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Details:

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WISCONSIN STATE LEGISLATURE ...
PUBLIC HEARING - COMMITTEE RECORDS

2007-08

(session year)

Assembly

(Assembly, Senate or Joint)

Committee on ... Agriculture (AC-Ag)

COMMITTEE NOTICES ...

- Committee Reports ... **CR**
- Executive Sessions ... **ES**
- Public Hearings ... **PH**
- Record of Comm. Proceedings ... **RCP**

INFORMATION COLLECTED BY COMMITTEE FOR AND AGAINST PROPOSAL

- Appointments ... **Appt**
- Clearinghouse Rules ... **CRule**
- Hearing Records ... bills and resolutions
  (**ab** = Assembly Bill) (**ar** = Assembly Resolution) (**ajr** = Assembly Joint Resolution)
  (**sb** = Senate Bill) (**sr** = Senate Resolution) (**sjr** = Senate Joint Resolution)
- Miscellaneous ... **Misc**

Wisconsin Department of Agriculture, Trade and Consumer Protection

Business Impact Analysis[1]

Rule Subject:	**Nutrient Management**
Adm. Code Reference:	**ch. ATCP 50**
Rules Clearinghouse #:	**05-013**
DATCP Docket #:	**04-R-05**

Overview

This rule modifies current rules related to nutrient management on farms. Current rules are based on nitrogen, not phosphorus. This rule incorporates federal standards based on nitrogen *and phosphorus*. Phosphorus is a key component of manure, and an important crop nutrient. But when applied in excessive amounts, it poses a serious runoff and water pollution threat. Enforcement of this rule, like the current rules, is contingent on cost-sharing.

Businesses Impact; General

This rule will have a significant impact on farms in this state. Many of these farms are "small businesses" as defined in s. 227.114(1), Stats. This rule may also affect the following businesses:

- Nutrient management planners, including private crop consultants, farm cooperatives, and farm supply organizations that provide nutrient management planning.
- Soil and manure testing laboratories and businesses that haul manure.
- Commercial fertilizer dealers.
- Businesses that design and install farm conservation practices.

This rule will have the greatest impact on livestock operators, who may incur additional costs related to the disposal of manure (which provides more phosphorus than nitrogen, compared to crop needs). Overall effects are as follows (more detail provided below):

- Most dairy operations will be minimally affected.
- Swine operations, and beef operations with alfalfa rotations, will be affected to approximately the same degree as dairy operations.
- Crop farmers who do not use manure will not be significantly affected.
- Perennial fruit crop producers, like cranberry growers, will benefit because the new standard is more flexible.
- Some poultry operations will be significantly affected, but others will not. Most turkey and laying chicken operations will not be affected, because they are separately regulated by DNR. However, broiler chicken operations will be affected, and compliance costs may be significant. Broiler operations have not yet adopted, to any great degree, the more advanced manure management techniques used in the turkey and laying chicken sectors. However, broiler

[1] This analysis includes, but is not limited to, a small business analysis ("regulatory flexibility analysis") under s. 227.114, Stats.

operations are often combined with other livestock operations, and may have manure spreading options that could reduce costs.

The total estimated annual cost to comply with the proposed standard is:

Dairy (2.5 million animal units):	=	$ 1.7 million
Beef (400,000 animal units):	=	$ 1.7 million
Swine (210,000 animal units):	=	$ 0.3 million
Chickens (390,000 animal units):	=	$ 2.0 million
Ducks (33,000 animal units):	=	$ 0.3 million
Turkeys (47,000 animal units):	=	$ 0.4 million
Sheep/Goats (11,000 animal units):	=	$ 0.05 million
		$ 6.5 million

The total statewide cost of $6.5 million per year, divided by the total number of cropland acres in the state (about 9 million), yields an average cost of $0.72 per cropland acre per year. Some farms will have lower costs, and others will have higher costs. Most of the costs represent increased manure hauling costs. The cost for an individual livestock operation will depend on a number of factors, but the existing level of soil-test phosphorus is critical. If livestock producers prevent further increases in soil-test phosphorus levels, and reduce soil-test phosphorus levels in high-testing soils, costs will be lower over time.

The cost estimate of $6.5 million per year ($0.72 per acre) assumes full, voluntary statewide compliance with this nutrient management rule. Actual costs in the short term will be lower, because some farmers will not comply voluntarily and cannot be forced to comply without cost-sharing (the current shortage of cost-share dollars effectively limits enforcement). However noncompliance will drive up soil-test phosphorus levels over time, and that will increase long-term compliance costs. Many farmers will actually save money by complying with this rule, and benefits will generally increase over time.

A farmer can prepare his or her own nutrient management plan, if the farmer is qualified as a nutrient management planner. However, this rule may increase demand for professional nutrient management planning services. Farmers who comply with a nutrient management plan prepared or approved by a qualified nutrient management planner (other than the farmer) are presumed to comply with the nutrient management standards in this rule. The nutrient management planner is responsible for ensuring that the plan complies with the nutrient management standards.

This rule updates and clarifies current standards for certification of soil testing laboratories, and establishes standards for manure testing laboratories. The changes will help ensure accurate laboratory testing and nutrient management recommendations. The changes will not have a significant adverse impact on the affected laboratories.

This rule may have some impact on fertilizer dealers, by reducing demand for phosphorus and increasing demand for nitrogen fertilizer in some cases. This rule may also increase demand for soil and water conservation practices, and for businesses that design and construct those practices.

Current Rules

The Department of Agriculture, Trade and Consumer Protection ("DATCP") currently administers nutrient management rules for farms. DATCP adopted the current rules in 2002, as part of a redesign of state nonpoint pollution abatement programs mandated by the Legislature.

Under *current* DATCP rules (ch. ATCP 50, Wis. Adm. Code), all farmers who apply manure or commercial fertilizer to cropland (not just livestock operators) must have a nutrient management plan. This requirement took effect on January 1, 2005 in certain watersheds, and will take effect on January 1, 2008 elsewhere. But under state law, enforcement is contingent on cost-sharing.

Under current DATCP nutrient management rules, a nutrient management plan must comply with all of the following requirements:

- It must be prepared or approved by a qualified nutrient management planner. A farmer may prepare his or her own plan if the farmer has completed a DATCP-approved training course within the preceding 4 years, or is otherwise qualified under current rules.
- It must identify the lands on which the operator will apply manure and other nutrients.
- It must be based on soil tests that determine the nutrient needs of the affected cropland. A soil test laboratory, certified by DATCP, must conduct the soil tests.
- It may not call for nutrient applications in excess of amounts needed to achieve crop fertility levels recommended by the University of Wisconsin (there are limited exceptions).
- It must comply with nutrient management standards published by the Natural Resource Conservation Service of the United States Department of Agriculture ("NRCS"). The current rules incorporate a 1999 version of the NRCS standards based on nitrogen, not phosphorus.

Updated Federal Standard

NRCS updated its nutrient management standard in September 2005. Farmers must comply with the new federal standard in order to qualify for federal cost-share grants. The new federal standard is based on nitrogen *and phosphorus*. Phosphorus is a key component of manure, and an important crop nutrient. But when applied in excessive amounts, it poses a serious runoff and water pollution threat.

This rule incorporates the updated federal standard for the following reasons:

- It will help prevent manure and phosphorus runoff, and improve water quality.
- It will help ensure that manure, an important crop nutrient, is applied in a cost-effective and environmentally sound manner.
- It will help limit long-term nutrient management costs.
- It will reduce fish kill and well contamination risks.

- It will maintain consistent state and federal standards. DATCP made a commitment, when it adopted nonpoint rules in 2002, to try to keep Wisconsin rules consistent with federal standards.
- It will not add significant costs for most farm operations. Most farmers who comply with current rules will be able to comply with the new rules at little additional cost.
- Farmers must follow essentially the same steps under the new standard as under the current standard (the new standard does not complicate procedures, and provides more flexibility).
- Enforcement will be contingent on cost-sharing, as under current rules.
- Farmers who comply can receive federal, as well as state, cost-share funds.

Implementing the New Standard

Due to cost-share funding limitations, implementation of the new standard (like the current standard) will be largely voluntary. Information and education programs will be expanded. Cost-sharing and enforcement will be mainly targeted at farms where runoff has caused fish kills or well contamination, or which are located in highly vulnerable areas. Current cost-share funding levels make it possible to target about 20,000 acres per year (less than 1% of Wisconsin's crop acreage).

There are some exceptions to the cost-sharing requirement. The following farms must comply with nutrient management requirements *regardless of cost-sharing*:

- Farms that hold pollution discharge permits from the Department of Natural Resources (about 140 livestock operations, mainly over 1,000 animal units). *See* ch. NR 243, Wis. Adm. Code.
- Farms that claim farmland preservation tax credits (about 12,000 farms). *See* ch. 91, Stats., and ATCP 50.54(2)(c)2., Wis. Adm. Code.
- Farms that hold local manure storage facility permits (about 150 livestock operations per year). *See* ATCP 50.54(2)(b), Wis. Adm. Code.
- Farms that require local livestock facility siting permits, under new Livestock Facility Siting Law (about 50-70 livestock operations per year, mainly over 500 animal units). *See* ch. ATCP 51, Wis. Adm. Code.

