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## Appendix K– Wastewater

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# Blue Earth County Water Management Plan 2017-2026 Wastewater Section



## Appendix K — Wastewater Blue Earth County Land Use Plan

# Wastewater Treatment

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Wastewater contains bacteria, pathogens, chemicals, nutrients, and solids. Untreated wastewater is a potential threat to public health and can pollute surface and ground water. The bulk of the County population (79 percent in 2014) and commercial and industrial uses are located in one of the 11 municipalities utilizing State-permitted wastewater treatment facilities.

An estimated 5,000 seasonal and year-round dwellings, commercial, industrial, and public land uses utilize subsurface soil treatment systems (SSTS) regulated by State Rules and County ordinance.

## Centralized Publicly-Owned Treatment Works

Centralized wastewater treatment refers to a community wastewater treatment plant (WWTP) and unincorporated areas in the county served by the WWTP. Of the 11 municipalities in the County, seven own and operate their own MPCA-permitted, publicly owned treatment works (POTW) and three are partners with the City of Mankato. The remaining wastewater is generated in lower density, decentralized areas.

### *Blue Earth County Municipalities*

Seven municipalities in the county operate wastewater treatment systems. Most of these municipalities are in the LeSueur River watershed. Two municipalities' wastewater treatment systems discharge to County Ditch systems. Mapleton discharges to County Ditch 57 in the Cobb River watershed. Amboy's wastewater treatment system discharges to County Ditch 49 in the Maple River watershed. The Good Thunder and Pemberton wastewater treatment facilities were constructed within the last 20 years and were issued phosphorus permits by the MPCA.

### *City of Mankato Wastewater Treatment Plant and Regional System*

Mankato's wastewater treatment plant, located at 701 Pine Street, serves the cities of Mankato, North Mankato, Eagle Lake, Madison Lake, Skyline, South Bend Township and the Lake Washington Sanitation District. In addition to the City of Madison Lake and the areas of Duck, Ballantyne and Madison Lake that were annexed to the City of Madison Lake, there were 399 parcels in the county located outside of the city limits connected to the Lake Washington sewer district on Lake Washington, Lake George, Lake Ballantyne and Madison Lake.

The wastewater treatment plant (WWTP) has grown from the mid-1950's primary settling tanks to the current tertiary treatment facility that produces water which is generally about 0.4 mg/l Total Phosphorus, <5 mg/l in Total Suspended Solids and <2 mg/l Biochemical Oxygen Demand. Current flows are approximately 7.0 million gallons per day (MGD) with a maximum month capacity of 11.25 MGD.

The City permits and monitors industrial dischargers through the City's delegated pretreatment program. Local industries have spent millions of dollars to reduce pollutants in their effluent resulting in cleaner water and biosolids end products at the wastewater treatment plant.

## Summary of Wastewater Treatment Plants in Blue Earth County

Municipality	Size	Watershed
Amboy	Large (0.2 -1 mgd)	Maple River
Good Thunder	Small (0- 0.2 mgd)	Maple River
Lake Crystal	Large (0.2 -1 mgd)	Minneopa Creek
Mapleton	Large (0.2-1 mgd)	Cobb River
Pemberton	Small (0- 0.2 mgd)	Little Cobb
St. Clair	Large (0.2 -1 mgd)	Le Sueur
Vernon Center	Small (0- 0.2 mgd)	Blue Earth River

**Source:** 2016 Pollution Report to the Legislature, April 2016

## Decentralized Wastewater Treatment

Most wastewater in unincorporated areas of the county is treated in subsurface sewage treatment systems (SSTS). Treatment of wastewater in decentralized areas is the responsibility of the individual property owner.

Through local ordinance consistent with State Rules, Blue Earth County regulates SSTS, including some SSTS located within municipalities. All other wastewater treatment systems are regulated and permitted by the MPCA with the exception of additional EPA regulations for Class V wells. Class V wells are subsurface discharge systems or septic systems most often associated with a business but also include systems serving more than twenty persons.

