APPENDIX A

Recommendations for Livestock and Poultry Mortality Management
Prepared for the Chesapeake Bay Program Partnership's Agriculture Workgroup by the
Animal Mortality Management Expert Panel Establishment Group
Approved by Agriculture Workgroup, March 15th, 2018

Background

In the recently approved Chesapeake Bay Program (CBP) Phase 6.0 Watershed Model, animal mortality and associated mortality management practices are not fully represented for crediting purposes. The only existing partnership-approved Best Management Practice (BMP) associated with mortality management is termed "mortality composting" and is defined as: "A physical structure and process for disposing of any type of dead animals. Composted material is land applied using nutrient management plan recommendations. Enter units of the percent of dead animals composted, animal count, animal units, or number of systems." Efficiency values for nitrogen (N) and phosphorus (P) are not currently represented in the model for the mortality composting BMP.

The Agriculture Workgroup (AgWG) has requested a review of mortality management practices currently in use in the Chesapeake Bay watershed for the Phase 6.0 Model. This is in response to increased implementation of mortality composting systems and other alternative management processes for routine mortality management on agricultural operations. The review is also intended to address the current deficiency of available information in the Phase 6.0 Model that would allow for planning or crediting animal mortality management practices towards Total Maximum Daily Load (TMDL) goals.

The Animal Mortality Management Expert Panel Establishment Group (EPEG) was formed to:

- Determine the necessity for a Phase 6.0 Animal Mortality Management Expert Panel (EP).
- Identify priority tasks for the Phase 6.0 Animal Mortality Management EP,
- Recommend areas of expertise that should be included on the Animal Mortality Management EP, and
- Draft the Animal Mortality Management EP's charge for the review process.

From November 8, 2017 through January 19th, 2018 the EPEG met two times by conference call and worked collaboratively to complete this charge for presentation to the AgWG on February 15th, 2018. Final approval of the charge was obtained by online polling of all EPEG members (Table 1).

Table 1. Animal Mortality Management Expert Panel Establishment Group membership and affiliations.

Member	Affiliation
Frank Schneider	PA State Conservation Commission
Chris Brosch	Delaware Department of Agriculture
Shelly Dehoff	PA Agricultural Ombudsman Program
Gary Felton	University of Maryland
George Malone	Malone Poultry Consulting
John Moyle	University of Maryland Extension
EPEG Support Staff	
Loretta Collins	University of Maryland
Mark Dubin	University of Maryland
Lindsey Gordon	Chesapeake Research Consortium
Jeremy Hanson	Virginia Tech

Glossary of Terms

Farmstead: Area on commodity and livestock operations that includes service buildings (e.g., headquarters), feed and commodity storage, and other pervious and impervious areas not already addressed by BMPs designed for production areas. This does not include barnyards, loafing lots, or other production areas which are represented separately. Farmstead areas are not directly represented in the Phase 6.0 modeling support tools by a discrete agricultural land use.

Feeding Space: Livestock and poultry production and feeding areas associated with livestock operations which includes barnyards, loafing lots, and other pervious and impervious production areas. Feeding space areas are directly represented in the Phase 6 modeling support tools by a discrete agricultural land use for the application and crediting of BMPs designed for production areas (e.g., animal waste management systems).

Animal Mortality Management: This represents the management of routine agricultural animal mortality which protects ground and surface water from contamination by carcasses or runoff/leaching from areas containing carcasses. These practices can also prevent the spread of pathogens off the site as well as protect the biosecurity of the farm by preventing off-farm pathogens from being introduced during pickup or handling of carcasses by contractors or service providers. Mortality management can be accomplished by several methods, including composting, incineration or gasification, offsite disposal in permitted landfills, or on-farm freezing and removal for recycling or rendering to alternative uses.
Mortality Burial: Disposal method in which whole carcasses are buried underground and decompose via natural processes over a period of time, dependent on site conditions. Burial site factors such as distance from waterways and depth to groundwater are important considerations and are regulated in most states. Poor site selection can pose risks to water quality. Management by burial treats the whole carcass as a waste product, rather than a by-product with marketable value. Mortality burial is not recommended as a BMP for evaluation by the EP, but it may be considered a baseline from which to measure alternative mortality management practices.

