

Dunn County

Livestock Operations Study Group Report

July 26, 2017

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ACKNOWLEDGEMENT

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1. OVERVIEW

This informational report was developed by members of the Dunn County Livestock Operations Study Group (LOSG). The workgroup included invited participants representing a cross-section of interests concerned with the impacts of concentrated animal feeding operations (CAFO) on groundwater, surface water and air quality within the County.

The LOSG committee was created as a result of the October 19, 2016 ordinance passed by the Dunn County Board of Supervisors (Board) imposing a moratorium on the establishment of all new livestock facilities with 1,000 or more animal units (AU, Appendix A), expanding livestock operations that would increase to 1,000 or more animal units, and for new or altered manure storage facilities. The workgroup was asked to review a broad set of issues associated with CAFOs and to develop recommendations for Dunn County. The workgroup has no formal authority to establish policy for any jurisdiction within Wisconsin.

Agriculture is engrained into the fabric of everyday life for many people throughout the State of Wisconsin, and Dunn County is no different. While the state is known for its agriculture, the geographic make up, existing conditions, policies, and people dictate the agricultural practices throughout the state. As people move out of urban centers for more green space in rural areas but still within close proximity to the urban centers where they work, sprawl can result. This leads to prime agricultural lands being parceled into smaller lots for human habitation and subsequent commercial outlets pushing farm operations out.

Dunn County has stayed relatively agricultural with one city (City of Menomonie) and seven villages (Boyceville, Colfax, Downing, Elk Mound, Knapp, Ridgeland, and Wheeler). Just over 94% of the entire county is zoned for agriculture. Many parcels of land zoned agriculture, however, are not necessarily used for agriculture due to a variety of factors such as land characteristics (waterbodies, slope of land), residential properties, and intended use other than agriculture (hunting land, vacation home, etc).

During the Information Gathering stage, the LOSG committee spent a significant amount of time gathering facts and data through specific presentations provided by experts (Appendixes B, C, D) and literature reviews (Appendix E). The most relevant information to livestock operations was then compiled into the Key Findings section of this report.

There are currently five permitted CAFOs (all dairy cattle operations) located in Dunn County (Wisconsin Department of Natural Resources, Appendix F). Additionally, a number of turkey farms in the County fall under a single Jennie-O Turkey Store, Inc. CAFO permit (primary location, Barron County). The number of CAFO permits is on the rise throughout the state of Wisconsin, with a 235% increase in permitted facilities since 2000.

A number of State regulations apply to livestock operations. The Livestock Facility Siting Law sets statewide standards in five areas: setbacks from property lines, odor and air emissions, nutrient management, waste storage facilities, and runoff from livestock facilities. In addition, state regulations only apply to livestock facilities that are new and/or expanding to 500 or more AU.

The state standards are applicable if a County or Town in which the livestock facility is located has adopted the standards through local ordinance. Most counties in Wisconsin, including Dunn County, have also adopted a county manure storage and nutrient management ordinance to protect surface water and groundwater. LOSG reviewed current County and statewide ordinances and the key findings related to livestock operations are listed.

The LOSG committee utilized the Key Findings to draft the Recommendations section in this report. A recommendation is a statement that Dunn County can potentially act on or use to guide decision-making to address issues identified from the key findings. Decisions and recommendations made by the workgroup were based on a consensus seeking process. For many aspects of recommendations, the workgroup did achieve consensus. Due to time constraints, the LOSG committee was unable to develop an implementation schedule.

This report is informational. The report is a group product, compiled and edited by Vang and Colson with contributions and comments from all workgroup members. The report does not represent the views of any individual workgroup member, nor the views of any of the participating organizations. As noted, this report does not establish policy for any jurisdiction in Wisconsin. It is intended to serve as a resource for citizens and elected officials engaged in discussions about appropriate next steps in Dunn County around the issue of CAFOs.

2. EXISTING CONDITIONS

2.1 Regional Setting

Dunn County is located in west central Wisconsin and consists of 22 unincorporated towns, 7 incorporated villages, and 1 city. The county seat is located in the city of Menomonie, which is also the largest municipality in the county. The county is bordered to the north by Polk and Barron Counties, to the east by Chippewa and Eau Claire Counties, to the south by Pepin County and to the west by Pierce and St. Croix Counties. Dunn has a combined land and water area of approximately 553,252 acres, or roughly 864 square miles. It is rectangular and is about 24 miles east to west and 36 miles north to south.

The topography of Dunn County ranges from flat and wide-open fields in the eastern areas to hilly and rough terrain in the west and northern areas. Glaciations and erosion has reduced the landscape to a nearly flat plain in eastern Dunn County with isolated remnants locally called “mounds”. Further west the landscape has more relief, the sandstone has been partially dissected by geologic erosion, and slopes are irregular and steep. The elevation ranges from 1000 to 1250 feet above sea level in the northern part of the county and from 750 to 1000 feet above sea level in the southern part of the county.

Throughout most of the county, sandstone bedrock underlies unconsolidated soil deposits. The sandstone is underlain by crystalline rock such as granite. In the higher elevations of the western and southern portions of the county, the sandstone is capped by dolomitic limestone. The depth to bedrock ranges from exposed bedrock and very thin soils (less than 22 inches thick) to deep soils greater than 100 feet in the pre-glacial valleys. According to the Wisconsin DNR Wiscland study¹, Dunn County has the following land cover; Urban 0.5%, Agriculture 35.5%, Grassland 17.4%, Forest 37.4%, Water 1.4%, Wetland 7.5% and Shrub land 0.2%.

¹ "Wisconsin land cover data - "Wiscland"." 12 Sep. 2016, <http://dnr.wi.gov/maps/gis/datalandcover.html>.

Agriculture is engrained into the fabric of everyday life for many people throughout the State of Wisconsin, and Dunn County is no different. While the state is known for its agriculture, the geographic make up, existing conditions, policies, and people dictate the agricultural practices throughout the state. As people move out of urban centers for more green space in rural areas, but still within close proximity to the urban centers where they work, sprawl can result. This leads to prime agricultural lands being parceled into smaller lots for human habitation, and subsequent commercial outlets pushing farm operations out.

Dunn County has stayed relatively agricultural with one city (City of Menomonie) and seven villages (Boyceville, Colfax, Downing, Elk Mound, Knapp, Ridgeland, and Wheeler). Just over 94% of the entire county is zoned agriculture. Many parcels of land zoned agriculture, however, are not used for agriculture due to a variety of factors such as land characteristics (waterbodies, slope of land), residential properties, and intended uses other than agriculture (hunting land, vacation home, etc).

According to the 2012 US Census, Dunn County had 1,404 farms with an average of 265 acres each. Wisconsin's 2015 Annual Statistic showed that Dunn county had 21,500 dairy cows in 158 total herds, for an average herd size of 136 milking cows. Total cattle including calves and beef in Dunn County were 63,000.

There are currently five CAFOs (farms housing more than 1000 animal units) permitted in Dunn County, all dairy operations, with a sixth proposed. Additionally, a number of turkey farms in Dunn County fall under a single Jennie-O Turkey Store, Inc. CAFO permit, which is

Dunn County Farmland Values, Income, and Sales

In 2012, Dunn County had...

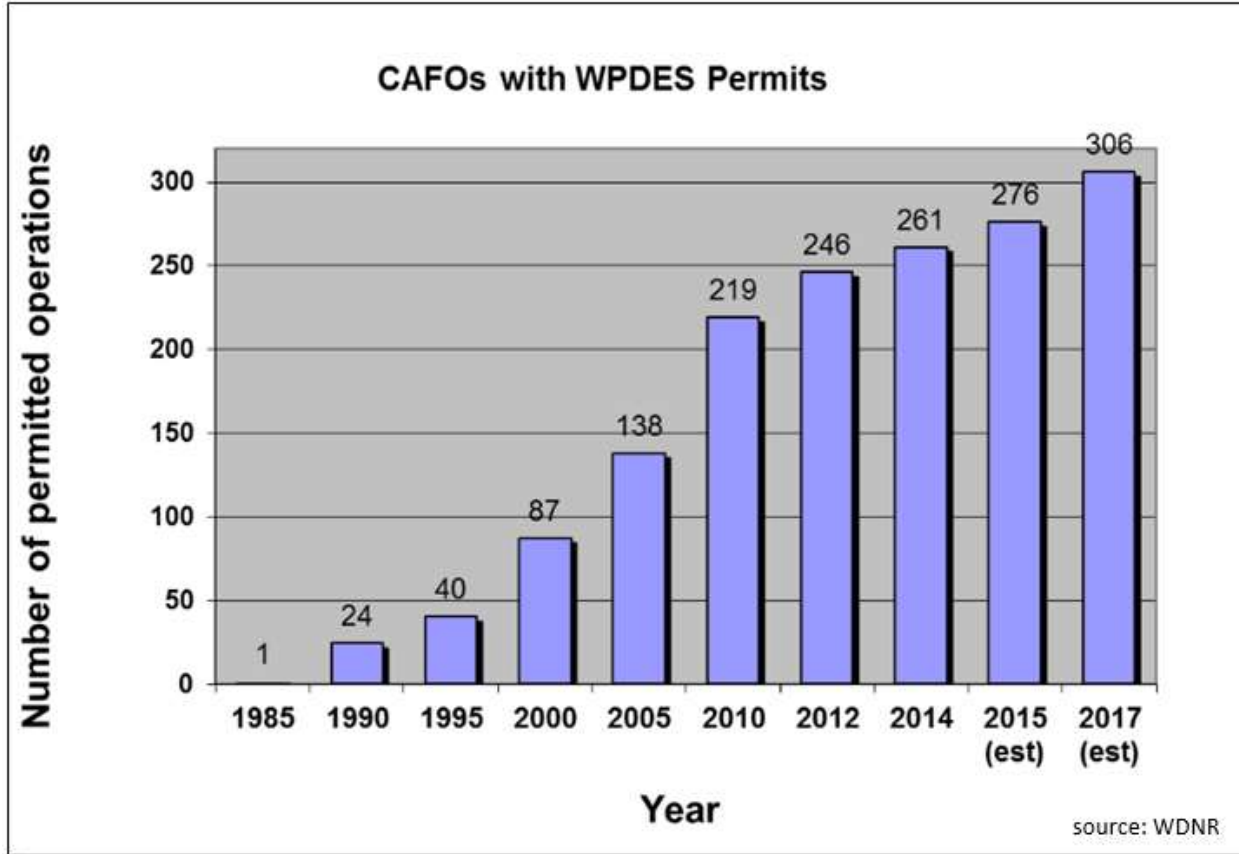
- An average per farm estimated market value of land and buildings of \$879,304.
- An average per farm estimated market value of all machinery and equipment of \$141,909.
- 54% of farm operators with a primary occupation other than farming.
- Net cash farm income of \$78,850,000 (or \$56,161 per farm), which includes sales, government payments, and other income less expenses, excluding depreciation.
- Market value of all agricultural products sold of \$283,183,000, including \$128.7 million from crops and \$134.5 million from livestock and their products.

In 2015, Dunn County had...

- \$38,431,100 in equalized assessed value of Agricultural lands and \$83,522,400 in assessed Agricultural Forest, excluding buildings.
- \$13,751,800 in equalized assessed value of "other" lands and \$145,062,100 of "other" improvements, which consists of buildings and improvements on a farm.

based in Barron County. Since 2000, the number of CAFOs in Wisconsin has grown by 235%. Recently, WDNR has been receiving about 15 CAFO applications per year, mostly for dairy operations. (See FIGURE 1 for Wisconsin CAFO permitting trends.)

FIGURE 1: WISCONSIN CAFOS WITH WPDES PERMITS



3. INTRODUCTION

3.1 Definitions

This section provides definitions for key vocabulary words to help readers understand the subjects and topics discussed in the study. The list was developed by the LOSG, and is not a comprehensive list of all possible definitions.

Anaerobic: Pertaining to the absence of oxygen.

Anaerobic Digester: An engineered system which uses biological processes of microorganisms to break down biodegradable material in the absence of oxygen.

Antibiotics: Also known as antibacterial, are medications used in the treatment and prevention of bacterial growth and infections.

Animal Units (AU): a unit of measure to equalize different species of livestock into a uniform number for permitting purposes. Each animal type has an animal unit measure per individual animal, as specified in s. NR 243.11 (Appendix A).

Board of Adjustment (BOA): a quasi-judicial body which acts on appeals for variances, special exceptions and interpretations in the zoning regulations. The BOA consists of seven members: five regular members and two alternates which are appointed to two-year terms by the Chair of the Dunn County Board of Supervisors.

Best Management Practices (BMP): Management techniques and practices that allows for the most economical and viable production while achieving the least possible adverse impact on the environment. BMPs minimize possible adverse impacts on human and, animal health, and the environment. Examples of BMPs in agriculture are: cover crops, nutrient management, no-tillage practices, and buffers to wells, as well as many others.

Concentrated Animal Feeding Operation (CAFO): An animal feeding operation consisting of 1,000 animal units (AUs) or more. An animal feeding operation may be designated as a CAFO at as a smaller-scale (i.e., fewer than 1,000 AUs) if it has pollutant discharges to navigable waters or contaminates a well.

Dunn County Board of Supervisors: The local governing body comprised of 29 elected officials, each representing a specific district of Dunn County. The Board enacts ordinances and resolutions, adopts the annual budget, approves contracts, appropriates funds, determines land use zoning for the unincorporated areas, and appoints certain County officers and members of various boards and commissions.

Department of Agriculture, Trade, and Consumer Protection (DATCP): The governmental agency of the U.S. responsible for regulating agriculture, trade, and commercial activity in the state the state of Wisconsin.

Dragline: A method of manure application by dragging a hose behind a tractor where the hose is connected to a supply pump. Manure application is usually directly incorporated into the soil with tilling equipment pulled by the tractor.

Environmentally Sensitive Areas (ESA): An area or feature within Dunn County that benefits the greater public good and is worth protecting, maintaining, enhancing, or restoring due to its fragile nature or its long-term community benefit for present and future generations. (Defining Environmentally Sensitive Areas & Conservation Features in Dunn County)

Estrogen: Hormone that is responsible for the healthy growth and development of female sexual characteristics and reproduction.

Etiology: the reason, origin, or cause of a disease or condition.

Expansion: An increase of 20% or greater in the number of animals fed, confined, maintained, or stabled.

Freeboard: Additional vertical capacity required as a safety precaution to prevent overflow from a manure storage structure in the event of a major storm event.

Farm: Any place from which \$1,000 or more of agricultural products are produced and sold, or normally would have been sold, during the year.

Implements of Husbandry (IoH): A self-propelled or towed vehicle that is manufactured, designed or reconstructed to be used and that is exclusively used in the conduct of agricultural operations.

High Capacity Well: One or more wells, drillholes, or mine shafts that have a combined approved pumping or capacity of 70 or more gallons per minute. Also referred to as a “high cap well”. (<http://dnr.wi.gov/topic/wells/highcapacity.html>)

Leachate: A solution or liquid that drains or leaches from a source material, such as a landfill, manure pile, or feed storage bunker, typically as a result of water percolating through a permeable material.

Land and Water Conservation Division (LWCD): The Land and Water Conservation Division is a part of the Environmental Services Department, which works with people in an honest, respectful, and accountable manner to manage the land and water resources of Dunn County.

Livestock: Domestic animals used in the production of food, fiber, or other animal products.

Livestock facility: A feedlot, dairy farm or other operation where livestock are or will be fed, confined, maintained or stabled for a total of 45 days or more in any 12-month period. A livestock facility includes all of the tax parcel of land on which the facility is located, but

does not include pasture or winter grazing area. Related livestock facilities are collectively treated as a single livestock facility.,

Livestock Operation Study Group (LOSG): A special committee created by the Dunn County Board of Supervisors to study livestock operations and CAFOs.

Land and Water Resource Management (LWRM) Plan: The Dunn County Land and Water Resource Management Plan provides direction for the Dunn County LWCD.

Manure Storage Structure: An impoundment constructed with an embankment, pit, dugout structure to contain manure and other animal or agricultural wastes.

Mesophilic: Pertaining to microorganisms that grow best in moderate temperatures, typically between 68 and 113°F. A mesophilic digester is typically designed to operate at 95-100°F.

Nutrient Management Plan (NMP): A plan used by farmers to account for all nitrogen, phosphorus and potassium (N, P,K) nutrients contained in fertilizer, manure, or other organic materials that are applied to fields over an entire crop rotation. A NMP follows the requirements the NRCS 590 Standard.

Natural Resources Conservation Service (NRCS): An agency of the United States Department of Agriculture (USDA) that provides technical assistance to farmers and private landowners.

Polychlorinated biphenyl (PCB): A toxic environmental contaminant requiring special handling and disposal in accordance with USEPA regulations.

Peak Flow: The maximum rate of discharge during the period of runoff caused by a storm.

Part-Per-Million (PPM): A unit of concentration in a solid or liquid measured as one part of the material of interest per million total parts. At low concentrations ppm is essentially equivalent to milligrams per liter (mg/L).

Planning Resource and Development (PR&D): A five-member County Board of Supervisors committee responsible for policy and direction in development, planning, surveying, zoning, and land assessment of Dunn County.

Transportation Impact Analysis (TIA): Analysis of potential damage to a road due to an increase in traffic volume, load, or use.

Thermophilic: Pertaining to microorganisms that grow best at relatively high temperatures.

Thermophilic digester: An engineered anaerobic designed to operate at a temperature typically between 120 to 140°F,

Total Maximum Daily Load (TMDL): The amount of a pollutant a water body can receive and still meet water quality standards.

University of Wisconsin-Extension (UW-EXT): Supports the University of Wisconsin System mission by providing leadership and research-based information to the public, integrating a scholarly approach to outreach, and addressing the needs of the community through workshops, programs, and education.

West Central Wisconsin Regional Planning Commission (WCWRPC): A multi-county planning agency created under Wisconsin State Statute 66.0309.

Wisconsin Pollutant Discharge Elimination System (WDPES): Wastewater permit administered and regulated by the Wisconsin Department of Natural Resources.

Zoonotic Disease: A disease that can be transmitted from animals to humans.

3.2 Purpose

The purpose of the study is to:

- Investigate the impacts of large-scale livestock facilities on groundwater, surface water and air quality within the County.
- Review current ordinances and determine whether amendment of existing ordinances and/or creation of a Livestock Facilities Zoning Ordinance or other ordinance in all unincorporated areas within the County is necessary.
- Determine whether the County has adequate staff and resources to administer and enforce any new or existing ordinances applicable to livestock facilities.
- Provide unzoned towns within the County an opportunity to consider enacting zoning or other regulatory ordinances or adopt County zoning.

3.3 Moratorium

On October 19, 2016 the Dunn County Board of Supervisors (Board) passed an ordinance imposing a six (6) month moratorium on the establishment of new livestock facilities with 1,000 or more animal units, the expansion of existing livestock facilities if the expansion would create a facility with 1,000 or more animal units and, for new or altered manure storage facilities. As part of the moratorium, the Board created a special study group known as the Livestock Operations Study Group (LOSG) consisting of the following persons:

- The Planning, Resources and Development Committee (PR&D)
- The Chair of the Health and Human Services Board or designee
- The County Planner/Zoning Administrator
- The County Land and Water Conservationist
- Representative from the UW-Extension System
- Minimum of six (6) interested Dunn County residents and property owners, at least three (3) of whom shall be employed or engaged in farming whose main income is derived from livestock production
- Others appointed by the County Board Chair

The ordinance outlined the issues to be considered by the LOSG, which included but were not limited to:

- Research, gather, analyze and synthesize scientific literature regarding the impact of livestock facilities of 1,000 or more animal units on groundwater, surface water, air quality, and public health and safety, as these issue apply to Dunn County.
- Identify areas where new regulations may be needed, where current regulations need to be modified, and where enforcement of current regulations is inadequate to protect public health or safety.
- Propose solutions to mitigate problems and/or shortcomings identified during the study such as:
 - Adoption of a manure storage ordinance, and requirements related to a certificate of use for storage facilities operated within the county.
 - Implementation of State performance standards to address gaps in livestock siting ordinance including standards related to processing wastewater, tillage setback, phosphorous index.
 - Adoption of zoning measures to create special zones for livestock facilities of 1,000 or more animal units.
 - Adoption of a Livestock Operations Ordinance.

The ordinance directed LOSG to create a report with recommendations on appropriate county-level regulatory approaches relative to siting and/or operation of livestock facilities and to present the report to the Board at least 30 days prior to the end of the moratorium (May 2, 2017).

3.4 Moratorium Reinstated

At its April meeting the LOSG realized the study would not be completed before the moratorium's expiration date of May 2, 2017 and requested PR&D recommend a 45-day moratorium extension to the Board. At the April 25, 2017 PR&D meeting the Committee was supportive of the LOSG request but discovered a 45-day moratorium extension was not possible as the next Board meeting was May 17, 2017, 15 days after the moratorium was scheduled to expire. Instead PR&D recommended the Board reinstate the moratorium for an additional 45-days. The Board voted in support of PR&D's recommendation and the moratorium was reinstated 45-days from the date of publication (May 20, 2017) with the understanding that the final report would be presented at the July Board meeting. The reinstated moratorium expired on July 4, 2017.

3.5 West Central Wisconsin Regional Plan Commission

Prior to the initial meeting of LOSG, Dunn County contracted with West Central Regional Planning Commission (Regional Planning) for facilitator services. Their services included preparing meeting materials, leading meetings and group discussions, guiding the LOSG towards consensus related to specific agenda topics and presentations, keeping notes and organizing upcoming meetings. After each meeting and before the next meeting, Regional

Planning met with members of the Health Department, Land and Water Conservation Division and Planning/Land Use Control Division (Team) to discuss and consolidate notes from the previous meeting into a report, confirmed upcoming presentations and presenters, adjusted the schedule as needed and developed a draft agenda, all of which were distributed to PR&D and to the LOSG before the group's next meeting.

Regional Planning's contract provided facilitator services up to and including May 17, 2017 when the report was to be presented to the County Board. In sync with the group's request to extend the study timeline an additional 45 days, Regional Planning agreed to extend its services up to June 8, 2017. Regional Planning could not continue providing its services past June 8th because of commitments which could not be adjusted. From June 8th through July 26th, when the report was presented to the Board, Dunn County staff assumed Regional Planning's duties and responsibilities.

3.6 Livestock Operations Study Group

After the moratorium was imposed and according to the moratorium ordinance, the County Board formed the Livestock Operations Study Group (LOSG) which began meeting on November 30, 2016. LOSG was tasked with analyzing the impacts from large livestock operations to County resources and producing a report with recommendations for County Board consideration.

Once formed, the LOSG met about every two weeks. The schedule was amended as needed, with group consensus, to reflect topics of interest, LOSG schedules and availability of presenters (Appendix B). In general, the schedule provided date, time, and location of meetings, description of discussion topics, name and credentials of presenters, and an overview of meeting objectives. In total, the group met 23 times. All meetings were open to the public and noticed accordingly.

