Minnesota Agricultural Certainty Program: Is It Working for Water Quality?

An Assessment of Minnesota’s Agricultural Water Quality Certification Program
Minnesota Center for Environmental Advocacy
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This report was made possible through the generous support of the Walton Family Foundation. We deeply appreciate its partnership in this effort to improve water quality outcomes in agricultural landscapes.

We also thank the Minnesota Department of Agriculture and its certification program staff for their cooperation and assistance.

The Minnesota Center for Environmental Advocacy (MCEA) is a nonprofit organization dedicated to the protection of Minnesota’s Environment and the health of its people. Founded in 1974, MCEA uses policy analysis, law, and science to advocate positive, long-term solutions to the most critical environmental issues facing Minnesota.

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SUMMARY AND RECOMMENDATIONS

The Minnesota Agricultural Water Quality Certification Program was initiated in January 2012 by a memorandum of understanding signed by Governor Mark Dayton, United States Department of Agriculture Secretary Tom Vilsack, and (then) Administrator of the United States Environmental Protection Agency Lisa Jackson. The voluntary program promises agricultural producers immunity from new water quality regulations for the term of their agreement if a level of conservation practices sufficient to become certified is implemented and maintained.

Legislation enacted by the Minnesota Legislature in 2013 authorized program implementation, set forth its purpose, and defined requirements for the certification instrument, certifying agents, and program auditing and reporting.

The certainty program was piloted in four selected areas beginning in June 2014, with the Minnesota Department of Agriculture expanding eligibility statewide in 2015. To date, state funding for the program has come from Minnesota’s Clean Water Fund (the portion of Constitutionally-dedicated Legacy funds for water quality restoration and protection), but this appropriation ends in fiscal year 2016.

ABOUT THIS REPORT

From its inception, the certainty program has been proclaimed as a way to keep agriculture as a cornerstone of Minnesota’s economy and to protect our abundant rivers, lakes, streams and groundwater resources. The Minnesota Center for Environmental Advocacy (MCEA) has carefully tracked the program’s development, serving on the Minnesota Department of Agriculture’s advisory committee, crafting the program framework, and providing (and seeking) related recommendations to state agency staff leaders, lawmakers, the Clean Water Council, and interested conservation and environmental groups.

In this report, MCEA seeks to answer these key questions:
Does the certainty program protect and support water quality standards?
Can the program be scaled up to achieve agricultural water pollution reductions necessary to achieve Minnesota’s adopted water quality goals?
How can producer participation and conservation practices be targeted for maximum water quality benefit?
Is the program accountable and transparent to the public?
MCEA analyzed a data set representing the only farm operations in the state that both monitor farm field runoff and subsurface drain tile discharges and have been scored using the certification assessment tool. We found that every location with tile monitoring significantly exceeded the safe drinking water standard for nitrate (ranging from 1 ½ to 5 times the standard) and several of these locations scored high enough to certify. As a result, MCEA concludes that the program does not currently protect water quality standards for nitrate and recommends that:

The Minnesota Department of Agriculture (MDA) should request the University of Minnesota to prepare new or additional best management practices for nitrogen fertilizer use on corn with tile drainage that are demonstrated to result in discharges within water quality standards, including as appropriate: the rate, timing, and location of applications; cropping systems; and tile drainage discharge treatment practices.

In its above analysis, MCEA also found little relationship between assessment tool-derived scores and monitored levels of nitrate and total suspended solids. We ascribe this disconnect in part to several ways in which Minnesota’s assessment tool inflates scores over those of the USDA’s Natural Resources Conservation Service (NRCS) and to the use of conservation practices that do not address subsurface discharges to boost scores on fields with tile drainage.

MCEA recommends that the MDA revise its scores for conservation practices by:

- Utilizing more conservative score adjustments of the NRCS;
- For practices lacking robust, Upper Midwest research, undertaking monitoring at the edge-of-field (for sediment and attached pollutants) of tile lines (for nitrate) and “downstream” of conservation practices; and
- Revising NRCS score adjustments as appropriate based on field research.

The MDA must insure that conservation practice score adjustments for tile-drained fields be applied only for practices demonstrated to attenuate sub-surface discharges.

Until conservation practice scoring adjustments and revised nitrogen fertilizer BMPs are complete and incorporated into the assessment tool, the tool should be adjusted such that a facility with tile drainage under corn may not achieve a “certifiable” score unless an operation achieves a nutrient management score of 10 and a combination of continuous living cover and/or tile drainage water retention and treatment is in place.

MCEA reviewed state-adopted water quality goals for sediment and nitrogen and the scale of conservation practice adoption necessary to achieve them. At present, the pollution reduction
capacity of the certainty program has not been determined. We believe it would be useful to do so, allowing the program to be integrated into Minnesota’s watershed-based approach to water quality assessment, protection, and restoration. As such, MCEA recommends that:

The MDA and the Minnesota Pollution Control Agency should work to quantify the average pollutant-specific reductions likely to result from certification and utilize the results in modeling the scale and locations of actions needed at the watershed scale. Results should be incorporated into Total Maximum Daily Load studies, Watershed Restoration and Protection Strategies, and local watershed plans.

The enormous scale of modified agricultural practices needed to achieve water quality standards and goals, coupled with finite public resources, highlight the need for careful targeting of investments in agricultural best management practices. To assist in targeting future enrollment in the certification program and siting of conservation practices, MCEA conducted several analyses using Geographic Information System maps to locate high priority areas. Analyses include presence of required 50-foot buffers, a calculation of field runoff risk, and precise siting of specific conservation practices for water quality benefit.

MCEA recommends that pilot leaders first make an effort to insure that required buffers are installed where they are missing; then focus program recruitment efforts towards land managers of fields posing critical runoff risk; and review the recommended sites for specific practices when seeking to reduce surface and subsurface runoff.

To date, the certainty program lacks any measures of success relative to actual water quality markers, with MDA reporting only pilot area outputs in acres certified and practices installed.

The MDA and the Minnesota Pollution Control Agency should develop metrics by which to gauge the program’s ability to meet water quality standards at the watershed scale. This could be done by utilizing TMDL and Watershed Restoration and Protection Strategy (WRAPS) scale of implementation needs to gauge the degree of producer participation needed for the voluntary program to be effective.

The Minnesota Legislature should tie a significant portion of future state certainty program funding to one or more watersheds with established water quality goals and robust water quality monitoring so that we may learn whether this voluntary program can achieve the level of watershed participation necessary to restore agriculturally-impacted waterways.

Certification programs in general need to operate with a high degree of accountability and transparency. Consumer products with a “green seal” must be backed by specified standards,
Executive Summary

independent auditing, and so forth to inspire public trust and command a higher price. The certainty program’s promise of immunity from water quality protection requirements similarly demands high standards of public accountability and reporting. MCEA reviewed several related program administration issues including: conflict of interest; auditing; certification tool revision; reporting; and data management. We found a number of opportunities to strengthen the program, recommending that:

The MDA should adopt rules that:
- contain a conflict of interest policy that clearly makes a certifying agent ineligible to certify any operation from which he or she has received financial recompense;
- set forth an auditing process by which both certifying agents and a minimum of 10% of certified operations will be randomly audited, and that insures operations are audited at least once during the 10-year certification period, and
- require review of and resulting revisions to the assessment tool at least every three years.

The Minnesota Legislature should amend the reporting provision in Minn. Stat. Chapter 17.992 to require reporting on percent of certified acres within high priority areas identified in TMDLs, WRAPs, and other runoff risk analyses and on tile line, edge-of-field, and downstream of conservation practices monitoring results at certified farms (these should be field-specific without identifying farm operations—e.g., location 1, 2, etc.).

This report concludes by reviewing the elements of voluntary programs essential in achieving water quality outcomes: actively targeting conservation practices; outcome-based measures of success; resource monitoring and reporting; and a regulatory driver. Each of these elements is contained in the Sage Grouse Initiative—the program upon which the certainty program is based. Each of these elements is missing in the agricultural certainty program. Instead, the only element common to the two programs is the “certainty” provided that farmers or ranchers receive a waiver from any future regulatory requirements. Recommendations addressing the first three elements are included above. MCEA finds that the lack of a regulatory driver accounts for modest producer participation in the program to date, and recommends that:

The Minnesota Legislature should amend Minnesota Statutes Chapter 17.9891 to require participation in the certainty program in watersheds of surface waters impaired by agricultural runoff and in areas where shallow groundwater monitoring shows nitrate levels above the drinking water standard. Financial assistance should be provided to producers demonstrating economic need.
BACKGROUND

WHAT IS MINNESOTA’S AGRICULTURAL CERTAINTY PROGRAM?

The Minnesota Agricultural Water Quality Certification Program (hereafter “certainty program”) was initiated in January 2012 by a memorandum of understanding signed by Governor Mark Dayton, United States Department of Agriculture Secretary Tom Vilsack, and (then) Administrator of the United States Environmental Protection Agency Lisa Jackson. The voluntary program promises agricultural producers immunity from new water quality regulations for the term of their certification agreement if a substantial level of conservation practices is implemented and maintained. It was heralded as a “historic agreement” and a “bold step” that “keeps agriculture a cornerstone of our economy and also protects the health of our rivers, lakes and streams.”

The memorandum of understanding (MOU) called for establishment of technical and stakeholder advisory groups to develop a program “that will support state water quality standards and goals.” The Minnesota Department of Agriculture (MDA), which administers the program, appointed an advisory committee comprised of agricultural, county government and environmental representatives.

The advisory group met throughout 2012, presenting a suite of recommendations to MDA Commissioner David Frederickson in November of that year. The recommendations covered:

- Piloting of the program;
- Farm operation coverage and steps in the certification process;
- Platforms for and content of the certification measurement tool;
- Meaning of and term of “certainty” provided;
- Management, confidentiality and public accessibility of data on certified operations; and
- Program incentives and promotion.

