



Standards Oversight Council (SOC)

Supporting Technical Standards for Urban and Rural Soil and Water Conservation

702 E. Johnson Street, Madison, Wisconsin 53703
(608) 441-2677 || Fax (608) 441-2676 || soc@wlwca.org || socwisconsin.org

590 Nutrient Management Standard Team

DRAFT MEETING NOTES

Tuesday, June 11, 2013 || 9:00am – 3:00pm

Attendees: Pat Murphy, Terry Kelly, Matt Zoschke, Todd Schaumberg, Tony Smith, Sara Walling, Kevin Masarik, Sue Porter, Nikki Wagner, Carrie Laboski, Andrew Craig, Mary Ellen Vollbrecht (substitute for Laura Chern). Not present: Joe, John, Laura.

RUSLE 2 Leaching Index – Evaluation of efficacy across regions and landforms of the state

Terry presented information and led a discussion on the input values used to calculate the Leaching Index (LI) in RUSLE2. We discussed LI in RUSLE2 and loss of N to groundwater. Handouts were provided that compared the leaching index with certain problematic soils identified in Wisconsin Conservation Planning TN-1.

It was challenging to find much information regarding the leaching index in RUSLE 2, particularly the equations that created the formulas in the model. We do know that the equations used in the NY Leaching Index are the same equations used in RUSLE 2. We are not clear how they came up with those equations. Questions/emails have been sent to NRCS staff to determine more.

Leaching Index is a product of the percolation index (annual precip and soil hydro class) and seasonal index. There is concern about the average temperature used as part of formula for reaching the N leaching index. This temperature for fall/winter precipitation uses the daily average temperature to get the sum of precipitation during the period when there is not much active vegetative growth (Oct – Mar), and therefore the plants are not actively taking up nitrogen. The default is 50 degrees F. The team was perplexed that the precipitation was tied to soil temperature. There is also question about whether the temperatures listed are for soil temperature or air temperature. Supposedly the temperatures are for the soil temperature and the data appears to be air temperatures.

In reviewing a series of model runs on various soils, it appears we have a problem with the muck soils in their determination of LI. Rule of thumb – sands have high or moderate risk; wp distinctions (wet and permeable) are listed as not high, even though they should be. Hydrological soils A could be the problem. How many soil types are in the moderate range that are not being flagged? W soils aren't considered prone to leaching, so are they going to be lumped? Terry will run the model on additional soils known to be moderate leachers and bring the results back to the team.

The team is not sure just what the LI provides. The team also looked at the ARS Nitrogen leaching index. Terry to send out link for where to download the N Index program.

<http://www.ars.usda.gov/services/software/download.htm?softwareid=426>

Existing WI 590 standard

The standard is all about activities to mitigate risk. What do you do when you have moderate or high risk? The team is leaning toward keeping our current system of using the 590 restriction maps, as they appear to be more accurate and provide a better risk assessment of N leaching. Current 590 restrictions

do a pretty good job of risk assessment, except for karst areas. Current WI restrictions are better at protecting the resources than RUSLE 2. We will need to have more discussion on how to fill the gap of defining risk in karst areas. Should groundwater conditions or resource conditions be another factor in defining risk, not just soils and precipitation? If we know groundwater is impacted, but the soils tell us that they shouldn't be impacted, what do we do? Check for over application (not following standard), spills, and other anomalies.

Recap: The model shows many of our soils as moderate risk for leaching at best, but team feels the model does not accurately portraying risk assessment. The way the data is presented is not an accurate assessment based on our crops and growing season. Moving forward, we plan on using our current risk assessment. We will need to provide documentation as to why we are not using the RUSLE 2 LI. Given that we have a reasonable assessment, how do we respond to ground water impaired areas.

Continuation of Nitrogen Management Discussion

The above discussion led into a broader N management discussion. Team may want to review [Nitrogen in Agricultural Systems: Implications for Conservation Policy](#).

The team reiterated that the most important issue in NM is making the standard implementable, and possibly focusing on areas where we would have the most impact. There is concern that we only have 22% of our farms with NM plans right now. So we can't know the overall effectiveness of the standard if 78% of the farmers aren't using it. Wisconsin needs more effective marketing or incentives to attract more farmers to implement the current standard. How can we adapt the standard to make it more implementable? The team is also asking for what data is available that assesses the environmental and behavioral effectiveness of our standard. Ken Genskow's 2006 article provides data on farmer adoption of the practice.