Rule Contents

This rule modifies current DATCP nutrient management rules as follows (DATCP made significant changes to the final draft rule in response to farmer comments):

Updated Federal Standard

Current rules incorporate an outdated version (March, 1999) of the NRCS nutrient management standard. This rule incorporates an updated NRCS standard (Sept. 2005), except that this rule does not incorporate certain portions of the new standard. NRCS made significant changes to the final draft standard in response to farmer comments.

A nutrient management plan (if required) must adhere to the following provisions in the new standard (many, but not all, of these provisions already apply under the current standard):

- The nutrient management plan must consider all primary nutrients – nitrogen, phosphorus, and potassium. The older NRCS standard focused on nitrogen rather than phosphorus and potassium. Phosphorus is a key nonpoint pollutant, and has been applied in excessive amounts (as reflected in rising average soil-test phosphorus levels in Wisconsin). The new standard will limit excessive phosphorus applications.

- Nutrient applications may not exceed the amounts needed to achieve soil fertility levels recommended by the University of Wisconsin for crops in the farmer's rotation (there are some exceptions). Phosphorus and potassium needs are generally determined over a crop rotation, so that some buildup of these nutrients is permitted in anticipation of future crop needs during the rotation.

- The nutrient management plan must consider all nutrient sources, including existing nutrients in the soil, manure applications, fertilizer applications, and nitrogen from legumes. The plan must account for relevant limitations on nutrient applications -- for example, on frozen land, near water bodies, or on highly eroding fields (see below).

- Nutrient calculations must take into account the amount and timing of nutrient applications from all sources.

- Soil tests must be used to determine existing soil fertility levels (soil tests must be not more than 4 years old). Soil tests must be performed at a DATCP-certified laboratory (this rule updates certification standards and procedures).

- Nutrient management plans must be updated annually (to account for relevant changes in cropping patterns, land base, nutrient applications, soil test results, etc.). Each annual update must document and consider relevant cropping patterns and nutrient applications from the preceding year.

- Manure nutrient content may be determined by laboratory analysis or from standard "book values" specified in the NRCS standard. Labs performing manure analyses must meet requirements specified in this rule.

- Nutrients may not run off the field during application.

- Nutrients may not be spread in certain areas, including the following:

  - Fields eroding in excess of "T-value" levels (the standard specifies acceptable methods for calculating erosion rates).
  - Surface water areas, or areas of established concentrated flow.
  - Permanent non-harvested vegetative buffers or wetlands.
  - Areas within 50 feet of drinking water wells shall not receive mechanical application of manure.
  - Areas within 200 feet up-slope of direct conduits to groundwater (such as wells, sinkholes, fractured bedrock, tile inlets or mine openings), unless the nutrients are effectively incorporated within 72 hours.

- Nutrients may not be applied to frozen or snow-covered land within 1,000 feet of a navigable lake or within 300 feet of a navigable stream. This prohibition does not apply to manure deposited directly by grazing animals, provided that applications do not exceed the standards for nitrogen or phosphorus.

- Liquid manure may not be applied to frozen or snow-covered land at a rate of more than 7,000 gallons per acre.

- Manure may not be applied to frozen or snow-covered land at a rate that provides more phosphorus than will be used by crops in the next growing season.

- Manure may not be applied to frozen or snow-covered land that has a slope greater than 9% (12% if contour-cropped).

- Manure applications to frozen or snow-covered land must comply with supplementary local restrictions, if any, spelled out in an individual farm conservation plan agreed upon between the farmer and the county land conservation committee.

- Commercial fertilizer may not be applied to frozen or snow-covered land, except on pasture or surfaces planted in winter grains.

- At least one of the following practices must be used when applying nutrients to unfrozen surfaces within 1,000 feet of a navigable lake or within 300 feet of a navigable stream:

  - Install or maintain permanent vegetative buffers.
  - Maintain 30% crop residue or vegetative cover on the soil surface after application.
  - Incorporate nutrients within 72 hours, leaving adequate residue so that erosion does not exceed "T-value."
  - Establish cover crops promptly following application.

- Unincorporated liquid manure (less than 12% solids) applied to unfrozen soil within 1,000 feet of a navigable lake or 300 feet of a navigable stream is restricted in the following ways:

  - If the soil is saturated, applications are prohibited.
  - If the soil is not saturated, any single application may not exceed the following applicable rates (farmer may apply more after 7 days):

Soil Type	***Maximum Application Rate (Unincorporated Gallons Per Acre)***	
	% Residue on Soil Surface ≥ 30%	***% Residue on Soil Surface < 30%***
Fine texture soil (clay)	*5,000*	*3,000*
Medium texture soil (loam or silt)	*7,500*	*5,000*
Coarse texture soil (sand, peat or muck)	*10,000*	*7,000*

- In order to minimize nitrogen loss to groundwater in certain sensitive areas, most crop nitrogen must be applied to those areas after the crop is established in the spring. This applies to areas with coarse soils, areas with less than 20 inches to bedrock or 12 inches to water table, and areas within 1000 feet of a municipal well.

- In order to minimize phosphorus losses to surface water, a farmer must use one of the following strategies (and establish perennial vegetative cover where there are recurring gullies):

  - Maintain a phosphorus index, calculated according to the Wisconsin phosphorus index model, over a maximum crop rotation period of 8 years, at or below a level of 6. Stop phosphorus applications to fields that exceed that index level, unless UW recommendations call for additional phosphorus applications (based on soil tests and crop needs).

  - Regulate phosphorus applications based on soil tests. Forego or limit phosphorus applications as necessary, based on soil test levels and phosphorus removal by relevant crops over a maximum crop rotation period of 8 years (the standard specifies application limits based on soil test levels).

Excess Nutrient Applications

Under current DATCP rules, a nutrient management plan may not recommend nutrient applications that exceed the amounts needed to achieve fertility levels recommended by the university of Wisconsin for relevant crops. However the current rules allow certain exceptions.

One current exception allows for excess soil nutrient values caused by manure applications in prior years. This rule limits that exception, so that it only applies to manure applications in the year immediately preceding implementation of the nutrient management plan.

The current rules also permit excess nutrient applications for the following reasons:

- The farmer applies only organic nutrients (such as manure).
- Excess nutrients from organic nutrient applications will be used later in the planned crop rotation.
- Corn after corn is conservation tilled with greater than 50% residue after planting.
- Starter fertilizer is properly applied to row crops.
- The crop is irrigated.

This rule eliminates these exceptions, because these conditions are more precisely addressed in the (updated) NRCS technical guide nutrient management standard 590 (incorporated in this rule). This rule, like the current rules, permits excess nutrient applications based on special agronomic conditions documented by the nutrient management planner.

Presumption of Compliance

A farmer is presumed to comply with the nutrient management standards in this rule if the farmer follows a nutrient management plan that is prepared or approved by a qualified nutrient management planner other than the farmer. The nutrient management planner is responsible for ensuring that the plan complies with this rule. Current rules spell out nutrient management planner qualifications.

Cost-Sharing and Initial Applicability Not Affected

This rule does not change the previously-established effective dates for DATCP nutrient management rules (2005 in some watersheds, and 2008 elsewhere), nor does it change current cost-sharing requirements (enforcement of nutrient management standards is normally contingent on cost-sharing). Those effective dates and cost-sharing provisions are required by state statutes and still apply under this rule.

Impact on Farmers and Other Affected Businesses

Impact on Farmers; General

This rule will generally have more impact on livestock farmers than other farmers. Some livestock farmers will be significantly affected, but others will not. Many farmers will actually save money by complying with this rule. Benefits will tend to increase over time.

The primary impact of this rule relates to phosphorus management, and its effect on manure applications. Manure generally provides relatively more phosphorus than nitrogen, compared to crop needs for those nutrients. So farmers who apply manure based solely on nitrogen needs may end up applying too much phosphorus. Some livestock operators may need more acreage for manure disposal, to avoid excessive phosphorus applications.

Costs will vary widely by livestock species (poultry manure, for example, is especially high in phosphorus). Costs will also vary by size of livestock operation, geographic location, cropping patterns, availability of acreage for manure disposal, and (importantly) current soil-test phosphorus levels. The total estimated annual cost to comply with the proposed standard is show below:

Dairy (2.5 million animal units):	=	$ 1.7 million
Beef (400,000 animal units):	=	$ 1.7 million
Swine (210,000 animal units):	=	$ 0.3 million
Chickens (390,000 animal units):	=	$ 2.0 million
Ducks (33,000 animal units):	=	$ 0.3 million
Turkeys (47,000 animal units):	=	$ 0.4 million
Sheep/Goats (11,000 animal units):	=	$ 0.05 million
		$ 6.5 million

This cost estimate represents the most restrictive, high-cost scenario. It includes costs to meet both the soil-test phosphorus management standard and the phosphorus index standard, when in fact farms are required to comply with only one of these 2 alternative standards.

The cost estimate assumes that soil-test phosphorus values will not continue to rise as they have been doing steadily for the last 40 years. If farmers allow their soil-test phosphorus levels to rise above 100 ppm, subsequent costs to comply with the nutrient management standard will be much higher.

Hearing comments suggested that DATCP's estimates of manure hauling costs were too low, and that DATCP had failed to consider costs of substituting nitrogen fertilizer for manure (substitution will be necessary in some cases to prevent excessive phosphorus application from manure). On the other hand, the DATCP simulations also ignored potential cost-savings related to:

- Manure processing and sale as commercial fertilizer (an option widely used in the poultry industry).

