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Comments on the CAR Nitrogen Management Project Protocol (NMPP) Reducing Nitrous Oxide Emissions through Improved Nitrogen Management in Crop Production, Version 1.0

Dear Teresa and Members of the Climate Action Reserve:

Thank you for the opportunity to serve on the Working Group and to comment on the public review draft of the Nitrogen Management Project Protocol (NMPP) recently released for comment. Camco commends the way the Climate Action Reserve has gone about the process of bringing together stakeholders, scientists and experts to develop a protocol that can incentivize beneficial practice changes on American farms.

Camco is a global developer of emission reductions and clean energy projects. In the United States, we have developed a portfolio of landfill gas and dairy digester projects which generate clean energy while reducing greenhouse gas emissions. We have also invested time and resources preparing to become an aggregator of greenhouse gas (GHG) offsets from farm nitrogen management. Camco has funded research and development work at USDA's National Lab for Agriculture and the Environment and created the Nitrace Program (www. Nitrace.com) to help corn growers access environmental markets. We are currently working under a USDA Conservation Innovation Grant with the Fertilizer Institute and others to evaluate and road test several nitrous oxide emission reduction protocols. Our team has travelled across Iowa and Illinois over the last year talking to growers, crop advisors, fertilizer and chemical retailers, and other technical service providers in an effort to understand the challenges involved in helping incentivize enhanced fertilizer management.

We applaud CAR for deciding to develop a protocol for generating offsets through nitrogen management on farms. The size of the source is significant – nitrous oxide emissions from cropland soils total over 200 million tons of CO2-e annually and mitigation potential is high as well. Harnessing the market to incentivize adoption of GHG best management practices will also reduce nitrogen loading to rivers and streams. Greater environmental benefits will result when CAR addresses the comments contained herein and approves additional project activities utilizing more advanced methodologies capable of crediting a broader range of best management practices.

OVERARCHING GENERAL COMMENTS

Comment 1. The NMPP is wisely designed to evolve over time to incorporate new quantification approaches as they mature. This current version only applies to corn fields where a majority of N_2O emissions from soils occur. In addition, the current methodology only quantifies reductions related to a decrease in the total rate of N application. However, we know that good nitrogen management involves all of the 4R's of nutrient management; The Right Rate, at the Right Time, in the Right Place, and from the Right Source of N. Other N management practices based on the rest of the 4Rs should be rapidly developed.

Comment 2. New methodologies should be allowed and fostered to establish a more complete basis for measuring N2O reductions in Midwestern corn production. It is more important to get the corn belt methodology correct than it is to prioritize work on other crops and regions where the potential reductions are much lower. This must be a priority in order to drive adoption and acceptance of this Protocol. Experience has shown that growers are more willing to hear about approaches to enhanced N efficiency when a broader management approach is planned. A singular focus on rate reduction is unlikely to lead to broad participation, but rate reduction taken as part of a broader suite of activities will lead to better grower acceptance.

Comment 3. Developing a protocol like the NMPP requires a number of policy decisions to be made with careful attention to details. Experience and judgement are drawn on to reach the right balance between transparency against accuracy; between inclusion and exclusion, between risk and reward. Each individual decision may have a small impact on the overall protocol, but taken in aggregate, all those small decisions can add up to big problems for successful implementation and widespread adoption.

This protocol will be a challenge to implement at scale. A number of factors make it difficult to drive down emissions from corn production with this type of approach including:

- Fertilizer is the most important variable farmers can control to ensure high yields at harvest. Asking a grower to reduce N application rate raises real concerns that the overall yield may be reduced.
- Midwestern fields can produce 170 or more bushels of corn per acre, but most farms will generate less than 1 carbon credit per acre. Offsets cannot compete with cash payments for crops, especially when corn prices are near record highs. A methodology that covers a wider range of practice change based on the 4Rs of nutrient management and that emphasized increasing nitrogen use efficiency would be more readily adopted.
- The potential credit value generated by the NMPP is modest. Driving behaviour change with such a small financial incentive is very difficult.

- Individual farms are unlikely to be able to take advantage of the NMPP. The transaction costs are too high for individual farms and the protocol requires aggregation to reduce uncertainty.

Comment 4. At a time when international best practice is moving towards ever-simplified, easily-monitored and easily-verified climate protocols, this protocol clearly goes against the trend. As, for example, the UNFCCC's Clean Development Mechanism (CDM) Executive Board moves towards simplified methodologies, standardised baselines, and significant reduction of transaction costs for aggregating, generating reductions, monitoring and verifying those reductions from small-scale activities, this protocol would impose far more time-consuming, far more onerous procedures.