Following the 590 standard provides guidance for the base level of protection; conservation planning is the next level of management. We need an enhanced 590 for NRCS cost-sharing, which may include additional BMPs for sensitive areas, in particular karst and wellhead protection areas. Adaptive nutrient management (BMP flexibility) will come into play at this next level of management.

The team suggested reformatting Criteria B into a Table with BMPs as rows and resource concerns as columns across the top. Terry and Pat will draft this chart for discussion at the next meeting, and will provide to the team by the end of June. The team also wants farmers on this team to weigh in on the presentation of the information and how it would be most useful, a chart or a model. How do you define the karst areas? You could define karst areas as depth to bedrock or percentage of area, although 20" or less is not sufficient. We may put more information in considerations about karst issues or in tech note. We need to plan for the highest level managers.

Below is a rough draft of what was discussed as an option:

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DATCP Richard Castelnuovo (608) 224-4608	WDNR Gretchen Wheat & Mary Anne Lowndes (608) 264-6273	NRCS Pat Murphy & John Ramsden (608) 662-4422	UWEX Ken Genskow (608) 262-8756	WLWCA Reps Perry Lindquist (262) 548-7867 & Bruce Olson (608) 785-9867	WLWCA Jim VandenBrook (608) 441-2677
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Soil Risk Class/ Resource Conditions	W; wet soils	P; highly permeable soils	R; rocky soils	Tile	Karst features	Well head	SWQMA
BMPs							
Timing							
Source							
Rate							
Place							

Kevin will help draft a disclaimer for the table that this standard will not necessarily address resource concerns in high risk areas.

Manure Ammonium N content (Criteria) –

From Team Charge: To meet the requirements of the current NRCS national practice standard, manure analysis must include available Ammonium Nitrogen content. Ammonium N is immediately available for conversion to Nitrate N in the soil which can easily be lost by leaching.

Since the last 590 standard revision farms are now producing a wider variety of manure types, liquid vs. solid manure. Liquid manure tends to have more Ammonium N.

National standard requires testing manure for Ammonium N, but does not say what to do with it. UW recommendations in A2809 acknowledge that manure with less than 2% dry matter has higher Ammonium N content. If manure is injected or immediately incorporated, then there is higher N credit. Injected manure could decrease Ammonium N volatilization, but could increase denitrification. Are there practices that we should suggest to mitigate risk of leaching? We have a limited database on the ammonium content, because there are not many samples being tested for it. There is concern that we don't have enough data.

CAFOs are required to test for Ammonium N. The team would like Andrew to summarize how DNR uses ammonium N tests. The equipment to get to 2% dry matter and high ammonium content is probably not available to non-CAFOs, and therefore may only be a concern for larger operations. However, some smaller farms are receiving and applying off-farm sources of manure, which may be liquid manure.

We need to determine reason for having this information from ammonium testing. Is there inherently more risk with higher Ammonium N? Would the purpose just be educational? Or do we request farmers to install a BMP because of their ammonium content. We could suggest another BMP for high level managers who test for ammonium N, and put the BMP into the table as a practice for high level managers.

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What about fall application window? Historically, many dairies were not present in the sands. How do other states handle their CAFOs? Minnesota does have a lot of sand and cows. Carrie will call John Peters and Jerry Florien (MN) and ask why MAP doesn't test for ammonium. The concern is that there is a risk for immediate leaching loss of Ammonium N and nitrate. Carrie will let us know if it's a viable test. Producers will let us know what impact the NH4 test will have besides cost. The team could pursue recommendations depending on test results in the Tech Note.

How does dry matter affect N availability? Nitrogen is available to plants in the nitrate and ammonium form. There are challenges in regulating manure in the same way as fertilizer because of great variability in nutrient content and availability. The NR 243 permit can regulate manure and processed wastewater, but not fertilizer.

The team will have more discussion on testing for ammonium N at the next meeting after we have more information.

Soil Sampling requirements

Some farmers would prefer to take fewer soil samples than required. Changes in herd size may require more sampling. If herds are staying the same, then maybe less samples are needed. There have been recommendations for the team to consider something less rigid. Farms need to start with the recommended soil samples, but is there a way the frequency could be lessened for certain operations?