Mortality Composting: Composting is a controlled, biological heating process that results in the natural degradation of organic resources (such as animal carcasses) by microorganisms. Microbial activity within a well-managed compost pile can generate and maintain temperatures sufficient to inactivate most pathogens. *Mortality composters* refer to specifically designed physical structures for composting

routine mortality on the farmstead. Mortality composting can be applied to various species. The fate of the composted product is often land application under the guidance of a nutrient management plan. There is potential for the compost to be removed from the farmstead for use elsewhere as a value-added product.

Mortality Freezers: Routine mortality is temporarily stored in large on-farm freezer units for collection by a contractor or service-provider. Primarily used for smaller animal types like poultry, a bio-secure vehicle arrives between flocks to take the material off-site, presumably to a rendering facility.

Mortality Incineration or Gasification: The carcass is completely consumed by fire and heat within a self-contained incinerator utilizing air quality and emissions controls. Gasification is a high temperature method of vaporizing the biomass with no direct flame, with oxidation of the fumes in an after-burning chamber. Incinerators and gasifiers are subject to applicable state air quality/emissions requirements. The remaining solid by-product of incineration is ash, which should be spread in accordance with a nutrient management plan or disposed of by other means acceptable to water quality protection goals. Gasification by-products include syngas and char or ash, depending on the feedstock and design of the system.

Mortality Landfill: Off-site disposal of carcasses at a licensed and permitted landfill that accepts animal mortalities and is designed to be protective of surface and groundwater sources. Unlike mortality burial, appropriate landfilling removes nutrients associated with the carcass from the agricultural nutrient stream. Similar to burial, however, no valuable by-product is produced.

Rendering: Typically refers to the process of breaking down animal by-products (e.g., fat, bone, and hides) from animal processors and slaughter facilities. For the purposes of the EP, rendering would refer to the processing of animal mortalities via pick-up and removal of the remains from the farmstead by the rendering facility or an intermediary. The rendering industry as a whole reduces the burden on regional landfills that would otherwise serve as disposal sites for these products.

Animal Groups: The EPEG recommends to the AgWG that the forthcoming EP organize consideration of animal mortality practices and subsequent water quality benefits into two general groupings:
   o   Primary Animal Group (PAG): Swine and poultry.
   o   Secondary Animal Group (SAG): All other animal groups. It is left to the discretion of the EP to assess the BMP efficiencies and verification for these animal groups and/or group components.

Method
The Animal Mortality Management EPEG developed its recommendations in accordance with the process specified by the AgWG in 2014[1]. This process is informed by the strawman proposal presented at the December 11, 2014 AgWG meeting, the Water Quality Goal Implementation Team (WQGIT) Best

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[1]

http://www.chesapeakebay.net/channel_files/22323/january_8_2015_agwg_expert_panel_process.pdf

Management Practice (BMP) protocol, input from existing panelists and chairs, and the process recently undertaken by the AgWG to develop the charge for the Manure Treatment Technologies EP.

The collective knowledge and expertise of EPEG members formed the basis for the recommendations contained herein. Several of the EPEG members have had experience on BMP expert panels or subcommittees. EPEG members and the technical support team also have knowledge and/or expertise in state and federal programs, the Chesapeake Bay model, and livestock and poultry mortality management practices within the Chesapeake Bay watershed.

Communication among EPEG members was by conference call and email. All decisions were consensus-based.

Recommendations for Expert Panel Member Expertise
The Animal Mortality Management EPEG recommends that the AgWG establish an Expert Panel to evaluate routine animal mortality and associated mortality management practices currently being implemented in the Chesapeake Bay watershed by livestock and poultry operations, and develop a recommendation report of its findings following standard CBP partnership protocols.