Comment 5. The vast majority of offset protocols have been written for point source quantification – very few have been prepared to measure environmental benefits from a program of small scale activities enacted over broad geographic areas with multiple project participants. The fundamental principles of a point source approach are not very relevant to bundled or aggregated small-scale activities that each have multiple sources of emissions and each of which can only be viewed, from a protocol's perspective, as parts of a whole. Treating each field as a point source puts enormous burdens on both project participants and aggregators in terms of data requirements to set baselines and to monitor, report and verify any emission reductions against those baselines.

Comment 6. Point source protocols tend to require in-depth site visits to complete verification but Programs of Activities (PoA) under the Kyoto Protocol are verified under a different approach that relies more on desktop reviews and programmatic verification. The reason for this is that highly accurate verification can be accomplished without travelling to each location, and because the costs of traditional boots-on-the-ground verification can exceed the value of the credits being generated, thereby eliminating the incentive for practice change.

The approach to verification contained in NMPP v1.0 is based on verification of point sources where the costs of a field visit are warranted by the large number of credits originating at a single point. It will not work when applied to a large aggregate. The costs of verification would exceed the value of the credits and the project will collapse from excessive verification costs. An example is provided in the detailed comments to illustrate the impracticality of the current verification model.

Comment 7. The NMPP does not provide enough incentive to overcome natural obstacles to its adoption. Changing fertilizer management practices is a big "ask" of farmers and requires sufficient incentive to risk lowering yields. The combination of strict performance standard, short crediting period (in some cases less than 5 years), and high verification costs will discourage adoption.

Comment 8. This protocol uses a simple metric – reduction in emissions of N_2O per unit of land (acre) – for crediting. This is not the appropriate metric when dealing with ever increasing demands on farmers to supply food, fuel and fiber for an expanding population. In a situation where over thirty years of intensification of corn yields per unit of land in the targeted area (the US Midwest), a more appropriate unit of measuring emission reductions is nitrous oxide reductions per unit of output (lb N_2O-N/bushel). Greenhouse gases attributable to land use cannot be dealt with in a point source manner. If rate of application is to be used, then, that rate should be measured against output, not against a unit of land to which it is applied.

Comment 9. Given the concerns articulated above, it is Camco's opinion that practically, realistically, this version of the protocol will not be successfully adopted by corn growers and their aggregators. The transaction costs (data collection, baseline development, monitoring, verification) are so high and so complicated that very few farmers will utilize this protocol to obtain emission reduction credits for improving their nitrogen use and management. A key test to any protocol must be its relative ease of application and utilization by the target participants. The more complex and difficult a protocol is to apply, the less it will be utilized and the less relevant it is to its target audience. This protocol, in its current format, fails on these counts.

Comment 10. CAR should seek professional review and comments from auditors and approved verification service providers. The verification approach outlined in NMPP ver 1.0 could be aligned with standard procedures from the insurance industry's approach to fraud detection, including an assessment of the risk of fraudulent reporting and gaming. Corn growers and aggregators will gladly accept harsh penalties for misreporting in exchange for a presumption of good faith efforts.

Comment 11. Car should continue the work of the Science Advisory Committee and the Working Group.

DETAILED COMMENTS

Section 2.1.2. Aggregation

Comment 12. The Protocol states: "*aggregation allows for "economies of scale" within the methodology, allowing streamlined requirements for individual farmers while upholding rigorous quantification and verification standards at an aggregate level. This is primarily accomplished through pooling uncertainty and sampling fields for verification activities.*"

The concept of pooling uncertainty and cost is found at the beginning of the Protocol. But, then, it is cast away by the extremely detailed and extensive record keeping, data collection, data analyses, and data monitoring and verification such that it eliminates the benefit of aggregation. Likewise, it is difficult to believe that any single farmer

would have the inclination to pursue this, as the costs and level of effort to qualify are so onerous.

Section 2.2.1 Defining Field Boundaries

Comment 13. "*...N fertilization composition, rates, placement, and cover crops must be implemented consistently throughout the field.*"

Field definition should not preclude strategies to reduce N_2O emissions within the field. The footnote allows for use of precision or variable rate technologies but as written would exclude other techniques used to target specific areas of the field where moisture and soil characteristics combine to create an emission "hot spot." In the current draft this could include manually adjusting application rate on certain portions of a field and in future versions of this protocol, additional practices such as applying nitrification inhibitor products could/should be allowed within a field. Localized variances of application rate greater than +/- 15% may be justified as effective strategies to reduce N loss. CAR should increase the 15% limit on variations within field.