The soil sampling protocol in A2809 was reviewed and clarified for soil sampling intensity. To determine the number of samples needed divide the size of field divided by 5, and round down or up. See chart below. A2809 also outlines recommendations for sampling by conservation management units. Sue will call Laura Ward Good about SNAP Plus to change soil sampling intensity in model.

# of acres	Divide by 5	# of samples
1	0.2	1
2	0.4	1
3	0.6	1
4	0.8	1
5	1	1
6	1.2	1
7	1.4	1
8	1.6	2

Given the clarification on soil sampling intensity above, this should provide farmers with added flexibility.

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A draft suggestion to consider: If soils test below optimum levels, then environmental risk is lower and farmers can test less frequently, but a disclaimer is needed that less frequent testing is not for agronomic reasons. There is a difference between agronomic or environmental risk for certain farms, particularly smaller farms not increasing their herd size.

Include the following draft language under Criteria A.1.c.: If soils tests below optimum (define specific ppm, because of crop), the interval between soil tests could extend to the full length of the rotation or up to a maximum of 8 years.

NRCS will craft an option/draft language, and team will consider loop holes that it could create. NRCS will bring back a draft for the group to react to and have farmers react to.

ATCP 50 rule on pastures: UW guidelines for soil sampling on pastures suggests not sampling within 60 feet of animal congregation areas (trees/shade, supplemental feed, watering station), and consider those areas as a separate conservation management unit. Farmers would sample animal congregation areas as one conservation management unit and the other pastures 20m from those areas as additional conservation management units.

Next Meetings: Meeting dates with draft agenda items.

July 17 at Hancock Ag Research Station.

- Nitrogen Management
 - Adapt N review. Risk Assessment component. 30– 45 min.
 - Review additional RUSLE 2 LI runs for moderate soils from Terry.
 - Review BMP table for groundwater.
- Manure Analysis – Ammonium N
- Review Soil Test Recommendation Revisions – Review soil testing intensity clarification (chart for farmers) and frequency (drafted language).
- Groundwater risks for fall application - regarding MAP and DAP. Team would like farmers to start talking to co-ops and other folks about not having N in fall fertilizers, and requesting triple super phosphate. Team members could possibly talk with Agribusiness Council.

Aug 21 Koepke Farms. Farm tour during lunch, lunch maybe 1 hr to 1.5 hrs.

- Koepke farm is mainly no-till operations with lots of wellheads. Reminder to bring restriction maps to refer to during tour/discussion. (Sue to bring maps)
- Tile Drainage, Potential for transport of nutrients to tile
- Manure Land Base Estimate (Plans & Specs) – strategy if farm doesn't have adequate land base to spread manure produced on farm

Sep 18

- Winter Spreading Risk Assessment (manure irrigation, setbacks, shallow bedrock)
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- Irrigation Water

Oct 16

- Winter Spreading Risk Assessment
- Air Quality

Nov 12

- Phosphorus
 - Impaired watersheds, SWQMAs, damns, aligning WI 590 with NR243?

Dec 10

- Adaptive Nutrient Management
- 590 Alternative Format, consider simplified/tiered plan.

For each meeting we'll begin collecting additions to the Tech Note – BMPs for NH4, karst issues, etc.

Action Items:

- Terry will run the N Leaching Index model on some additional moderate soils and bring the results back to the team.
- Terry to send out link for where to download the ARS N Index program:
<http://www.ars.usda.gov/services/software/download.htm?softwareid=426>
- Team members may want to review [Nitrogen in Agricultural Systems: Implications for Conservation Policy](#).
- Terry, Pat, and Andrew to draft a BMP chart for ground water protection, ready to send to the team by end of June. If time allows they will start drafting a similar chart for surface water.
- Kevin will help draft a disclaimer for the table that this standard will not necessarily address resource concerns in high risk areas.
- Reminder about [Nitrogen Use Efficiency Conference](#) in Kansas City Aug 13 -15.
- Andrew to summarize how NR 243 uses ammonium tests.
- Carrie will call John Peters and Jerry Florien (MN) and ask why MAP doesn't test for ammonium.
- Sue will call Laura Ward Good about SNAP Plus to change soil sampling intensity in model to clarify sampling requirements and allow greater flexibility.
- NRCS will craft an option/draft language on soil sampling frequency and bring to next team meeting for review.
- Gini and Sue to discuss how to start editing language in 590 standard, and keeping track of edits versus sections/topics of discussion.

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