In 2013, the legislature enacted the certainty program into statute. The new law authorized program implementation, set out its purpose, and defined requirements for the certification instrument, certifying agents, and program auditing and reporting. The statute echoes the MOU’s insistence that the program insure that water quality standards and goals are met:

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4 Minn. Stat. § 17.9891-17.993.
Background

- **Purpose**—“a producer who demonstrates *practices and management sufficient to protect water quality* is certified for up to ten years”
- **Certification instrument**—“shall be used to certify that the water quality practices and management of an agricultural operation *are consistent with state water quality goals and standards*” and
- **Certification instrument**—“shall... *comprehensively address water quality impacts.*” [Emphases added]

The legislative appropriated $3 million for the biennium from Minnesota’s Clean Water Fund to the MDA to implement the new program.

**ADMINISTRATION BY THE MINNESOTA DEPARTMENT OF AGRICULTURE**

The Minnesota Department of Agriculture’s role in administering the program includes:
- Development, funding and oversight of pilot projects;
- Development, review and adjustment of the assessment tool used to determine if an operation may be certified; and
- Program operations including management of certifying agents, data handling, auditing and reporting.

**PILOTING THE PROGRAM**

The certainty program’s appointed advisory committee recommended to the Commissioner that the program start with pilot projects prior to consideration of opening up the program for statewide participation. Additional recommendations\(^5\) included:

- Selection of three pilot areas, to enable samples from three primary agricultural regions of the state: the Northwest, Central/Southwest, and Southeast, with consideration of areas in the Sentinel Watershed program;
- Three-year duration of pilot projects, to enable diverse sample conditions in weather, production systems, practice implementation, and other factors including emphasis on replication of successful local program implementation and operation;
- Pilot areas in three regions geographically targeting minor watersheds (12-digit hydrologic unit code), to enable a watershed basis for samples while providing opportunity for potential pilot assessment on a county basis;
- Pilot areas chosen to represent the characteristics of the three different regions identified above, with additional consideration for areas with locally representative diversity of

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\(^5\) See footnote 3.
MINNESOTA AGRICULTURAL CERTAINTY PROGRAM

Background

agriculture (predominant land use types, crops, livestock, water quality goals and resource concerns); and

- Inclusion of measurement metrics to establish the qualities needed for a successful program.

Legislation enacting the certification program into law in 2013 mandated a pilot phase, providing that the program:

“will first be piloted in selected watersheds across the state, until the commissioner, in consultation with the Minnesota Agricultural Water Quality Certification Program Advisory Committee, commissioner of natural resources, commissioner of the Pollution Control Agency, and Board of Water and Soil Resources, determines the program is suitable to be implemented in other watersheds.”

PILOTS SELECTED

The MDA solicited applications for pilot areas via a self-recommendation form asking applicants why the pilot watershed was important; why it was best equipped to pilot the certification program; what level of producer participation was anticipated (and how it was determined); and other factors applicants believed would contribute to a successful pilot. The MDA selected four pilots from 11 applications received, announcing its selections in June 2014. MDA’s choices adhered to most committee recommendations (multiple projects, in different areas of the state, representing diverse and representative agricultural systems, and lasting three years). The sizes of the pilot watersheds are generally somewhat larger than recommended (HUC 10, or several minor watersheds, rather than HUC 12, or a single minor watershed). The four pilots and some key features associated with each are below.

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6 Minn. Stat. § 17.9891.
Table 1. Agricultural Certification Program Pilot Projects

<table>
<thead>
<tr>
<th>Pilot Watershed</th>
<th>Location</th>
<th>Size Land Use</th>
<th>Governance</th>
<th>Predominant Ag Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle Sauk</td>
<td>Stearns County Central</td>
<td>175,640 acres</td>
<td>Stearns Cty Soil and Water Cons. District</td>
<td>Dairy/Corn/Soybean Pasture/Hay</td>
</tr>
<tr>
<td>Whiskey Creek</td>
<td>Wilkin &amp; Ottertail Counties Northwest</td>
<td>137,130 acres 70% cropped</td>
<td>Watershed District</td>
<td>Corn/Soybeans Sugar Beets/Wheat</td>
</tr>
<tr>
<td>Whitewater</td>
<td>Olmsted, Wabasha, Winona Counties; SE MN</td>
<td>205,000 acres 45% cropped</td>
<td>Joint Powers Board</td>
<td>Row crops/Pasture Hay/Dairy/Beef</td>
</tr>
<tr>
<td>Elm Creek</td>
<td>Jackson and Martin Cty South Central MN</td>
<td>173,000 acres 85% cropped</td>
<td>Joint Powers Board/ NGO*</td>
<td>Corn/Soybeans Swine</td>
</tr>
</tbody>
</table>

* Pilot governance changed from non-governmental organization (Rural Advantage) to the Greater Blue Earth River Basin Alliance Joint Powers Organization in 2015.

In October 2014, the MDA applied to the USDA’s Natural Resources Conservation Service (NRCS) for 5 years of funding under its federal Regional Conservation Partnership Program (RCPP) to support expanding the agricultural certainty program statewide. MDA’s proposal was successful; NRCS selected the program to receive $9.8 million in federal assistance over the five year period 2015-2019, conditional on a state match from Minnesota’s Clean Water Fund (CWF) of $11.3 million over the same period.

Earlier in the year, MDA sought a recommendation for a major increase (from $3 million to $5.4 million) in CWF monies for the fiscal year 2016-2017 biennium from the Clean Water Council. The Council’s final recommendation was for $2.5 million. The legislature appropriated $2.5 million for FY 2016 to expand the program statewide, mandated that MDA submit a report due January 2016 on funding sources other than the CWF that could serve as a match for NRCS funds, and authorized MDA to seek funding for FY 2017 in the future. The MDA has divided up the state into 8 regional service areas and is hiring staff to deliver the program in each.

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7 FY16-17 Clean Water Fund Recommendations Report, Biennial Report to the Legislature, p. 11, December 1, 2014;

8 Minnesota Session Laws 2015, 1st Special Session, Chapter 2.
DEVELOPMENT OF CERTIFICATION MEASUREMENT TOOL

In late 2012, the NRCS debuted an agricultural water quality index model (hereafter WQIag) meant to describe the quality of runoff water from agricultural fields. It consists of 6 broad categorical components that influence field runoff: field and soil characteristics; nutrient management; tillage management; pest management; irrigation/drainage management; and added conservation practices. Each of the first four components is scored separately on a scale of 1-10 (with 10 being highest estimated water quality), a weighting factor is applied, and then the scores are averaged into a single value between 1 and 10. This overall score is then adjusted for irrigation/drainage management, and further adjusted by addition of up to three conservation practices.

The MDA utilized the WQIag as the basis for its certification measurement tool (hereafter “assessment tool”) and adapted it for use in Minnesota, issuing the first version in September 2013. MDA requires a final adjusted score of 8.5 or higher on the 1-10 scale for an operation to be eligible for certification.

Using funds from a McKnight Foundation grant, MDA contracted with the Stearns County Soil and Water Conservation District (which was also a pilot project) for an evaluation of the assessment tool. This evaluation was completed in January 2015, and MDA revised the assessment tool April 2015 to address several of its recommendations.

COSTS AND STAFFING

For each of the Fiscal Years 2014-2016, MDA has had five FTE staff for the program, funded by the state’s Clean Water Fund (CWF). The CWF also supports agency administrative expenses,

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13 The Clean Water Fund receives thirty-three percent of the constitutionally-dedicated sales tax revenue from the Legacy amendment, a ballot initiative enacted in 2008. These funds may only be spent to protect, enhance, and restore water quality in lakes, rivers, and streams and to protect groundwater from degradation.
and pass-through funding for local project staff (technical assistance) and financial subsidies for agricultural producers undergoing certification. Partial staff support has been provided by pesticide fees administered by the MDA’s Pesticide Management and Fertilizer Management Division.

Minnesota’s key funding partner, the NRCS, provided a share of support for local project staff (technical assistance) and financial assistance to producers in FY’s 14-15, increasing its contribution in FY 2016 per the RCPP grant.

Remaining funding was provided by The McKnight Foundation via a 2-year grant to MDA to conduct an analysis of the assessment tool.

Table 2. Agricultural Certification Program Budget, Fiscal Years 2014-2016

<table>
<thead>
<tr>
<th>State—Clean Water Fund</th>
<th>FY 14</th>
<th>FY 15</th>
<th>FY 16</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDA Salaries/Benefits</td>
<td>$450,000</td>
<td>$450,000</td>
<td>$450,000</td>
<td>$1,350,000</td>
</tr>
<tr>
<td>MDA Administrative</td>
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<td>$250,000</td>
<td>$412,500</td>
<td>$912,500</td>
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<tr>
<td>Technical Assistance – Pilot match</td>
<td>$250,000</td>
<td>$250,000</td>
<td>N/A</td>
<td>$500,000</td>
</tr>
<tr>
<td>Financial Assistance to Producers</td>
<td>$180,000</td>
<td>$180,000</td>
<td>$453,750</td>
<td>$813,750</td>
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<tr>
<td>Local Technical Assistance/Support</td>
<td>$370,000</td>
<td>$370,000</td>
<td>$1,183,750</td>
<td>$1,923,750</td>
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<tr>
<td>TOTAL</td>
<td>$1,500,000</td>
<td>$1,500,000</td>
<td>$2,500,000</td>
<td>$5,500,000</td>
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<table>
<thead>
<tr>
<th>State—MDA-PFMD</th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MDA Salaries/Benefits</td>
<td>$50,000</td>
<td>$50,000</td>
<td>$0</td>
<td>$100,000</td>
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</table>

<table>
<thead>
<tr>
<th>Federal—NRCS</th>
<th>FY 14</th>
<th>FY 15</th>
<th>FY 16</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Assistance – Pilot match</td>
<td>$250,000</td>
<td>$250,000</td>
<td>N/A</td>
<td>$500,000</td>
</tr>
<tr>
<td>Financial Assistance to Producers</td>
<td>$1,500,000</td>
<td>$1,500,000</td>
<td>$1,800,000</td>
<td>$4,800,000</td>
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<tr>
<td>Technical Assistance to MN-NRCS</td>
<td></td>
<td></td>
<td>$450,000</td>
<td>$450,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$1,750,000</td>
<td>$1,750,000</td>
<td>$2,250,000</td>
<td>$5,750,000</td>
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<tr>
<th>Other—McKnight Foundation</th>
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<tr>
<td>Assessment Tool Grant</td>
<td>$50,000</td>
<td>$50,000</td>
<td></td>
<td>$100,000</td>
</tr>
</tbody>
</table>

| GRAND TOTAL               | $3,350,000 | $3,350,000 | $4,750,000 | $11,450,000 |
DOES THE ASSESSMENT TOOL PROTECT WATER QUALITY STANDARDS?

