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NRCS 590 Nutrient Management Standard Team

MEETING NOTES

Thursday, October 26, 2023 ▲ 9:00am – 2:30pm ▲

NRCS, 2912 Red Fox Run, Portage, WI 53901 ▲ FSA Conference Room ▲

SCHEDULE IN BRIEF

9:00 Welcome
9:05 Notes Review
9:15 Manure Characteristics and Variability
10:30 *Break*
10:45 DNR Nitrate Rule Progress and Technical Advisory Committee Summary
11:15 Minnesota Nitrogen Management
12:00 *Lunch*
12:30 Nitrogen Management Issues
Break as needed
1:45 Review Existing Standard
2:15 Meeting Review
2:30 *End*

9:00 **Welcome** (Kate, Team)
Goal: Attendance and review the meeting objective.

Attendance: Kate Brunner, Mike Stanek, Andrea Topper, Andrew Craig, Aaron O'Rourke, Morgan Kepler, Daniel Smith, Matt Ruark, Carl Hahn, Kyle Much, Travis Engels

Absent: Eric Hurley, Sara Walling
Guests: Joel Peterson (remotely)

Please keep in mind this team process:

- Allow each other space and grace. Work through ideas together and allow for "first drafts" and growth in the conversation.
- Maintain a degree of confidentiality with the stories. Individual thoughts stay here; the learning and team work leaves the room.

Input from other outside parties is valuable and part of the SOC process. Kate and Mike will be doing some additional outreach before the draft is ready for review. Kate and Mike have started an outreach list focusing mostly on agricultural interests and they plan to set up some meetings later, likely next summer. If anyone on the team wants to participate in this, let Mike know. If anyone on Team has ideas for who would be good to include in this outreach or would like to participate with some partners, let Kate or Mike know.

9:05 **Notes Review** (Kate, Team)
Goal: Review and approve 9/28/23 draft meeting notes.

Draft meeting notes from the 9/28 meeting were emailed around to the team. No open action items—some literature was sent to team via email and posted on team website, some topics will be discussed in-meeting today.

No comments or questions on the notes. Kate will finalize and post Sept. notes online for public.

9:15 **Manure Characteristics and Variability** (Mike, Joel Peterson)
Goal: Review data to identify variables in manure, including lab data vs book values.

Joel Peterson is a professor at University of Wisconsin at River Falls that has been researching manure composition. He's currently working with Mike Stanek, Laura Good (UW Madison) and Andrew Stammer (WSLH Soil and Forage Lab) on evaluating manure through recent lab data and performing statistical analysis to updating manure values in SnapPlus. Project is still underway.

Some key points of the presentation and team discussion:

- Snap Plus default values are over 30 yrs old and don't reflect changes in productivity, diet, sampling, etc. This new data will be used to update Snap Plus tables.
- The project is to group lab data by waste types for median nutrient concentrations, compare lab data to equation-based estimates, and update default manure nutrient values.
- He looked at information in A2809 (2012) and ASABE Std D384 (2005) and compared with a statistical analysis of both liquid and solid manure samples submitted 2017-2020. For some waste types they have ample data and others still needs more sample collection. Confident with dairy and beef data; other animals less reliable though are still an update from the current defaults.
- Solid manure results – N had some increases from book values and some decreases
    - 11% increase in beef
    - 19% decrease in dairy semi-solids
    - 22% decrease in swine
- Solid manure results – P2O5
    - 35% decrease in dairy semi-solid, no change in dairy solid
    - 15% decrease in poultry
    - 32% decrease in swine
- Liquid manure results – N
    - Gaining N in just about every category
    - Large decreases in both beef and dairy (slurry and liquids)
- Liquid manure results – P2O5
    - Relatively small changes for beef and dairy
    - 47% increase in swine
    - Large increase in poultry (though small sample size)
- Next steps for this project: Compare lab data as excreted to account for volatilization, dilution and other diet changes. Incorporate the data into SnapPlus. Develop case studies.