The AgWG expert panel organization process directs that each expert panel is to include eight members, including one non-voting representative each from the Watershed Technical Workgroup (WTWG) and Chesapeake Bay Program modeling team. Panels are also expected to include three recognized topic experts and three individuals with expertise in environmental and water quality-related issues. A representative of USDA who is familiar with the USDA-Natural Resources Conservation Service (NRCS) conservation practice standards should be included as one of the six individuals who have topic- or other expertise.
In accordance with the WQGIT BMP protocol, panel members should not represent entities with potential conflicts of interest, such as entities that could receive a financial benefit from Panel recommendations or where there is a conflict between the private interests and the official responsibilities of those entities. All Panelists are required to identify any potential financial or other conflicts of interest prior to serving on the Panel. These conditions will minimize the risk that Expert Panels are biased toward particular interests or regions.

The Animal Mortality Management EPEG recommends that the Phase 6.0 Animal Mortality Management EP should include members with the following areas of expertise:
- Expertise in design/engineering/implementation of mortality management systems.
- Experience with carrying out scientific research projects relating to mortality management.
- Expertise in fate and transport of N and P from farmsteads.
- Knowledge of effectiveness of livestock and poultry mortality management practices implemented in the Bay jurisdiction(s).
- Knowledge of how BMPs are tracked and reported, and the Chesapeake Bay Program partnership's modeling tools.
- Experience with verification of livestock and poultry mortality management practices used at farmsteads.
- Knowledge of and experience with relevant USDA-NRCS conservation practice standards and codes.

Expert Panel Scope of Work

The general scope of work for the Animal Mortality Management EP will be to define and configure the Animal Mortality Management BMPs in the Phase 6 model. Specifically, the Animal Mortality Management EPEG recommends the following charge with associated tasks for the Phase 6.0 Livestock and Poultry Mortality Management EP:

1. Determine scope of the EP based on available data and impact on water quality
   - Animal groups and/or group components to be addressed
     - Definitions available on CBP's Chesapeake Assessment Scenario Tool (CAST)[2]
   - Mortality management practices to be addressed (Table 2)
2. Define load reduction efficiencies for N and P of selected practices for agricultural feeding space areas.
   - Consider fate of N and P across selected practices
     - Decomposition and mineralization
     - Leachate
     - Volatilization
     - Field application
     - Removal from agricultural system
3. Determine how the selected mortality management practices can be represented in the model.
   - Consider the information necessary to address Options 1 and 2 (Figure 1)
     - Option 1: applicable to 2020-2021 milestone planning
     - Option 2: applicable to post-Phase 6.0 Watershed Model

Figure 1. Potential Crediting Mechanisms Presented to the AgWG on October 19th, 2017

Potential Credit Mechanisms:

Option 1: If an EP finds a water quality benefit, that benefit could be added as a % reduction to feed space loads in a future milestone period.

Option 2: Ag Workgroup could request a change to the manure calculations from the Water Quality GIT and Modeling Workgroup in a future milestone period if an EP defines:
- % mortality
- nutrients available in carcasses
- water quality benefit

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[2] http://cast.chesapeakebay.net/Home/SourceData

Table 2. Data Needed for Animal Mortality Management Representation in the Phase 6.0 Watershed Model

General Animal Group (defined by EPEG)	BMP Animal Groups	% N per Carcass	% P per Carcass	Mortality %	Avg. Dead weight?	Mortality Management Baseline (1984)	Mortality Management Today**	
Primary Animal Group	Poultry	?	?	?	?	Burial	Burial	Yes
							Freezer	Yes
							Compost	Yes
							Incineration	Yes
	Swine	?	?	?	?	Burial	Burial	Yes
							Freezer	Yes[#]
							Compost	Yes
							Incineration	Yes
Secondary Animal Group	Cattle	?	?	?	?	Burial	Burial	Yes
							Freezer	No
							Compost	Yes
							Incineration	No
	Equine*	?	?	?	?	Burial	Burial	Yes
							Freezer	No
							Compost	Yes
							Incineration	No
	Other? (e.g. Sheep, Goats)	?	?	?	?	Burial	Burial	Yes
							Freezer	No
							Compost	Yes
							Incineration	No

*Direct-to-rendering also practiced
** Current mortality management in the Bay watershed, as understood by EPEG members
[#]Piglets (nursery) only

Consider incorporating relevant USDA-NRCS conservation practice standards and codes and other established practices in recommending BMPs for livestock and poultry mortality management practices, e.g., NRCS Conservation Practice Standard 316 (Animal Mortality Facility).

