Appendix F: Technical Requirements to Enter Phase 6 Urban Tree Planting and Urban Forest Planting BMPs into Scenario Builder

Presented to the WTWG for Review and Approval:

Background: In accordance with the *Protocol for the Development, Review, and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model* (WQGIT, 2015) each BMP expert panel must work with CBPO staff and the Watershed Technical Workgroup (WTWG) to develop a technical appendix for each expert panel report. The purpose of this technical appendix is to describe how the Urban Tree Canopy Expert Panel's recommendations will be integrated into the Chesapeake Bay Program's modeling tools including NEIEN, Scenario Builder and the Watershed Model.

Part 1. Technical Requirements for Reporting and Crediting Phase 6 Urban Tree Planting BMP

Q1. How is the Urban Tree Planting BMP defined in the Phase 6 Chesapeake Bay Watershed Model?

A1. The Urban Tree Planting BMP is defined as the planting of trees in an urban area that are not otherwise part of a riparian forest buffer or a structural BMP (e.g. bioretention, tree bioretention/planter), without the intent of re-establishing forest ecosystem processes. The expert panel has established nutrient and sediment reduction credits based upon a default broadleaf tree for the Bay-wide climate, where 300 newly planted trees are equivalent to 1 acre of tree canopy land use. The conversion factor is based on the panel's recommendation of 144 sq ft average of canopy per tree planted. This BMP does not require trees to be planted in a contiguous area or meet planting density requirements.

Q2. What are the nutrient and sediment reductions a jurisdiction can claim for Urban Tree Planting in the Watershed Model?

A2. The expert panel recommended that the Phase 6 Model treat urban tree plantings as a land use change to either "tree canopy over impervious" or "tree canopy over pervious". The nutrient and sediment reduction credit for a land use change BMP equals the relative, or percent change in nitrogen, phosphorus and sediment load achieved by converting the underlying pervious or impervious land use to the appropriate tree canopy land use. No additional upland reduction will be applied.

Q3. What should jurisdictions submit to NEIEN to receive credit for urban tree planting in the Phase 6 Model?

A3. For urban tree plantings, jurisdictions should report the following information to NEIEN:

- *BMP Name:* Urban Tree Planting

- *Measurement Name:* Number of Trees Planted
- *Geographic Unit:* Qualifying NEIEN geographies including: Latitude/Longitude; *or* County; *or* Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); *or* State
- *Date of Implementation:* Year the trees were planted
- *Land Uses:* Turfgrass, Roads, Buildings and Other

Q4. Is Urban Tree Planting an annual or cumulative BMP?

A4. The credit of this BMP is cumulative, which means that the acres reported in a previous year carry over into the next year.

Q5. Is Urban Tree Planting a stackable BMP?

A5. This BMP may be considered a 'stackable' BMP, where additional BMPs may be applied to the underlying land use. For example, urban nutrient management may be applied to the pervious area under the tree canopy. As a land use change BMP, the converted acres will be eligible to receive other urban BMPs reported to through NEIEN.

Q6. What is the credit duration for the Urban Tree Planting BMP in the Model?

A6. The suggested BMP credit duration is 10 years. Once new high resolution imagery is available, the trees will be captured through the tree canopy land uses rather than annual BMP submissions. The area of the reported canopy projects within the period of credit duration will continue to be tracked through the BMP history since these projects represent management actions. Once new high resolution imagery is available, changes in the aerial extent of tree canopy will be captured through these data.

Q7. How does the Urban Tree Planting BMP avoid the double counting of reductions caused by overlap with the tree canopy land uses?

A7. To avoid double counting with the existing tree canopy land use,-new acres through canopy expansion projects will be tracked and reported as BMPs since they represent on-the-ground management actions. It's assumed that the expansion of canopy through these projects are part of the net change in canopy tracked through different points in time of the high resolution imagery. The environmental models simulate this net change. If there's an overall reduction in canopy between the two points in time, the nutrient and sediment loads will increase because of the changing conditions. If there's a net increase in canopy, nutrient loads will decrease. Again, reported canopy project are part of the overall net change. If there's a net decrease in existing canopy over time through deforestation due to development, the urban tree planting project can be thought of as lessening the degree of the decrease.