- Variability in NPK in some samples was huge, due to diet and what happens after excretion. It may not be appropriate to use a book value, though may be a starting point in initial planning.
- They are still working out WHY some of these changes. Data set isn't tied to specific farms to go back and filter out some specific handling, for instance. Leachate was not separated out from the data set.
- See Joel's presentation slides for more information; **Kate** will send PDF of Joel's slides to Team.

10:30 Break

10:45 DNR Nitrate Rule Progress and Technical Advisory Committee Summary (Andrew, Mike)
Goal: Summary of TAC work and components that may assist the standard team.

Andrew emailed the team some information from the TAC that summarized the work toward a proposed DNR rule for background. DNR website on this process is still available online, with links to presentations, meeting notes, and reports: https://dnr.wisconsin.gov/topic/nonpoint/nr151nitrate.html.

Some key points:

- TAC consisted of wide group of stakeholders – DNR, DATCP, NRCS, County conservation staff, producers, environmental groups. Mike was a member of the Technical Advisory Committee.
- TAC summary was presented at a meeting on March 25, 2021: https://widnr.widen.net/s/tvt7wtmtjb/2021-03-25-n-tps-overview-to-tac
- Scope statement in 2019 – develop a targeted performance standard for nitrate to improve groundwater quality. TAC acknowledged that agriculture is important to WI, groundwater is used as drinking water, and a new performance standard would help achieve compliance with the groundwater standard for nitrate.
- TAC work stopped in summer 2021—DNR saw that the 30-month clock for rulemaking wasn't going to be achieved.
- Purpose
  - Identify specific areas to reduce nitrate leaching and loading.
  - "Targeted" since not all areas of the state would be subject to the restriction. The nitrogen restricted soils were proposed to be: P soils (high permeability), R soils (<20" bedrock), W soils (<12" water table), shallow soils (<5' to bedrock), <1,000 feet of community well.
- TAC recommendations
  - Nitrogen leaching limit <2.2 pound/acre of nitrate per acre per inch of groundwater recharge (equivalent to 10 mg/L). Based on a calculation using details like application rate and groundwater recharge rate. Irrigation water included in nutrient management.
  - Prohibition of application of commercial fertilizer or liquid manure to certain susceptible soils during certain times of the year. Some exceptions allowed.

- There were screening criteria of well sampling data to identify these susceptible areas. DNR has an online mapping tool to identify the nitrogen restricted areas and proposed targeted areas: Groundwater Nitrogen Targeted Areas of Wisconsin. https://wi-dnr.maps.arcgis.com/apps/webappviewer/index.html?id=fea5c014a9dd4a6f901140b05e317b6e
- One TAC output was the Reidel paper on cover crops, now posted on SOC website and **Team** should review. https://socwisconsin.org/wp-content/uploads/2023/05/Reidel_NTPS-Annotated-Bibliography-FINAL-DRAFT-web-upload.pdf. Use of cover crops traps residual nitrate and provides more flexibility on NM. This paper also includes groundwater recharge. If Team wants more information on groundwater recharge, either Joe Baeten or Kevin Masarik could present to the team.

11:15 Minnesota Nitrogen Management (Mike)
Goal: Review the Minnesota Nitrogen Management Strategy in TN 32.

As an action item from the last meeting, Mike was going to reach out to MN state agronomist for insight into how regional implementation is working for them. MN has a recent Tech Note 32 that was sent to this work team as part of meeting preparation. Some key points of team discussion:

- The MN NRCS tech note has some useful information for WI to consider adopting:
  - "Permeability" is a general reference. Ksat is more accurate though it's infiltration, and is not a field test. Ksat is depth specific and captures impacts from management (like cover crops, compaction, etc.). P soils in soil survey are moderate to very rapid permeability rates from permeability charts—this method used to simplify the approach. SnapPlus uses soil survey values; using Ksat would be more accurate.
  - MN broke their state into 5 regions with different application timing to meet the new national standard risk-loss approach. Their system accounts for both N and P losses. The regional divisions account for differences in general soil/geology and climate. The regions each have subset of restrictions by soil type for commercial fertilizer and manure.
  - Nitrogen cycle is complicated and the MN tech note has a graphic on the nuances and relationships. Masarik total nitrogen budget calculator is a tool that considers a lot of factors. This could be part of a supplemental guidance to the 590 standard, though there may be some input from UW and national information as well.
  - Setback summary table is helpful to have information in one place.
- The MN P Index is very different from Wisconsin's. WI P Index wasn't developed for water quality but that information is being extracted/extrapolated.

