Appendix A: Technical Requirements for Reporting and Simulating Animal Waste Management Systems in the Phase 6 Watershed Model

Background: In June, 2013 the Water Quality Goal Implementation Team (WQGIT) agreed that each BMP expert panel would work with CBPO staff and the Watershed Technical Workgroup (WTWG) to develop a technical appendix for each expert report. The purpose of the technical appendix is to describe how the expert panel's recommendations will be integrated into the modeling tools including NEIEN, Scenario Builder and the Watershed Model.

Q1. What are the various Animal Waste Management Systems available for credit in the Phase 6 Model?

A1. An Animal Waste Management System is any structure designed for collection, transfer, and storage of wastes generated from the confined portion of animal operations and complies with NRCS 313 (Waste Storage Facility) or NRCS 359 (Waste Treatment Lagoon) practice standards. Reduced storage and handling loss is conserved in the manure and available for land application or export from the farm.

These can include structures designed to treat waste from any of the animal types simulated in the Chesapeake Bay Model. Those animal types are: beef cows; dairy cows; other cattle; hogs for slaughter; hogs for breeding; broilers; layers; turkeys; pullets; sheep; horses; goats

Q2. What are the benefits that will be credited to each Animal Waste Management System?

A2. The Phase 6 Model will provide estimates of the amount of manure deposited within barnyard areas for all animal types. A percentage of this manure is assumed to be "recoverable" and made available for land application or export from the farm. All "unrecoverable" nutrients are assumed to be available as runoff from the barnyard areas. Animal waste management is a general system that includes many practices on animal operations that together reduce the potential loss of manure to the environment and improve recoverability of manure for subsequent use or transport. Animal operations have always had animal waste management systems in that general sense, but over time the practices have improved expected recoverability. The "AWMS" BMP is defined specifically as described above for annual BMP reporting purposes through NEIEN and simulates improved recoverability based on the presence of a properly constructed storage structure. The values for recoverability before and after the implementation of an AWMS BMP are included in the table below.

Table 1. Recoverability before and after AWMS by Animal Type

Animal	% Recoverable Without AWMS	% Recoverable with AWMS
Beef	60	99
Dairy	75	95
Other Cattle	60	99
Hogs for Slaughter	90	99
Hogs for Breeding	90	99
Broilers	90	99
Layers	90	99
Turkeys	90	99
Pullets	90	99
Sheep	95	98
Horses	95	98
Goats	95	98

Q3. Are the Animal Waste Management Systems considered annual or cumulative practices?

A3. These are cumulative practices. States should report the total amount of newly implemented practices each year. They should also continue to report inspection and maintenance dates for the practices to ensure continued credit past the recommended credit duration of 15 years.

Q4. What information should a state report to receive credit for each Animal Waste Management System?

A4. States should report the following information to NEIEN.

- *BMP Name:* Choose from available BMP names in the NEIEN Phase 6 Appendix
- *Measurement Name:* Choose from: Systems; (Animal)_AU; or Animals
    - Note, it is strongly recommended that states report the number of animals treated rather than a number of systems to ensure proper credit in the tools.
- *Land Use:* N/A
- *Geographic Location:* Approved NEIEN geographies: County; County (CBW Only); Hydrologic Unit Code (HUC12, HUC10, HUC8, HUC6, HUC4); State (CBW Only)
- *Date of Implementation:* Year system was constructed.

Q5. How many animals does each system treat?

A5. The panel did explore population and operation size information when determining the "model farm" for each animal type in its report, but did not recommend new default numbers for animals or animal units treated by each reported AWMS BMP. The Agricultural Modeling Subcommittee did find the following average animals per farm in the 2012 Ag Census, and recommends using these values to translate systems into animals treated.

Average Number of Animals per Farm Across Chesapeake Bay Watershed States in 2012 Ag Census

Animal	Average Farm Size

Beef	22
Dairy	84
Other Cattle	43
Hogs for Slaughter	74*
Hogs for Breeding	428*
Broilers	198096*
Layers	1720
Turkeys	3744*
Pullets	9733.5*
Sheep	33
Horses	7
Goats	13

*Adjusted Ag Census inventory values upward using NRCS cycles of animals/year