Nutrient Management Plan Review Process – Lean Six Sigma Project
DNR - Division of Water
October, 2012

Introduction:
As part of a department-wide initiative, each division selected at least one project for Lean Six Sigma, a process of continuous improvement intended to find efficiencies in government. The Division of Water selected the nutrient management plan review process as a Lean Six Sigma (LSS) project. Specifically, the effort was focused on improving the review process for nutrient management plans (NMPs) for Concentrated Feeding Operations (CAFOs). DNR has delegated authority for permitting CAFOs under the Clean Water Act, so the review responsibility rests with the department. The selection of the NMP process was primarily customer focused, with the intent of reviewing the process to create a more user friendly document. The five goals of each department-selected LSS project, as identified by DNR management, included:

1. DNR staff review time is reduced.
2. Customer receives the decision in a timely manner.
3. Customer's satisfaction improves.
4. Number of steps or exchanges is reduced.
5. Program safety issues are incorporated.

The charter for the project is included in Appendix A.

Key Issues:
The DNR reviews NMPs for compliance with state and federal regulations, specifically ch. NR 243 and WI-NRCS Nutrient Management Technical Standard, 590. Anecdotal reports from the industry suggested that the NMPs were cumbersome and too hard to implement. The consultant's organization, Wisconsin Association of Professional Agricultural Consultants (WAPAC), submitted a list of their concerns with the plans. These concerns are included in Appendix B.

DNR's concern is that NMPs submitted to the department for required review and approvals are not always complete or compliant with state code, ch. NR 243 or the 590 Standard. DNR staffing levels for the CAFO program have been limited due to ongoing vacancies so existing staff have limited time to review NMPs. Consequently NMP reviews are not consistent statewide. DNR is equally concerned that NMPs are not consistently implemented by CAFO owners/operators, as required by WPDES permits.

The Process:
A project team was selected, that included DNR, NRCS, DATCP and WLWCA staff as well as WAPAC representatives, to work on these two key issues. Customers, the CAFO owners and operators, were surveyed to understand their issues and to offer them the opportunity to comment. Using the tools of Lean Six Sigma, the team defined the problem, recognized federal and state requirements related to NMPs, analyzed the steps in the process for value added, collected data on the current review process, brainstormed and grouped problems and solutions and identified short-term and long-term options to improve NMP development and review. Finally, department staff will implement a standard operating procedure and track compliance with the recommended steps and timelines. The following documents are provided in the appendices that outline the process taken by the team:

- Appendix C – SIPOC (Suppliers-Input-Process-Output-Customer)
- Appendix D – Voice of the Customer Survey Results
- Appendix E – Fishbone Analysis of Problems related to cost, delivery, ease of use and reliability

Results:
From January 2009 - June 2012, the department tracked Nutrient Management Plan (NMP) review activities for 118 CAFO permitted farms. Activities tracked included:

- Number of days for DNR to approve NMP
- Number of exchanges between DNR and Farm before approval
- Number of days DNR and Farm had NMP before approval

The resulting data set, summarized below in Table 1, provides some benchmark values that were reviewed by all project group members. The values shown are averages. The department intends to use these average benchmark values to measure and evaluate against current actions or planned actions for streamlining CAFO NMP development and review.