At the initial LOSG meeting, the study group recognized the importance of large livestock operations to the County and the role the study group was to play regarding these operations. In those initial meetings the group agreed that in some instances focusing only on large livestock operations was somewhat short-sighted given that the cumulative effect of multiple unregulated small livestock operations could have similar impacts to County resources as a large operation. As such the group agreed that whenever possible its findings and recommendations would reflect livestock operations in general. While the economic impacts of agriculture are an important topic, however due to time constraints the LOSG was not able to address this topic.

The study was segregated into three (3) major phases: Phase 1: Information Gathering; Phase 2: Identify Key Findings; and Phase 3: Develop Recommendations. The general workflow through the phases included inviting experts to present specific topics to the LOSG, using worksheets provided by staff to list the important aspects of the presentations,

discussing and achieving consensus on the key findings, and finally using the key findings to formulate recommendations. The phases of the process are further described as follows.

In the Information Gathering Phase, facts and data were gathered by staff and LOSG members through literature reviews of professional journals, research documents, articles, websites, and through presentations given by experts in a variety of disciplines including groundwater hydrology, water quality, health, environmental pollutants, agricultural production, etc. The presentations provided a collaborative opportunity for the LOSG to ask questions, gain knowledge and insight on these areas of importance, which helped the LOSG connect livestock operations to the presenter's respective areas of expertise. A worksheet (Appendix C) was developed to help the LOSG identify and track aspects of the presentations such as: Key Impacts, Data Needs or Gaps, Policy or Program Gaps, and Opportunities for Action.

Before presentations on a specific topic were given, relevant scientific research literature and additional information were disseminated to the LOSG by staff and study group members via a "Research Summary Cover Sheet" template (

Appendix E). The cover sheets provided access to the full article and a summary of the article which included the author, key findings, publication date and the name of the person submitting the summary. Before moving on to a different topic, the LOSG transitioned to Phase 2, where they discussed the main issues surrounding the topic at hand and through consensus, agreed on the Key Findings, which were then archived for future use.

Once the group had agreed on the Key Findings they turned their attention to the last and probably most important task, Recommendations. The process for formulating recommendations was similar to that used for Key Findings in that the group reviewed relevant information (Key Findings) which led to open discussion and draft recommendations. Draft recommendations then were given to staff who organized them under one of the following major headings;

- General/Other Recommendations
- Transportation
- Odor & Air Quality
- Other Public Health
- Groundwater & Surface Water

Each major heading was further subdivided into;

- Community Planning, Study, Monitoring and Tracking
- Rules, Regulations, Policies, Permitting and Compliance
- Best Practices and Programming
- Other Education, Communications, etc.

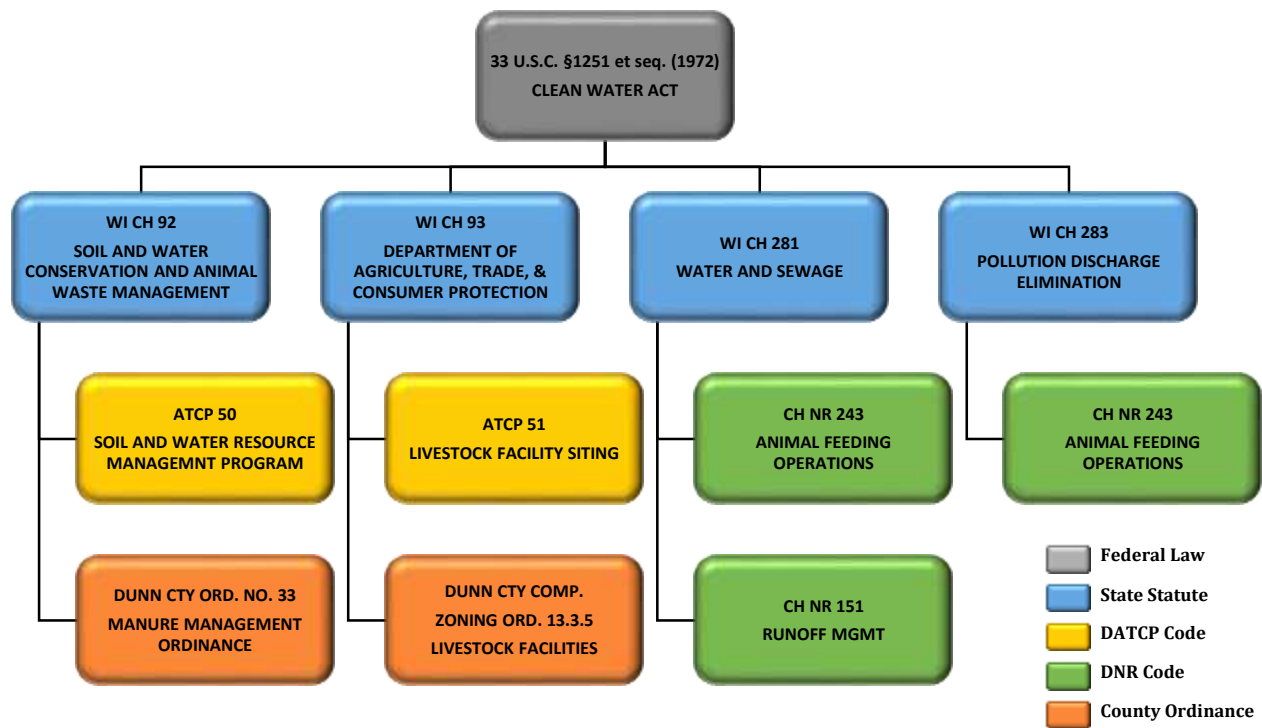
The draft recommendations were brought back to the group for additional discussion and editing until the group reached consensus on a given recommendation. While the processes for Key Findings and Recommendations were similar in nature it is worth noting that unlike Key Findings during Recommendations the group did not always reach unanimous consensus.

4. RELEVANT REGULATIONS

There are a number of Federal, State, and County regulations that apply to large scale livestock operation and CAFOs; some directly and others indirectly. The state agencies that play the largest role in livestock operations are the WDNR and DATCP. Figure 2 will help with understanding the connections between different regulating authorities. This section attempts to provide clarity to the state regulations and programs that affect the livestock operations.

The County and Towns regulatory authority allows local government to directly implement policies within their jurisdiction. However, state policies and regulations still provide an overarching role in how local government authoritative powers may be issued.

Figure 2: Diagram of State and Local Laws Regulating CAFOs



4.1 Clean Water Act 33 U.S.C. §1251

The U.S. Environmental Protection Agency established the Clean Water Act as the basic structure for regulating discharges of pollutants into the waters of the United States.

Under the Clean Water Act, Wisconsin regulates pollutant discharges from waste storage structures and manure applications for large farms such as CAFOs through the Wisconsin

Pollutant Discharge Elimination System (WPDES). The bulk of WPDES is administrated through Wisconsin Statutes Chapter 281 Water and Sewage and Chapter 283 Pollution Discharge and Elimination.

4.2 Wisconsin Statute § 92.15(3)(a): Exceeding Agricultural Performance Standards

WI Statute § 281.16 and WI Administrative Code Chapter NR 151 outline agricultural performance standards meant to protect water quality from non-point agricultural runoff. NRCS 590 Nutrient Management Practice Standards, included by reference, outlines specific restrictions, practices, or methods livestock operations must follow when applying fertilizer or manure.

WI Statute § 92.15(3)(a) allows a local government unit to enact more stringent regulations than are included in the 590 Practice Standard only if the local government unit gains approval from the WDNR or WI DATCP and demonstrates that such regulations are necessary to achieve the water quality standards outlined in WI Statute § 281.15.

4.3 ATCP 51: Livestock Facility Siting Regulations

A number of State regulations apply to livestock operations, most prominently and comprehensively are Wisconsin Administrative Code Chapter ATCP 51 and Chapter NR 243. ATCP 51 implements the Livestock Facility Siting Law (Section 93.90 of the Wisconsin Statutes) and sets statewide standards in five areas: setbacks from property lines, odor and air emissions, nutrient management, waste storage facilities, and runoff from livestock facilities. The standards set forth in the ATCP 51 only apply to livestock facilities if a County or Town in which the livestock facility is located has adopted the standards through local ordinance. In addition, the ATCP only applies to livestock facilities with new and/or expanding livestock operations with 500 or more animal units (AU).

As stated in ATCP 51, the Wisconsin Livestock Facility Siting Law (Siting Law) was developed to provide uniform standards intended to be “protective of public health or safety, practical and workable, cost-effective, objective, based on available scientific evidence that has been subject to peer review, designed to promote growth and viability of animal agriculture, and designed to balance the economic viability of farm operations with protecting natural resources and other community interests”. Local governments are not allowed to enact more stringent standards unless: 1) the proposed standards are based on reasonable and scientifically defensible findings-of-fact, and 2) the findings-of-fact show that the standards are needed to protect public health or safety.

In general, the Siting Law prohibits a local government unit from restricting the size of a livestock facility. However, a local government unit can create zoning districts or overlays to regulate the size of operations within specific districts as long as at least one district within the local government unit allows livestock operations of unlimited size.

4.4 NR 243: Confined Animal Feeding Operations

Livestock operations with 1000 or more animal units (CAFOs) are required to obtain a WPDES permit from the Wisconsin Department of Natural Resources (WDNR) as outlined in NR 243. Under WPDES, a CAFO shall have zero discharge of pollutants from livestock production facilities and shall develop and implement a nutrient management plan as outlined in the NRCS 590 Nutrient Management Planning Practice Standard. Livestock operations needing a WPDES permit must also meet manure storage capacity requirements and manure spreading restrictions.

The WPDES zero discharge requirement applies to the buildings and animal lots in the farmstead. It does not apply to non-point runoff from fields managed by the CAFO. The nutrient management rules are meant to address non-point runoff by limiting nutrient losses from fields. The nutrient management rules do not prohibit nutrient losses from fields.

4.5 Administrative Rule NR 151

Wisconsin adopted administrative rules in 2002 (NR151), with revisions effective in 2011 that set statewide performance standards and prohibitions for all Wisconsin farms. All farmers must comply with these standards and prohibitions. Cost-share funding may be available to assist with compliance. Some state and local programs may require compliance whether or not cost-share funds are available.

4.6 County Manure Management Ordinance

ATCP 51 standards and the WPDES permit requirements apply to large-scale livestock operations, i.e., >500 AU. Most counties in Wisconsin, including Dunn County, have also adopted a county manure management ordinance to regulate the storage and spreading of manure for livestock operations, including those under 500 AU. The ordinance requires anyone building a new manure storage facility or significantly altering an existing facility to obtain a manure storage permit from the county. To obtain the permit the operator must follow the NRCS 313 Waste Storage Facility Practice Standard, and develop a nutrient management plan that conforms to the current NRCS 590 Nutrient Management Standard. The ordinance requires operators to develop a construction plan for the storage facility that also includes clean water diversions and runoff control to prevent discharge of pollutants to surface and ground water. Dunn County adopted its Manure Management Ordinance in April 2000.

4.7 Dunn County Livestock Facilities Siting Ordinance

In October 2013, Dunn County adopted the Siting Law Standards (Section 13.3.5 Livestock Facilities Siting) as part of the Dunn County Comprehensive Zoning Ordinance.

Livestock facility siting standards apply to new and/or expanded livestock facilities in the Intensive Agricultural (IA) District that will have 500 or more animal units. The standards address setbacks and conditions that require a Special Exception Permit. A Special Exception permit is required for the expansion of a pre-existing or previously approved livestock facility if the number of animal units will exceed the 1) applicant’s size threshold for a permit, or 2) maximum number of animal units previously approved, or 3) if there is an increase of animal units by 20% if no maximum number of animal units was previously approved.

Currently 16 of the 22 Towns in Dunn County have adopted the Comprehensive Zoning Ordinance, which allows county regulatory authority in those Towns (Figure 3). Zoning standards are administered by the Planning & Land Use Control Division. The remaining 6 Towns are un-zoned as they have not adopted the Dunn County Comprehensive Zoning Ordinance. In these Towns the County has no livestock siting authority unless a structure is within jurisdictional distances of navigable waterways as defined in the Dunn County Shoreland Zoning Ordinance.

Figure 3: Dunn County Zoned and Unzoned Towns

Zoned (16 Towns)		Unzoned (6 Towns)	
Colfax	Red Cedar	Eau Galle	Rock Creek
Dunn	Sheridan	Elk Mound	Sand Creek
Grant	Sherman	New Haven	Spring Brook
Hay River	Stanton		
Lucas	Tainter		
Menomonie	Tiffany		
Otter Creek	Weston		
Peru	Wilson		

5. KEY FINDINGS

During the course of the LOSG meetings, key findings were based on documented facts. These key findings were important toward understanding the current and potential livestock operation issues in Dunn County relevant to the mandated topics outlined by the moratorium ordinance. Key findings also identified gaps in understanding that would need investigation beyond the scope of the LOSG's ability or time frame. Key findings included opportunities that Dunn County could potentially pursue toward achieving the stated objectives. The LOSG looked at livestock operations of various sizes (not just CAFOs) and types (not just dairy).

Key findings can include:

- Presentations
- Research and journal articles
- Regulations and policies
- Data from the County, State, etc.
- Cooperation and partnerships
- Resources and programs
- Relationships to other levels of government

Key findings were agreed to by consensus of the LOSG as a statement of fact that can be substantiated. The group made an effort to omit general statements and opinions. The key findings were compiled and used to formulate recommendations.

GENERAL

1. Agriculture is important to the economy and rural fabric of Dunn County. It is Dunn County's responsibility to protect and balance the agricultural industry with the health, safety, and general welfare of the entire Dunn County community.
2. The sizes and types of farms and livestock operations in Dunn County are changing and the number of CAFOs in Wisconsin is increasing (WCWRPC Dunn Co Agricultural data).
 - a. From 1997 to 2012 in Dunn County (U.S. Census of Agriculture):
 - i. The number of medium size farms between 180 acres and 999 acres decreased by 218 farms (or -34.3%), while the number of large farms over 1,000 acres increased by 31 (or +77.5%). The number of small farms with less than 180 acres increased by 137 (or +146%).
 - ii. All farms with cattle and calves (dairy, beef or other cattle) decreased from 817 farms in 1997 to 660 farms in 2012. The total number of cattle decreased by 6,221 head. Average cattle herd size increased from 84.7 to 95.5 head per farm.

- iii. The number of farms with 500 or more head of cattle grew from 7 to 27 farms. The total cattle housed on these larger farms increased from 4,493 head in 1997 to 23,466 head in 2012
 - iv. The number of farms with 50 to 499 head of cattle decreased from 465 farms to 233 farms. The total cattle herd size on these medium-sized farms decreased from 56,507 head to 32,492.
 - v. The number of beef cows changed little from 5,754 in 1997 to 5,776 in 2012, though the number of farms with beef cows increased from 314 to 356.
 - vi. The number of milk cows decreased from 26,511 to 21,222, with a dramatic decrease in the number of farms with milk cows from 478 to 199 farms.
 - vii. Farms with poultry increased from 74 to 152. Nearly 87% of farms with poultry in 2012 housed layers, for a total of 4,328 layers.
 - viii. Specialty crop and livestock enterprises increased during the period. For example, the number of milk goat farms increased from 3 to 15.
 - ix. Milk cow numbers decreases from 29,000 to 21,500 along with a slight decrease in total milk production from 469,800,000 to 417,100,000 lbs. However, milk per cow increased from 16,200 to 19,400 lbs. per cow (WI Agricultural Statistics bulletin).
- b. number of CAFOs with WPDES permits in Wisconsin have increased from 87 in 2000 to over 300 in 2017.
3. Dunn county farmers have been instrumental in conservation initiatives and adopting innovative conservation practices in both livestock and crop production. Dunn County farmers have:
- i. Organized one of the state’s first farmer-led watershed projects,
 - ii. Established a demonstration farm to evaluate conservation practices,
 - iii. Have greatly increased cover crop use.
 - iv. Demonstrated growing interest in utilizing managed grazing systems in dairy and livestock production. These systems are recognized to provide a conservation-focused path for supporting an efficient and profitable dairy and livestock sector. (Owens, Klingberg)

4. Ambitious goals for reducing environmental impacts from farming have been included in the Red Cedar Basin TMDL Implementation Plan.
5. CAFOs, given their larger size, pose a unique set of risks and greater potential for negative impacts if something goes wrong due to the large concentration of manure. However, larger farms often have more resources to implement management practices that mitigate these risks.
6. Depending on the situation the CAFO permitting and monitoring process can involve any of the following: Wisconsin DNR (WDNR), Wisconsin DATCP, Dunn County. See Figure 2.
 - a. WDNR is required to inspect a CAFO a minimum of twice over a five-year permit cycle. A Summer 2016 audit of WPDES permit management and enforcement was highly critical of WDNR management of the WPDES program. It is important to continue monitoring whether recent WDNR staff reorganization for WPDES permitting will sufficiently address the audit concerns. (WDNR; Legislative Audit Bureau audit report)
 - b. CAFOs self-report to WDNR for WPDES permitting. Soil sampling is required every three years and WPDES permits must be renewed every five years.
7. Not all potential sites in Dunn County are appropriate for a CAFO due to environmental risk factors, limitations of local infrastructure, and/or potential land use conflicts. Risk factors and considerations identified by LOSG that may need to be addressed during planning and permitting decisions, include, but are not limited to:
 - a. local soil, geology, depth to groundwater, and groundwater contamination susceptibility;
 - b. proximity to wells and sources of drinking water;
 - c. proximity to surface waters, shorelands, wetlands, outstanding natural resources, and environmentally sensitive areas;
 - d. availability of appropriate land for acceptable nutrient management practices, including manure storage and landspreading;
 - e. the design, capacity, and safe use of roads and highways;
 - f. proximity to existing or planned residential or urban transitional areas; and,
 - g. the potential to mitigate or prevent possible land use conflicts through comprehensive planning, zoning, setbacks, or voluntary management practices.

8. Non-CAFOs are regulated differently than CAFOs.
9. In terms of reducing water quality risks from manure, management practices (e.g., facility design & maintenance, the manner, timing, & location of landspreading) are frequently more important than the size of the livestock operation. A smaller operation that is poorly managed can have greater negative impacts than a well-operated CAFO.
10. Counties cannot adopt livestock siting standards that exceed state water quality standards without WDNR or DATCP approval. (DATCP Options)
11. State permitting is “one size fits all.” State policies do not account for local variations in soil conditions, geology, watershed characteristics, etc. Regulatory setbacks from wells are largely arbitrary in that they do not consider specific site conditions. (Masarik; *Moving Forward*)
12. Other Wisconsin counties (e.g., Bayfield, Kewaunee) have adopted livestock operations (not siting) and groundwater protection ordinances under State public health and “police power” authority.
13. County zoning ordinances can be used to regulate the location for new livestock facilities, although there are limitations for such an approach. As part of local facility siting review, some counties have adopted more stringent standards based on reasonable, scientifically defensible findings-of-fact due to a public health or safety risk. (Straight; Bonness; Fischback)
 - a. A Livestock Siting Ordinance adopted under County zoning is enforced only in zoned Towns.
 - b. a Livestock Licensing Ordinance would be enforced County-wide. (Clayton)
14. Dunn County Land Use Control and Land and Water Conservation Departments do not have citation authority (authority to issue citation when enforcing County ordinances/policies). (Prestebak)
 - a. Dunn County could adopt citation authority.

GROUNDWATER & SURFACE WATER

Dunn County is within the Lower Chippewa River Basin and contains part of eight major watersheds. Although each watershed is unique, the majority of the surface water concerns are consistent for each watershed. Sedimentation and phosphorus loading are the two major concerns for our lakes and flowages. Bank erosion, increased water temperature, and loss of natural habitat are major concerns for our rivers and streams. Groundwater is plentiful and in Dunn County. There is one aquifer in sandstone bedrock which underlays a wide variety of soils. Many of the county’s soils have high infiltration rates making our groundwater susceptible to contamination from surface sources.

SURFACE WATER

1. Soil erosion, nutrient runoff, peak flows, and groundwater deliver phosphorus to downstream waters. Excess phosphorus causes algae growth. Overgrowth of algae depletes oxygen concentration causing fish kills, can make water dangerous to humans and animals to swim in and drink (due to toxins produced by certain algae), and impacts property values and the local economy. (*Moving Forward; Zerr*)
 - a. Barnyards, feedlots, and dry lots with unmitigated runoff to surface waters pose a threat to water quality and public health. (Bayfield County)
 - b. The State has a Stormwater Discharge Permit for construction sites over 1 acre in size.
 - c. Dunn County does not have a Stormwater/Erosion Control Ordinance. (Prestebak).
 - d. Peak flows containing sediments and dissolved phosphorus are the primary sources of phosphorus and algal blooms to surface water. (Zerr)
 - e. Groundwater can be a secondary source of phosphorus contribution to surface water. (Zerr)
 - f. Algal bloom toxins can adversely affect human and animal health through exposure to contaminated recreational water. (Scientific World Journal)
 - g. Certain agricultural practices such as cover crops, no-till, and nutrient management planning (NMP) can have a positive effect on soil health and surface water quality. (Masarik)

2. The number of impaired waters (i.e., that do not meet Clean Water Act water quality standards) in Dunn County has been increasing. In 2011 portions of eight waterbodies were listed as “Impaired” in Dunn County. By 2016 the list has grown to portions of 20 waterbodies. The causes of impairment include sediment, total phosphorus, polychlorinated biphenyls (PCBs), and total suspended solids. (Zerr, Land and Water Conservation Division)
 - a. Phosphorus and sedimentation from agricultural runoff contribute to impaired surface waters in Dunn County. (Zerr)

- b. There is evidence that water quality is cleaner at headwaters of streams. (Prestebak)
- c. Impairment of the Chippewa River is due to PCBs. (Zerr)
- 3. Nitrate levels in the Red Cedar River have been increasing. (Zerr)
 - a. Increasing nitrate levels in surface waters may be primarily due to increased row crops production and human, changes to the landscape along with livestock or manure management practices. (Zerr)
 - b. Best management practices (e.g., such as split nitrogen fertilizer application) are potentially reducing nutrient losses in runoff. (Masarik; Zerr)

GROUNDWATER

- 1. Nitrates and bacteria are two of the top groundwater contamination concerns with regard to agricultural practices. Statewide 9% of wells tested exceeded the 10 ppm Nitrate-N safe drinking water standard. Nitrate levels in many Dunn County wells have been increasing. Approximately half of the towns tested in the county exceed the 9% state average (Appendix J). (Masarik; Dunn County Public Health Department)
 - a. Important levels for understanding the concentration of nitrates in groundwater are:
 - Greater than 10 PPM: Nitrate Levels exceed state and federal limits for drinking water.
 - 1 to 10 PPM: Nitrate levels in groundwater reflect evidence of human induced land use impacts. (Masarik)
 - Less than 1 PPM: The natural or background level of nitrates in Wisconsin groundwater. (Masarik)
 - b. High nitrates in drinking water can result in methemoglobinemia (“blue baby syndrome”) and a potential higher risk of carcinogenicity (agent that can produce cancer) from nitrites in combination with amines and amides. (Division of Toxicology and Human Health Sciences)
 - c. Bacteria from land spreading of manure, animal or human waste generally do not pose a threat to groundwater unless there is:
 - a. an improperly abandoned well (creating a direct conduit to groundwater),
 - b. geologic karst formations, and/or
 - c. highly-permeable soils that percolate rapidly.
 - However, due to well depth and proper construction, it is unlikely that bacteria from the surface will contaminate well water. Bacteria

can affect wells if there is an inadequate sanitary seal on the well, a well is not properly constructed, or the well is not far enough from contamination sources.