- Use of the phosphorus index standard, rather than the soil-test phosphorus standard (farmers may opt to use the phosphorus index standard, which is less likely to limit phosphorus applications).

DATCP believes that any underestimated costs are offset by underestimated savings, so that the cost estimates are on balance reasonably accurate. The total statewide cost of $6.5 million per year, divided by the total number of cropland acres in the state (about 9 million), yields an average cost of $0.72 per cropland acre per year. Some farms will have lower costs, and others will have higher costs. Most of the costs represent increased manure hauling costs. The cost for an individual livestock operation will depend on a number of factors, but the existing level of soil-test phosphorus is critical. If livestock producers prevent further increases in soil-test phosphorus levels, and reduce soil-test phosphorus levels in high-testing soils, costs will be lower over time.

The cost estimate of $6.5 million per year ($0.72 per acre) assumes full, voluntary statewide compliance with this nutrient management rule. Actual costs in the short term will be lower, because some farmers will not comply voluntarily and cannot be forced to comply without cost-sharing (lack of cost-share funds effectively limits enforcement). However noncompliance will drive up soil-test phosphorus levels over time, and that will increase long-term compliance costs.

Dairy Farms

Relatively few dairy farms will have to change current practices to comply with this rule. Most (approximately 2/3) of Wisconsin's dairy farms are self-sufficient in grain and forage production, and therefore have ample cropland area for manure spreading. Legume forage production helps meet crop demands for nitrogen, and liquid dairy manure has a relatively high ratio of nitrogen to phosphorus. Those factors make it less likely that manure applications to meet nitrogen needs will result in excessive applications of phosphorus.

A recent University of Wisconsin study of 33 representative dairy farms (summary attached) concluded that this rule will have a modest impact on dairy farms:

- Most (approximately 2/3) have more-than-adequate cropland for manure spreading under the new phosphorus-based standard.

- On the 33 dairy farms studied:

    - Nitrogen applications comply with the new standard on 89% of corn acreage (the new nitrogen standard is essentially identical to the current standard).
    - Phosphorus applications generally comply with the new phosphorus standard.
    - Farmers will need to modify winter manure applications on about 7% of their crop acres to comply with the new standard. The farmers were generally willing and able to make the necessary changes.

This rule will affect winter spreading of manure, especially in water quality management areas (within 300 feet of a perennial stream or within 1,000 feet of a lake). However, winter applications currently affect a relatively small share of dairy farm acreage, and the vast majority of winter applications are made outside water quality management areas. UW survey results indicate that many farmers who winter-spread manure in water quality management areas are willing (and able) to change their manure application practices to comply with this rule.

Other Livestock Operations

DATCP estimated nutrient management compliance costs under this rule, compared to current rules, for a wide variety of livestock operations. DATCP simulated compliance costs for 80 hypothetical livestock operations representing 8 different livestock types (dairy, beef, swine, chickens, ducks, turkeys, and sheep and goats), 5 different soil types (representing soils in Chippewa, Adams, Outagamie, Jefferson and Lafayette counties), and 2 different soil-test phosphorus levels (52 ppm and 105 ppm). DATCP used typical nutrient values for the manure of each livestock species, common crop rotations, and various tillage options used on Wisconsin farms. Simulation scenarios, analyses and results are shown at the following website: http://www.datcp.state.wi.us/arm/agriculture/land-water/conservation/nutrient-mngmt/planning.jsp

About 63% of Wisconsin farm acreage tests below 50 ppm phosphorus (the median state soil test for phosphorus is 38 ppm and the average is 50 ppm). DATCP therefore assumes that about 63% of Wisconsin livestock operations have soil-test phosphorus below 50 ppm. According to DATCP's analysis, those operations will incur no added cost to comply with the proposed phosphorus-based standard compared to the current nitrogen-based standard.

About 26% of all livestock operations have soil-test phosphorus between 50 ppm and 100 ppm. With the exception of dairy operations, nearly all of those operations will need to reduce phosphorus applications per acre to comply with the new standard. Most dairy operations will be unaffected, for reasons discussed above. Other operations will experience added costs per "animal unit" (for manure hauling, added land spreading area, substituting nitrogen fertilizer for manure, etc.) ranging from $0 for dairy to $26 for poultry.

About 11% of Wisconsin livestock operations have soil-test phosphorus over 100 ppm. Essentially all of those operations (including dairy operations) will need to reduce phosphorus applications per acre in order to comply with the new phosphorus standard. That will add costs per "animal unit" (for manure hauling, added land spreading area, nitrogen fertilizer rather than manure, etc.) ranging from $5 for dairy to $38 for poultry.

Cost-Sharing Required

Under current state law, enforcement of nutrient management standards is generally contingent on cost-sharing. This rule does not change the current cost-sharing requirement. Although farmers are theoretically required to have and comply with nutrient management plans (beginning in 2005 for some farmers and 2008 for others), current statutes prevent enforcement against most farmers unless those farmers receive cost-sharing.

A shortage of cost-share funding effectively limits enforcement. In cases where a farmer is actually forced to comply, the cost must be shared. Farmers may also receive cost-sharing for voluntary compliance.

The cost-share offer must cover 70% of the cost to conduct soil tests and prepare a nutrient management plan (90% if there is financial hardship), or $7 per cropland acre, whichever amount is greater (the farmer chooses). The percentage rate applies only to costs of writing a nutrient management plan and performing soil tests (not manure hauling, etc.). The flat-rate payment ($7 per acre) applies regardless of actual costs.

Cost-share payments (whether flat-rate or percentage) are limited to 4 years. After that, the farmer assumes the full cost of compliance. Once a farmer achieves compliance, the farmer must maintain compliance regardless of cost-sharing. If a farmer falls out of compliance, the farmer is not eligible for cost-sharing to regain compliance.

In cost-share transactions to date, nearly all farmers have chosen the flat-rate ($7 per acre) payment. If farmers need additional acres to spread manure (as some will under a phosphorus standard), the total cost-share payment will increase accordingly (even if the rate per acre does not change). The limited availability of state cost-share funds will limit actual enforcement of nutrient management requirements. Available funds will be allocated among fewer operations.

Some farmers must comply with nutrient management requirements, regardless of cost-sharing. These include:

- Farmers who claim farmland preservation tax credits (about 12,000 farms).
- Livestock operators who need "point source" pollution discharge permits from DNR (about 140 farms).
- Livestock operators who need a local manure storage permit for a voluntarily constructed manure storage facility (about 150 farms per year). See current ATCP 50.54(2)(b).
- Livestock operators who need a local permit for a new or expanded livestock facility (about 50-70 farms per year). See current ATCP 51.

Nutrient Management Planners and Soil Testing Laboratories

This rule will marginally increase the demand for professional nutrient management planning and soil testing services. While farmers can qualify to write their own nutrient management plans, they

will likely retain professional services because greater expertise is needed to develop phosphorus-based plans. Soil tests (and manure tests if used to determine the nutrient contents of manure) must be conducted at qualified laboratories.

Manure Haulers

This rule will increase demand for manure hauling services. Some livestock operators will not be able or willing to haul all of their own manure, and will hire commercial haulers to transport and apply manure to appropriate fields.

Commercial Fertilizer Dealers

This rule will reduce sales of commercial phosphorus fertilizer, but may increase sales of commercial nitrogen fertilizer to meet crop needs (where manure applications are curtailed because of phosphorus constraints).

Construction Contractors and Conservation Planners

This rule may increase demand for construction projects and conservation planning to reduce soil erosion on farmland. This rule does not change farm conservation construction standards or requirements, but may result in a slight increase in demand for practices that help reduce soil erosion to "T-value" (the rule limits nutrient applications to lands on which soil erosion exceeds "T-value").

National Cost Studies Compared

A literature review of national, farm-level studies supports the statement that the proposed changes may increase a livestock farmer's costs of production in the short run. In general, higher costs are the result of greater concentrations of phosphorus in manure than of nitrogen, relative to crop nutrient needs. This means that farmers must spread manure on more acres to meet a phosphorous standard. If more land is needed, farmers will incur added costs for manure hauling, which represents the most significant part of the costs in meeting the standard.[2]

A number of other factors contribute to producer's ultimate costs including the type of manure handling system.[3] The willingness of cropland owners to accept manure is a critical variable in determining transportation and spreading costs.[4] Data also indicates that smaller operations may incur lower costs than larger operations.[5]

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[2] Innes, R. 1999. "Regulating Livestock Waste," *Choices*. second quarter, pp. 14-19.

[3] Daugherty et. al, Liquid Dairy Waste Transport and Land Application Cost Comparisons Considering Herd Size, Transport Distance, and Nitrogen versus Phosphorus Application Rates. Presented at the 2003 ASAE Annual International Meeting July 27-30, Paper No. 01-2263 ASAE 2950 Niles Road St. Joseph, MI, available at http://wastemgmt.ag.utk.edu/adams%20asae%20paper.pdf

[4] Ronald A. Fleming, Bruce A. Babcock, Erda Wang. 1998. Resource or Waste? The Economics of Swine Manure Storage and Management. *Review of Agricultural Economics* , Vol. 20, pp. 96-113, 1998

[5] Ribaudo, M. et al. Manure Management for Water Quality, p. 31

Nationally, for operations over 1000 animal units, manure handling costs may increase two-fold under a phosphorus-based versus a nitrogen-based standard.[6] These dramatic increases would likely not be seen in Wisconsin primarily because of the abundance of cropland that can utilize manure as a nutrient source. The increase in costs will vary depending on the type of manure handling system employed,[7] the distances required to haul manure,[8] need for supplementary fertilizer,[9] and the amount of cropland contained in surface water quality management areas.

