DANE COUNTY WATER QUALITY PLAN

APPENDIX I UPDATE

PRIVATE ON-SITE WASTEWATER TREATMENT SYSTEMS

DRAFT FOR PUBLIC COMMENT
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Prepared by the staff of the Capital Area Regional Planning Commission

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Background

Private on-site wastewater treatment systems, primarily in-ground septic tank-soil absorption systems, currently serve over 23,000 households in Dane County. This is about 11 percent of the total 216,022 housing units in the county according to the 2010 Census. It is expected that the number of on-site wastewater systems will increase to over 28,000 by the year 2030 serving about 73,000 people. Onsite systems represent an important segment of the wastewater management and water quality planning programs in the region.

This report is an update of Appendix I of the Dane County Water Quality Plan, the official areawide water quality management plan for Dane County. Appendix I: On-Site Wastewater Systems Management Program, was initially adopted and incorporated into the Water Quality Plan in 1986. It was last updated in 1998. Other closely related elements of the Water Quality Plan include Appendix C: Point Source Inventory and Analysis, dealing with municipal and industrial wastewater; Appendix F: Residual and Solid Waste Disposal, dealing with wastewater biosolids or sludge and solid waste disposal; and Appendix G: Groundwater Protection Plan.

There have been a number of changes since 1998, necessitating an update of this element of the Water Quality Plan. First, the revisions to Comm 83 in 2000 (now SPS 383[1]) resulted in substantial changes to the state administrative rules regulating on-site systems. Secondly, advances in on-site wastewater treatment systems have led to systems that can be installed in many locations where conditions are not suitable for a in-ground system, as well as, systems that can effectively remove nitrogen. Thirdly, additional data is available on nitrate levels in private drinking water wells. Finally, several of the principal recommendations in the 1998 report have been implemented.

Findings

Nitrates

The primary concern regarding on-site wastewater systems is the effect of these systems on nitrate levels in groundwater. Excessive nitrate levels in shallow groundwater and

[1] As of January 1, 2012, Administrative codes previously under the authority of the Department of Commerce were retitled to reflect the authority of the new Department of Safety and Professional Services. "Comm" codes became "SPS" codes with "300" added to the previous code numbers. For example, Comm 83 became SPS 383.

private wells are a problem throughout Dane County. A significant percentage (18%) of private wells tested in Dane County exceed the 10 mg/L enforcement standard for nitrate in drinking water. An additional 52% of private wells tested in Dane County exceed the 2 mg/L preventative action limit for nitrate in drinking water. There is evidence that the level of nitrates levels in groundwater is increasing.

It is difficult to determine the relative contribution to the nitrate problem from past and present agricultural practices versus from on-site wastewater treatment systems. It is not likely that scattered on-site systems contribute significantly to the overall problem, but they can be a source of nitrate contamination of nearby shallow wells. There is some concern that large on-site systems or clusters of systems (such as in rural subdivisions or hamlets) can, when added to background nitrate levels in groundwater, result in raising nitrate levels in nearby shallow wells to above drinking water standards if the density or loading of on-site systems is too high.

The potential impacts of nitrate contamination resulting from large on-site systems or clusters of on-site systems (rural subdivisions) can be addressed by review and evaluation of specific proposals (permit applications, subdivision plat reviews) to determine if there is a likelihood that waste disposal practices will affect nitrate levels in nearby water supply wells. There are innovative methods and technologies for improving the nitrogen removal of on-site wastewater treatment systems. However, very few of these systems are currently in use in Dane County. The Wisconsin Administrative Code exempts private sewage systems from having to meet groundwater nitrate standards. However, the US EPA recommends that private on-site wastewater treatment systems sited in drinking water aquifers or near sensitive aquatic areas incorporate additional nitrogen removal technologies prior to final soil discharge.

Finally, the problems and impacts associated with excessive nitrate concentrations at some existing sites need to be evaluated and solutions to any significant problems assessed and pursued. The Towns of Bristol, Burke, Middleton and Windsor, in particular, appear to have some significant nitrate contamination issues. Appropriate solutions to the problems can range from on-site improvement or replacement of individual systems, to providing centralized sewerage collection and treatment systems, depending on the magnitude and scale of the problem. In other cases, providing a

protected water supply may be the best solution.

System Design and Maintenance

Many existing on-site wastewater disposal systems were installed before modern wastewater codes were enacted. Some of these older systems may fail or function poorly because of inadequate design and construction standards in effect at the time they were built, unsuitable site conditions, or lack of proper maintenance. Septic systems should be inspected at least every three years and pumped when the tank is 1/3rd full of scum or sludge to prevent clogging and failure. Although proper maintenance and servicing is not costly, it is sometimes postponed or neglected until a serious problem or failure occurs. Since 1998, Dane County has required periodic evidence of adequate maintenance and servicing for all on-site systems. The year 2000 revisions to Chapter Comm. 83 of the Wisconsin Administrative Code required that maintenance plans be submitted with every application for an on-site system. These changes have dramatically improved system performance, reduced system failures and increased the prompt replacement of failed systems.

In general, the current siting, design, construction and maintenance standards for on-site wastewater disposal systems result in systems that are reliable and have minimal environmental impact. According to the Department of Public Health for Madison & Dane County records, 89% of the on-site wastewater treatment systems in Dane County were operating in full compliance in 2010. On-site systems have the beneficial effect of returning water directly to the source, avoiding the impacts of groundwater pumping and diversion through the sewer system. Other designs, including mound systems, are available to replace failing systems where site conditions do not permit in-ground system replacement. Current regulations and inspection programs are generally ensuring the level of maintenance and servicing of on-site systems necessary to reduce failures, ensure continued functioning, and provide a long system life.

Septage Disposal

One of the goals of the Dane County Water Quality Plan is the practice of returning organic waste to the land for the beneficial reuse of the nutrients. Realizing this objective requires careful management to avoid environmental problems and impacts on water quality. Management practices need to be followed to ensure that disposal operations comply with the standards and regulations while maximizing the beneficial use of the organic wastes.

About 26 million gallons of septage (the material pumped and removed from on-site wastewater systems) is disposed in Dane County annually. Septage is hauled and disposed of both at wastewater treatment plants and at landspreading sites. The proportion of septage that is landspread has continued to decline. Septage disposal at wastewater treatment plants increased from 9% in 1983 to 60% in 1994. Currently about 89% of septage is disposed of at wastewater treatment plants and 11% is applied to landspreading sites.

The most important water quality considerations of managing the land application of septage include:

(1) avoiding contamination of surface waters from runoff from application sites;
(2) avoiding groundwater contamination from precipitation infiltrating through the waste materials into groundwater; and
(3) preventing the accumulation or buildup of toxic or hazardous materials in soil, water, or plants.

It is, of course, also important to maximize the benefits of land application of organic materials to the greatest extent possible, rather than looking at land application merely as a disposal technique. This means selecting sites and applications where the benefits of the nutrients and organic materials are utilized to the greatest extent in improving soil fertility and productivity, reducing erosion, and reducing chemical fertilizer use.

State regulations have established standards for licensing disposal sites. The rules in effect since 1997 have specified the allowable slopes, soil permeability, minimum separation distances, and rate and manner of application necessary to protect public health and water quality. In addition, Dane County ordinance prohibits the spreading of septage on frozen or snow-covered ground.

While the regulations for landspreading septage under controlled conditions are sufficient to protect public health and water quality, there is not enough information to determine whether or not the required site conditions and application procedures are being observed. Many of the currently approved septage disposal sites are in close proximity to site conditions that are unsuitable for septage disposal. This underscores the importance of a rigorous monitoring and inspection program for septage disposal sites.

Summary

This updated evaluation of on-site wastewater treatment systems indicates that in general, typical systems work well, are reliable, and can meet most public health and ground water quality performance standards if they are properly designed for the incoming waste load, installed in areas with appropriate soils and hydraulic capacities, and properly maintained to ensure long-term performance. Nitrogen removal rates vary significantly and the effluent plumes of many systems do not achieve drinking water standards (i.e., 10 mg/L) for nitrate concentrations. There are advanced and alternative methods and technologies available for improving the nitrogen removal of on-site wastewater treatment systems to meet these standards. This report describes the few potential problems associated with on-site wastewater systems, and indicates that relatively minor changes in present programs can be implemented to address these issues.

Principal Recommendations

The following recommendations include any new recommendations made as a result of this report as well as all of the on-site wastewater system and septage disposal recommendations from the 2004 Summary Plan Update of the Dane County Water Quality Plan. Previous recommendations from the 1998 On-Site Wastewater System Management Program report that are being reaffirmed are also included. Some of the recommendations have been updated or reworded to reflect the current state of knowledge of on-site wastewater treatment systems and regulations. The history refers to related recommendations as numbered in the previous plans.

1. Governmental units responsible for the regulation of private on-site wastewater treatment systems should continue to maintain a rigorous inspection and enforcement program. (History: 2004-O–1, 1998-1)

Dane County is currently the governmental unit responsible for the regulation of private sewage systems and has delegated this authority to the Department of Public Health for Madison & Dane County (PHMDC). However, the state statute includes an exception in a county with a population of 500,000 or more where the "responsible unit" becomes the city, village or town where the private sewage system is located. Dane County is expected to unofficially surpass a population of 500,000 in 2012. This section of the statutes will become effective with the 2020 US Census. At that point under the current statutes, all cities, villages, and towns will have to regulate the private on-site wastewater treatment

systems within their respective jurisdictions or enter into an intergovernmental agreement with Dane County for the county to provide that oversight. The county and local governments should collaborate to ensure the continuation of rigorous inspection and enforcement program for private on-site wastewater treatment systems. The use of a geographic information system for record keeping would facilitate the tracking and analysis of the data.

2. Local management and planning agencies should cooperate in investigating and developing cost-effective solutions for existing concentrations of rural development experiencing on-site wastewater system problems and/or nitrate contamination issues. (History: 2004-O–2, 1998-3)

This report includes available data on nitrates in private water supply wells in Dane County. Detailed evaluations of rural subdivisions or hamlets with known or potential problems are recommended to identify possible solutions. The state, county and local agencies with responsibility and jurisdiction need to cooperate in this effort.

3. Large on-site wastewater systems and clusters of systems (over 150 gallons/acre/day loading or less than 1.0 to 1.5 acre lots) should only be approved where wells and water supplies can be protected from excessive nitrate levels. (History: 2004-O–3, 1998-2)

In reviewing proposed rural subdivisions or developments, large on-site systems or clusters (more than 20) of on-site systems resulting in a wastewater loading greater than 150 gallons/ acre/day (corresponding to an average density of one house per 1-1.5 acres) could result in elevated nitrate levels, and should be evaluated to ensure that drinking water supplies are protected and groundwater standards are met. If the evaluation indicates risk, alternatives such as alternative or protected water supplies (well location and depth), or providing nitrogen-reducing wastewater systems, should be explored.

4. Holding tanks should continue to be used for wastewater disposal only in instances when adequate servicing and pumping can be assured, and when suitable disposal methods (well-regulated land disposal sites or wastewater treatment plants) are specifically available for receiving the wastes. (History: 2004-O–4)

The Department of Public Health for Madison & Dane County currently implements this recommendation through their ordinance. Holding tanks are only approved when there is no option for a system with soil

distribution or when the wastewater quantity so low that a holding tank is a cost-effective option.

5. Municipal wastewater treatment plants should include provisions for receiving and treating septage generated within a reasonable service area or distance. (History: 2004-O–5, 1998-4)

Provisions for receiving septage at municipal wastewater treatment plants at a reasonable cost are important to provide waste haulers flexibility and to avoid the need to landspread septage under adverse conditions (such as on frozen ground in winter). This recommendation has largely been implemented. Opportunities for disposing of septage at treatment plants have expanded considerably; about 89 percent of septage is currently disposed of at wastewater treatment plants.

6. Explore innovative methods for improving waste disposal and groundwater quality through site design and new technologies. (History: 2004-O-6)

There are innovative methods and technologies for improving the nitrogen removal of on-site wastewater treatment systems. However, very few of these systems are currently in use in Dane County. The US EPA recommends that private on-site wastewater treatment systems sited in drinking water aquifers or near sensitive aquatic areas incorporate additional nitrogen removal technologies prior to final soil discharge.

7. Land application sites for septage should be carefully located and designed to avoid groundwater contamination, and should not be located in areas of extreme groundwater contamination risk or well protection zones. Existing sites located in these areas should be monitored and subjected to stringent design and operating requirements. (History: 2004-O–7)

8. Dane County and/or local units of government should assume responsibility for, or participate in, the approval and inspection of landspreading sites for the disposal of septage. (History: 2004-O–8, 1998-5)

The involvement of County and/or local municipal staff in the review and approval of septage landspreading sites would incorporate greater knowledge and familiarity with local site conditions It would also allow better monitoring and observation of site conditions and landspreading practices. The program should include site location and licensing requirements, application and operating criteria and procedures, surveillance and enforcement procedures, and the revenue necessary to support the

program. The use of a geographic information system for record keeping would facilitate the tracking and analysis of the data. The Department of Public Health for Madison & Dane County attempted to gain authority from WDNR to regulate septage spreading in Dane County, but their request was denied because the current county ordinance would hold the land owners responsible for any violations on their land rather than the septage hauler. PHMDC is currently working to incorporate the tracking of septage pumping and disposal into its septic maintenance program. This will help PHMDC and WDNR to track spreading activities and identify any potential problems.

9. Local units of government and Public Health Madison & Dane County should encourage all residents with private wells to have their water tested for nitrates, especially those with infants. (New Recommendation)

The WDNR Groundwater Retrieval Network (GRN) database contains information on about 12,000 private water wells in Dane County. However there are an estimated 23,000 private potable water wells in Dane County in total. In addition, only 27% of those wells in the GRN database include nitrate test results. Collection of this data is essential to preventing the potential public health impacts from nitrates.

10. State and local funding for on-site wastewater management and septage disposal programs should be increased to adequate levels. (History: 1998-6)

Some aspects of this recommendation have been implemented. In 2006, WI Act 347 included an incentive to address septage disposal needs by providing no interest Clean Water Fund loans to wastewater treatment plants for septage receiving facilities and the portion of the treatment capacity necessary to treat the septage component. The "Wisconsin Fund" is a state grant program operated through the responsible local governmental units to provide grant assistance for the replacement of failing on-site systems to income qualifying households. However, the program is currently underfunded such that most qualifying applicants do not receive the full amount allowed by the grant.

CHAPTER 2

REGIONAL SETTING AND TRENDS

Dane County occupies 1,230 square miles in south- central Wisconsin, and is the second most populous county in the state with a 2010 census population of 488,073. Most of the land in the county is very productive farmland. At the geographic center of the county is the City of Madison, the state capital and the main campus of the state university system. Most of the work force is employed in trade or service industries.

As state government and the university have grown in recent years, so has the county population. The City of Madison and other cities and villages have expanded into neighboring agricultural land. In addition, many individual houses and subdivisions with on-site wastewater systems have been built outside of these urban areas. Both the pressures of urbanization and changes in the farm economy have pushed farmers to convert more land to cash crops such as corn. Pasture land has been converted to hay, and drainage in wet areas has been improved to provide more land for corn or pasture.

Physical Features

General

Dane County is an area of geographic contrasts. The eastern part of the county is a slightly rolling plain of low hills interspersed with wetlands drained by sluggish streams and man- made ditches. The western part of the county has steep valleys and ridges drained by fast-flowing, spring-fed streams. In the center of the county is the Yahara River with its large scenic lakes and adjacent marshes. These geographic differences may be explained by the geological history of the area.

Physiography

The bedrock in the county is comprised of many layers of sandstone and dolomite (up to 1,700 feet thick) formed from sediments deposited by an ancient sea 420 to 600 million years ago. Under these layers of sedimentary rock is an even older crystalline rock, mostly rhyolite, granite, and basalt. The crystalline rock allows little water penetration, and forms a floor under the water-bearing sedimentary rocks. All the sedimentary rocks can contain water in places where they are below the water table, and all these units form aquifers in some parts of Dane County. The ancient sea that deposited the sedimentary rocks disappeared millions of years ago when geological forces raised the land in Wisconsin above sea level.

A well-developed drainage pattern had been cut into the sedimentary rock when the climate changed about 70,000 years ago and glaciers began to be formed in the northern portions of the continent. At least four glaciers moved across what is now Wisconsin. The last glacier reached the Dane County area from 14,000 to 18,000 years ago.

The western third of Dane County is part of the driftless area -- an area that was not covered by the most recent Wisconsin glaciation. The forces of wind and water have eroded the bedrock in this area into steep ridges and valleys drained by fast- flowing streams. Most of the streams are fed by springs and seeps, which flow from water-bearing layers of sandstone or dolomite exposed along the hillsides. An irregular layer of soil formed from the disintegration of the bedrock or blown from the western plains covers the hills. In many places there is only a thin layer of soil with moderate or moderately slow permeability over fractured dolomite and sandstone.

The large valley of the Wisconsin River and its benches have deep alluvial deposits of sand and gravel with some organic material. The soil along the river valley is mostly poorly-drained sand with organic inclusions. This area is subject to seasonal high water tables and frequent flooding. Poorly-drained silty soils with mineral and organic material are also found in lowlands along some of the smaller streams. The benches and outwash terraces along the streams have well-drained to excessively drained silty or sandy soils underlain by sand and gravel.

On the eastern edge of the driftless area are numerous moraines -a band of hills made up of debris which was scraped up by the glacier and left behind when the ice melted. There are two main moraines in Dane County: the terminal moraine or Johnstown moraine at the far edge of the glaciated area, and the recessional moraine or Milton moraine which formed when the glacier stopped retreating and dumped unstratified and unsorted clay, silt, and boulders with sand lenses. The moraines once included blocks of ice left behind by the glacier. These blocks melted, leaving pot holes or kettles, some of which remain as small ponds, marshes, and bogs. The moraines are a drainage divide where many of the headwater streams of the Yahara River, Sugar River, and Wisconsin River watersheds are located.

East of the moraines, in the center of the county, is the Yahara River Valley. In this area glacial deposits, over 350 feet deep in some places, dammed up large preglacial valleys, forming a chain of large lakes and wetlands. The formation of peat in these wetlands seems to have been

rapid. Today the peat deposits are extensive and deep, reaching over 90 feet deep in some spots. In many places, an aquifer in the bedrock of adjacent hills supplies springs that maintain high water levels in the peat and assist peat formation. The streams of this area of the county are slower flowing than the streams of the driftless area, and fewer are spring fed.

Farther east, the glacier filled the flatter watersheds of smaller pre-glacial streams, and the resulting lakes and wetlands are much shallower. The wetlands in this part of the county are interspersed by drumlins - long, low, whale-back shaped parallel hills which formed as the glacier advanced and retreated, flowing over piles of material, which it had deposited earlier. In addition to creating drumlins, the glacier deposited a sheet of debris 25 to 100 feet deep over most of the landscape when it retreated. The glacial deposits blocked old drainageways creating an extensive system of interconnected wetlands with a poorly defined drainage pattern. Small streams wind slowly through the lowlands. Since the groundwater contribution from the glacial deposits is minimal, there are few springs in this part of the county, and stream flow is very dependent on overland runoff. During the summer months, the water level in these streams may be very low. The only lakes in this part of the county are small stream impoundments and shallow marshy lakes.

In the moraines, the Yahara River Valley, and the drumlin-marsh area of the county, the lowland soils are poorly drained silts with mineral and organic material, underlain by alluvial deposits. The adjacent benches and terraces are covered by well-drained and excessively drained silty soils, underlain by sand and gravel. On most of the surrounding uplands, moderately permeable, medium textured soils cover the glacial till. Figure 2-1 shows the different physiographic regions of the county.