- In Dunn County, there have been no documented cases of properly constructed and maintained wells being contaminated by bacteria due to land spreading of manure or human waste.

(Koch; Bergeson)

- d. Rising nitrate levels in groundwater are likely not due primarily to livestock facilities or the land application of manure. Increases in row crops (especially corn and potatoes), other types of fertilizers, and other land use changes are major contributing factors, though there is insufficient data to estimate the percentage differences between sources. (Masarik)
 - e. Even with existing rules, nutrient management, and best practices, contamination of groundwater can still occur. (Masarik; Bonness)
 - f. Old wells that are not properly abandoned or those with insufficient casing can be contributors to groundwater pollution.
 - g. There are gaps in groundwater monitoring, testing, and tracking.
 - h. Groundwater phosphorus is often overlooked and less data are available. (Masarik)
2. The leaching of nitrates from fertilizer and manure in areas of sandy soils in Dunn County pose an increased risk of groundwater contamination.
- a. Sandy soils have high infiltration rates. (Masarik)
 - b. Well data reports for Dunn County show a correlation between high nitrates and sandy soils.
 - c. Row Crops (corn and potatoes) have shown to contribute to nitrate leaching more so than forages. (Masarik)
 - d. Best management practices are improving on applications of fertilizers such as split application and season long applications. (Masarik; Zerr)
 - e. Selecting the appropriate nitrogen rate is the primary management consideration on medium- and fine-textured soils. However, on sandy soils, other decisions such as nitrogen source, and method and time of application are of equal concern to ensure that nitrogen is not lost by nitrate leaching during the growing season. Even under ideal conditions, most crops recover no more than 60% of the applied nitrogen. (Wolkowski et al.)

3. Water related data is maintained by a variety of Departments and stakeholders.
 - a. Some of the well data are old/outdated (Bergeson)
 - b. Dunn County is pursuing increased testing and correlating data.
 - c. Dunn County has capabilities to track groundwater data. (Bergeson)
4. Well test results from private testing labs are not always shared with the Health Department or UW-Stevens Point. (Bergeson)
5. Groundwater baseline testing is important to the management of groundwater quality and quantity. (Bonness)
6. Nitrate may be an indicator of other contamination in groundwater (Masarik)
7. High capacity wells and dams have the potential to affect the flow of groundwater and impact nearby streams and wells.
 - a. The number of high capacity wells in Dunn County has increased by over 300 (+61%) since 2000.
 - b. There are approximately 300 high capacity wells in Dunn County that are agriculture related, primarily for irrigation in areas of sandier soils. Of these, 22 high capacity wells are used for dairy farming.

MANURE & NUTRIENT MANAGEMENT

1. CAFOs are considered point sources and no discharges including leachate are allowed from the livestock facility. (Prestebak)
 - a. Leachate collection and treatment systems for Non-CAFOs can be required if cost sharing is offered. (Prestebak)
 - b. Significant discharges of leachate to surface water are not allowed under State Livestock Siting rules. (Prestebak)
2. Handling of manure (storage and spreading) is a potential risk to water quality. (Masarik)
 - a. NRCS 313 and 634 contain standards for manure storage and waste transfer.
 - b. Winter spreading of manure and nutrients pose a higher risk of runoff to surface water. Runoff during the spring typically has a higher nutrient load.
 - c. Farmers can check the Runoff Risk Advisory Forecast at: <http://www.manureadvisorysystem.wi.gov/app/runoffrisk> before spreading.
 - d. All farms are not required to have manure storage.

3. To obtain a WPDES permit for a manure storage structure, CAFOs are required to meet specific requirements such as: (Prestebak; Nicol)
 - a. Manure pits for CAFO's are designed for a minimum of 180-day storage capacity
 - b. Manure pits are designed to hold a 25-year 24-hour storm event, and have 1 foot of additional storage (freeboard). (Prestebak)
 - c. Historically storm events greater than 25-year, 24 hours have occurred in Dunn County. Major storm events are projected by climatologists to continue and perhaps increase in the future. (Notaro)
 - d. All manure spills and overflowing pits must be reported to the WDNR by the owner at: <http://dnr.wi.gov/topic/agbusiness/manurespills.html> .
 - e. If a storm event exceeds the holding capacity of a manure storage pit, excess stormwater is allowed to be discharged over land. (Nicol; NR 243.13(2)(a)(1))
4. The creation, implementation, and compliance with Nutrient Management Plans (NMPs) are very important to protecting surface water and groundwater quality. (Prestebak)
 - a. 11% of Dunn County's cropland acres have NMP. (DATCP; Wisconsin Nutrient Management Update, 11/16)
 - b. NMP Participation is much higher in Farmland Preservation Program districts. (Prestebak)
 - c. Cropland that receives commercial fertilizer, manure, or other nutrients is required by State Statutes NR 151 to have a NMP, regardless of the type of farm operation. (NR 151)
 - d. While all farmers that apply nutrients must have a NMP by State law, counties cannot require nutrient management planning (or prescribe specific, related practices) unless the county provides cost-sharing or if the operation: (i) is causing a significant discharge, (ii) is regulated by a local manure storage ordinance, a livestock siting ordinance, or by a WPDES permit, (iii) accepting manure storage cost share funds, or (iv) participating in a farmland preservation program. (DATCP; Wisconsin Nutrient Management Update, 11/16)
 - e. The NMP standards do not differentiate between nutrients in manure vs commercial fertilizers. (NRCS 590)

OTHER WATER-RELATED

5. More research is needed to accurately estimate pollutant loading into groundwater and surface water by source including different types of agricultural operations in Dunn County. (Zerr)
6. Soil health practices are imperative to protecting both surface and groundwater. (Zerr; NRCS)
7. Farmer education and farmer-led initiatives are critical to improving Dunn County's water, soil health and conservation efforts. (Styer; WDNR; Zerr)
8. "There is a dynamic relationship between groundwater and surface water." (Masarik)

TRANSPORTATION

1. Heavy trucks associated with livestock operations for the movement of dairy products, manure, crops, livestock, and other goods and services can damage roadways and shoulders and increase traffic safety risks. (Rintala)
 - a. County and Town roads are not constructed to the same standards.
 - b. Implements of Husbandry (IoH) laws allow the permitting of heavy farm equipment/vehicles on roads in certain circumstances. (Skjolaas et al.; Khazanovich)
 - c. Modern agricultural farming equipment/vehicles and large farm operation can decrease road longevity by more than 50% (*Develop a Long Term 7*)
2. Dunn County Highway Department conducts Traffic Impact Analysis (TIA) for non-metallic mines to determine potential impacts from proposed traffic generators, but a similar procedure for CAFOs and large livestock operations does not exist. (Rintala)
 - a. TIA analysis is usually limited to County Roads (Rintala)
 - b. Agreements/contracts usually are between the traffic generator and the jurisdiction responsible for the road. (Rintala)
 - c. TIA can be conducted at local and county levels.
 - d. Construction and maintenance cost of public roadways are out pacing funding.
 - e. Ag. vehicles are exempt from the fuel tax
3. Weight & speed restrictions can be placed on Town and County roads year round. (Rintala,)
 - a. A written policy does not exist regarding exceptions to the road ban at the Town and County level. (Rintala,)
4. Draglines can be an efficient method to spread liquid manure resulting in fewer heavy equipment trips on roadways. (Pittman)
 - a. County/Town policies do not exist to allow draglines to be in the County ROW or to cross under County roads through a culvert. (Rintala)
 - b. Currently there are no data on manure spill risk between a manure dragline vs hauling.
 - c. No policy is in place for draglines near or crossing navigable waterways at this time.
5. Manure is allowed to be transported across jurisdictional lines.

ODOR & AIR QUALITY

1. Concentrated livestock operations can emit hazardous chemicals and particulates including ammonia, hydrogen sulfide, and dust in quantities larger than smaller livestock operations.
 - a. Increased exposure to air pollution from livestock operations can cause or exacerbate respiratory conditions (asthma, eye irritation, difficulty breathing, wheezing, sore throat, chest tightness, nausea, and bronchitis and allergic reactions). (Lawrence et al.)
 - b. Of the 25 known toxic air pollutants, two are likely emitted from agricultural waste above levels of concern. These pollutants are ammonia (NH₃) and hydrogen sulfide (H₂S). The U.S. EPA has determined that simultaneous exposure of the two substances (both pulmonary irritants) results in a stronger effect. (*Beneficial Management Practices*; Hodne et al.)
 - c. Even when using beneficial management systems and mitigation techniques, some airborne contaminants may be generated. Most concerns are associated with chronic or long-term exposure. However, some human and animal health concerns or safety hazards can result from acute or short-term exposures. (*Beneficial Management Practices*)
 - d. There is an extensive literature documenting acute and chronic respiratory diseases and dysfunction among workers, especially swine and poultry workers, from exposures to complex mixtures of particulates, gases and vapors within CAFO units. (Hodne et al.)
 - e. WPDES permit (CAFO) does not address odor. (WDNR)
2. CAFOs (Livestock operations) can negatively affect air quality through emissions from land spreading, storage, and drift from manure applications.
 - a. Odor Management scoring is required as part of the Wisconsin Livestock Siting Standards for farms with 500 or more Animal Units (AU). However, there are several exceptions to this. ATCP 51 provides an exemption to the odor standards for: (i) an expansion of a facility with fewer than 1,000 AU total, (ii) a new facility with fewer than 500 AU total, and (iii) all livestock structures associated with a facility located at least 2,500 feet from the nearest neighbor. In Dunn County, these siting standards only apply to those sixteen towns participating in County Zoning; no Dunn County towns have adopted town-level livestock siting standards.
 - b. Under the Wisconsin Livestock Siting Standards, the “odor score” is calculated primarily on: (i) predicted odor from livestock structures, (ii) separation distance from those structures to the nearest affected neighbor, and (iii) management practices used to control odor. Once a livestock operation receives their siting permit and odor score, the odor score is not recalculated if new housing or other affected neighbors move to the area.

The odor score would be recalculated if a new facility siting permit is required due to a proposed expansion in the number of animal units beyond the original permit, though this recalculated odor score would be based upon the nearest affected neighbors in the original siting permit and not consider any subsequent housing or other nearby development in the interim. A significant change in management practices that affect odor may also necessitate a recalculated odor score and a permit modification or new permit. (Clayton)

3. Monitoring air quality and odor is difficult and costly. (Hodne et al.)
 - a. Bayfield County limited their study recommendations regarding odor to best management practices and education; they decided to wait for Federal and State standards instead of regulating locally.
 - b. There is limited research about how odor and air quality overlap and impact those who live near CAFOs.
4. Different animal type-CAFOs present different air and odor quality challenges
 - a. Different production methods, animal types, and manure management systems have the potential to create different types and quantities of air emissions. Similarly, different management practices may be required for different types of livestock species. (*Beneficial Management Practices*)
5. There are best management practices and alternative strategies that can mitigate air and odor emissions.
 - a. In 2010, the WDNR convened the Agricultural Waste Air Emissions Advisory Group to develop BMPs for the reduction of hazardous air pollutants (primarily ammonia and hydrogen sulfide) from livestock operations. (*Beneficial Management Practices*)
 - b. In general, practices that reduce odor tend to reduce ammonia and/or hydrogen sulfide, but not always. (*Beneficial Management Practices*)
 - c. While certain practices may be effective for controlling emissions from one part of a farm, it is important to understand how emissions are controlled at other parts (*Beneficial Management Practices*)

OTHER PUBLIC HEALTH

Diseases, pathogens, and pollutants that are detrimental to public health can be transmitted or spread in a variety of ways. The Other Public Health Findings in this section focus on health findings and potential impacts that are not solely water- or air-related. Public health findings specific to water (e.g., nitrates in drinking water, nutrient runoff) are largely addressed in the Groundwater & Surface Water Findings. Public health findings specific to air quality are largely addressed in the Odor & Air Quality Findings.

1. Disease organisms in manure pose a threat to public health. (Thiboldeaux)
 - a. Risk reduction depends on BMPs at each point of collection, processing/treatment, storage, transfer, and land application. (Genskow)
 - b. In general, manure is not routinely tested for pathogens. (Jensen)
 - c. The makeup and biological activity in stored manure changes when it is applied to the land. (Borchardt; Genskow)
 - d. Types of pathogens and their concentrations in field runoff are highly variable. Runoff may contain pathogens many months after manure application. The problem is if the manure has high pathogen concentration to begin with, even despite a 99.9% reduction, the concentration in runoff can remain above the dose that will cause infections. (Borchardt)
 - e. Livestock manure generally contains three types of zoonotic disease organisms: bacteria (campylobacter, salmonella, E. coli), protozoa (cryptosporidium, giardia), and viruses (rotavirus, enterovirus, hepatitis E). (*Moving Forward*)
 - f. There are multiple ways for antimicrobial resistant bacteria (ARB) to be spread in the community in poultry feeding operations. (Mceachran et al.)
 - g. Manure applications and irrigation present different risks. A 500-foot setback from a manure irrigation system may present a median risk of illness downwind from 1-in-100 to 1-in-100,000 for a single exposure. Risk can increase with multiple exposures. (Borchardt)
 - h. Pathogen concentrations in air downwind from manure irrigation depend primarily on wind speed, initial pathogen concentration in manure, and distance. Results show microbial concentrations decline with distance but still detectable at 700 feet downwind depending on wind velocity and microbe concentration in manure. (Borchardt)
 - i. Research with mesophilic anaerobic digesters show reduced pathogen concentration, although pathogen removal was highly variable. (Borchardt)

j. The LOSG did not have sufficient time to study manure digesters.

2. FDA veterinary feed directive changes effective January 1, 2017.

Per WI DATCP "Antibiotics in Feed" brochure, "To ensure a safe food supply, the Food and Drug Administration (FDA) oversees the use of animal medications. Some medications have been approved for use without a veterinarian's permission, while others require permission. Recently, the FDA changed how some antibiotic medications, which are important to human medicine, are used for animal feed. After January 1, 2017, these medications will require a Veterinary Feed Directive (VFD) order to be used in medicated feed. Going forward, the antibiotics used in animals and humans will only be allowed to control or prevent disease, not for production uses, such as increased rate of gain."

3. The LOSG did not have the time to study public health impacts of estrogenic compounds, antibiotics, and other components of manure migrating to groundwater and surface waters.

4. The proper management and disposal of carcasses is important to protecting public health. (DATCP; WDNR)

6. RECOMMENDATIONS

A recommendation is a statement that the Dunn County Government can potentially act on or use to guide decision-making to address issues identified from the key findings.

Recommendations can be acted on, but cannot become policies without having gone through the appropriate procedures. Some recommendations are policies that require action by County Board of Supervisors and further research, while others are meant to encourage or educate the public or relevant stakeholders.

Recommendations can include:

- Planning and studies
- Monitoring and testing
- Regulations and policies
- Cooperation and partnerships
- Resources and programs
- Education, outreach, and support
- Relationships to other levels of government
- Continue the status quo (no change)

GENERAL
<p>The Dunn County Livestock Operations Study Group advises that the Dunn County Board consider the following general recommendations for action.</p> <p>Due to time constraints, LOSG was unable to explore other topics of interest such as: economics, tax implications, animal-to-animal diseases, and climate change.</p>
Community Planning, Study, Monitoring, and Tracking
<ol style="list-style-type: none"> 1. Inventory and map environmentally sensitive areas (ESAs) in Dunn County. Incorporate ESAs and groundwater recharge/susceptibility area maps and data into the Dunn County Comprehensive Land Use Plan, the Dunn County Land & Water Resource Management Plan, and other County policies and ordinances. 2. Develop an evaluation plan for the continued monitoring of the recommendations implemented as a result of this report to evaluate their overall effectiveness, along with any unintended consequences. Identify the party(s) responsible for monitoring as part of the evaluation plan.
Rules, Regulations, Policies, Permitting, and Compliance
<ol style="list-style-type: none"> 1. Ensure that state and local regulations regarding livestock operations are enforced in a fair and timely manner. 2. Provide citation authority to County Land & Water Conservation and Planning & Zoning staff regarding compliance/enforcement of livestock operation policies,

manure storage requirements, nutrient management plans and spreading of manure and nutrients in Dunn County.

3. *Adopt a Dunn County Livestock Operations Ordinance that:
 - Protects farmers who are engaged in good practices to the extent required by law.
 - Focuses on protecting water quality and quantity, public health, and safety while preventing pollution, and nuisance concerns from neighbors.
 - Is developed with input from and in consultation with a study group of farmers and community members.
 - Considers geology, susceptibility for groundwater/surface water contamination, and general conditions for safe and sustainable operations in the interest of all Dunn County citizens.
 - Provide coverage to all unincorporated jurisdictions.
 - Recognize there may be different standards depending on operation size, livestock type, and different operational practices.
 - The ordinance should contain an appeals process.
4. *Adopt a Dunn County Facility Siting Licensing Ordinance
 - Applicable countywide
 - Monitoring

* Livestock Siting, Licensing, and Operations

Local governments have three choices if they wish to regulate new and/or expanding livestock operations:

1. **Control land use through zoning districts:** Local governments may use zoning ordinances to create districts that prohibit livestock facilities as a land use. However, they must follow special rules if they exclude livestock facilities in an agricultural zoning district.
2. **Adopt ordinances that require permits for new and/or expanded livestock facilities:** Local governments may adopt licensing or zoning ordinances that require individual permits for new and/or expanding livestock facilities that exceed 500 animal units. The livestock facility siting law does not require that local governments regulate siting of individual livestock facilities. This is a local decision. If local governments adopt ordinances that require a siting permit, they must follow state standards and procedures when they issue permits for livestock facilities.

3. **Adopt a livestock operations ordinance:** Local governments may adopt a livestock operations ordinance to effectively regulate livestock operations. The ordinance would be intended to protect public health, safety, and general welfare, to prevent pollution and the creation of private nuisances and public nuisances, and to preserve the quality of life, and the environment.

The LOSG used the chart (Figure 4) below to understand the differences between the two choices: a Livestock Siting through zoning and a Livestock Siting Licensing Ordinance. Included in the chart was also a Livestock Operations Ordinance that could supplement the siting regulations with regulations that cannot be regulated by siting alone.

Figure 4: Livestock Ordinance Comparisons Chart

LIVESTOCK SITING AND OPERATIONS COMPARISONS			
Issues	Livestock Siting (Zoning)	Livestock Siting Licensing Ordinance	Livestock Operations Ordinance **
<i>Countywide</i>	No	Yes	Yes
<i>Odor Score</i>	Yes	Yes	No
<i>NMP</i>	Yes	Yes	No
<i>Manure Storage</i>	Yes	Yes	No
<i>Run off</i>	Yes	Yes	No
<i>Monitoring</i>	Yes	Yes	Optional
<i>Fees</i>	\$1,000 max	\$1,000 max	No Maximum
<i>Scale</i>	500+ Animal Units & CAFOs	500+ Animal Units & CAFOs	Optional - May affect farm sizes less than 500 AU
<i>Financial Assurance</i>	No	No	Optional
<i>Conditions</i>	Yes	Yes	Optional
<i>Impaired Waters</i>	No	No	Optional

** In addition to the options listed in the table above, a Livestock Operations Ordinance may include other options such as: Transportation Impact Analysis (TIA), groundwater, surface water, and draglines, etc.

The LOSG does not want regulations to undervalue the overall intent of agriculture. They believe there is a need for a basic understanding between farm and non-farm players to move policy forward.

1. The LOSG committee voted for the County to consider adopting a Livestock Siting Licensing Ordinance. (The group did not have a unanimous consensus.)
2. The LOSG committee voted for the County to consider adopting a Livestock Operations Ordinance to address gaps in the County Siting Regulations. (The group did not have a unanimous consensus.)

The LOSG committee's decision to adopt a Livestock Siting Licensing Ordinance and Livestock Operations Ordinance was not a unanimous decision. With respect to adopting a Livestock Operations Ordinance the following benefits and concerns were identified:

Benefits:

- Provide coverage to all unincorporated jurisdictions.
- Conditions can be added to CAFO applicants.
- Financial assurance to cover cost for cleanups and closeouts.
- Can apply to livestock operations with less than 500 AU.
- Fees can reflect the actual cost of the review process.

Concerns:

- Monitoring beyond the Nutrient Management Plan standards.
- Potential to supersede local authority.
- Cost of Traffic Impact Analysis.
- Financial assurance.
- Incurred fees on livestock operations.
- The general perception of the message the county is sending regarding agriculture.
- Unforeseen/unintended consequences.

Best Practices and Programming
<p>1. Because of the importance of agriculture to the economy and fabric of Dunn County, rely support partnerships to build relationships with organizations and agencies, and then the agriculture economy and protect the environment.</p>
Other Education, Communications, etc.
<ol style="list-style-type: none">1. Create a supportive and trustful climate for livestock operations to succeed in Dunn County while ensuring ground and surface water quality.2. Educate the public and local elected officials on the importance of agriculture to the developing resources such as: handouts, interactive websites, demonstration plots and on-3. Develop an education plan for continued public education regarding livestock operation. Such educational efforts should include:<ul style="list-style-type: none">• Distribution of this report to farmers and elected officials.• Promoting civic and good neighbor responsibilities throughout the entire community.• Educate the public on the right-to-farm law.• The County Board may engage State Legislative representatives on related implications or to clarify the right to farm law.• Other educational and outreach efforts as recommended in this report.4. Actively engage State Legislative representatives to assure that County governments have adequate authority to manage the impacts of livestock operations.5. Create a Dunn County Livestock Operations Partnership to study new policies and agriculture developments, assist producers, and educate all stakeholders on best management practices.