Comment 14. CAR should reconsider the definition of a field, recognizing that in most cases a field is defined in legal documents already as part or all of a parcel of land within a given Section or county. Any clearly referenced geographic area adequately defined and supported by aerial and satellite photography and used consistently across the baseline and crediting time period should satisfy the protocol's criteria.

Section 2.2.4 "Leaving an Aggregate"

Comment 15. "*Fields can switch their participation to another aggregate during a crediting period if and only if...3. The aggregator breaches its contract with the project participant.*"

Who determines if the contract has been breached? What if the Aggregator and project participant disagree?

Section 3.3 "Crediting Period"

Comment 16. Selection of the crediting period is an important element in the design of a protocol and can have a powerful impact on adoption. Too short of a crediting period may leave an insufficient incentive for real change in behaviour. Corn growers in the Midwest face increasing variability in weather, increasing volatility in prices and an ever changing global economy. Many farmers will phase in change slowly after running field test trials to determine if there are any yield impacts. A longer timeframe for crediting will better allow growers to evaluate results and confirm the gains in nitrogen use efficiency.

Section 3.5.2 "The Legal Requirement Test"

Comment 17. "*Attestations of Voluntary Implementation must be signed and submitted to the Reserve...each time the project or aggregate is verified*." An single attestation at the beginning that 1) implementation is completely voluntary, and 2) that any future change in the voluntary nature of the practices will be promptly reported, should suffice without the need for resending the same letter every year.

Table 4.1 "Description of all Sources, Sinks, and Reservoirs"

Comment 18. "GHG emissions from cultivation equipment." Consider excluding changes in diesel fuel use from the list of SSRs. These types of changes will be de minimis compared to total farm fuel use and inclusion only adds unnecessary complexity to the protocol with no real benefit to the environment.

Comment 19. "GHG emissions from fertilizer transportation." Consider excluding indirect lifecycle calculations of transportation emissions. Changes in diesel fuel use will be de minimis compared to total farm fuel use and inclusion only adds unnecessary complexity to the protocol with no real benefit to the environment.

Section 3.5.1 "The Performance Standard Test"

Comment 20. The performance standard used for the NMPP is based on the ratio of removed to applied N (RTA). Values for RTA were calculated at the state level and a performance threshold value was set to ensure that only the top 25% of fields will satisfy the performance standard test. This is unnecessarily restrictive and curtails potential reductions for high emitting fields. Some of the fields in the top quartile for nitrogen use efficiency will not be eligible for the NMPP due to early adoption of practices and an already lowered baseline. The threshold value for the performance standard should be set to allow for broad participation in the NMPP and should not exclude farms that are struggling to improve N use efficiency and lower GHG emissions. CAR should consider allowing all farms that are reducing emissions relative to their field specific baseline(s) to participate in the protocol.

Comment 21. The performance standard test is conducted annually by comparing each field's RTA to the state threshold value established in the NMPP Ver1.0. Because this performance standard is based on future yield, there is no way to determine eligibility Ex Ante. Carbon markets have always informed investors and project participants in advance as to the eligibility of the project. The prospect of "in one year, out the next" will discourage investment and adoption. CAR should consider a single test for eligibility at the beginning of the crediting period instead of an annual test.

Section 3.5.2 "The Legal Requirement Test"

Comment 22. The NMPP states "...supporting documentation should be made available to the verifier..." to document that the project was undertaken voluntarily. It is not easy to document a negative – guidance to verifiers should acknowledge that the presence of laws, regulations, court orders etc is easier to document than their absence.

Section 5.1 "Applicability Conditions for N Rate Projects"

Comment 23. The quantification approach contained in the NMPP applies to the approved project activity of N rate reduction only. Additional practices that have been shown to reduce N_2O emissions include changing timing and form of N applied, based on the widely acknowledged 4R's of nutrient management. Work on a standardized quantification methodology that can address the other aspects of 4R management is urgently needed to allow for this protocol to incentivize broader emission reductions. CAR should continue working with the SAC to investigate Tier II approaches or the use of DNDC or similar biogeochemical models.

Section 5.4.1 "Calculating Baseline and Project Direct N_2O Emissions from Soils"

Comment 24. *In Equation 5.11 used to calculate the MSU-EPRI Tier 2 emission factor, the denominator should not include the 0.8 manure correction factor.*

Section 7.3.1 "Recordkeeping for Aggregates"

Comment 25. "*Aggregators should retain the following records...for each field... Copies of air, water, and land use permits relevant to project activities.*"

Farmers may have a variety of local ordinances, state regulations and federal standards to comply with. Some farms are diversified businesses; some operate dairy operations, raise hogs and chickens, and operate small businesses on premise. There is no reason to require blanket collection of all permits and official permissions and communications that might be relevant to project activities to be reviewed for the NMPP. This open-ended requirement could easily spiral out of control if verifiers don't have clear standards for materiality, understand the purpose and use of this information, and have a usable definition for what constitutes "relevance" to project activities.