The characteristics of the different portions of the county, such as soil, depth to bedrock and groundwater, and susceptibility to flooding, are key physical factors affecting septage disposal and on-site wastewater disposal. Extensive areas of thin soils and shallow, fractured bedrock are found in the unglaciated portion of the county. These characteristics make these areas generally unsuitable for the landspreading of septage or the placement of septic tank absorption fields. A second category occurs in the glaciated upland areas of the county. Most of the glaciated part of the county is covered by moderately permeable, medium textured soils, underlain by glacial till. Where

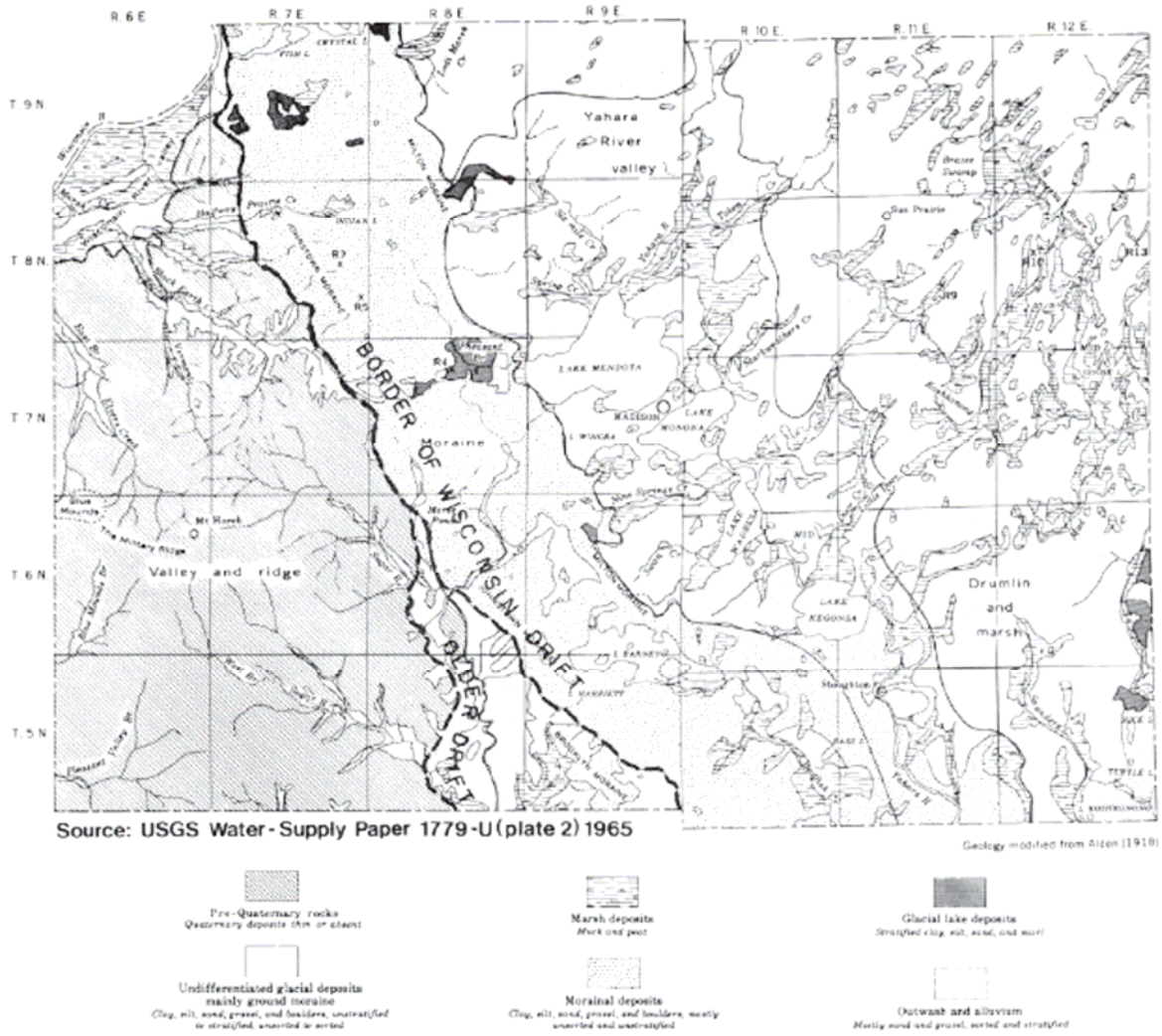
flooding and shallow groundwater are not present, these soils provide generally suitable conditions for septic tank absorption fields and the landspreading of septage. A third general category is areas with soils formed in outwash material and alluvium in stream valleys, lake basins, and marshes. These soils are generally poorly drained and subject to ponding and flooding. Adjacent benches and terraces to these lowlands areas at a slightly higher elevation and not subject to flooding, but they tend to have poor filtering capacity and inadequate seepage in their bottom layers. Both areas are generally unsuitable for landspreading or conventional septic systems.

The Natural Resources Conservation Service (NRCS) Soil Survey for Dane County (Soil Survey Staff, 2011) rates each soil type's potential suitability for conventional septic system soil absorption fields. The limiting factors considered in the soil ratings are depth to a saturated zone, depth to bedrock, slope, permeability, and frequency of flooding or ponding. Using this rating system, 20.6% of the soils in Dane County are classified as somewhat limited for the use of conventional septic system soil absorption fields and 79.4% are classified as very limited.

These very limiting soil conditions in large parts of Wisconsin were one of the driving forces behind the extensive research and development program, the Small Scale Waste Management Project, at the University of Wisconsin - Madison. As Engebretson and Tyler (1998) noted in their evaluation of using soil surveys to predict the type of on-site wastewater treatment system, a NRCS soil rating of very limited does not mean that no on-site wastewater treatment system can be used. Rather it indicates that an alternate system such as an at-grade or mound system will likely be required to overcome the soil limitations.

Revisions to the Wisconsin Administrative Code in 2000 expanded the options for putting alternate on-site wastewater treatment technologies into general use. It also specified performance standards; site-specific design; and management plans with demonstrated compliance for every system.

FIGURE 2-1 - MAP OF DANE COUNTY, WISCONSIN, SHOWING PHYSIOGRAPHIC AREAS AND DEPOSITS OF QUATERNARY AGE



Water Resources

Water covers an area of approximately 23,000 acres in Dane County (3% of the total area of the county). This includes 37 named lakes and 475 miles of streams and rivers. There are an additional 50,000 acres of wetlands in the county.

Surface waters in the county belong to either the Wisconsin River or the Rock River drainage basins. The Rock River basin drains over four-fifths of the county, including all of the glaciated area. Streams on the glaciated plain have poorly developed drainage patterns and are interrupted in their courses by numerous marshes and impoundments. Well-defined dendritic drainage patterns, which have eroded through the bedrock, characterize stream sub- basins in the western fifth of the county, and few lakes and marshes remain. In this area, valley sidewalls may be steep and high, and stream-eroded features are a prominent part of the landscape.

The natural lakes of Dane County may be classified into two categories: the large Yahara River lakes created by drift dams across preglacial valleys; and the smaller kettle lakes created by impressions of ice blocks left by the receding glacier. The lakes of the latter category are usually shallow, landlocked, and short-lived. The same process that produced the inland lakes created extensive wetland areas in the eastern part of the county. Since the early 1920s, two-thirds of the wetland acreage in the county has been lost due to ditching and draining for agricultural production. The most important sources of pollution for the surface waters in Dane County are nonpoint source pollution from agricultural and urban areas.

Groundwater is the principal source of nearly all of the water used in Dane County for household, commercial, and industrial purposes. In municipal areas, deep municipal wells reaching 500 to 1,000 feet below the ground surface provide the needed water. In rural areas, shallower private wells with depths of less than 300 feet are the source of domestic water. The deep aquifer is generally more protected from contamination by surface and near-surface activities (road salt, chemical spills, agricultural and lawn care chemicals, etc.) and sub-surface activities (landfills, underground tanks, septic systems, etc.). The shallow aquifer is generally more susceptible to contamination from surface and sub-surface activities. However, because of the variability of soil, groundwater, and subsurface conditions, it is very difficult to predict the susceptibility of the shallow aquifer with confidence.

Groundwater is recharged from the surface by precipitation and surface water bodies. Uplands are generally groundwater recharge areas; groundwater discharge areas are in the lowlands. Local ground-water flow systems in the county show considerable variety in the direction, rate, and depth of flow as well as recharge/discharge characteristics. In addition, groundwater depth and flow patterns can be distorted by heavy pumping, such as in the Madison area, and locally by the cones of depression of individual high capacity wells. Following use, most of the municipal and industrial well water is conveyed to wastewater treatment facilities for treatment. The treated effluent is then generally discharged to a nearby stream. In rural areas, where wastewater is treated by on-site systems, the local groundwater is recycled by being drawn from a private well, used, and discharged back into the ground through the drainfield.

The configuration of terrain, frequency and intensity of precipitation, and the permeability of surface and subsurface materials control depth to the water table. The water table lies closer to the surface in relatively less permeable materials and in the lowlands. It is deeper in relatively more permeable materials and in upland areas. Depth to the water table varies throughout the county from 0 to 200 feet below the surface.

Table 2-1 shows sources of pollution that have the potential to degrade groundwater quality if they are not properly managed. On-site wastewater systems and septage disposal are two of the potential waste-related pollution sources.

Climate

The climate in Dane County is typical of interior North America. The annual temperature range is large, and short-period temperature changes are frequent. Winters tend to be cold and snowy; while summers are warm and humid. The Wisconsin State Climatology Office is the official state repository for climate records of Wisconsin. According to their records of climate for the Madison area from 1971 to 2000, January has been the coldest month, averaging about 17 degrees Fahrenheit (F), while July has been the warmest month averaging about 72 degrees F. Typically, 22 days per year have temperatures of 0 degrees F or less. Average annual precipitation has been about 33 inches. About 67% of this precipitation falls during the six months from April through September. August has been the wettest month with 4.3 inches of precipitation on the average, and January has been the driest month with about 1.2 inches. Precipitation fell on 125 days per year on

average. About 84% of the precipitation events were half an inch or less. Snowfall averaged 50 inches per year.

Table 2-1 – Potential Sources of Groundwater Pollution

Origin	Waste Related	Non Waste Related
At or Near the Land Surface	Feedlots Junkyards & Salvage Yards Manure Storage & Spreading Septage Disposal Sludge Disposal Wastewater Irrigation & Land Spreading	Above and Ground Level Storage of Chemicals Highway Deicing Irrigation, Fertilizers, Pesticides, Silage Salt Piles Stockpile Spills Underground Tanks
Below the Land Surface	Landfills Manure Pits On-site Wastewater Systems Sanitary Sewers Wastewater Impoundments or Infiltration Ponds	Improperly Constructed & Abandoned Wells Over-pumping Pipelines Underground Tanks

Adapted from: Groundwater Protection Principles and Alternatives for Rock County, Wisconsin. (1985) A. Zaprozec, editor. Wisconsin Geological and Natural History Survey. Special Report 8.

Population and Land Use Trends

Population

Dane County is currently the second largest metropolitan area in Wisconsin. Figure 2-2 illustrates the changes in Dane County population from 1930 to 2010. Dane County experienced rapid growth rates (around 30% per decade) in the 1940's through the 1960's. More moderate growth rates, ranging from 11% to 16% per decade, have prevailed since the 1970's. Dane County is expected to unofficially exceed a total population of 500,000 people in the year 2012.

The population growth in Dane County's cities and villages has essentially mirrored that of the county as a whole. Cities and villages experienced rapid growth rates (around 39% per decade) in the 1940's through the 1960's, followed by a slow growth rate of 9% per decade in the 1970's and more moderate growth rates, ranging from 15% to 17% per decade, since the 1980's.

The population growth in Dane County's towns exhibits a different pattern. Towns experienced slow growth rates (around 10% per

decade) in the 1940's through the 1950's, followed almost no growth (1% per decade) in the 1960's. In the 1970's the town growth rate increased dramatically to 24% per decade. Slow to moderate growth rates, ranging from 6% to 12% per decade, have prevailed in the towns since the 1980's.

The trend since the 1980's of a greater growth rate in cities and villages compared to towns is expected to continue into the future.

Land Use

Agriculture is still the predominant land use in Dane County. In 2005, approximately 54% (430,200 acres) of the total area of the county was devoted to crop and pastureland. An additional 28% (221,500 acres) was categorized as woodland, water, or vacant land. Total developed area in the county comprised about 140,300 acres, or 18% of the total area of the county.

Table 2-2 summarizes land use by category in Dane County, comparing the results of land use inventories conducted from 1970 to 2005. The figures indicate that the total developed area of the county increased by about 10% between 2000 and 2005 at a rate of about 2,654 acres per year. This is almost double the rate of growth compared to the decade of 1990 to 2000 when 1,440 acres per year was developed in Dane County. The outdoor recreation component of land use grew most rapidly, with nearly a 21% increase in acreage between 2000 and 2005. The residential component of land use grew by 15% between 2000 and 2005, an increase of 7,359 acres. Between 2000 and 2005 only 42% of the residential land use increase occurred in cities and villages where public sanitary sewers are available. The other 58% of the residential development occurred in towns. Public sanitary sewers serve some of the development in some towns, but the majority is served by private on-site wastewater treatment systems.

Trends in Residential On-Site Wastewater Systems

Table 2-3 shows data on dwelling units in Dane County, served by on-site wastewater systems. The 1970 to 1990 data has been derived from U.S. Census housing data, which is a sampled data representing an estimate. It should be noted that the number of on-site systems, as estimated in the 1970 and 1980 census housing data, was larger than the number of residential units outside of urban service areas, because when these service areas were delineated in 1978, they included many on-site systems. Since their original delineation, urban service areas have expanded and their boundaries have been reformed to more accurately reflect plans for development and sanitary sewer extensions, and most of the

older units with septic systems have been connected to public sewers. Consequently, in the 1990 Census, the total number of residential on-site systems is almost the same as the total number of dwelling units outside urban service areas (generally, a dwelling unit located outside an urban service area cannot be legally connected to public sanitary sewers; thus it has to be served by an on-site system). Information on household sewage disposal was not collected as part of the 2000 or 2010 Censuses. The 2000 data was estimated from census data on municipal households and information on urban service areas. The 2010 data is from the Department of Public Health for Madison & Dane County records.

In 1990, almost 19,000 residential units in Dane County relied upon on-site wastewater systems, representing nearly 13 percent of the total housing units in the county (DCRPC and 1990 U.S. Census). In 2010, this figure had increased to over 23,000 units or 11 percent of total housing units. If this trend continues, over 28,000 residential units will be on septic systems in Dane County by 2030. This is approximately a 22 percent increase over 2010 figures, or an average increase of about 10 percent per decade. The five Towns of Middleton, Cottage Grove, Bristol, Oregon, and Burke contained over 30% of the total number of on-site systems in Dane County in 2010. Attachment B contains maps showing the parcels in Dane County with on-site wastewater treatment systems in 2010 according to the Department of Public Health for Madison & Dane County records.

Figure 2-3 shows the annual trend in new residential development since 1986. These figures are based on building permits issued, not necessarily buildings completed; but represent a relatively accurate picture of the ratio of annual development in the county on municipal sanitary sewer compared to on-site systems. When the revisions to Comm 83 were promulgated in 2000, a major concern of several municipal and environmental groups was that the new regulations would cause an increase in rural development because they allowed alternative technology systems to be used in areas that were previously undevelopable with on-site systems due to restrictive soil conditions (Jaskula, 2002). The data thus far does not substantiate this concern. From 1986 to 2000 the number of new residential units with on-site wastewater systems was 12.9% of the total new units on average. Since 2000, it has been 8.5% on average.

Figure 2-2: Dane County Population Trends

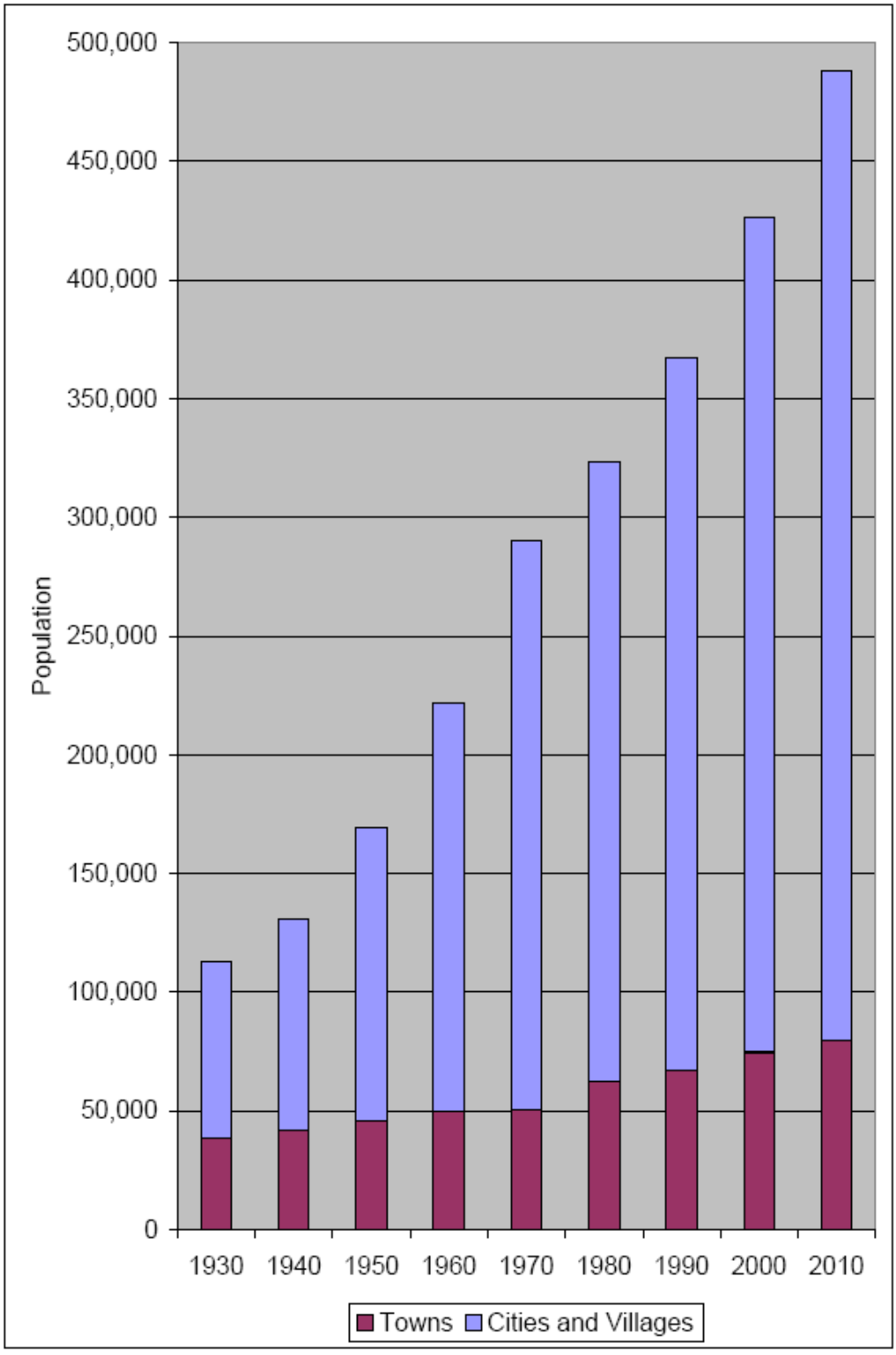


Table 2-2: Dane County Land Use

	2005			2000			1990			1980			1970		
Land Use Category	**Acres**	**% Total**	**% Dev'd**	**Acres**	**% Total**	**% Dev'd**	**Acres**	**% Total**	**% Dev'd**	**Acres**	**% Total**	**% Dev'd**	**Acres**	**% Total**	**% Dev'd**
Residential	56,552.4	7.1	40.3	49,193.7	6.2	38.7	48,001.7	6.1	42.6	41,560.1	5.3	41.7%	29,846.6	3.8	35.0
Industrial	7,681.5	1.0	5.5	7,361.8	0.9	5.8	5,190.4	0.7	4.6	4,084.2	0.5	4.1%	1,507.0	0.2	1.8
Transportation	46,075.2	5.8	32.8	43,842.1	5.5	34.5	37,418.0	4.8	33.2	35,289.3	4.5	35.4%	29,144.0	3.7	34.2
Communications & Utilities	1,248.5	0.2	0.9	1,777.5	0.2	1.4	1,515.1	0.2	1.3	1,323.0	0.2	1.3%	5,248.0	0.7	6.2
Commercial-Retail	3,371.5	0.4	2.4	3,008.5	0.4	2.4	2,522.2	0.3	2.2	2,254.0	0.3	2.3%	1,426.0	0.2	1.7
Commercial-Services	4,015.4	0.5	2.9	3,655.1	0.5	2.9	2,202.6	0.3	2.0	1,210.1	0.2	1.2%	1,172.1	0.1	1.4
Institutional & Government	5,544.4	0.7	4.0	5,082.9	0.6	4.0	4,707.4	0.6	4.2	4,479.7	0.6	4.5%	5,332.9	0.7	6.3
Recreation	15,835.1	2.0	11.3	13,133.4	1.7	10.3	11,102.8	1.4	9.9	9,543.6	1.2	9.6%	11,632.2	1.5	13.6
Total Developed Area	140,324.1	17.7	100.0	127,054.9	16.0	100.0	112,660.2	14.3	100.0	99,744.0	12.7	100.0%	85,308.8	10.8	100.0
Agriculture & Undeveloped	651,654.3	82.3		666,280.3	84.0		674,160.9	85.7		687,077.0	87.3		701,367.5	89.2	
Total Area[2]	791,978.4	100.0		793,335.2	100.0		786,821.1	100.0		786,821.0	100.0		786,676.3	100.0	

Source: Capital Area Regional Planning Commission

[2] The total area is not the same for each time period due to differences in the source data and methodology used for each land use inventory.