TRANSPORTATION
The Dunn County Livestock Operations Study Group advises that the Dunn County Board consider the following transportation recommendations for action.
Community Planning, Study, Monitoring, and Tracking
<ol style="list-style-type: none"> 1. Dunn County should investigate the rules and any regulatory gaps related to draglines/hoselines crossing surface waters and waterways. As needed, encourage State agencies and elected State representatives to develop policies related to the use of draglines/hoselines across surface waters and waterways.
Rules, Regulations, Policies, Permitting, and Compliance
<ol style="list-style-type: none"> 1. Dunn County should develop and adopt a transportation impact analysis (TIA) policy where a significant increase in traffic is anticipated. Costs for the completion of a TIA should be paid by the applicant based on guidelines established by the Highways Department. 2. Develop a specific, written County policy on where and in what manner hoselines for manure transport can be located in county rights of way and culverts. Encourage draglines/hoselines for transport and manure injection in places where there is minimal risk of spillage in surface water. When feasible, Dunn County should give preference to the use of draglines/hoselines over the hauling of manure via roadways. 3. Dunn County Emergency Management and the County Highway Department, in coordination with livestock facilities in the County, should investigate the need to develop a policy to mitigate the impacts of agriculture related spills.
Best Practices and Programming
N/A
Other Education, Communications, etc.
<ol style="list-style-type: none"> 1. Create a pro-active communication system that reaches out to the public, farm operators and local officials to inform stakeholders on policies, circumstances, and conditions of roadways. 2. As opportunities allow, involve towns and consider town roads as part of the TIA process and the implementation of other transportation-related policies, such as hoselines/draglines.

ODOR & AIR QUALITY
Air quality from all livestock operations must be maintained at a safe level to ensure the health of on-site workers and citizens of Dunn County. The Dunn County Livestock Operations Study Group advises that the Dunn County Board consider the following odor and air quality recommendations for action
Community Planning, Study, Monitoring, and Tracking
N/A
Rules, Regulations, Policies, Permitting, and Compliance
N/A
Best Practices and Programming
<ol style="list-style-type: none"> 1. Convene a study group of farmers from the dairy, poultry and swine industries, citizens (preferably those living close to each farm type), and public health staff to consider the Best Management Practices (BMPs) for odor mitigation recommended by the 2010 Wisconsin Agricultural Waste Air Emissions Advisory Group. The group will make specific recommendations to Dunn County on ways to engage and connect with the agricultural community and their neighbors to encourage best practices and good neighbor practices
Other Education, Communications, etc.
<ol style="list-style-type: none"> 1. Encourage State agencies and elected State representatives to establish measurable standards and monitoring systems that address the air quality and odor key findings in this report.

OTHER PUBLIC HEALTH
The Dunn County Livestock Operations Study Group advises that the Dunn County Board consider the following additional public health recommendations for action.
Community Planning, Study, Monitoring, and Tracking
N/A
Rules, Regulations, Policies, Permitting, and Compliance
<ol style="list-style-type: none"> 1. Develop and adopt manure irrigation standards based on the recommendations of the Wisconsin Manure Irrigation Study group. (The LOSG had limited time to study this.)
Best Practices and Programming
<ol style="list-style-type: none"> 1. Reduce pathogens and pollutants by promoting BMPs for herd health, for manure storage, and for the transport and spreading of manure.
Other Education, Communications, etc.
<ol style="list-style-type: none"> 1. Encourage safe work practices for livestock operation employees to prevent exposure to and spread of infections. 2. Educate the public and local elected officials on the benefits and concerns regarding the use of manure irrigation.

GROUNDWATER & SURFACE WATER

The Dunn County Livestock Operations Study Group advises that the Dunn County Board consider the following groundwater and surface water recommendations for action.

Community Planning, Study, Monitoring, and Tracking

Testing and Monitoring

1. Establish and maintain a County wide, quality and quantity well testing program to track and evaluate the impacts of land use, policy changes, and best management practices.
 - Identify wells to monitor groundwater quality and quantity in areas of high capacity wells and also CAFO and other farm operations.
 - Identify citizens willing to participate in a groundwater monitoring programs.
 - Develop a comprehensive groundwater database in order to improve our understanding of risks and challenges to the water resources.
 - Provide public access to the results and database such as: well testing, well drilling records, and etc.

Inventory and Analysis

2. Research, identify, and map sources of groundwater and surface water contamination to protect public health.
 - Develop strategies to resolve contamination issues.
 - Initiate an analysis of other pollutants (e.g., pesticides) in areas identified with high nitrate levels in groundwater.
 - Investigate and implement innovative approaches, while engaging landowners, in order to address where there are areas of elevated and/or rising nitrate levels in groundwater.
3. Develop a database that identifies and maps abandoned and deficient wells with strategies for their proper closure to reduce potential groundwater contamination and provide public access to the database.
4. The County Health Department should collaborate with UW-System including UW-Stevens Point Center for Watershed Science and Education to ascertain etiology of contamination for well results that are above acceptable standards.

Other Planning

5. Develop a strategy to increase the number of cropland acres in Dunn County that are covered by a Nutrient Management Plan (currently 11%, 25 to 35% in Towns with Farmland Preservation Zoning).
 - Set a goal of 100% participation
 - Provide training and cost-sharing to farmers to write and implement nutrient management plans.
 - Encourage all livestock operations to have appropriate manure storage relative to size of operation and a current management plan to protect groundwater and surface water quality.
 - Encourage in Dunn County winter no-spread and frozen ground manure regulations that restrict January through March manure spreading to reduce nutrient runoff into lakes, rivers, and streams.
 - LWCD should maintain contact with the owners and monitor the NMP plans regularly.
6. Amend the County's Manure Storage Ordinance to:
 - Require evidence that all farms using manure storage structures regardless of size can demonstrate that they have adequate land to spread manure or alternatives such as composting without relying on emergency measures.
 - Encourage all livestock operations to have appropriate manure storage relative to size of operation and a current management plan to protect groundwater and surface water quality.
 - Require 210 days of manure storage for CAFOs.
 - Encourage a minimum of 90 days of manure storage for livestock operations with less than 1000 animal units to address winter spreading. (See Bayfield County Study)
 - Require leachate collection for feed storage.
 - Encourage LWCD to maintain an inventory of contacts with the owners and monitor manure storage structures regularly.
7. Utilize data, content, and funding opportunities available through the approved Red Cedar Watershed TMDL implementation plan.
8. Ensure adequate funding resources by the County Board including staff support and technical assistance.
9. The County should recognize implementation of certain recommendations may require substantial cost sharing and should actively pursue funding.

<p>Rules, Regulations, Policies, Permitting, and Compliance</p>
<ol style="list-style-type: none"> 1. Require all Dunn County livestock operations over 500 animal units to have an approved Nutrient Management Plan by 2022.
<p>Best Practices and Programming</p>
<ol style="list-style-type: none"> 1. Publicize farm and septic BMPs to farms and area citizens in excellent/very high recharge areas and around sensitive or impaired streams, lakes, and wetland areas. 2. Offer cost sharing for BMPs for these areas such as buffers, proper pollution control around wells, and waterways. 3. The County should provide continued programming, technical assistance, and incentives where possible to assist farmers and landowners to improve soil health of the county's land resources. 4. The County should provide continued programming, technical assistance, and incentives where possible to: <ul style="list-style-type: none"> • Encourage farmer-led initiatives to promote BMPs • Engage with farmers in a team approach • Identify and solve water quality problems. 5. Dunn County Land and Water Division should apply for Wisconsin Department of Natural Resources Targeted Runoff Management (TRM) Grants (Up to \$1,000,000) to help fund and support best practices in livestock operations for securing ground and surface water quality across the county. 6. Establish an agricultural composting initiative to expand composting practices by farmers that includes technical assistance, access to cost-sharing, equipment-sharing and leasing, and peer-to-peer collaboration. 7. Encourage expansion of managed grazing as a livestock management strategy that provides economic and conservation benefits.
<p>Other Education, Communications, etc.</p>
<ol style="list-style-type: none"> 1. Protection and improvement of Dunn County groundwater and surface water requires all public and private citizens to take responsibility to establish a respectful, confident, civil, transparent, responsive and sustained dialogue between stakeholders.

2. Educate the public and local elected officials on groundwater threats, testing, best practices, and requirements, including:
 - risks to groundwater contamination
 - groundwater testing and available data in Dunn County
 - private well testing and interpreting water test results, including available testing programs
 - wellhead protection, well treatment options, and well maintenance
 - required setbacks from wells
 - proper maintenance of septic systems and well treatment options
 - proper well abandonment
3. Educate the public, farmers, and local elected officials on livestock operations and manure storage/management for water quality improvements in Dunn County.
 - Include education on practices such as limited and no tillage, managed grazing, and the use of cover crops as effective soil and water conservation practices.
4. Dunn County should continue its support of the Red Cedar Land, Water and People Conference, and promote the CAFO conference and other educational opportunities to create and sustain a dialogue on supporting livestock operations and improving ground and surface water quality.

7. IMPLEMENTATION

Due to time constraints the LOSG was unable to develop an implementation schedule.

8. APPENDIX

Appendix A: Animal Units

Livestock Type		Animal Unit Factor
Dairy Cattle	Milking and Dry Cows	1.4
	Heifers (800 lbs to 1200 lbs.)	1.1
	Heifers (400 lbs to 800 lbs.)	0.6
	Calves (up to 400 lbs.)	0.2
Beef Cattle	Steer or Cows (600 lbs.)	1
	Calves (less than 600 lbs.)	0.5
	Bulls (each)	1.4
Veal Calves	Per Animal	0.5
Swine	Pigs (55 lbs.)	0.4
	Pigs (up to 55 lbs.)	0.1
	Sows (each)	0.4
	Boars (each)	0.5
Turkeys	Per bird	0.018
Ducks	Per Bird	0.2
Sheep	(each)	0.1
Goats	(each)	0.1
Llamas	(each)	0.1
Alpacas	(each)	0.075
Horse or Pony	(each)	1.0

Appendix B: List of Presenters (in order of presentations)

Presenter	Subject	Affiliation
Kevin Masarik	Groundwater	Groundwater Education Specialist, University of Stevens Point/University of Wisconsin-Extension
Dan Prestebak	State and local regulations	Dunn County Land and Water Conservation Division
Chris Clayton	DATCP regulations	Department of Agriculture, Trade and Consumer Protection
Davina Bonness	Kewanee County CAFO study	Kewanee County Land and Water Conservation Department
Robert Thiboldeaux	Other public health	Toxicologist, Wisconsin Department of Health Services
Leah Nichol	Manure management	Agricultural Runoff Specialist, Wisconsin Department of Natural Resources
Joe Baeten	Manure management	Water Resources Management Specialist, Wisconsin Department of Natural Resources
Aaron O'Rourke,	Manure management	Water Resources Management Specialist, Wisconsin Department of Natural Resources
Jesse Rintala	Transportation/roads	Dunn County Highway Department
Jason Fischbach	Bayfield County CAFO study	Agriculture Agent Bayfield/Ashland Counties, University of Wisconsin-Extension
Steve Pittman	No till practices	Bazooka Farmstar Representative
Keith Bergeson	Wells and public health	Dunn County Public Health
Chris Straight	Wisconsin Case laws	West Central Wisconsin Regional Planning Commission
Dan Zerr	Surface water	Natural Resource Educator, University of Wisconsin-Extension

Appendix C: Presentation Notes Template

**Dunn County Livestock Operations Study Group
Presentation Notes**

Date:	
Presenters(s):	
Key Impacts:	<i>These potential impacts concern me most:</i>
Data Needs or Gaps:	<i>More information is needed on:</i>
Policy or Program Gaps:	<i>Existing policies, rules, or programs do not appear to address:</i>
Opportunities for Action:	<i>Planning, study, monitoring, and tracking</i>
	<i>Rules, regulations, permitting, and compliance</i>
	<i>Best practices and programming</i>
	<i>Education, communications, and other</i>

Appendix D: Presentation Notes (Listed In Order of Presentation)

January 25

**Dunn County Livestock Operations Study Group
Presentation Notes**

Date:	1/25/2017
Presenters(s):	Dan Prestebak, Dunn County - Manure Management
Key Impacts:	<p><i>These potential impacts concern me most:</i></p> <ul style="list-style-type: none"> ● Manure management ● How to address the leachate from the feed storage <ul style="list-style-type: none"> ○ LCD does not manage leachate since it is not designated as manure
Data Needs or Gaps:	<p><i>More information is needed on:</i></p>
Policy or Program Gaps:	<p><i>Existing policies, rules, or programs do not appear to address:</i></p> <ul style="list-style-type: none"> ● Does 313 standard require a minimum # of days storage? ● What resources (e.g., budget, staffing) is the County willing to commit? What should the County take on? Could do more if more resources available. <ul style="list-style-type: none"> ○ County's role with reviewing Nutrient Management Plans. ○ County relies on DNR (for CAFOs) and NRCS (for non-CAFOs) for technical review; no County engineer. (DNR is in the process of changing engineering approval on engineering plans and developing a certification program for engineers.) Should to County rely on this or have our own engineer.? ● How can the County collect/track leachate information <ul style="list-style-type: none"> ○ New feed storage and also existing feed storage ○ Ordinance silent on leachate. ● County can request "spreading agreements", etc., as part of application; but can ask and could require them. ● Limited follow-up once permitted to begin construction. (LWCD is diligently working to get all nutrient management plans up-to-date. ● limited support from DATCP budget to fund Livestock Siting or Manure Management Ordinance implementation costs. ● County staff lacks "citation authority" under current County rules. ● The State limits the permit fees under facility siting at \$1000. <ul style="list-style-type: none"> ○ \$700 Dunn County fee
Opportunities for Action:	<p><i>Planning, study, monitoring, and tracking</i></p> <ul style="list-style-type: none"> ● Request of copies of plans and reports

	<p><i>Best practices and programming</i></p> <ul style="list-style-type: none">● More stringent standards<ul style="list-style-type: none">○ based on scientific facts that there is a threat to public health and safety.○ Review what other counties have done.○ Utilizing <u>licensing</u> to cover all of the county○ 4 prohibitions (licensing) to see if it might fit in siting● Encourage Odor Management plans or better controls<ul style="list-style-type: none">○ Inclusion of incentives
	<p><i>Education, communications, and other</i></p> <ul style="list-style-type: none">● Ensure setbacks ordinance standards are understood/known.<ul style="list-style-type: none">○ Clarify the various setbacks requirements. (facility siting rules, CAFO rules, zoning, stormwater/erosion control)

**Dunn County Livestock Operations Study Group
Presentation Notes**

Date:	1/25/2017
Presenters(s):	Chris Clayton, DATCP - Facility Siting
Key Impacts:	<p><i>These potential impacts concern me most:</i> The county should weigh in on the impacts created with</p> <ul style="list-style-type: none"> ● Zoning ordinance, and ● Licensing ordinance ● Licensing would increase county-wide tracking <p>Odor Score - Can be fairly easy to get passing score depending on site and practices.</p> <ul style="list-style-type: none"> ● Setbacks offer most control
Data Needs or Gaps:	<p><i>More information is needed on:</i> Location of wells</p> <ul style="list-style-type: none"> ● Do farmers and County know where wells are located? ● Must coordinate well siting with CAFOs/farmers/NM Planning <p>Are Nutrient Management Plans covering this Odor Management data required on livestock siting</p> <ul style="list-style-type: none"> ● There is a need to review the Odor Management in the County Ordinance
Policy or Program Gaps:	<p><i>Existing policies, rules, or programs do not appear to address:</i></p> <ul style="list-style-type: none"> ● How the siting ordinance applies to the zoned towns. <ul style="list-style-type: none"> ○ Unzoned towns currently not covered by facility siting regulations in Dunn County. ● How would/to licensed ordinance impact county-wide and unzoned towns. ● Expansions less than 20% under 1,000 a.u. do not require license/permit. ● Odor management plan not required for many/most facilities based on score. Exempt if no homes, etc., within 2,500'. County can't require O.M. plan or specific odor management practices. ● Does County have the technical resources to evaluate applications, effectiveness of odor mgmt. practices, etc? Towns often rely on County staff.
Opportunities for Action:	<p><i>Planning, study, monitoring, and tracking</i></p> <ul style="list-style-type: none"> ● Actions should be consistent with comprehensive plan. <ul style="list-style-type: none"> ○ Addition of multiple ag zoning districts with different farm sizes and setbacks, and if ordinance includes scientific facts regarding risks to health and safety. ● State-wide oversight
	<p><i>Rules, regulations, permitting, and compliance</i></p> <ul style="list-style-type: none"> ● Zoning vs. Licensing approach. ● Stringent siting standards ● Compliance with newer NRCS 590 standard. ● Update County ordinances to regarding penalties and fines for non-compliance; current approach limits enforcement options. ● Does County have the resources to monitor and enforcement NMP compliance? ● County can require additional documentation when considering granting of a permit/license, such as proof that there is land available to spread and past compliance. Review what other counties have done.

	<p><i>Rules, regulations, permitting, and compliance</i></p> <ul style="list-style-type: none"> ● See Dan’s “Future Considerations” slide. Address policy/program gaps. ● County Manure Management Ordinance appears to cover updated NRCS standards; might need to confirm with legal that this approach is adequate. ● Consider a “use permit” approach that is issued after an inspection and review of as-builts. ● Citation authority. ● How can compliance with NMPs and odor management practices be better monitored and, if needed, enforced. ● Explore other avenues and fee options to help cover true costs of permitting and compliance. ● Develop <i>Stormwater Erosion Control Ordinance</i> ● Water Quality Management Areas ● Define terms (i.e. Altered, Mismanaged, Malfunctioning)
	<p><i>Best practices and programming</i></p> <ul style="list-style-type: none"> ● DNR vs County manure management ● In house review with engineer of Nutrient Management Plan
	<p><i>Education, communications, and other</i></p> <ul style="list-style-type: none"> ● Annual CAFO meeting - UW-Extension Barron ● Organize Dunn County CAFO group to meet/discuss ● Outreach Program - Much like Farm Days

February 2

Dunn County Livestock Operations Study Group Presentation Notes

Date:	2/2/17
Presenters(s):	Robert Thiboldeaux, Wisconsin Dept. of Public Health
Key Impacts:	<p><i>These potential impacts concern me most:</i></p> <ul style="list-style-type: none"> ● DHS role is more advisory <ul style="list-style-type: none"> ○ They take a more reactive approach, e.g. after a spill ● Liquid manure have more phosphorus than solid. <ul style="list-style-type: none"> ○ Poultry is dryer than dairy ● As livestock feeding and housing is concentrated, the waste is more concentrated. ● In terms of solids and wastewater based on average U.S. resident use, 3 cows = 1 person. ● CAFOs and large manure holding facilities can strain community/neighbor relationships. ● Microbes and bacteria. Some strains can pass between species. <ul style="list-style-type: none"> ○ The chemistry and composition changes in a pit; very different than when it first leaves the animal. This is a difference between a feedlot where manure is collected and stored vs. a grazed herd. ○ Quantitative Microbial Risk Assessment (QMRA) use to understand composition of livestock waste ● A variety of potential airborne pollutants or pathogens; hydrogen sulfide and ammonia most hazardous. Usually not concentrated enough to be a problem offsite. ● Health standards are based on scientific assessments and impacts to the most vulnerable populations.
Data Needs or Gaps:	<p><i>More information is needed on:</i></p> <ul style="list-style-type: none"> ● Studies lacking on antibiotic resistance concerns with surface and groundwater runoff of land spread manure ● Difference in opinion on what is an Antibiotics <ul style="list-style-type: none"> ○ Need to clearly define what is an antibiotic; very broad or narrow description ○ Study of feed and additives that includes antibiotics
Policy or Program Gaps:	<p><i>Existing policies, rules, or programs do not appear to address:</i></p> <ul style="list-style-type: none"> ● Are County procedures for reporting and handling of manure spills adequate? ● "Right to Farm" law protects agricultural industry from unwarranted nuisance claims by neighbors, but may also limit ability for needed local government action.
Opportunities for Action:	<p><i>Planning, study, monitoring, and tracking</i></p> <ul style="list-style-type: none"> ● Dunn County map of susceptibility and link between soil and water water quality ● 254 - Dunn County Human Health Hazard ordinance <ul style="list-style-type: none"> ○ Increasing water testing to identify sensitive areas and trends

	<p><i>Rules, regulations, permitting, and compliance</i></p> <ul style="list-style-type: none"> ● Need to review findings and recommendations in the Manure Irrigation Work Group report. Was not codified or acted upon at the State level; could encourage State legislative action. Some counties (e.g., Bayfield) have considered and/or integrated into their own programs and ordinances. Some of the recommendations could be integrated into a County public health ordinance. <ul style="list-style-type: none"> ○ Can Dunn County take the same approach as Bayfield?
	<p><i>Best practices and programming</i></p> <ul style="list-style-type: none"> ● Digesters “make manure better.” <ul style="list-style-type: none"> ○ Different types of digesters can be more effective at reducing pathogens. ○ Need a large herd (e.g., 1,000+ head) for digesters to be economically feasible. ○ What practices are required by regulations (and which regulations) vs. other reasons a practice might have been put into place (e.g., incentives, being a good neighbor or steward). ○ Digesters are part of emerging technology for pollution control
	<p><i>Education, communications, and other</i></p> <ul style="list-style-type: none"> ● Dunn County Public Health - water testing for pregnant women, children, and plumpers are informed of public health codes ● Right-to-Farm law - inform the public of the law.

Dunn County Livestock Operations Study Group Presentation Notes

Date:	2/2/17
Presenters(s):	Davina Bonness, Kewaunee County Land and Water Conservation
Key Impacts:	<p><i>These potential impacts concern me most:</i></p> <ul style="list-style-type: none"> ● Kewaunee residences have become used to Brown-water events ● Kewaunee County is entirely zoned A1 with 80% of the land under a NM Plan because landowners are claiming the FPP credit. ● The ordinance isn't CAFO specific but more of a nuisance ordinance ● Compliant network ● Nitrates, coliform, hormonal wells. Risks were from both bovine and human sources. ● Based on Davina's statewide map, only 5% of Dunn County's cropland acres have a NMP. ● Spring and fall recharge are the most vulnerable times. ● Long process - 8 years if data, 8 years of research, hard pressed by environmental groups
Data Needs or Gaps:	<p><i>More information is needed on:</i></p> <ul style="list-style-type: none"> ● How much of the Kewaunee County experience can be applied to Dunn County? Dunn County have excessive drained sandy soils vs karst <ul style="list-style-type: none"> ○ Are the groundwater contamination vulnerabilities comparable? ● Kewaunee had extensive data and studies collected over 8 years to build on. They demonstrated a direct relationship between vulnerable areas (largely based on soils, geology, and hydrogeology) and well contamination. Based on this data, they were able to identify criteria that was later codified as part of a public health ordinance. <ul style="list-style-type: none"> ○ Dunn County has well data and groundwater contamination data, but is there enough empirical evidence currently available to demonstrate a direct connection and develop. ● Based on soil types, bedrock, etc., some water quality tests (e.g., nitrates, alkalinity) provide more reliable long-term results than others.
Policy or Program Gaps:	<p><i>Existing policies, rules, or programs do not appear to address:</i></p> <ul style="list-style-type: none"> ● Current regulations covering land applications are inadequate for protecting home health. Even good farming can pollute in karst.
Opportunities for Action:	<p><i>Planning, study, monitoring, and tracking</i></p> <ul style="list-style-type: none"> ● Create a Dunn County Water Data Clearinghouse. ● Create a compliant network/procedure. ● Need to review recommendations in the WDNR Groundwater Study report, which incorporated the results of the Kewaunee County task force. <ul style="list-style-type: none"> ○ Had four work groups that yielded a wide variety of recommendations; not all regulatory. ○ Recommendations included different levels of protection based on different vulnerability/risk criteria, then a variety of recommendations and regulatory requirements for each level. ○ Considering all of this study will require significant time.