Q8. How do the panel's recommendations for Urban Tree Planting affect ongoing historical BMP data cleanup efforts of the jurisdictions?

A8. Jurisdictions should report tree canopy expansion projects with the associated planting date going back to 1985 – for which they have data. Jurisdictions should not report overall net changes in canopy since these are captured through changes in imagery data with prescribed methods. Jurisdictions should consult the BMP definitions to determine which historical BMP acres align with the Phase 6 definitions for Urban Tree Planting or Urban Forest Planting.

Part 2. Technical Requirements for Reporting and Crediting Phase 6 Urban Forest Planting BMP

Q9. How is the Urban Forest Planting BMP defined in the Chesapeake Bay Watershed Model?

A9. The Urban Forest Planting BMP is defined as tree planting projects in urban or suburban areas of at least ¼ acre in size and minimum width of 50 ft and having little to no disturbance of the understory except to aid tree establishment, manage for conditions that improve forest health, and natural causes that may impact understory conditions. Planting density should follow State, District or Federal recommendations.

Q10. What are the nutrient and sediment reductions a jurisdiction can claim for Urban Forest Planting in the Watershed Model?

A10. The Partnership recommended that the Phase 6 Model treat urban forest plantings as a land use change to "mixed open". The nutrient and sediment reduction credit for a land use change BMP equals the relative, or percent change in nitrogen, phosphorus and sediment load achieved by converting the underlying pervious or impervious land use to the forest land use. No additional upland reduction will be applied.

Q11. What should jurisdictions submit to NEIEN to receive credit for urban forest planting in the Phase 6 Model?

A11. For urban forest plantings, jurisdictions should report the following information to NEIEN:

- *BMP Name:* Urban Forest Planting
- *Measurement Name:* Acres Planted
- *Geographic Unit:* Qualifying NEIEN geographies including: Latitude/Longitude; *or* County; *or* Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); *or* State
- *Date of Implementation:* Year the trees were planted
- *Land Uses:* Turfgrass, Roads, Buildings and Other

Q12. Is Urban Forest Planting an annual or cumulative BMP?

A12. The credit of this BMP is cumulative, which means that the acres reported in a previous year carry over into the next year.

Q13. Is Urban Forest Planting a stackable BMP?

A13. No. Since this BMP is a conversion to the Forest land use, additional urban BMPs are not applicable.

Q14. What is the credit duration for the Urban Forest Planting BMP in the Model?

A14. The suggested BMP credit duration is 15 years. Once new high resolution imagery is available, the trees will be captured through the forest land use rather than annual BMP submissions.

Q15. How does the Urban Forest Planting BMP avoid the double counting of reductions caused by overlap with the forest land use?

A15. To avoid double counting with the existing tree canopy land use, new acres through forest planting projects will be tracked and reported as BMPs since they represent on-the-ground management actions. It's assumed that the expansion of forest through these projects are part of the net change in forest tracked through different points in time of the high resolution imagery. The environmental models simulate this net change. If there's an overall reduction in forest between the two points in time, the nutrient and sediment loads will increase because of the changing conditions. If there's a net increase in forest, nutrient loads will decrease. Again, reported forestry projects are part of the overall net change. If there's a net decrease in forest over time due to deforestation or fragmentation from development, the urban forest planting project can be thought of as lessening the degree of the decrease.

Q16: How does the recommended Phase 6 Urban Forest Planting BMP affect ongoing historical BMP data cleanup efforts of the jurisdictions?

A16. Jurisdictions should report forest planting projects with the associated planting date going back to 1985 – for which they have data. Jurisdictions should not report overall net changes in forest since these are captured through changes in imagery data with prescribed methods. Jurisdictions should consult the BMP definitions to determine which historical BMP acres align with the Phase 6 definitions for Urban Tree Planting or Urban Forest Planting.