Comment 26. "The project developer/*aggregators should retain the following records...for each field...All maintenance records relevant to the farm equipment and monitoring equipment."*

Comment 27. As above, what reason would justify the expense of requiring verifiers to review maintenance records of farm equipment? Given the extensive use of farm machinery on a variety of farm practices, other than fertilizer application, it is not at all obvious the incremental value of this information would be, or how any verifier could conclusively use that information except with reference to the most specialized pieces of equipment used for fertilizer applications. Clear standards for materiality and relevancy should be provided to verifiers to minimize cost and burden to growers.

Comment 28. "The project developer/*aggregators should retain the following records...for each field...Onsite fossil fuel use records*".

Simple and accurate methodologies exist to quantify increases in on-farm fuel combustion GHG emissions by using estimates of additional time of operation (if any) and simple mpg data for relevant equipment. Verifying this calculation would not require access to all (or any) fossil fuel purchase records.

Using purchase records to calculate the amount of fossil fuel usage attributable to fertilizer application is unnecessary. Growers use fossil fuels for a variety of on-farm activities throughout the year including plowing, harvesting, soil preparation, irrigation or any other number of on-farm uses. The amount of fossil fuel use attributable to fertilizer applications and management is small. Fossil fuel purchase records should be totally excluded from the data collection, monitoring and verification.

Comment 29. Project Activity Data: It is not at all clear why this statement is included in the Protocol for record-keeping for verification: "Farm management records, particularly pertaining to nitrogen management" (page 52). What is the relevance to a nitrogen management protocol of farm management records that have nothing to do with nitrogen management?

Section 8.3 "Verification Sampling and Schedule for Aggregates"

Comment 30. Site Verification Visits: The benefit of site visit verification is unclear.

The NMPP itself states:

> *"The actual requirements for performing a site visit verification and desktop verification are the same. A desktop verification is equivalent to a full verification, without the requirement to visit the site."*

We agree.

On a farming field always in a state of change (planting, tilling, weeding, harvesting) what will a verifier observe during a visit to a field at any point in time? There is no call for the verifier to take soil samples for nitrogen analysis for instance, which would require a site visit.

Projects can make available a wealth of information for verification, from aerial photographs, to fertilizer purchase and application records, to crop yield records, and many other points of information to create an iron clad evidentiary trail. On-site verification seems unlikely to provide any tangible benefits to verification while adding considerable cost. As seen in the forestry sector, on-ground verification is extremely costly, time-consuming and has diminishing returns unless kept to a minimum. In forestry, a verifier needs to be on site to assess the composition and stratification of a forest and to evaluate the understory and make stand density measurements to complement aerial photography and other verifiable information. A verifier looking at a plowed field or even a field of corn will see only a field of corn, a snapshot in time of a dynamic system.

Section 8.3.3.1 "Sampling for Site Visit Verification for large Multi-Participant Aggregates"

Comment 31. The costs of complying this with the provisions in this section are prohibitively large relative to the expected return from carbon financing. There are three rules used to determine the minimum number of mandatory site visits to project participants (growers)

Take as an example, an aggregate with 100 participants. This section would require that the verifier "*...shall site visit at least 33.3 percent of the fields, selected at random,*" or in this example, 33 farms, and perform desktop audits on 45 fields. Imagine the time, energy and GHG emissions involved in this activity. Assuming it is possible to average two site visits a day, the cost (for airfare, car rental, per diem, & labor) for one verifier to travel for 17 days visiting 33 farms and with some time before and after to prepare and report exceeds $50,000. Aggregators may suffer equal or greater costs as they prepare growers and verifiers in advance, attend every site visit, and follow up to respond to audit concerns. For a protocol like this requiring specialised expertise not previously found in audit and verification companies, it will be common to expect two people on an audit team, an experienced verifier and an agronomer for instance, which would raise verification costs over $80,000.

These verification costs are not just expensive in absolute dollars – they are high relative to the projected carbon value of the project, exceeding 35% in this example.

Comment 32. A List of Forms would be useful to include in the preface. Here is a complete list for aggregators:

- Aggregate Submittal form
- Field Management Transfer form
- Aggregate Transfer Form
- Aggregator Attestation of Title form
- Attestation of Regulatory Compliance form
- Attestation of Voluntary Implementation form

We would welcome the opportunity to have further dialogue with CAR staff to discuss these comments and the improvements we suggest.

Yours sincerely,

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