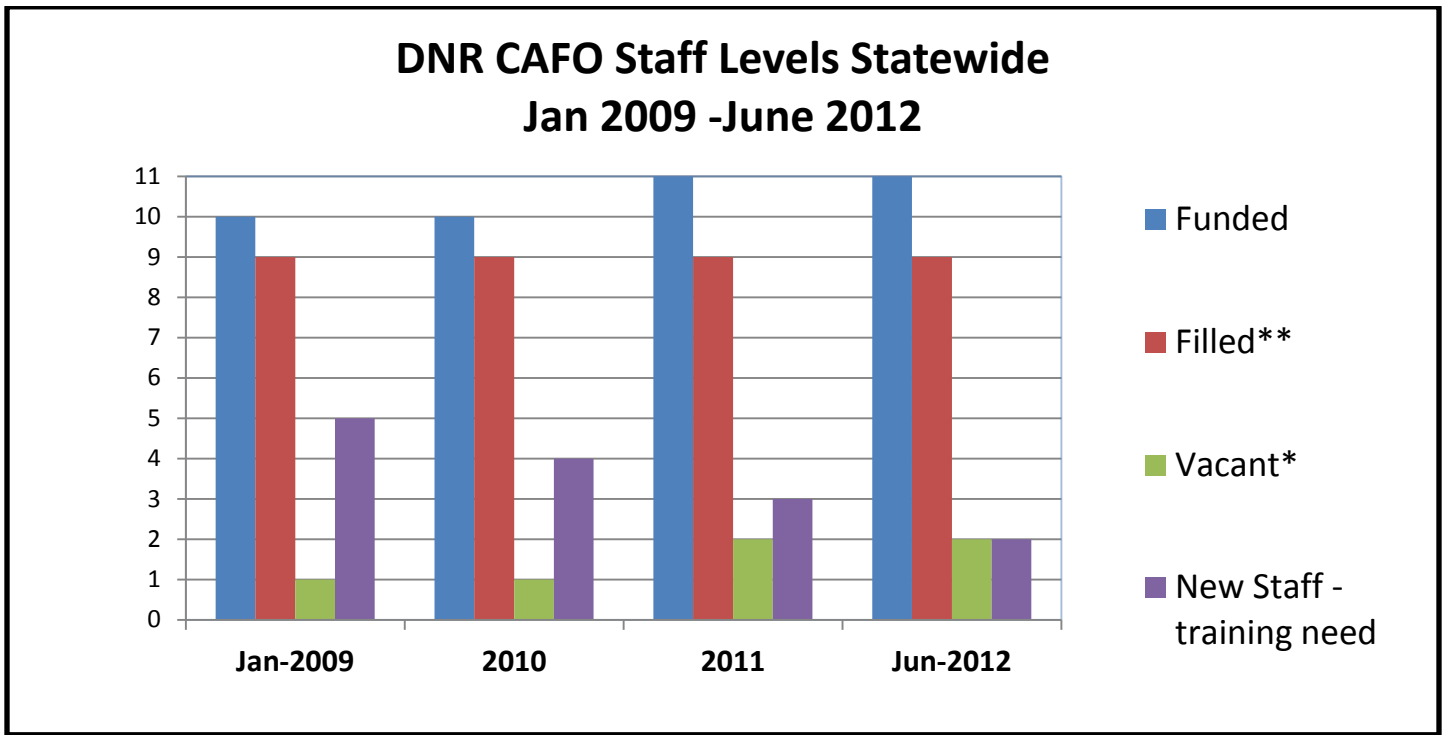
Table 1

Days to Approve	No. Exchanges	Days at DNR	Days at DNR region	Days at DNR CO	Days at Farm
248	**4.5**	**149**	**85**	**54**	**95**

For context, NR 243 requires that CAFO permitted farms submit a complete NMP (i.e., plan is consistent with NR 243 or NRCS 590 requirements) **within 180 days** of permit issuance date for review and approval.

<u>Reasons for exceeding 180 days</u>

- NMP submitted had incorrect or was missing required information because farm consultant had limited, poor or no understanding of NR 243 NMP requirements.
- DNR review comments for incomplete NMPs were not responded to by farm consultants in a timely manner (e.g., crop scouting duties).
- DNR did not reject NMPs it reviewed that repeatedly failed to meet submittal deadlines or meet NR 243 requirements.
- DNR regional staff have, for reasons listed below, limited time, training and expertise for reviewing NMPs:
    - Ongoing staff vacancies, resulting workload on existing staff and limited time for training – see DNR CAFO staff levels chart below.
    - DNR staff focus was (up to January 2009) on CAFO production area requirements and not NMP requirements.
    - Obtaining compliance with CAFO production area problems often takes substantial amounts of DNR staff time and resources to complete.
    - Many DNR staff are expected to handle non-point agricultural duties in addition to CAFO permit workload until nonpoint coordinators can be hired.
- DNR nutrient management specialist at central office required training and time for on the job experience before reviewing NMPs efficiently and having capacity to train other DNR staff to review NMPs efficiently.
- DNR central office did not attempt to standardize several CAFO NMP information/elements to meet NR 243 requirements until January 2011.



* = Vacant positions are averages for each year. Actual vacant positions may have been higher than shown in chart for some years.

** = Since June 2012, DNR CAFO staff levels and resulting workload changed in the following ways:

- DNR management approved filling two vacant CAFO positions in early 2012.
- As of July 1, 2012 the two vacant positions were filled.
- The new staff will increase training needs.
- One of two filled non-point coordinator positions became vacant; existing DNR CAFO staff must now cover this workload which will reduce NMP review capacity. That position is approved for filling and is in process. Three additional nonpoint coordinators are needed statewide.