Farms under 1000 animal units may have lower costs than large operations, since smaller operations would have a greater likelihood of already controlling adequate land to meet new manure spreading requirements. Furthermore, dairy operators may have lower costs on a per animal basis than hog producers.[6] North Carolina, for example, has high swine densities relative to the amount of available cropland for manure disposal.

Areas with limited cropland available for manure disposal are much more heavily impacted by a phosphorus-based nutrient management strategy. The Midwest would face lower costs to implement a P-based nutrient management standard for all livestock types. One study estimated that the increased cost to dairy operations in the Midwest to meet a P-based nutrient management standard would be roughly $10 per animal unit, or approximately one-fourth the estimated increase in cost for dairies in the Northeast.[6] This estimate is likely high since it assumed that phosphorous could not build in soil. The Wisconsin standard allows P buildup if soil tests are below 50 parts per million P. Of particular interest, this national study estimated that Midwest hog producers would likely find little if *any* increased costs to comply with a P-based standard.

Wisconsin Cost Simulations

In its simulations, DATCP used typical nutrient values for manure of each livestock species (the phosphorus content of dairy manure, relative to nitrogen, is lower than for beef and other livestock species), common crop rotations, and various tillage options used on Wisconsin farms. Simulations did not include soil-test phosphorus below 50 ppm since under this scenario a farmer could follow a nitrogen-based plan and there would be no cost difference between the existing N-based standard and the proposed P-based standard. Additional farm-site assumptions include the following:

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[6] Ribaudo, M. et al. Manure Management for Water Quality: Costs to Animal Feeding Operations of Applying Manure Nutrients to Land Agricultural Economic Report No. (AER824) 99 pp, June 2003

[7] Daugherty et. al, Liquid Dairy Waste Transport and Land Application Cost Comparisons Considering Herd Size, Transport Distance, and Nitrogen versus Phosphorus Application Rates. Presented at the 2003 ASAE Annual International Meeting July 27-30, Paper No. 01-2263 ASAE 2950 Niles Road St. Joseph, MI, available at http://wastemgmt.ag.utk.edu/adams%20asae%20paper.pdf

[8] Daugherty et. al, Liquid Dairy Waste Transport and Land Application Cost Comparisons Considering Herd Size, Transport Distance, and Nitrogen versus Phosphorus Application Rates. Presented at the 2003 ASAE Annual International Meeting July 27-30, Paper No. 01-2263 ASAE 2950 Niles Road St. Joseph, MI, available at http://wastemgmt.ag.utk.edu/adams%20asae%20paper.pdf

[9] Daugherty et. al, Liquid Dairy Waste Transport and Land Application Cost Comparisons Considering Herd Size, Transport Distance, and Nitrogen versus Phosphorus Application Rates. Presented at the 2003 ASAE Annual International Meeting July 27-30, Paper No. 01-2263 ASAE 2950 Niles Road St. Joseph, MI, available at http://wastemgmt.ag.utk.edu/adams%20asae%20paper.pdf

- Each simulation involved a single predominant soil type from Adams, Chippewa, Jefferson, Lafayette, and Outagamie Counties
- Nutrient applications do not contain starter fertilizer
- All fields have 8% slope, 150 feet of slope length, and all fields meet tolerable soil loss (T)
- Calculations for all operations have a P Index less than 6 (complies with proposed standard)
- Tillage was assumed as follows: fall chisel for dairy and beef, ½ fall chisel and ½ no-till for swine and poultry
- Manure hauling costs were assumed as follows: dairy manure - $0.005 per gallon @ 10,000 gallons/acre; beef manure - $2 per ton @ 15 tons/acre; swine manure - $0.005 per gallon @ 4,000 gallons/acre; poultry manure - $6 per ton @ 5 tons/acre.

Table 1. shows the costs to producers to implement the September 2005 nutrient management standard. Under scenarios with soil-test phosphorus below 50 ppm, a farmer could follow a nitrogen-based plan and there would be no cost difference between the existing N-based standard and the proposed P-based standard. Since 63% of Wisconsin soils analyzed by the Wisconsin soil labs test below 50 ppm phosphorus, it is assumed that 63% of all livestock operations, equally, will have no costs to comply with the new standard. If soil test phosphorus is below 50 ppm, nutrients can be applied to meet the nitrogen need of the crop (similar to the current nitrogen-based standard). This can continue until soil-test phosphorus reaches 50 ppm.

When soil-test phosphorus exceeds 50 ppm, but is less than 100 ppm, all of the simulated operations (26% of all livestock operations) needed to curtail commercial phosphorus applications with the exception of dairy operations. The high nitrogen to phosphorus content of liquid dairy manure allows dairy producers to follow a nitrogen-based strategy without building soil test phosphorus and thus maintain compliance with the new standard at this soil-test level. All other livestock operations on soils testing between 50 and 100 ppm phosphorus would be required to reduce manure applications per acre in order to comply with the new phosphorus standard. More acreage for land application of manure is needed resulting in increased costs to haul manure to more distant application sites. Under this scenario costs per animal unit range from $0.00 for dairy to $26 for poultry.

When soil-test phosphorus exceeds 100 ppm (11% of livestock operations), ALL operations are impacted by the proposed standard. It should be noted that costs to comply with the proposed standard do not increase after soil-test results exceed 100 ppm phosphorus. Phosphorus restrictions under the new standard increase until soil-test phosphorus reaches 100 ppm, but remain constant after that point (assuming the phosphorus management strategy is based on soil test phosphorus, not the phosphorus index). The costs to comply under this scenario range from $5 to $38 per animal unit.

The total estimated cost to comply with the proposed standard is $6,403,000. These are annual costs and do not assume that soil-test phosphorus values will rise as they have been doing steadily for the last 40 years. If farmers allow their phosphorus levels to exceed 100 ppm, costs to comply with the nutrient management standard will be much higher. On the other hand, the simulations did not consider other potential manure disposal options, such as processing and sale as commercial fertilizer (an option commonly used in the poultry industry).

Table 1. Costs to comply with proposed P-based vs. existing N-based Nutrient Management Standard (590)

Livestock Type	Statewide Animal Units (A.U.)	Soils < 50 ppm P (63%) # of A.U. where soil <50 ppm P	Soils < 50 ppm P (63%) Cost/A.U. of new NRCS 590	Soils < 50 ppm P (63%) Total Cost where soil < 50 ppm	Soils > 50 but <100 ppm P (26%) # of A.U. where soil >50, <100 P	Soils > 50 but <100 ppm P (26%) Cost/A.U. of new NRCS 590	Soils > 50 but <100 ppm P (26%) Total Cost where soil >50, <100 P	Soils > 100 ppm P (11%) # of A.U. where soil >100 ppm P	Soils > 100 ppm P (11%) Cost/A.U. of new NRCS 590	Soils > 100 ppm P (11%) Total Cost where soil >100 ppm	**Total Cost to Comply with NRCS 590**
Dairy	2,500,000	1,575,000	$0.00	$0	650,000	$0.00	$0	275,000	$6.00	$1,650,000	**$1,650,000**
Beef	400,000	252,000	$0.00	$0	100,000	$8.00	$800,000	40,000	$24.00	$960,000	**$1,760,000**
Swine	210,000	132,300	$0.00	$0	55,000	$3.00	$165,000	23,000	$5.00	$115,000	**$280,000**
Chickens	390,000	245,700	$0.00	$0	102,000	$13.00	$1,326,000	43,000	$14.00	$602,000	**$1,928,000**
Turkeys	47,000	29,610	$0.00	$0	12,000	$26.00	$312,000	5,000	$38.00	$190,000	**$502,000**
Ducks	33,000	20,790	$0.00	$0	9,000	$15.00	$135,000	4,000	$26.00	$104,000	**$239,000**
Sheep/Goats	11,000	6,930	$0.00	$0	3,000	$9.00	$27,000	1,000	$17.00	$17,000	**$44,000**
							$2,765,000			$3,638,000	
							Statewide Cost to Comply with NRCS 590 (all livestock)				**$6,403,000**

Key Assumptions and Data Sources

1. Of the 650,717 soil samples compiled in the 1995-1999 Wisconsin Soil Test Summary 63% tested below 50 ppm Phosphorus, 26% tested between 50 and 100 ppm Phosphorus, and 11% tested above 100 ppm Phosphorus

2. The number of animal units is calculated using the 2002 Census of Agriculture from the Wisconsin Agricultural Statistics Service. The number of ducks in WI are DATCP's best estimate.