The MDH also regulates and licenses food, beverage and lodging establishments, manufactured home parks, and other public facilities that use decentralized wastewater treatment.

### Subsurface Sewage Treatment Systems Compliance Definitions

**“Failure to protect groundwater system”** means a seepage pit, drywell, leaching pit, or other pit receiving septic tank effluent; a SSTS with less than the required vertical separation distance, described in MR Chapter 7080.1500 Sub. 4 D and E; and a system not abandoned in accordance with part 7080.2500 are considered to be an SSTS that does not protect groundwater

**“Imminent threat to public health or safety”** means a SSTS with a discharge of sewage or sewage effluent to the ground surface, drainage systems, ditches, or storm water drains or directly to surface water; SSTS that cause a reoccurring sewage backup into a dwelling or other establishment; SSTS with electrical hazards; a cesspool; or sewage tanks with unsecured, damaged, or weak maintenance access covers are considered to be an imminent threat to public health or safety.

**“Straight pipes”** transports raw or partially settled sewage directly to a lake or stream, to a drainage system, or onto the ground.

## Blue Earth County Program

Blue Earth County’s program is administered by the Environmental Services Department and includes permitting, inspections and enforcement. The County’s program requirements are prescribed by Minnesota Rules, County Code and administrative policy.

### Subsurface Soil Treatment Systems (SSTS)

SSTS are grouped by their status as either in-compliance, “failing to protect ground water,” or are considered an “imminent public health threat.”

**From 2010 through 2015, 282 straight pipes in Blue Earth County were replaced.**

**Permitting and Inspections**

The County has required permits for septic systems for nearly 45 years. Permit records have been maintained since 1972. Since 1972 the County has issued more than 6,000 permits for septic systems and holding tanks. The table to the right displays a numeric summary of the septic system permits issued since 1972 and the table below shows the number of systems for new construction or existing dwellings.

**Summary of Septic Systems Installed from 2008 to 2016**

Year	Number of Replacement Residential Systems	Number of Residential System for New Construction	Number of Business/ Other System	Total
2008	94	45	4	143
2009	71	35	6	112
2010	83	28	5	116
2011	97	18	14	129
2012	98	37	15	150
2013	112	27	12	151
2014	87	23	7	117
2015	87	27	7	121
2016	75	32	9	116

**Blue Earth County Septic System Permit Summary 1972-2016**

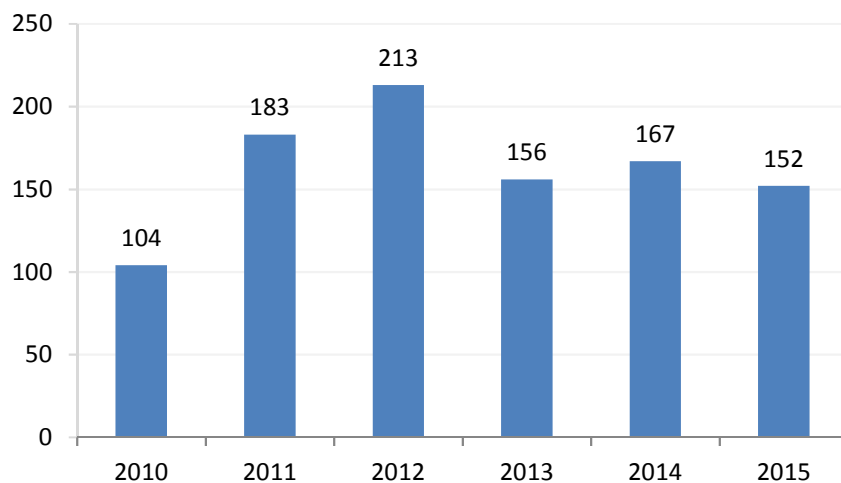
Year	Number of Permit Records	Year	Number of Permit Records
1972	113	1994	252
1973	117	1995	240
1974	138	1996	189
1975	86	1997	187
1976	100	1998	217
1977	172	1999	240
1978	169	2000	211
1979	86	2001	220
1980	66	2002	162
1981	81	2003	157
1982	66	2004	188
1983	71	2005	150
1984	88	2006	161
1985	90	2007	127
1986	102	2008	143
1987	117	2009	112
1988	85	2010	116
1989	92	2011	129
1990	85	2012	150
1991	126	2013	151
1992	176	2014	117
1993	177	2015	121
		2016	116
		<b>Total</b>	<b>6,259</b>