Table 2-3

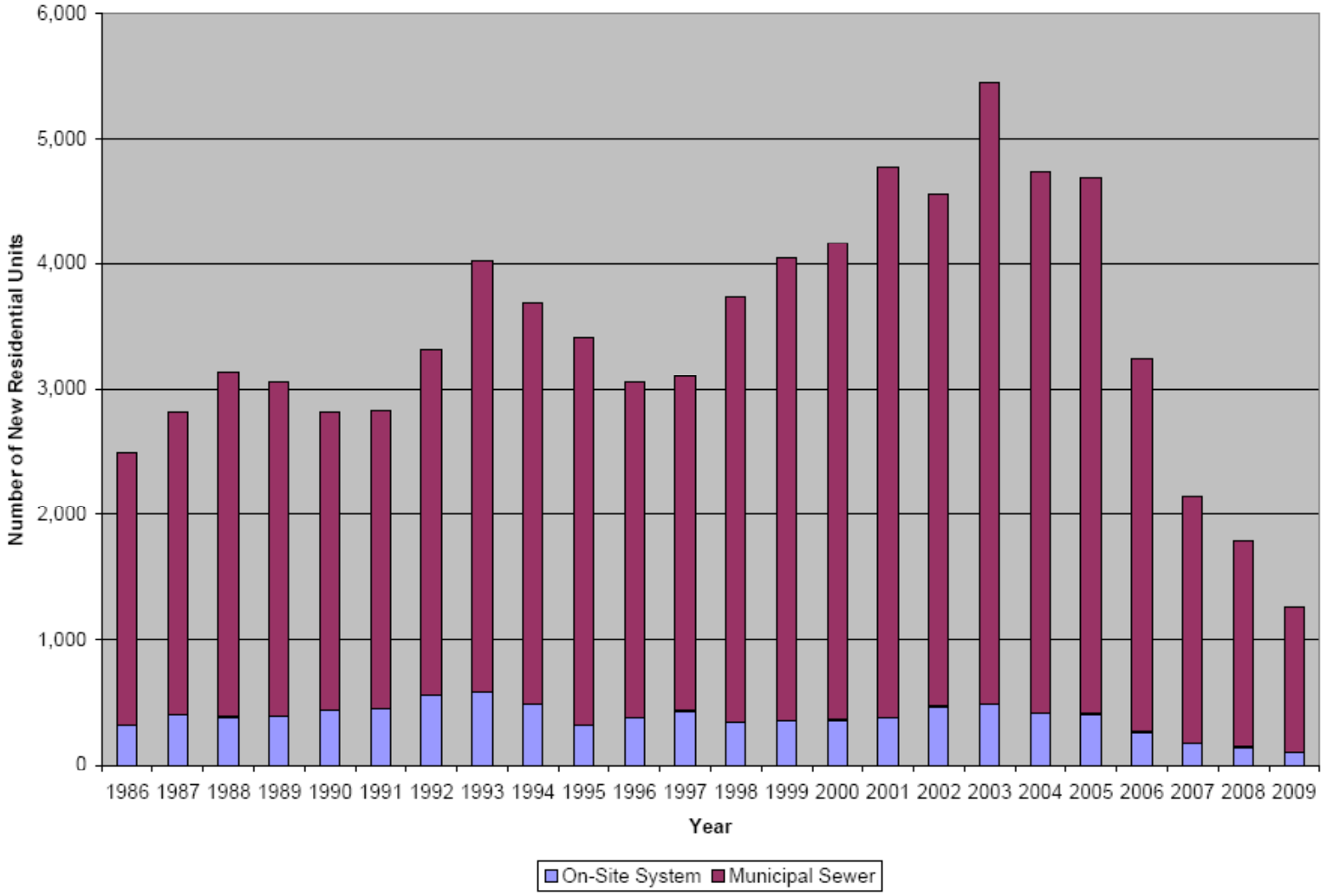
Dwelling Units with On-Site Wastewater Systems in Dane County

	1970	1980	1990	2000	2010
Towns					
Albion	566	503	549	643	493
Berry	229	345	365	428	489
Black Earth	99	132	136	149	205
Blooming Grove	180	350	379	372	375
Blue Mounds	197	229	226	309	321
Bristol	369	518	595	956	1,278
Burke	476	816	886	968	1,130
Christiana	358	393	397	480	486
Cottage Grove	458	910	1,120	1,473	1,433
Cross Plains	237	317	416	526	571
Dane	196	258	292	371	357
Deerfield	220	353	371	466	550
Dunkirk	605	688	691	738	778
Dunn	1,021	1,107	678	657	670
Fitchburg[1]	876	1,063			
Madison	147	56	45	54	56
Mazomanie	235	316	392	493	437
Medina	292	334	397	445	492
Middleton	451	786	1,142	1,593	2,063
Montrose	262	343	377	447	436
Oregon	274	559	789	1,113	1,167
Perry	212	206	229	270	280
Pleasant Springs	580	828	1,031	780	851
Primrose	169	207	205	247	281
Roxbury	280	390	467	547	558
Rutland	336	485	550	700	786
Springdale	308	402	456	584	724
Springfield	459	677	857	1,013	943
Sun Prairie	386	583	629	742	839
Vermont	156	229	260	302	331
Verona	395	503	529	673	608
Vienna	288	398	422	401	363
Westport	538	540	443	395	410
Windsor	376	450	707	749	890
York	194	215	212	268	265
Subtotal	12,425	16,489	17,240	20,352	21,916
Cities and Villages	1,009	749	1,479	1,300	1,183
	13,434	17,238	18,719	21,652	23,099

Sources: 1970 – 1990 US Census data
2000 Estimated from US Census data, DCRPC USA and LSA data, and Department of Public Health Madison & Dane County records
2010 Department of Public Health Madison & Dane County records

[1] The Town of Fitchburg incorporated as a city on April 26, 1983.

Figure 2-3: Residential Development Trends



CHAPTER 3

PUBLIC HEALTH AND ENVIRONMENTAL ISSUES

Toxic compounds, excessive nutrients, and pathogenic agents are among the potential impacts on public health and the environment from onsite wastewater systems. Domestic wastewater contains several pollutants that could cause significant public health or environmental risks if it is not managed effectively. Onsite systems can fail to meet human health and water quality objectives when the fate and transport of potential pollutants are not properly addressed. Failing or failed systems can threaten human health if pollutants migrate into ground waters used as drinking water or nearby surface waters used for recreation. Such failures can be due to improper siting, inappropriate choice of technology, faulty design, poor installation practices, poor operation, or inadequate maintenance.

A conventional on-site wastewater treatment system is capable of nearly complete removal of suspended solids, biodegradable organic compounds, and fecal coliforms if properly designed, sited, installed, operated, and maintained (US EPA, 2002). Research and monitoring studies have demonstrated removals of these constituents to acceptable levels. However, these wastewater constituents can become pollutants in ground water or surface waters if treatment is incomplete. More recently, other pollutants present in wastewater are raising concerns, including nutrients (e.g., nitrogen and phosphorus), pathogenic parasites (e.g., Cryptosporidum parvum, Giardia lamblia), bacteria and viruses, toxic organic compounds, and metals. Concerns have also been raised over the movement and fate of a variety of endocrine disrupters and antibiotics, usually from use of pharmaceuticals. However, no data have been developed to confirm a risk at this time. Research by McMahon et al. (2007) found the presence of antibiotic resistant bacteria in septic tank effluent, but not a correlation to their presence in groundwater monitoring wells. Typical wastewater pollutants and their potential impacts on water resources and public health are summarized in this chapter.

Biochemical Oxygen Demand

Biodegradable organic material creates biochemical oxygen demand (BOD), which can cause low dissolved oxygen concentrations in surface water, creating anoxic conditions harmful to aquatic life. Reduced oxygen conditions can also create taste and odor problems in well water, and cause leaching of

metals from soil and rock into ground water and surface waters.

Total Suspended Solids

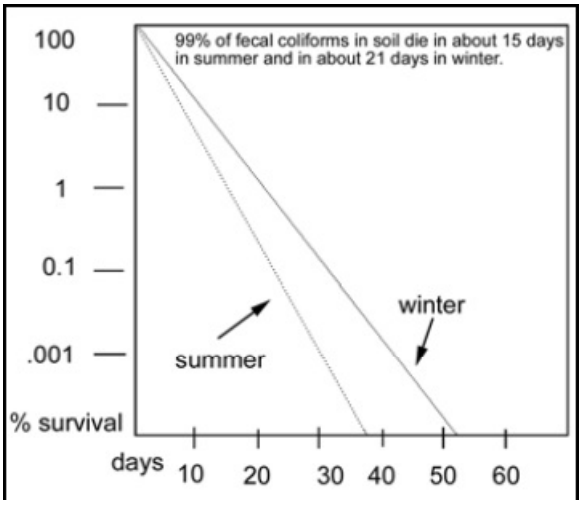
In surface waters, suspended solids can result in sediment deposits that smother benthic macroinvertebrates and fish eggs. In drinking water, turbidity is aesthetically displeasing.

Pathogens

Septic tank effluent contains pathogens with a wide range of size, shape, and physical and biological (mortality) characteristics. Parasites, bacteria, and viruses can cause communicable diseases through direct or indirect body contact or ingestion of contaminated water (US EPA 2002). Humans who are infected or carriers of a particular disease discharge pathogenic organisms found in septage. The usual bacteriological pathogenic organisms that may be excreted by humans cause diseases of the gastrointestinal tract such as typhoid and paratyphoid fever, dysentery, diarrhea, and cholera. A study by Borchardt et al. (2003) found that holding tank septic system densities were associated with endemic diarrheal illness in central Wisconsin. A particular threat can occur if partially treated sewage pools on ground surfaces, migrates to recreational waters, or enters highly vulnerable hydrogeologic settings. A case study by Borchardt et al. (2011) examined a norovirus outbreak caused by a new septic system in the highly vulnerable hydrogeologic setting of a fractured dolomite aquifer in Northeastern Wisconsin.

In general, organisms larger than 3µ (microns) are physically trapped by the soil. This includes intestinal bacteria, parasites and their ova, and protozoa (Kaplan, 1991). The US EPA (2002) reports a 99% removal rate for fecal coliform bacteria in soil infiltration systems.

Figure 3-1: Survival Times of Fecal Coliforms in Soil



Source: Sopper, 1973

Kaplan (1991) cites a literature review by Hagedorn, et al. (1981), which arrived at the following conclusions:

1. Microorganisms move only a few feet in unsaturated soil, but much larger distances in saturated soil.
2. Bacterial retention is higher in finer-textured soils.

3. The main limitation to travel through soil is physical straining or filtration (of bacteria and larger microbes).
4. Adsorption plays a role in retention of bacteria, and increases with clay content.
5. Death of the microorganism plays an important role. Death may occur due to ingestion by other organisms, adverse soil conditions (no nutrients, drying, antagonistic aerobic organisms' secretions, such as antibiotics), and "aging" during long retention periods.

These conclusions are supported by other studies cited by Canter and Knox (1985). Most significantly Bouma (1979) found that antibiotics are produced by high populations of actinomycetes, pseudomonas, and bacillus in the aerated zone beneath the clogged layer formed at the soil-bed interface in the soil absorption system, causing rapid die-off of fecal coliforms and streptococci. This highlights the importance of unsaturated conditions beneath the absorption bed.

Experimental results cited by Hagedorn et al. (1981) from Bouma's 1972 experimental results indicate that 1 to 3 feet of unsaturated soil below the clogging mat is adequate for bacterial removal. Wisconsin regulations require a minimum of 2 or 3 feet of unsaturated soil under the clogging mat, depending on the influent quality, to provide sufficient protection for the groundwater from bacterial contamination.

Viruses however are too small to be physically trapped. Transport distances of these pathogens in groundwater or surface waters can be significant (US EPA 2002). For these organisms other soil factors such as chemical characteristics and moisture content are critical for proper purification. Compared to bacteria, viruses are more resistant to changes in their environment, are more mobile because of their smaller size, and have longer life expectancy in the soil.

The *Onsite Wastewater Treatment Systems Manual* (US EPA, 2002) cites several studies that found adsorption onto soil particles to be the most important mechanism of virus removal in soils. The effectiveness of this mechanism depends on maintaining low flow rates, having sufficient clay and fine silt content in the soil for viruses adsorption, and soil acidity (lower than pH 7.4) and other soil chemical characteristics (Canter and Knox, 1985). Additionally, Canter and Knox cite studies to conclude "that virus adsorption cannot be considered a process of absolute immobilization of the virus from the liquid phase. Any process that results in a breakdown of virus association with solids will result in their further movement through

porous media." Rapid flow due to high rainfall or flooding of the absorption field, hydraulic overcharging of the absorption system, and organic matter in the water phase competing for adsorption sites could dislodge viable viruses and carry them to the groundwater.

Kaplan (1991) cites several cases of biological contaminant movement through absorption field media and then through several hundred feet of saturated soil (groundwater). He cites a 1983 study by McGinnis and DeWalle that measured the distances traveled by bacteria in different aquifers. The distances range from 1 to 300 feet in sandy aquifers, to 2,800 feet in gravelly aquifers, and up to 3,300 feet in a fractured limestone. This has important implications for the minimum allowable distance between private water wells and on-site wastewater systems, especially in the western portions of Dane County where fractured limestone bedrock is within 10 feet of the ground surface.

Phosphorus

Most of the phosphorus in the wastewater is turned into the water-soluble orthophosphate form by the anaerobic treatment in the septic tank (Canter and Knox, 1985). Chemical change and adsorption further reduce the phosphorus as it flows through the soil column. Chemically, phosphorus reacts with calcium, aluminum, and iron minerals in the soil to produce insoluble precipitates that are retained in the soil (Bouma, 1979). However, the capacity of the soil to chemically react with the phosphorus and for soil particles to adsorb phosphate ions is reduced over time.

Phosphorus enrichment of groundwater from septic systems is generally not a concern unless the system is installed in an unsuitable area with coarse sand and gravel, or a high water table. Under normal conditions, phosphorus is efficiently fixed in the soil and migrates extremely slowly. Typically, only very low concentrations of phosphorus are introduced in the groundwater. However, in the presence of a shallow groundwater, high rainfall or hydraulic loading, and coarse soils, it is possible for higher concentrations of phosphorus to get into the groundwater.

The phosphorus found in septic tank effluent is not harmful to humans and is only a concern if it finds its way into surface waters where it can act as a fertilizer for weeds and algae and contribute to eutrophication and the reduction of dissolved oxygen (US EPA 2002). The phosphorus enrichment of surface waters may be a concern in lakeshore settings, especially where

large numbers of on-site systems are clustered around relatively small lakes. On-site wastewater systems installed near lakeshores are often subject to high groundwater and soil conditions unfavorable to proper operation.

Nitrogen

Nitrogen, as a gas, comprises about 78% of the air we breathe. It also is one of the elements in the make-up of proteins. About a quarter of the nitrogen in sewage is part of fecal amino acids and amino sugars, and most of the rest is part of urea (Kaplan, 1991). In the anaerobic septic tank, these organic compounds are broken down to produce several gases and compounds. The nitrogen is turned mostly into ammonia (some of the nitrogen is turned into inorganic mineralized forms and some of it is immobilized through absorption into organic cells), some of which combines with water to produce ammonium ions (the rest of the ammonia volatilizes out of the soil). Aerobic soil bacteria in the unsaturated soil column under the absorption field oxidize the ammonium ions to produce nitrate in a process called nitrification. Nitrate-nitrogen is the most common contaminant identified in groundwater, and is very mobile in many hydrogeologic environments, especially where highly permeable sediment or fractured rock are present. This form of nitrogen is cause for concern, because it is stable, highly soluble in water, and can be carried by the flow of the groundwater to distant wells.

Human health is the primary reason high levels of nitrate in drinking water are of concern (Degen, Reneau, Hagedorn, and Martens, 1991). Nitrate can cause a condition called methemoglobinemia, or "blue-baby syndrome," in infants under six months of age. Nitrate in water used to make baby formula converts to nitrite in the child's stomach and changes the hemoglobin in blood to methemoglobin. The infant's body is then deprived of oxygen. In extreme cases, methemoglobinemia can be fatal; the long-term effects of lower-level oxygen deprivation are unknown. The maximum contaminant level for nitrate in drinking water is 10 ppm nitrate-nitrogen (also shown as 10 mg/l nitrate-N) or 45 ppm nitrate ($N0_3$) Both numbers are the same equivalent contaminant concentration, and are noted here because the literature contains both concentrations. No cases of methemoglobinemia have been reported resulting from consuming drinking water at or below the maximum contaminant level (Fan, 1994). The Lower Rock River Water Quality Management Plan, which covers a large portion of the county, notes: "All infants under 6 months of age are at risk of nitrate poisoning, but some babies may be

more sensitive than others. Serious poisonings in infants have occurred following ingestion of water containing nitrate concentrations as low as 50 mg/l, just 5 times the current standard. Fatal poisonings usually involve ingestion of water containing 100-150 mg/l nitrate." (WDNR 1997) It should be noted that the main adult intake of nitrates is from food rather than from water. Processed meats and some vegetables (notably spinach, beets, green beans, squash, and carrots) can contain nitrate or nitrite levels as high as 200 ppm. However, the greatest risk of nitrate poisoning (methemoglobinemia) still occurs in infants fed well water contaminated with nitrates. The American Academy of Pediatrics recommends that households with infants should test their water supply for nitrate, if the source is a private well (Greer 2005)

The conversion of nitrate to nitrite in the human body also creates N-nitroso compounds, which are some of the strongest carcinogens known. As a result, additional human health concerns linked to nitrate-contaminated drinking water include increased risk of non-Hodgkin's lymphoma (Ward, 1996), gastric cancer (Xu, 1992), and bladder and ovarian cancer in older women (Weyer, 2001). There is also growing evidence of a correlation between nitrate and diabetes in children (Moltchanova, 2004). The current drinking water limit of 10 mg/L for nitrate-nitrogen addresses only methemoglobinemia; the concentration at which these cancer risks occur is unknown.

Nitrogen enrichment of surface waters may also be a concern in lakeshore settings, especially where large numbers of on-site systems are clustered around relatively small lakes. On-site wastewater systems installed near lakeshores are often subject to high groundwater and soil conditions unfavorable to proper operation.

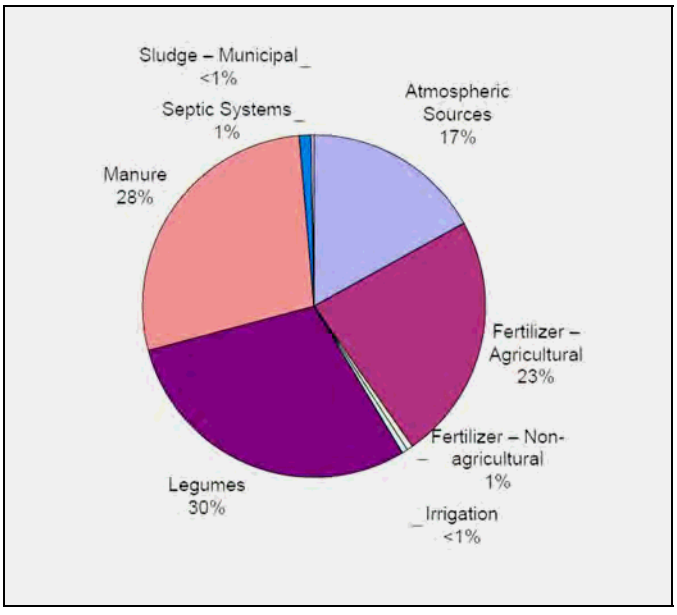
Immobilization of nitrate can occur through plant root uptake, and through denitrification where bacteria use the oxygen in the nitrate and produce nitrogen gas. Denitrification requires carbonaceous food sources for the bacteria, and an anaerobic environment where free oxygen is scarce (Canter and Knox, 1985; Kaplan, 1991; Degen, et al., 1991). Immobilization of nitrates through plant uptake usually results in only minor reduction in nitrate levels because the amount released by an on-site system greatly exceeds that which can be utilized by plants (Canter and Knox, 1985), and because nitrification usually occurs at soil depths below the root zone (Degen, et al., 1991). Where periodic high water levels exist in the soil, or where mounding of water serves to hold nitrates at shallower levels,

plant root uptake could be substantial, resulting in as much as 46% removal of nitrogen (Degen, et al., 1991).

