



Agricultural Modeling Team Meeting Minutes

April 10, 2026
9:00-11:00 AM

[Visit the meeting webpage for meeting materials and additional information.](#)

Purpose: To stay informed regarding model development, as well as review and discuss the final broiler information that will be used in the Phase 7 model.

Summary of Actions & Decisions

Action: Tom Butler, EPA, will add an additional column to the data provided in Appendix B to include pounds per pound of bird and continue additional data analysis and visualizations of broiler data for the AMT's reference.

Action: Please provide feedback and suggestions by 4/24 to Tom Butler (Butler.Thomas01@epa.gov), and Caroline Kleis (Kleis.Caroline@epa.gov) regarding additional topics you would like to discuss at upcoming AMT meetings. In addition to other potential suggestions solicited via email, the group expressed interest in viewing results of the state's inputs relative to high hay and high pasture over time and across BMPs, once the Phase 7 Model development process is further along.

Meeting Minutes

I. Introduction & Announcements

Lead: Zach Easton, VT

Zach gave the group a quick refresher on the February decisions and outlined the plan for the next few months.

II. Broiler Data Update

Lead: Tom Butler, EPA

In February the AMT voted to update relevant broiler information within the counties of the Delmarva Peninsula. Final data were submitted for incorporation into Phase 7 and were reviewed by the group. The group engaged in subsequent discussion.

Actions:

1. Tom Butler, EPA, will add an additional column to the data provided in Appendix B to include pounds per pound of bird and continue additional data analysis and visualizations of broiler data for the AMT's reference.
2. Please provide feedback and suggestions by 4/24 to Tom Butler (Butler.Thomas01@epa.gov), and Caroline Kleis (Kleis.Caroline@epa.gov) regarding additional topics you would like to

discuss at upcoming AMT meetings. In addition to other potential suggestions solicited via email, the group expressed interest in viewing results of the state's inputs relative to high hay and high pasture over time and across BMPs, once the Phase 7 Model development process is further along.

Discussion Notes:

Dave Montali: Back one slide where you summarized, you said in the bottom line there that “N and P lbs per bird have decreased.” Is that accurate, or is it per pound of bird? I don't understand if it's larger birds and they're making less per bird or that the per pound of bird is lower.

Tom Butler: Yeah, so it's per bird. I'll get into the concentrations that get us to the litter. So, it's bigger birds with less litter and then less nitrogen pounds per litter.

Hunter Landis: The orange and blue lines [on slide 6], I'm just thinking through them. I'm not sure if the answer matters, but is that truly tons generated by birds or tons moved out of the house?

Tom Butler: Yeah, so this is generated by the birds, and this is the pounds per bird. So, we don't have the overall tonnage for you because we don't have our population in place to see what that would be. So, we would have to put this essentially into the equation with the new ag census data to see what that would be overall.

Hunter Landis: That answers my question, though, thank you.

Ken Staver: Did they propose a mechanism? I mean, I look at that graph, and I see a counting change. I don't see something that happened industry-wide in one year or two years. So, what do they say? What's their explanation for a 20% drop in pounds of litter per bird in two years?

Tom Butler: Yeah. That's a good question, Ken. I don't think that there's necessarily a good answer for that. I certainly don't have it, so I can't give you one.

Ken Staver: I mean, we've got three major integrators that don't talk to each other because they're secretive, and they all just did the same thing at the same time? I mean, I don't know. It doesn't look to me like what would have actually happened, I am just saying.

Tom Butler: I appreciate that.

Ken Staver: Yeah. I'll quit; that's just sort of my reaction. I have no basis for what I'm saying other than being someone who looks at a lot of data. It's just stuff like that that makes you think, hmm, that's odd.

Zach Easton: That's a good point. I think we had a discussion about that - Joseph, Tom and I - last week, and I couldn't quite wrap my mind around why that drop occurred other than there's just new data starting then.

Ken Staver: Yeah, I'm fine. I just thought a comment should be made about it, that's all.