The following resources should also be considered by the EP as part of developing its recommendations in addition to any relevant peer-reviewed or gray literature identified and reviewed by the EP:

File Resources accessible from: Chesapeake Bay Program's OneDrive Cloud Storage. Access available upon request from AgWG Coordinator.

1. Previously approved CBP documents relating to animal mortality management
2. Mortality and carcass nutrient data
   a. Poultry
   b. Swine
   c. Cattle

Online Resources:
1. Spartan Compost Optimizer
   http://www.canr.msu.edu/managing_animal_mortalities/composting_tools

Timeline and Deliverables
The Expert Panel project timeline for the development of the panel recommendations is based on reasonable expectations informed by previous CBP BMP Expert Panels.

- **Spring 2018** – EPEG recommendations approved by AgWG; Virginia Tech issues Request for Proposals (RFP) to solicit panel membership
- **Summer 2018** – Virginia Tech selects proposal and shares proposed panel membership with CBP partnership for feedback; final proposed panel membership brought to AgWG for approval
- **Fall 2018** – Panel hosts open stakeholder session and face-to-face meeting
- **Summer 2019** – **Target date** for panel to release full recommendations and final report for approval by the AgWG, WTWG, and WQGIT. This process is expected to take three to six months.
- **Summer/Fall 2019** – If approved by the partnership, panel recommendations are final and will be represented in the Phase 6.0 modeling tools in 2019 as part of the model updates.

Separately, during spring and summer of 2018, CBPO staff and the AgWG will work to update the previously approved interim BMP for mortality management[3] to clarify the nutrient reductions that can be used for planning purposes.

Phase 6.0 BMP Verification Recommendations:
The panel will utilize the Partnership approved *Agricultural BMP Verification Guidance[4]*, as the basis for developing BMP verification guidance recommendations that are specific to the BMP(s) being evaluated. The panel's verification guidance will provide relevant supplemental details and specific examples to provide the Partnership with recommended potential options for how jurisdictions and partners can verify livestock and poultry mortality management practices in accordance with the Partnership's approved guidance.

Attachment 1: Outline for Final Expert Panel Reports

- Identity and expertise of Panel members
- Practice name/title
- Detailed definition of the practice
- Recommended nitrogen and phosphorus loading or effectiveness estimates
  - Discussion may include alternative modeling approaches if appropriate
- Justification for the selected effectiveness estimates, including
  - List of references used (peer-reviewed, unpublished, etc.)
  - Detailed discussion of how each reference was considered, or if another source was investigated, but not considered.
- Description of how best professional judgment was used, if applicable

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https://www.chesapeakebay.net/channel_files/23293/mortality_management_interim_bmp_recommendation_04212016_5.pdf

4 http://www.chesapeakebay.net/documents/Appendix%20B%20-Ag%20BMP%20Verification%20Guidance%20Final.pdf

- Land uses to which the BMP is applied
- Load sources that the BMP will address and potential interactions with other practices
- Description of pre-BMP and post-BMP circumstances, including the baseline conditions for individual practices
- Conditions under which the BMP works:
    - Should include conditions where the BMP will not work, or will be less effective. An example is large storms that overwhelm the design.
    - Any variations in BMP effectiveness across the watershed.
- Temporal performance of the BMP including lag times between establishment and full functioning (if applicable)
- Unit of measure (e.g., feet, acres)
- Locations within the Chesapeake Bay watershed where this practice is applicable
- Useful life; effectiveness of practice over time
- Cumulative or annual practice
- Description of how the BMP will be tracked, reported, and verified:
    - Include a clear indication that this BMP will be used and reported by jurisdictions
- Suggestion for a review timeline; when will additional information be available that may warrant a re-evaluation of the estimate
- Outstanding issues that need to be resolved in the future and a list of ongoing studies, if any
- Documentation of any dissenting opinion(s) if consensus cannot be reached
- Operation and Maintenance requirements and how neglect alters performance

Additional Guidelines
- Identify ancillary benefits and unintended consequences
- Include negative results
    - Where studies with negative pollution reduction data are found (i.e. the BMP acted as a source of pollutants), they should be considered the same as all other data.
- Include results where the practice relocated pollutants to a different location. An example is where a practice removes nutrients from the farmstead but moves the nutrient into subsurface water flow and/or groundwater via burial.