Denitrification rates for conventional systems vary depending on soil texture, hydraulic characteristics of the drainfield system, availability of organic carbon food sources for bacteria, and presence of anaerobic conditions. Eastburn and Ritter's review of literature (1985, as cited in Kaplan, 1991) includes 48% to 86% denitrification rates in some mound systems, rates similar to those found by Harkin (1979) in Wisconsin.

The amount of nitrogen contributed by septic systems to the groundwater should be viewed in the context of the overall nitrogen input to the ground- water. In 2006, the WDNR and the Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP) reported that nitrate-nitrogen (NO_3-N) is the most widespread groundwater contaminant in Wisconsin, and that the nitrate problem is increasing both in extent and severity (WGCC, 2006). An estimated 2,040 million pounds of nitrogen are deposited on Wisconsin's surface annually from agriculture, the atmosphere, septic systems and other sources (Shaw, 1994). Approximately 80% of these nitrate inputs originate from manure spreading, agricultural fertilizers, and legume cropping systems (See Figure 3-2). Another 18% of the nitrogen comes from atmospheric sources including combustion of gasoline in automobiles, the breakdown of nitrogen fertilizers and manure, and lightning. The remaining 2% comes from septage, sludge disposal and other sources. These statistics are based on general assumptions and estimated application and yield numbers because accurate data is not available for most categories. The statistics highlight the difficulty of attributing nitrate contamination of groundwater to any one source. They also indicate that at a regional scale, the contribution of on-site systems to the groundwater nitrate load is small compared to other sources of nitrate.

Figure 3-2: ESTIMATED NITROGEN INPUTS TO WISCONSIN SOILS



Source: Shaw, 1994

Shaw estimates that roughly 10% of the total nitrogen added to Wisconsin soils each year leaches to groundwater as nitrate. Ninety percent of this is from agriculture, 9% from septic systems and 1% from other sources. Though agriculture is the largest source on a statewide basis, other sources can be locally important. Nitrate loading from septic systems in dense, unsewered subdivisions can be as high as some of the most intensive farming operations (Shaw, 1994). On-site wastewater systems can be a particularly significant nitrate source in densely populated areas, areas where fractured bedrock is near the surface, or areas with coarse-textured soils (WGCC, 2002).

Concentrations of nitrate-nitrogen in private water supplies frequently exceed the drinking water limit (federal and state Maximum Contaminant Level, or MCL, also referred to as the Enforcement Standard or ES) of 10 mg/L. The WDNR maintains a database of groundwater quality testing called the Groundwater Retrieval Network (GRN). From 1994 to 2011, 3,333 private well samples have been collected in Dane County. 18% of the private wells tested exceeded the health-based drinking water limit of 10 mg/L (milligrams per liter, or parts per million) nitrate-nitrogen. The remaining 82% of the wells tested have met the drinking water limit for nitrate-nitrogen. 52% of the wells tested contained between 2 mg/L (referred to as the Preventative Action Limit or PAL) and 10 mg/L nitrate-nitrogen, and serve as indicators that land use has likely affected groundwater quality. The WDNR GRN database contains information on about 12,000 private water wells in Dane County. However there are an estimated 23,000 private potable water wells in Dane County in total. About 27% of those wells in the GRN database include nitrate test results. Attachment A includes maps of this data for each town in Dane County. The well data is located on a quarter-quarter section basis.

Although not a significant source of nitrates at a regional level, on-site systems can cause increased levels of groundwater nitrate in localized areas if many systems are concentrated in a relatively small area. In such circumstances, the close proximity of systems surpasses the ability of the groundwater to dilute the nitrate concentrations released by the systems. National studies have established a correlation between the density of on-site systems and the concentration of nitrates in the groundwater. Persky (1986) found a positive relationship between housing density and high groundwater nitrate-N concentrations. In their study of the impacts of subdivisions on groundwater quality, Shaw, et, al.

(1993) concluded that housing densities of less than 0.44 to 0.68 dwellings per acre (1.5 to 2.3-acre lots) are required for subdivisions on sandy soils to maintain nitrate-N concentrations below the 10 mg/l groundwater enforcement standard. Smith and Ince (1989), report on a study by the Illinois Water Survey, which recommended a maximum density of one home per acre based on modeling of housing densities in an area surrounding the Village of Roscoe, Illinois. In Jefferson County, Colorado, contamination exceeding the federal limit of 10 mg/l of nitrate-nitrogen was associated with housing densities greater than one dwelling unit per acre and with separation distances of 100 feet or less between wells and septic systems (Smith and Ince, 1989). Shaw (1994) states that septic systems can be a locally significant source of high nitrate-nitrogen.

A study by DCRPC of nitrate-nitrogen levels in private residential wells in central Dane County (1993) could not establish a direct correlation between rural residential subdivision lot size (or density of on-site systems in a subdivision) and elevated nitrate-nitrogen concentrations in the groundwater, due to the presence of other contributing factors, such as average age of the systems, adjacent agricultural practices, varying soils and geologic conditions, etc. The study concluded that more comprehensive sampling and data would be necessary to establish a causal relationship between on-site system density and groundwater nitrate- nitrogen contamination. A study by Bradbury (2003) concluded that identifying changes in groundwater chemistry due to land-use change can be difficult if similar contaminants are associated with both the new and former land use. They found that two of the principal contaminants in wastewater (chloride and nitrate) were already present in groundwater beneath the Savannah Valley site due to previous agricultural activity. They suggested the use of tracer methods that can differentiate between contaminant sources.

The limited national and state/local information available suggest that it is not likely that localized groundwater nitrate contamination will be caused by on-site systems at a lower density than one system per two acres, but that there is a greater potential for groundwater contamination where systems exceed a density of one per acre. Based on this information, the following recommendation was included in the 2004 Summary Plan Update of the Dane County Water Quality Plan:

> *Large on-site wastewater systems and clusters of systems (over 150 gallons/acre/day or 1.0 to 1.5 acre lots) should only be approved*

where wells and water supplies can be protected from excessive nitrate levels.

This recommendation was intended to serve as screening criteria, in order to direct attention and further evaluation to those instances where there is a significant possibility that the added nitrogen load from on-site systems might result in an exceedance of groundwater quality standards.

Several types of treatment processes are capable of removing nitrogen in wastewater. Nitrogen removal systems are used in onsite treatment trains to ensure protection of ground water as well as surface waters recharged by ground water. Biological nitrogen removal requires aerobic conditions to first nitrify the wastewater, then anaerobic conditions to denitrify nitrate-nitrogen to nitrogen gas. The successful removal of nitrogen from wastewater requires that environments conducive to nitrification and denitrification be induced and positioned properly. The limited ability of conventional on-site wastewater treatment systems to achieve enhanced nitrate reductions and the difficulty in predicting soil nitrogen removal rates means that systems sited in drinking water aquifers or near sensitive aquatic areas should incorporate additional nitrogen removal technologies prior to final soil discharge (US EPA 2002). However, the Wisconsin Administrative Code currently exempts private sewage systems from having to meet groundwater nitrate standards.

Metals

Metals like lead, mercury, cadmium, copper, and chromium can cause physical and mental developmental delays, kidney disease, gastrointestinal illnesses, and neurological problems. For example, cadmium contained in the diet accumulates in the kidneys and may cause a chronic disease called proteinuria (increased excretions of protein in the urine).

Metals can be present in raw household wastewater because many commonly used household products contain metals. Aging interior plumbing systems can also contribute lead, cadmium, and copper (Canter and Knox, 1985). Other sources of metals include vegetable matter and human excreta. Several metals have been found in domestic septage, confirming their presence in wastewater. They primarily include cadmium, copper, lead, and zinc (US EPA, 2002)

Canter and Knox (1985) cite at least one study in South Carolina that showed metallic contamination of shallow water supply sources from septic systems to be quite common.

Contaminants found in this study included mercury, lead, and arsenic, in some cases higher than drinking water limits recommended by US EPA. Consequently, the risk of groundwater contamination by heavy metals from septic systems deserves consideration in this report.

Metals are captured in the soil column by four major reactions; namely, adsorption, ion exchange, chemical precipitation, and complexation with organic substances. Adsorption is the most important mechanism for fixation of heavy metals (Canter and Knox, 1985). Although the effectiveness of any of the mechanisms is dependent on soil composition, soil texture, pH, and the oxidation-reduction potential of soil ions (Bates, 1980). In general, finely textured soils containing high levels of clay and organic matter in an alkaline environment is best suited for heavy metal fixation. Unfortunately, the anaerobic environment of the septic tank and the clogging mat under the absorption field produces organic acids that result in more soluble forms of heavy metal compounds. The presence of chloride and phosphate (standard constituents of household wastewater) can also serve to increase the mobility of some heavy metals in the soil column (Canter and Knox, 1985). Keeping heavy metals from entering the system is, consequently, an important first step in reducing the risk of local groundwater contamination from septic systems.

Organic Chemicals

A number of toxic organic compounds that can cause neurological, developmental, or other problems in humans and interfere with biological processes in the environment can be found in septic tank effluent. The toxic organics that have been found to be the most prevalent in wastewater are 1,4-dichlorobenzene, methylbenzene (toluene), dimethylbenzenes (xylenes), 1,1-dichloroethane, 1,1,1-trichloroethane, and dimethylketone (acetone). (US EPA, 2002) These compounds are usually found in household products like solvents and cleaners.

Several studies have shown nationwide evidence of groundwater contamination by synthetic organic chemicals released through septic systems (Canter and Knox, 1985). Canter and Knox (1985) cite numerous studies which show synthetic solvents, herbicides, and pesticides to have sufficient mobility through soil, under some flow circumstances and soil characteristics, to reach the groundwater and result in the contamination of nearby shallow wells. An important source of such chemicals is the use of organic degreasers and solvents (usually trichloroethylene, which is not

allowed in Wisconsin) as a cleaner and declogger for the septic system. Careless housekeeping can also result in significant amounts of herbicides, pesticides, and organic solvents to be washed into the septic system. Kaplan (1991) suggests that toxic septic tank cleaners and decloggers should be outlawed (they are already regulated in Wisconsin), but, more importantly, the users of on-site systems should be thoroughly educated about keeping synthetic organic chemicals out of their septic systems.

In Dane County, the industrial, agricultural, and commercial sources of groundwater contamination by organic chemicals have posed a more serious threat. For example, according to data from the DNR Groundwater Retrieval Network, 21% of the 390 samples from rural wells in Dane County were found to exceed the Preventative Action Limit for atrazine (an agricultural herbicide). As of 2006, the use of atrazine has been prohibited in a large part of Dane County. Nonetheless, local contamination of the groundwater by inappropriate disposal or use of toxic organic chemicals in septic systems can pose health and environmental threats, especially considering the relatively short distances the pollutants would have to travel to contaminate nearby private wells in rural subdivisions.

Health and environmental impacts of various potential pollutants from residential on-site wastewater systems have been examined. Some of these, such as synthetic organic chemicals, should never used or disposed in a septic system. Some other contaminants, such as nitrate-nitrogen, are characteristically produced by septic systems and can pose a significant threat to the groundwater in high concentrations. The remaining potential pollutants are due to poorly maintained, designed, constructed, and located systems, and not necessarily characteristic of a typical modern on-site wastewater system. Proper siting, appropriate choice of technology, good design and installation practices, and adequate operation and maintenance are crucial in assuring proper treatment of wastewater and protection of the groundwater from contamination.

CHAPTER 4

DESIGN, OPERATION AND EFFECTIVENESS OF PRIVATE ON-SITE WASTEWATER TREATMENT SYSTEMS

Types of On-Site Wastewater Systems

This chapter outlines the design, operation, and effectiveness of the various types of private on-site wastewater treatment systems to understand their unique benefits and risks. Attachment C explains the basic terms, concepts, and processes of wastewater treatment. Knowledge of the basic theory of wastewater treatment is helpful to understanding how and why the processes are applied in the various types of on-site wastewater systems.

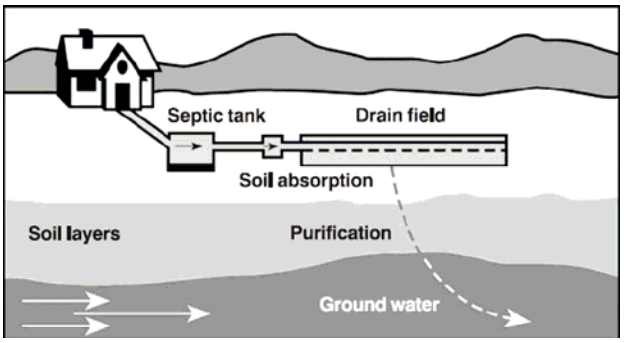
Holding Tank

The holding tank is the simplest of all the onsite sewage systems. A large storage tank is installed below ground that collects wastewater that must be pumped out periodically for treatment at another facility. A holding tank can be installed with a minimum of three inches of compacted bedding material. An alarm on the tank signals when the tank is full and the contents need to be pumped and properly disposed. Counties have the option to ban holding tanks in certain areas.

In-Ground System

The in-ground septic system is the most common system used in Wisconsin and nationwide due to the fact that it is the easiest and least costly to install and maintain. It has been codified in Wisconsin since 1969. This system consists of a septic tank followed by a soil absorption field (Figure 4-1).

Figure 4-1
In-Ground System



Source: US EPA (2002).

A septic tank is buried tank designed and constructed to receive and pretreat wastewater from individual homes by separating settleable and floatable solids from the wastewater. Grease and other light materials, collectively called scum, float to the top. Gases are normally vented through the building's sewer pipe. Septic tanks allow most solids to settle, remove floatable materials, and promote partial anaerobic digestion of the retained organic matter. Septic tank effluent, which contains significant concentrations of pathogens and nutrients (see Table 4-1), is

discharged to the soil through a drain field for further treatment through biological processes, adsorption, filtration, and infiltration into underlying soils. The septic tank requires periodic pumping of solids as well as inspection to determine if the tank remains watertight. In cases where the septic tank is lower than the distribution system, in-ground systems can be designed with a pump in the septic tank to transfer the wastewater to the distribution system. It is still considered a in-ground system as long as the pump does not put the wastewater under pressure.

A typical soil absorption system consists of perforated piping and gravel in a field or trench, although gravel less systems can also be used. Soil absorption systems are normally placed at relatively shallow depths (e.g., <2 ft). Excellent TSS, BOD, phosphorus, and pathogen removal is provided in the unsaturated soil that surrounds the infiltrative surfaces.

In-ground systems can be used where the native soils are of a depth to provide at least 36 inches of suitable soil with the appropriate texture and structure between the bottom of the soil absorption system and either the bedrock or the water table. Of the 36 inches of suitable soil, 24 inches must be in situ (native) soil found at the site. Because the bottom of the soil absorption system is normally about 20 inches below the ground surface, in-ground systems require at least 56 inches of soil between the ground surface and bedrock or the water table (WDOC, 1998).

These in-ground systems work well, are reliable, and can meet most public health, and ground water quality performance standards if they are properly designed for the incoming waste load, installed in areas with appropriate soils and hydraulic capacities, and properly maintained to ensure long-term performance. Nitrogen removal rates vary significantly, and many in-ground systems do not achieve drinking water standards (i.e., 10 mg/L) for nitrate concentrations in effluent plumes. Clogging can occur along the distribution pipes as solids and bacteria biomass accumulate in flow areas.

In-Ground Pressure Distribution System

The principal difference between a in-ground system and an in-ground pressure distribution system and the is the addition of a pump chamber that delivers effluent from the septic tank to the soil absorption bed in controlled pressurized doses. Thus, the pressure system can be used when gravity cannot convey septic tank effluent to the absorption field or

where the absorption field is located on a slope.

Pressure dosing systems distribute water over more infiltrative surface and provide a resting period between doses. This provides the added benefit of even distribution of the effluent and therefore a more uniform loading to the soil, which reduces the probability that the system may clog and increases the life of the system. Through the manipulation of the dosing regime it is also possible to achieve better performance of the leach field by reducing saturated flow through the soil, which results in better treatment.

Dosing siphons or pumps provide the required pressure. However, pumps require additional maintenance demands. Overheating pumps are one of the mechanical issues that arise with this type of system. In addition, deterioration of electrical wiring or the connections in the pump can be the result of harsh weather or corrosive gases inside the pump chamber.

Like the in-ground system, 24 inches of unsaturated in situ soil from the soil absorption system to the bedrock or ground water is necessary to install this treatment system. Space for the drain tile, gravel trench, and overlying fill above the soil absorption bed boosts the native soil requirement to 49-53 inches from the surface to the bedrock or the water table (WDOC, 1998). These components, the same as those in in-ground systems, have a long history in Wisconsin. (WDOC, 1999).

Mound System

Mound systems have been developed for areas where soils lack sufficient depth, or where there is insufficient distance between the bottom of the absorption field and the groundwater, for a in-ground septic tank and leach field system (Figure 4-2). Like the in-ground system, the mound system also consists of a septic tank and a soil absorption bed. The mound system, however, allows the use of sand where native soil is insufficient. Effluent from the septic tank is pumped in pressurized doses to an aboveground, free-standing sand layer, in the form of a mound situated above the native soil, to create an absorption field with sufficient separation from the water table or the bedrock.. The sand layer, serves as the medium on which aerobic bacteria facilitate secondary treatment and filter the septic tank effluent before it reaches the natural soil. The sand layer, in addition to the layer of native soil, provides 36 inches of vertical soil separation above bedrock or the water table (WDOC, 1998). The mound is covered with topsoil to provide frost protection, establish and maintain a good vegetative

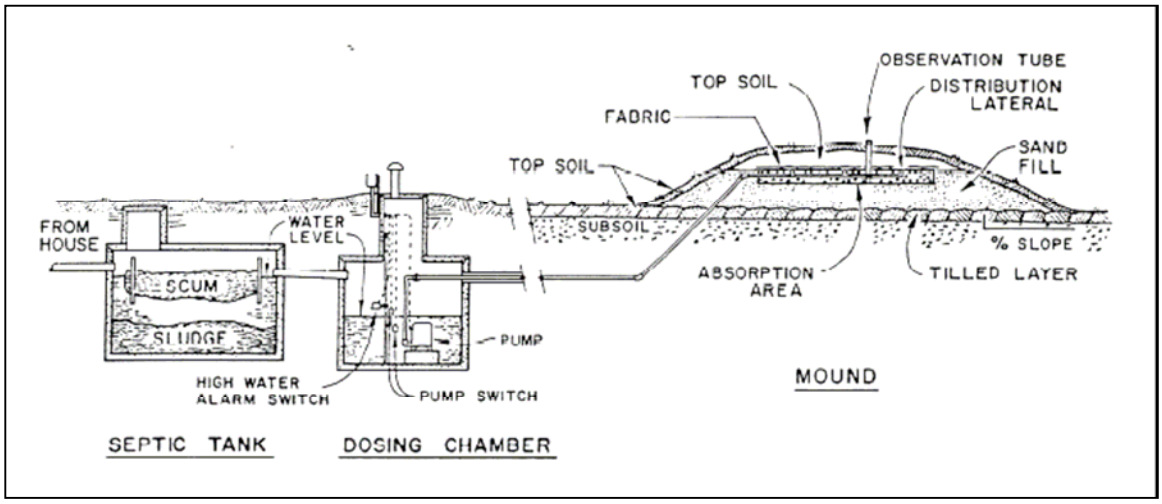
cover, and promote runoff of precipitation.

Mound systems are used for the following circumstances (On-Site Domestic Sewage Disposal Handbook; 1982; Midwest Plan Service):

- Slowly permeable soils with or without high water tables.
- Shallow permeable soils with fractured or porous bedrock.
- Permeable soils with high water tables.

Mounds systems can effectively treat wastewater on sites with as little as four inches of soil beneath the layer of top soil called the "A horizon." (WDOC, 1998). The use of sand as a medium for wastewater treatment, rather than native soil, is more than 100 years old. Using sand in the mound system became permitted for general use in Wisconsin in 1980. Prior to the revision of Comm 83 (now SPS 383) in 2000, new construction was restricted to sites with 24 inches of in situ soil. Since the WDOC asserted that there was no technical or public health reason for this restriction, the current code allows mound systems on sites with only six inches of in situ soil where another 30 inches of sand can be added (WDOC, 1999).

Figure 4-2: Typical Mound System



Source: Coverse and Tyler (2000)

At-Grade System

For at-grade systems, the distribution piping is placed on a prepared gravel bed on the ground surface (hence, at-grade). The effluent is pumped and dispersed just below the land surface. Twenty-four inches of in situ soil is necessary to install an at-grade system totaling to 36 inches of suitable soil between the infiltrative surface and the bedrock or ground water. These systems are less expensive than the traditional mound. Before the revisions to COMM 83 (now SPS 383) in 2000, at-grades were approved for experimental use only. Since 2000, the code approves them for general use in Wisconsin (WDOC, 1999).