	<ul style="list-style-type: none"> ● Baseline well testing is important to determine potential impacts of rule changes, BMPs, etc. <ul style="list-style-type: none"> ○ Testing in January would provide a better year-to-year comparison, while June testing would provide a better understanding of variability. ○ Kevin Masarik might be able to assist in establishing a testing program. <p><i>Rules, regulations, permitting, and compliance</i></p> <ul style="list-style-type: none"> ● County could adopt a Public Health and Groundwater Protection Ordinance under State public health and/or “police power” authority. This would be a nuisance-style ordinance (i.e., targets impacts, not a specific industry) that is not linked to specific land uses and would apply to all <u>mechanical</u> spreading of waste and the stacking/stockpiling of waste. ● Ordinance can have variances, with leniency on penalties during initial year. County staff assists with preparing variance plans. To qualify for a variance, should demonstrate progress addressing the non-conformance and long-term risk. ● Conduct hauling audits. ● Can the County combine multiple related county ordinances under a single ordinance? <ul style="list-style-type: none"> ○ Or, would we be mixing “apples and oranges” if one set of standards are more nuisance-related (i.e., based on impacts, not uses), while another is specific to livestock facilities of a certain size (i.e., use specific)? ● Referendum by towns are required for any ordinance <p><i>Best practices and programming</i></p> <ul style="list-style-type: none"> ● <p><i>Education, communications, and other</i></p> <ul style="list-style-type: none"> ● Prior to adoption of their Public Health Ordinance, Kewaunee Co engaged in an intensive, multi-month educational campaign. 83% of residents (and all towns) approved the ordinance for their municipality in a ballot referendum. ● Following adoption, Kewaunee County sent follow-up letters and maps to landowners and producers, does windshield inspections, and significant tracking.
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**Dunn County Livestock Operations Study Group
Presentation Notes**

Date:	2/16/17
Presenters(s):	Leah Nichol, Agricultural Runoff Specialist, WDNR Joe Baeten, Water Resources Management Specialist, WDNR Aaron O'Rourke, Water Resources Management Specialist, WDNR
Key Impacts:	<p><i>These potential impacts concern me most:</i></p> <ul style="list-style-type: none"> ● WPDES covers manure and process wastewater impacts and “discharge issues” to the waters of the State (groundwater, surface water, wetlands) ● Seepage allowed, provided groundwater standards not exceeded ● Sandy soils are a “sensitive area” and more prone to leaching; (Joe’s slide #37 for related science). ● EC-DNR fully staffed
Data Needs or Gaps:	<p><i>More information is needed on:</i></p> <ul style="list-style-type: none"> ● More data on livestock and farming trends in Dunn County. ● SNAP-PLUS (NMP mapping software) - Are there any weakness or local data input that should be considered or strengthened? <ul style="list-style-type: none"> ○ Does it consider barnyard and feedlot runoff and practices? ○ Does it consider any influences from irrigation (either water or spray manure)? ○ While SNAP-PLUS is a field approach, is there an opportunity to collect this data to help calibrate watershed-level SWAT, STEPL, or similar modelling? ● Mortuary areas as part of compost facilities ● What is the list of WPDES “restrictive features”?
Policy or Program Gaps:	<p><i>Existing policies, rules, or programs do not appear to address:</i></p> <ul style="list-style-type: none"> ● Most non-compliances are reported by local entities or public. ● Self-monitoring and reporting required for spills. <ul style="list-style-type: none"> ○ If minor spill then farmer can clean up ○ What constitutes a major spill that needs to be reported ● WDNR visits CAFOs (or all WPDES?) a minimum 2 times in the five year permit period, plus “manure audits.” ● Will there be sufficient WDNR review should proposed assurance initiative is implemented? ● Manure storage is based on a 25-year 24-hour storm event + 1 foot of freeboard. <ul style="list-style-type: none"> ○ Recurrence intervals have been increasing exponentially due to climate change; what historic data is this engineering standard based on? ○ Is 180-days of storage adequate ○ What about multiple pumping? ● Monitoring of lines and equipment varies. “Sometimes things fail.” Increasingly technology-based; battery or power generator available? ● Groundwater baseline testing or ongoing monitoring around CAFOs not typically required for Dunn County area under WPDES permitting. ● No monetary fines for WDNR “notice of discharge” non-compliances. ● WDNR does not walk every acre and does not review nutrient management plans for every restrictive feature.

March 2

Dunn County Livestock Operations Study Group Presentation Notes

Date:	3/2/17
Presenters(s):	Jason Fischback, Bayfield County, UW-Extension
Key Impacts:	<p><i>These potential impacts concern me most:</i></p> <ul style="list-style-type: none"> ● manure - storage failure, barnyard runoff, improper spreading ● phosphorus in surface water ● nitrates in groundwater ● odor & hazardous air emissions ● zoonotic disease ● Different geology from Dunn County ● No silver bullet to fix nitrate issues ● Bayfield County is negotiating with the DNR on the stricter Fish Creek Ordinance
Data Needs or Gaps:	<p><i>More information is needed on:</i></p> <ul style="list-style-type: none"> ● Many technologies and methods available to limit emissions, though the LOSG is not familiar with these (and may not have time to explore these). ● Tracking of cattle expansion only if 20% increase <ul style="list-style-type: none"> ○ triggers BOA
Policy or Program Gaps:	<p><i>Existing policies, rules, or programs do not appear to address:</i></p> <ul style="list-style-type: none"> ● DATCP 51 goal is uniformity across Wisconsin, but WI is not uniform. ● DATCP 51 goal is to provide balance between economic benefits and environment, but how is balance measured and defined? ● Pathogen loads in manure is not tested or regulated. ● Air quality is “not regulated” and air emissions are exempt from point-source regulations. ● 180 days of manure storage was not adequate <ul style="list-style-type: none"> ○ Can county require more than 180 day ● Pathogen load reduction strategies and technologies exist, but are typically not required.
Opportunities for Action:	<p><i>Planning, study, monitoring, and tracking</i></p> <ul style="list-style-type: none"> ● baseline groundwater testing ● Are Dunn County groundwater contamination susceptibility maps accurate enough to drive policy or decision making? ● Manure spill response planning and training ●
	<p><i>Rules, regulations, permitting, and compliance</i></p> <ul style="list-style-type: none"> ● Manure storage of 5,000 c.u. feet must be built to NRCS standards. ● Adopted a County Operations licensing ordinance for CAFOs. This ordinance focuses on <u>operations, not siting</u>. Must include an operations plan demonstrating how the operation would not cause pollution or cause a public nuisance and includes bonding. Approvals may be conditional to prevent or mitigate potential impacts. ● Can adopt an impaired watershed or high risk area-specific ordinance with special requirements (e.g., spreading windows, incorporation, storage capacity,

Dunn County Livestock Operations Study Group Presentation Notes

Date:	3/2/17
Presenters(s):	Jesse Dunn County Highway
Key Impacts:	<p><i>These potential impacts concern me most:</i></p> <ul style="list-style-type: none"> ● road and shoulder damage ● highway safety and transportation conflicts ● improper use of road right-of-way ● costs to County/local governments for road improvements & maintenance ● Road Bans due to unstable grounds from saturation <ul style="list-style-type: none"> ○ No more permits issued during ban ○ past county was more lose on road bans ○ can still haul smaller non-oversized manures
Data Needs or Gaps:	<p><i>More information is needed on:</i></p> <ul style="list-style-type: none"> ● no information provided on typical traffic impacts of large livestock facilities (e.g., volumes, seasonality, type/tonnage, dairy vs. meat) ● Did we get a complete picture of Implements of Husbandry (IoH) law implications or policy options ● Manure hauling - Where does it fall under "Implements of Husbandry" (IOH) ● Analysis of Average Daily Traffic (ADT)
Policy or Program Gaps:	<p><i>Existing policies, rules, or programs do not appear to address:</i></p> <ul style="list-style-type: none"> ● County does not have adopted, standard procedures or guidelines for evaluating transportation-related impacts of livestock facilities and related recommendations. ● It is often difficult to identify or isolate the cause of road damage. ● County does not enforce IoH weight limits. State weight enforcement staff is limited and often cannot respond quickly enough. ● Traffic Impact assessment (TIA) - and its connection with CAFO's <ul style="list-style-type: none"> ○ how to tie TIA with towns and their roads ● However, how are these best codified and enforced (e.g., by use such as zoning/licensing or by nuisance (road use/damage ordinance)), especially given the County's limits on regulating town roads?
Opportunities for Action:	<i>Planning, study, monitoring, and tracking</i>
	<p><i>Rules, regulations, permitting, and compliance</i></p> <ul style="list-style-type: none"> ● County could adopt transportation impact assessment procedures for livestock similar to those for sand mining. Is the enforcement of IoH and weight limits a significant enough issue that additional costs (e.g., purchase of scale, man hours) is needed? Can penalties help cover these costs?

March 16

Dunn County Livestock Operations Study Group Presentation Notes

Date:	3/16/2017
Presenters(s):	Keith Bergeson, Dunn County Public Health
Key Impacts:	<p><i>These potential impacts concern me most:</i></p> <ul style="list-style-type: none"> ● bacteria (often a localized threat) ● nitrates (blue baby syndrome, potential carcinogen, livestock births) ● old wells that are not properly abandoned or insufficient casings ● dams and wells can impact groundwater movement ● higher nitrates in areas with high capacity wells in permeable soils ● Seasonal and weather event and patterns (rain, drought) can impact nitrate levels ● the # of wells with high nitrates is generally increasing in the county ● Potential concerns as nitrate is broken down by Adults into carcinogens
Data Needs or Gaps:	<p><i>More information is needed on:</i></p> <ul style="list-style-type: none"> ● Are nitrate-related risks fully understood? (e.g., Parkinsons, dementia, Alzheimers) ● Do nitrates impact milk quality? ● Nitrates in well water can come from many different sources. Not just livestock and manure. Do we know what the sources are? Sometimes we don't know why nitrate levels are elevated. ● Are there different nitrate levels for animals vs humans <ul style="list-style-type: none"> ○ What are "Grade A" Wells tested for ● What to do about contaminated abandoned wells, not just known wells ● Viking Bowling (Colfax) may have reduced nitrate levels from a CAFO from sitings and manure storage practices
Policy or Program Gaps:	<p><i>Existing policies, rules, or programs do not appear to address:</i></p> <ul style="list-style-type: none"> ● Does 10ppm for nitrates provide adequate protection? ● Policy challenge - Risks vary significantly by hydro-geology. Focusing policies and programs on certain towns may miss a high risk area (e.g., Town of Sand Creek).
Opportunities for Action:	<p><i>Planning, study, monitoring, and tracking</i></p> <ul style="list-style-type: none"> ● Map construction of new wells to a GPS location. Continue GIS mapping of past well data. Link GIS data to well test data. Make results available for nutrient management planning and permitting. ● Conduct additional well testing so that a more current baseline can be established, with initial priority on areas of highest risk. Maintain a testing program so trends over time can be monitored.
	<p><i>Rules, regulations, permitting, and compliance</i></p> <ul style="list-style-type: none"> ● Can well testing be required (and data submitted to county) at time of sale of real estate? ● County build relationship with DNR testing laboratory <ul style="list-style-type: none"> ○ complete water tests, not just nitrates ●

	<p><i>Best practices and programming</i></p> <ul style="list-style-type: none">● well treatment systems● Send letters on testing to residents in susceptible areas
	<p><i>Education, communications, and other'</i></p> <ul style="list-style-type: none">● provide information and maps to the public on well-related trends, risks, and best practices● provide information to well drillers on high risks areas, known bedrock features, etc.● Clearinghouse or one-stop-shop for well and other datas● Send letters on testing to residents in susceptible areas● Letters notifying results of soil tests

**Dunn County Livestock Operations Study Group
Presentation Notes**

Date:	3/16/2017
Presenters(s):	Steve Pittman, Bazooka Farmstar
Key Impacts:	<p><i>These potential impacts concern me most:</i></p> <ul style="list-style-type: none"> ● runoff when applying manure ● timing and over application of manure ● maintenance of drag lines ● drag lines may reduce effective diameter of culverts if under a road ● Over applications will show in soil tests
Data Needs or Gaps:	<p><i>More information is needed on:</i></p> <ul style="list-style-type: none"> ● How does injection stack up against sunlight breakdowns
Policy or Program Gaps:	<p><i>Existing policies, rules, or programs do not appear to address:</i></p> <ul style="list-style-type: none"> ● Need to establish dragline policy
Opportunities for Action:	<i>Planning, study, monitoring, and tracking</i>
	<p><i>Rules, regulations, permitting, and compliance</i></p> <ul style="list-style-type: none"> ● Could precision application/injection be required as part of an operation permit for CAFOs or larger operations? Make a standard in the permitting process ● Require submittal of flow meter and GPS data to monitor compliance with nutrient management plans.
	<p><i>Best practices and programming</i></p> <ul style="list-style-type: none"> ● precision application/injection as part of BMP toolbox; could provide cost- or equipment-sharing for smaller operators ● Opportunity to be better steward to go above and beyond typical farming practices
	<p><i>Education, communications, and other</i></p> <ul style="list-style-type: none"> ● Public perceive manure applications to be too much

March 30

Dunn County Livestock Operations Study Group Presentation Notes

Date:	3/30/17
Presenters(s):	Dan Zerr, UW-Extension Natural Resources Educator
Key Impacts:	<p><i>These potential impacts concern me most:</i></p> <ul style="list-style-type: none"> • Phosphorus and sedimentation from agricultural runoff are contributing to impaired surface waters in Dunn County. The number of impaired waters in Dunn County has been increasing. • Nitrate levels in the Red Cedar River have been increasing from agricultural runoff and groundwater sources, largely due to human modifications.
Data Needs or Gaps:	<p><i>More information is needed on:</i></p> <ul style="list-style-type: none"> • Proportionately, what are the sources of phosphorus in Dunn County surface waters? (How much is from humans, manure, natural, etc)
Policy or Program Gaps:	<p><i>Existing policies, rules, or programs do not appear to address:</i></p> <ul style="list-style-type: none"> • The Red Cedar TMDL does not cover all of Dunn County. • There is only one TMDL even though there are many more impaired waters in the county. • TMDLs and associated plans have not been approved for other impaired waters.
Opportunities for Action:	<p><i>Planning, study, monitoring, and tracking</i></p> <ul style="list-style-type: none"> •
	<p><i>Rules, regulations, permitting, and compliance</i></p> <ul style="list-style-type: none"> • Encourage <u>WDNR</u> to develop and set TMDLs for other impaired waters and sub-sheds.
	<p><i>Best practices and programming</i></p> <ul style="list-style-type: none"> • Work with producers to encourage soil health best practices that encourage infiltration and reduce runoff. • Encourage TMDL and 9 Key Element Plans. • NMP support TMDL even though it is a point source.
	<p><i>Education, communications, and other</i></p> <ul style="list-style-type: none"> • Support implementation of the Red Cedar River Watershed Plan and similar plans such as the Dunn County Land and Water Plan

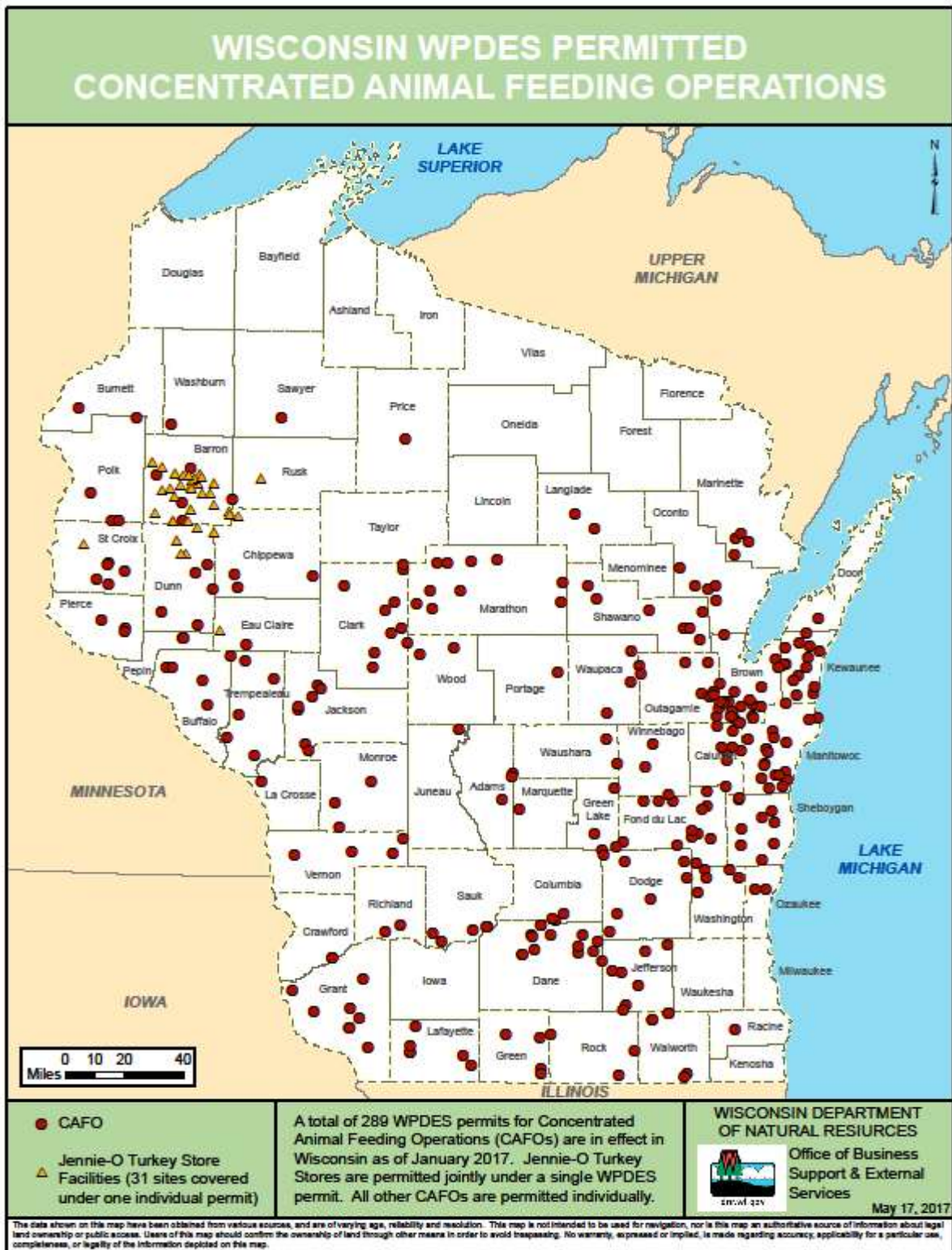
Appendix E: Research Summary Cover Sheet Template

DUNN COUNTY CAFO STUDY - RESEARCH SUMMARY COVER SHEET

Very briefly, what impact(s), questions, or concerns are being addressed:
Author of Summary:
Date:
Source(s) of Information <i>(with full citation)</i>:
Initial Key Findings from Author <i>(may attached a summary if needed)</i>:
Key Findings and Comments of the Group:
Group Recommendations, if any:

This form is a tool to assist in the tracking and summarization of research. A form can be completed for a single report/study, a specific source (e.g., website, agency), or for a specific issue. Modify as needed.

Appendix F: Statewide CAFO Map



Appendix G: Dunn County Livestock Facilities Siting Ordinance



13.3.5 Livestock Facilities

13.3.5.01 Purpose: The purpose of this section is to comply with requirements of Sec. 93.90 of WI. Statutes and ch. ATCP 51, WI. Adm. Code, and to establish standards and authority to protect the public health and safety of the people of the County of Dunn. This section sets forth the procedures for obtaining a permit for the siting of new and expanded livestock facilities.

13.3.5.011 "Livestock" Defined. For purposes of livestock facility and siting regulation pursuant section 13.3.5, "Livestock" means domestic animals traditionally used in this state in the production of food, fiber or other animal products. "Livestock" includes cattle, swine, poultry, sheep and goats. "Livestock" does not include equine animals, bison, farm-raised deer, fish, captive game birds, ratites, camelids or mink. (06/15/2016)

13.3.5.02 Permit Required

(a) General

1. A Special Exception permit is required for new or expanded livestock facilities that will have 500 or more animal units in the IA district.
2. A Special Exception permit is required for the expansion of a pre-existing or previously approved livestock facility if the number of animal units kept at the expanded livestock facility will exceed all of the following:
 - a) The applicable size threshold for a permit.
 - b) The maximum number of animal units previously approved, or if no maximum number of animal units was previously approved, a number that is 20% higher than what was in existence on the effective date of this ordinance.
3. A Special Exception permit is not required for a livestock facility that was previously issued a special exception permit, except as provided in sub. 2. A prior approval for the construction of a livestock facility implies approval for the maximum number of animal units that the approved livestock facility was reasonably designed to house, except as otherwise clearly provided in the approval. Prior approval of a single livestock structure, such as a waste storage structure, does not constitute prior approval of an entire livestock facility.

13.3.5.03 Permit Standards

(a) The standards for issuing a permit are as follows:

1. The state livestock facility siting standards adopted under ATCP 51, Wis. Adm. Code, inclusive of all appendices and worksheets and any future amendments to this chapter, except as may be noted in this section of the ordinance, are incorporated by reference in this ordinance, without reproducing them in full.
2. The following setbacks shall apply to livestock structures:
 - a) Property lines
Except as provided for waste storage structures, livestock structures must be located a minimum of 100 feet from the property line if the livestock facility will have fewer than 1,000 animal units, and 200 feet from the property line if the livestock facility will have 1,000 or more animal units.

The setback requirements do not prevent the use or expansion of a livestock structure that was located within the setback area prior to the effective date of the setback requirements, except that a structure may not be expanded closer to the property line.

b) Public road right-of-way

Except as provided for waste storage structures, livestock structures must be located a minimum of 100 feet from public road right-of-way if the livestock facility will have fewer than 1,000 animal units, and 150 feet from a public road right-of-way if the livestock facility will have 1,000 or more animal units.

The setback requirements do not prevent the use or expansion of a livestock structure that was located within the setback area prior to the effective date of the setback requirements, except that a structure may not be expanded closer to the right-of-way.

c) Waste Storage Structure

A new waste storage structure may not be located within 350 feet of a property line, or within 350 feet of the nearest point of any public road right-of-way.

A single new waste storage structure may be constructed closer to the property line or public road if the new structure is:

Located on the same tax parcel as a waste storage structure in existence before the effective date of this ordinance

- i. No larger than the existing structure
- ii. No further than 50 ft. from the existing structure
- iii. No closer to the road or property line than the existing structure.

