and Goal Implementation Teams prepare to present significant findings related to these actions and/or factors, existing programs and gaps to the Management Board. | Secondary Purpose: To enable those who are not familiar with a workgroup to understand and trace the logic driving its actions.
Reminder: As you complete the table below, keep in mind that removing actions, adapting actions, or adding new actions may require you to adjust the high-level Management Approaches outlined in your Management Strategy (to ensure these approaches continue to represent the collection of actions below them).
Long-term Target: (the metric for success of Outcome):
Two-year Target: (increment of metric for success):

KEY: Use the following colors to indicate whether a Metric and Expected Response have been identified.	
Metric	Specific metrics have not been identified
	Metrics have been identified
Expected Response	No timeline for progress for this action has been specified
	Timeline has been specified

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
1. Continuing to enhance and sustain the capacity of local governments and the private sector to	Continued funding and technical assistance support for BMP implementation, tracking,	Connecting water quality practices to other local priorities (co-benefits); continuous and stable funding	Use the WIPs and two-year milestones to describe this capacity, and **needed resources to ensure the**	METRIC EXISTS: Consistent grant administration is one measure of progress: Fed: • CBRAP • CBIG • CREP • MACS	State funding efforts for cover crops is one example: certification each year and expenditure figures attest to program implementation. See example: (http://news.maryland.gov/mda/press-release/2017/04/20/21170/	Successful and popular program, reinforces education; High level of buy in. Costly investment by the State.

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
implement practices	verifying, and reporting through voluntary and regulatory (NPDES permits) measures	stream to support implementation efforts; strengthened coordination between federal, state and local levels	**policy, funding, programmatic, and regulatory infrastructures are in place to sustain BMP implementation over time**.	State: • Trust Fund • BRF • Open Space Reports on dollars spent, results achieved in reductions (N,P,TSS)		
2. Delivering the necessary financial capacity to implement practices and programs	Development of citizens monitoring programs; CBPO Grant Programs (CBIG, CBRAP); WIP Assistance Funding; state programs targeted towards delivering funding and technical assistance to local programs and initiatives; Farm Bill/NRCS funding; exploration of private investment options	Ensuring funding is targeted towards priority practices and watersheds; continued federal, state and local funding coupled with the identification and leveraging of other (e.g., private) funding sources	**Quantification of existing and potential funding gaps**, and the **identification of new revenue sources and financing** to address these gaps; consideration of how costs might be reduced by more **cost-effectively reallocating nutrient and sediment reductions among source sectors**; evaluation of	CURRENT METRIC EXISTS BUT COULD BE REFINED. While funding programs are in place, refinement of the assessment of need and best use can be improved. This is an ongoing factor which will be a focal point in the Phase III WIP, as modeling results are finalized and finer grained goals are developed.	State funding efforts to distribute BRF and Trust Fund dollars currently use priority funding metrics to evaluate projects and implementation. These metrics rank best performance on a pound of reduction per dollar spent. See, e.g., MDE Program webpage: http://mde.maryland.gov/programs/water/WQFA/Pages/index.aspx . See also DNR Program webpage: http://dnr.maryland.gov/ccs/Pages/funding/trust-fund.aspx See also, areas designated by MDP called PFA's which direct state dollars to targeted urban areas. See, e.g., http://data.imap.maryland.gov/datasets/maryland-priority-funding-	We have learned that targeted frameworks for spending millions of dollars are complex and important economic drivers. Ongoing evaluation of results and implementation success is always needed. New initiatives to incent private sector participants are being pursued in MD.

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
			BMP implementation and maintenance costs; and **communication of funding needs to elected officials**		areas?geometry=-80.963%2C38.435%2C-72.036%2C39.925	
3. Improving the identification of sources and their contributions to nitrogen, phosphorus and sediment pollutant loads	Explaining trends project provided initial findings on relation between nutrient sources and trends in the watershed. Information shared with WQ GIT reps, and the findings being used to inform WIP development; High resolution land cover and land use data produced and used to improve Phase 6 model inputs;	Continuation of current efforts and future data collection efforts to coincide with two-year milestones and annual progress runs. Better translate the scientific findings into management implications and work with State and local governments to apply findings toward implementing water-quality practices	**Continue to incorporate additional/more recent local land use data. Refine information on the factors affecting the changes in sources and loads through the Bay watershed, and their delivery and impacts on the estuary. Better predict future impacts of population growth and climate change in the Bay watershed and**	METRIC EXISTS. The Mid Point Assessment is nearly complete. New modeling tools were finalized in 2017 and Phase III WIPs are to be completed in 2019.	More refined local goals; more study and remedies in response to new sources with implementation planning improvements. See e.g., the MDE webpage related to Water Quality Certification of the Conowingo Dam and solutions to sediment infill: http://mde.maryland.gov/programs/Marylander/Pages/conowingo_pilot.aspx	This is an ongoing effort.