In addition, the Expert Panel will follow the "data applicability" guidelines outlined Table 1 of the Water Quality Goal Implementation Team Protocol for the Development, Review, and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model[5].

References

Hamilton, D., K.Cantrell, J. Chastain, A. Ludwig, R. Meinen, J. Ogejo, and J. Porter. 2016. Manure Treatment Technologies: Recommendations of the Manure Treatment Technologies Expert Panel to the Chesapeake Bay Program's Water Quality Goal Implementation Team to define Manure Treatment Technologies as a Best Management Practice. With J. Hanson, B. Benham, C. Brosch, M. Dubin, A. Toy, and D. Wood for EPA Chesapeake Bay Program. Agriculture Workgroup. https://www.chesapeakebay.net/documents/MTT_Expert_Panel_Report_WQGIT_approved_Sept2016.pdf (accessed 2 Feb. 2018).

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[5] https://www.chesapeakebay.net/documents/CBP_BMP_Expert_Panel_Protocol_WQGIT_approved_7.13.15.pdf

LPE Learn Center. 2017. Animal Mortality Management Conservation Practices: A Virtual Tour. LPELC.org. United States Cooperative Extension System. https://lpelc.exposure.co/animal-mortality-management-conservation-practices (assessed 2 Feb. 2018)

NRCS. 2016. Animal Morality Facility (No.)(316)(9/15). Conservation Practices. USDA. https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/cp/ncps/?cid=nrcs143_02684 9 (accessed 1 Feb. 2018).

Payne, J. 2015. What Are Common Animal Disposal Options. eXtension. United States Cooperative Extension System. https://articles.extension.org/pages/66140/what-are-common-animal-mortality-disposal-options (accessed 31 Jan. 2018).

Statement of Work (SOW)
Animal (Livestock and Poultry) Mortality Management BMP Expert Panel
Submitted for consideration to the
Chesapeake Bay Program (CBP) partnership
Water Quality Goal Implementation Team (WQGIT), Agriculture Workgroup (AgWG),
Watershed Technical Workgroup (WTWG) and advisory committees

Approved by the AgWG on August 16, 2018

Overview

Fate of nutrients (Total Nitrogen, TN, and Total Phosphorus, TP) released by animal mortality disposal are not explicitly covered in the Chesapeake Bay Program (CBP) Phase 6.0 Watershed Model (CB Model). The only disposal method currently covered by the Bay Model is composting, and there is no mechanism for entering the mass of TN and TP contributed by mortality composting to the model.[1]

This statement of work describes how the proposed expert panel will be brought together to write a report to the CBP Agriculture Workgroup (AgWG) recommending estimated loadings and BMP effectiveness values of TN and TP to the CB Model from disposal of routine poultry and livestock mortalities.

As requested by the AgWG[2] the panel will evaluate, define and describe disposal methods, which will include (but may not be limited to): burial, composting, landfilling, incineration or gasification, and refrigerated storage followed by rendering. The panel will determine the environmental fate of TN and TP in the defined disposal methods relative to a background method (burial). The panel will recommend how mortality management can be represented in the CB Model. The panel will provide Best Management Practices (BMP) verification guidance for the defined mortality management methods to supplement existing AgWG BMP Verification Guidance as needed. The panel will address other hazards and concerns with mortality disposal, such as potential microbial contamination of surface and ground waters and spread of animal and human diseases.

The total panel will consist of seven members identified here: the panel chair, five land grant university panelists representing a wide range of expertise, and a representative of USDA who is familiar with relevant USDA-Natural Resources Conservation Service (NRCS) conservation practice standards. Three additional non-voting representatives from the CBP Watershed Technical Workgroup (WTWG), the CBP modeling team, and EPA Region III office will be identified by the CBP prior to formation of the panel.

The panel will be supported under Virginia Tech's cooperative agreement with the EPA-CBP for Expert Panel Management. This includes facilitation and administrative support by Virginia Tech's Panel Coordinator (Jeremy Hanson), plus resources for panelists' travel to in-person meetings and a portion of the Panel Chair's time to compensate for the significant effort required as Panel Chair.

