Nitrogen Management Project Protocol V2.0

Public Comment Webinar
August 15, 2018

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Agenda

Background
Introduce NMPP v2.0
Highlight key updates from v1.1
Questions
Next Steps
Reserve Staff

Trevor Anderson, Policy Manager
– Protocol development lead

Sami Osman, Senior Policy Manager
– Assist with protocol development
Section 1

BACKGROUND
NMPP Background

- **June 2012**: NMPP v1.0 adopted
- **January 2013**: NMPP v1.1 released (current version)
  - Uses a modified version of the MSU-EPRI empirical emission factor-based methodology for nitrogen rate (N rate) reductions
  - Applicable only to N rate reductions on Corn in the Corn Belt (12 States)
  - No projects have been registered to date
- **Currently**: Finalizing significant v2.0 update (EDF-led CIG)
  - Expanded applicability (i.e., additional regions/crops/activities)
  - Improved protocol elements (e.g., additionality criteria) and usability
  - New standardized quantification methodology
## NMPP v2.0 Update Timeline

<table>
<thead>
<tr>
<th>Milestone/Task</th>
<th>Timeline</th>
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</thead>
<tbody>
<tr>
<td>Technical Contractor began work</td>
<td>Aug 1, 2017</td>
</tr>
<tr>
<td>Staff work with contractor</td>
<td>Aug 2017 – Aug 2018</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; WG meeting (webinar) – technical elements</td>
<td>Aug 29, 2017</td>
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<tr>
<td>Staff protocol drafting</td>
<td>Sep 2017 – Jul 2018</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; WG meeting (webinar) – quantification methodology (QM)</td>
<td>Oct 10, 2017</td>
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<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; WG meeting (webinar) – QM</td>
<td>Dec 12, 2017</td>
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<tr>
<td>Draft protocol to Workgroup</td>
<td>Jun 14, 2018</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt; WG meeting (webinar) - draft protocol sections</td>
<td>Jun 20, 2018</td>
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<tr>
<td>WG comment on draft protocol; Reserve revised protocol</td>
<td>Jun – Jul 2018</td>
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<tr>
<td>30-day Public Comment Period</td>
<td>Aug 2018</td>
</tr>
<tr>
<td>Produce “Board-ready” protocol</td>
<td>Sep 2018</td>
</tr>
<tr>
<td>Final protocol adoption by Reserve Board</td>
<td>Oct 17, 2018</td>
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</tbody>
</table>
# Summary of Changes from V1.1 to V2.0

<table>
<thead>
<tr>
<th>Protocol Element</th>
<th>V1.1</th>
<th>V2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practices</td>
<td>Synthetic N Rate Reductions</td>
<td>Synthetic N Rate Reductions; Nitrification inhibitor or Slow-release fertilizer; Long-Term No-Till (under consideration)</td>
</tr>
<tr>
<td>Crops</td>
<td>Corn (grain + silage)</td>
<td>Corn (grain + silage), Barley, Cotton, Oats, Sorghum (grain), Spring Wheat, Winter Wheat, Tomatoes</td>
</tr>
<tr>
<td>Regions</td>
<td>U.S. North Central Region</td>
<td>Contiguous U.S. 48 States (pending data availability for additionality tests and capabilities of quantification methodology )</td>
</tr>
<tr>
<td>Project Size</td>
<td>1 Field</td>
<td>1 or More Fields</td>
</tr>
<tr>
<td>Aggregation</td>
<td>More than 1 field; field size limits; aggregate size distinctions</td>
<td>Can aggregate multiple fields / farmers into single project AND / OR multiple projects can combine into cooperative for joint MRV</td>
</tr>
<tr>
<td>Ownership Structure</td>
<td>Single field – simple ownership</td>
<td>Can be multiple owners / managers – must nominate single project developer</td>
</tr>
<tr>
<td>Irrigation</td>
<td>Emergency-Only</td>
<td>Allowed; SSR 4 included in GHG Assessment Boundary</td>
</tr>
<tr>
<td>Start Date</td>
<td>6 months prior to submission</td>
<td>12 months prior to submission</td>
</tr>
</tbody>
</table>
# Summary of Changes from V1.1 to V2.0