While these systems are less expensive to construct than mound systems, they are more expensive to repair. In mound systems it is possible to easily replace the sand medium. Repair of an at-grade system would require the complete removal and reconstruction of the whole absorption cell with new fill.

Advanced and Alternative Technologies

Up-to-date septic technologies that reflect the current advances in onsite wastewater treatment science were added to the code with the revisions to Comm 83 (now SPS 383) in 2000. The single-pass sand filter, recirculating sand filter, aerobic treatment units (ATU), drip-line dispersal, and constructed wetlands are septic technologies now available for general use. Advances in septic technology have allowed more systems to be installed where soil conditions were restrictive under the previous code.

Intermittent Sand Filter

Sand filters provide advanced secondary treatment of settled wastewater or septic tank effluent. They consist of a lined excavation or structure filled with uniform washed sand that is placed over an underdrain system (see Figure 4-3). The wastewater is dosed onto the surface of the sand through a distribution network and allowed to percolate through the sand to the underdrain system. The underdrain system collects the filter effluent for further processing or discharge to a soil absorption system. A septic tank (or other pretreatment system) is required to remove settleable solids and grease, which can clog the sand.

Sand filters are essentially aerobic, fixed-film bioreactors. In fixed-film systems, aerobic microorganisms attach and grow on an inert media (sand in this case). Wastewater flows across the slime layer created by the growth of the attached microorganisms, which extract soluble organic matter from the wastewater as a source of carbon and energy. The adsorbed materials are incorporated into a new cell mass or degraded under aerobic

conditions to carbon dioxide and water. Other treatment mechanisms that occur in sand filters include physical processes, such as straining and sedimentation that remove suspended solids within the pores of the media. Chemical adsorption of pollutants onto media surfaces also plays a finite role in the removal of some chemical constituents such as phosphorus.

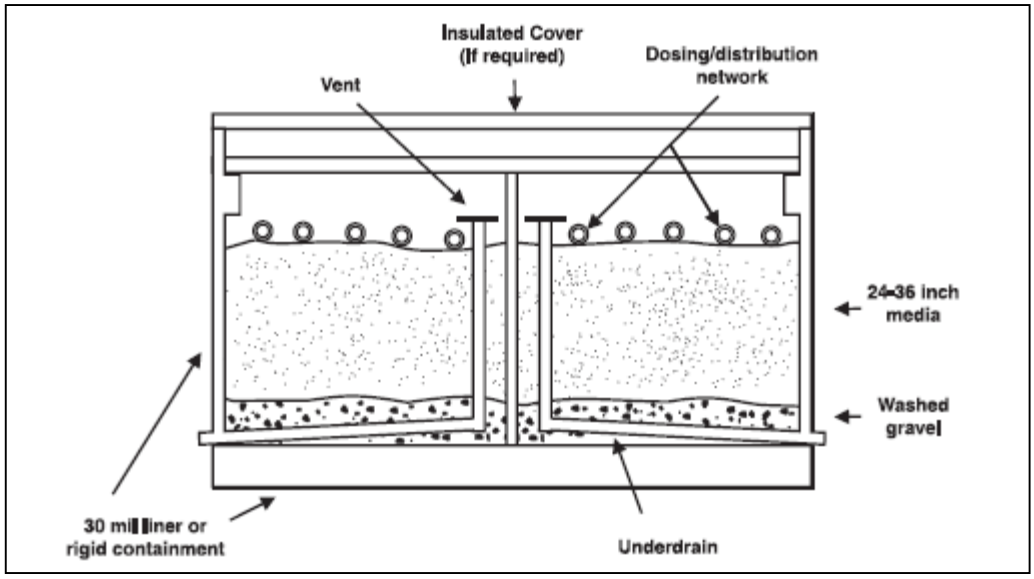
Dosing volume and frequency have been shown to be the critical design variables. Small dose volumes are preferred because the flow through the porous media will occur under unsaturated conditions with higher moisture tensions. Better wastewater media contact and longer residence times occur under these conditions. Smaller dose volumes are achieved by increasing the number of doses per day. Uniform distribution of influent is very important to filter performance.

It is often necessary to provide a cover for the filter surface because the surface of a fine medium (e.g., sand) exposed to sunlight can be fouled with algae. A cover also addresses concerns about odors, cold weather impacts, precipitation, leaf and debris accumulation, and snowmelt. The cover must provide ample fresh air venting to keep the system aerobic.

Sand filters should be checked regularly (at least every 3 to 4 months), to prevent surface problems. Periodic raking and resting is recommended to maintain percolation and prevent ponding. Scraping off the top layer (e.g., 1 inch) of sand helps to prevent clogging. Intervals between scraping vary from a minimum of 3 months up to greater than 1 year. Removed surface layers need not be replaced until the total filter depth falls below 18 inches.

Typical effluent concentrations from sand filter wastewater treatment systems are less than 5 mg/L for BOD and less than 10 mg/L for TSS. Effluent is nearly completely nitrified but some variability can be expected in nitrogen removal capability. Controlled studies have generally found typical nitrogen removal rates of 18 to 33 percent. Fecal coliform removal ranges 99 to 99.99 percent. Fecal coliform removal is a function of hydraulic loading, with reduced removals as the loading rate increases above 1 gpm/ft^2 (Emerick et al., 1997).

Figure 4-3: Typical Sand Filter System



Source: US EPA (2002)

Media / Trickling Filter

The term media filter or trickling filter is used to describe a variety of packed-bed filters that are available on the market. The technology that can generally be described as the "trickling" of liquid over a media to achieve treatment. Media filter systems function the same as sand filters, but use materials other than sand as the filter medium. Most media filters are packaged in units or placed in enclosures and use pressure dosing to distribute the effluent in the filter. The media can be can be a wide variety of materials ranging from natural materials such as peat, bottom ash, and stones to synthetic materials such as expanded polyurethane foam and honeycombed plastic. The technology can be used to provide a final "polish" to the effluent, or it can be the intermediate step in an overall process.

As applied to onsite septic systems, trickling filters receive septic tank effluent. As the effluent passes or trickles over the media, available oxygen (as these systems are usually well ventilated to supply fresh air), is used by nitrifying bacteria to convert the ammonia in the effluent to nitrate and the BOD is reduced. After passing over the filter media, the effluent is sometimes discharged to the soil absorption system or leaching facility. If denitrification is desired, a portion of the filtrate is recycled back to an anaerobic chamber such as the septic tank. It should also be noted that, in many cases, the

growth on the filter media thickens to the point where there are some anaerobic microzones in the media in which denitrification can take place.

Recirculating Sand Filter

The basic components of recirculating filters include a recirculation/dosing tank, pump and controls, distribution network, filter bed with an underdrain system, and a return line. The return line or the underdrain must split the flow to recycle a portion of the filtrate to the recirculation/dosing tank. A small volume of wastewater and filtrate is dosed to the filter surface on a timed cycle 1 to 3 times per hour. Recirculation ratios are typically between 3:1 and 5:1. In the recirculation tank, the returned aerobic filtrate mixes with the anaerobic septic tank effluent before being reapplied to the filter.

A recirculating sand filter is really a trickling filter. The difference is that media in trickling filters generally is much more open (contains relatively large pore spaces compared with the sand filter), and the residence time in the media is comparatively shorter than a sand filter. Recirculating filters must use a coarser media than single-pass filters because recirculation requires higher hydraulic loadings. Both coarse sand and fine gravel are used as filter media. Because of the high hydraulic conductivities of the coarse media, filtrate recirculation is used to provide the wastewater residence times in the media necessary to meet the treatment requirements.

As the effluent passes through the sand filter, the ammonium-nitrogen is converted to nitrate-nitrogen in a sequence of steps that occur in the presence of air and two types of bacteria. Nitrosomonas bacteria convert ammonium (NH_4^+) to nitrite (NO_2^-) and Nitrobacter bacteria convert nitrite to nitrate (NO_3^-). Following the conversion of ammonium to nitrate in the sand filter, a portion of the effluent is piped back to the pump chamber or the septic tank, while a portion of the effluent passes on to the drain field. The nitrate contained in the portion that returns to the pump chamber or the septic tank undergoes a further transformation to nitrogen gas (N_2). This harmless gas is vented to the atmosphere through the vents in the system. Anaerobic conditions and a carbon food source must be present for the conversion of nitrate to nitrogen gas to take place. Both the pump chamber and the septic tank are potential candidates for these conditions, so nitrified waste can be returned to either component. It is most common to return nitrified waste from the sand filter to the pump chamber for subsequent denitrification in order to minimize

the disruption in the septic tank and promote its function as a primary anaerobic digestion unit in the system.

BOD and TSS removals are generally the same as those achieved by single-pass filters. Nearly complete ammonia removal by nitrification is also achieved. In addition, the mixing of the return filtrate anaerobic septic tank effluent removes approximately 50 percent of the total nitrogen. However, because of the greater hydraulic loadings and coarser media, fecal coliform removal is somewhat less than in single-pass filters. Recirculating filters offer advantages over single-pass filters. Greater control of performance is possible because recirculation ratios can be changed to optimize treatment. The filter can be smaller because of the higher hydraulic loading. Recirculation also reduces odors because the influent wastewater (septic tank effluent) is diluted with return filtrate that is low in BOD and high in dissolved oxygen. Adjustment of recirculation rate accompanied with laboratory analysis of effluent is necessary to optimize nitrification/denitrification rates. A maintenance contract with a professional POWTS maintainer is required by SPS 383.

Aerobic Treatment Unit

An Aerobic Treatment Unit (ATU) is a suspended growth treatment system in which microorganisms are suspended in an aerated reactor by mixing. The system is a variation of the activated sludge process used in many municipal wastewater treatment plants. An ATU consists of a self-contained unit that uses blowers or propellers to aerate the wastewater. They may also have filters to remove suspended solids. An onsite sewage system that incorporates an ATU has either a septic tank or contains a septic compartment for solids separation, followed by the ATU, and a soil absorption bed.

Oxygen is supplied to oxidize organic carbon and, possibly, nitrogen compounds. Effluent is discharged either to surface water or subsurface systems. Suspended growth systems can be engineered as package plants to serve clustered residential housing, commercial establishments, or small communities with relatively small flows. ATUs are initially seeded with bacteria to provide a suspended medium for the growth of aerobic microorganisms that remove organic materials from the wastewater. Wastewater is dispersed to a soil absorption bed. Depending on the amount of treatment the wastewater receives in the ATU (quality of the effluent leaving the ATU), treatment required of the soil absorption bed will be reduced, providing the potential to reduce the size of this bed. Thus, ATUs can be used where

there is insufficient soil for the standard 36-inch vertical separation to groundwater or bedrock. Since effluent from the ATU is an aerobic product with low concentrations of BOD, it can also be used to rehabilitate an existing soil absorption bed that is clogged with microbial biomass.

Solids must be periodically pumped from the septic tank and the pump chamber. The ATU unit itself must be pumped at regular intervals to maintain a balance in the microbial fauna. Events such as a prolonged disruption of electrical service could disrupt the balance and require the tank to be pumped, reactivated, and re-seeded. A professional should inspect these units every six months or whenever an alarm is activated.

Aerobic Treatment Units have been used in Wisconsin for over 30 years. SPS 383 allows systems that use ATUs with proven treatment capability to reduce the vertical separation of the soil absorption bed to 24 inches.

Constructed Wetlands

Constructed wetlands are engineered systems designed to optimize the physical, chemical, and biological processes of natural wetlands for reducing BOD and TSS concentrations in wastewater. These systems are comprised of wetland vegetation growing in a lined, gravel filled bed. These systems mimic the processes that occur in natural wetland systems. Wastewater from a septic tank flows through a pipe into the constructed wetland, where it is evenly distributed across the inlet. The vegetation growth absorbs nutrients in the wastewater and filters suspended solids and other organic matter. Sedimentation of solids also occurs within the gravel substrate. The resulting effluent is then typically sent to a soil absorption field.

Constructed wetlands are very effective for BOD and TSS removal. The literature (Wallace and Knight, 2006) reports that horizontal subsurface flow constructed wetlands can be successfully used in cold climates. Nitrogen removal requires a combination of horizontal flow and vertical flow constructed wetlands (Vymazal, 2005).

Aquatic Systems

A special variation of a constructed wetland is a proprietary aquatic system called the Living Machine. The first stage in the system is a settling tank where the flow is equalized and solids are allowed to settle. Then the wastewater flows through a series of wetland beds constructed in tanks that contain gravel aggregate, specially engineered films of beneficial microorganisms, and plants working together to use the nutrients in the effluent. This system can be constructed in an enclosed

environment, such as a greenhouse, to provide climate control during cold periods. It utilizes a central control system to manage the flow of water through the system and monitors system performance.

Drip Line Dispersal

A drip line effluent dispersal component is an element of the soil absorption system. As with all onsite treatment technologies, primary treatment in a septic tank is required prior to discharging wastewater to the soil. A pump chamber delivers effluent to the drip lines in timed pressurized doses through a distribution network that contains a series of filters. The filters are flushed periodically to prevent clogging. The lines and emitters are impregnated with inhibitors to prevent solids build up and root intrusion. Frequent automatic flushing of the lines helps ensure trouble free operation.

Drip lines offer an alternative to rigid effluent piping, aggregate, leaching chambers, and excavation in the distribution field. By using flexible tubing, a shallowly placed drip line network can be installed with minimal site disturbance. This flexible tubing can be "plowed" around obstructions (trees and boulders) that might otherwise need to be removed. These systems allow the delivery of smaller more frequent doses using pressure compensating emitters. By allowing smaller more frequent dosing, and spacing the lines two feet apart, drip-line irrigation better facilitates the use of slowly permeable soils for wastewater distribution. By discharging effluent directly to the root zone, wastewater can also be a source for irrigation and fertilization. Studies have shown that nutrient absorption by plant uptake can reduce the concentration of nitrogen and phosphorous in the effluent that enters groundwater.

Drip-line technology is a proven and efficient means of dispersing domestic wastewater that has been in use in the United States since the late 1980s. These systems have undergone extensive research in the State of Minnesota to examine their operation in cold climates. Results from Minnesota and Wisconsin have shown that properly designed and maintained systems successfully resist freezing at depths of six inches below grade, the minimum depth required by SPS 383. Drip line systems are in use in other northern states including Michigan, Washington, and Pennsylvania.

Separation of Black Water and Gray Water.

Black water (toilet water) can be segregated from other sources of household wastewater (gray water) for separate treatment and disposal. A separate plumbing system within a house is required. Black water, which contains 80% or more of the

nitrogen in household wastewater, can be discharged directly to a holding tank. The remaining gray water can then be discharged to a septic tank / soil absorption system or gray water reuse system.

Composting Toilets

Composting toilets are contained waste treatment systems that use natural biological decomposition to convert toilet wastes into water vapor, carbon dioxide, and a stable compost-like end product. The decomposition process is accomplished by aerobic (oxygen-using) bacteria and fungi. The complex population of microorganisms in the composting material make conditions unfavorable for the growth of disease-causing organisms which can be present in human waste. Pathogenic organisms die off or are consumed by the composting organisms as long as the composting process is proceeding normally and has adequate time to work. Composting toilets and other non-water based alternatives to the water closet (such as a privy or incinerating toilet) may be installed per SPS 391.

Evapotranspiration Beds

In this system growing plants absorb and evaporate the water in the wastewater and produce plant growth by absorbing the nutrients in the wastewater. This system is used to augment a soil absorption field. The effectiveness of the system is dependent on climatic variables such as the amount of precipitation, evaporation, and growing season length. Year-round evapotranspiration systems require large surface areas and are most feasible in the southwest United States. They are least suited for the climate in the eastern half of the United States, including our region.

Disinfection Systems

Disinfection refers to the destruction of disease-causing organisms called pathogens (e.g., bacteria, viruses) by the application of chemical or physical agents. Disinfection may be necessary where other types of treatment are inadequate to reduce pathogen levels to the required regulatory standards for surface discharge. The most common types of disinfection for decentralized systems are chlorination and ultraviolet treatment systems.

Chlorination

Chlorination occurs by mixing/diffusing liquid or solid chlorine forms with wastewater. Chlorination is considered to be the most practical disinfection method for onsite wastewater treatment because it is reliable, inexpensive, and easy to use; however, dechlorination may also be needed to prevent the release of residuals that may be harmful to aquatic life.

Ultraviolet Disinfection

In an ultraviolet treatment system, high intensity lamps are submerged in wastewater or the lamps surround tubes that carry wastewater. Disinfection occurs when the ultraviolet light damages the genetic material of the bacterial or viral cell walls so that replication can no longer occur. Effective disinfection is dependent on wastewater quality, as measured by turbidity, which shields the bacteria from the radiation. Therefore, it is important that pretreatment provide a high degree of suspended and colloidal solids removal and care must be taken to keep the surface of the lamps clean because surface deposits can reduce the performance of the system. Ultraviolet radiation is a highly effective technique especially attractive in cluster systems where the effluent cannot include any residuals or where there are overriding concerns with safety.

Cluster Systems

Cluster systems are decentralized wastewater collection and treatment systems serving two or more dwellings, but less than an entire community. The wastewater from several homes may be pretreated onsite by individual septic tanks before being transported through alternative sewers to an off-site, nearby treatment unit that is relatively small compared to centralized systems.

System Costs in WI

Capital construction costs for private on-site wastewater treatment systems will vary depending on local site and soil conditions. A cost range for each representative type of residential system in WI is shown in Table 4-1 (Finger, 2012). Attachment G contains a present worth cost analysis for private on-site wastewater treatment systems in comparison to public sanitary sewer.

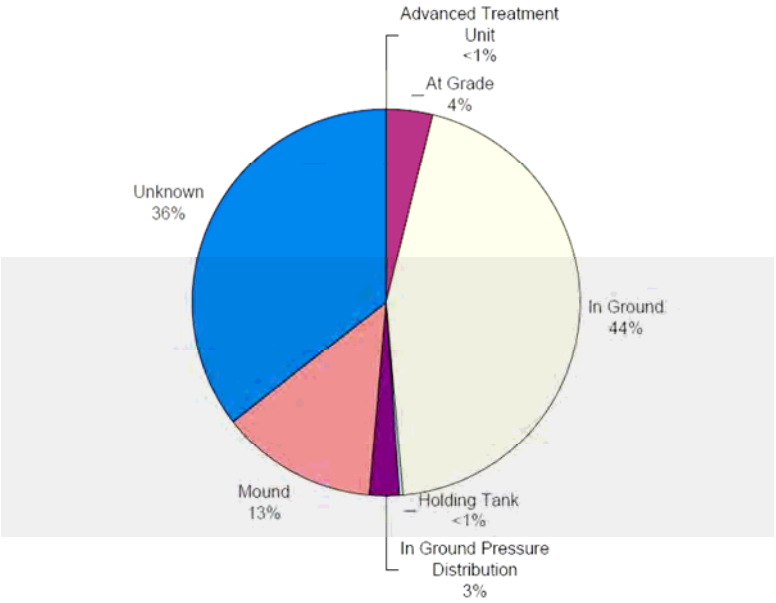
Table 4-1: Typical Capital Costs

System Type	Cost Range
In-ground	$5,000 – $7,000
Mound	$12,000 – $15,000
In Ground Pressure	$8,000 - $10,000
At-Grade	$9,000 - $11,000
Aerobic Treatment	$9,000 – $23,000
Sand Filter	$9,000 – $23,000
Constructed Wetland	> $15,000

Systems in Dane County

The Department of Public Health for Madison & Dane County is the organization responsible for permitting private on-site wastewater treatment systems in Dane County. Figure 4-4 shows the different types of systems currently in use in Dane County based on their records.

Figure 4-4
POWTS in Dane County



Effluent Quality

Onsite wastewater treatment system performance should be measured by the ability of the system to discharge a treated effluent capable of meeting public health and water quality objectives established for the receiving water resource. Most onsite systems ultimately discharge treated water to groundwater.

Contaminant attenuation (removal or inactivation through treatment processes) begins in the septic tank and continues through the distribution piping of the drain field or other treatment unit components, the infiltrative surface biomat, the soils of the vadose zone, and the saturated zone. Those constituents that pass through the septic tank and the zone of absorption in the soil will likely end up in the groundwater. It is therefore necessary to evaluate the effectiveness of each of the mechanisms in treating the wastewater.

The septic tank serves the functions of solid-liquid separation, storage of solid and floatable materials, and anaerobic treatment of these materials. Table 4-2 shows the representative concentrations of various constituents of concern in the effluent from typical treatment units (adapted from US EPA, 2002). Due to anaerobic conditions in the septic tank, nitrates are not produced. However, ammonia and organic nitrogen in the tank effluent are transformed into nitrates in the aerobic conditions of the absorption field. Although biofilms develop on exposed surfaces as the effluent passes through piping to and within the drain field, no significant level of treatment is provided by these growths. (US EPA, 2002)

The next treatment site is the infiltrative zone, which contains the biomat. Filtration, microstraining, and aerobic biological decomposition processes in the biomat and infiltration zone remove more than 90 percent of the BOD and suspended solids and 99 percent of the bacteria (US EPA, 2002). As the treated effluent passes through the biomat and into the vadose and saturated zones, other treatment

processes (e.g., filtration, adsorption, precipitation, chemical reactions) occur.