3. DATCP calculated the average cost per animal unit for each species by simulating 5 nutrient management plans based on different soil types from representative counties. To view the results of these simulations go to: http://www.datcp.state.wi.us/arm/agriculture/land-water/conservation/nutrient-mngmt/planning.jsp

These cost estimates represent the most restrictive, high-cost scenario. They include costs to meet both the soil test P management and P Index standards, when in fact farms are required to comply with only one of these 2 alternative standards. These are annual costs and do not assume that soil-test phosphorus values will rise as they have been doing steadily for the last 40 years. If farmers allow their phosphorus levels to exceed 100 ppm, costs to comply with the nutrient management standard will be much higher.

The median soil-test value for phosphorus, based on over 650,000 soil tests analyzed from 1995 to 1999 is 38 ppm. Farmers with soils testing at the median (38 ppm soil phosphorus) or below, could follow the nitrogen recommendations of the proposed standard and allow soil-test P to build to 50 ppm. Under this scenario, the proposed standard would have no impact beyond the current standard until soil-test P surpassed 50 ppm.

Depending on livestock type the build-up to 50 ppm from 38 ppm soil phosphorus could take from 4 to 10 years or longer. In the case of poultry the build-up would occur most quickly, 4 to 5 years. In the case of beef, 7 to 10 years. Swine would take 5 to 10 years. In the case of dairy operations, soil build-up would not occur if the operations followed an N-based strategy. If soils on a dairy operation test below 50 ppm phosphorus, based on DATCP simulations, a nitrogen-based nutrient management plan can be followed indefinitely, with the lone exception of dairy operations on irrigated sands.

Livestock farmers can lower the phosphorus loading to their soils in a number of ways including feed management. Reductions in dietary phosphorus in dairy cows can significantly reduce the phosphorus content of manure while maintaining animal health and productivity. Farmers may adopt innovations such as diet manipulation to improve their profitability and reduce environmental impacts. According to Garcia et. al (2003), diet manipulation and other practices may improve milk production, milk quality, and/or cow longevity, resulting in a source of additional net revenue rather than a cost to a farmer.

Accommodation for Small Business

DATCP has worked extensively with farmers and their representatives in order to minimize adverse effects on small business. Farmers and members of farm organizations participated on the technical advisory and standards committee that provided recommendations for input on the rule draft. The panel that provided recommendations for technical standards was required to consider practicality and other factors of concern to small businesses. DATCP also held numerous public hearings throughout the state, prepared simplified information materials, and incorporated the concerns of small businesses in drafting the rule.

DATCP made the following changes, among others, to the final draft rule:

- Expanded exemption for farms that apply municipal and industrial waste according to DNR rules.

- Deleted, from the DATCP nutrient management rule, portions of the NRCS standard related to particulate air emissions (section V.D), "additional criteria" to protect soil condition (section V.E), and "discretionary considerations" (Section VI).

- Gave farmers the option of applying nutrients to maximum levels provided in 1998 UW recommendations (as under the current rules), or in subsequent editions of the UW recommendations, whichever the farmer prefers.

- Clarified that a farmer who follows a nutrient management plan prepared or approved by a qualified nutrient management planner, other than the farmer, is presumed to comply with the nutrient management standards under this rule. The planner is responsible for ensuring that the plan complies with rule standards.

- Clarified certification standards for soil testing laboratories. This rule clarifies the lab certification application form, and incorporates the application form as an appendix to this rule.

NRCS made the following changes to its final draft standard, which DATCP incorporated by reference in this rule (DATCP and NRCS held joint public hearings):

- Modified provisions related to manure applications to frozen or snow-covered land.

- Clarified provisions related to liquid manure applications near lakes and streams.

- Clarified provisions related to winter manure applications near lakes and streams. Exempted manure deposited by grazing animals.

- Allowed phosphorus calculations over a maximum 8-year, rather than 4-year, crop rotation. This change better reflects the length of a typical dairy rotation.

- Allowed tissue analysis as a way to determine nutrient recommendations for cranberries and other fruit crops.

- Clarified provisions related to crop yield goals.

- Clarified provisions related to irrigated nitrogen applications.

Conclusion

This rule will have a significant impact on agriculture in this state. This rule will facilitate the protection of Wisconsin water resources through the implementation of sound nutrient management principles which will reduce the impacts of both nitrogen and phosphorus run-off. This rule may increase costs for some livestock operators, in the short-run. But many farmers will save money by complying with the standards in this rule, and the benefits will increase over time. Noncompliance will, on the other hand, increase long-term nutrient management costs.

This rule may have a significant economic impact on small businesses, and is therefore subject to the delayed small business effective date provision in s. 227.22(2)(e), Stats. (delays rule application to small businesses by 2 months, compared to effective date for other businesses).

Dated this 20 day of December, 2006.

STATE OF WISCONSIN
DEPARTMENT OF AGRICULTURE,
TRADE AND CONSUMER PROTECTION

By _____
Kathy F. Pielsticker, Administrator,
Division of Agricultural Resource Management

Manure Management on Wisconsin Dairy Farms
Implications for Code 590 Nutrient Management Standards
Attachment 1 to Final Business Impact Analysis, December 2006

Research Brief compiled for WDATCP, October 2005

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Most (approximately two-thirds) of Wisconsin's dairy farms are self-sufficient in grain and forage production, and therefore have more than adequate cropland area for manure spreading[1, 2]. Recent studies revealed, however, that many dairy farmers use only a portion (25-45%) of their total cropland area for manure spreading[2]. Manure spreading on Wisconsin dairy farms can be linked to the amount of manure actually collected, and therefore that needs to be land-spread [for example, less manure is collected in the southwest (56% of total annual herd production) than in the south central (72%) or the northeast (68%) regions] [3]; the presence of manure storage; labor availability and machinery capacity for manure spreading; variations in the manure "spreading window", or days that manure can be spread given regional differences in weather and soil conditions; and distances between where manure is produced and fields where manure can be applied. Although Wisconsin dairy farmers face these and other challenges in manure management, most farmers appear to be adhering already to the Natural Resources Conservation Service 2005 Code 590 Nutrient Management Standard. Information in this Research Brief was gleaned from the "On-Farmers' Ground" project that studied nutrient management practices on 54 representative dairy farms across Wisconsin during the period 2002-2005. Detailed records were kept on the types and amounts of feed, fertilizer and manure used, and legume nitrogen credits available during the period October 2003 to September 2004.

Dairy farm selection and characteristics
"On-Farmers' Ground" (OFG) farms were selected from a pool of 804 respondents to the 1999 Wisconsin Dairy Farm Survey [4]. "Stratified random sampling" procedures were used to provide an OFG study population of 54 farms that represent the range of farm sizes, livestock densities (cow:cropland ratios) and manure recycling capacities typical of the Wisconsin dairy industry[2, 3]. The farms are distributed across the 12 principal dairy counties, major soil types, and watersheds of impaired waterbodies in Wisconsin (Figure 1). The hilly, southwest (SW) is characterized by well-drained silt loam soils; the relatively flat, northeast (NE) region has less permeable clay loam and loam soils; and the undulating south-central (SC) region has landscapes and soils somewhat intermediate to those of the SW and NE. The dairy herd and cropping system characteristics of the OFG farms (Table 1) are similar to the general dairy farm population in these regions[5]. Farmer attrition, incomplete data and other factors provided verifiably reliable nutrient management information on 33 of the original 54 farms.

Manure phosphorus (P) and nitrogen (N) application rates to cropland
Wisconsin's Code 590 Nutrient Management Standard (http://www.datcp.state.wi.us/arm/agriculture/land-water/conservation/nutrient-mngmt/planning.jsp, accessed September 6, 2005) provides the following general guidelines:

- V.A.1.d. Annual P recommendations may be combined into a single application that does not exceed the total P recommendation for the rotation (this high single application not permitted on frozen ground).

- V.A.1.f. Available N from all sources shall not exceed the annual N requirement of non-legume crops....

Phosphorus applications to cropland. The amount and source of P applications were tracked on 8,880 cropland acres in 1,070 fields (Table 2). On average, annual available P_2O_5 applications were similar, a rate range of 32 to 37 lbs/acre, across all three regions. There was, however, considerable variation in available P_2O_5 application rates. Approximately 80 to 90% of the total surveyed cropland area received available P_2O_5 applications below 50 lbs/acre, the annual P_2O_5 replacement level for most field crops, and 95 to 98% of the total cropland received available P_2O_5 application rates below the two-year replacement level of 100 lbs/acre. Of all surveyed cropland acres (8,880), application in excess of three-year P crop removal (150 lbs/acre) occurred only on approximately 35 acres situated on 2 of the 12 surveyed farms in the NE, on 30 acres on 4 of 12 farms in the SC, and on 50 acres on 5 of 9 farms in the SW. In all regions, approximately 70% of total P_2O_5 applications came from manure and 30% from fertilizer.

Nitrogen applications to corn. On the 33 farms, manure was applied to corn (3;345 acres), established alfalfa/hay (3,130 acres), newly established alfalfa/hay (810 acres), soybeans (705 acres), small grains (435 acres), and a few miscellaneous crops. Available N applications to corn varied from 0 to 600 lbs/acre across the state and averaged 105 lbs/acre in the SC, 165 lbs/acre in the NE, and 180 lbs/acre in the SW (Table 3). From 55 to 60% of the total corn acreage received between 75 and 225 lbs available N /acre. Application in excess of 225 lbs available N /acre occurred on 6 of 12 farms comprising 19% of the total corn acreage in the NE; on 3 of 12 farms comprising 5% of the corn acreage in the SC; and on 6 of 9 farms comprising 10% of the total corn acreage in the SW region. In all regions, 28-36% of available N applications came from previous legumes, 26-33% from manure and approximately 40% from fertilizer. Given that total available N applications rates to corn corresponded closely to recommended levels[6], most dairy farmers appear to be crediting the amount of N provided by previous legumes and manure applications.