### Compliance Inspections

Blue Earth County ordinances require compliance inspections for septic systems at the time of property transfer, with all applications for construction permits in Shoreland Areas, and conditional use permits or variance application. In addition, compliance inspections are required in non-shoreland areas with an application for a construction permit if the septic system is more than 15 years old. Some property owners forgo the compliance inspection and simply install a new system.

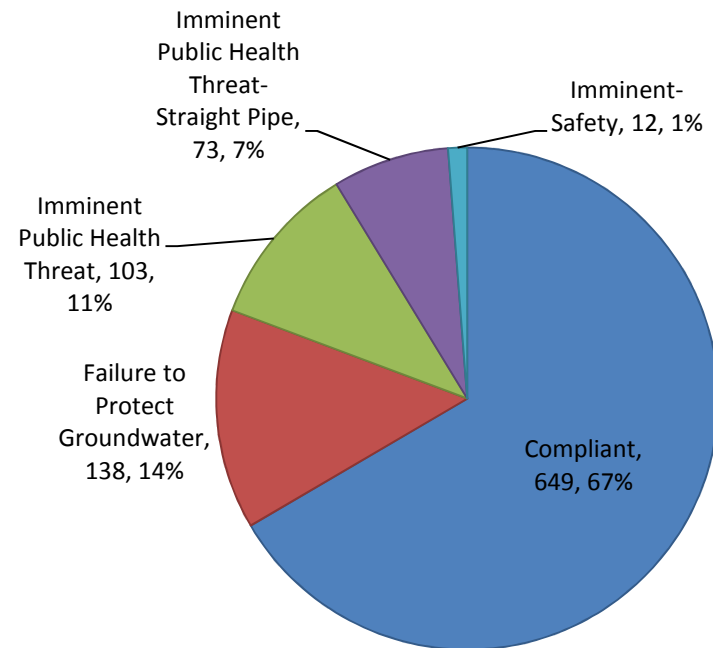
The chart below shows the number of compliance inspections completed from 2010 to 2015 in Blue Earth County. In that time period, there were just over 162 compliance inspections completed on average each year and a total of 975 inspections completed.

**Number of Septic System Compliance Inspections Completed from 2010 to 2015**



From 2010 to 2015, 67-percent of the systems that were inspected were found to be compliant. Fourteen percent of the systems that were inspected were found to be a failure to protect groundwater systems, and 19-percent of the systems were classified as one of the Imminent Threats to Public Health classifications.

**Result of Compliance Inspections from 2010 to 2015**



The most common triggers for a compliance inspection in Blue Earth County are property transfers and construction permits. Combined those categories reflect 87.9-percent of all compliance inspections completed in the County. From 2010 to 2015 there were 523 compliance inspections for property transfers and 334 for construction permits. The table below shows the number of compliance

**Summary of “Triggers”/Reasons for a Septic System Compliance Inspection for Inspections from 2010 through 2015**

Reason for Compliance	Number Of Compliance Inspection Submitted	Percent
Property Transfer	523	53.6%
Construction Permit	334	34.3%
Complaint	46	4.7%
Not Listed	23	2.4%
Conditional Use	18	1.8%
Variance	15	1.5%
Property Split	5	0.5%
Shoreland Alteration	4	0.4%
Subdivision	3	0.3%
Change in Use	2	0.2%
Rezoning	2	0.2%
Total	975	100.0%

inspections by the reason for the compliance inspection.