This setback requirement does not apply to existing waste storage structures, except that an existing structure within 350 feet of a property line or road may not expand toward that property line or road.

13.3.5.04 Application

- (a) A livestock operator must complete the application form and worksheets prescribed by ATCP 51, including any authorized local modifications. The application form and worksheets must demonstrate compliance with standards in ATCP 51 and this ordinance.
- (b) The operator must file three (3) duplicate copies of the application form, including worksheets, maps and documents (other than engineering design specifications) included in the application.

13.3.5.05 Application Fee: A non-refundable application fee of \$750.00 payable to Dunn County Zoning shall accompany an application for the purpose of offsetting the county costs to review and process the application. The Board of Adjustment may retain or appoint third party experts and/or legal professionals as the Board deems prudent to examine the application and to make recommendations to the Board of Adjustment on whether the livestock facility siting application proposed by the applicant will meet the standards of this ordinance, to assist in evaluating special exception requests and considering conditions and to assist the Board in administering and enforcing the ordinance. The applicant shall pay for the reasonable cost of all third party experts as a condition of approval.

13.3.5.06 Application Procedures

- (a) Pursuant to ATCP 51.30 (5), within 45 days after staff receives an application, it shall notify the applicant whether the application is complete. If the application is not complete, the notice shall

describe the additional information needed. Within 14 days after the applicant provides all of the required information, staff shall notify the applicant that the application is complete. This notice does not constitute an approval of the proposed livestock facility.

- (b) Upon determination of completeness, a public hearing will be held for those livestock facilities that are proposed in the IA district.

13.3.5.07 Criteria for Issuance of a permit

- (a) A permit shall be issued if the application for the proposed livestock facility:
 - 1. Complies with this section, and
 - 2. Is complete, and
 - 3. Contains sufficient credible information to show, in the absence of clear and convincing information to the contrary, that the proposed livestock facility meets the standards specified in this section.
- (b) A permit shall be denied if any of the following apply:
 - 1. The application, on its face, fails to meet the standards for approval in the previous paragraph,
 - 2. The Board of Adjustment finds, based on other clear and convincing information in the record that the proposed livestock facility does not comply with applicable standards in this ordinance.
 - 3. Other grounds authorized by s. 93.90, Wis. Stats. that warrant disapproving the proposed livestock facility.

13.3.5.08 Transferability of Permit: A permit and the privileges granted by this permit run with the land and remain in effect, despite a change in ownership of the livestock facility, as long as the new operator does not violate the terms of the approval.

13.3.5.09 Expiration of Permit

- (a) Except as provided in sub. b) or s. ATCP 51.34(4), the special exception permit:
 - 1. Runs with the land and remains in effect despite a change in ownership of the livestock facility or the land on which it is located.
 - 2. Remains in effect regardless of the amount of time that elapses before the livestock operator exercises the authority granted under the permit and regardless of whether the livestock operator exercises the full authority granted by the approval.
- (b) The Board of Adjustment may withdraw approval granted under this chapter unless the livestock operator does all of the following within 2 years after approval is granted:
 - 1. Begins populating the approved livestock facility.
 - 2. Begins construction on every new or expanded livestock housing structure, and every new or expanded waste storage structure, proposed in the application for approval.

13.3.5.10 Terms of Modification: A permit and the privileges granted by a permit issued under this ordinance are conditioned on the livestock operator's compliance with the standards in this ordinance, and the commitments made in the application for a permit. The operator may make reasonable changes that maintain compliance with the standards in this ordinance, and Dunn County shall not withhold authorization for those changes.

13.3.5.11 Appeals of Livestock Facilities Requiring a Special Exception permit

- (a) In addition to other appeal rights provided by law, Sec. 93.90(5), States, provides that any "aggrieved person" may request review by the Livestock Facility Siting Review Board of any decision by the Board of Adjustment in connection with a permit application. An "aggrieved person" may challenge the decision on the grounds that the Board of Adjustment incorrectly applied the standards under this ordinance or violated Sec. 93.30, Wis. Stats.
- (b) An "aggrieved person" under this section as defined in Sec. 93.90(5) of Wis. Statutes means a person who applied to the Board of Adjustment for approval of a livestock siting or expansion, a person who lives within 2 miles of the livestock facility that is proposed to be sited or expanded, or a person who owns land within 2 miles of a livestock facility that is proposed to be sited or expanded.
- (c) Any appeal to the State Livestock Facility Siting Review Board shall comply with Sec. 93.90 of Wis. Statutes and administrative rules of said board.

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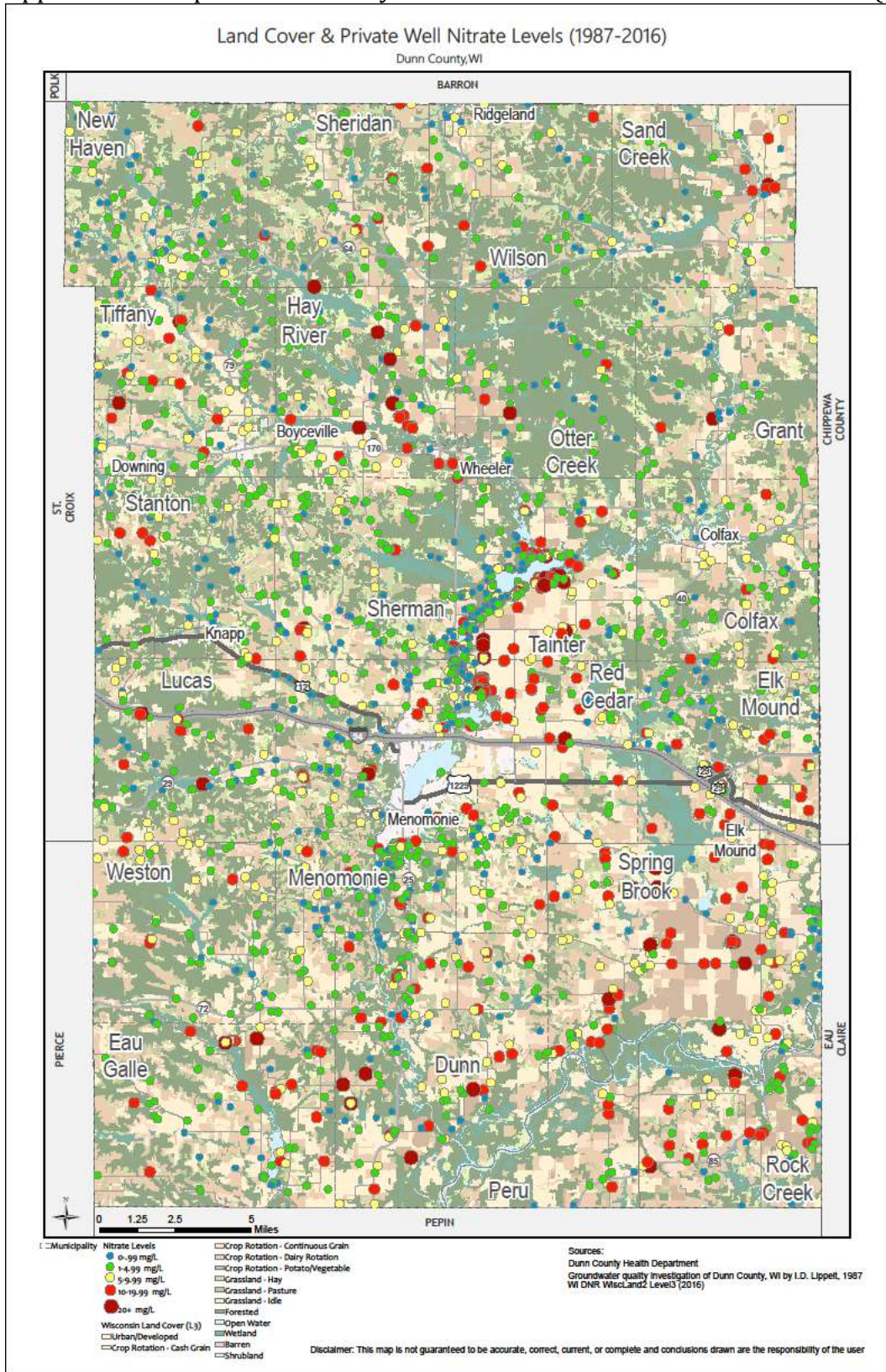
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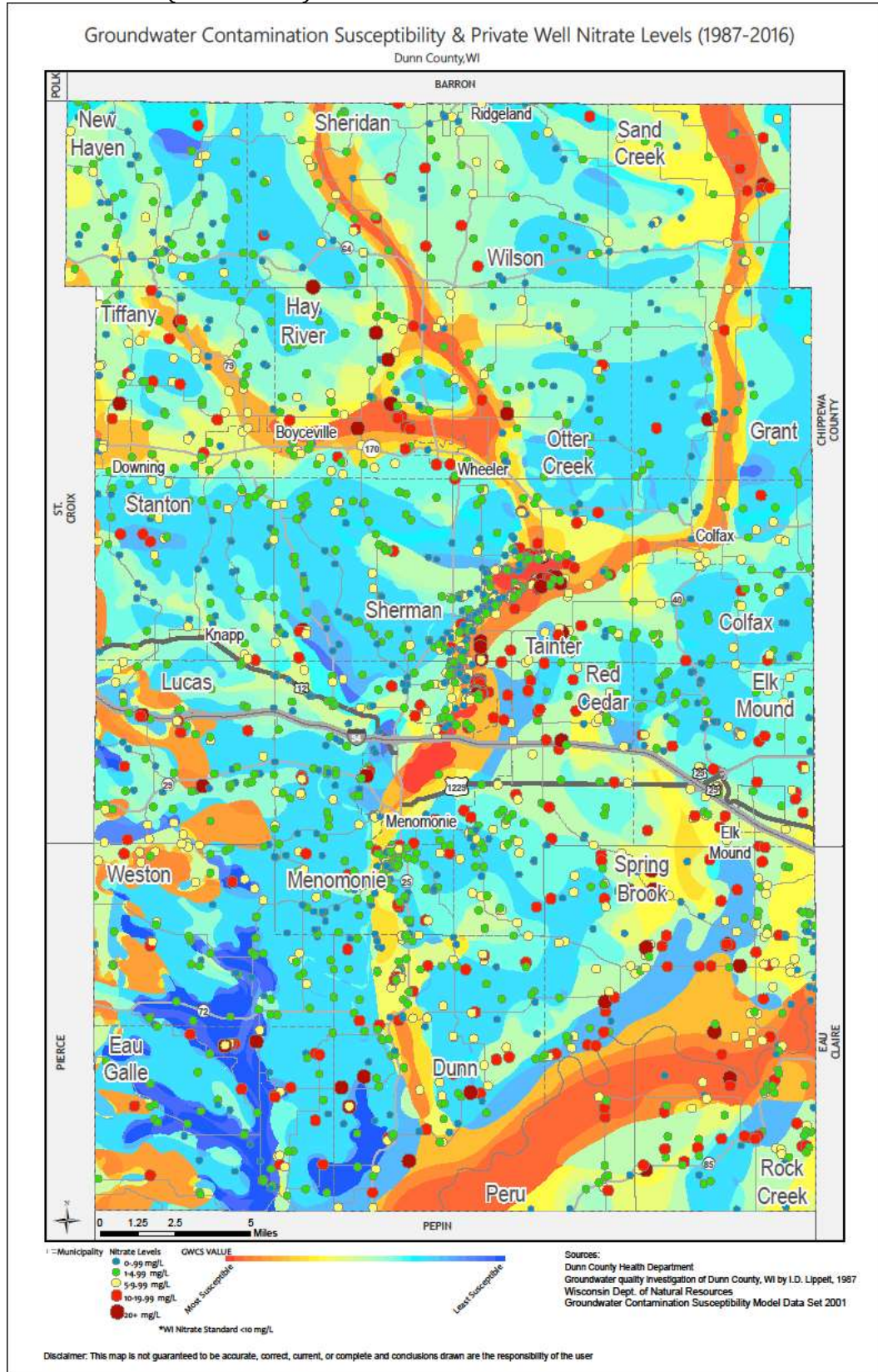
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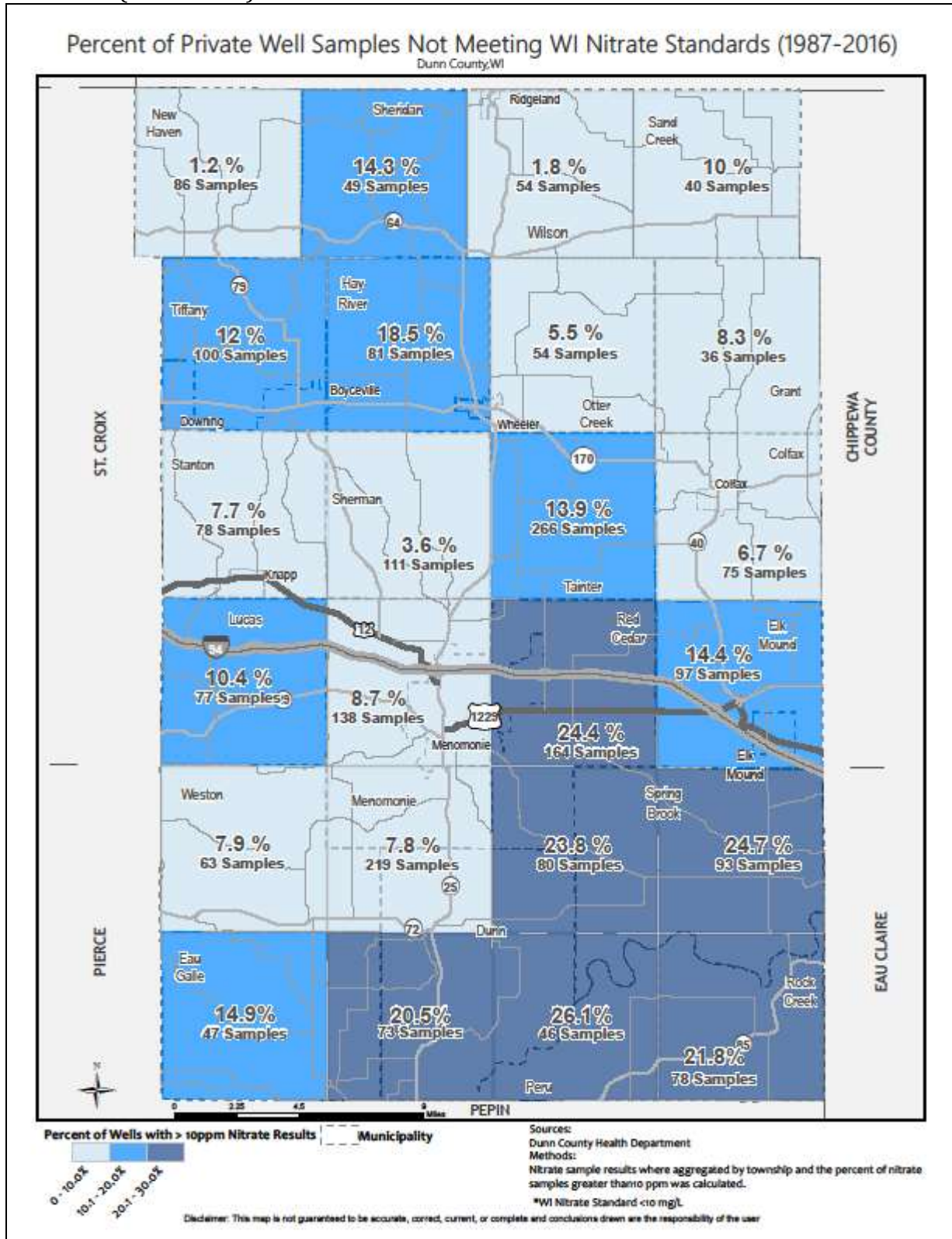
Appendix H: Map of Dunn County Land Cover & Private Well Nitrate Levels (1987-2016)



Appendix I: Dunn County Groundwater Contamination Susceptibility & Private Well Nitrate Levels (1987-2016)



Appendix J: Dunn County Percent of Private Well Samples Not Meeting WI Nitrate Standards (1987-2016)



Appendix K: Dunn County Agriculture Trends



DUNN COUNTY AGRICULTURE AND LIVESTOCK TRENDS FOR THE LIVESTOCK OPERATIONS STUDY GROUP

Dunn County General Farm Trends

Definition of a Farm: The U.S. Census of Agriculture defines a farm as "any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year."

of Farms and Acreage

	1997	2002	2007	2012	# change	% change
Number of Farms	1,397	1,683	1,690	1,404	7	0.5%
Acres of Land In Farms	368,618	398,768	382,545	372,259	3,641	1.0%
Acres (%) of Ag Land Rented from Others	55,223 (15.0%)	74,652 (18.7%)	86,292 (22.6%)	97,377 (26.2%)	42,154	76.3%
Average Farm Size In Acres	264	237	226	265	1	0.4%
Median Farm Size in Acres	163	154	105	122	-41	-25.2%
Cropland						
Farms w/Crops	1,308	1,538	1,498	1,231	-77	-5.9%
Cropland Acres	234,530	254,868	250,764	252,539	18,009	7.7%
Acres Grain Corn	73,054	71,782	82,841	104,508	31,454	43.1%
Acres Silage Corn	13,476	11,758	13,776	11,732	-1,744	-12.9%
Acres Soybeans	19,760	37,265	39,952	54,992	35,232	178.3%
Acres Forage	79,605	65,545	58,448	46,554	-33,051	-41.5%
Irrigated Acres	13,425	25,890	29,335	36,300	22,875	170.4%

Source: USDA, National Agricultural Statistics Service

of Farms by Size

	1997	2002	2007	2012	# change	% change
1 to 9 acres	31	48	64	50	19	61.3%
10 to 49 acres	169	317	391	287	118	69.8%
50 to 179 acres	525	680	673	579	54	10.3%
180 to 499 acres	514	473	397	320	-194	-37.7%
500 to 999 acres	118	108	110	97	-21	-17.8%
1,000 acres or more	40	57	55	71	31	77.5%

Source: USDA, National Agricultural Statistics Service



of Farms with Cattle or Calves by Inventory (excludes sales)

Herd Size	2002		2012		# change	
	farms	head	farms	head	farms	head
1 to 9	169	851	138	698	-31	-153
10 to 19	108	1,479	105	1,479	-3	0
20 to 49	181	5,642	157	4,859	-24	-783
50 to 99	150	10,966	94	6,579	-56	-4,387
100 to 199	143	19,332	92	12,535	-51	-6,797
200 to 499	56	15,800	47	13,379	-9	-2,421
500 or more	10	7,571	27	23,466	17	15,895
Totals	817	61,641	660	62,995	-157	1,354
Beef Cows	357	5,208	356	5,776	-1	568
Milk Cows	323	22,189	199	21,222	-124	-967
Other Cows	763	34,244	599	35,997	-164	1,753

Source: USDA, National Agricultural Statistics Service; "Other Cows" include heifers not calved, steers, calves, and bulls

According to the Wisconsin 2016 Agricultural Statistics:

- Dunn County had an estimated 63,000 cattle and calves in 2016.
- Dunn County had an estimated 19,800 milk cows in 2015.

of Farms with Poultry Inventory (excludes sales)

Poultry Type	2002		2012		# change	
	farms	head	farms	head	farms	head
Layers	102	4,519	132	4,328	30	-191
Pullets	11	68	6	84	-5	16
Broilers	16	1,367	26	914	10	-453
Turkeys	6	n.a.	9	n.a.	3	n.a.
Ducks, geese, other	41	n.a.	43	n.a.	2	n.a.
Total Farms	123	n.a.	152	n.a.	29	n.a.

Source: USDA, National Agricultural Statistics Service

- Data for poultry can include multiple sites under a single farm owner, which can "skew the numbers" over time.
- Only layers are available by inventory "herd size."



of Farms with Hogs and Pigs by Inventory (excludes sales)

Herd Size	2002		2012		# change	
	farms	head	farms	head	farms	head
1 to 24	24	202	21	n.a.	-3	n.a.
25 to 49	4	139	2	n.a.	-2	n.a.
50 to 99	10	700	3	217	-7	-483
100 to 199	3	320	-	-	-3	-320
200 to 499	4	1390	-	-	-4	-1,390
500 to 999	-	-	-	-	-	-
1,000 or more	3	7844	2	n.a.	-1	n.a.
Totals	48	10595	28	2,795	-20	-7,800

Source: USDA, National Agricultural Statistics Service

Treated Agricultural Land

Treatment Type	Acres			
	1997	2012	# change	% change
Fertilizer, Total	160,995	180,377	19,382	+12.0
Fertilizer, Manure	n.a.	41,455	n.a.	n.a.
Chemical, Fungicide	3,363	16,299	12,936	+384.7%
Chemical, Herbicide	99,793	186,263	86,470	+86.6%
Chemical, Insecticide (exclude nematocides)	32,884	48,051	15,167	+46.1%
Chemical, Insecticide (nematocides)	2,787	12,352	9,565	+343.2%
Chemical, Other	6,222	2,541	-3,681	-59.2%

Source: USDA, National Agricultural Statistics Service



Dunn County Farm Land Values, Income, and Sales

In 2015, Dunn County had...

- \$38,431,100 in equalized assessed value of Agricultural lands and \$83,522,400 in assessed Agricultural Forest, excluding buildings.
- \$13,751,800 in equalized assessed value of "Other" lands and \$145,062,100 of "Other" improvements, which consists of buildings and improvements on a farm.

In 2012, Dunn County had...