The certainty program’s initial Memorandum of Understanding promises “support” of state water quality standards and goals in exchange for 10 years of regulatory certainty that additional water quality protective practices will not be required. Minnesota statute requires the certification instrument (assessment tool) to be “consistent” with state water quality standards and goals:

The commissioner…shall develop an analytical instrument to assess the water quality practices and management of agricultural operations. This instrument shall be used to certify that the water quality practices and management of an agricultural operation are consistent with state water quality goals and standards.

Does the certainty program’s assessment tool protect water quality standards for Minnesota’s rivers, streams, and lakes? To answer this question, this chapter looks at the extent to which the assessment tool is calibrated to insure that runoff from certified farms meets water quality standards at the individual farm level.

What are water quality standards? Water quality standards are measures that describe the desired condition of a water body and are derived to protect human health, fish and other aquatic life, and recreational uses. Minnesota has adopted water quality standards for its lakes and rivers for pollutants often found in agricultural runoff, notably sediment, phosphorus, nitrate and pesticides.

IS THE ASSESSMENT TOOL CALIBRATED TO ACHIEVE WATER QUALITY STANDARDS IN RUNOFF FROM CERTIFIED FARMS?

Pollutants from agricultural fields get into lakes, rivers and streams (“surface waters”) by two primary mechanisms. In general, sediment and sediment-attached pollutants like phosphorus wash into waterways via overland runoff of precipitation (rainfall or snowmelt). Water soluble pollutants including nitrogen and some pesticides percolate through the soil to groundwater.

14 The Memorandum of Understanding states that “Now therefore, we do hereby agree to...” develop and implement, in consultation with stakeholders, a certification program that will support state water quality standards and goals...” Memorandum of Understanding “Engaging In A State and Federal Partnership in Support of the Minnesota Agricultural Water Quality Certification Program,” January 17, 2012.

15 Minn. Stat. §17.9893.
(water found underground in the cracks and spaces in soil, sand and rock). The groundwater then either discharges over time to surface waters or is intercepted by agricultural drain tile (underground perforated pipes installed to convey water quickly from fields to ditches and waterways) and discharged directly to surface waters.

To gauge whether the MDA’s assessment tool insures that runoff from certified farms protects water quality standards, MCEA obtained and analyzed monitoring data from Discovery Farms Minnesota at operations that had also been assessed using the certification tool. These are the only sites in the state with water quality monitoring data paired with certainty program scores. Discovery Farms sites cover a range of management systems, but all included in this dataset are considered to be high performing.

Table 3 shows the annual (flow-weighted) mean concentrations of nitrate for each of the sites monitoring tile lines.

Table 3. Discovery Farms Minnesota Tile Monitoring
Nitrate in Milligrams per Liter (parts per million)

<table>
<thead>
<tr>
<th>Tile Monitoring Site</th>
<th>Water Year</th>
<th>Nitrate FWMC (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location 1</td>
<td>2011</td>
<td>16.21</td>
</tr>
<tr>
<td>Location 1</td>
<td>2012</td>
<td>15.22</td>
</tr>
<tr>
<td>Location 1</td>
<td>2013</td>
<td>26.07</td>
</tr>
<tr>
<td>Location 2</td>
<td>2011</td>
<td>16.85</td>
</tr>
<tr>
<td>Location 2</td>
<td>2012</td>
<td>38.41</td>
</tr>
<tr>
<td>Location 4</td>
<td>2013</td>
<td>26.89</td>
</tr>
<tr>
<td>Location 6</td>
<td>2013</td>
<td>22.81</td>
</tr>
<tr>
<td>Location 7</td>
<td>2012</td>
<td>14.81</td>
</tr>
<tr>
<td>Location 7</td>
<td>2013</td>
<td>25.95</td>
</tr>
<tr>
<td>Location 8</td>
<td>2012</td>
<td>30.12</td>
</tr>
<tr>
<td>Location 8</td>
<td>2013</td>
<td>50.25</td>
</tr>
<tr>
<td>Location 9</td>
<td>2013</td>
<td>15.35</td>
</tr>
<tr>
<td>Location 10</td>
<td>2012</td>
<td>17.74</td>
</tr>
<tr>
<td>Location 10</td>
<td>2013</td>
<td>19.82</td>
</tr>
</tbody>
</table>

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16 Discovery Farms Minnesota, an organization that collects environmental performance data on core farms in partnership with MDA, has been collecting water samples from “edge-of-field” monitoring sites and for some operations from drain tile outlets since 2011. As part of its analysis of the assessment tool (see footnote 10), the Stearns County team scored the Discovery Farms sites using the assessment tool.

17 Sensitivity Analysis, p. 40. (See footnote 10.)
Strikingly, every one of the drain tile monitoring sites yielded nitrate concentrations well in excess of Minnesota’s drinking water standard of 10 parts per million (mg/L) and its draft aquatic life standard of 4.9 parts per million. Three of the site/year combinations scored high enough to certify without the addition of any conservation practices. Since underground drain tiles discharge to surface waters, and these sites would not require any treatment practices to certify, these results indicate that the assessment tool is not currently calibrated to insure that nitrate water quality standards are met.

To better understand the relationship of these results to the certainty program, MCEA plotted the nitrate data against the sum of scores derived using the assessment tool for the core components of field characteristics/soils, nutrient management, and tillage management. The results, shown below, reveal very little correlation between the scores and the monitored nitrate levels (an extremely low coefficient of determination, or $R^2$ of 0.0086).

MCEA next plotted the same nitrate data, but compared it with the sum of the three components less the drainage adjustment (if any) applicable to each site. (Recall that drainage management can result in adjustments to the overall score of the core components.) This increased the correlation slightly ($R^2 + 0.0547$), as shown below.

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19 The fourth (and final) core component of pesticide management is not included due to a lack of monitoring data for pesticides. In addition, MDA considers pesticide management to have little or no influence on the assessment tool’s performance for other water quality parameters.
Does the Assessment Tool Support Water Quality Standards?

Figure 2.

This low correspondence between operation scores and measured nitrate levels in tile lines further indicates that the assessment tool needs to be adjusted to better address soluble pollutants such as nitrate.

MCEA conducted similar analyses of data for total suspended solids (sediment) and found a somewhat stronger relationship between high scores and lowered TSS values \( (R^2 = 0.1116) \), shown in Figure 3.

Figure 3.
MCEA concurs with the finding of the authors of the Sensitivity Analysis\textsuperscript{20} that the narrowed variability in sediment levels at the higher end of the scoring scale indicates a stronger performance of the assessment tool for sediment runoff. It is impossible to guess the sediment levels in runoff reaching surface waters,\textsuperscript{21} and this data is not collected at Discovery Farm Minnesota sites (or anywhere else in the state to MCEA’s knowledge). MCEA does not have access to information on the conservation practices in place at the Discovery Farms operations, but expects that these practices would substantially attenuate sediment loads before runoff reaches surface waters.

**HOW CAN THE ASSESSMENT TOOL BE ADJUSTED TO MORE CLOSELY REFLECT WATER QUALITY?**

MDA made several changes to the WQIag scoring system utilized by NRCS, and these “grade inflations” may, at least in part, explain some of the apparent disconnect between MDA’s assessment tool scores and water quality impacts, particularly for nitrate in subsurface tile line discharges. These changes include higher scoring for:

- most conservation practices;
- use of University of Minnesota recommendations for nitrogen fertilizer; and
- tile drained fields with either drainage water management or high scores on nutrient and tillage management.

**Conservation practice scoring**

The Sensitivity Analysis found that conservation practices have the most influence on final assessment scores, making it very important that these practices are scored accurately for water quality impact. Use of up to three among 11 MDA-specified conservation practices may be used to boost the “semi-final” site score.\textsuperscript{22} Table 4 below compares NRCS’s score adjustments for a given practice with MDA’s original (September 2013) and amended (April 2015) scoring adjustments. As shown, MDA’s adjustments are generally more generous (some considerably so) than those of the NRCS, with the exception of the 2015 scoring for sediment basins.

\textsuperscript{20} Sensitivity Analysis, p. 37 (see footnote 10).

\textsuperscript{21} Minnesota’s water quality standards for Total Suspended Solids range from 10-100 milligrams per liter, depending on waterbody class and location. (Minn. R. 7050.0222)

\textsuperscript{22} “Semi-final” score refers to the weighted mean value of the four core components (field/soil characteristics; nutrient management; tillage management, and pesticide management) as adjusted by irrigation or tile drainage adjustments.
Table 4. Comparison of NRCS and MDA Conservation Practice Score Adjustments

<table>
<thead>
<tr>
<th>Conservation Practice</th>
<th>NRCS WQI Score Adjustment %</th>
<th>MDA 2013 Score Adjustment %</th>
<th>MDA 2015 Score Adjustment %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contour strip cropping</td>
<td>27.5</td>
<td>38.5</td>
<td>45</td>
</tr>
<tr>
<td>Contour buffer strip</td>
<td>23.75</td>
<td>43.5</td>
<td>45</td>
</tr>
<tr>
<td>Sediment basins</td>
<td>42.5</td>
<td>42</td>
<td>35</td>
</tr>
<tr>
<td>Field borders</td>
<td>37.5</td>
<td>43</td>
<td>45</td>
</tr>
<tr>
<td>Riparian forest buffer</td>
<td>37.5</td>
<td>38</td>
<td>45</td>
</tr>
<tr>
<td>Filter strip</td>
<td>37.5</td>
<td>43</td>
<td>45</td>
</tr>
<tr>
<td>Grass waterway</td>
<td>35</td>
<td>43.5</td>
<td>35</td>
</tr>
<tr>
<td>Conservation cover</td>
<td>35</td>
<td>35</td>
<td>45</td>
</tr>
<tr>
<td>Water and sediment control basin</td>
<td>25</td>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td>Grade stabilization structure</td>
<td></td>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td>Cover crop</td>
<td>N/A</td>
<td></td>
<td>45</td>
</tr>
</tbody>
</table>

MDA has not presented scientific evidence to support its scoring changes from NRCS’s tool. The agency lists several sources of information on conservation practice pollutant removal efficiencies in its technical guide, and directs readers to its handbook on agricultural best management practices for further information. MCEA collected and reviewed the references cited in both the technical guide and the handbook. Results are summarized in Appendix A, Conservation Practice Summary Table.