Proposed Expert Panel Membership

Letters of collaboration, curriculum vitae and Conflict-of-Interest Disclosure forms for the proposed panel members are provided in Attachments A, B and C for consideration by the CBP partnership.

Douglas W. Hamilton (Panel Chair), PhD, PE Doug Hamilton is Associate Professor and Extension Waste Management Specialist at Oklahoma State University. Dr. Hamilton has previously chaired the CBP expert panel on Manure Treatment Technologies, and served on the Animal Waste Management Systems expert panel. He has developed guidance for successful operation of routine poultry mortality composters and lead carcass disposal efforts during recovery from wildfires in Oklahoma during spring 2018. Dr. Hamilton will provide expertise in evaluating Nutrient Management Plans and document preparation.

Thomas M. Bass Tommy Bass is an Associate Extension Specialist at Montana State University. He conducts research and provides extension programming in environmental and emergency management of livestock and poultry production, as well as, sustainability in local/regional food systems. He has conducted agricultural and food waste composting research and consulting for 12 years, including routine and mass animal mortality composting. He has also been a nutrient management planner and CAFO permit coach in Montana and Georgia. Mr. Bass will provide expertise in sustainable livestock systems, nutrient management planning, and carcass disposal methods.

Amanda Abnee Gumbert, PhD Amanda Gumbert is an Extension Specialist for Water Quality at the University of Kentucky. Dr. Gumbert currently serves as lead co-chair of SERA-46, a multi-state land grant university team focused on reducing nutrient losses in the Mississippi River Basin. She provides leadership on agricultural water quality policy in Kentucky and develops educational materials with practical approaches for farmers (including two extension publications focused on proper disposal of animal mortalities). Dr. Gumbert will provide expertise in on-farm water quality best management practices and task group facilitation.

Ernest P. Hovingh, PhD Ernest Hovingh is an Associate Research Professor and Extension/Field Investigation Veterinarian at the Pennsylvania State University. He is leader of the Veterinary Extension Program Team at Penn State. Dr. Hovingh has conducted research in the epidemiology of antimicrobial-resistant and zoonotic bacteria from livestock facilities. He has been trained as an expert in large animal carcass management. Dr. Hovingh will provide expertise in biosecurity and lend the perspective of veterinary medicine to the panel.

Mark Hutchinson Mark Hutchinson is Extension Professor at the University of Maine. He is director of the famed Maine Composting School and a USDA Subject Matter Expert in Animal Carcass Composting. He has also provided extension programming in organic vegetable production. Mr. Hutchinson will provide expertise in carcass composting methods, compost quality evaluation, and incorporation of composting in sustainable livestock systems.

Teng Teeh Lim, PhD, PE Teng Lim is an Associate Professor of Agricultural Systems Management at the University of Missouri. Dr. Lim has extensive research experience in dust, odor, and gaseous emissions in animal agriculture. He has conducted research and has provided extension programming in biosecurity and animal mortality management. He co-wrote the ASABE standard for animal mortality composting. Dr. Teng will provide expertise on engineered systems for sustainable production and mortality disposal methods.

George (Bud) Malone Bud Malone is retired Extension Poultry Specialist with the University of Delaware. He currently consults part time as Malone Poultry Consulting. Mr. Malone has

extensive experience working with poultry litter and mortality management. He will provide expertise on poultry production and general animal agricultural practices on the DelMarVa peninsula.

Sandra L. Means, PE Sandy Means is an Environmental Engineer on the National Animal Manure Nutrient Management Team for USDA-NRCS at the East National Technical Support Center in Greensboro, North Carolina. Her responsibilities include development of policy, review of standards, and delivery of technical assistance and training nationally to assist in the transfer of innovative technologies to the field. She will act as representative of USDA and as an expert on USDA-NRCS practice standards, programs, and policy.

Narrative of Initial Timeline and Tasks to Fulfill Scope of Work

The process to create the recommendation report will adhere to *Protocol for the Development, Review and Approval of Loading and Effectiveness Estimates for Nutrients and Sediment Controls in the Chesapeake Bay Watershed Model[2] (BMP Protocol)*. Sequential steps to achieve this process are outlined as follows. An initial timeline to meet narrative goals is given in Table 1. As the panel progresses the timeline is subject to change to reflect partnership needs or panel capacity.