**Extension of Municipal Services**

In recent years municipal sewer has been extended to serve residential areas that were developed in the 1950’s through the 1980’s. Municipal sewer was extended to parts of Lime and Mankato

Township around the City of Mankato and the extensions of the Lake Washington Sewer District to shoreland areas around Ballantyne, Duck and Madison lakes. Even though the lots now served by the sewer extension were often too small to accommodate replacement septic systems meeting today’s standards, the developments are not as dense as many subdivisions in municipalities. Because of the lack of density, extending sewer is costly for home owners and the entity providing the services as well tax dollars used to fund grants and loans for these projects. The cost for individual home owners in recent sewer extensions has been upward of approximately \$25,000 per lot.

*County Comprehensive Land Use Plan.* In 1998 the County Land Use Plan was updated. Addressing wastewater treatment and other issues on lots platted near municipalities and around lakes was addressed in the land use plan because accommodating new and replacement SSTS in these areas was unsustainable due to lot size and suitability for SSTS.

The County’s 1998 Comprehensive Land Use Plan guides growth to areas where municipal utilities can be provided. These goals and policies were aimed at protecting water quality and reducing the short- and long-term costs of providing government services and addressing unplanned growth. The applicable County Land Use Plan goals and policies include:

- It is in the best interest of the County to limit the development of uses that may eventually require the extension of urban utilities. The County supports orderly growth out from urban areas with utility services.
- The County will encourage housing to locate in areas that can be serviced by city utilities.
- Adopting an urban fringe overlay district around the cities of Mankato, Eagle Lake and Madison Lake to require that any development in that district be connected to city utilities.

- Promoting annexation agreements between municipalities and townships to encourage development to occur in areas with municipal services.
- Prohibiting residential subdivisions with more than four lots in unincorporated areas of the county unless they are served by city services.

### Maintenance

Minnesota Rules and County ordinance requires the owner of the septic system to maintain their septic system at least every three years. The owner must hire a state-licensed maintenance contractor to determine if pumping the septic tank is needed to remove septage (scum, grease and sludge). While pumping septage, the contractor will assess whether the tank leaks. A good maintenance contractor will also check inspection pipes in the drainfield to assess overuse.

The quantity of septage removed from septic tanks each year is not tracked by the county, state or the federal government at this time. If all SSTS owners comply with state rules, an average of 1,500 of the estimated total 5,000 systems in the county will require pumping each year and the average tank capacity is 1,500 gallons. Using these assumptions, about 2,250,000 gallons of septage are pumped in the county each year.

Systems may not receive proper maintenance because owners are either unaware of the need for maintenance, or believe it to be unnecessary or too costly. Improper operation and maintenance will result in premature clogging of the soil's infiltrative surface which may result in system back-up or seepage on the ground surface. Generally improper maintenance does not result in groundwater contamination; improper operation of SSTS (such as the discharge of hazardous waste or other non-treatable wastes into the system) will result in groundwater contamination.

### Class V Injection Wells

Class V Injection Wells are regulated by the Federal government. The EPA has inspected many businesses in Blue Earth and other counties to determine if floor drains were present. The EPA ordered business owners to correct violations and the EPA conducted follow up inspections to ensure the violations were resolved.

Dry wells, cesspools, and septic system leach fields are examples of simple Class V wells. Because their construction often provides little or no pretreatment and these fluids are injected directly into or above an underground source of drinking water, proper management is important. A Class V well is used to inject non-hazardous fluids underground. Most Class V wells are "low-tech" and depend on gravity to drain fluids directly below the land surface. (Source: EPA)

Examples of "low-tech" Class V injection wells that typically rely on gravity drainage include:

- **Motor vehicle disposal wells** include vehicle repair home businesses, new and used car dealers, boat yards, auto body shops, farm machinery dealers, where service floor drains or sinks lead to a septic system or otherwise discharged into the ground. Motor vehicle disposal wells are banned. Holding tanks or sanitary sewer systems are required.
- **Carwashes** where wastewater enters a floor drain that leads to a dry well or septic system

The County addresses potential Class V injection wells when issuing land use permits. Holding tanks are required for garage floor drains and floor drains.

