

Appendix B Conformity of report with BMP Protocol

The BMP review protocol established by the Water Quality Goal Implementation Team (WQGIT, 2015) outlines the expectations for the content of expert panel reports. This appendix references the sections within the report where panel addressed the requested protocol criteria.

- 1. Identity and expertise of panel members:** See Section 1
- 2. Practice name or title:** See Appendix A
- 3. Detailed definition of the practice:** See Sections 4-10 for more specific definitions for each type of technology. See Appendix A for definitions of BMPs that are recommended for nitrogen removal in the modeling tools.
- 4. Recommended N, P and TSS loading or effectiveness estimates:** TSS reductions are not applicable to this BMP since no sediment load is associated with manure in the modeling tools. See sections 4-10 for more detailed discussions of the Nitrogen and Phosphorus Separation Efficiencies (NSE and PSE), and Nitrogen Volatilization Efficiencies (NVE) for each technology. See the Executive Summary and Appendix A for a summary of the recommended nitrogen reductions for each practice.
- 5. Justification of selected effectiveness estimates:** See the corresponding “Review of Available Science” for each type of manure treatment technology.
- 6. Description of how best professional judgment was used, if applicable, to determine effectiveness estimates:** Published literature was used to determine effectiveness estimates for each technology and is outlined in the Review of Available Science part of each technology section. Each panel member relied on their experience as an engineer or animal scientist in interpreting the results published in the literature.
- 7. Land uses to which BMP is applied:** See Appendix A.
- 8. Load sources that the BMP will address and potential interactions with other practices:** See Sections 2-3 and Appendix A.
- 9. Description of pre-practice and post-practice circumstances, including the baseline conditions for individual practices:** See Sections 2-9.
- 10. Conditions under which the practice performs as intended/designed:** Sections 4-9 each provide a discussion of relevant process factors that play a role in the performance of the respective technology.

- 11. Temporal performance of BMP including lag times between establishment and full functioning:** *Treatment systems perform immediately following installation. Some lag-times may exist, but are negligible on both an annual or long term basis.*
- 12. Unit of measure:** *See Appendix A*
- 13. Locations in CB watershed where the practice applies:** *Applicable to animal operations throughout the watershed.*
- 14. Useful life; practice performance over time:** *Engineered lifespans will vary by specific technology and many other factors. For purposes of the CBP, this is an annual practice so a credit duration is not applicable.*
- 15. Cumulative or annual practice:** *Annual.*
- 16. Recommended description of how practice could be tracked, reported, and verified:** *Appendix A describes how a jurisdiction should report the practice to the CBP through NEIEN. Section 12 discusses BMP verification, stating that the jurisdictions should follow the AgWG's existing BMP Verification Guidance for this new suite of BMPs for the Phase 6 modeling tools.*
- 17. Guidance on BMP verification:** *Jurisdictions will follow BMP verification guidance and principles already established in the CBP partnership's adopted BMP verification framework. As explained in section 12 of the report, they should follow the AgWG's guidance.*
- 18. Description of how the practice may be used to relocate pollutants to a different location:** *As described throughout the report, manure treatment technologies with a NVE (i.e., thermochemical and composting) transfer N from treated manure to the atmosphere. Other relocations of nutrients are likely to occur as a result of transportation. See section 3 for a general discussion, and also Sections 4-10 and Appendix A.*
- 19. Suggestion for review timeline; when will additional information be available that may warrant a re-evaluation of the practice effectiveness estimates:** *Review timeline will depend on the pace and extent of implementation and research. As noted in the report, many technologies are still at bench- or pilot-scale.*
- 20. Outstanding issues that need to be resolved in the future and a list of ongoing studies, if any:** *See Section 11.*
- 21. Documentation of dissenting opinion(s) if consensus cannot be reached:** *Not applicable. All panel recommendations were reached by consensus.*

22. Operation and Maintenance requirements and how neglect alters the practice effectiveness estimates: *The panel's discussion of each technology's process factors offers insights into how the operation and maintenance of a manure treatment system can affect its performance. See sections 4-9.*

23. A brief summary of BMP implementation and maintenance costs estimates, when this data is available through existing literature: *This varies significantly based on the type of treatment technology, and the specific system or operation. The panel was unable to gather or provide this information at this time.*

24. Technical appendix for Scenario Builder: *See Appendix A*