Tom Butler: Yeah, I appreciate it. And I think that it's a product of the timeline that we're working on because we've seen similar things like this with fertilizer and we had discussed that at length to try and accommodate some of these jumps and smooth them. We just don't have time as we're going through our timeline to fix those. I think, in an ideal world, we would have had a longer runway on this one to see the data and to work with it. We obviously approved the principle of using it, and I think this is essentially what that is. I just don't think there's a good answer other than the time that we have as a partnership to work on that, but I won't go too far down that rabbit hole.

Alisha Mulkey (in chat): Data was only back to 2014, so prior years may be artificially higher.

Joseph Delesantro (in chat): I did mention that this would likely be an issue at past meetings.

Clint Gill (in chat): I agree with Alisha, that line was moving up based off the old data, it does look odd, but just an artifact of the data we have

Dave Montali: Alright, so I'm guessing that Chris's study - his polling of the industry - started in 2014 and the prior parts of the graph are a different data source. Is that accurate?

Tom Butler: Yes, and I think Clint and Alisha are touching on it [in the chat]. It was old data from before 2014, and that trend maybe not have been accurate. So, I won't make the argument, but the

argument could potentially be made that just that artifact is putting the data back where it should be. But I won't speculate on that. That would be for someone else to discuss.

Dave Montali: Okay, alright. I don't know why my mind wants to think everything that we should be talking about should be pounds of litter or whatever per pound of bird weight produced. Isn't that the way we've done it, or am I off base?

Tom Butler: You're on base, Dave. I wanted to go through essentially the very raw information coming from Chris. I do appreciate, though, and hopefully I get to your exact point there.

Alex Soroka (in chat): Ag schools have raised broilers for various reasons for a long time. Any chance we could find corroboration for the drop? in lbs produced?

Ken Staver: Just a clarification on the left axis [on slide 12], is this in pounds of TN per pounds of litter? It's a little bit of an odd axis label.

Tom Butler: Yeah, that's fair. That's on me. Yes.

Ken Staver: Okay, so pounds of TN per pound of dry litter? Wet litter? What are we talking about here?

Tom Butler: This is dry.

Ken Staver: Could you go back to the nitrogen one? So, pounds of N per pound of litter. Is this saying we were running along at 7.5% concentration of TN in litter?

Tom Butler: Yeah.

Ken Staver: That's really high. I've never seen litter that high ever. Even when you add the moisture back and you cut it some. What percentage moistures are we talking about?

Tom Butler: I would need to look up what those were. I don't know off the top of my head now.

Ken Staver: Okay, because we've always had this problem over the years. This is in litter. I'm guessing it was like 70%. That seems like a really high number. But, anyways, I'll keep watching.

Tom Butler: We're kind of towards the end of the results here. So, I don't have too much more to show in terms of that because we ideally would have the animal numbers, we'd put it in, and we'd see what that did to applications. So, I can't show you what that looks like today. But I did want to highlight that these changes do seem like they could have an impact. Obviously, there isn't the smoothing in place that we would have liked to have. In the Delmarva, obviously we're seeing those changes, and we don't really know what the impact will be.

Clint Gill (in chat): The problem is we have trouble equating raw manure to what the litter numbers are.

Tom Butler: Yes, thank you, Clint.

Robert Sabo (in chat): Is nitrogen concentration drop in litter due to the excrement concentration from chickens becoming lower or shifts in litter management?

Tom Butler: Robert, I think there are two elements to that that are both probably true. I'd let people from those jurisdictions who have been involved in the process speak to that.

Alisha Mulkey (in chat): I think both. Feed use efficiency and in-house management

Clint Gill (in chat): It might be both, the feed conversion has improved as well as the litter management

Tom Butler: Clint and Alisha are both hinting that it could be both. Feed conversion is improved as well as litter and house management.

Dave Montali: Something seems amiss. I am pretty sure in the model documentation, the pounds of N per pound of litter is around 0.05. So, Ken made the comment that 0.075 doesn't sound right. So, this is pounds per pound. The straight line is prior to 2014. Is the stuff prior to 2014 the way it is in Phase 6? Is it supposed to be the way it is in Phase 6?