This review yielded three major findings:

- Some referenced studies did not support the pollutant removal efficiencies utilized by MDA;
- The referenced studies contain relatively little actual field research, consisting of literature reviews, studies of a single field or basin, and/or work outside of Minnesota or the Upper Midwest;
- The studies discuss removal efficiencies of subsurface nitrate pollution for only one practice—cover crops—and the rates are quite variable but lowest in Minnesota-specific research.

MCEA recommends that the Minnesota Department of Agriculture revise the scoring of conservation practices via a three-step process:

1. Utilize more conservative score adjustments of the NRCS;

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24 The Agricultural BMP Handbook for Minnesota, Minnesota Department of Agriculture, September 2012.
2. For practices lacking robust, Upper Midwest research, undertake monitoring both at the edge-of-field (for sediment and attached pollutants) or of tile lines (for nitrate) and “downstream” of conservation practices; and
3. Revise NRCS score adjustments as appropriate based on field research.

To more fully assess the impact of the boost in final scores from conservation practices where subsurface drainage is present, MCEA requested information from MDA on acres with tile drainage certified in each watershed, the average raw score for these fields, the average score after adjusting for drainage, the conservation practices implemented, and average final score. Results are shown below.

<table>
<thead>
<tr>
<th>Table 5. Conservation Practice Effects on Scoring on Tile-Drained Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Certified acres with tile</strong></td>
</tr>
<tr>
<td>--------------------------------</td>
</tr>
<tr>
<td>Average raw score (acres w/ tile)</td>
</tr>
<tr>
<td>Average score adjusted for tile</td>
</tr>
<tr>
<td>Average final score</td>
</tr>
</tbody>
</table>

**Practices implemented**

<table>
<thead>
<tr>
<th>Practice</th>
<th>Middle Sauk</th>
<th>Whiskey Creek</th>
<th>Whitewater</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter strips</td>
<td>52</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Grassed waterways</td>
<td>32</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Field borders</td>
<td>24</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Water &amp; sediment control basins</td>
<td>6</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Contour strip cropping</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Riparian forest buffer</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cover crops</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Average raw scores and scores adjusted for drainage were below the 8.5 needed for certification in each watershed. Average final scores after applying credits for over 140 practices were well above the certification threshold. However, only one of these practices addresses subsurface tile drainage pollution (cover crops). This indicates that operations are achieving certification without addressing nitrate and other soluble pollutants in tile lines.

The MDA must insure that conservation practice score adjustments for tile-drained fields be applied only for practices demonstrated to attenuate sub-surface discharges.

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25 Elm Creek is not included, as the pilot had certified only one farm operation.
**Fertilizer rate scoring**

The rate of nitrogen fertilizer application is a major factor in environmental losses, with reduced rates showing removal efficiencies between 10-70 percent. Both the NRCS and the MDA score this component using the local land grant university’s recommendations (in MDA’s case, those of the University of Minnesota). Fertilizer rate is the highest weighted factor in the nutrient management component score, and the nutrient management score in turn is the highest weighted of the four core components comprising an operation’s “raw” score before drainage and/or conservation practice adjustments are made. Nutrient management weighs in again with drainage adjustments, where a penalty for tile drainage is removed if the nutrient and tillage management scores average 9 or greater.

The MDA’s assessment tool departs significantly from the NRCS Water Quality Index in scoring the application rates of nitrogen and phosphorus fertilizers, as shown below.

<table>
<thead>
<tr>
<th>NRCS Nitrogen Fertilizer Rate Scoring (WQI)</th>
<th>MDA Nitrogen Fertilizer Rate Scoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Rate</td>
<td>Score</td>
</tr>
<tr>
<td>No fertilizer applied</td>
<td>10</td>
</tr>
<tr>
<td>50% less than LGU recommendation</td>
<td>7.5</td>
</tr>
<tr>
<td>40% less than LGU recommendation</td>
<td>7</td>
</tr>
<tr>
<td>30% less than LGU recommendation</td>
<td>6.5</td>
</tr>
<tr>
<td>20% less than LGU recommendation</td>
<td>6</td>
</tr>
<tr>
<td>10% less than LGU recommendation</td>
<td>5.5</td>
</tr>
<tr>
<td><strong>LGU recommendation</strong></td>
<td><strong>5</strong></td>
</tr>
<tr>
<td>10% over LGU recommendation</td>
<td>3</td>
</tr>
<tr>
<td>10% over LGU recommendation</td>
<td>1</td>
</tr>
</tbody>
</table>

MDA’s assessment tool departs significantly from the NRCS Water Quality Index in scoring the application rates of nitrogen and phosphorus fertilizers, as shown below.

<table>
<thead>
<tr>
<th>Application Rate</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No nitrogen applied</td>
<td>10</td>
</tr>
<tr>
<td>MN BMP recommendation</td>
<td>9</td>
</tr>
<tr>
<td>10% over the BMP ranges</td>
<td>6</td>
</tr>
<tr>
<td>20% over the BMP range</td>
<td>4</td>
</tr>
<tr>
<td>30% over the BMP range</td>
<td>2</td>
</tr>
<tr>
<td>50% over the BMP range</td>
<td>1</td>
</tr>
</tbody>
</table>

MCEA sought MDA’s rationale for these changes by letter dated October 15, 2013. MDA’s response provided a generic chart showing that as nitrogen application rates increase, nitrate leaching increases and crop yields increase up to a point, then level off and two related statements: “[t]he development of Minnesota’s nitrogen BMPs is based on an optimum nitrogen rate from an economic standpoint, which is also the point at which environmental loss of nitrogen is minimal as can be seen in the figure below” and “The scoring for nitrogen and phosphorus application rates was adjusted based on the expertise of the technical

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27 Letter from MDA Assistant Commissioner Matt Wohlman to Kris Sigford, Beth Kallestad, Jim Riddle (members of the MAWQCP advisory committee), Gene Merriam, Trevor Russell and Don Arnosti, December 2, 2013.
committee.” (Chart shown below; from *Best Management Practices for Nitrogen Use in Minnesota*, University of Minnesota Extension.)

This figure illustrates general principles; it obviously does not tie specified, recommended rates of nitrogen application to leachate concentrations. In fact, the U of M’s Best Management Practices for Nitrogen Fertilizer application are explicitly based on the “maximum return to nitrogen.” This return represents the peak profitability for the producer, not water quality protection, let alone a proxy for water quality standards. The U of M clearly states this, instructing producers to: “Select the appropriate N fertilizer rate using U of M guidelines...which are based on current fertilizer and corn prices, soil productivity, and economic risk.”

The U of M’s own research establishes that its recommended BMPs will not protect groundwater. For example, the Best Management Practices for Nitrogen Use in South-Central Minnesota recommends an economically optimal spring-applied fertilization rate of 120 pounds per acre, while that same document concludes that this application rate will yield nitrate loss to drain tile systems at 13.7 mg/L – nearly 40 percent above the safe drinking water standard for nitrate of 10 mg/L. Note that heavy-textured soils in this area of the state hold more water and are less prone to soluble pollutants than coarse-textured soils.

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Does the Assessment Tool Support Water Quality Standards?

Unfortunately, the U of M recently significantly increased its recommended rate of nitrogen fertilizer application to corn grown on irrigated sandy soils—soils most prone to leaching to groundwater—stating that “The MRTN value shown in Table 1 is the N rate that maximizes profit to the producer based on the results of experiments supporting these guidelines.”

MCEA recommends that the Minnesota Department of Agriculture request the University of Minnesota to prepare new or additional best management practices for nitrogen fertilizer use on corn with tile drainage that are demonstrated to result in discharges within water quality standards, including as appropriate:

- the rate, timing, and location of applications;
- cropping systems; and
- tile drainage discharge treatment practices.

Drainage management scoring adjustments

The Sensitivity Analysis found that drainage management scores are the second most influential variable in determining an operation’s final score. As with conservation practices and fertilizer rate scoring, MDA’s system departs from that of NRCS without a scientific rationale. Table 7 compares NRCS’s Water Quality Index for agriculture and MDA’s assessment tool scoring of drainage management factors.

