Nitrogen Management Project Protocol: Reducing Nitrous Oxide Emissions through Improved Nitrogen Management in Crop Production

Version 2.0 – Public Comment Draft – August 1, 2018

Neville Millar – submitted August 31, 2018

I am pleased for the opportunity to submit public comments to the Climate Action Reserve on Version 2.0 of Nitrogen Management Project Protocol (NMPP v2.0). CAR is to be commended for assembling a comprehensive nitrogen management offsets protocol that in general is robust, verifiable, conservative, and based on the best-available peer-reviewed science. Nevertheless, there are several major issues I believe need further clarity and revision if the protocol is be useful and used; several elements of this version will likely significantly reduce the potential uptake of CAR's approach by farmers.

General Comments and Suggestions

- Allow projects to either reduce N rate or use an EEF in appropriate crops / locations. I understand the use of EEFs is de facto additional, given that it is not common practice. Currently I understand this is a modeling limitation, as opposed to an absence of evidence for EEF efficacy.
- Expand the list of eligible county / crop / management combination options as soon as possible after relevant information from publications is available
- Remove the requirement of the NUE metric to determine eligibility. This test is overly prescriptive, somewhat complex, likely restrictive (especially to 'bad actors'), and somewhat unfair, particularly when used ex-post with a threshold based on county statistics. Simpler BMP approaches as encouraged in the protocol are more agronomically appropriate.
- Exclude the requirement for leakage (shifting crop production) calculations. They are onerous and again rely on ex-post, county based statistics.
- Credit reductions in organic N rate equally to synthetic N rate. There is sufficient literature evidence that N2O response to variable organic N rate is consistent with synthetic organic N rate. The protocol uses a synthetic N based eqn. (5.16 - MSU-EPRI algorithm) to calculate emissions increases associated with increased organic N rate; why not for reductions in N rate? If not already done so, I suggest checking whether there are scenarios where the use of this Tier 2 eqn leads to actual increases in project emissions, even though organic N has been increased by less than synthetic N has been decreased (i.e., still an overall N rate reduction).
- Has consideration been given to using available organic N (and not total organic N) in a cultivation cycle as an input metric?
- Allow all producers who have switched to no-till (irrespective of duration [maybe 3-5 years, but not 10] and crop / region scenario) and who are otherwise eligible, to participate. This change in practice is predominantly beneficial and should not be a reason for exclusion; model prediction or otherwise.
- Clarify in one location in the protocol (glossary?) whether the terms cultivation cycle, crop year, annual, and season are used synonymously. Maybe also limit the number of these terms used.
- While 4R practice adoption is encouraged, there are conflicting disincentives (or at least not compatible requirements) to this in the protocol (e.g., split application and the

requirement to quantify emissions associated with multiple passes). Even if de minimis, more calculations and effort required.

- The use of EEFs in the look back period as an exclusion for their credited use during the project period should be relaxed. I understand that any use of any EEF on any crop during the look back period [even if the crop is no longer part of the rotation?] excludes its credit. Again, I understand that this is a modeling restriction at this time.
- Quantify and allow credit for percentage reductions in synthetic (and organic) N rate in single units (i.e., 1% increments), as opposed to rounding down to the nearest 5 or 10%. Currently, this appears to be a further disincentive to increased N rate reductions (e.g., a 19% reduction would only be credited for 15%?).
- Revise the NMQuanTool to accommodate finer % N rate reduction increments and expand range beyond 30 (or 50%?).
- Clarify whether an ex post exclusion of one reporting period counts as one of the 10 reporting periods of the crediting period?
- Reduce the look-back period to require 2 and not 3 eligible cultivation years; relying on historical farmer records preferable and more reliable to approaches 2 and 3.

Specific Comments

- Footnote 31: "deducted" not "deduced"
- Section 5: appears to be inconsistent use of percentage reductions for use with the NMQuanTool (is it to the nearest 5 or 10%; hopefully former, but ideally nearest 1%!).
- 5.3.1 (1st para): "…nine years (two eligible cultivation years of a three-crop rotation)…" should this be three?
- 5.3.1 (2nd para) "…Section 5.3.2 for each eligible crop…"
- Table E2:
    - Column "Direct N2O" units. Are they Mg CO2eq per acre?
    - Increasing N rate reductions appear to result in a linear decrease in N2O emissions (0.024, 0.048, and 0.072 at 10, 20, and 30%, respectively). This modeled output is compatible with a Tier 1 EF, but seemingly incompatible with the Tier 2 EF eqn (5.16) used for organic N increases in corn in the NCR? Should these be consistent?
    - The 'additional' reductions (0.154 Mg CO2e per acre) when using an NI in combination with N rate reduction, compared to N rate reduction only are surprisingly high (~6 fold and ~3 fold greater at 10% and 20% N rate reductions, respectively)? Assuming the above units are correct a 10% reduction in N rate would lead to only a ~0.05 kg N2O-N reduction, but in conjunction with the use of an NI this reduction would be ~0.4 kg N2O-N. Are these model output values (singly or in combination) compatible with literature values? This small credit for N rate reduction would seem to offer little incentive for management change.