Tom Butler: Yeah, that's unchanged.

Dave Montali: Something's wrong here, I think. Maybe I am wrong. I'm pretty sure in West Virginia it's a 0.04 number. We can look at the model documentation. It doesn't have anything to do with as excreted. It's the litter value per pound.

Ken Staver: If this is dry, and they were saying it's 60 or 70 percent moisture, then it would get it down closer to 5. If you are talking about what's going to the field, what a farmer would be

interested in, a nutrient management plan goes by as-is. So, that's the tricky part about translating this. What we're familiar with is "as is" basis. That would knock this down considerably depending on the moisture content. But it's hard to know without seeing that.

Tom Butler: Yeah, and I didn't plot that out. Essentially the difference between these [lines on graph] is whatever percentage it would be of moisture. So, it might be around 75% moisture, but I don't know off the top of my head. That's speculating off this graph.

Robert Sabo (in chat): Do we have reports specifically on the excrement content from the chickens Alisha and Clint?

Alisha Mulkey (in chat): None I am aware of.

Clint Gill (in chat): Just litter.

Ken Staver: Just for clarification, these numbers are ready for field application? Is that right? All these numbers are after house losses, storage losses, all those categories. This is what is hauled to fields?

Tom Butler: This is with volatilization as the only impact that was a BMP on this one. So, all of those still have to be put in place. I think volatilization is what we've accounted for. I might lean on Jess for this in terms of the order.

Jess Rigelman: This is pre-volatilization. The concentration is the dry concentration. The fraction dry is around 70%, so 30% would be wet. This is pre-animal waste management systems, so the litter that is provided had the animal waste management systems data added back in for processing.

Tom Butler: So, again, there's a lot that needs to happen to it to get to that final stage.

Ken Staver: This is not pre-volatilization in terms of house volatilization because then we are getting back into excreted. This is post-house losses, isn't it?

Jess Rigelman: I can't see the screen, but the data that was provided from Chris and Mark had the volatilization in there. Our numbers added it back in because we need to account for that in our processes in the model. So, basically, we just got Appendix B with whatever values are in there continued from 2013 all the way to 2024. I was able to replicate the process of getting the 1985-2013 data (what is currently in the model) using a certain process, and then I just applied that same process to the 2014-2025 data. So, this is the same processing that was done to Appendix B back in 2016/2017.

Tom Butler: So, unfortunately, we don't have the full picture to show everyone, which is what we would normally have, due to the time constraints we've got. But the highlight is we were able to get information, and we have been able to process it in a way that can be used. Eventually, we can show you what the "real deal" looks like, but that's contingent on what people would want to see.

Andrew Leight (in chat): Is the 0.075 value supposed to align with a value in Appendix B?

Alisha Mulkey (in chat): Storage and handling losses?

Clint Gill (in chat): This is based on transport data, so it's the tonnage coming off the farm post in house management.

Dave Montali: This doesn't concern West Virginia. But, I would just think that we should present this new information in contrast to the documentation for Phase 6. I keep hearing about Appendix B. Are we talking about the Poultry Litter Subcommittee report- Appendix A in the documentation?

Tom Butler: This actually is from a different report, so this comes from the report I have linked on the slides if you are in the materials.

Dave Montali: To me it would be better if you could just compare this to how we documented things in Phase 6 and show how this would change.

Tom Butler: I appreciate that. I think once we work through it a little bit more, we can get the comparison you are asking for. Overall, if you look at it without having done that, there are still some things you can probably glean from this. We're going to see decreasing nitrogen concentrations. You are going to see changes in litter generation. So, I think those are some takeaways that we obviously won't know the answers to until we run it, but are still certainly

noteworthy. I definitely take your word on this, Dave. I will make sure that if this is what people want to see, we can allocate the time to that. Were there other questions, comments, concerns about this? I understand people want to see that and we just don't have that.