Kick-off Meeting: A two day, face-to-face meeting will initiate the project. The meeting location will be in a central location in the Chesapeake Bay Watershed (CBW). Before the meeting, the panel chair will provide an outline of project goals; the BMP Protocol; USDA-NRCS 590 Nutrient Management Standards, USDA-NRCS 316 Animal Mortality Facility Standards, and state rules for disposal of livestock and poultry carcasses for each state in the CBW. On the first day of the meeting, the panel member representing the CBP modeling team will brief expert panelists on the CBP model and how recommendations from the panel may affect the model. The panel will outline specific water quality and biosecurity concerns related to carcass disposal, and develop a specific timetable for panel goals. On the morning of the second day, the panel will finalize disposal options for consideration, form task groups to tackle goals, and assign tasks to achieve before the first panel conference call.

Public Forum: An open forum to garner input, aid in data set identification, and to identify any additional carcass disposal methods for consideration will be held in the CBW. This forum will be held on the afternoon of the first day of the initial face-to-face meeting. This forum will be organized and advertised by CBP.

Task Groups: In order to facilitate efficient collection of data, the expert panel will divide itself into several smaller task groups. These groups of two or three individuals will be self-forming. Task groups will collect data on fate of TN, TP, and pathogens, and will recommend BMP verification and biosecurity procedures for each carcass disposal method. Task groups will remain intact until the recommendation report is written.

Panel Communication: The panel chair will establish a common protected virtual space (for example a Google Team Drive or One Drive/Sharepoint) where panelists can securely share information and data. In addition to face to face meetings, panelists will communicate in monthly conference calls.

Collection of Data Sets: Task groups will gather data sets for the selected disposal methods and rank their validity using criteria of Table 1 of the *BMP Protocol*.

Analysis of Data: Using data sets and best professional judgment of the panelists, selected disposal methods will be analyzed. Each group will prepare a written report giving a detailed

definition of the disposal method and results of data analysis. This report will also include a list of references and a discussion of how each reference was considered.

Consensus of Results: A second face-to-face meeting will be held in which task groups will orally present the reports created during the data analysis phase. Draft reports will be available to all panelists before this meeting on the common virtual space. The panel will evaluate and provide feedback to each task group. Dissenting opinions of panelists will be noted and preparation will be made to add these dissenting views as an appendix to the recommendations report. The second face to face meeting will be held in a central location in the CBW.

Preparation of Draft Report: The Panel Chair will coalesce the task group reports into a draft final report. The Panel Chair will send the draft report to entire panel via the common virtual space. Panelists will return written comments to chair in one month.

Approval of Final Recommendation Report: After one month's review time, the expert panel will approve or disapprove of the document via voice vote in a conference call. In the case of non-unanimity, a separate dissenting report will be attached as an appendix. The Panel Chair will then forward the report to Agricultural Work Group as prescribed by the *BMP Protocol*.

References:

1. *Protocol for the Development, Review, and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model.* July 14, 2014. Chesapeake Bay Program Water Quality Goal Implementation Team.

2. *Recommendations for Livestock and Poultry Mortality Management.* March 15, 2018. Chesapeake Bay Program. Animal Mortality Expert Panel Establishment Group,

Table 1. Timeline to Meet Expert Panel Goals.

	2018			2019												2020		
	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Kick-Off Meeting	■																	
Public Forum	■																	
Final List of Disposal Methods and Animal Groups	■																	
Collection of Data Sets		■	■	■														
Analysis of Data				■	■	■	■	■										
Initial Reports Delivered to Panel by Task Groups								■										
Second Meeting to Come to Consensus on Nutrient Delivery, BMP Verification, Potential Modelling of Practice									■									
Panel Chair Coalesces and Writes Draft Report to CMP AgWG									■	■	■							
Approval of Draft Report by Panel											■	■						
Report Delivered to CBP AgWG												■						
CBP Partnership Review and Approval													■	■	■	■	■	■