12:00 Lunch, provided

12:30 Nitrogen Management Issues (Mike)
Goal: Discuss options for nitrogen management in updated standard.

Earlier in the meeting the team learned about manure characteristics and nitrogen issues in Wisconsin and Minnesota. This informs updates on N management aspects in the technical standard. Standard purpose includes reducing excess nutrients to surface water and to groundwater. There are corresponding criteria and considerations.

Key points of the team discussion:

- Manure sampling is inexpensive and quick; however, in some cases the planning needs to start when sampling isn't possible. A single sample also may not be a representative snapshot (like more dilute) so an average of a few samples over the course of a year would have more meaningful data.
- **Book values** have a place and are still needed as a starting point (preplanning, initial planning), but would not be allowed after first year. If book values are used the spreading is more restrictive—sampling is very likely to save money in the long run.
    - Values for grazing farms would be as extracted; not sampled. Book values are appropriate for grazing application.
    - **Mike** and **Kate** will prepare revised standard language to cover changes discussed related to the use of book value.
- **Manure sampling** specifics
    - All manure sources (e.g., liquid and solid and bedding pack) for mechanical applications would be tested separately to complete the plan.
    - First year sampling clarifies the plan for the second year, and so on. Sample over 3 consecutive years to establish an average (as in current std). Rather than stopping sampling at that point, team decides to include ongoing sampling.
    - Frequency - Sampling could be per application, or 2x per year in spring and fall, or one per year. 1 solid sample per year, 2 liquid samples per year.
    - CAFOs have sampling requirements; NR 243 requires annual sampling. Standard (tech note?) could include parameters for a sampling plan like how many samples, when and where sampled, agitated or not.
    - Current standard references Extension Publication 3769 Recommended Methods of Manure Analysis. **Team** should review this document and see if this would still be followed.
    - Parked: sampling specifics will be clarified further at a later meeting.
- Item (h) of current WI standard has a lot of allowances for nitrogen. Team discusses the exception for additional N in starter and wants to carry that forward. 20 pounds is the minimum ability for most mechanical applications.
- Item (i) of current WI standard:
    - Statement is overall confusing – both how it's worded and the external references. Needs clarity.
    - Tech Note Table 2 developed from Carrie Laboski's nitrogen utilization work needs updating.
    - 2nd paragraph ("Where excessive rainfall…") needs much more clarification and is unrelated to the 1st paragraph.
    - The Tech Note Appendix 3 calculations when over UW recs (like for excessive rainfall) are not calibrated to Wisconsin and some aren't feasible (like in sands or late season corn). Team doesn't want to remove this concept but needs clarity, like guidance on what to do with PSNT testing results.

  - The 46 pounds per acre of in-season supplemental N is very precise and likely from Laboski research. There may be other publications to consider, for example the PSNT Table 6.6 of A2809 or Table 11.3 of A3588 have different rates.
  - **Mike**, **Aaron** (and incorporate **Matt**?) will look at Table 2 nitrogen utilization and Appendix 3 adaptive nutrient management to draft up clarification and correction to the exiting language related to N cycling and documenting N need. They will present proposed revised standard language at next Team meeting.
- Item (j) – includes 2nd year legume. Why not 2nd year nitrogen **manure** credits used (see CAFOs)? Team would like to look at including first and second year manure credits--it makes sense but need more information and discussion on what data to use?

Break as needed

1:45 **Review Existing Standard** (Mike)
Goal: Identify components of Section A. Criteria for Surface and Groundwater Resources and B. Criteria to Minimize Entry of Nutrients to Groundwater to carry forward into the next draft standard.

Portions of this topic were incorporated into earlier discussions; see notes above.

