WWTWG's Biosolids Ad Hoc Task Force

March 3, 20156 Conference Call

Meeting Notes

Summary of Actions/Decisions

ACTION: MDE will provide Matt with biosolids land use application data aggregated on a monthly basis by the crop to which it is applied, similar to what was presented from Blue Plains.

ACTION: Prior to the next call, Matt Johnston will develop application curves for biosolids that are similar to the ones used to simulate manure application. The curves will be based on the Blue Plains data and will prioritize the application of biosolids on grass/hay/pasture over corn and row crops.

ACTION: CBPO staff will write a brief memo outlining the methods for filling biosolids data gaps and send it out prior to the next call. Biosolids Task Force members will be asked to come to a final decision on these methods during the next call.

Welcome/Introductions

Karl Berger (MWCOG) asked members to introduce themselves and reemphasized the primary purpose of the group:

- To see if any further data could be submitted by the states to augment what has already been submitted
- To develop recommendations for how biosolids data should be used in Scenario Builder and to develop rules for how to address data gaps.

Berger stressed the two overarching principles that should be followed when filling data gaps:

- Try to use the same rules everywhere, to the extent possible.
- The level of precision needed to fill data gaps in biosolids data does not need to exceed the level of precision used in Scenario Builder for fertilizer and manure data.

Matt Johnston (UMD, CBPO): Where the biosolids data collection starts is much more accurate than where manure and fertilizer data starts, because most states are tracking individual plants. In the end, all the specificity that is needed in Scenario Builder are the pounds or N and pounds of P going down in a county. We can talk about what land uses they need to be applied to, later.

West Virginia DEP Methods for Filling Biosolids Data Gaps

James Summers (WV DEP) gave an overview of the methods that WV DEP used to fill gaps in their biosolids data, from 1985-2013.

Discussion:

- Berger: Does CBPO want, or need, the annual pounds of biosolids applied by county on a monthly basis?

    - M. Johnston: In Phase 6.0 of the Model, the nutrient loads are only slightly sensitive to timing. It is orders of magnitude more sensitive to the total annual pounds, so therefore it is more important to get the pounds right.
- M. Johnston: It is important to get the dry pounds of biosolids, but it is also important to get the species of nutrients.
- Berger: Maryland and Virginia data seem to capture the tonnage down to the field level. To get to their county-wide totals, they take the sum of all the fields in that county without making any assumptions.
    - Summers: We had field-level tonnage on a monthly basis. It sounds like they took their total permitted acreage in a county and assumed sludge was spread out evenly?
        - Berger: It is more like they know the exact date, location and tonnage applied.
- If you need to make a broad assumptions about acreage, from my experience, biosolids are typically applied at approximately 90% of the permitted rate.
- John Uzupis (Synagro): Was there a decision last meeting regarding whether we are going to address biosolids applied to forest or reclamation land?
    - M. Johnston: Right now, we are only concerned about agricultural land applications. Please feel free to submit data on applications to other land uses to Ning if you would like, but the partnership has only developed rules for modeling application on agriculture lands at this point.
- Berger noted that the Bay Program distinction between a manure application to non-legume hay and an application to pasture does not match biosolids practice, which tends to be to a joint hay-pasture field. At least in Virginia, hay fields to which biosolids are applied can provide both a cutting of hay and subsequent grazing. M. Johnson said the same is true in West Virginia.
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<u>Potential Methods for Filling Biosolids Data Gaps Bay-Wide</u>

Matt Johnston (UMD, CBPO) presented proposed methods for filling biosolids data gaps that could be applied to all jurisdictions in the Chesapeake Bay Watershed.

Discussion:

- Johnston: To start, I would like to note that for cases where data exists at the facility-level, the West Virginia methods were very good methods to use. These proposals address what I would do if I didn't have all of that data:

1) Interpolation
    - Trudy Johnston (Material Matters): Sometimes treatment plants don't go to land application, but instead go to landfill. I don't know if states track that.
        - M. Johnston: Landfills aren't included as a source of nutrient runoff in the model, so we are only looking at land applied biosolids. I would also like to point out that when we talk about data gaps, there is a big different between a zero and a blank. A zero represents a known "no application", while a blank represents missing data.

2) Back-Cast

- Berger: Are there any other better methods for back casting than what Matt recommended? My own thought is that there is probably slightly less production as you go further back in time because flows were lower. I think that number should decline back in time, but I don't have any data to support that.
    - T. Johnston: Good point. When treatment plants change their processes, it really does impact production.
- Berger: We will tentatively recommend steady state back-casting for now. We need a valid basis for decreasing the amount back in time.

3) Future-casting
    - Berger: Blue Plains went from lime stabilized to digestion around 2014, which has a lot of implications for total tonnage. The P stays the same, but less N leaves the biosolids when it is processed using digestion. Going forward at Blue Plains, we could estimate that there would be a projected change in N over the next 10 year period moving forward.
    - M. Johnston: It isn't necessarily a priority for this month to be able to project out past 2013. However, I think this method is still important, because sometimes you can't find data beyond 2010, so you would need a method like this to address 2011-2013. Eventually, we will need to be able to project out to 2025.