Timing of manure N and P applications

The 590 Standard provides the following general guidelines:

V.A.2.b.(3). When frozen or snow-covered soils prevent effective incorporation at the time of application and the nutrient application is allowed.....

- ...do not apply nutrients within the Surface Water Quality Management Area (SWQMA - The area within 300' and draining to perennial streams and within 1,000' of lakes or ponds), and
- ...do not exceed the P removal of the following growing season's crop when applying manure.

Winter manure applications in SWQMA. On average, most (80-90%) of the cropland area operated by Wisconsin dairy farmers is not situated in the SWQMA (Table 4). Some farms in each zone, however, have one-third to one-half of their total operated cropland areas within SWQMA. Of total annual manure applications, only 10-25% occurred during winter, most (75-95%) applications were outside the SWQMA. Data variability suggests that relatively few farms would have to change current practices to adhere to the 2005 Code 590 Standard.

The last OFG interviews (March, 2005) revealed that many farmers who winter-spread manure in SWQMA would be willing and able to change the timing and location of manure application to adhere to 590 Standard. Some, however, would require assistance in managing manure runoff from feedlots and unrestricted livestock access in SWQMA to reduce the risk of impairing water quality.

Winter application of manure P. Manure applications during the winter (Dec.-Feb) were limited to relatively small cropland areas (Table 5). In the SW, only 8% of total manured area (annual basis) received the manure during winter months, followed by the NE (12%) and the SC (22%) regions. In areas where manure was winter-spread, most application levels did not exceed 50 lbs P_2O_5/acre, the approximate P removal of a following growing season's crop. Of the 8,880 acres surveyed, approximately 2.5% (155 acres in the SC region, and 70 acres in the SW) received manure during winter that would have been in excess of annual crop P removal.

Citations

(1) Phosphorus feeding and manure recycling on Wisconsin dairy farms. J.M. Powell, D.B. Jackson-Smith, and L.D. Satter. *Nutr. Cycl. in Agroecosyst.*, 62, 277-286. 2002.

(2) Exploring the use of animal density standards for nutrient management policy on Wisconsin dairy farms. H. Saam, J.M. Powell, D.B. Jackson-Smith, W.L. Bland, and J.L. Posner. *Agric. Syst.*, 84:343-357. 2005.

(3) Manure collection and distribution on Wisconsin dairy farms. J.M Powell, D.F. McCrory, D. B. Jackson-Smith, and H. Saam. *J. Envir. Qual.* (in press).

(4) A profile of Wisconsin's dairy industry. F.H. Buttel, D. Jackson-Smith, and S. Moon. Program on Agricultural Technology Studies (PATS), Univ. of Wisconsin-Madison. 1999.

(5) Farming in Wisconsin at the end of the century: Results of the 1999 Wisconsin farm poll. D.B. Jackson-Smith, S. Moon, M. Ostrom, and B. Barham. Research Summary No. 4. Program on Agricultural Technology Studies (PATS). Univ. of Wisconsin-Madison. 2000.

(6) Nutrient management practices for Wisconsin corn production and water quality protection. L.G. Bundy, K.A. Kelling, E.E. Schulte, S. Combs, R.P. Wolkowski, and S.J. Sturgul. Pub. A3557. Univ. Wisconsin Cooperative Extension, Madison. WI. 1994.

Figure 1. Regional, county and watershed location of "On-Farmers' Ground" dairy farms in Wisconsin.

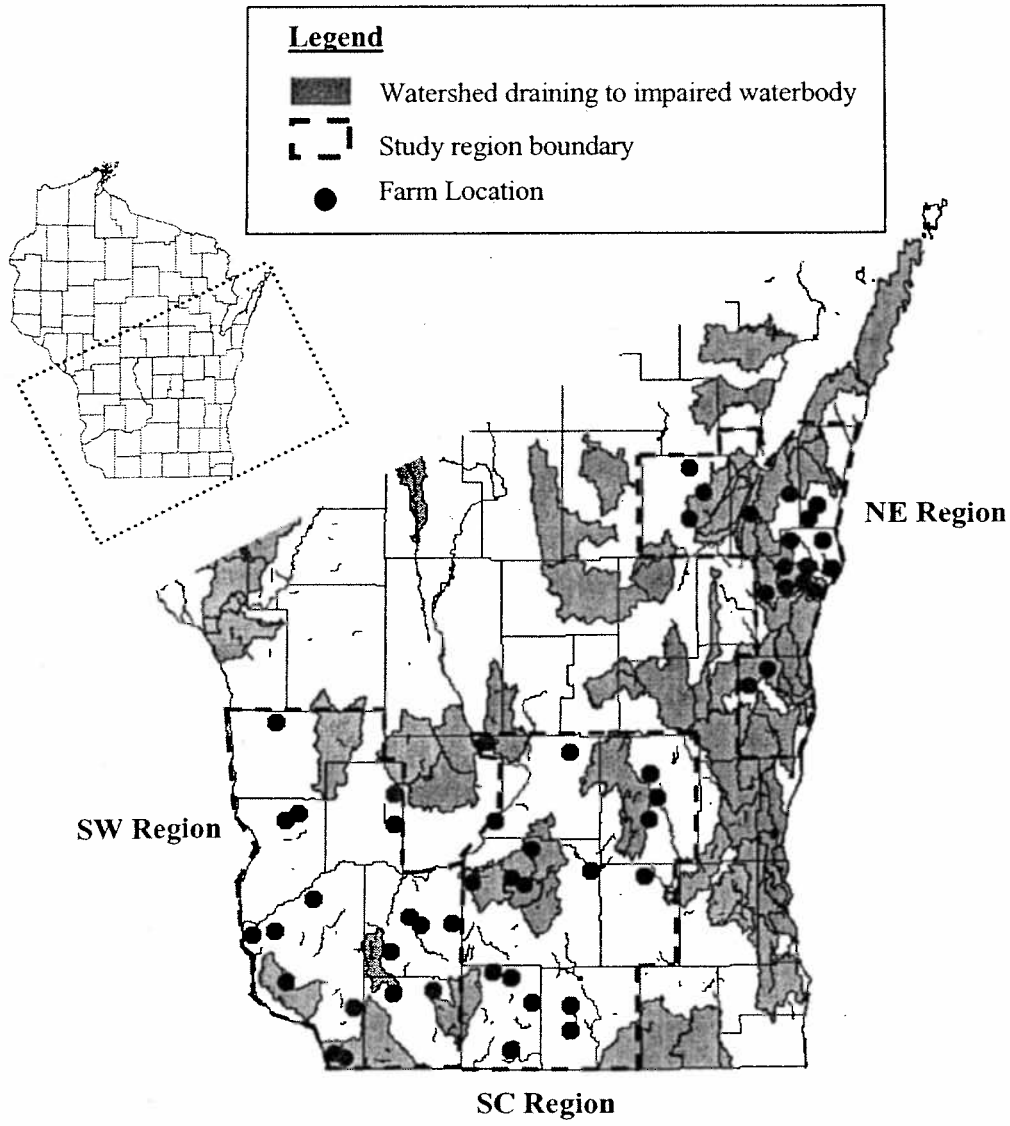

Table 1. Regional dairy herd and cropping characteristics of fifty-four representative dairy farms in Wisconsin.

Production components	Regions SW (n=18 farms)	SC (n=18 farms)	NE (n=18 farms)	All (n=54 farms)
Herd size	% of n farms			
1 to 49 cows	31	26	16	25
50 to 99 cows	56	53	68	59
100 to 199 cows	0	10	5	6
200+ cows	13	11	11	10
Animal type	number of animals per farm			
Lactating cows	49 (11-270)†	53 (23-480)	52 (32-387)	52 (11-480)
Dry cows	9 (2-50)	10 (0-75)	8 (3-46)	9 (0-75)
Young heifers	14 (0-30)	20 (5-173)	15 (5-145)	15 (0-173)
Mature heifers	20 (0-55)	28 (5-247)	35 (0-245)	28 (0-247)
Land use	acres per farm			
Total operated cropland	161 (37-636) †	223 (94-1094)	203 (74-839)	198 (37-1094)
Corn grain	35 (0-171)	74 (0-342)	30 (0-134)	37 (0-342)
Corn silage	12 (0-267)	27 (0-322)	37 (17-327)	27 (0-327)
Soybeans	0 (0-64)	0 (0-743)	0 (0-131)	0 (0-743)
Alfalfa	54 (10-245)	62 (20-277)	64 (32-270)	62 (10-277)
Small grain	0 (0-32)	0 (0-40)	0 (0-151)	0 (0-151)
Pasture	42 (0-129)	10 (0-186)	3 (0-15)	10 (0-186)

† Median (minimum-maximum). For data sets (e.g., dairy herd size and land use distribution) that do not have a normal distribution, a median is a better measure of central tendency than a mean.

Table 2. Available phosphorus applications to cropland on thirty-three dairy farms in the northeast (NE), south-central (SC) and southwest (SW) regions of Wisconsin (Oct. 03 to Sept. 04).