- The average per farm estimated market value of land and buildings was \$879,304.
- The average per farm estimated market value of all machinery and equipment was \$141,909.
- 54% of farm operators had a primary occupation other than farming.
- Net cash farm income was \$78,850,000 (or \$56,161 per farm), which includes sales, government payments, and other income less expenses, excluding depreciation.
- Market value of all agricultural products sold was \$283,183,000, including \$128.7 million from crops and \$134.5 million from livestock and their products.

of Farms by Value of Sales

Value of Sales	1997	2002	2007	2012	# change	% change
less than \$2,500	558	747	793	460	-98	-17.6%
\$2,500 to \$9,999	294	261	279	208	-86	-29.3%
\$10,000 to \$24,999	179	180	147	173	-6	-3.4%
\$25,000 to \$49,999	162	112	99	117	-45	-27.8%
\$50,000 to \$99,999	168	121	65	116	-52	-31.0%
\$100,000 to \$249,999	251	168	159	121	-130	-51.8%
\$250,000 to \$499,999	65	62	90	102	37	56.9%
\$500,000 or more	24	32	58	107	83	345.8%
Total Farms	1,701	1,683	1,690	1,404	-297	-17.5%

Source: USDA, National Agricultural Statistics Service

Direct Sales of Agricultural Products to Individuals

Treatment Type	1997 and 2012			
	1997	2012	# change	% change
# of Farms	99	130	31	31.3%
Estimated Value of Products Sold	\$440,000	\$732,000	\$292,000	66.4%

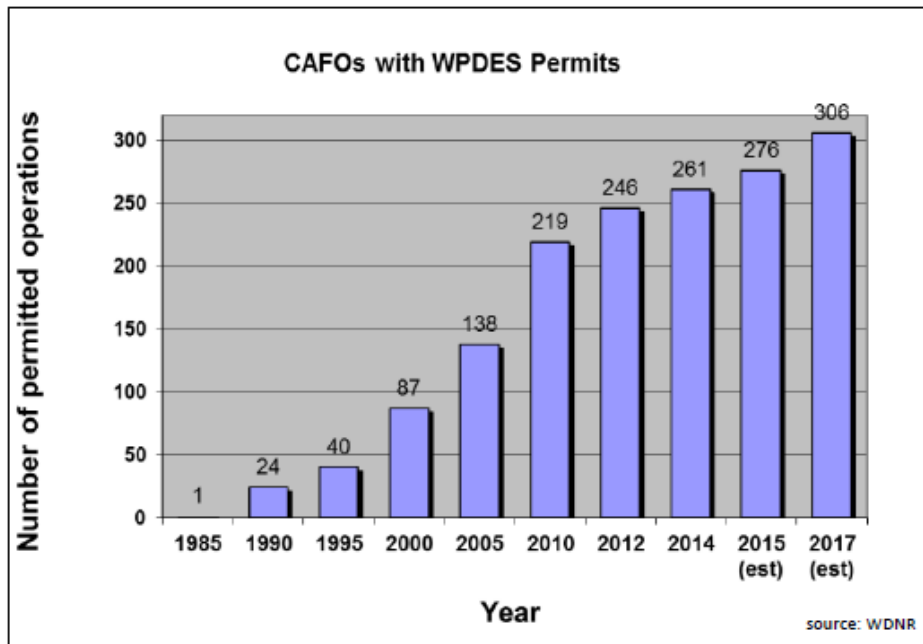
Source: USDA, National Agricultural Statistics Service



Concentrated Animal Feeding Operations (CAFOs)

A Wisconsin animal feeding operation with 1,000 animal units or more is a large Concentrated Animal Feeding Operation (CAFO). The DNR may designate a smaller-scale animal feeding operation (fewer than 1,000 animal units) as a CAFO if it has pollutant discharges to navigable waters or contaminates a well.

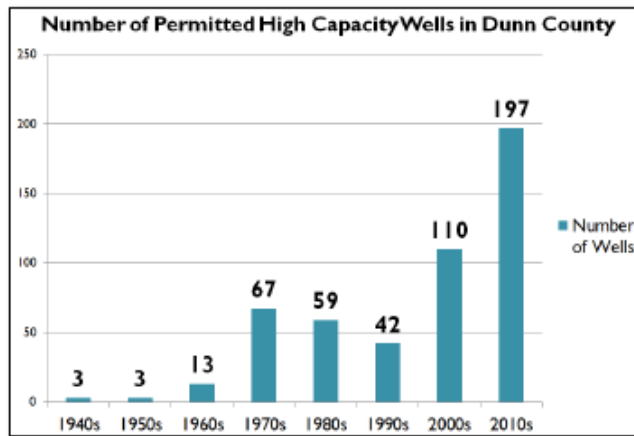
- There are currently five CAFOs permitted in Dunn County, all dairy operations, with a sixth proposed. Additionally, a number of turkey farms in the County fall under a single Jennie-O Turkey Store, Inc. permit, which is based in Barron.
- Since 2000, the number of CAFOs in Wisconsin has grown by 235%. Recently, WDNR has been receiving about 15 CAFO applications per year, mostly for dairy.



High Capacity Wells

Definition of High Capacity Well: means one or more wells, drillholes, or mine shafts used or to be used to withdraw water for any purpose on one property, if the total pumping or flowing capacity of all wells, drillholes, or mine shafts on one property is 70 or more gallons per minute (100,000 gallons per day) based on the pump curve at the lowest system pressure setting, or based on the highest flow rate from a flowing well or wells.

- There were 7 applications for high capacity wells in Dunn County in 2016.
- Currently, about 500 high capacity wells have been permitted in Dunn County. Of these, 410 wells have reported withdrawals in 2013, 2014, or 2015. In 2015, 364 wells reported withdrawals.
- In 2015, 4.7 billion gallons of ground-water were withdrawn by high capacity wells in Dunn County.
- Reported total high capacity well withdrawals can vary significantly by year. For example, 9.8 billion gallons were withdrawn in 2013. The 2013 number includes 5.7 billion of additional gallons used for irrigation compared to 2015 irrigation withdrawals.

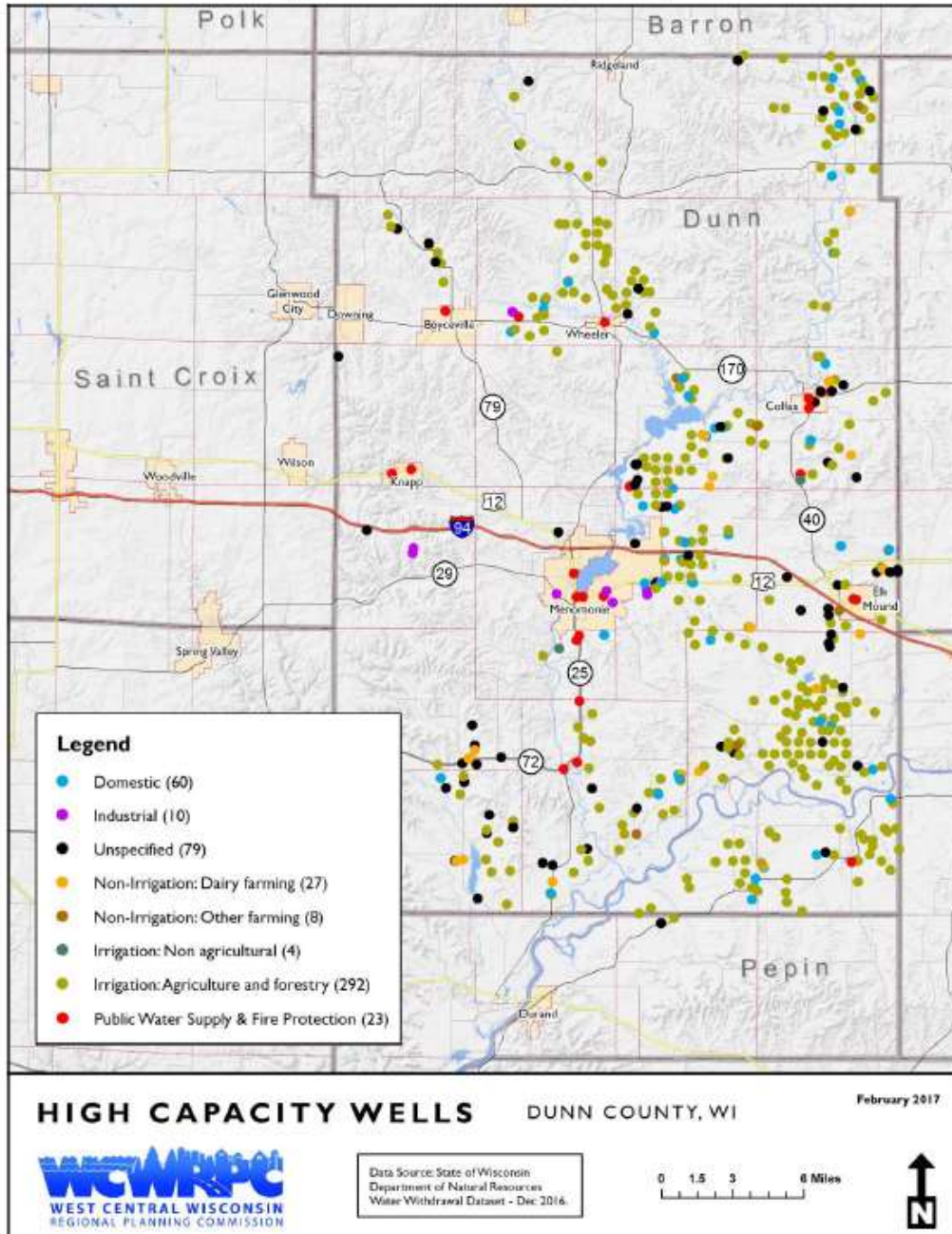


2015 High Capacity Well Annual Withdrawals (for wells with reported withdrawals)

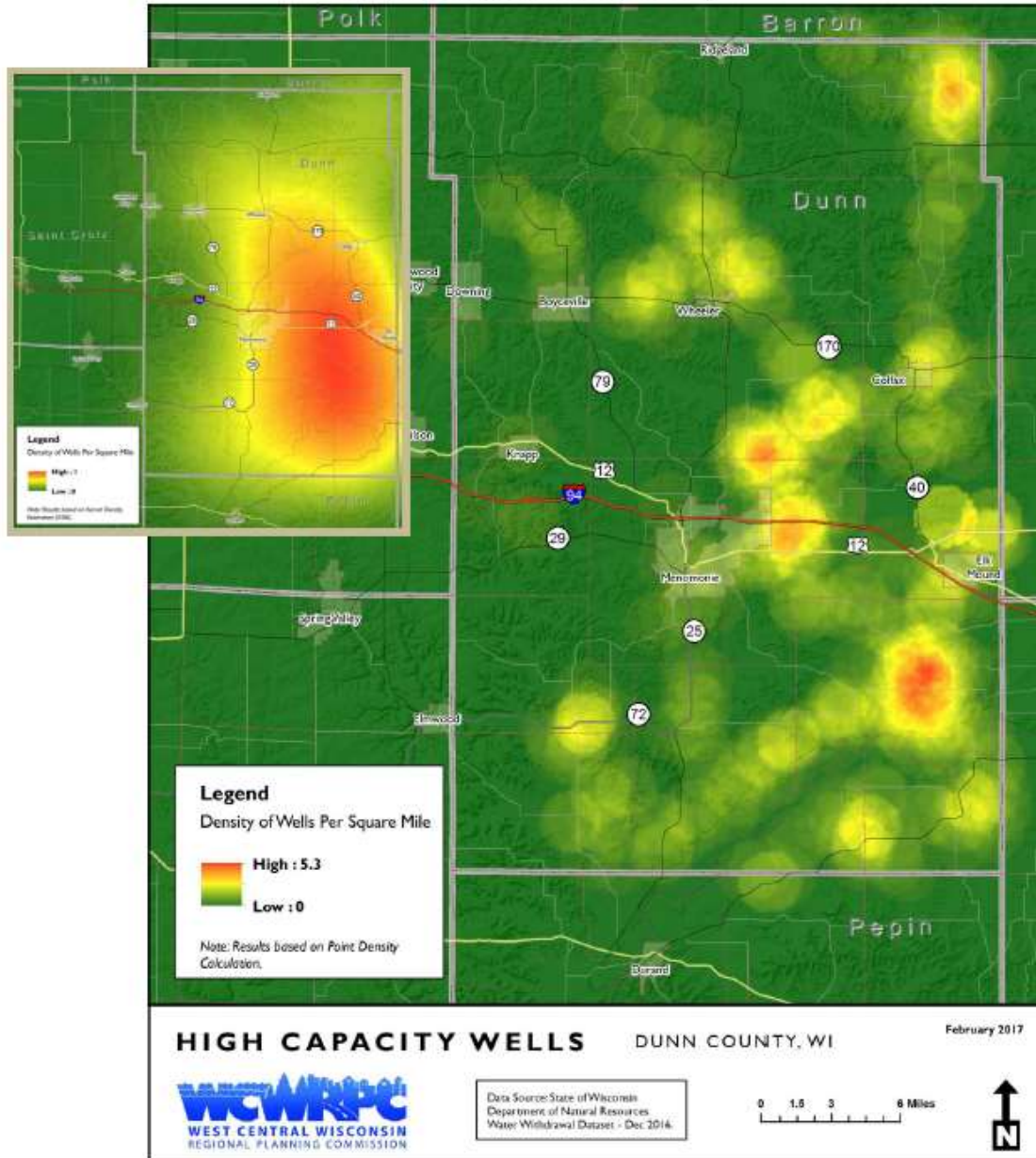
Use	# of Wells	% of Wells	Annual Gallons	% of Gallons
Domestic	28	7.7%	2,639,840	0.1%
Industrial	10	2.7%	404,897,474	8.6%
Non-Irrigation: Dairy Farming	22	6.0%	94,808,945	2.0%
Non-Irrigation: Other Farming/Aquaculture	5	1.4%	128,049,210	2.7%
Irrigation: Non-Agricultural	4	1.1%	21,471,540	0.5%
Irrigation: Agricultural & Forestry	273	75.0%	3,177,180,018	67.1%
Public Water Supply & Fire Protection	22	6.0%	905,750,130	19.1%
Totals	364	100%	4,734,797,157	100%

Source: WDNR Water Withdrawal Dataset, Dec 2016

High Capacity Well Distribution (permitted wells through 2015)



High Capacity Well Concentrations (permitted wells through 2015)



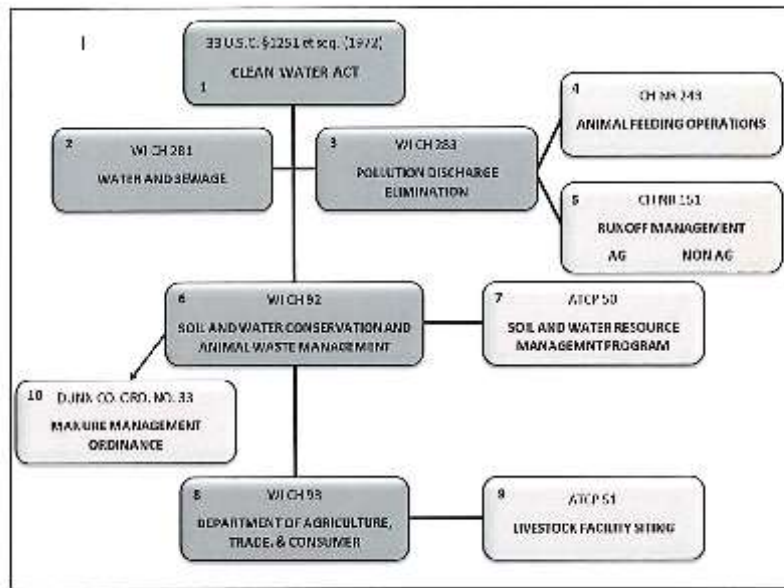
Appendix L: Relevant Livestock Facility Compliance and Case Law

for the Dunn County Livestock Operations Study Group
WCWBPC, 4/14/17

This supplemental overview was prepared for the Dunn County Livestock Operations Study Group (LOSG) in the context of their 2016-2017 study effort. Generally, this overview does not attempt to fully summarize or repeat the LOSG's previous presentations and discussions on the topics herein.

Existing Laws, Rules, and Standards Previously Discussed by the LOSG

- Federal Clean Water Act (Sec 502 Animal Feeding Operations, Section 303c)
- Federal Safe Drinking Water Act (10 ppm nitrate standard)
- Wisconsin Livestock Facility Siting Law (ATCP 51; includes odor)
- WPDES Permits for CAFOs (NR 243, NR 151)
- Wisconsin Soil & Water Conservation Laws (Wis. Stats. § 92.11 and § 92.15(3)(a))



graphic from Dunn County Land & Water Conservation

- Dunn County Manure Management Ordinance and State codes related to waste and biosolids (NR 214, NR 204, NR 113, NR 151, NR 243)
- NRCS 590 Nutrient Management and NRCS 313 Waste Storage Facility Standards
- State Public Health Enabling Regulations (Wis. Stats. § 59.03, 59.70, 254.51, 254.59)
- Dunn County Human Health Hazard Ordinance
- Wisconsin NR 445 – Control of Hazardous Air Pollutants
- Dunn County Comprehensive Plan and Zoning Ordinance (and shoreland, floodplain, & wetland rules), as well as any city, village, and town plans and ordinances
- Red Cedar River Watershed Plan and Tainter Lake/Lake Menomin TMDL
- Transportation regulations (driveways/access, weight limits, IOH, TIA, ROW use)
- Some other potentially related rules: high capacity well permitting (NR 812), wellhead protection, stormwater management/erosion control, Federal Clean Air Act

This document does not constitute legal advice.

for the Dunn County Livestock Operations Study Group
WCVIRPC, 4/14/17

Wisconsin's Right-to-Farm Law (Wis. Stats. § 823.08)

- Directs the courts to give favor to agriculture in certain disputes. Provide farmers with protection for lawsuits for the normal consequences of an agricultural activity, such as odors, noise, dust, flies, and slow-moving vehicles.
- The agricultural use is not a nuisance if: (1) the use began before the plaintiff "came to the nuisance" and (2) the agricultural use does not present a substantial threat to public health or safety. To be a nuisance, an activity or use must be unreasonable and cause significant harm.
- The Law does not address changes in the scale or intensity of an agricultural use.

Livestock Facility Siting & CAFO Compliance History

Livestock Facility Site Law Compliance History

Currently, local governments have reported 150 active permits to DATCP under Wisconsin's Livestock Facility Siting Law. Nearly 90 percent of the permitted facilities were dairy operations. The Facility Siting Law is enforced locally; State-level compliance data is not available. According to Chris Clayton, DATCP:

- No facility having filed a complete application to a local government for a siting permit has been denied. A complete application is presumed to be in compliance. In Taylor County, one facility failed to obtain a siting permit, but they also failed to obtain other necessary permits such as a manure storage permit and possibly a CAFO permit. That facility was proposing to locate at a very challenging site that presented numerous issues.
- Of all the siting permits issued, not one has been revoked.

Though no permits have been revoked, this does not mean there has been full compliance. Nutrient management and storage compliance issues are not uncommon. For example, one Wisconsin county recently reported to DATCP that all seven of their facilities have had problems with nutrient management, with three farms having "problems beyond minimal issues." Counties have also reported that annual reporting deadlines are sometimes missed. Odor complaints are also not uncommon, though the operations may be in compliance. Some counties are struggling with limited resources to monitor or enforce compliance.

Perhaps a more important question is how many local governments with siting authority routinely monitor compliance at permitted facilities? DATCP speculates that this number is relatively low. The State's four-year review of the Siting Law encourages improved local monitoring and suggests using compliance checklists.

CAFO-WPDES Compliance History

Wisconsin DNR has been receiving about fifteen CAFO applications per year and anticipates there will be over 300 CAFOs with WPDES permits before the end of 2017.

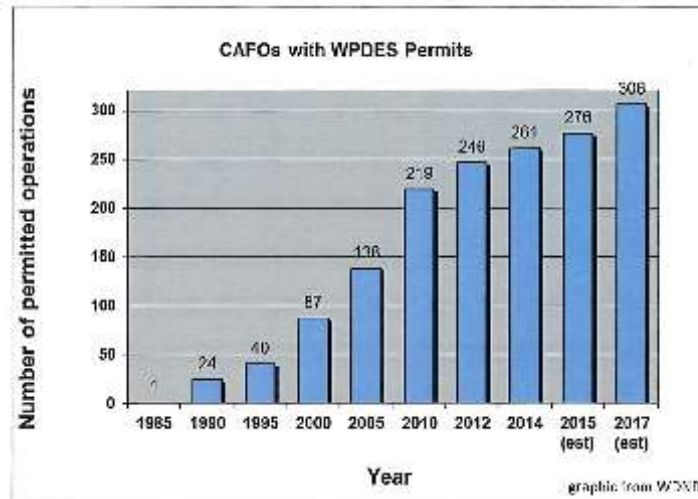
According to data provided by WDNR, from January 2014-December 2016, there were 148 WPDES permit violations at 101 CAFOs or other livestock operations with a WPDES permit; nine (9) violations were at facilities that had not yet been permitted. Seventeen (17) violations were referred or in the process of being referred to the Department of Justice.

This document does not constitute legal advice.

for the Dunn County Livestock Operations Study Group
WCVBPC, 4/14/17

The following are the primary WPDES permit violation types from January 2014-December 2016:

- 1 land application and production site discharge violation
- 46 land application violations
- 42 production site violations
- 42 production site discharge/issue violations
- 60 reporting and approval violations



Environmental Analysis as part of a CAFO WPDES Permit

WDNR conducts environmental analysis in compliance with Chapter NR 150 for the issuance, reissuance, revocation and reissuance, or modification of an individual WPDES permit for a CAFO. CAFO permitting falls under NR 150.20(2) *Integrated Analysis Actions*, which means that the environmental analysis is built into the WPDES permit review and approval process; a separate environmental analysis process is not required. For individual CAFO permits, this is primarily accomplished through WDNR review of a standard environmental analysis questionnaire that applicants must complete and provide with their application.

For certain projects, WDNR may require a more robust Environmental Impact Report (EIR) under Wis. Stats. §23.11(5). There have been instances where the applicant has requested an EIR be prepared. Due to the magnitude or complexity of a specific CAFO WPDES permit application, WDNR has decided to follow the more comprehensive Environmental Impact Statement (EIS) process under NR 150.20(4)(b) and NR 150.30 on a very limited number of occasions. This is a case-by-case decision; an EIS is never required for a CAFO WPDES permit.

A Summer 2016 Legislative Audit Bureau report was very critical of WDNR enforcement of WPDES permits, including the following findings:

- WDNR only issued violation notices in 33 of 558 instances serious enough for such citations under DNR policies between 2005 and 2015. Policy enforcement has been inconsistent.
- In many years, inspection goals were being met for fewer than half of the sites. Some inspections were occurring after permits had already been issued.
- There was insufficient time for WDNR to review annual compliance reports, with only 36 of 1,900 CAFO reports electronically recorded as being received. Some permits were administratively extended for years without proper review due to a backlog and staff do not have time to thoroughly monitor.

This document does not constitute legal advice.

for the Dunn County Livestock Operations Study Group
WCWRPC, 4/14/17

- Heavy workloads and high turnover in WDNR employees may have contributed to inaction when excessive toxins were detected in monitoring wells at five CAFOs. In three cases, the WDNR was still evaluating the situation as many as 11 years after pollutants were found.

WDNR has been taking action to address the above audit findings, and it is important that Leah Nicol's presentation to the Livestock Operations Study Group on WDNR staffing increases be considered in the context of the above audit findings.

The previous information should not be used to make comparisons between CAFOs and smaller livestock operations regarding regulatory compliance. CAFOs and other livestock operations with a WPDES permit are typically more highly regulated and more closely monitored than operations without such a permit.