### Septage Management

Septage carries pathogens and emerging contaminants which are a public health concern. This assessment is a summary of the MPCA



## 2016 *Septage and Restaurant Grease Trap Waste Management Guidelines*.

### Definition of Septage

As defined by the EPA, “domestic septage is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool, or similar treatment works that receives either commercial wastewater or industrial wastewater and does not include grease removed from a grease trap at a restaurant.”

### Septage Regulations

Septage is regulated by federal laws. Federal requirements for land application provide limited information on how to prevent runoff or contamination of groundwater. As stated in the *MPCA Septage and Restaurant Grease Trap Waste Management Guidelines*, “the federal 503 rule simply states that these things cannot occur.” The MPCA does not permit or inspect septage storage or land application.

### Septage Management and Storage

Septage is managed in a variety of ways throughout Minnesota. Common methods of management include: 1) transfer of septage to a Publicly Operated Treatment Works (POTWs), 2) direct land application after pumping, and 3) the temporary storage of septage in locally permitted sewage tanks prior to land application at a better time. Temporary storage and land application are used for managing most septage in the county.

All septage must be land applied by a Minnesota licensed SSTS maintenance contractor (Maintainer). Certified Maintainers are required to provide proper training and oversight of work done by noncertified employees (Minn. R. Ch. 7083.0770).

The MPCA guidelines provide Maintainers with detailed information on site suitability, separation distances to features such as surface waters and wells, and detailed site management requirements. These are practices commonly used for land application of other by-products and wastes in Minnesota.

Temporary storage of septage is regulated by Minnesota Rules and local land use controls.

### Septage Site Suitability

The Maintainer must determine whether land application sites are suitable. The Maintainers’ land application sites are not reviewed or approved by any local, state or federal agency. According to MPCA guidelines, sites are considered suitable if the soil conditions, slope restrictions and separation distances are met.

### Septage Land Application

Maintainers are not required to analyze septage before it is land applied. Both state and federal requirements use average septage analysis results to calculate allowable application rates. The MPCA Guidelines contain specific nitrogen management requirements.

### Record Keeping

The Maintainer must keep records of the source of all loads of septage applied to the site.

# Wastewater Treatment Goals and Strategies

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## Centralized Wastewater Treatment Goals and Strategies

**Goal:** Eliminate discharge of untreated and undertreated wastewater to surface water and groundwater.

**ONGOING STRATEGY: MUNICIPAL WASTEWATER TREATMENT.**

All municipalities in the county utilize wastewater treatment facilities.

**STRATEGY: MAINTAIN WASTEWATER TREATMENT CAPACITY.**

**Action:** Support water reuse projects and water conservation measures to ensure treatment system capacity.

**Action:** Reduce inflow and infiltration (I&I) in all cities and townships using municipal wastewater treatment facilities.

**Action:** Reduce pollutants entering wastewater treatment facilities with pre-treatment and waste reduction measures.

**Responsible agency:** Municipalities and their regional partners.

**STRATEGY: PLANNING.**

**Action:** Plan and implement expansions of area served by publicly owned, centralized wastewater treatment where needed to serve existing populations and planned future growth.

## Decentralized Wastewater Treatment Goals and Strategies

**Goal:** Ensure all subsurface sewage treatment systems (SSTS) are in compliance with Blue Earth County Code.

**ONGOING STRATEGY: COUNTY SSTS PROGRAM.**

**Action:** The County will maintain qualified staff to administer the local SSTS program.

**Action:** The County will issue permits, conduct inspections and maintain records for SSTS in Blue Earth County.

**Action:** The County will maintain and update the County Ordinance consistent with State Statutes and local goals.

**ONGOING STRATEGY: SSTS COMPLIANCE.**

**Action:** Update and analyze all available data to reasonably estimate the number of imminent public health threats and determine a baseline to evaluate future results related to this goal.