Recommendations:
The review of problems identified by the team and the analysis by the team of the survey results from the customer identified a number of implementation options with both long term and short term considerations. These are listed in the Implementation Plan. Many of these items require the involvement of our partners: NRCS, DATCP, UW-EXT, WLWCA and support of the regulated community. We look especially to certified crop consultants and their organizations to improve the quality of NMP submittals and shorten the overall review time and number of exchanges for NMPs, by enlisting their help in developing guidance needs, providing training, and encouraging use of templates and checklists.

Specific recommendations as to what DNR can do in the next year include development of a standard operating procedure (SOP) to ensure consistent review and to set review timeline expectations. The SOP is provided in Appendix F. In addition to DNR recommendations, Appendix G includes comments and recommendations by externals on this report.

Response Actions to Report Findings – Implementation Plan

The two tables below describe short term and long term response actions to many findings of this report. Some actions the department can complete alone, while other actions will require collaboration with others to complete the action(s). The department intends to verify, and possibly revise, these response actions for completion on an ongoing basis (schedule to be determined at later date).

DNR = Department of Natural Resources
UW = University of Wisconsin Soils
NRCS = Natural Resources Conservation Service
DATCP = Department of Agriculture Trade and Consumer Protection

Short-Term Actions – 12 months, or less

Goal	Action	Who	When
Record keeping is time consuming	Create Daily Manure Application Log within SNAP+	DNR UW	Sept 2012
Record keeping is time consuming	Encourage or require all CAFO farms to use existing NM plan templates and forms	DNR	Sept 2012
Make NM Plans More Reliable	Develop more standard tools and templates for CAFO NM plans	DNR UW	Sept 2012
Make NM Plans More Reliable	Create guidance for CAFOs applying manure on shallow bedrocks soils	DNR	Dec 2012
Make NM Plans More Reliable	Amend SNAP+ to reflect crop nutrient recommendations for Predominant vs. Dominant critical soils	DNR UW	Sept 2012
Shorten time to develop and review NM plan	Option for SNAP+ users to select field attributes within SNAP+ manually and have automatic spreading restriction flags/notices	DNR UW DATCP	Sept 2012
Shorten time to develop and review NM plan	DNR on-line file sharing, application submittal and posting (Sharepoint project)	DNR	Dec 2012
Shorten time to develop and review NM plan	DNR management approves filling one vacant DNR CAFO position and three vacant DNR non-point coordinator positions to reduce workload on existing DNR CAFO staff.	DNR	Dec 2012
Shorten time to develop and review NM plan	DNR utilizes central intake CAFO position for NM plan submittals; assigns single reviewer and tracks until approval.	DNR	Sept 2012
Shorten time to develop and review NM plan	Adopt standard operating procedures for DNR staff to track, review, approve or reject NM plans within 60 days	DNR	Dec 2012
Shorten time to develop and review NM plan	Reform NR 243 checklist to remove repetitive questions. (Checklist was developed to improve NM plan submittals; will be used for completeness determination; appears to be improving quality of submittals)	DNR	Sept 2012
Shorten time to develop and review NM plan	Require all CAFO NM plans use DNR standard NM plan narrative (or equivalent)	DNR	Sept 2012

Operational Flexibility	DNR guidance for mass balance approach for manure instead of requiring five-year manure allocation	DNR	2013
Operational Flexibility	Allow for adaptive management related to yields and crop nutrient recommendations – CAFO Advanced Ag Research Exemption. CAFO farm must first apply for exemption and agree to meet DNR conditions for approval.	DNR UW NRCS	2013