4) Nutrient species state-wide
5) Nutrient species watershed-wide
    - M. Johnston: Looking at the EPA 2009 NSSS report might be a great method for estimating default nutrient species concentrations.
    - Berger: You could calculate, for each county application, the pounds of NH3, TN, TP etc. and just sum them up. How detailed does this speciation data need to be?
        - M. Johnston: I prefer not to take away specificity from the states. This group could recommend that we apply the average speciation rates everywhere, but because the states are collecting nutrient species information, I'd like to continue to give them the flexibility to report that. We would input the total pounds of each nutrient species in each county into Scenario Builder based on what the states report. The model is set up to handle that.
    - Berger: How does this level of specificity compare to the level of specificity in manure?
        - M. Johnston: The specificity on manure is at the county level. We have total animal numbers, and assumptions of animal size and the amount of manure generated by that size animal at a county-level. That is all broken down into the individual nutrient species. The methods generally come from USDA.
        - Berger: In places where we actually have field-specific data linked to facility data, the level of precision is greater than what exists on the manure side.
    - M. Johnston: I think this rule is important because a lot of states have the dry pounds of biosolids, but they generally have to make assumptions about nutrient concentrations for some years for some facilities.
    - Berger: Are nutrient concentration averages pretty steady over time?

    - Al Razik (MES): Some of our smaller plants have a lot of variability in the nutrients. Anywhere from 2% to 5% N for instance. I don't think I see much N variability in the Blue Plains data except for when there are process changes.
    - T. Johnston: We see more variability with aerobic digestion than with other processes.
    - Uzupis: I generally don't see much variability.
    - Aaron Stephens (Material Matters): Whether the samples were done in the lab or field also tend to impact the variability.
- Berger: It sounds like Matt's proposed assumptions are pretty good. The level of variation we're talking about are pretty small.

6) If county applied is not provided, biosolids will be proportioned to counties based upon the recent county distribution supplied.
    - Berger: The only huge hole in the county data is in Pennsylvania. I think it is unusable in its current form. I think all other states did report on a county basis.
    - M. Johnston: Even in states where you have the data for the known years, you will need to use this assumption for the years where you interpolated or back-cast.
    - Razik: I can remember 20-some years ago we applied biosolids in some places that we no longer apply, like Prince William Co. and Howard Co.
        - M. Johnston: If you think that some percentage of biosolids was historically applied in counties that are not currently receiving land application, that can be built into the assumptions. Just provide the locations, estimated percentage of pounds those counties received, and the years they received application.
    - T. Johnston: How do we address Pennsylvania where there is no data?
        - Berger: I want to skip Pennsylvania for now. I will send you the data, which was not supplied by Pennsylvania but pulled from ICIS NPDES. It was created from flow data from the plants and we know it is not accurate. I am hoping we get something from Pennsylvania soon.
        - T. Johnston: A lot of the facilities in Pennsylvania go straight to land fill, so it would be good to have some weighing in from folks who know the region about how good the assumptions are.

7) If county applied is NEVER provided by state, biosolids will be proportioned to counties based on manure eligible crop application goal for that year.
    - M. Johnston: We will skip this for now, so I hope we don't have to use it.
    - M. Johnston: Again, timing of application does not matter much in the Phase 6 Model. The model is not very sensitive to the timing of application. Manure is applied when the crops need it (for example, corn received manure in April).
    - Bill Keeling (VA DEQ): The Phase 5.3.2 Model input files require month-by-month application numbers. Does Phase 6 have that?
        - Johnston: Yes, we still require data to be reported by month, the Model is just not very sensitive to it. I would suggest states provide total nutrients that went down in the county and then find a method that can be applied from 1985-forward to spread that out by month.

Blue Plains Data

Karl Berger (MWCOG) reviewed data on the timing of biosolids land application from Blue Plans WWTP on a range of land uses in Virginia, which was produced by Al Razik of MES.

- **Discussion:**Berger: Can we take data such as this Blue Plains data and use it to distribute the biosolids across the ag land uses over the course of a year? How do we take this data and use it in the sort of application diagrams the Bay Program has developed for manure application?
    - M. Johnston: Yes, looking at Blue Plains, it seems the amount of biosolids going to pasture and hay compared crops is totally flipped compared to manure.
        - Berger: It is. For the most part, biosolids are not stored, so they are going out and being applied every day.
- Berger: This data is Virginia land application. I am not sure it is representative for other states. Do we have anything like this data set for other states?
    - Allison Marong (MDE): We have data similar to this, and I think the graphs would look different because of new agriculture rules prohibiting future application in the fall/winter.

ACTION: MDE will provide Matt with biosolids land use application data aggregated on a monthly basis by the crop to which it is applied, similar to what was presented from Blue Plains.

- Berger: Can we do different curves in each of the different states?
    - M. Johnston: Yes. We would want the data to drive the curves, then this group to make decisions based on both.
- Berger: Let's start with generating curves based on Blue Plains. Another consideration is that this changes based on the county. For instance, counties in the coastal plains,such as Essex, tend to receive biosooids for row crop application in late winter and early spring whereas ounties in the PiedmonT, such as Cumberland, gtend to receive biosolids during the smuumer and fall for hay/pasture applicagtion.
    - M. Johnston: I wouldn't suggest taking these application curves down to the county-level of precision because manure application is not down to that level.

ACTION: Prior to the next call, Matt Johnston will develop application curves for biosolids that are similar to the ones used to simulate manure application. The curves will be based on the Blue Plains data and will prioritize the application of biosolids on grass/hay/pasture over corn and row crops.

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Adjourned

List of Call Participants

Name	**Affiliation**
David Wood	CRC, CBPO
Brian Churchill	DE DNREC

Trudy Johnston	Material Matters
Lisa Boudeman	Material Matters
Aaron Stephens	Material Matters
Alisha Mulkey	MDA
Allison Marong	MDE
Greg Busch	MDE
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Matt Johnston	UMD, CBPO
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James Summers	WV DEP