Ken Staver: Can you go back to your first slide, the one that has all the summary numbers? What did we decide these numbers are again? These are going to the field? When you say pounds N per bird, it's not pounds N per pound of bird, this is pounds per bird?

Tom Butler: Yes, so this is probably the closest thing to what Dave is asking for. This is essentially the table for Appendix B. Let me pull up the Appendix.

Ken Staver: Is this on the calendar page? Where is this?

Tom Butler (in chat):

https://d18lev1ok5leia.cloudfront.net/chesapeakebay/documents/recommendations_to_estimate_poultry_n...

Tom Butler: This is what is being updated. So, in this one I've got Delaware with 1985-2013 in the initial Appendix. It's got average market pounds per bird, wet pounds of litter, dry litter per bird, and it's essentially a progression to get to the pounds of nitrogen per bird. The update comes from that table and goes from 2014 through 2024. So, these are essentially the same columns abbreviated a little bit differently, and this is what that would show.

Dave Montali: I think I figured it out – the 0.07 is pounds per bird whereas the .046/.05 numbers were in pounds per pound of dry litter. I think that's the thing that's been hanging us up.

Tom Butler: We get that Appendix, and we have to back out information as Jess described. So, these concentration values are going to be different than what you are going to see there because we have to modify that, at least for the later part. So, you'd see that for 2013 backwards.

Robert Sabo (in chat): Clint and Alisha, my overall understanding is that our larger birds produce less manure and excrete less nitrogen per unit of body weight gain or per kg of meat/eggs produced-- though I am sure based on what I have read the N/protein content of their excreta is not changing. It will be intriguing to see the final mass flux calculation!

Tom Butler: Thank you, Robert.

Clint Gill (in chat): The industry has gotten very good at getting more pounds of chicken for less, house ventilation better feed etc.

Tom Butler: I might open the floor to you on this, Clint, as the person involved from the Delaware side. It sounds like there are certainly improvements in the industry. I think we heard that from Chris in the past. I didn't know if you wanted to highlight that again today just as a refresher.

Clint Gill: I think the industry has gotten a lot better at converting feed to pounds, and the litter treatment has changed dramatically. There's a lot more windrowing blowing off a lot of ammoniacal nitrogen. There have been a lot of changes since we last looked at this, and it's still changing. We're going to have to keep an eye on it going forward. But, the birds are a lot bigger, and they are doing it for less feed. So, that's all I have to contribute.

Alisha Mulkey (in chat): No mic., but Clint is correct.

Tom Butler: Thank you, Clint. Alisha agrees with you. Hunter, I didn't know if you wanted to speak to any of this on the Virginia side. If you wanted to provide input, you have an opportunity here as well.

Hunter Landis: I'm just kind of looking at process, and I didn't have a comment. I don't know if any others did right now. Thank you.

Ken Staver: To what Dave was asking for, it would be super easy to add two more columns to this table [Appendix B] just to put it in pounds per pound of bird. This would be like a ten second Excel process. It might fill up the page a little bit, but it would be really easy. It looks to me like N is about half from '85-now. The N in litter per pound of bird was almost cut in half. So, that could be.

Tom Butler: If I try and do an Excel calculation in front of you that should take 10 seconds, I could certainly bungle that up because you are watching. If I did that offline, it would probably take 10 seconds, but if I try to do it in front of you guys, I will absolutely mess that up. So, I'm not going to do that now.

Ken Staver: Fair enough. The information is all right there.

Tom Butler: Ok, we can work on that. We kind of want to plot a little bit of a path forward here. As we kind of wind this down, it seems like we have a little bit of time here in the coming months to look at anything and everything we really want. So, this obviously can be the forefront. This could be a side note. There are obviously other things people might want to talk about. Over the next two weeks, please provide feedback to us by email as to what you guys want to look at. Then we could certainly try to dig into that and get that going. That should give us some time to get things put up and get things posted, and we can have feedback beforehand so that we get things on a set path that looks good for everyone else. Otherwise, I don't think there's a lot here that people want to talk about, but we certainly have the time.