Long-Term Actions – more than 12 months

Goal	Action	Who	When
Record keeping is time consuming	Create a hand-held application for farmers/manure haulers that interfaces with SNAP+ software; requires funding source; alternative to excel.	UW DNR + others	2014-2015
Record keeping is time consuming	Evaluate Green Tier approach for record keeping system deemed equivalent (proven performance required – would need to set up a team to review how this could be implemented)	DNR + others	2015
Record keeping is time consuming	Create computer programs compatible with SNAP+, maps used in NMP and with farm tractor equipment; software interface issues with SNAP+ are critical	DNR UW DATCP	2020
Make NM Plans More Reliable	Develop better guidance/tools for fields with multiple soils and productivity needs – requires UW and NRCS collaboration (possible under WI NRCS 590 revision?)	DNR UW, DATCP NRCS	2014
Make NM Plans More Reliable	Update DNR "W" soils guidance for CAFOs - based on recent collected depth verification data within various counties. Create "W" soils spatial tool – have soils on map (like network with weather), take farm data into account to determine when depth verification can stop	DNR DNR+ others	2014 2014
Make NM Plans More Reliable	Coordinate with other county permits and field evaluations. (Requires forming a team to look at efficiencies of use of existing data and collection of data for slopes, soils, waterways) (590 Tech Note?- 2014)	DNR, NRCS, DATCP, WLWCA	2014-2015
Make NM Plans More Reliable	Create auto map selection feature for CAFO SWQMAs within SNAP+ and revise DNR SWQMA CAFO guidance	DNR UW	2014-2015
Make NM Plans More Reliable	Revise SNAP+ to include standard CAFO SWQMA language when SWQMA selected by CAFO user	DNR UW	2013
Make NM Plans More Reliable	Amend NRCS 590 standard or its Technical Note to include winter spreading and additional groundwater protection requirements	DNR NRCS DATCP	2014
Make NM Plans More Reliable	Adopt UW amended Nutrient Application guidelines for field, vegetable and fruit crops in Wisconsin (A 2809) to reflect manure crediting and availability if UW research warrant changes	UW DNR	2013-2014
Shorten time to develop and review NM plan	DNR maintains no vacant positions for CAFO and Non-point Ag staff	DNR	2013-2015
Shorten time to	Modify SNAP+ to make it GIS based and improve it for	UW	2014-2015

develop and review NM plan	better manure allocation	DNR DATCP	
Shorten time to develop and review NM plan	Modify SNAP+ to improve access permissions/security to improve review process via on-line application submittal	UW DNR DATCP	2016
Shorten time to develop and review NM plan	If other actions fail to work, DNR evaluates use of certified reviewers instead of DNR reviewers (DNR and DATCP cooperatively review plans)	DNR	2016
Shorten time to develop and review NM plan	If other actions fail to work, DNR offers an expedited review for a fee. Requires statutory change; no fee at all now.	DNR	2016
Shorten time to develop and review NM plan	All state and federal agencies and local authorities agree to have a single set of NM plan requirements for all farms (not just CAFOs); requires applying CAFO requirements to all farms.	DNR DATCP	2020
Shorten time to develop and review NM plan	Data collection from grower/land owner needs to be standardized; Mobile application option?	DNR UW DATCP	2016
Operational Flexibility	Review use of NRCS planning tools for regulation – WI NRCS 590 standard revision	DNR NRCS DATCP	2014
Operational Flexibility	Modify SNAP+ with revised 590 report and/or Manure allocator tool help demonstrate manure allocation over 5 year permit term	DNR UW DATCP	2014-2015
Operational Flexibility	Find alternatives to basing NM plans upon lots of assumptions that result in cumulative error. Explore what other options farmers have if not actual data collection?	DNR UW NRCS DATCP	2016
Operational Flexibility	Allow for adaptive management related to crop yields and nutrient recommendations. Revisions to WI NRCS Standard 590 and Advanced Ag Research Exemption for CAFOs option. Both options require farms to commit to on-site trial strips and track responses	DNR NRCS DATCP	2014
Operational Flexibility	SNAP+ Adaptive Management trials interface – evaluating strip trials requires exact yield measurements to enter into SNAP+. Close coordination with Dr. Carrie Laboski required. SNAP+ can help evaluate economic optimum yield. It will not evaluate maximum yield – this is not the goal	UW DNR	2015-2016

Conclusions:

- Nutrient management planning is the single most important practice for water quality in the state. We have many stakeholders in this process that are committed to making it better.
- The process is not broken. We have struck a balance between compliance and implementation for CAFOs by working with stakeholders to standardize procedures using templates and guidance.
- Ultimately the plan is the farmer's responsibility to implement. Streamlining and consistency cannot be structured in a way that the farmer will lose the specificity critical to effective implementation on their land. While the data is important to showing compliance, maps are the primary tool for implementation.
- Further improvement will depend on DNR's commitment to maintaining a full complement of staff.
- This LSS project was conducted under a short time frame at a time of year that was particularly busy for our partners and the industry (i.e., start/midcrop season). Therefore, we view this document as a living document that is intended to be amended over time after additional comments are received from stakeholders. We believe this report has captured some valuable dialogue, identified some key NMP issues, and will serve as a workplan for the future.