Table 4-3 shows the representative concentrations of various constituents of concern in the effluent from the soil adsorption field at a depth of 3 to 5 feet (adapted from US EPA, 2002). To obtain these values, the percent removal due to the adsorption field is multiplied by each of the effluent concentrations from Table 4-1. These are the concentrations that would be introduced into the groundwater if it were located 5 feet under the absorption field. Once in the groundwater, dilution is the primary mechanism to reduce the concentration of dissolved constituents of BOD, COD, organic carbon, and nitrogen (phosphorus is reduced through ion absorption by iron and aluminum minerals in strongly acid to neutral environments, and by calcium minerals in neutral to alkaline environments).

A 1992 study by Shaw and Turyk did not find any significant difference between the treatment efficiency of mound systems, pressurized systems, and in-ground septic systems. The study was conducted in sandy soil areas of Wisconsin, and involved residential units. Other research (US EPA, 2002) has also found that these types of systems provide similar levels of treatment .

The effluent quality noted in this section characterizes a properly functioning on-site system. Much Higher concentrations of contaminants could be released into the environment by a system that is not functioning properly or has failed. Hydraulic failure, for example, can result in ponding of wastewater on the absorption field and overland drainage of pollutants into surface water. Treatment failure, where rapid percolation of wastewater to the groundwater occurs, can result in significant contamination of the groundwater.

Nitrogen

Nitrogen in raw wastewater is primarily in the form of organic matter and ammonia. After the septic tank, it is primarily (more than 85 percent) ammonia. After discharge of the effluent to the infiltrative surface, aerobic bacteria in the biomat and upper vadose zone convert the ammonia in the effluent almost entirely to nitrite and then to nitrate. Many investigators have documented nitrogen contamination of ground water below adsorption fields (US EPA, 2002). Nitrate-nitrogen concentrations in ground water were often found to exceed the drinking water standard of 10 mg/L near the infiltration field. Soil-based systems can remove some nitrogen from septic tank effluent, but high-density installation of OWTSs can cause

contamination of ground or surface water resources.

When nitrate reaches the ground water, it moves freely with little retardation. Denitrification has been found to be significant in the saturated zone only in rare instances where carbon or sulfur deposits are present. Reduction of nitrate concentrations in ground water occurs primarily through dispersion or recharge of ground water supplies by precipitation (Shaw and Turyk, 1994). In general, however, nitrate concentrations in SWIS effluent can and often do exceed the 10 mg/L drinking water standard. The limited ability of SWISs to achieve enhanced nitrate reductions and the difficulty in predicting soil nitrogen removal rates means that systems sited in drinking water aquifers or near sensitive aquatic areas should incorporate additional nitrogen removal technologies prior to final soil discharge.

Pathogens

Pathogenic microorganisms found in domestic wastewater include a number of different bacteria, viruses, protozoa, and parasites. The occurrence and concentration of pathogenic microorganisms in raw wastewater depend on the sources contributing to the wastewater, the existence of infected persons in the population, and environmental factors that influence pathogen survival rates. Such environmental factors include the following: initial numbers and types of organisms, temperature (microorganisms survive longer at lower temperatures), humidity (survival is longest at high humidity), amount of sunlight (solar radiation is detrimental to survival),

Hydraulic Failure

On-site wastewater disposal systems are sometimes thought to have a tendency to fail. However, failure is not due to inherent shortcomings of the modem septic tank/soil absorption system, but rather due to the improper location, construction, operation, or maintenance of the system. Where soils are moderately permeable, unsaturated to a depth of 5 or more feet, and not located on steep slopes, on-site waste disposal systems are quite reliable if properly maintained, and generally represent an environmentally suitable disposal technique. However, prior to 1976 site evaluation and system permitting and installation procedures were not sufficiently rigorous to assure that septic systems were constructed properly and located in areas of suitable soils.

One of the principal causes of poor functioning or failure of on-site wastewater disposal systems is neglect of proper maintenance and servicing. Septic systems should be inspected and pumped every three years to remove the accumulated

solids. Overlooking maintenance will result in the eventual clogging and failing of the absorption field. Although proper maintenance and servicing is not costly, it tends to be postponed or neglected until a serious problem or failure occurs. Since 1980, Dane County has required periodic evidence of adequate maintenance and servicing for all new or replacement on-site systems. Since 2000, a maintenance plan has been required for all on-site systems to address the issue of premature failure due to lack of maintenance.

The septic tank/soil absorption system depends upon the ability of the soils in the absorption area to accept the liquid and to treat it. These functions are related to the hydraulic characteristics of the soil which are governed by the size, shape and spacing of the soil voids or pore spaces. Septic system failures can occur if either adequate absorption or treatment is not achieved. Hydraulic failure of an individual on-site system can occur due to clogging of the soil pores in the infiltration zone, and a system can fail to treat septic tank effluent due to the presence of unsuitable or insufficient (thin) soil material.

The following actions contribute to the development of soil pore clogging:

1. compaction, puddling and smearing of the soil during construction;
2. puddling caused by the constant soaking of the soil during operation (caused either by an undersized system, or due to plumbing leaks, especially a leaking toilet tank);
3. blockage of soil pores by solids which have been flushed out of the septic tank;
4. accumulation of biological mass from growth of microorganisms;
5. deterioration of soil structure caused by ion exchange in clay;
6. build-up of insoluble sulfides due to the activity of anaerobic bacteria;
7. excretion of slimy gums by certain soil bacteria.

Failure due to clogging manifests itself by seepage of septic tank effluent over the ground surface or by wastewater backups in the plumbing. Backups, seepage or surface ponding of effluent can pose a substantial nuisance and a health threat to people and animals who come in contact with it. Seepage can also enter surface drainageways, increasing exposure and potential health hazards. Residents of dwellings affected by hydraulic failure sometimes resort to very frequent pumping of the septic tank.

Current siting standards require a parcel to have sufficient land area for a primary as well as a replacement

absorption field. In general, with the construction of a second absorption field, the first absorption field can be allowed to rest and regain its treatment capacity, allowing both absorption fields to be used alternately for an indefinite period. Mound systems can be repaired by the removal and replacement of the mound soil media, and similarly provide long-term wastewater treatment.

Treatment Failure

A second, potentially more serious type of failure is the failure of the soil absorption system to properly treat wastes. The soil usually serves as an efficient medium to remove organic matter, chemicals, and pathogenic organisms and viruses from the waste effluent, after the septic tank has provided partial treatment. Factors that are important in the removal of bacteria and viruses include soil type, temperature, pH, bacteria absorption to soil and soil clogging materials, soil moisture and nutrient content and bacterial antagonisms. The nature of liquid flow is also important because maintaining unsaturated soil conditions encourages liquid movement through the smaller soil pores and increases the time liquid is detained in the soil. To enhance "unsaturated flow," the application of effluent to the soil must be controlled (through dosing devices), or a clogging zone must develop at the drainfield/soil infiltration surface. If absorption soils are constantly saturated, or if soil characteristics do not provide efficient removal of bacteria and viruses, potential exists for pathogenic contamination of groundwater.

The Role of Maintenance

Maintenance of an on-site system is extremely important to ensure proper performance. A system that is properly designed, located, and installed can still fail in a short period of time if the homeowner is not aware of proper maintenance and use procedures. The need for maintenance has become even more acute since most homes are now equipped with dishwashers, garbage disposals and washing machines which place additional hydraulic and organic loads on the on-site wastewater system, and because a larger number of people lacking prior experience with the proper use and maintenance of on-site systems are moving to homes served by these systems.

Maintenance of on-site systems is necessary to preserve the following primary functions of the septic tank: 1) to provide physical settling and partial stabilization of solids from the wastewater; and 2) to prevent floatable solids, scum, oils and greases from being discharged to the soil distribution system and absorption field. If the septic tank

does not perform these functions properly, the soil absorption field is likely to fail prematurely.

Regular inspection and pumping are the most important aspects of an on-site system maintenance program. SPS 383.54 and Dane County Chapter 46 require all private sewage systems to be inspected at least every 3 years, or more frequently if required for aerobic treatment units or other alternative systems. The combined accumulated of sludge and scum must be removed by the time they occupy one-third of the volume of the septic tank (per Wisconsin Administrative Code chapter SPS 383.54[3]).

Daily care in the use of an on-site system also contributes to its proper functioning. Such care would include avoiding the installation of garbage disposals in the house, because they contribute high per capita loads of organic matter and suspended solids (higher than even toilets), and are therefore not suited for use with septic systems. Large inorganic solids and toxic materials should be kept out of the plumbing system. Water conservation measures such as using dishwashers and washing machines only for full loads, fixing leaks in the water system, the use of front loading washers, low flow or dual flush toilets, and water conserving fixtures, as well as, taking shorter showers can all help to reduce the hydraulic load placed on an on- site system.

System Performance in Dane County

According to the Department of Public Health for Madison & Dane County records, 89% of the on-site wastewater treatment systems in Dane County were operating in full compliance in 2010. The majority of those systems issued corrective action notices (see maps in Attachment B) were due to failure of the owner to submit the required system maintenance reports. Only 14 systems (less than 0.1%) were identified with a failure or other maintenance problem requiring system modification. There is a system in place to refer problem property owners to Dane County's Corporation Counsel for legal action if they do not comply with a citation issued by the Department of Public Health.

Table 4-2: Typical Range of Treatment System Effluent Concentrations Prior to Absorption Field

Constituent of Concern	Type of Treatment System			
	Domestic Septic Tank	Tank w/ Recirculating Filter	Tank w/ Aerobic Treatment Unit	Tank w/ Intermittent Sand Filter
Oxygen Demand (BOD^5 mg/L)	140 – 200	80 – 120	5 – 50	2 – 15
Particulate Solids (TSS mg/L)	50 – 100	50 – 80	5 – 100	5 – 20
Nitrogen (Total N mg/L)	40 – 100	10 – 30	25 – 60	10 – 50
Phosphorus (Total P mg/L)	5 – 15	5 – 15	4 – 10	<1 – 10
Bacteria (Fecal Coliform / 100 mL)	10^6 - 10^8	10^6 - 10^8	10^3 - 10^4	10^1 – 10^3
Virus (pfu/mL)	0 - 10^5	0 - 10^5	0 - 10^5	0 - 10^5
Organic Chemicals (µg/L)	0 – trace levels	0 – trace levels	0 – trace levels	0 – trace levels
Heavy Metals (µg/L)	0 – trace levels	0 – trace levels	0 – trace levels	0 – trace levels

Table 4-3: Typical Range of Effluent Concentrations 3 to 5 Feet Below Absorption Field

Constituent of Concern	Percent Removal In Soil Adsorption Field	Type of Treatment System			
		Domestic Septic Tank	Tank w/ Recirculating Filter	Tank w/ Aerobic Treatment Unit	Tank w/ Intermittent Sand Filter
Oxygen Demand (BOD^5 mg/L)	>90%	14 – 20	8 – 12	<5	<2
Particulate Solids (TSS mg/L)	>90%	5 – 10	5 – 8	<10	<2
Nitrogen (Total N mg/L)	10 – 20%	32 – 90	8 – 27	20 – 54	8 – 45
Phosphorus (Total P mg/L)	0 – 100%	0 – 15	0 – 15	0 – 10	0 – 10
Bacteria (Fecal Coliform / 100 mL)	>99.99%	10^2 - 10^4	10^2 - 10^4	<1	<1
Virus (pfu/mL)	>99.9%	0 - 10^2	0 - 10^2	0 - 10^2	0 - 10^2
Organic Chemicals (µg/L)	>99%	0 – trace levels	0 – trace levels	0 – trace levels	0 – trace levels
Heavy Metals (µg/L)	>99%	0 – trace levels	0 – trace levels	0 – trace levels	0 – trace levels

CHAPTER 5

SEPTAGE DISPOSAL

Septage Characteristics and Disposal Practices

The Nature of Septage

The mixture of sludge, fatty materials and wastewater pumped from a septic tank, holding tank, grease trap or portable toilet is commonly called septage. Septage is a highly variable organic waste that often contains large amounts of grease, grit, hair, and debris. It is characterized by an objectionable odor and appearance, a resistance to settling and dewatering, and the potential to foam. These characteristics can make septage difficult to handle and treat. The major reason for providing adequate treatment and disposal systems is to protect public health and the environment, as septage may harbor disease causing viruses, bacteria, and parasites. When properly managed, domestic septage is a valuable soil conditioner. Septage contains nutrients that can reduce reliance on chemical fertilizers for agriculture. A good septage management program recognizes the potential benefits of septage and employs practices to maximize these benefits (US EPA, 1994).

Septage is a more concentrated waste than domestic sewage and characteristics are not directly comparable. When adjusted for solids concentration, septage is considerably higher in COD, volatile solids, and grease than domestic sewage (DCRPC, 1998). The concentrations of both nitrogen and phosphorus found in septage are also high as compared to typical domestic wastewater, but the metal concentrations observed in septage are considerably less than those typically observed in domestic sewage sludge (US EPA, 1984). Tables 5-2 and 5-3 include reported literature values for various constituents of septage. It is important to note the range of values reported for many of the parameters. The cause of this variability may be the result of a number of factors including user habits, tank size and design, pumping frequency, climate and seasonal weather conditions, and household appliances such as garbage disposals, water softeners, and washing machines, as well as difficulties in obtaining representative samples of the entire tank contents (US EPA, 1984).

Table 5-4 lists the primary parameters for each of the various components of septage disposed by waste haulers at the Madison Metropolitan Sewerage District

(MMSD). MMSD records reflect wastes hauled from commercial, industrial and institutional sources, as well as residential septic tanks. The majority of the septage received by MMSD is from holding tanks (see Figure 5-1), which is more dilute than other types of septage and therefore has lower concentrations of chemical oxygen demand, total suspended solids, total nitrogen and total phosphorus compared to the general mix of septage types reported in the literature.

Septage Disposal Options

In Dane County, over 26 million gallons of septage was disposed by licensed commercial haulers, private pumpers, and plumbers in 2010. Septage must be disposed with care in order to minimize possible public health hazards and public nuisance problems. There are three basic methods for disposing septage; disposal on land, treatment at a wastewater treatment plant, and treatment at a separate septage handling facility. Land disposal practices not currently used in Dane County are co-disposal of septage with municipal wastewater sludge, and disposal at sanitary landfills.

The practice of returning organic waste to the land where the nutrients can be recycled through crop uptake and the organic material can enhance agricultural soils is one of the goals of the Dane County Water Quality Plan and should be encouraged. However, management practices need to be followed to ensure that disposal operations comply with the standards and regulations.

Several municipal wastewater treatment plants in Dane County accept septage from haulers for treatment (see Table 5-1). Septage is most commonly discharged to the liquid process stream at these facilities. An alternative method of disposal is to introduce septage into the solids (sludge) process stream at a wastewater treatment plant. Regardless of how septage is treated at the wastewater treatment plant, the digested biosolids are ultimately used as a fertilizer and soil conditioner on agricultural lands. These biosolids typically contain trace levels of metals and other contaminants. State and federal regulations control the site approval, management, and loading limits to insure that the land application of biosolids is conducted in a manner that protects human health and environmental quality.

TABLE 5-1
2010 WWTP SEPTAGE

Wastewater Treatment Plant	Septage Received (gallons)
MMSD	22,475,000
City of Stoughton	0
City of Sun Prairie	0
Dane – Iowa	1,080,101
Village of Blue Mounds	NA[1]
Village of Marshall	7,100
Village of Oregon	83,000
Total	23,645,201

Source: Wastewater treatment plant records

Separate septage treatment facilities do not currently exist in Dane County. Such separate treatment facilities range from lagoons to mechanical, biological, and chemical systems. Simple, lined lagoon systems can only be used as storage. More advanced treatment mechanisms, disposal at a wastewater treatment plant, or landspreading are necessary to ensure the protection of groundwater and surface water from contamination. Mechanical plants with high operation and maintenance requirements have been found to be most cost-effective in areas with very high density of septic systems that provide a relatively constant flow and high volume of septage. Separate treatment facilities could be privately or publicly owned and operated. Such facilities are most prevalent in areas where municipal wastewater treatment plants are widely scattered and beyond reasonable hauling distances, and where conditions are largely unsuitable for landspreading.

[1] Not Available - The Village of Blue Mounds wastewater treatment plant did not provide the requested information.

TABLE 5-2
CHARACTERISTICS OF SEPTAGE

	Concentration (mg/l)		
Parameter	Average	Minimum	Maximum
Total Solids	34,106	1,132	130,475
Total Volatile Solids	23,100	353	71,402
Total Suspended Solids	12,862	310	93,378
BOD_5	6,480	440	78,600
COD	31,900	1,500	703,000
Total Nitrogen (TKN)	588	66	1,060
Ammonia Nitrogen (NH_3-N)	97	3	116
Total Phosphorus	210	20	760
Grease	5,600	208	23,368
Arsenic	0.141	0	3.5
Barium	5.76	0.002	202
Cadmium	0.097	0.005	8.1
Chromium	0.49	0.01	34
Cyanide	0.469	0.001	1.53
Cobalt	0.406	<0.003	3.45
Copper	4.84	0.01	261
Iron	39.3	0.2	2,740
Mercury	0.005	0.0001	0.742
Manganese	6.09	0.55	17.1
Nickel	0.526	0.01	37
Lead	1.21	<0.025	118
Silver	0.099	<0.003	5
Tin	0.076	<0.015	1
Zinc	9.97	<0.001	444
pH	-	1.5	12.6
Methyl Alcohol	15.8	1	369
Isopropyl Alcohol	14.1	1	391
Acetone	10.6	0	210
Methyl Ethyl Ketone	3.65	1	240
Toluene	0.17	0.005	1.95
Methylene Chloride	0.101	0.005	2.2
Ethylbenzene	0.067	0.005	1.7
Benzene	0.062	0.005	3.1
Xylene	0.051	0.005	0.72

Source: US EPA, Guide to Septage Treatment and Disposal, 1994

TABLE 5-3
CHARACTERISTICS OF SEPTAGE

Parameter	Typical Range (counts / 100ml)
Total Coliform	10^7 - 10^9
Fecal Coliform	10^6 - 10^8
Fecal Streptococci	10^6 - 10^7

Source US EPA, Handbook Septage Treatment and Disposal, 1984.

TABLE 5-4
CHARACTERISTICS OF SEPTAGE RECEIVED
AT MMSD'S NINE SPRINGS TREATMENT PLANT
1996 – 2010

	mg/l			
	CBOD	TSS	TKN	TP
GREASE TRAPS				
Mean Value	30,644	36,245	1,080	118
Minimum Value	19,817	19,561	379	56
Maximum Value	46,744	52,136	1,700	211
HOLDING TANKS				
Mean Value	644	1,116	161	25
Minimum Value	301	362	84	15
Maximum Value	1,088	2,455	321	51
PORTABLE TOILETS				
Mean Value	7,210	22,064	3,688	382
Minimum Value	4,560	10,754	2,307	238
Maximum Value	9,589	36,040	5,147	518
SEPTIC TANKS				
Mean Value	2,679	10,434	357	101
Minimum Value	1,479	5,297	245	65
Maximum Value	4,262	17,857	517	198
SETTLING BASINS				
Mean Value	4,902	104,425	455	223
Minimum Value	2,246	56,165	272	153
Maximum Value	9,103	197,236	1,235	306
Source: Madison Metropolitan Sewerage District.				

The Practice of Landspreading.
The design requirements and constraints associated with land disposal of septage are dependent on the type of crop grown, soil conditions, and the septage characteristics (pathogens, organics, nutrients and metals).

The Clean Water Act Amendments of 1987 authorized 40 CFR 503, in which septage is regulated as a Class B biosolid. These federal regulations were later incorporated into NR 113.

Wisconsin Administrative Code Chapters NR 113 and 114 establish standards for disposing septage and certifying operators, respectively. Prior to 1984 there were no site registration requirements for the land disposal of septage. With the passage of the Wisconsin Groundwater Law (Wisconsin Act 410), provisions were established for DNR review, approval and permitting of pumping trucks and land application sites. The Groundwater Law permits counties to apply to the DNR for approval of local programs to regulate the land application of septage. NR 113 establishes standards for disposal sites, site licensing, and specifies slope, permeability, water content, minimum separation distances, and rate and manner of application. The following separation distances are specified in NR 113:

- 3' minimum depth from surface to bedrock and groundwater
- 6% maximum allowable slope
- 200' minimum distance to a stream, river, pond, lake, sinkhole, flowage, or wetland
- 1,000' minimum distance to a community well

NR 113 contains more restrictive criteria for winter spreading.