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
	Phase 6 model calibration; Maintained monitoring networks and provided trend updates.		**impacts on water quality.**			
4. Quantifying the reductions from pollution control practices and verifying their continued performance	BMP expert panels and implementation of BMP verification programs	Streamlining and simplification of the requirements for BMP verification as described in the 2014 BMP Framework to recognize resource limitations; implementation of BMP verification programs; continued crediting of new, innovative practices	**Further quantifying the effect of variations in watershed properties (such as soils, geology) on nutrient and sediment reduction practices; quantifying changes in Best Management Practices (BMP) performance over time through verification; and evaluating the potential future impacts of climate change on BMP performance**	METRIC EXISTS. Current annual progress is one method to assess implementation relative to achievement of the 2025 goals.	This is an ongoing effort. There will be further review of methods to quantify reduction scenarios as needed once modeling tools are finalized and local goals are developed.	This is an ongoing effort. One lesson has become evident: BMP verification must be robust and applicable across sectors.

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
5. Enhancing the next generation of decision support tools (Phase 6)	Completed - Phase 6 model development occurred over past 5 years, approval by PSC for management application	Continue to build in optimization system to address costs and effectiveness. Explore approaches to build in co-benefits of water quality practices with other CBP outcomes into decision support tools. Refine Phase 6 Model as agreed to address simulation of phosphorus in soil	Completed – Phase 6 suite of modeling tools released and approved by the CBP partnership for management application in the Phase III WIPs and two-year milestones. Modeling tools will be updated with new information every two years, to coincide with two-year milestone development. Develop approaches to better quantify co-benefits with other outcomes into decision-support tools	METRIC EXISTS. The Mid Point Assessment is nearly complete. New modeling tools were finalized in 2017 and Phase III WIPs are to be completed in 2019.	Better understanding and application of modeling framework has become possible. The models represent better and more land use categories, take advantage of refined land use capture methods and incorporate local data in some jurisdictions, all of which improves the accuracy and resolution of the products which in turn helps to better guide Chesapeake Bay restoration decisions.	State agencies, NGOs and local government and citizen advisory committees will continue to participate in Chesapeake Bay Partnership meetings, decisions and to contribute to the assessment of progress toward 2025.
6. Revisiting watershed	Completed – Modeling	Project completed –	Completed – Phase 6 suite of	See response to # 5 above.		

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
model calibration methods with the goal of improving local watershed results	Workgroup, WQGIT, and source sector workgroups spent last 5+ years preparing Phase 6 modeling tools for final calibration.	Phase 6 suite of modeling tools underwent final calibration and are now ready for management application in the Phase III WIPs and two-year milestones	modeling tools released and approved by the CBP partnership for management application in the Phase III WIPs and two-year milestones. Modeling tools will be updated with new information every two years, to coincide with two-year milestone development.			
7. Reviewing and updating historical implementation data that has been submitted by the jurisdictions to the CBP partnership, confirming that BMPs are still in	Completed – jurisdictions have spent the last couple years updating their BMP historical data, as well as developing their BMP verification programs	The Basinwide BMP Verification Framework needs to be streamlined and simplified to allow for realistic verification programs based on available	BMP verification program protocols simplified. BMP verification program implementation and annual progress submissions	METRIC EXISTS. Annual progress reviews will continue.	Verification protocols were developed. See response to # 4 above	This is an ongoing effort.

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
place and ensuring that accurate information is included in the modeling tools		resources. BMP verification program implementation and annual progress submissions				
8. Understanding the factors affecting the ecosystem response to pollutant load reductions to focus management efforts and strategies	Better understanding of "lag times", which has been built into the Phase 6 suite of modeling tools for planning purposes. Explaining trends project (through STAR) provided initial findings for both the watershed and estuary. Held a STAC workshop, with WQ GIT reps, on ways to integrate the findings and inform WIP development. Explaining trends project	The relationships between water quality improvements and the recovery of habitat conditions for fish and shellfish populations and how increases in plant and animal biomass in response to improved water quality improves the assimilative capacity of the system for nutrients and sediment. Assess the time	Refine studies and tools to improve the understanding of **relation between BMP implementation and watershed and estuary response**. Provide enhanced focus how **population changes and economic influences impact restoration activities** and an **improved understanding of uncertainty** associated with model projections.	SEVERAL METRICS WILL BE NEEDED HERE. This is an ongoing effort.	Many options are available and could include: • Technical, scientific studies of the uncertainties, such as time lag in restoration or targeting more effective practices and implementation locations • Financial studies and gap analyses to determine innovative funding initiatives and needs • Population projections and trends coupled with economic estimates related to restoration and growth capacity analysis Development of co-benefits analysis and promotion of multi-faceted interventions that produce economic activity in addition to resulting in higher eco system service benefits	This is an ongoing effort. Jurisdictions engage with Chesapeake Bay partners that range from NGOs to academic institutions to develop economic solutions that improve environmental outcomes.