2:15 **Meeting Review** (Kate)
Goal: Identify topics/goals for the next meeting and review Action Items.

Next meeting date is Nov. 30 in person at the Columbia County office in Portage (112 East Edgewater Street). Topics on the agenda in November will be to build foundational knowledge on the changes to the standard, though not too basic. Possible topics:

- N management – Team acknowledges there is a nitrate issue, the work for the standard is how to minimize and team wants to understand more about tools that might be incorporated into the standard.
  - Kevin Masarik at UWSP has a nitrogen decision support tool for use statewide. **Kate** will ask Kevin Masarik to join a team meeting to speak about his nitrogen tool.
  - Chris Kucharik worked with other researchers on nitrogen decision tool for the central sands. He had webinar that explained this and Team could review outside of a meeting. Kate will get the webinar link (from Andrew or Chris).
- DNR nonpoint program website has a nitrate webinar series – **Kate** will send team the link. Team understands that nitrates are bad and should focus more on what to do about it, though these webinars can be used to inform what edits to make in the standard.
- **Kate** will ask Kevin Masarik to come speak to the 2.2 pounds/acre nitrogen leaching number (TAC recommendation). Joe Baeten is also a resource for this topic. Team will get information to discuss if that is integrated that into the standard, and how?
- Cover crops and nutrient cycling and unknowns (different crops, new planting strategies) – Matt Ruark.
- Davina Bonness at Kewaunee Co has many years of groundwater data and could present on trends for N and pathogens and Silurian bedrock area, including analysis before and after their winter spreading ban. **Mike** will follow up see if there are bullet points for preliminary summary.

No Dec. meeting due to holidays. Jan. 25 meeting will also be at Columbia Co office conference room.

January meeting will include Laura Good presenting on the P Index. At Nov. meeting, expect homework about P Index –slides from Laura, and research/evaluation on P trapping practices (like filter strips, contour buffer strips, diversions, grassed waterways).

Action Items developed today:

1. **Kate** will send the Team a PDF of Joel Peterson's presentation slides: https://socwisconsin.org/wp-content/uploads/2023/11/Peterson_manure-char-presentation_OCT2023.pdf .
2. **Mike** and **Kate** will prepare revised standard language to cover changes discussed related to the use of book value. Report back at future team meeting.
3. **Team** should review the Reidel paper on cover crops: https://socwisconsin.org/wp-content/uploads/2023/05/Reidel_NTPS-Annotated-Bibliography-FINAL-DRAFT-web-upload.pdf to prepare for upcoming discussion related to cover crops in the 590 standard.
4. **Team** should review Extension Publication 3769 Recommended Methods of Manure Analysis and identify what portions are pertinent to the technical standard. This will inform discussion of parked topic on sampling details.
5. **Kate** will send team the link to DNR's nonpoint program nitrate webinar series: https://dnr.wisconsin.gov/topic/Nonpoint/aboutAgNPS.html . **Team** should review in particular the webinars dated Aug 6, 13 and 20 to inform discussions at future team meetings.
6. **Kate** will send team link to nitrate mapping tool: https://wi-dnr.maps.arcgis.com/apps/webappviewer/index.html?id=fea5c014a9dd4a6f901140b05e317b6e.
7. **Mike**, **Aaron** (and possibly **Matt**?) will look at nitrogen utilization and adaptive nutrient management (like item A.1.i in current standard) to draft up clarification and correction to the existing language related to N cycling and documenting N need. Report back at Nov. team meeting.
8. **Kate** will reach out to Kevin Masarik for presentation to the team, potentially the Nov. meeting.
9. **Mike** will ask Kewaunee Co. if they have a summary of the groundwater data trends for N and pathogens relative to manure spreading restrictions in the Silurian bedrock area. Possible presentation.
10. Carried over from last meeting: **Mike** is coordinating with Laura Good to present on P Index (and SnapPlus?) at January 25, 2024 meeting.
11. **Kate** will prepare draft meeting notes then reviewed by full **Team**.
12. **Kate** and **Mike** will prepare agenda for Nov. 30. Kate will send to the full team with preparation materials 1 week in advance.

2:30 End