Parameter	Measurement	Region		
		NE	SC	SW
Operational	Farms (n)	12	12	9
	Fields (n)	293	289	488
	Cropland area that received manure (acres)	3420	3090	2370
Rates of available P_2O_5 applied to cropland (lbs/acre)[†]	Field average (range)	32 (0-310)	34 (0-415)	37 (0-460)
	Application category	% of total cropland area		
	0	30 (12)[‡]	23 (12)	41 (9)
	1-50	50 (12)	54 (12)	48 (7)
	51-100	15 (12)	17 (11)	8 (8)
	101-150	4 (5)	5 (7)	1 (6)
	>150	1 (2)	1 (4)	2 (5)
Source of total P_2O_5 applications (%)	Manure	70[¶] (40-100)	70 (35-100)	70 (27-100)
	Fertilizer	30 (0-58)	30 (0-64)	30 (0-73)

[†]Assumed manure availability of 60% and fertilizer availability of 100%.
[‡]Mean, (number of farms having cropland within application category) in parentheses.
[¶]Mean, (minimum – maximum)

Table 3. Available nitrogen applications to corn on thirty-three dairy farms in the northeast (NE), south-central (SC) and southwest (SW) regions of Wisconsin (Oct. 03 to Sept. 04).

Parameter	Measurement	Region		
		NE	SC	SW
Operational	Farms (n)	12	12	9
	Fields (n)	108	116	132
	Corn area (Acres)	1200	1330	815
Rates of available N applied to cropland (lbs/acre)	Field average (range)	165 (0-600)	105 (0-340)	180 (15-600)
	Application category	% total corn		
	0	<1 (1)†	<1 (1)	0 (0)
	1-75	26 (8)	39 (6)	31 (5)
	76-150	33 (10)	41 (12)	45 (7)
	151-225	21 (8)	14 (10)	14 (7)
	>225	19 (6)	5 (3)	10 (6)
Source of available N (%)	Legume credits‡	30¶ (0-90)	28 (0-100)	36 (0-100)
	Manure	28 (0-100)	33 (0-100)	26 (0-100)
	Fertilizer	42 (0-100)	39 (0-100)	38 (0-100)

†Mean, (number of farms having cropland within application category) in parentheses.
‡ Assumed (1) 1st year alfalfa N credits of 120 and 70 lbs/acre for medium/fine and sandy textured soils, respectively and 40 lbs N/acre for soybeans except no credit on sandy soils ; (2) 1st year manure N availability of 60%; (3) fertilizer N availability of 100%.
¶ mean, (range) in parentheses.

Table 4. Mean (minimum-maximum) cropland and SWQMA buffer areas, and farmer manure spreading behavior on 33 dairy farms in northeast (NE), south-central (SC) and southwest (SW) Wisconsin.

Parameter	Measurement	Region		
		NE	SC	SW
Operational	Farms (n)	12	12	9
	Total cropland area (acres/farm)	274† (74-670)	245 (91-673)	161 (37-283)
Cropland not within SWQMA	% of total operated cropland	88 (66-100)	80 (52-94)	91 (62-100)
Cropland within SWQMA	% of total operated cropland area	12 (0-34)	20 (6-48)	9 (0-38)
	% of total cropland area in 300' stream buffer	1 (0-5)	7 (0-28)	7 (0-35)
	% of total cropland area in 1000' pond buffer	11 (0-34)	13 (0-48)	2 (0-14)
Winter-spread manure	% of annual manure spreader trips in winter	10 (0-100)	27 (0-100)	25 (0-100)
Winter-spread manure in code 590 buffers	% of total winter-spread cropland not in buffers	93 (69-100)	75 (38-100)	82 (40-100)
	% of total winter-spread cropland within buffers	7 (0-31)	25 (0-62)	18 (0-58)

†Mean, (minimum – maximum) in parentheses

Table 5. Manure P_2O_5 applications during winter on thirty-three dairy farms in the northeast (NE), south-central (SC) and southwest (SW) regions of Wisconsin (Oct. 03 to Sept. 04).

Season	Measurement	Region		
		NE	SC	SW
Operational	Farms (n)	12	12	9
	Cropland area that received manure over year (acres)	3420	3090	2370
	Winter-spread cropland area (acres)	410	675	190
Available manure P_2O_5 applied to cropland during winter (lbs/acre)	Application category	% total crop area		
	0	88 (12)†	78 (12)	92 (9)
	1-50	12 (8)	17 (10)	5 (6)
	51-100	0	4 (9)	1 (5)
	101-150	0	0.5 (1)	1 (3)
	>150	0	0.5 (1)	1 (2)

†Mean, (number of farms having cropland within application category) in parentheses.

DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION
FINAL ENVIRONMENTAL ASSESSMENT
December 2006

Division Affected: Agricultural Resource Management

Rule Number: ATCP 50, Soil and Water Resource Management Program

HISTORY AND BACKGROUND

1. ***Rule number and title:*** ATCP 50, Soil and Water Resource Management

   [ ] New Rule

   [X] Modification of Existing Rule

2. ***Statutory Authority***

   A. To adopt the proposed rule: Sections 92.05(3)(k), and 281.16(3)(b) and (c), Stats.

   B. Statute(s) being interpreted by proposed rule: chapter 92, and section 281.16, Stats.

3. ***Summarize the history of the proposed rule and the reason the rule was developed:***

   The Department of Agriculture, Trade and Consumer Protection was directed to make changes in administrative rules as a result of changes to ch. 92, Stats, made by 1999 Wisconsin Act 9 and 1997 Wisconsin Act 27. Both of these acts made significant changes to the state's Soil and Water Resource Management Program and the related Nonpoint Source Water Pollution Abatement Program. These changes were implemented through DATCP and DNR rules (ATCP 50 and NR 151) in October of 2002. At that time, our department cited the March 1999 Natural Resources Conservation Service (NRCS) 590 nutrient management standard as the minimum requirement for nutrient management planning in Wisconsin in ATCP 50. This standard did not contain a significant phosphorus management component. However, within ATCP 50, our department made a commitment to initiate rulemaking by January 1, 2005 to incorporate a new NRCS 590 phosphorus-based nutrient management standard if one existed. NRCS adopted its nutrient management standard in September 2005. The new federal standard is based on nitrogen *and phosphorus*. This rule amendment fulfills the department's commitment.

C. ***Provide a summary of procedures required by the proposed rule:***

(1) Requirements the public will have to follow:

The proposed rules will require farmers who voluntarily adopt or are required to implement a nutrient management plan to follow the September 2005 version of the NRCS 590 standard.

(2) Requirements counties and other local governments will have to follow:

Counties will need to update their manure storage ordinances (58 of 72 counties have manure storage ordinances) to include the new nutrient management requirements contained in the September 2005 version of the 590 standard. Counties will also be required to update their Land and Water Resource Management plans to incorporate the new standard and indicate how they will implement the performance standard.

(3) Requirements the department will have to follow:

1997 Wisconsin Act 27 requires the department to prescribe conservation practices to meet the state's agricultural performance standards adopted under NR 151. The proposed rule establishes a consistent standard for nutrient management that will meet the states agricultural performance standards in NR 151.

D. ***Identify and explain implicit or explicit exemptions to the proposed rule and explain why they are exempt (e.g., what similar activities or entities would not be affected):***

The requirement for nutrient management planning under ATCP 50.04(3) only applies to mechanically applied nutrients. Fields where manure is directly deposited by pasturing or grazing only will not be required to have a nutrient management plan.

A landowner is not required to have a nutrient management plan under ATCP 50.04(3) if the landowner applies *primarily* septage, municipal sludge, industrial waste or industrial byproducts according to ch. NR 113, 204 or 214. If septage, biosolids, or industrial waste are applied to a site, they will be applied at a rate not to exceed the nitrogen needs of the crop to be grown (or for septage the hydraulic loading limit or whichever is less) as required under chs. NR 113, 204, or 214. All sources of nitrogen must be taken into account in setting application rates, including commercial fertilizer and manure. Additional phosphorus from the materials regulated under chs. NR 113, 204 and 214 is allowed. However, additional phosphorus from manure and commercial fertilizers applied to fields receiving septage, biosolids, or industrial wastes may be limited as specified in the nutrient management plan. The future phosphorus inputs on these fields may need to be limited in order for farmers to maintain compliance in their nutrient management plan.

agricultural soil types from Chippewa, Adams, Outagamie, Jefferson and Lafayette counties. Each of these scenarios (8 livestock types times 5 soil types) were analyzed at different soil-test phosphorus levels: 1. Soil test P greater than 50 ppm but less than 100ppm (52 ppm), and 2. Soil test P greater than 100 ppm (105ppm). Spreadsheets showing the data supporting the scenarios and the resulting calculations can be found at the following website: http://www.datcp.state.wi.us/arm/regulation/soil_water.jsp

In its simulations, DATCP used typical nutrient values for manure of each livestock species (the phosphorus content of dairy manure, relative to nitrogen, is lower than for beef and other livestock species), common crop rotations, and various tillage options used on Wisconsin farms.