**Action:** The County will continue to enforce compliance triggers in the Blue Earth County Code that require compliance inspections at 1) property transfer, and 2) in conjunction with all land use permits, including construction permits, conditional use permits and variances.

**Action:** The County will continue to ensure the availability of low interest loans for replacement SSTS construction for existing, occupied dwellings.

**Action:** Prioritize SSTS upgrades for systems in areas with high groundwater pollution sensitivity.

**STRATEGY: SSTS MAINTENANCE.**

Maintaining SSTS every three years ensures longevity of the system reducing long term costs.

**Action:** The County will evaluate compliance with SSTS maintenance requirements and will work with SSTS maintainers (pumpers) to identify and address education, disposal and other needs related to septic system maintenance issues.

## Land Use Management Strategies

**STRATEGY: LAND USE PERMITS.**

**Action:** Coordinate review of land use permits in the county to ensure compliance inspections are conducted and replacement systems are constructed when required.

**STRATEGY: CLASS V INJECTION WELLS.**

A Class V well is used to inject non-hazardous fluids underground. Dry wells, cesspools, and septic system leach fields are examples of simple Class V wells. Because their construction often provides little or no pretreatment and these fluids are injected directly into or above groundwater sources of drinking water, proper management is important. (Source: EPA) Class V injection wells are not a concern in municipalities where all wastewater is collected and conveyed to a wastewater treatment plant.

**Action:** Blue Earth County, Lime Township and Mankato Township, and other jurisdictions with planning and zoning authority in areas where there is no centralized wastewater treatment will minimize the potential for Class V injection wells during the construction permit process by reviewing building plans and requiring holding tanks for

floor drains and other practices to ensure a Class V injection wells are not constructed. This is especially important in areas with moderate and high pollution sensitivity.

Examples of "low-tech" Class V injection wells that typically rely on gravity drainage include:

- **Motor vehicle disposal wells** include vehicle repair home businesses, new and used car dealers, boat yards, auto body shops, farm machinery dealers, where service floor drains or sinks lead to a septic system or otherwise discharged into the ground. Motor vehicle disposal wells are banned. Holding tanks or sanitary sewer systems are required.
- **Carwashes** where wastewater enters a floor drain that leads to a dry well or septic system

**Action:** Jurisdictions in areas with moderate and high pollution sensitivity will eliminate Class V injection wells for stormwater management.

**STRATEGY: LAND USE PLANS.**

**Policy:** Support long term, sustainable wastewater treatment to protect groundwater and surface water from contamination from sewage and hazardous substances.

**Policy:** Continue to support orderly annexation agreements and coordinated sewer extension projects.

**Policy:** Continue County Land Use Plan policies that encourage growth in municipalities or areas with city sewer to ensure that wastewater treatment needs for the future are met and to help reduce long-term costs associated with growth to the taxpayers.

## Septage Management Goals and Strategies

**Goal:** Manage septage to reduce potential contamination of surface and groundwater resources.

Septage management is regulated by federal laws. The MPCA published *Septage and Restaurant Grease Trap Waste Management Guidelines* in 2016 for state-licensed SSTS maintainers (pumpers). Most septage is land applied in the county. The MPCA does not permit or inspect sites used for septage land application.

**STRATEGY: MANAGE LAND APPLICATION.**

**Action:** The County will evaluate SSTS maintainers' septage management systems, including disposal, storage and land application and will work with SSTS pumpers, contractors, municipalities and other representatives to assess needs related to septage management in the county.

**Action:** The County will display on its website maps of areas in the county with moderate and high groundwater pollution sensitivity as shown in *Blue Earth County Geologic Atlas, Part B*.