Dane County Chapter 46 prohibits the spreading of septage on frozen or snow-covered ground. Attachment D contains maps showing the general location of WDNR approved septage disposal sites and the disposal site location criteria in NR 113. These maps indicate that many of the currently approved septage disposal sites are in close proximity to site conditions that are unsuitable for septage disposal. This underscores the importance of a rigorous monitoring and inspection program for septage disposal sites.

Table 5-5 summarizes the septage haulers, operating in Dane County, who submitted annual land application reports to the DNR in 2010. Most haulers conduct landspreading operations conscientiously and with due regard to safe disposal. Management measures, however, need to be adopted to ensure that disposal

operations follow the standards and regulations.

TABLE 5-5
2010 LANDSPREAD SEPTAGE

Hauler	Landspread Septage (gallons)
Hubred Septic Pumping	10,000
Kalscheur Septic Service	1,222,000
Richardson Sanitation Service	1,641,680
Total	2,873,680

Source: Annual Land Application Reports to DNR

NR 114 establishes certification and training (continuing education) requirements for septage haulers and their operators. Certification is for 3 years, with the possibility of renewal if continuing education requirements are met. When properly conducted, the landspreading of septage can return nutrients and organic matter to disposal sites with few adverse impacts on the land and surrounding areas.

The level of heavy metal concentration is of particular significance when consideration is given to septage application to land. The lifespan of an application system is limited, based on the cumulative amounts of lead, copper, nickel, zinc, and cadmium applied to the soil. Maximum application loadings suggested by the US EPA (1984) are listed in Table 5-6. It should be noted that those loadings are cumulative loadings and are a function of the soil's cation exchange capacity. When one of the trace elements is loaded to its maximum allowable limit, septage and/or other sludge disposal at the site should be terminated. For septage with the average characteristics presented in Table 5-2, zinc would be the limiting metal based on these loading factors.

Table 5-6
Maximum Amount of Septage Metals to be Applied to Agricultural Land (lb/acre/yr)

Metal	Soil Cation Exchange Capacity (meq / 100g)		
	0-5	5 - 15	15
Pb	500	1,000	2,000
Zn	250	500	1,000
Cu	125	250	500
Ni	125	250	500
Cd	5	10	20

Source US EPA 1984

An additional constraint that limits the rate at which septage can be applied to land used for crop production is the health risk associated with cadmium. Federal criteria limit the annual amount of cadmium applied to crops to 0.45 pounds per acre per year (US EPA 1984). The criteria also require that the septage and soil mixture pH be maintained at 6.5 or above.

Nitrogen and phosphorus is also of interest with respect to specific loading rates as they apply for land treatment of septage. Nitrogen application in excess o f the amount required for crops results in the potential for nitrate (NO3) contamination of groundwater supplies. Because nitrogen requirements vary significantly from crop to crop, and due to the fact that some nitrogen may carry over from year to year, close monitoring of nitrogen application is required.

Federal criteria state that septage applied to the land or incorporated into the soil must be treated by a "process to significantly reduce pathogens" (PSRP) prior to application or incorporation, unless public access to the facility is restricted for at least 12 months, and unless grazing by animals whose products are consumed by humans is prevented for at least 1 month. PSRP's include aerobic digestion, air drying , anaerobic digestion , composting, lime stabilization , or other techniques that provide equivalent pathogen reduction. The federal criteria also require septage to be treated by a "process to further reduce pathogens" (PFRP) prior to application or incorporation if crops for direct human consumption are grown within 18 months subsequent to septage application or incorporation where contact between the septage applied and the edible portion of the crop is possible. PFRP's include composting, heat drying, heat treatment, thermophilic aerobic digestion, or other techniques that provide equivalent pathogen reduction.

When septage is land applied in Wisconsin, one of three vector attraction reduction methods are required.

1. PH Adjustment (lime stabilization)
2. Subsurface incorporation
3. Subsurface injection

Surface Spreading and Stabilization

Septage can be stabilized in order to eliminate odors, reduce pathogens, and reduce the potential for putrefaction. Stabilization is a relative term that refers to the degree of decomposition that limits further biological activity and renders the product satisfactory for further handling or utilization. In general, there are four ways to stabilize septage:

1. Biological reduction of volatile content.
2. Chemical oxidation of volatile matter.
3. Sterilization by heat.
4. Chemical (lime) addition to render the septage unsuitable for microorganism survival.

Lime stabilization is a low capital cost, simple technology and the

most common method of stabilization used in our region. Addition of lime to septage in sufficient quantities to maintain a high pH (>12) for 30 minutes creates an environment that is not conducive to microorganism survival. This criterion (pH>12 for 30 minutes) has been found to correlate well with dewaterability and odor conversion in U.S. practices. As a result, the septage will not putrefy, cause odors, or pose a health hazard as long as the pH is maintained at a high enough level (US EPA, 1984). Actual dosage may require adjustment due to local conditions and the period of stability required.

Most septage application consists of a pumping truck driving slowly across the discharge site while emptying its contents. Pumping trucks are equipped with waste spreading or distribution devices. This type of surface application of septage is acceptable if the pH of the septage is adjusted with lime to stabilize the septage. Properly stabilizing the septage will reduce odor problems and vector attraction. Surface spreading is, however, subject to erosion and transport in stormwater runoff.

Surface spreading with stabilization is the most common septage land disposal practice due to its low labor and equipment requirements and its low cost.

Subsurface Incorporation

Subsurface incorporation of septage is not widely used for septage, but is commonly used for municipal wastewater sludge disposal. Incorporation reduces aesthetic problems attributable to surface spreading, and reduces surface runoff of waste. Incorporation also tends to make the greatest use of the nutrient and organic content of sludge or septage as a soil amendment.

Subsurface incorporation has several possible disadvantages when used in a septage disposal program. One disadvantage is that septage can remain on the ground for up to six hours before incorporation, which can create odor problems compared to stabilization and surface spreading or injection. Another disadvantage is that less nitrogen removal is achieved since ammonia volatilization is eliminated, thereby decreasing the allowable application rate compared to surface application. Incorporation requires that a plow be available or that plowing is scheduled within a few hours of application.

Subsurface Injection

Subsurface injection of septage corrects many of the disadvantages of surface spreading and incorporation, but is not widely used for septage. Subsurface injection is commonly used for municipal

wastewater sludge disposal. Injection reduces odor and aesthetic problems and reduces surface runoff of waste. In addition, the potential for vector attraction and for human contact with waste is substantially lower than for other land disposal methods.

Subsurface injection has several possible disadvantages when used in a septage disposal program. One disadvantage is that less nitrogen removal is achieved compared to stabilization and surface spreading since ammonia volatilization is eliminated, thereby decreasing the allowable application rate. More specialized and sophisticated equipment is necessary for subsurface injection than for surface spreading. Injection of septage is complicated by the possibility of equipment clogging due to the large solids contained in freshly pumped septage. At a minimum, septage should be screened prior to injection. Injection of septage is likely to be most feasible in a publicly managed and monitored septage disposal program with a small number of relatively large, fully used land disposal sites. In such a program, a local governmental unit or management authority might own, operate, and manage injection equipment and vehicles, and septage storage facilities.

Trends in Septage Disposal

Table 5-7 shows the acreage of state licensed septage disposal land area by township in Dane County for 2010 and 1997. The total amount of land approved for septage disposal in Dane County has decreased by almost two-thirds from 5,848 acres to 2,080 acres. This is most likely due to the more stringent land disposal criteria adopted in NR 113 and in effect since 1997, as well as, the ability of haulers to more easily dispose of septage at municipal wastewater treatment plants.

Figure 5-1 shows a 15-year record of the annual septage received at MMSD by type. Septage disposal at MMSD has more than doubled between 2000 and 2010, from about 9.6 million gallons to 22.5 million gallons. The majority of this increase is from septic tanks and holding tanks. Septic tank septage disposal has increased from about 1.2 million gallons in 2000 to 7.2 million gallons in 2010. Holding tank septage disposal has increased from 7.8 million gallons in 2000 to 14.4 million gallons in 2010.

The proportion of septage disposed at wastewater treatment plants has continued to increase. In 1983 it was only 9 percent (DCRPC 1998). By 1994 it had grown to 60 percent (DCRPC 1998). It is currently estimated to be 89 percent, based

on WDNR and wastewater treatment plant records.

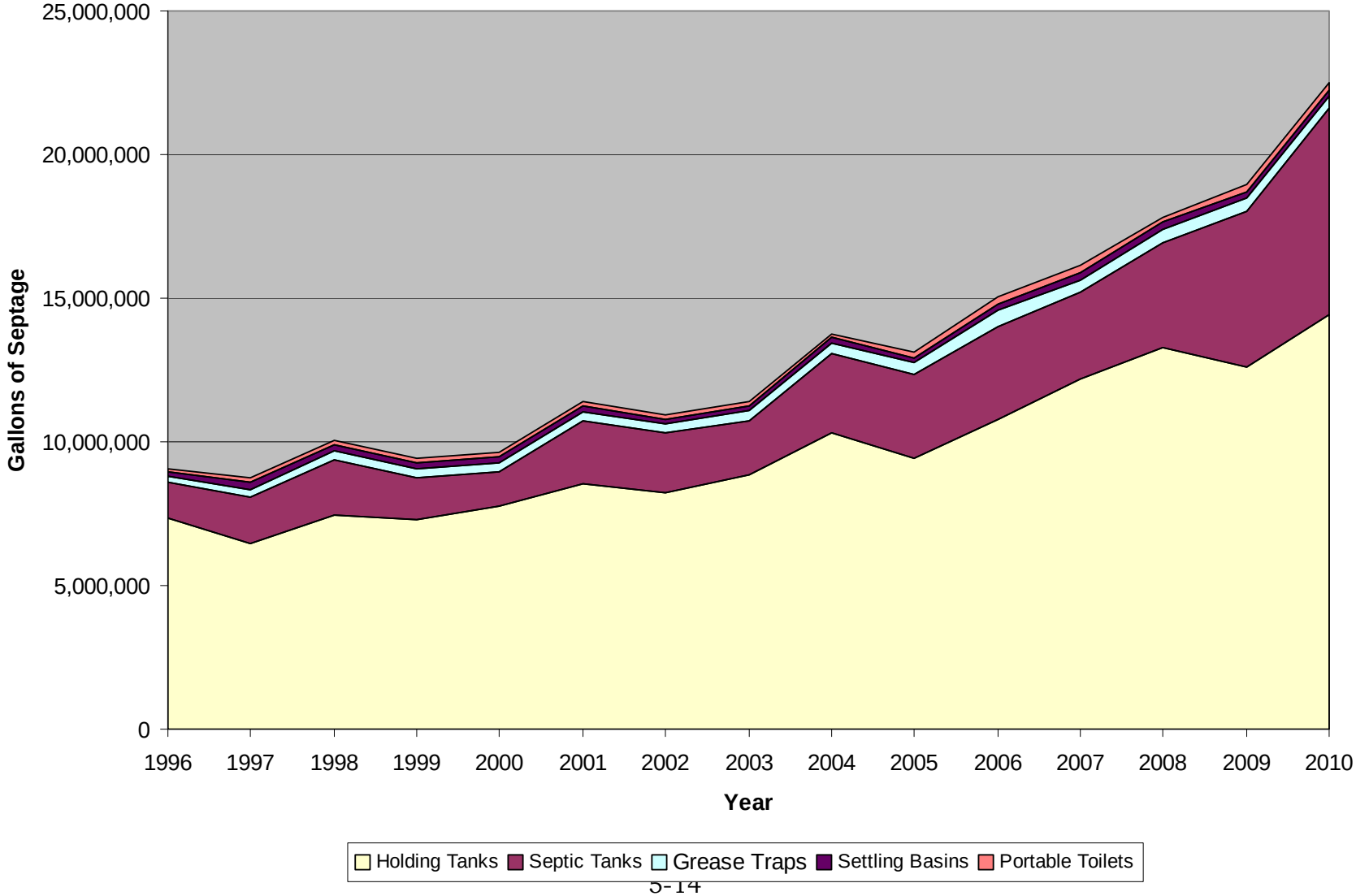
The increase in septage disposal at MMSD, and at wastewater treatment plants in general, has been due to a number of factors including; an increase in the number of private on-site wastewater treatment systems, more frequent inspection and pumping requirements for on-site systems, increased standards and regulations for landspreading sites, and Dane County's prohibition on the spreading of septage on frozen or snow covered ground. These factors along with the relatively easy availability of wastewater treatment plants that accept septage is expected to continue to favor septage disposal at treatment plants in the coming years.

TABLE 5-7
LAND AREA APPROVED FOR SEPTAGE DISPOSAL BY TOWNSHIP

Township	2010 (acres)	1997 (acres)
Albion	30	0
Berry	39	580
Black Earth	0	0
Blooming Grove	0	0
Blue Mounds	50	165
Bristol	10	431
Burke	101	442
Christiana	0	0
Cottage Grove	344	359
Cross Plains	68	190
Dane	306	103
Deerfield	0	65
Dunkirk	0	547
Dunn	0	0
Madison	0	0
Mazomanie	63	447
Medina	0	0
Middleton	30	180
Montrose	150	100
Oregon	0	0
Perry	0	15
Pleasant Springs	0	30
Primrose	52	35
Roxbury	203	167
Rutland	0	100
Springdale	0	0
Springfield	91	817
Sun Prairie	0	190
Vermont	17	0
Verona	17	0
Vienna	113	26
Westport	0	272
Windsor	352	543
York	44	44
TOTAL	2,080	5,848

Source: DNR Records

Figure 5-1
Septage Received at MMSD



CHAPTER 6

INSTITUTIONAL SETTING FOR THE REGULATION OF PRIVATE ON-SITE WASTEWATER TREATMENT SYSTEMS

Federal, state and local regulations exist to ensure that on-site wastewater systems are properly designed, installed on suitable soils, properly maintained, and repaired or replaced when they fail. Other regulations address the disposal of waste from on-site systems, and the licensing of septage disposal sites, trucks and septic tank pumpers. This chapter describes the statutory basis for regulation, the administrative codes governing on-site systems, and the division of responsibility between federal, state and local agencies.

Federal Statutory Authority

The Clean Water Act Amendments of 1987 required the U.S. Environmental Protection Agency (EPA) to develop a new regulation to protect public health and the environment from any reasonably anticipated adverse effects of pollutants that might be present in sewage sludge biosolids, including domestic septage. This regulation, The Standards for the Use or Disposal of Sewage Sludge (Title 40 of the Code of Federal Regulations [CFR], Part 503), was published in the Federal Register on February 19, 1993, and became effective on March 22, 1993. The 503 regulations set minimum requirements for land application of domestic septage that all states must meet.

The Clean Water Act, as amended, identifies federal requirements for wastewater treatment facilities discharging to waters of the U.S., i.e., a minimum of secondary treatment and water quality standards. Decentralized systems which discharge to a surface water must, and can, meet these requirements.

Conventional onsite systems discharge effluent through the soils to the groundwater. Groundwater can be protected with properly maintained onsite systems or with additional treatment to control nutrients. The Safe Drinking Water Act addresses the risk to groundwater quality posed by the large capacity septic systems (systems with the capacity to serve 20 or more persons per day). EPA includes large capacity septic systems as a type of Class V well that is regulated within the Underground Injection Control program to protect ground waters.

Statutory and Administrative Responsibility - State of Wisconsin

Standards for On-Site Systems

Prior to July 2011, the Wisconsin Department of Commerce was responsible for establishing, maintaining and enforcing uniform statewide standards for plumbing (including on- site waste systems) under Section 145.02, Wisconsin Statutes. Those duties are now part of the Department of Safety and Professional Services. Chapter SPS 383 of the Wisconsin Administrative Code (previously Comm. 83) contains administrative procedures, standards, and specifications to assure the proper siting, design, installation and inspection of private onsite wastewater treatment systems. A number of significant changes were made to Comm 83 in 2000. The previous POWTS code had not been significantly revised since 1980 when the Wisconsin mound was approved for general use. The WDOC identified four reasons for revising the code (Corry, 1999):

(1) to increase local control over the administration and enforcement of the code;
(2) to provide citizens with access to modern wastewater treatment systems so that they can build homes and businesses on lots zoned by local government for those purposes;
(3) to improve the treatment process and maintenance programs to help ensure that the systems protect public health and the ground water; and
(4) to clarify the status of 680,000 treatment systems currently in use in the state, including systems installed prior to 1969 when there were few restrictions in the code.

The specifications for septic system design and installation contained in SPS 383 are mandatory statewide.

Standards and procedures for soil and site evaluations conducted for the treatment or dispersal of wastewater, treated wastewater, final effluent or human wastes into soil are contained in Chapter SPS 385 of the Wisconsin Administrative Code (previously Comm. 85), which is also now administered by the Department of Safety and Professional Services. SPS 385 specifies the number, type, and depth of soil evaluations that must be conducted for the approval of private onsite wastewater treatment systems.

Licensing, Certification of Soil Testers, Plumbers and Pumpers

Several regulations and codes are administered by the state in order to assure that individuals who assess site suitability, install, inspect, and maintain on-site systems meet

minimum levels of competence and adhere to certain standards.

Wisconsin Administrative Code Chapter SPS 305.33 (previously Comm. 5.33) describes the certification program for soil testers (s.145.045, Wis. Stats.), which is administered by the Department of Safety and Professional Services. A certified soil tester must conduct soil and site evaluations required by Chapter SPS 383 of the Administrative Code. Section 145.05 of the Wisconsin Statutes requires that all plumbing, including on-site waste systems, must be installed under the supervision of a licensed master plumber. The Department of Safety and Professional Services administers the apprenticeship and licensing of plumbers under Subchapter IX of SPS 305 of the Wisconsin Administrative Code. Chapter SPS 383 requires the licensed plumber responsible for the installation of a private sewage system to arrange for an inspection of the installation prior to backfilling. The county or the Department of Safety and Professional Services may require additional inspections, which must be facilitated by the plumber in charge.

The Department of Natural Resources (DNR) is responsible for the adoption of rules for the servicing of septic tanks, soil absorption fields, holding tanks, grease interceptors and privies. General supervision and control of servicing methods are granted to DNR in s.281.48, Wis. Stats. Under this authority, DNR licenses vehicles used for the servicing of on-site waste systems, reviews the qualifications of applicants for such licenses, and licenses septage storage and land application sites. Chapter NR 113 of the Wisconsin Administrative Code contains licensing procedures, vehicle requirements, servicing methods, and licensing procedures, rules and criteria for the disposal of septage, administered by the Department of Natural Resources.

Chapter NR 113 also provides specific criteria for septage landspreading sites which include soil types, depth to bedrock and groundwater, slope, minimum distances to property line, private and public wells, other sensitive land uses (such as schools, health care facilities, and residences) and water bodies. The code also specifies application rates based on the source (and thus strength) of the septage. Chapter NR 113 allows counties to apply to DNR for approval of local programs to regulate the land application of septage.

Other rules related to service and maintenance of septic tanks are contained in section SPS 383.54 of the Wisconsin Administrative Code.

Section SPS 383.55 establishes the reporting requirements for private on-site wastewater treatment systems.

Sanitary Permits, County Administration of Private Wastewater Systems

Section 145.19 of the Wisconsin Statutes requires property owners to obtain a sanitary permit prior to purchasing or installing an on-site wastewater system. No person may sell or retail a septic tank unless the purchaser holds a valid sanitary permit. Section 145.19 requires the local governmental unit responsible for the regulation of on-site sewage systems to forward a copy of the sanitary permit and a portion of the permit fee to the Department of Safety and Professional Services.

Every governmental unit responsible for the regulation of private sewage systems, as defined under s. 145.01 (5), is required to adopt a private sewage system ordinance that conforms to the state plumbing code (Section 59.70(5); see also s.145.01, s.145.20, and s.145.245). "Governmental unit responsible for the regulation of private sewage systems" or "governmental unit", unless otherwise qualified, means the county except that in a county with a population of 500,000 or more these terms mean the city, village or town where the private sewage system is located. This language in the statue will become relevant to Dane County after the 2020 US Census when the population will officially exceed 500,000 (the county population is expected to unofficially surpass 500,000 in 2012).

Chapter SPS 383 of the Wisconsin Administrative Code contains specific requirements for information that is to be filed with the governmental unit responsible for proposed private sewage systems. In general, these administrative codes prescribe that soil evaluation reports and complete plans and specifications shall be filed with the responsible governmental unit for review; that the responsible governmental unit shall establish administrative procedures for approving and issuing sanitary permits; that the responsible governmental unit may assign administrative duties to any department, unit, or person; that the responsible governmental unit shall inspect on-site systems after construction but before backfilling; and that the responsible governmental unit shall investigate violations and file reports with the state, as required.