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
	also providing a better understanding of other factors in addition to nitrogen, phosphorus and sediment pollutant load reduction that affect response of DO, clarity, SAV and chlorophyll; the effects of climate change due to increased temperatures and sea level rise in the estuary	it will take for different tidal segments to achieve water-quality standards to better understand responses restoration efforts	Establish stronger use of results to inform implementation of WIPs through 2025.			
9. Factoring in effects from continued climate change	CBP partnership developed the tools to quantify the effects of changes in watershed flows, storm intensity and changes in hypoxia due to	Better understanding of climate resilient BMPs and the quantification of nutrient and sediment loads due to 2025 climate change impacts.	**Document current state and local programs, policies, and strategies to address climate change impacts in the Phase III WIPs; continue**			

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
	increased temperatures and sea level rise in the estuary. Current efforts are to frame an initial future climate change scenario based on estimated 2025 conditions		**to understand the science and research behind climate-resilient BMPs to better address climate change conditions, such as storm intensity; and continue to refine the estimate of pollutant load changes due to 2025 conditions so that jurisdictions will be able to meet the expectation to account for these additional nutrient and sediment pollutant loads**			

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
			beginning in 2022.			
10. Assessing the implementation potential of filter feeders for nutrient and sediment reductions	The oyster model has been revised as necessary to incorporate aquaculture operations and additional oyster biomass brought about by restoration activities including sanctuaries. First part of oyster BMP panel completed and approved by the CBP partnership.	Complete second part of oyster BMP panel in the 2018 timeframe and update modeling tools as a result of this information.	Oyster model revisions completed and **oyster BMP panel work underway** – anticipated completion is 2018.	METRIC EXISTS. The Oyster Recovery Partnership's 2017 presentation on metrics and ways to measure progress of oysters as a BMP can be found here: https://www.chesapeakebay.net/channel_files/24983/oyster_bmp_panel_wqgit_update_5-8-17_final_(2).pdf	Oyster Recovery Partnership Further information is posted on ORP's website: https://oysterrecovery.org/water-quality-improvement/	the ORP'S Oyster Recovery Partnership 2016 – 2021 Strategic Plan is available here: https://oysterrecovery.org/wp-content/uploads/2017/02/2016-2021-ORP-strategic-plan-web1-4.pdf
11. Examining the impact the lower Susquehanna dams have on the pollutant loads to the Bay, including	Numerous studies have been completed to understand the trapping capacity behind dams, especially the	Development of a Conowingo WIP and Planning Targets, as well as a financing strategy to fund implementation of the	Development and implementation of a Conowingo WIP, two year milestones, and financing strategy to achieve the	Phase 6.0 Modeling and planning metrics are being developed and will be elaborated upon through the Conowingo WIP	This effort is ongoing by state and federal agencies in cooperation with several private and NGO partners. Partners have developed a draft Framework for the Conowingo Watershed Implementation Plan.	

Factor	Current Efforts	Gap	Actions **(critical in bold)**	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential to achieve our outcome?*	*Optional: Do we have a measure of progress? How do we know if we have achieved the intended result?*	*Optional: What effects do we expect to see as a result of this action, when, and what is the anticipated application of these changes?*	*Optional: What did we learn from taking this action? How will this lesson impact our work?*
changes over time	Conowingo, as well as greater representation of local impoundments and reservoirs throughout the Phase 6 Watershed Model.	Conowingo WIP and its associated two-year milestones over time. Also, development of a timeline for implementing the Conowingo WIP and achieving the Conowingo Planning Targets.	nutrient and sediment load reduction targets because of Conowingo dam reaching its trapping capacity.			
12. Conducting a detailed multi-year assessment of chlorophyll in the tidal James River using augmented monitoring and modeling approaches	CBP partnership is working closely with the principal investigators of the James River chlorophyll-a criteria assessment to determine the criteria necessary to meet water quality standards in the James River.	Modeling and criteria and assessment alternatives analysis have delayed final rule making that will establish new Chlorophyll-a criteria for the James until late in 2018.	Planning targets developed for the James River for dissolved oxygen only. Any additional actions needed to meet new chlorophyll-criteria will be developed separate from the Phase 3 WIP planning process.			