Table 7. Comparison of NRCS and MDA Tile Drainage Scoring

<table>
<thead>
<tr>
<th>Tile drain system</th>
<th>NRCS Score Adjustment</th>
<th>MDA Score Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Drain Tile</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Standard Density Tile Drain (STD)</td>
<td>-20.00%</td>
<td>-20.00%</td>
</tr>
<tr>
<td>STD with drainage water management</td>
<td>-5.00%</td>
<td>10.00%</td>
</tr>
<tr>
<td>High Density Tile Drain (HDTD)</td>
<td>-15.00%</td>
<td></td>
</tr>
<tr>
<td>HDTD with drainage water mgmt</td>
<td>-5.00%</td>
<td></td>
</tr>
<tr>
<td>STD with score &gt;9 in nutrient management and tillage mgmt</td>
<td>0%</td>
<td></td>
</tr>
</tbody>
</table>

Again, MDA’s scoring system is more lenient, with two major departures from that of NRCS, which always penalizes the presence of drain tile. First, MDA awards a 10 percent bonus for drain tile with one of four types of drainage water management, where NRCS levels a penalty of

5 percent. MDA staff has stated that this change was a policy decision aimed at encouraging management of drain tile effluent, strongly recommended by former NRCS Minnesota Chief Don Baloun. As noted, MDA also does not levy a penalty for tile drainage if the site scored well on nutrient and tillage management. Given that several site/year combinations in the Discovery Farms Minnesota tile line data scored well enough to certify without additional conservation practices despite high nitrate levels, and that only one newly added conservation practice addresses subsurface nitrate levels, MCEA recommends that:

**Until conservation practice scoring adjustments and revised nitrogen fertilizer BMPs are complete and incorporated into the assessment tool, the tool should be adjusted such that a facility with tile drainage under corn may not achieve a “certifiable” score unless an operation achieves a nutrient management score of 10 and a combination of continuous living cover and/or tile drainage water retention and treatment is in place.**

**Conclusion**
Based on the above analyses of data from the only farms in Minnesota with water quality monitoring data that have been scored using MDA’s assessment tool, MCEA concludes that the assessment tool is not currently calibrated to insure that water quality standards are met at certified farms and has offered several recommendations that we believe are likely to greatly improve the correlation between certification and support of water quality standards in line with MDA’s statutory directive.

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30 Personal communication with MDA Program Coordinator Brad Jordahl Redlin and MDA Assistant Commissioner Matt Wohlman, meeting October 25, 2013.
CAN THE PROGRAM SUPPORT WATER QUALITY GOALS?

Minnesota has adopted many water quality goals, most of which are expressions of the aggregated pollutant reductions needed to meet water quality standards for a major watershed or region of the state. What is the likelihood that enough farm operations will become certified that watershed and basin-scaled water quality goals derived to support water quality standards will be met? To answer this question, this chapter looks at water quality conditions in pilot watersheds, certainty program participation to date, water quality goals, and the scale of agricultural clean-up needed to meet them.

WATER QUALITY CONDITIONS IN PILOT WATERSHEDS

Understanding water quality conditions is an essential platform for developing watershed plans, understanding the scope and scale of practices needed to restore waters, and targeting implementation efforts for maximum benefit. Water quality monitoring is the ultimate determinant of whether water quality standards are being met. When a water body is found to violate one or more water quality standard(s), it is placed on an impaired waters list, and a clean-up plan called a Total Maximum Daily Load (TMDL) is prepared that quantifies the amount of the pollutant the water body can assimilate and still meet the standard(s).

Each of the pilot project watersheds has significant local water quality impairments associated with agricultural runoff. Table 8 shows the results of water quality assessments conducted by the Minnesota Pollution Control Agency for each pilot area. Each stream segment meets water quality standards (supporting), violates water quality standards (impaired), or there is not enough sampling data to determine whether standards are met or not (not assessed).31

Several similarities among the pilot watersheds stand out. First, the watersheds are largely or entirely unassessed for some key agriculturally-driven parameters, including pesticides and dissolved oxygen.32 Among stream reaches assessed for bacteria, all but one was impaired. All four reaches assessed for low dissolved oxygen were impaired. Where both fish and macro invertebrate biology were assessed, macro invertebrates were more widely impacted.

31 Assessment maps for each pilot watershed may be found at: http://www.mncenter.org/issues/water/mn-agricultural-certainty-program-review.aspx.
32 The relative paucity of assessments for nitrate and phosphorus is tied to the lack of water quality standards for a) nitrates in streams not designated for drinking water use, and b) phosphorus in streams of any use class. Nitrate and phosphorus assessments presented are based on meeting or exceeding ecoregional expectations.
There are notable differences as well. Seven out of eight stream reaches assessed for turbidity in the Middle Sauk were clean, while in the Whitewater, eight of nine assessed reaches were impaired for this parameter.

**AGRICULTURAL SOURCE REDUCTION GOALS FOR PILOT WATERSHEDS**

Regional, state and local agricultural reduction goals have been established in studies to restore the Gulf of Mexico, other downstream waters (such as Lake Winnipeg in Canada and Lake Pepin on the Mississippi River in Minnesota and Wisconsin) and scores of TMDLs for smaller, local waterbodies and watersheds. Often, meeting these water quality restoration goals would require large-scale changes in management of agricultural lands within the subject watershed.

While municipal and industrial dischargers and urban stormwater sources are required through federal Clean Water Act permits to meet pollution reduction goals, agricultural sources are
exempt from such permits, leaving achievement of reduction goals to voluntary implementation of BMPs.

Many of the impaired streams in pilot areas have not yet had TMDL cleanup plans prepared that quantify the agricultural runoff reductions needed to achieve water quality standards in local waters. Two documents provide the scope of need at a broader scale—the draft Minnesota River Turbidity TMDL (which includes Elm Creek) and the Minnesota Nutrient Reduction Strategy (which encompasses all pilot areas).

The turbidity TMDL provides the scale of agricultural practice changes needed throughout the Minnesota River basin to achieve water quality standards for sediment delivered largely from overland runoff (and serves as a proxy for phosphorus reduction needs, since phosphorus in agricultural runoff is generally attached to sediment). Meeting sediment and phosphorus standards in the Minnesota River Basin requires massive, landscape-level changes by agricultural sources. This Rx has been dubbed “paradigm change” and includes:

- 20 to 30 percent of the entire Minnesota River basin in perennial cover;
- conservation tillage on 75 percent of all cropped acres;
- increased land in the Conservation Reserve Program (CRP);
- elimination of surface tile inlets;
- low-till or perennials on slopes over 12 percent;
- cover crops on 100 percent of row cropped land with slopes over 3 percent; and
- controlled drainage on all land with slope over 1 percent.

Similarly, the Minnesota Nutrient Reduction Strategy calls for major reductions in nitrogen loading to surface waters of 20 percent by 2025, 35 percent by 2035 and 45 percent by 2045. The University of Minnesota and the Minnesota Pollution Control Agency created a tool to estimate the rate of BMP adoption required to meet these nitrogen goals. MCEA ran the tool for each of the major watersheds containing the pilot areas. Appendix B—Adoption Rates to Achieve Nitrogen Reduction Goals—shows the results, expressed as the rate of adoption of

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33 The exception is a permit requirement for certain large livestock confinement facilities (Concentrated Animal Feeding Operations, or CAFOs).
36 Turbidity TMDL p. 166-167.
each of twelve practices required to achieve 20 percent, 35 percent and 45 percent nitrogen reductions on suitable acres in each of the four watersheds. These results show a similarly massive, landscape-level degree of BMP saturation to meet even the 20 percent reduction goal, progressing to multiple practices needing adoption on 90-100 percent of suitable acres to reach a 45 percent reduction.

Achieving water quality goals for sediment, phosphorus and nitrate is an enormous task. Is certification equivalent to meeting these goals at the individual farm level? In some respects, yes. For example, it would be difficult for an operation to be certified without some of the nutrient, tillage and/or drainage management practices called for in the watershed nitrogen BMP tool and the turbidity TMDL. In other respects, no; certification does not require 100-foot riparian buffers, conversion of row crops to perennials, wetland restoration, removal of tile inlets and the like.

In recent years, Minnesota has developed a watershed-based approach to monitoring water quality, developing clean up and protection strategies for affected water bodies, and framing up plans to implement agricultural and other reductions. These strategies, called Watershed Restoration and Protection Strategies or WRAPS, are required by law to include the scale of adoption needed for each action. Integrating the certainty program into this watershed approach may be quite helpful in both refining the scale of practice adoption needed and in significantly expanding the certainty program’s reach. As such, MCEA recommends that:

The Minnesota Department of Agriculture and the Minnesota Pollution Control Agency should work to quantify the average pollutant-specific reductions likely to result from certification and utilize the results in modeling the scale and locations of actions needed at the watershed scale. Results should be incorporated into TMDLs, WRAPSs, and local watershed plans.

WHAT ARE THE PROSPECTS FOR WIDESPREAD CERTIFICATION PROGRAM ADOPTION?

Insofar as certification would at least partially accomplish Minnesota’s adopted water quality goals, it would take extremely strong participation throughout the state to make significant progress toward them. While MDA did not establish goals or performance expectations against

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38 Minn. Stat. §114D.26 Subd. 1.
which to measure the pilots’ success, it does track the number of certified operations and acreage certified. As shown below, pilot outputs\(^{39}\) by these metrics have been quite uneven:

<table>
<thead>
<tr>
<th>Pilot</th>
<th>#Farms Certified</th>
<th># Acres Certified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elm Creek</td>
<td>1</td>
<td>231</td>
</tr>
<tr>
<td>Middle Sauk</td>
<td>17</td>
<td>5,664</td>
</tr>
<tr>
<td>Whiskey Creek</td>
<td>9</td>
<td>8,980</td>
</tr>
<tr>
<td>Whitewater River</td>
<td>25</td>
<td>15,725</td>
</tr>
</tbody>
</table>

No formal assessment of the pilots has been conducted to date. Informal observations by pilot participants and MDA have endorsed creative outreach and promotional methods, dedicated local staffing, program delivery through local Soil and Water Conservation Districts, and use of an independent, impartial assessment tool\(^{40}\) as keys to success.

**MDA should prepare and administer a survey of pilot leaders regarding lessons learned, barriers, and successes regarding initial producer outreach efforts, enlisting producers into the certification process, any feedback on producers’ motivations for becoming certified or choosing not to once they are informed about the program.**

Further insights on producer knowledge and motivations have been gained from the first round “Knowledge, Attitudes, and Practices” survey conducted by Dr. Karlyn Eckman at the University of Minnesota.\(^{41}\) Comparing results across the pilots,\(^{42}\) the survey found:

- Knowledge of local surface water quality challenges and pollutants of concern in tile drainage/drinking water were low for all pilots;
- Half of respondents did not think their operation contributed pollutants to local lakes, streams, or rivers; another third were uncertain;

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\(^{39}\) Pilot outputs provided by Brad Jordahl Redlin, Agricultural Water Quality Certification Program Manager, October 27, 2015 via email.