Alisha Mulkey (in chat): Clint, did any of the data see miscanthus litter v woodchips?

Clint Gill (in chat): I don't know that for sure my data doesn't always show by integrator.

Clint Gill (in chat): Chris and Mark linked our data to integrator so they might have an inkling. I know they're still playing around with what they've got for other potential insights.

Ken Staver: We are fighting with this fertilizer N stuff, which is kind of what we are really struggling with overall- the fertilizer numbers. If a lot of the poultry litter N goes away, until we see the numbers, we don't know what the totals are. But it looks like it could be a significant amount of poultry litter plant available nitrogen being pulled out of the equation, then it makes space for the increasing fertilizer N. So, it could make that look not as bad as it looks. The bottom line here is that everything affects everything. It could change your number of manure acres because you've got less N. So, there's a whole bunch of moving parts that tie into manure nitrogen. So, I think there's going to be some "knock on effects" as they say.

Tom Butler: That's a really good point there, Ken, because I think we do often lose sight of the manure nitrogen and its impact on the acres, whether they go to with manure or without manure. That's certainly something to keep an eye on. Obviously then the fertilizer implications could be something. So, seeing the whole picture of this would be a good starting point for a lot of those.

Robert Sabo (in chat): when will poultry manure/litter N + P mass flux calculations be completed?

Tom Butler: We are trying to get Phase 7 put together. It will be several months until we have anything more concrete. I know Jess and Joseph would have more insights on that, but I'm not going to push them on this. They might have more insights. I would say it will be several months at least.

Dave Montali: I think a lot of the stuff that people may be interested in is going to take 3-4 months before we can even start looking at anything. I think one item to put on your list would be the results of the state's input relative to high hay and high pasture and looking at that over time/ comparing with BMPs. But I think we will need all the land uses set up, and we are going to need that couple/three months before we ever get to being able to look at that.

Tom Butler: Yes, that's a good point. The land use is currently not in, so that is just something we have to wait on there.

Joseph Delesantro: Dave hit the nail on the head there. Right now, we need to focus all our time on getting all the Phase 7 inputs together and getting that passed along down the chain so we can do the full calibration. So, it will be a while before that's all done and then we can come back to these questions to do the comparisons and scenarios I think you all are asking for. The manure numbers that we will produce in a couple of weeks are going to have a lot of Phase 7 changes in them. So, in order for us to swap things out to do an apple and apple comparison, we basically have to have everything else done and passed along before we can come back and revisit with those comparison scenarios.

Tom Butler: Ok, well we definitely have eyes on when things are set up and put together. In terms of some of the more rudimentary data we want to see, that would be good to know in the next few weeks. So, please reach out if you have any questions or things you want to look at. Again, I recognize we can't do full on scenario comparisons like people might want until things are a little further down the line.

III. Wrap-Up

Lead: Tom Butler, EPA

IV. Adjourn

Next Meeting: June 12, 2026 from 9:00AM-11:00AM

Attendees:

Zach Easton, VT

Tom Butler, EPA

Petra Baldwin, CRC

Mark Dubin, VA Cooperative Extension

Jess Rigelman, J7 LLC/CBPO

Auston Smith, EPA

Tim Larson, VA DCR

Arianna Johns, VA DEQ

Patrick Thompson, Energy Works

Rachel Owrutsky, DNREC

A.K. Leight, MDA

Joseph Delesantro, Koniag

Krista Crone, PA DEP

Dave Montali, Tetra Tech

Cassie Davis, NYDEC

Seth Mullins, VA DCR

Alisha Mulkey, MDA

Tad Williams, VA DCR

Cass Klingaman, NY DEC

Hunter Landis, VA DCR

Ken Staver, UMD/Wye

Alex Soroka, USGS

Bo Williams, EPA

Clint Gill, DDA

Curtis Dell, USDA ARS

Denise Uzupis, PDA

Robert Sabo, EPA