Under scenarios with soil-test phosphorus below 50 ppm, a farmer could follow a nitrogen-based plan and there would be no cost difference between the existing N-based standard and the proposed P-based standard. Since 63% of Wisconsin soils analyzed by the Wisconsin soil labs test below 50 ppm phosphorus, it is assumed that 63% of all livestock operations, equally, will have no costs to comply with the new standard. If soil test phosphorus is below 50 ppm, nutrients can be applied to meet the nitrogen need of the crop (similar to the current nitrogen-based standard). This can continue until soil-test phosphorus reaches 50 ppm.

When soil-test phosphorus exceeds 50 ppm, but is less than 100 ppm, all of the simulated operations (26% of all livestock operations) needed to curtail commercial phosphorus applications with the exception of dairy operations. The high nitrogen to phosphorus content of liquid dairy manure allows dairy producers to follow a nitrogen- based strategy without building soil test phosphorus and thus maintain compliance with the new standard at this soil test level. All other livestock operations on soils testing between 50 and 100 ppm phosphorus would be required to reduce manure applications per acre in order to comply with the new phosphorus standard. More acreage for land application of manure is needed resulting in increased costs to haul manure to more distant application sites. Under this scenario costs per animal unit range from $0.00 for dairy to $26 for poultry. It should be noted that costs to comply with the proposed standard do not increase *after* soil-test results exceed 100 ppm phosphorus. Phosphorus restrictions under the new standard increase until soil-test phosphorus reaches 100 ppm, but remain constant after that point (assuming the phosphorus management strategy is based on soil test phosphorus, not the phosphorus index).

When soil-test phosphorus exceeds 100 ppm (11% of livestock operations), ALL operations are impacted by the proposed standard. The costs to comply under this scenario range from $5 to $38 per animal unit.

The total estimated cost to comply with the proposed standard, based on estimates of increases for the approximately 3.5 million animal units of livestock in Wisconsin, is **$6,403,000.** These are annual costs and estimate the most restrictive, high-cost scenario. They include costs to meet both the soil test P management and P Index standards, when

planning and other related services provided to farmers such as soil testing. While farmers can qualify to write their own nutrient management plans, they will likely retain professional services because greater expertise is needed to develop phosphorus-based plans. Soil tests (and manure tests if used to determine the nutrient content of manure) must be conducted at qualified laboratories.

This rule will increase demand for manure hauling services. A percentage of farmers will have greater manure transportation requirements than they can or desire to handle themselves. They will hire commercial manure haulers to apply their manure on appropriate fields. This industry should realize increased revenue and business from farmers.

This rule will likely decrease the sale of commercial phosphorus fertilizers but may increase sales of commercial nitrogen fertilizer to meet crop needs (where manure applications are curtailed because of phosphorus constraints). Corn utilizes approximately three times more nitrogen than phosphorus, while liquid dairy manure supplies nitrogen and phosphorus at approximately a 2:1 ratio. When manure is applied to meet crop phosphorus needs, and legumes are not in the crop rotation, insufficient nitrogen will be supplied to the crop in the form of manure, requiring additional nitrogen.

6. ***List agencies, groups, and individuals contacted regarding the proposed rule.***

The department looked to a wide range of constituents for guidance on the proposed rule including representatives from: the Wisconsin Department of Natural Resources; Wisconsin Land and Water Conservation Association; Wisconsin Association of Land Conservation Employees; University of Wisconsin-Extension; USDA Natural Resources Conservation Service; Wisconsin Farm Bureau Federation; Wisconsin Egg Producers; Industrial waste hauler representatives; Wisconsin Association of Professional Ag Consultants; Wisconsin Certified Crop Advisors; Wisconsin Custom Manure Applicators Association; and, individual agricultural producers.

7. ***List the existing administrative code (affected or replaced by the proposed rule):***

The existing ch. ATCP 50, Wis. Adm. Code, is updated through the proposed rule. The ch. ATCP 51, Wis. Adm. Code, (Livestock Siting Rules) references the September 2005 NRCS 590 nutrient management.

8. ***List department directives and/or publications the proposed rule would affect.***

The proposed rule will have a minimal impact on department directives and publications. Modification of the department website and factsheets regarding nutrient management will need to be made.

nutrient management planning and defrays the cost of plan development, not the cost of plan implementation. Due to severe limitations on State cost-share funding, implementation of the new standards will be largely voluntary. Information and education programs will be expanded. Limited cost-share funds, which can be used to require compliance, will be targeted to farms having had a nutrient or manure runoff event resulting in a fish kill or well contamination or are located in highly vulnerable areas. These funds will address about 20,000 acres annually, which is less than 1% of Wisconsin's crop acreage.

(2) Cost to local government operations:

The cost to local governments should be minimal. This rule does not increase the number of nutrient management plans that are required to be developed or reviewed. It does alter the content of a nutrient management plan. The anticipated workload is in response to inquiries about the changes to the 590 standard. Existing staff should be able to handle the workload that will be generated by the proposed rule.

3) Impact on state and local economies:

The proposed rule will have a minimal to moderate impact on local economies.

(4) Economic impact on individuals:

Farmers will have to prepare and follow nutrient management plans. Farmers will have costs to develop the plans and possibly to implement them. Based on estimates above, farmers will experience wide ranging costs but on average can expect less than $1 per acre in annual increases.

C. ***Identify and briefly describe anticipated direct and indirect impacts on the social and cultural environment (lifestyle) of the parties affected by the proposal:***

This rule may positively affect the social and cultural environment of affected parties. The proposed rule will positively effect soil conservation and the protection of water quality. These efforts will have a long-term positive impact for public health and well-being and for water-based recreation. Improved water quality may also result in improved social relationships between urban and rural residents, if they each perceive the other as doing the most possible to protect water quality.

D. ***Identify and briefly describe anticipated direct and indirect impacts on the availability and use of energy (Section 1 12, Wisconsin Statutes).***

The proposed rule will not significantly impact the overall availability or use of energy in Wisconsin.

EVALUATION

13. ***Evaluation: Discuss each category using additional sheets or pertinent information if necessary. Specifically identify those factors which may distinguish the proposed rule as a major action significantly affecting the quality of the human environment.***

A. ***Secondary Effects: To what extent would the proposed rule result in other actions, which may significantly affect the environment? Identify the parties affected by secondary effects in item 5.***

The phosphorus management requirements of the proposed nutrient management standard are more restrictive than the requirements of DNR's biosolids, septage, and industrial waste rules. Farmers may be reluctant to allow their land to be used for the spreading of these high-phosphorus wastes because they will elevate their soil phosphorus levels and make it more difficult for them to dispose of their own animal wastes. This would affect municipalities, private on-site waste haulers, and industries producing waste waters.

B. ***New Environmental Effects: To what extent would the proposed rule result in new physical, biological, or socio-economic impacts?***

The proposed rule will reduce both nitrogen and phosphorus inputs to ground water and surface water. Proper animal waste handling may also result in fewer acute releases of manure and nutrients to surface waters. This may limit the incidence of fish kills.

C. ***Geographically Scarce Resources: To what extent would the proposed rule affect existing environmental features that are scarce, either locally or statewide?***

Improved water quality and soil resources may protect some scarce or endangered environmental resources, but we do not know which specific resources may be involved at this time.

D. ***Controversy: What reaction has been received or anticipated from the public or affected parties on the proposed rule or the objective of the proposed rule? Which of the parties identified in item 5 have been contacted? Summarize their comments. (Attach additional sheets if necessary.)***

The proposed rule sets new precedents for applying minimum nutrient management standards on farms. We anticipate a negative reaction from farm groups because of increased record keeping and in some cases the need to move manure longer distances or off the farming operation completely. We expect that poultry producers and municipal biosolids applicators will have the most concern because of their high P testing byproducts. Those regulated under Wis. pollution discharge elimination system permits issued by DNR for septage, municipal sludge, industrial waste or industrial byproducts are concerned they will not be able to find producers that will take these materials after the rules go into effect.

2. ***Identify and describe deregulation or reduced regulation explicit or implied in the proposed rule:***

No deregulation is proposed in this rule.

3. ***Identify requirements of other state, federal and local agencies that may be relevant to the proposed rule and explain the differences.***

The rule provides consistency with DNR's NR 151 Agricultural Performance Standards, and USDA NRCS's technical standard for nutrient management. DATCP will adopt the NRCS standard through this rule. County Land Conservation Departments will implement future nutrient management programs through their Land and Water Resource Management plans.

H. Other: Identify and describe (or cross-reference) other relevant factors which relate to the effects of the proposed rule on the quality of the human environment (e.g., foreclose future options, socio-cultural impacts, cumulative impacts to affect entities, visual impacts, and irreversible commitments of resources):

The rule amendment is expected to encourage the implementation of nutrient management practices to protect soil resources and improve water quality.

CONCLUSION

This assessment finds that the update of chapter ATCP 50 would have no significant adverse environmental impact and is not a major state action significantly affecting the quality of the human environment. It is expected that the rule amendment will have a positive impact on protecting soil resources and improving and protecting water quality. No environmental impact statement is necessary under S. 1.11 (2), Stats.

Signed this 20 day of December, 2006

By _____
Signature of Evaluator

Approved for compliance with s. 1.11, Stats., and ch. ATCP 3, Wis.Adm.Code.

Signed this 20 day of December, 2006

By _____
Kathy F. Pielsticker
Signature of Administrator
Agricultural Resource Management Division