\(^{40}\) The pilot leader indicated that the tool doesn’t seem biased or personal to producers, rather “it’s like getting your cholesterol number from your doctor.”

\(^{41}\) Presentation to MAWQCP Advisory Committee June 17, 2015, unpublished. The survey will be repeated in 2016 and data sets compared. Surveys were sent to 1453 producers in FSA and county databases (without regard to participation in the certainty program); 33 percent were returned.

\(^{42}\) Results are from the Middle Sauk, Whitewater and Whiskey Creek pilots; Elm Creek had been discontinued at the time of the presentation.
Profitability was the most important factor in producers’ decision-making, with barriers to action led by potential cost concerns, and incentives to action led by cost-share availability, and

Less than 7 percent of respondents were “ready and willing” to get involved with the certainty program.

Participation in the program to date and interest in certification among producers polled indicate that the program is unlikely to be adopted broadly enough to move the needle in achieving challenging water quality goals.

Conclusion

It may seem unfair to assess the agricultural certification program in light of its ability to assist significantly in meeting challenging water quality goals, yet MCEA believes it is important to do so. Why? The certification program is explicitly in lieu of regulation, and provides a shield indemnifying producers from the imposition of any additional water quality requirements. Agricultural runoff and tile discharges are Minnesota’s largest water quality problem. The executive branch has clearly put a lot of Minnesota’s water quality restoration eggs in this basket.  

At the same time, Minnesota has a number of important water quality goals and standards explicitly derived to protect human health, aquatic life, and recreation—and achieving these goals appears to require more from individual farm operations, and greatly more participation by producers across the state, than is being delivered by the agricultural certification program.

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43 See, e.g., Minnesota Nutrient Reduction Strategy, Minnesota Pollution Control Agency, designating the program a “high priority strategy” in meeting nutrient reduction goals and “key to achieving goals and milestones” in the NRS; Nonpoint Priority Funding Plan, Board of Water and Soil Resources, describing the program as a key action toward “successful achievement of clean water goals” (see USEPA News Release, footnote 1).
TARGETING CERTIFICATION AND CONSERVATION PRACTICES FOR MAXIMUM WATER QUALITY BENEFIT

The enormous scale of agricultural practices needed to achieve water quality standards and goals, coupled with finite public resources, highlight the need for careful targeting of investments in agricultural best management practices. To assist pilot area leaders in targeting future enrollment in the certification program, MCEA conducted several analyses using Geographic Information System maps to locate high priority areas for agricultural conservation practices.

BUFFER ANALYSIS

Minnesota law requires 50-foot permanent vegetated buffers along public waters—an area defined as the “shore impact zone.” Since riparian buffers are very effective at attenuating surface runoff, and because compliance with applicable laws and requirements is a prerequisite for certification, MCEA mapped the presence or absence of 50-foot buffers along public waters in the Elm Creek and Whitewater River watersheds.

As shown in Appendix C, the Elm Creek watershed has 11.6 percent of the 50-foot shore impact zone in cropland (indicating likely non-compliant areas), while the Whitewater watershed has only 3.8 percent of this zone in cropland. Notably, these are the highest and lowest levels of non-compliance, respectively, among the eight watersheds MCEA has mapped since 2010.

The presence of potential agricultural encroachments is not uniformly distributed in either watershed. In each, the most pronounced encroachment activity includes:

- Modified watercourses, streams and ditches in the western part of the watershed; and
- Upstream and watercourse source areas (reaches and tributaries most remote from the main stem of Elm Creek and the Whitewater River).

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44 Minn. R. Chapter 6120.3300 subp. 7. The shore impact zone may, in the alternative, be operated under an approved conservation plan. Public waters are defined by statute: Minn. Stat. 103G.005 subd. 15.
FIELD RUNOFF RISK ANALYSIS

In order to help identify those fields that are likely to contribute the largest phosphorous and sediment loads via overland flow within the watershed, MCEA conducted a runoff risk assessment utilizing high resolution elevation data collected by the state and a conservation planning toolbox developed by USDA’s Agricultural Research Service (ARS).46

The runoff risk assessment is a cross classification between an agricultural field’s slope steepness and its proximity to a stream. Each field is categorized for slope and stream proximity as high, medium, and low. A field’s slope classification is determined using the steepest 25% of the field, while a field’s proximity to stream is determined by calculating the edge of field sediment delivery ratio.

Once categorized as high, medium, or low for steepness and stream proximity, fields are ranked as Critical, Very High, High, and Present. Critical fields are those that have the steepest slope and the edge of the field is closest to a stream. Results of these field runoff risk analyses for the Elm Creek and Whitewater River watersheds are shown in Appendices D and E.

Notable in the field runoff risk map for the Whitewater River watershed is the concentration of critical fields in the upper South Fork, North Fork and Logan Branch areas. These critical areas encompass areas also lacking the required 50-foot buffer and which are generally not assessed for most water quality parameters.

Similarly, the field runoff risk critical areas in the Elm Creek watershed are more prevalent in the upper reaches of Elm Creek and the South Fork of Elm Creek; these areas also frequently lack buffers. Once MCEA completed the field runoff risk analyses, we requested that MDA program staff compare the results with certified fields in the Whitewater River watershed. Results are shown in Table 10.

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Table 10. Comparison of Field Runoff Risk

<table>
<thead>
<tr>
<th>Classification</th>
<th>Overall Acres in Whitewater w’shed</th>
<th>Certified Acres in Whitewater w’shed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical</td>
<td>20,643</td>
<td>1,440</td>
</tr>
<tr>
<td>Very High</td>
<td>15,852</td>
<td>1,130</td>
</tr>
<tr>
<td>High</td>
<td>76,786</td>
<td>4,670</td>
</tr>
<tr>
<td>Present</td>
<td>35,626</td>
<td>2,115</td>
</tr>
</tbody>
</table>

As shown, the classifications of certified acres align very closely with those of the overall watershed. This indicates that if producer recruitment to the certification program was targeted to those with critical area fields, water quality benefits could be increased.

**ADDITIONAL ANALYSES SITING CONSERVATION PRACTICES**

MCEA conducted a suite of further analyses designed to site specific conservation practices throughout the Whitewater and Elm Creek watersheds, also using the high resolution digital elevation model we created and the USDA-ARS tool. The results, available at: http://www.mncenter.org/issues/water/mn-agricultural-certainty-program-review.aspx, show the best locations at the field scale for contour buffer strips, grassed waterways, water and sediment control basins, nutrient removal wetlands, drainage water management, and wetland restoration. The maps also show the most beneficial type and width of riparian buffers.

**MCEA recommends that pilot leaders first make an effort to insure that required buffers are installed where they are missing; then focus program recruitment efforts towards land managers of fields posing critical runoff risk; and review the recommended sites for specific practices when seeking to reduce surface and subsurface runoff.**

**CONCLUSION**

MCEA’s GIS analyses provide tools for local watershed planners and conservation professionals to use to seek compliance with existing regulations, target parcels for enrollment into the agricultural certainty program and other voluntary conservation programs, and to locate the best sites throughout the watersheds to locate specific conservation practices. Used together, these tools can help insure that public and private investments in agricultural practices yield the maximum water quality benefits.
IS MDA’S ADMINISTRATION OF THE PROGRAM ACCOUNTABLE AND TRANSPARENT?

Certification programs in general need to operate with a high degree of accountability and transparency. Consumer products with a “green seal” must be backed by specified standards, independent auditing, and so forth to inspire public trust and command a higher price. The certainty program’s promise of immunity from water quality protection requirements similarly demands high standards of public accountability and reporting. Several issues raised at the program’s advisory committee meetings, legislative hearings, Clean Water Council meetings, and other forums are discussed in this section: evaluation; conflict of interest; auditing; certification tool revision; reporting; and data management.

PROGRAM EVALUATION AND METRICS

The certainty program’s advisory committee recommended to the MDA that the pilot process “should include measurement metrics to establish the qualities needed for a successful program” and that these should be considered “prior to opening the program to statewide participation.” To date, MDA has not put forth any metrics by which to evaluate its pilot projects or to gauge the viability and wisdom of expanding the certification program statewide. Despite this, the MDA requested and received funding from the legislature to expand the program statewide, stating that “The pilot process has been instructive and clearly successful” and that “The program will be available statewide following the pilot period.” In doing so, the MDA also ignored its statutory directive to consult with the program’s advisory committee prior to making its determination that the program is suitable for expansion to other watersheds.

MDA’s measures of success for pilot projects cannot be discerned from the “recommendation form” the agency put out seeking pilot applicants. In fact, it appears that MDA expected applicants to provide these, stating that “characteristics for piloting MAWQCP include: Measurement metrics of the key elements needed for a successful program” and asking only

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47 Advisory committee recommendations (see footnote 3).
49 Minn. Stat. § 17.9891.
50 MDA did not put out a formal request for proposals; instead it sent out a “MAWQCP pilot project area recommendation” form to be used by applicants applying to be a pilot watershed area.
about anticipated producer participation levels and “other factors” the applicant believed would “contribute to a successful pilot in the project area recommended.”\(^{51}\)

In its recommendation form, the MDA asked pilot applicants to describe water quality concerns and impairments. As discussed above, each of the four selected pilot areas include waterbodies impaired by agricultural pollutants, and a number of clean up goals containing source reduction requirements necessary to meet water quality standards have been prepared by the Minnesota Pollution Control Agency and approved by USEPA. However, the certainty program lacks any measures of success relative to actual water quality markers.

The Minnesota Department of Agriculture and the Minnesota Pollution Control Agency should develop metrics by which to gauge the program’s ability to meet water quality standards at the watershed scale. This could be done by utilizing TMDL and Watershed Restoration and Protection Strategy (WRAPS) scale of implementation needs to gauge the degree of producer participation needed for the voluntary program to be effective.