APPENDICES

Appendix A: Project Charter

Project Charter [PDF]

Appendix B: Comments from Wisconsin Association of Professional Agricultural Consultants

WAPAC NMP Committee Position Statement B1 [PDF]
WAPAC NMP Committee Position Statement B2 [PDF]

Appendix C: SIPOC of NMP Review Process (Suppliers-Input-Process-Output-Customer)

The team outlined the steps for data collection and documentation that are needed for the nutrient management plan to show compliance with code and standards. For CAFOs, they must meet ch. NR 243 as well as the NRCS Technical Standard 590. DNR is the delegated agency to implement the Clean Water Act for EPA, so many of the requirements are based on federal law. Each step was identified as fulfilling a requirement of NR 243, EPA or the 590 standard. The result was that each step is currently required and that no category could be eliminated.

SIPOC [PDF]

Appendix D: Voice of the Customer Survey Results

The team developed a series of questions to measure the level of satisfaction of the CAFO owner with their nutrient management plans. The survey was intended to provide a baseline of customer issues as well as to collect suggestions or concerns that may not be covered by the questions. DNR had email addresses for 172 of the 235 CAFO owners. The consultants were also encouraged to pass on the survey to anyone they felt we might not have been able to reach by email. The survey was sent by our regional staff to their respective permittees. This worked very well and the response was excellent. We heard from 97 CAFO owners. Since we are not sure how many additional owners may have been picked up by the consultant's efforts, we can't verify the return rate, but in general this is an above average response.

The results and comments were then reviewed by the team and the issues were weighed and possible solutions offered. Many of the solutions are reflected in the Implementation Plan.

In general, the survey showed that CAFO owners find their NMPs moderately to very easy to implement, they update them regularly, are supported by their consultant in understanding and implementing the plan and they recognize that the NMP serves several important functions. What they saw as important improvements could be best summed up as needing better tools for recordkeeping. These might include electronic options for submittal, updating, and field views that include setbacks and application rates on the same map. They would also like to have a simpler user interface so that they could update the plan themselves. When asked how long they thought DNR should take to review a plan, for those who believed DNR should review the plans at all, the majority thought DNR could be done in 30-60 days.

Customer Survey Graphs [PDF]
Customer Survey Comments [PDF]

Appendix E: Analysis of Issues by Team

The team was tasked with identifying reasons that the nutrient management planning process takes so long, is expensive, is difficult to use and is less reliable. Specifically, the brainstorming effort focused on too long and not reliable. The ideas were grouped and areas where the team felt they could make a difference were selected for analysis of possible solutions. Many of those solutions are identified in the Implementation Plan.

Brainstorming Issues [PDF]
Brainstorming notes [PDF]
Customer Issues [PDF]
Recommendations [PDF]

Appendix F: Standard Operating Procedure for DNR Staff

The five goals of each department selected LSS project included:

1. DNR staff review time is reduced.
2. Customer receives the decision in a timely manner.
3. Customer's satisfaction improves.
4. Number of steps or exchanges is reduced.
5. Program safety issues are incorporated.

The Standard Operating Procedure (SOP) developed for review responds to the five goals as follows:

1. The goal for review time is to spend no more than 7 hours on a standard plan. This assumes that the plan is in a standard format and that it is not unusually large or complex.
2. The customer survey indicated that DNR should review the plans within 60 days. The SOP sets a goal of initial review completed in 45 days with a final approval within 60 days, but never to exceed 90 days. To maintain this timeline, plans will be rejected if the consultant is unable to respond with changes in a reasonable period of time.
3. The structure of a standard plan uses DNR templates & guidance, contains relevant SNAP+ reports, calculations and record keeping forms/logs. This will provide a consistent look to plans and provide a level of predictability as to whether it is compliant with the rules and approvable by the department. If we provide some assurance of our actions and meet the timeline suggested by the customer, we will improve customer satisfaction.
4. Training of staff and the consultants on the guidance and templates will reduce the number of exchanges between staff and consultants before a plan is approvable. The goal is to have no more than 3 exchanges.

5. Staff will be trained on confined spaces and manure safety using NRCS guidance included in the Comprehensive Nutrient Management Plan guidance as a reference.

Standard Operating Procedure [PDF]
Recommendations [PDF]

Appendix G: Additional Comments from Stakeholders:

WAPAC Comments on LSS NMP Report [PDF]