<table>
<thead>
<tr>
<th>Protocol Element</th>
<th>V1.1</th>
<th>V2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Reporting Period</td>
<td>1 cultivation year</td>
<td>1-2 cultivation years</td>
</tr>
<tr>
<td>Crediting Period</td>
<td>5 reporting periods</td>
<td>10 reporting periods</td>
</tr>
<tr>
<td>Performance Standard Test</td>
<td>Annual State Average Removed to Applied (RTA) Benchmark; Average Historical Yield</td>
<td>Multi-year County Average Partial Factor Productivity (PFP) Benchmark; Project Yield</td>
</tr>
<tr>
<td>Baseline</td>
<td>5-year lookback period; historical records only</td>
<td>3-year lookback period; hierarchical approaches: 1) historical records, 2) agronomic guidance, 3) county average</td>
</tr>
<tr>
<td>N₂O Emissions Quantification</td>
<td>MSU-EPRI Methodology</td>
<td>Nitrogen Management Quantification Tool (Emission factor-based Excel tool)</td>
</tr>
<tr>
<td>Leakage</td>
<td>Proportionate Increase in Emissions</td>
<td>Proportionate Increase in Project N Rates</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Corn Stalk Nitrate Test (CSNT)</td>
<td>Removed CSNT – same annual Project Monitoring Plan &amp; Report required</td>
</tr>
<tr>
<td>Verification</td>
<td>CSNT-informed</td>
<td>Risk – random sampling based verification scheduling</td>
</tr>
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Section 2
PROJECT DEFINITIONS
Objective: To reduce N₂O emissions by adopting best management practices (BMPs) that further improve nitrogen use efficiency (NUE) and enhance crop N uptake, beyond what is projected to happen in the future, absent a carbon market.

Definition: The adoption and maintenance of one or more eligible project activities during the cultivation year of an eligible crop, on one or more fields in an eligible project area, that reduce N₂O emissions.
Eligible Project Activities (Section 2.2.1)

Synthetic N Rate Reductions
– and –

New for v2.0:
• Use of Nitrification Inhibitors (NIs)
– or –
• Switch to Slow Release Fertilizers (SRFs)
Eligible Crops (Section 2.2.2)

Corn (Grain + Silage)

*New for v2.0:*

- Barley, Cotton, Oats, Sorghum (Grain), Spring Wheat (w/ or w/o Durum), Tomatoes (Processing), & Winter Wheat
- Default baseline yield option for new crops grown in project
- *Baseline crop compared to same crop in project*
# Eligible Regions

(Section 2.2.3)

<table>
<thead>
<tr>
<th>CROP</th>
<th>STATE</th>
</tr>
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<tbody>
<tr>
<td>Barley</td>
<td>AZ, CA, CO, ID, MN, MT, ND, OR, PA, VA, WA, WY</td>
</tr>
<tr>
<td>Corn (Grain)</td>
<td>CO, GA, IL, IN, IA, KS, KY, MI, MN, MO, NE, NY, NC, ND, OH, PA, SD, TX, WI</td>
</tr>
<tr>
<td>Corn (Silage)</td>
<td>TO BE UPDATED ONCE MODELING IS COMPLETE</td>
</tr>
<tr>
<td>Cotton</td>
<td>AR, GA, MS, MO, NC, TN, TX</td>
</tr>
<tr>
<td>Oats</td>
<td>IL, IA, KS, MI, MN, NE, NY, ND, OH, PA, SD, TX, WI</td>
</tr>
<tr>
<td>Sorghum (Grain)</td>
<td>CO, KS, NE, OK, SD, TX</td>
</tr>
<tr>
<td>Spring Wheat (Durum)</td>
<td>MT, ND</td>
</tr>
<tr>
<td>Spring Wheat (excluding Durum)</td>
<td>MN, MT, ND, SD</td>
</tr>
<tr>
<td>Tomatoes (Processing)</td>
<td>CA</td>
</tr>
<tr>
<td>Winter Wheat</td>
<td>CO, ID, IL, KS, MO, MT, NE, OH, OK, OR, SD, TX, WA</td>
</tr>
</tbody>
</table>
Other Activities

Organic N amendments
NM BMPs

*New for v2.0:*

- Irrigation
- Tillage

*Ineligible Scenarios:*

- Combinations with switch to short-term (<10 years) no till
Project Structures (Section 2.5)

New for v2.0:

- Multiple fields may be managed together under a single project, across multiple owners and multiple regions.
- Multiple projects may also be managed together as a “project cooperative” or “cooperative”.
- Single entity to manage all aspects of project development (submittal, reporting and verification).
Section 3

ELIGIBILITY RULES
Start Date / Reporting Period / Crediting Period

- 1st day of the cultivation year of an eligible crop, on an eligible field in which eligible activities are implemented
  – day 1 after the field’s previous harvest was completed
  – SUBMITTAL deadline
    • 1st field in project = 12 months
    • All other fields = 24 months
• Crediting period = 10 Reporting periods – can be renewed
• Reporting period flexibility
  – Flexible options to forgo crediting for given field / cult. year
Additionality (Section 3.5)

The performance standard test (PST) (Section 3.5.1)