The Minnesota Legislature should tie a significant portion of future state certainty program funding to one or more watersheds with established water quality goals and robust water quality monitoring so that we may learn whether this voluntary program can achieve the level of watershed participation necessary to restore agriculturally-impacted waterways.

**CONFLICT OF INTEREST POLICY**

To date, the MDA does not have a written conflict of interest policy applicable to certifying agents. The advisory committee recommended that “certifiers should not have a conflict of interest with the producer” and that the Commissioner “should develop a conflict of interest policy.”\(^{52}\) The subsequent legislation authorizing the program partially captures this advice by making the certifying agent “ineligible to provide certification services to any producer to whom the certifying agent has also provided technical assistance.”\(^{53}\) Technical assistance is defined as “professional, advisory, or cost-share assistance provided to individuals in order to achieve certification.”\(^{54}\) This appears to allow a producer’s crop advisor—someone who is paid by the producer—to certify his or her client, as long as the agent does not advise the producer on any conservation practices or other changes needed to achieve certification.

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\(^{51}\) Minnesota Agricultural Water Quality Certification Program, Pilot Project Areas, MAWQCP pilot project area recommendation, Minnesota Department of Agriculture, 2013.

\(^{52}\) Advisory committee recommendations (see footnote 3).

\(^{53}\) Minn. Stat. §17.9894 Subd. 1.

\(^{54}\) Minn. Stat. §17.9892 Subd. 7.
MCEA recommends that MDA adopt rules containing a conflict of interest policy that clearly makes a certifying agent ineligible to certify any operation from which he or she has received financial recompense.

AUDIT POLICY

The advisory committee recommended that MDA “should establish a process to randomly audit “certifiers” and producers for verification that they are meeting the criteria set forth by the program.”55 This advice was directly embodied in legislation—“The Commissioner shall perform random audits of producers and certifying agents to ensure compliance with the program.”56 MDA has stated its intent to audit 10% of certified operations, but because the number of certified operations is still quite small, agency staff is currently able to view each firsthand.57

MCEA recommends that the Minnesota Department of Agriculture adopt rules setting forth an auditing process by which both certifying agents and a minimum of 10% of certified operations will be randomly audited. In addition, the auditing process must insure that operations are audited at least once during the 10-year certification period.

Appendix F is a draft recommended conflict of interest and audit policy.

REVISIONS TO THE CERTIFICATION ASSESSMENT TOOL

The MAWQCP Advisory Committee recommended that the MDA “incorporate a process for updates and revisions” to the certification assessment tool.58 Again, the Committee’s recommendation was directly incorporated into the program’s enabling legislation.59 MDA has made revisions to the assessment tool, but to date, these have been on an ad hoc basis via periodic bulletins. Given the rapidity with which drainage and other best management practices are developing:

MCEA recommends that MDA adopt a rule requiring review of and resulting revisions to the certification assessment tool at least every three years.

55 Advisory committee recommendations (see footnote 3).
56 Minn. Stat. §17.9898.
57 Personal communication between MDA Program Coordinator Brad Jordahl Redlin and MCEA Water Program Director Kris Sigford, July 14, 2014.
58 Advisory committee recommendations (see footnote 3).
59 Minn. Stat. §17.9893.
DATA COLLECTION, MANAGEMENT, AND REPORTING

The program’s enabling legislation makes all data identifying a producer or a producer’s location nonpublic or private under Minnesota’s Data Practices Act, requiring only that MDA make available “summary data of program outcomes” on such data.\(^{60}\) The legislation also requires biennial reports on the program, but does not specify any report content.\(^{61}\) As already discussed, MDA has not developed any water quality metrics for the program.

As a result, the public has no way of knowing whether certification is well targeted to address local water quality challenges, or the most at-risk fields, or whether publicly-subsidized conservation practices installed were aimed at surface or subsurface runoff. MDA’s first biennial report, not surprisingly, reports program outputs of number of farms and acres certified and number of conservation practices installed.

In order to obtain the water quality monitoring data and assessment tool derived scores for Discovery Farms Minnesota sites discussed in Chapter 2, MCEA had to submit a formal Data Practices Act request to the Minnesota Department of Agriculture after Discovery Farms Minnesota denied MCEA’s earlier request. MCEA notes that this data is by law public data—as long as the producer and farm location is withheld. It is collected and managed using public funds.

The Minnesota Legislature should amend the reporting provision in Minn. Stat. Chapter 17.992 to require reporting on percent of certified acres within high priority areas identified in TMDLs, WRAPs, and other runoff risk analyses and on tile line, edge-of-field, and downstream of conservation practices monitoring results at certified farms (these should be field-specific without identifying farm operations—e.g., location 1, 2, etc.).

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\(^{60}\) Minn. Stat. §17.9899.  
\(^{61}\) Minn. Stat. §17.992.
WHAT ARE THE ELEMENTS OF SUCCESS FOR VOLUNTARY INCENTIVE PROGRAMS?

Numerous authors have written about the failure of national and state voluntary incentive programs in addressing water quality problems, suggesting both causes and corrections. Many of these as they relate specifically to the certainty program are discussed in *EPA-Minnesota Ag Certainty Program—Is It Up To The Task Of Cleaning Our Waters?* This article discusses four criteria essential to the success of the program in achieving water quality outcomes: actively targeting conservation practices; outcome-based measures of success; resource monitoring and reporting; and a regulatory driver. Each of these elements is contained in the Sage Grouse Initiative—the program upon which the certainty program is based. Each of these elements is missing in the agricultural certainty program. Instead, the only element common to the two programs is the “certainty” provided that farmers or ranchers receive a waiver from any future regulatory requirements.

TARGET RESOURCES FOR MAXIMUM WATER QUALITY BENEFIT

As with all federal and state agricultural subsidy programs, Minnesota’s agricultural certainty program is available to any producer who chooses to participate—first in pilot areas, and currently statewide. By contrast, the Sage Grouse Initiative (SGI), which has the goal of increasing populations of the sage grouse to avoid its listing as threatened or endangered under the federal Endangered Species Act, focuses on selected core areas of suitable habitat and higher bird populations.

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The enormity of Minnesota’s agriculturally-driven water quality challenges combined with limited public funding to subsidize agricultural BMPs underscore the need to target the watersheds and operations that public investments will do the most good.

**MCEA recommends that program funding be targeted to surface water resources for which clear, time-bounded cleanup strategies for agricultural sources have been developed via TMDLs and WRAPSs, and to areas where shallow groundwater resources have elevated nitrate levels.**

**DEVELOP WATER QUALITY BASED MEASURES OF SUCCESS**

As with other state and federal agricultural subsidy programs, the certainty program does not have resource-based measures of success; rather, outputs in number of operations and acres certified are the only reported metrics. Again, this is in contrast to the SGI, which established the goal of stabilizing and increasing bird populations within identified core management zones. Further, it frustrates the legislative purpose of the certainty program whereby “a producer who demonstrates practices and management sufficient to protect water quality is certified for up to ten years and presumed to be contributing the producer’s share of any targeted reduction of water pollutants during the certification period.”\(^65\) (Emphases added.)

The certainty program should adopt interim and final water quality goals in participating watersheds based on load allocations from TMDLs and Minnesota’s Nutrient Reduction Strategy, and insure that its assessment tool is calibrated such that certification is equivalent to meeting a given producer’s share of each applicable goal.

**MONITOR AND REPORT OUTCOMES**

Very little actual monitoring of farm runoff and drainage tile discharges is conducted in Minnesota, and such monitoring is not a requirement of the certification program. The SGI, by contrast, conducted robust monitoring of bird populations—data relied on and required for the U S Fish and Wildlife Service to make its September 2015 finding that listing of the greater sage grouse was not warranted.

What little data is collected at Discovery Farms Minnesota shows that concentrations of nitrate far exceed safe drinking water standards at every tile line monitored, despite several sites achieving certifiable scores. Edge-of-field monitoring shows high total suspended solids, but no

\(^{65}\) Minn. Stat. § 17.9891.
monitoring is available of runoff after it passes through any conservation practices and reaches the nearest available water body.

The Minnesota Department of Agriculture and Minnesota Pollution Control Agency should develop and implement a water quality monitoring protocol sufficient to determine whether, under a variety of conditions and cropping systems, water quality standards for total suspended solids, phosphorus, and nitrate are being met at certified operations.

**DEVELOP A REGULATORY BACKUP**

The history of water quality clean-up programs in Minnesota (as elsewhere) is very clear—when it comes to controlling agricultural pollution, voluntary programs alone do not work. The SGI was backed by a large stick—listing of the greater sage grouse as a threatened or endangered species under the federal Endangered Species Act. The threat of strict land use restrictions typically imposed by ESA listing drove sufficient funding of and participation in the SGI that five years after the program began, the US Fish and Wildlife Service found that listing was unwarranted based on level or rebounding bird populations.

Producer participation in the agricultural certainty program pilots has been modest, and surveys of pilot area producers indicate that it will remain so.