Livestock Facility & CAFO Case Law and Legal Actions

Livestock Facility Siting Review Board Decisions

Appeals of local siting decisions can be made to the State Siting Review Board. Reviews can be made on the grounds that the local jurisdiction incorrectly applied State standards based on evidence in the local record. To date, there have been eight such appeals to the Board, which included the following important insights:

- The Board can only review a local decision made on an application, not determine an application's completeness. (Larson Acres, Inc. v. Town of Magnolia, 2006)
- The Board reversed conditions imposed by the Town. Due to high nitrate levels in groundwater, the Town granted a siting permit with seven conditions, including that the town be allowed to conduct monthly water tests on the land and the farmer follow certain crop-rotation strategies. The applicant appealed to the Board. The Board's decision was upheld by the WI Supreme Court in 2012. (Larson Acres, Inc. v. Town of Magnolia, 2007; Adams v. Wisconsin LFSR Bd, 2012)
- The Board will uphold or overturn permits and permit decisions based on nutrient management calculations and plans, such as the accuracy of calculations and the exclusion of the amount of land available to spread projected manure. (Stadler v. Crawford County, 2008; Audrey Van Dyke v. Racine County, 2008)
- The Board has affirmed a permit on the grounds that inconsistencies in the plan did not overcome the presumption of compliance created by the checklist. (Audrey Van Dyke v. Racine County, 2009)

Legal Actions and Decisions

The following are some of the most recent, notable actions regarding CAFOs and livestock facilities in Wisconsin. This is not a comprehensive list, nor is it a robust summary of all pertinent legal actions and case law that would apply. In some other instances, legal action had commenced, but was dropped or settled prior to a court decision. The following is intended to make the Livestock Operation Study Group (LOSG) generally aware of some of the key legal actions for planning purposes, not provide a legal opinion or determine a course of action. Additional research and the opinion of legal counsel are strongly recommended before making policy decisions on any related matters.

This document does not constitute legal advice.

for the Dunn County Livestock Operations Study Group
WCWRPC, 4/14/17

Year	Case/Action	Summary
2001	Maple Leaf Farms v. WDNR (Racine Co.)	The Wisconsin Court of Appeals held that the Wisconsin legislature has "clearly and unambiguously" given the DNR authority to regulate off-site landspreading of manure. A concentrated animal feeding operation (CAFO) under s. 283.01 (12) includes not only where the animals are confined, but also the equipment that applies the animal waste to fields outside the confinement area, whether the fields are owned by the CAFO operator or others. Any overapplication of manure by the operator is a discharge under s. 283.01 (5) whether because of runoff to surface waters or percolation to groundwater. DNR has authority to regulate discharges from overapplication of manure from a CAFO regardless of whether the discharge occurs on land owned by the CAFO.
2005	Waterkeeper Alliance, et. al. v. U.S. EPA (Federal)	Some notable findings from the U.S. Court of Appeals include: <ul style="list-style-type: none"> • Upheld EPA's authority to regulate through NPDES permits the runoff to the waters of the U.S. containing manure that CAFOs have applied to crop fields. • Upheld the EPA's determination that runoff of manure qualifies as "agricultural storm water" (which is exempt from certain regulations) only where the CAFO has applied the manure to its crops at rates that represent "appropriate agricultural utilization" of the manure nutrients. • The Court vacated rules that allow permitting authorities to issue permits to CAFOs without including the terms of the NMP in the permit and without the NMP being reviewed by the permitting agency and available to the public. The NMP's terms are "effluent limitations" that must be made part of the permit.
2008	State of Wisconsin, et. al. v. Zawistowski, et. al. (Sawyer Co.)	Wisconsin's Right-to-Farm Law upheld by Wisconsin Court of Appeals, including compensation to defendant for legal fees
2012	Adams v. WI Livestock Facility Siting Board, 2012 WI 85 (Rock Co.)	Supreme Court affirmed the LFSRB decision in the 2007 Larson Acres v. Town of Magnolia appeal by the applicant; see second bullet in LFSB decisions above. This case upheld the State's legal framework for facility siting and established precedent for the LFSRB's role. The Supreme Court decision stated that: <i>"Our decision does not leave political subdivisions without recourse against polluters. Most importantly, political subdivisions retain authority to bring nuisance abatement actions against polluting farms. See Wis. Stats. § 823.01. More generally, this decision does not speak to political subdivisions' ability to regulate livestock facility operations. It simply says that the legislature has forbidden them from regulating livestock facility siting except as permitted by the Siting Law."</i>

This document does not constitute legal advice.

Appendix M: Large-scale Livestock Facility Moratorium Ordinance

ORDINANCE NO. _____

**Imposing a Moratorium on Expansion and Creation
of Large-Scale Livestock Facilities Pending Study**

NOW, THEREFORE, The Board of Supervisors of the County of Dunn does hereby ordain as follows:

Section 1. Legislative Findings

The Dunn County Comprehensive Land Use Plan 2010–2030, as amended in 2016, identifies the following concerns, among others, as integral to protection and preservation of farmland and agricultural use areas: Preservation of prime farmlands and limited areas of agricultural production; Protecting the environment and the important natural resources of Dunn County; Preservation of wildlife habitat; Maintaining groundwater recharging areas; Implementation of conservation compliance to ensure agricultural land use is always sensitive to surface waters and other natural resource areas; Separation of agricultural uses from residential development.

The Dunn County Comprehensive Zoning Ordinance may not may not adequately address the protection of surface and groundwater and other natural resources and the health, safety and welfare of Dunn County residents as a result of large livestock facilities. It is critical that all necessary and appropriate safeguards be in place before additional large livestock facilities commence or expand.

Section 2. Authority

This ordinance is adopted pursuant to the powers granted under Wisconsin Constitution, and Wisconsin Statutes including but not limited to Sections 59.02(2) and 59.69.

Section 3. Purposes

The purposes of this ordinance are as follows:

1. To allow Dunn County to investigate the impacts of large-scale livestock facilities on groundwater, surface water and air quality, specifically as those issues apply in Dunn County.
2. To allow Dunn County adequate time to review current ordinances and study, review, consider and determine whether amendment of existing ordinances and/or creation of a Livestock Facilities Zoning Ordinance or other ordinance applicable in all unincorporated areas within Dunn County is required to protect the public health, safety and welfare of the residents of Dunn County and the quality of land, air and water resources of Dunn County.
3. To determine whether it has adequate staff and resources to administer and enforce any new or existing ordinance applicable to livestock facilities.
4. To allow unzoned Towns within Dunn County the opportunity to consider enacting zoning or other regulatory ordinances or adopt County zoning.

Section 4. Definitions

1. “Expansion” means an increase of 20% or greater in the number of animals fed, confined, maintained, or stabled.
2. “Livestock facility” means a feedlot, dairy farm or other operation where livestock are or will be fed, confined, maintained or stabled for a total of 45 days or more in any 12-month period. A “livestock facility” includes all of the tax parcels of land on which the facility is located, but does not include pasture or winter grazing area. Related livestock facilities are collectively

treated as a single “livestock facility,” except that an operator may elect to treat a separate species facility as a separate “livestock facility.”

3. “Related livestock facilities” means livestock facilities that are owned or managed by the same person, and related to each other in at least one of the following ways:
 - (a) They are located on the same tax parcel or adjacent tax parcels of land.
 - (b) They use one or more of the same livestock structures to collect or store manure.
 - (c) At least a portion of their manure is applied to the same land spreading acreage.
4. “Separate species facility” means a livestock facility that meets all of the following criteria:
 - (a) It has only one of the following types of livestock, and that type of livestock is not kept on any other livestock facility to which the separate species facility is related under sub. 3:
 1. Cattle.
 2. Swine.
 3. Poultry.
 4. Sheep.
 5. Goats.
 - (b) It has no more than 500 animal units.
 - (c) Its livestock housing and manure storage structures, if any, are separate from the livestock housing and manure storage structures used by livestock facilities to which it is related under sub. 3.
 - (d) It meets one of the following criteria:
 1. Its livestock housing and manure storage structures, if any, are located at least 750 feet from the nearest livestock housing or manure storage structure used by a livestock facility to which it is related under sub. 3.
 2. It and the other livestock facilities to which it is related under sub. 3 have a combined total of fewer than 1,000 animal units.

Section 5. Moratorium Imposed

The Dunn County Board of Supervisors hereby imposes a moratorium on the establishment of all new livestock facilities that will have 1,000 or more animal units, the expansion of currently existing livestock facilities if the number of animal units kept at the expanded facility will be 1,000 or more, and new or altered manure storage facilities for such livestock facilities, except as provided in Section 6 of this ordinance.

Section 6. Exception

The moratorium imposed herein shall not apply to existing facilities not currently expanding herd size, applicants who have submitted permit applications to establish or expand a livestock facility of 1000 or more animal units and for manure management before the effective date of the moratorium that are determined to be in complete conformity with all state and county legal requirements in effect as of the date of applications. Any subsequent expansion not included in such applications shall be subject to the moratorium.

Section 7. Duration of Moratorium

This moratorium shall be in effect for a period of six (6) months from the date this ordinance is passed by the County Board of Supervisors unless the County Board of Supervisors rescinds this moratorium at an earlier date, or until the Action and Study contemplated by Section 8 of this ordinance is complete and the County Board of Supervisors adopts amendments to the Dunn County Comprehensive Zoning Ordinance, creates an ordinance applicable in all unincorporated areas within Dunn County, or rescinds this moratorium.

Section 8. Action and Study During Moratorium

The Dunn County Board of Supervisors hereby creates a special study group which shall be known as the "Livestock Operations Study Group," and which shall consist of the following persons:

- The Planning, Resources and Development Committee
- The Chair of the Health and Human Services Board or his or her designee from membership of that Board.
- The County Planner/Zoning Administrator
- The County Land and Water Conservationist
- A representative from the UW-Extension System
- At least six (6) interested Dunn County residents and property owners, at least three (3) of whom shall be employed or engaged in farming whose main income is derived from livestock production, to be appointed by the County Board Chair.

Issues considered by the Livestock Operations Study Group shall include, but are not limited to:

- A. Researching, gathering, analyzing and synthesizing scientific literature regarding the impact of livestock facilities of 1000 or more animal units on groundwater, surface water, air quality, and public health and safety, specifically as these issues apply to Dunn County;
- B. Identifying areas where new regulations may be needed, where current regulations need to be modified, and where enforcement of current regulations is inadequate and are needed to protect public health or safety;
- C. Proposing solutions to mitigate problems and/or shortcomings identified in the report. Examples of county-level regulations could be, but are not limited to:
 - 1) Adoption of a manure storage ordinance, and requirements related to a certificate of use for storage facilities operated within the county,
 - 2) Implementation of State performance standards to address gaps in the livestock siting ordinance including standards related to processing wastewater, tillage setback, and phosphorus index,
 - 3) Adoption of zoning measures to create special zones for livestock facilities of 1,000 or more animal units, and
 - 4) Adoption of a Livestock Operations Ordinance.

The Livestock Operations Study Group is authorized expend up to \$12,700.00 in order to fulfill its responsibilities and may engage a qualified individual to conduct research and analysis of scientific literature. Additional funds if needed must be approved by a majority of the Committee on Administration.

The Livestock Operations Study Group shall report its recommendations on appropriate county-level regulatory approaches relative to the siting and/or operation of livestock facilities, including livestock facilities of 1000 or more animal units within Dunn County to the full Dunn County Board of Supervisors at least 30 days prior to the end of the moratorium adopted pursuant to this ordinance or as soon as the Committee has developed recommendations based upon its research, whichever comes soonest.

Section 9. Severability

If any section, sentence, clause or phrase of this ordinance should be held to be invalid or unconstitutional by a court of competent jurisdiction, the remainder of this ordinance shall not be affected thereby.

Section 10. Effective Date

This ordinance shall take effect upon passage and publication as provided by law. This ordinance shall not be codified.

Offered this 19th day of October, 2016, at Menomonie, Wisconsin.

Enacted on: _____

OFFERED BY THE PLANNING, RESOURCES
AND DEVELOPMENT COMMITTEE:

Published on: _____

ATTEST:

Thomas Quinn, Chair

Julie A. Wathke, County Clerk

COUNTERSIGNED:

Approved as to Form and Execution:

Nicholas P. Lange, Corporation Counsel

Steven Rasmussen, Chair
Dunn County Board of Supervisors

Appendix N: Moratorium reinstated

ORDINANCE NO. _____

**Imposing a Moratorium on Expansion and Creation of Large-Scale Livestock Facilities
Pending Study**

NOW, THEREFORE, The Board of Supervisors of the County of Dunn does hereby ordain as follows:

Section 1. Legislative

Findings The Dunn County Comprehensive Land Use Plan 2010–2030, as amended in 2016, identifies the following concerns, among others, as integral to protection and preservation of farmland and agricultural use areas: Preservation of prime farmlands and limited areas of agricultural production; Protecting the environment and the important natural resources of Dunn County; Preservation of wildlife habitat; Maintaining groundwater recharging areas; Implementation of conservation compliance to ensure agricultural land use is always sensitive to surface waters and other natural resource areas; Separation of agricultural uses from residential development. The Dunn County Comprehensive Zoning Ordinance may not may not adequately address the protection of surface and groundwater and other natural resources and the health, safety and welfare of Dunn County residents as a result of large livestock facilities. It is critical that all necessary and appropriate safeguards be in place before additional large livestock facilities commence or expand.

Section 2. Authority

This ordinance is adopted pursuant to the powers granted under Wisconsin Constitution, and Wisconsin Statutes including but not limited to Sections 59.02(2) and 59.69.

Section 3. Purposes

The purposes of this ordinance are as follows:

1. To allow Dunn County to investigate the impacts of large-scale livestock facilities on groundwater, surface water and air quality, specifically as those issues apply in Dunn County.
2. To allow Dunn County adequate time to review current ordinances and study, review, consider and determine whether amendment of existing ordinances and/or creation of a Livestock Facilities Zoning Ordinance or other ordinance applicable in all unincorporated areas within Dunn County is required to protect the public health, safety and welfare of the residents of Dunn County and the quality of land, air and water resources of Dunn County.
3. To determine whether it has adequate staff and resources to administer and enforce any new or existing ordinance applicable to livestock facilities.
4. To allow ~~unzoned~~ Towns within Dunn County the opportunity to consider enacting zoning or other regulatory ordinances or adopt County zoning.

Section 4. Definitions

1. “Expansion” means an increase of 20% or greater in the number of animals fed, confined, maintained, or stabled.
2. “Livestock facility” means a feedlot, dairy farm or other operation where livestock are or will be fed, confined, maintained or stabled for a total of 45 days or more in any 12-month period. A “livestock facility” includes all of the tax parcels of land on which the facility is located, but does not include pasture or winter grazing area. Related livestock facilities are collectively treated as a single “livestock facility,” except that an operator may elect to treat a separate species facility as a separate “livestock facility.”
3. “Related livestock facilities” means livestock facilities that are owned or managed by the same person, and related to each other in at least one of the following ways: (a) They are located on the same tax parcel or adjacent tax parcels of land. (b) They use one or more of the same livestock structures to collect or store manure. (c) At least a portion of their manure is applied to the same land spreading acreage.
4. “Separate species facility” means a livestock facility that meets all of the following criteria:
 - a. It has only one of the following types of livestock, and that type of livestock is not kept on any other livestock facility to which the separate species facility is related under sub. 3:
 1. Cattle.
 2. Swine.
 3. Poultry.
 4. Sheep.
 5. Goats.
 - b. It has no more than 500 animal units.
 - c. Its livestock housing and manure storage structures, if any, are separate from the livestock housing and manure storage structures used by livestock facilities to which it is related under sub. 3.
 - d. It meets one of the following criteria:
 1. Its livestock housing and manure storage structures, if any, are located at least 750 feet from the nearest livestock housing or manure storage structure used by a livestock facility to which it is related under sub. 3.
 2. It and the other livestock facilities to which it is related under sub. 3 have a combined total of fewer than 1,000 animal units.

Section 5. Moratorium Imposed

The Dunn County Board of Supervisors hereby imposes a moratorium on the establishment of all new livestock facilities that will have 1,000 or more animal units, the expansion of currently existing livestock facilities if the number of animal units kept at the expanded facility will be 1,000 or more, and new or altered manure storage facilities for such livestock facilities, except as provided in Section 6 of this ordinance.

Section 6. Exception

The moratorium imposed herein shall not apply to existing facilities not currently expanding herd size, applicants who have submitted permit applications to establish or expand a livestock facility of 1000 or more animal units and for manure management before the effective date of the moratorium that are determined to be in complete conformity with all state and county legal requirements in effect as of the date of applications. Any subsequent expansion not included in such applications shall be subject to the moratorium.

Section 7. Duration of Moratorium

This moratorium shall be in effect for a period of 45 days from the effective date of this ordinance following adoption and publishing.

Section 8. Action and Study During Moratorium

The "Livestock Operation Study Group" shall continue its work on the report. The Livestock Operation Study Group shall report its recommendations on appropriate county- level regulatory approaches relative to the siting and/or operation of livestock facilities, including livestock facilities of 1000 or more animal units within Dunn County to the full Dunn County Board of Supervisors.

Section 9. Severability

If any section, sentence, clause or phrase of this ordinance should be held to be invalid or unconstitutional by a court of competent jurisdiction, the remainder of this ordinance shall not be affected thereby.

Section 10. Effective Date

This ordinance shall take effect upon passage and publication as provided by law. This ordinance shall not be codified.

Offered this 17th day of May, 2017, at Menomonie, Wisconsin.



Enacted on: _____

OFFERED BY THE PLANNING,
RESOURCES AND DEVELOPMENT
COMMITTEE:

Published on:

ATTEST:

Thomas Quinn, Chair

Julie A. Wathke, County Clerk

Livestock Operation Study Group

Approved as to Form and Execution:

COUNTERSIGNED:

Nicholas P. Lange, Corporation Counsel

Steven Rasmussen, Chair
Dunn County Board of Supervisors

□

Appendix O: Wisconsin's Runoff Rules

Wisconsin's Runoff Rules

what farmers need to know

January 2013 DNR Pub. No. WT 756 REV 1/13



Farms, like all major industries, must follow environmental requirements to control runoff from fields, pastures and livestock facilities. Otherwise this pollution can harm our lakes, streams, wetlands and groundwater.

Wisconsin adopted administrative rules in 2002 (NR 151), with revisions effective in 2011 that set statewide performance standards and prohibitions for all Wisconsin farms. All farmers must comply with these standards and prohibitions. Cost-share funding may be available to assist with compliance. Some state and local programs may require compliance whether or not cost-share funds are available.

This fact sheet explains the basic information that farmers need to know about these rules and how to comply with them. It is recommended that farmers contact their county land conservation staff for further details on these rules and their impact on farm operations.

► Agricultural Standards and Prohibitions:

ALL FARMERS MUST:

- Meet tolerable soil loss (*T^s*) on cropped fields and pastures.
- Annually develop and follow a Nutrient Management Plan (NMP) designed to keep nutrients and sediment from entering lakes, streams, wetlands and groundwater. Farmers may hire a certified crop advisor or prepare their own NMP if they have received proper training.
- Use the phosphorous index (*P_i*) standard to ensure that their NMP adequately controls phosphorous runoff over the accounting period.
- Avoid tilling within 5 feet of the edge of the bank of surface waters. This setback may be extended up to 20 feet to ensure bank integrity and prevent soil deposition.

► Additional Standards:

FARMERS WITH LIVESTOCK MUST:

- Prevent direct runoff from feedlots or stored manure from entering lakes, streams, wetlands and groundwater.
- Limit access or otherwise manage livestock along lakes, streams and wetlands to maintain vegetative cover and prevent erosion.
- Prevent significant discharges of process wastewater (milkhouse waste, feed leachate, etc.) into lakes, streams, wetlands, or groundwater.

FARMERS WHO HAVE, OR PLAN TO BUILD, MANURE STORAGE STRUCTURES MUST:

- Maintain structures to prevent overflow and maintain contents at or below the specified margin of safety.
- Repair or upgrade any failing or leaking structures to prevent negative impacts to public health, aquatic life and groundwater.
- Close idle structures according to accepted standards.
- Meet technical standards for newly constructed or significantly altered structures.

FARMERS WITH LAND IN A WATER QUALITY MANAGEMENT AREA (300 feet from streams, 1,000 feet from a lake, or in areas susceptible to groundwater contamination) MUST:

- Avoid stacking manure in unconfined piles.
- Divert clean water away from feedlots, manure storage areas, and barnyards located within this area.

Photos: Jeffrey L. Strobel, Diane Poppo and Lynn Schwilke

Wisconsin's Runoff Rules

what farmers need to know

DNR Pub. No. WT 756 REV 1/13

► Farmland Preservation Tax Credit:

A farmer must comply with applicable state standards to receive the Farmland Preservation Tax Credit, even if cost sharing is not available. Farmers may be considered in compliance by entering into a schedule of compliance.

This requirement applies to farmers whose land is located in a certified farmland preservation zoning district (i.e. exclusive agriculture), or for farmers who signed a farmland preservation agreement after standards were in effect for that county. Farmers should contact their county land conservation staff for more information regarding applicable standards and compliance documentation.

► Implementation and Financial Assistance:

Under DNR rules, a landowner is normally entitled to cost sharing if the landowner is required to implement best management practices on "existing cropland" or an "existing" livestock facility or operation in order to comply with a DNR performance standard. Cropland or livestock facilities brought into service after the effective date of the standard are considered "new" and must meet standards and prohibitions without cost-share funding. Farmers with existing cropland or livestock facilities may be eligible for state or federal cost sharing and are encouraged to contact their county land conservation staff or USDA Natural Resources Conservation Service (NRCS) office for information about current funding sources, rates and practices eligible for cost sharing.

Farmers also should work with their land conservation staff to determine how these performance standards and prohibitions may affect their participation in various federal, state and local programs, such as Farmland Preservation. You can find a directory of land conservation offices and related agencies at <http://datcp.wi.gov/Environment> under "Land and Water Conservation."

► Permits and Licensing:

Farmers may be required to meet NR 151 Standards in order to obtain local and state permits. For livestock siting and manure storage ordinance permits, for example, nutrient management plans and other requirements may be imposed on livestock operations without providing cost sharing. Contact your local officials for additional information.

Farmers with 1,000 or more animal units must operate under a Wisconsin Pollutant Discharge Elimination System (WPDES) permit and do not qualify for state cost sharing to meet permit requirements. Contact your DNR Service Center for more information about WPDES permits.

For more information about runoff management in Wisconsin and topics found in this brochure please visit:

runoffinfo.uwex.edu



Wisconsin Department of Natural Resources (WDNR), Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP), in cooperation with: USDA Natural Resources Conservation Service (NRCS), University of Wisconsin-Extension (UWEX), County Land Conservation Departments (LCD).

The cooperating agencies are EEO/Affirmative Action employers and provide equal opportunities in employment and programs including Title IX and ADA requirements. The Wisconsin Department of Natural Resources provides equal opportunity in its employment programs, services and functions, under an Affirmative Action Plan. If you have any questions, please write to Equal Opportunity Office, Department of Interior, Washington, D.C. 20240. This publication is available in alternative format (large print, Braille, audiotape etc.) upon request. Please call 608/267-7494 for more information.



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