- N rate reductions (next slide)
- *New for v2.0:* Use of NIs or switch to SRFs
  - Additional when applied in combination with N rate reduction
  - Field ineligible if applied in baseline

The legal requirement test (Section 3.5.2)

- Adoption of eligible NM activities in excess of legal mandates

The credit/payment stacking test (Section 3.5.3)

- If not receiving credits or payments for eligible NM activities
New for v2.0:

• Based on NUE metric – “partial factor productivity (PFP)”
  – $\text{PFP} = \frac{\text{Annual Crop Yield}}{\text{Total Annual N Rate}}$ (syn + org)

• Field’s RP PFP must exceed the 3-year, county- and crop-specific average PFP benchmark (Appendix C)
  – $\text{PFP}_{P,f} > \text{PFP}_{\text{avg,Co,c}}$

  Must pass each RP to be eligible for CRTs

• PFP benchmarks found in NMPCBLT
Section 4

GHG ASSESSMENT BOUNDARY
Direct and indirect N$_2$O emission reductions (SSR1 and SSR2)

- LVRO = leaching, volatilization and runoff

CO$_2$ emissions from equipment use changes for cultivation (SSR3) and irrigation (SSR4 – New for v2.0)

Market leakage (SSR7) must be estimated if yields go down; results in increased project synthetic N rate
Section 5

QUANTIFICATION METHODOLOGY
Quantifying GHG Emission Reductions

\[ ER = (PER_{syn} - PE_{org}) - SE \]

- **ER** = total emission reductions
  - **PE** = primary effect; **SE** = secondary effect
- **PER_{syn}** = N\(_2\)O ERs from implementation of eligible activities
  - Calculated using NMQuanTool
- **PE_{org}** = N\(_2\)O emissions from increases in organic N rate
  - Organic N rate may increase, but Total N rate must still decline
- **SE** = CO\(_2\) emissions from increases in fossil fuel use
  - Can be qualitatively or quantitatively proven to be *de minimis*
**New for v2.0:**

Emission-factor based Excel tool developed by Colorado State University (CSU) Team

Used for calculating direct and indirect $N_2O$ emission reductions from the implementation of eligible activities

- Project developers must calculate % Synthetic N Rate Reduction

Project developers must first confirm field eligibility
Baseline N Rate: Calculated from the average of the previous N rate applications during the baseline look-back period

*New for v2.0:*

Baseline Look-Back Period: Period of at least 3 years immediately prior to the field’s start date that comprises at least 3 eligible crop years

- E.g., previous 3 years (monoculture), 6 years (2-crop rotation), or 9 years (3-crop rotation) prior to the field’s start date
Baseline (continued) (Section 5.3.1.1)

New for v2.0:

Hierarchy of options for setting average baseline N rates:
1. Historical N management records
If no or insufficient records
2. Records of N rate recommendations from agronomic experts
   a) Historical records of N rate recommendations for the years in the baseline look-back period
   b) Records of N rate recommendations for the current year
3. Estimated historical county average N using the NMPCBLT
Section 6
MONITORING
• **Field Monitoring Parameters & Management Data**
  
  – **Table 6A Field Monitoring Parameters**
    - All field level monitoring parameters – including parameters needed for equations and for NMQuanTool
  
  – **Table 6.B Field Management Data**
    - GIS shapefile data
    - Key dates
    - Regulatory compliance records
    - Certain baseline practices
    - Agronomic records
Section 7

REPORTING
Reporting (Section 7)

Reporting periods & verification cycles

– Flexible verification options

• First RP – can be 1-2 cultivation years

• Subsequent RPs

  – 12 month RP/VP – *with site visit*

  – 24 month RP / VP – site visit every 2 cultivation years

  » No CRTs in interim desktop only verification cultivation year

Record keeping: keep all relevant records for 15 years
Section 8

VERIFICATION
Verification (Section 8)

Sampling & scheduling

– Same approach regardless of number of fields/projects grouped together

– Verification schedule developed by VB based on combination of risk-based and random sampling

– 3 step sampling process

  • 1) Risk based site visit selection

    – e.g. if a field fails site visit verification in given year, will need site visit following year to be eligible

  • 2) Additional field site visits selected at random

  • 3) Random sampling for desktop data verification

– Every field included in pool subject to site visit sampling = eligible to generate CRTs for that given RP
DEMONSTRATION
Nitrogen Management Project County Benchmark Lookup Tool
DEMONSTRATION
NMQuanTool
QUESTIONS?
Next Steps

Public comments accepted through COB Friday, August 31, 2018

Reserve to consolidate feedback into final “Board-Ready” Draft – September 2018

Final protocol submitted to Reserve Board for approval – October 17, 2018
Contact Information

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