**MCEA recommends that the Minnesota Legislature amend Minnesota Statutes Chapter 17.9891 to require participation in the certainty program in watersheds of surface waters impaired by agricultural runoff and in areas where shallow groundwater monitoring shows nitrate levels above the drinking water standard. Financial assistance should be provided to producers demonstrating economic need.**
<table>
<thead>
<tr>
<th>Conservation practice</th>
<th>Sources</th>
<th>Notes on sources</th>
<th>Overall findings</th>
<th>Tile N addressed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contour Stripcropping</td>
<td>2</td>
<td>Lit reviews; focus on hydrologic soil groups in Arkansas (no data for HSG B, which all Discovery Farms are)</td>
<td>Removal efficiencies substantially lower than MDA scoring; vary by pollutant, slope, soil type; no Upper Midwest data</td>
<td>No</td>
</tr>
<tr>
<td>Contour Buffer Strips</td>
<td>5</td>
<td>Primary source (Arora 1996) looked at herbicide retention on 6 strips, one event, with 30:1 or 15:1 drainage area to buffer ratio; 3% slopes</td>
<td>Sediment reductions found in research had a much broader range than shown in the AWQCP. Some were 80%+; those based on “effective area” were lower (15-43%)</td>
<td>No</td>
</tr>
<tr>
<td>Sediment basins</td>
<td>4</td>
<td>Two were not original research, one relied on 1 basin</td>
<td>Appears to rely solely on MPCA’s storm-water manual (for urban sediment controls)</td>
<td>No</td>
</tr>
<tr>
<td>Field Borders</td>
<td>8</td>
<td>Three studies relied on 1 field; 2 other studies did not clearly state reductions</td>
<td>Reductions found in research had a much broader range than shown in the AWQCP</td>
<td>No</td>
</tr>
<tr>
<td>Riparian Forest Buffer</td>
<td>1</td>
<td>Reference is to MN Ag BMP handbook; practice not included</td>
<td>Not included in Ag BMP handbook; referred to in Appendix B</td>
<td>No</td>
</tr>
<tr>
<td>Filter Strip</td>
<td>16</td>
<td>Sources include 8 for field borders; 4 are lit reviews, 3 others rely on 1 field</td>
<td>Reductions found had a much broader and lower range than shown in the AWQCP</td>
<td>No</td>
</tr>
<tr>
<td>Grass Waterway</td>
<td>2</td>
<td>Primary is Fiener &amp; Auerswald 2003.</td>
<td>Sediment reductions averaged 77-97% depending on shape of GWW</td>
<td>No</td>
</tr>
<tr>
<td>Conservation cover</td>
<td>3</td>
<td>Primary source is watershed-scale report by USGS</td>
<td>USGS report for gully formation &amp; sediment reductions; multiple practices on extremely steep slopes in MS; cannot determine removal for conservation cover</td>
<td>No</td>
</tr>
<tr>
<td>Water &amp; sediment control basin</td>
<td>7</td>
<td>5 of 7 did not conduct field tests. One of the remaining measured sediment, the other phosphorus.</td>
<td>Primary study (Mielke 1985) found sediment trapping can be quite high</td>
<td>No</td>
</tr>
<tr>
<td>Grade stabilization structure</td>
<td>7</td>
<td>Primary source USGS watershed-scale study above (Conservation cover)</td>
<td>USGS report for gully formation &amp; sediment loads; multiple practices on extremely steep slopes in MS; cannot determine removal for grade stabilization structures</td>
<td>No</td>
</tr>
<tr>
<td>Cover crops</td>
<td>2</td>
<td>Primary source same as contour stripcropping</td>
<td>Sources in MN Ag BMP Handbook vary widely in efficiency of nitrate removal; 13% to 64%</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Appendix B. Adoption Rates to Achieve Nitrogen Reduction Goals

Nitrogen Reduction Scenarios
Elm Creek (Blue Earth River)

Percent adoption on suitable acres

- Corn acres receiving target N rate
- Fall N target rate across
- Fall N applications switched to split spring
- Sidedressing
- Corn grain & soy ac w/ cover crop
- Perennial crop % of corn & soy area (Marginal Lands)
- Controlled drainage
- Saturated buffers
- Riparian buffers 100 feet wide
- Restoration of wetlands
- Tile line bioreactors

Goal Levels:
- 20% Goal
- 35% Goal
- 45% Goal
Appendix B. Adoption Rates to Achieve Nitrogen Reduction Goals

Nitrogen Reduction Scenarios
Middle Sauk (Sauk R. Watershed)
Appendix B. Adoption Rates to Achieve Nitrogen Reduction Goals

Nitrogen Reduction Scenarios
Whiskey Creek (Upper Red R. Watershed)

Percent adoption on suitable acres

- 20% Goal
- 35% Goal
- 45% Goal
Appendix B. Adoption Rates to Achieve Nitrogen Reduction Goals

Nitrogen Reduction Scenarios
Whitewater River

<table>
<thead>
<tr>
<th>Nitrogen Reduction Scenarios</th>
<th>Percent adoption on suitable acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn acres receiving target N rate</td>
<td>100%</td>
</tr>
<tr>
<td>Corn acres receiving N inhibitor</td>
<td>100%</td>
</tr>
<tr>
<td>Fall N target rate</td>
<td>120%</td>
</tr>
<tr>
<td>Fall N applications switched to split spring</td>
<td>100%</td>
</tr>
<tr>
<td>Fall N switch to split spring/sidedressing</td>
<td>100%</td>
</tr>
<tr>
<td>Restored wetlands</td>
<td>100%</td>
</tr>
<tr>
<td>The line bioreactors</td>
<td>100%</td>
</tr>
<tr>
<td>Controlled drainage</td>
<td>100%</td>
</tr>
<tr>
<td>Saturated buffers &gt; 100 feet wide</td>
<td>100%</td>
</tr>
<tr>
<td>Riparian buffers w/cereal rye cover crop</td>
<td>100%</td>
</tr>
<tr>
<td>Short season crops planted to a rye cover crop</td>
<td>100%</td>
</tr>
<tr>
<td>Perennial crop % of corn &amp; soy area (marginal lands)</td>
<td>100%</td>
</tr>
<tr>
<td>Perennial Crop % of corn &amp; soy area (all corn &amp; soy)</td>
<td>100%</td>
</tr>
</tbody>
</table>

Legend:
- 20% Goal
- 35% Goal
- 45% Goal
Appendix C. Agricultural Encroachments in 50-foot Shore Impact Zone

Land Cover in the 50-Foot Shore Impact Zone

<table>
<thead>
<tr>
<th>Landcover</th>
<th>Acres within 50-foot</th>
<th>% of 50-foot Buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest</td>
<td>1255.4</td>
<td>49.55%</td>
</tr>
<tr>
<td>Grassland</td>
<td>562.50</td>
<td>22.20%</td>
</tr>
<tr>
<td>Grassland w/Sparse Trees</td>
<td>183.5</td>
<td>7.24%</td>
</tr>
<tr>
<td>Woodland</td>
<td>153.9</td>
<td>6.07%</td>
</tr>
<tr>
<td>River</td>
<td>132.3</td>
<td>5.22%</td>
</tr>
<tr>
<td>Cropland</td>
<td>95.4</td>
<td>3.77%</td>
</tr>
<tr>
<td>Less than 50% Impervious Surface</td>
<td>71.1</td>
<td>2.81%</td>
</tr>
<tr>
<td>Shrubland</td>
<td>30</td>
<td>1.18%</td>
</tr>
<tr>
<td>Open Wetland</td>
<td>24.7</td>
<td>0.97%</td>
</tr>
<tr>
<td>Planted/Maintained Grasses and Trees</td>
<td>24.1</td>
<td>0.95%</td>
</tr>
<tr>
<td>76-100% Impervious Surface</td>
<td>0.91</td>
<td>0.04%</td>
</tr>
<tr>
<td>51-75% Impervious Surface</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td><strong>Total Acres:</strong></td>
<td><strong>2,533.8</strong></td>
<td></td>
</tr>
</tbody>
</table>
Tools used to calculate runoff risk: http://northcentralwater.org/acpf/
Tools used to calculate runoff risk: http://northcentralwater.org/acpf/

Appendix E. Whitewater Runoff Risk Map

Whitewater River Watershed
Ag Field Runoff Risk Assessment

Assessments for prioritization and design of practices

Runoff Risk Assessment:
Prioritize fields where multiple erosion control practices are most needed

<table>
<thead>
<tr>
<th>Slope steepness</th>
<th>Close to stream?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>H</td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td>M</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>L</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

Ag Field Runoff Risk
- Critical
- Very High
- High
- Present

Perennial Stream

Minnesota Center for Environmental Advocacy
Since 1974, the legal and scientific voice protecting and defending Minnesota’s environment
Draft Recommended MAWQCP Conflict of Interest Policy

Purpose.

State law prohibits certifying agents from providing technical assistance to achieve certification, but does not limit their potential interest in the certified operation. Such a potential interest may present a conflict that may reduce or appear to reduce the integrity of the program. As a result, the Commissioner finds that a policy to limit conflicts of interest is needed to ensure accurate assessment of certified operations.

Definitions.

Audit. “Audit” means a systematic, documented process for obtaining records, statements of fact or other relevant information and assessing them objectively to determine the extent to which specified requirements are fulfilled.

Conflict of interest. “Conflict of interest” means an appearance of impairment of objectivity could result from, an organizational conflict where, because of other activities or relationships with other persons or entities, a person is unable or potentially unable to render impartial assistance. This can include:

(1) other than a prospective employer, anyone with whom a certifying agent has or seeks a business, contractual or other financial relationship, that involves other than a routine consumer transaction;

(2) members of the agent’s household, or relatives with whom the agent has a close personal relationship;

(3) anyone for whom an agent’s spouse, parent or dependent child is serving or seeking to serve as an officer, director, trustee, general partner, agent, attorney, consultant, contractor or employee; or

(4) anyone for whom an agent has, within the last year, served as officer, director, trustee, general partner, agent, attorney, consultant, contractor or employee.

ALTERNATIVE DEFINITION: an actual or perceived interest in an action that results in or has the appearance of resulting in personal, organizational, or professional gain.

Second-party certifying agent. “Second-party certifying agent” means a certifying agent with a conflict or appearance of conflict of interest in the operation seeking certification.
Third-party certifying agent. “Third-party certifying agent” is a certifying agent who is independent of the operation being certified and has no conflict of interest in the operation.

Conflict of Interest Policy.

An operation seeking certification may only be certified by a third-party certifying agent. If no such agent is available, the operation must disclose any conflicts of interest held by a second-party certifying agent to the Commissioner. Any audit of a certified operation must be conducted by a third-party certifying agent.

Audit Policy.

Auditors must be certifying agents and must receive at least three hours of training every five years, in addition to training following any significant changes in the certifying instrument. A certified operation must be audited at least once per certification term by a third-party certifying agent. The Department will seek to conduct audits with staff employed by the Department.