Large On-Site Wastewater Systems

For large-scale (cluster or small community) on-site wastewater systems having a discharge capacity of over 12,000 gallons per day, state review and inspection is mandated

prior to installation. A Wisconsin Pollutant Discharge Elimination System (WPDES) permit is required for these systems by the DNR (See Ch. NR 200.03[3][d], Wisconsin Administrative Code, pursuant to s.283 of the Wisconsin Statutes).

Water Quality Protection, State Grants.

The Department of Safety and Professional Services has primary administrative responsibility for assuring that the placement, operation and maintenance of on-site systems does not impair surface or groundwater quality. This authority is primarily contained in Sections 145.02, 145.135, 145.19, 14.20, and 145.23, Wis. Stat. Specifically, the Department is authorized to do the following:

- Oversee the local implementation of the rules, standards, and permitting of on-site wastewater system installation and maintenance.

- Make and enforce rules relating to lot size and lot elevation necessary for proper sanitary conditions in subdivisions not served by a public sewer.

- Order the replacement or rehabilitation of a failing on-site system. A failing system is defined under s.145.245(4), Wis. Stats., as a system causing any of the following conditions:

  a. the discharge of sewage into surface water or groundwater
  b. the introduction of sewage into zones of saturation which adversely affects the operation of an on-site sewage system
  c. the discharge of sewage to a drain tile or into zones of bedrock
  d. the discharge of sewage to the surface of the ground
  e. the failure to accept sewage discharges and backup of sewage into the structure served by the system

The Department of Safety and Professional Services administers a septic system replacement and rehabilitation grant program for failing private wastewater systems (Section 145.245, Wis. Stats.). This program is administered through the counties and provides one-time grants of up to $7,000 to repair septic systems installed prior to July 1, 1978, against which enforcement orders have been issued. To be eligible, the household annual income may not exceed $45,000 and, if the applicant is a commercial establishment, its annual gross revenue may not exceed $362,500. The grant is awarded only after work is completed and if the replacement system meets the requirements of the code.

Section 145 requires that each responsible governmental unit

develop and adopt an approvable regulatory program before septic systems in that county are eligible to receive grant funds. The regulatory program must include the following: an ordinance which requires owners of all septic systems constructed after January 1, 1980 to have the systems inspected and, if necessary, pumped every three years; an inspection program which includes at least one inspection during installation of the private wastewater system; and a central recordkeeping system. Each responsible governmental unit may also adopt a system of user charges and cost recovery to reflect a grant application fee and the cost of supervising installation and maintenance of on-site systems. A responsible governmental unit 's regulatory program must also assign specific enforcement authority to an individual or department of the responsible governmental unit.

Groundwater Protection, Septage Disposal

1983 Wisconsin Act 410, popularly known as the Groundwater Protection Act, created Chapter 160 of the Wisconsin Statutes and revised a number of other statutory sections to effectively protect groundwater quality in Wisconsin and provide a basis for responding to and addressing specific cases of groundwater contamination. Several provisions of the Groundwater Act have an impact on septic tank replacement, operation, and the disposal of septage removed from septic tanks.

Chapter 160, pursuant to the Groundwater Act, requires that all regulatory agencies review their rules and "commence promulgation of any rules or amendments of its rules necessary to ensure that the activities, practices and facilities regulated by the regulatory agency will comply with this chapter." (160.19[1], Wis. Stats.) This includes the State Plumbing Code (see s.145.13, Wis. Stats.) under which septic systems are designed and installed. In 1995, the Wisconsin legislature amended Chapter 160 to give regulatory discretion to state agencies to exempt private sewage systems from having to meet groundwater nitrate standards (160.255). In 2000, the revisions to Com 83 (now SPS 383) incorporated this exemption into the Administrative Code.

Section 145.19 provides that the governmental unit responsible for the regulation of on-site waste systems shall collect a groundwater fee of $25 for each sanitary permit issued. This money is to be forwarded to the Department of Safety and Professional Services and credited to the environmental fund for groundwater management. The Groundwater Protection Act also provides that owners of existing private on-site systems that do not

meet siting or design standards may petition the Department of Safety and Professional Services for a variance to those standards. The Department may rescind such variances if the private on-site waste system fails or contaminates waters of the state (see s.145.24, Wis. Stat.).

The Department of Natural Resources has been given the authority to oversee water quality in the state under Chapter 281, Wis. Stats. Specifically, s.281.17(5), Wis. Stats., states that "the department may prohibit the installation or use of septic tanks in any area of the state where the department finds that the use of septic tanks would impair water quality. The department shall prescribe alternate methods for waste treatment and disposal in such prohibited areas."

In more general terms, s.281.19, Wis. Stats., gives the DNR authority to "issue general orders, and adopt rules applicable throughout the state for the construction, installation, use and operation of practicable and available systems, methods and means for preventing and abating pollution of the waters of the state (waters of the state has been defined under s.281.01, Wis. Stats., as " all lakes, bays, rivers, streams, springs, ponds, wells, impounding reservoirs, marshes, watercourses, drainage systems and other surface water or groundwater, natural or artificial, public or private, within this state or its jurisdiction."). Furthermore, s.281.19(3), Wis. Stats., states that the DNR "shall make investigations and inspections to insure compliance with any general or special order or rule which it issues. In the exercise of this power, the department may require the submission and approval of plans for the installation of systems and devices for handling, treating or disposing of any wastes." However, under a memorandum of understanding between the DNR and the Department of Commerce (now the Department of Safety and Professional Services), the Department of Commerce was given the general authority over the approval of all "private sewage systems" (as defined under Ch. 145, Wis. Stats.).

A major impact of the Groundwater Act on private on-site systems is in the area of septage disposal. Following are the primary septage disposal programs created under the Act:

(1) The Department of Natural Resources shall develop rules for servicing septic tanks, soil absorption fields, holding tanks, grease traps and privies to protect the surface and groundwaters of the state from contamination by septage. Such rules must comply with Chapter

160, Wis. Stats., and shall require each person who services a septic tank to maintain records of location of tanks serviced and the volume and location of septage disposed (s.281.48 Wis. Stats.).

(2) The Department of Natural Resources may require soil tests and a license for any location where septage is stored or disposed on land (s.281.48[4m], Wis. Stats.).

(3) The Department shall collect licensing, registration and site license fees, as well as, groundwater fees to be credited to the environmental fund for groundwater management; or a county may submit to DNR an application to regulate the disposal of septage on land. The county application shall include a complete description of the proposed county program, including a proposed ordinance and proposed personnel, budget and equipment to carry out the program. A county program approved by the Department would apply uniformly to the entire area of the county, and no city, village or town may adopt a septage disposal ordinance if the county has adopted such an ordinance. Under this proposal, a county may obtain an annual license fee for each septage disposal site, but site criteria and disposal procedures contained in a county ordinance must be identical to the statewide rules promulgated by DNR. Counties may not license or register persons or vehicles engaged in septage disposal. County septage disposal ordinances cannot be adopted until DNR develops administrative rules standards for an approvable program.

Section 281.49 of the Statutes requires municipal wastewater systems to accept septage for disposal under certain conditions, between the period of November 15 and April 15. Municipal systems are not required to accept and treat septage at other times during the year. Municipal systems may refuse to accept septage from a licensed disposer if treatment of the septage would cause the sewage system to exceed its operating capacity or to violate any standards. The municipal system may also refuse to accept septage if it finds that it is not compatible with the wastewater system. Section 281.49 allows a municipal system to accept septage generated within its service area before accepting septage generated outside of its service area. Licensed disposers who wish to dispose of septage in a municipal system are required to apply to the system each year and to file a disposal plan indicating the qualities, locations, times and methods of septage discharge each month as well as the

sources of the septage. A municipal system may charge disposal fees to reflect the cost of treatment as well as fees for administration of the septage receiving program. Municipal wastewater systems may require licensed disposers to analyze samples of septage in order to determine its characteristics and its compatibility with the treatment system, but the municipal system may not require the analysis of septage that is solely from residential sources.

Administrative Responsibility and Codes- Dane County

The Dane County Floodplain Zoning (Chapter 17), Subdivision (Chapter 75) and Private Sewage System and Health (Chapter 46) Ordinances describe the administrative procedures, roles and responsibilities of Dane County departments and agencies in carrying out the state statutes and administrative codes relative to the location, operation and maintenance of on-site systems.

The Department of Public Health – Madison and Dane County – Division of Environmental Health, administers the private sewage system ordinance under the provisions of Sections 59.70(5), 145.135, 145.19, and 145.20, Wis. Stats. The ordinance and administrative procedures are included in Chapter 46 of the Dane County Code of Ordinances. Chapter 46 indicates that the Dane County Ordinance and all systems installed in Dane County must conform to the State Plumbing Code with respect to siting, design, installation and inspection. The county must issue state sanitary permits, and sanitary permits are required before any septic tank or other on-site system may be installed in Dane County. Permits are issued and approved by the Department of Public Health for Madison and Dane County – Division of Environmental Health .

Several specific provisions of Chapter 46 include:

- A site evaluation by a certified soil tester in accordance with Chapter COM 85 is required for all sites. The evaluation must include soil conditions, properties and permeability, depths to zones of soil saturation, depth to bedrock, slope, landscape position, all setback requirements, and the potential for flooding.

- The Division of Environmental Health conducts on-site inspections and makes preliminary determinations of the suitability of the soil for location of an on-site waste system. However, a preliminary determination does not ensure that an application for a final sanitary permit will be approved.

- The Division of Environmental Health will inspect all installations of on-site systems at the completion of construction, but before backfilling.

- The Division of Environmental health shall place all septic tanks on a periodic maintenance program. Private sewage systems that include aerobic treatment units or other technology intended to treat wastewater are placed on an inspection program cycle appropriate to the component per COM 83.54(4). Pumping reports for holding tanks are submitted semi-annually. All other private sewage systems are placed on a three-year inspection program in conformance with COM 83.54(4). All owners must demonstrate compliance with this requirement by returning report forms prepared by the department, or certifications approved by the department.

- The Division of Environmental Health has the authority to make random inspections of on-site systems in order to verify data contained on sanitary permit applications.

- The Division of Environmental Health shall not approve any private on-site system for a site where public sewer service is available.

- The Division of Environmental Health may issue both stop-work and repair orders for on-site systems constructed without a sanitary permit, for non-conforming construction techniques and for malfunctioning systems which may cause public health and safety problems.

- The Division of Environmental Health may levy penalties of between $50 and $200 per day for violations of the sanitary code.

- The corporation counsel is responsible for prosecuting violations of the sanitary code at the request of the Department of Public Health for Madison and Dane County.

In 2007, Chapter 46 was amended to include standards for the land disposal of septage. It includes a provision that septage may not be spread on frozen or snow covered ground. This is a more protective standard than NR 113:

The Dane County Floodplain Zoning and Subdivision Regulations are contained in Chapters 17 and Chapter 75 of the Dane County Code of Ordinances, which are relevant to the regulation of on- site

systems in Dane County. The following are several of the more important provisions:

- On-site systems are regulated in the floodplain and shoreland district. Specifically, on-site systems are prohibited in the floodway zone, and on-site systems located in the flood fringe are to be flood proofed. Zoning permits issued for the floodplain and shoreland district must include data on the location of on-site systems.

- Subdivisions with on-site systems shall be developed consistent with the criteria contained in Chapters Comm. 83 and Comm 85 of the Wisconsin Administrative Code and Chapter 46 of the Dane County Ordinances.

- Design standards for subdivisions developed with on-site systems include a minimum lot area of 20,000 square feet and a minimum lot width of 100 feet compared to the sewered subdivision standards of 8,000 square feet and 60 feet. [(Chapter 75.19(6)(c)]

Attachment E contains the relevant state and local regulations pertaining to on-site wastewater treatment systems and septage disposal that are currently in effect.

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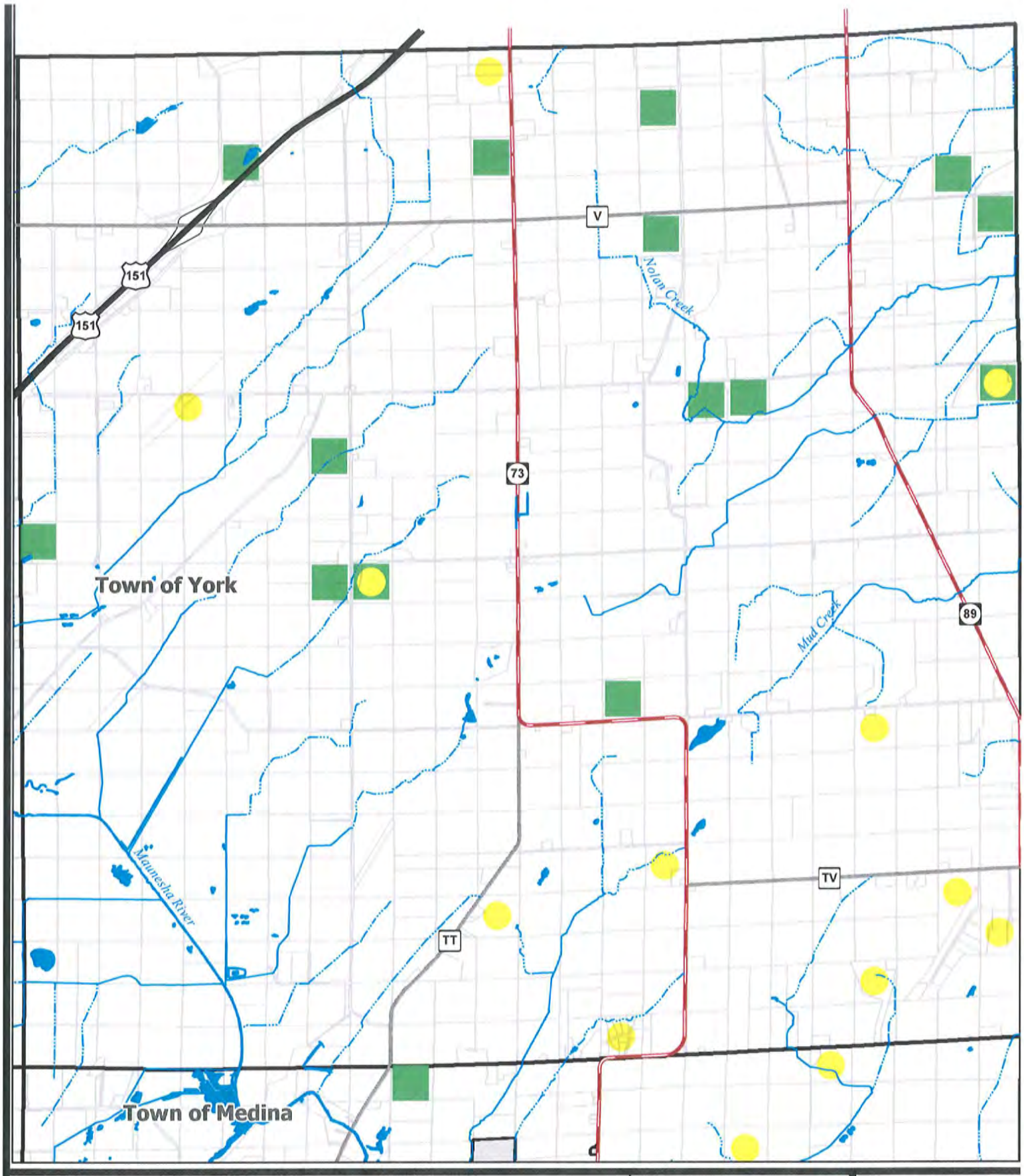
ATTACHMENT A

MAPS - PRIVATE DRINKING WATER WELL NITRATE LEVELS

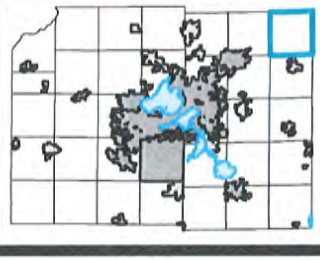
ATTACHMENT A

MAPS - PRIVATE DRINKING WATER WELL NITRATE LEVELS



Private Drinking Water Well Nitrate Levels

- Samples Exceed Enforcement Standard (10 mg/L)
- Samples Exceed Preventative Action Limit (2 - 10 mg/L)
- Samples Below Preventative Action Limit (< 2 mg/L)



7 Dec. 2011

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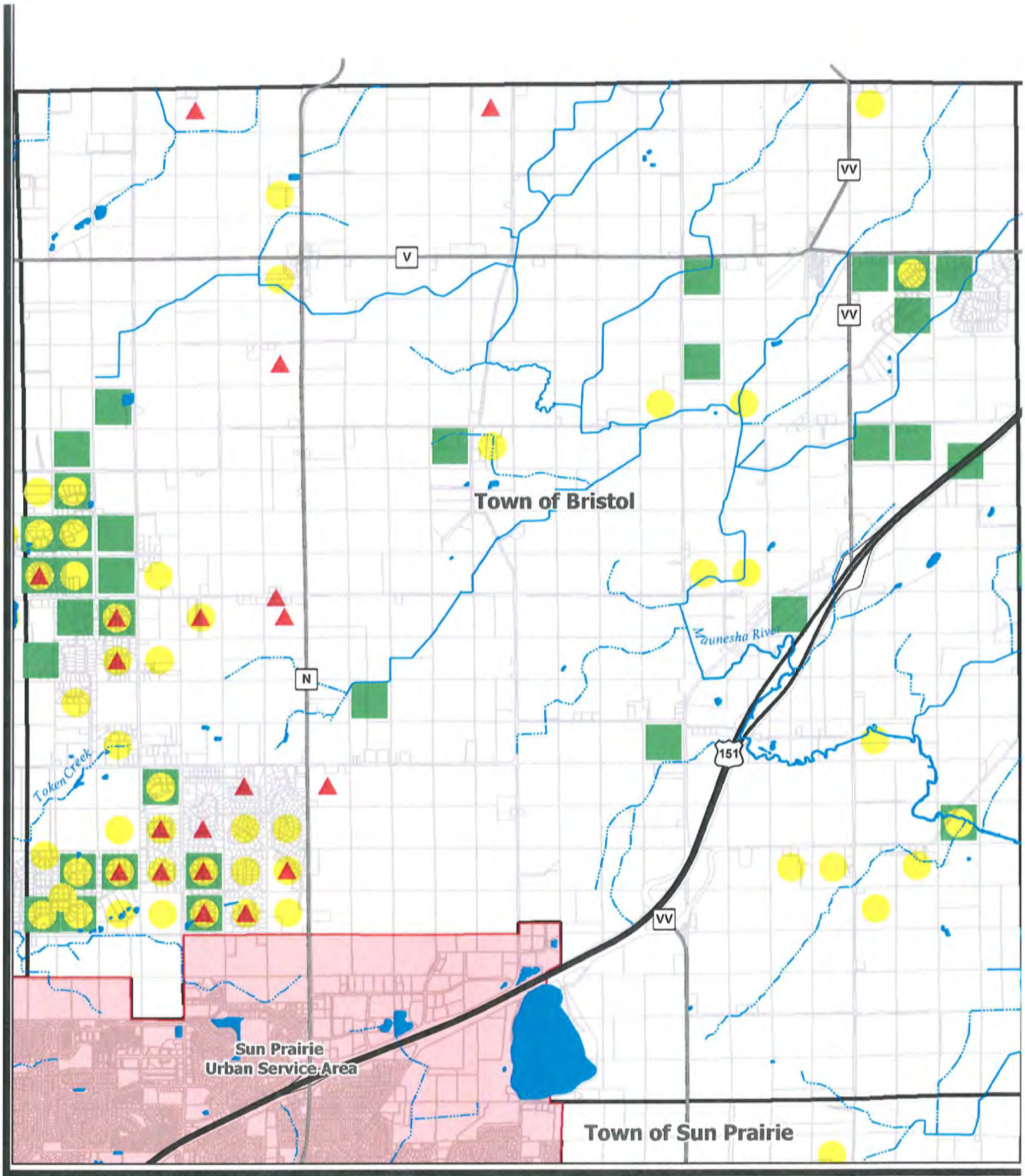

Private Drinking Water Well Nitrate Levels

- Samples Exceed Enforcement Standard (10 mg/L)
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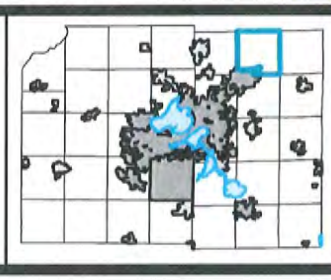

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Feet

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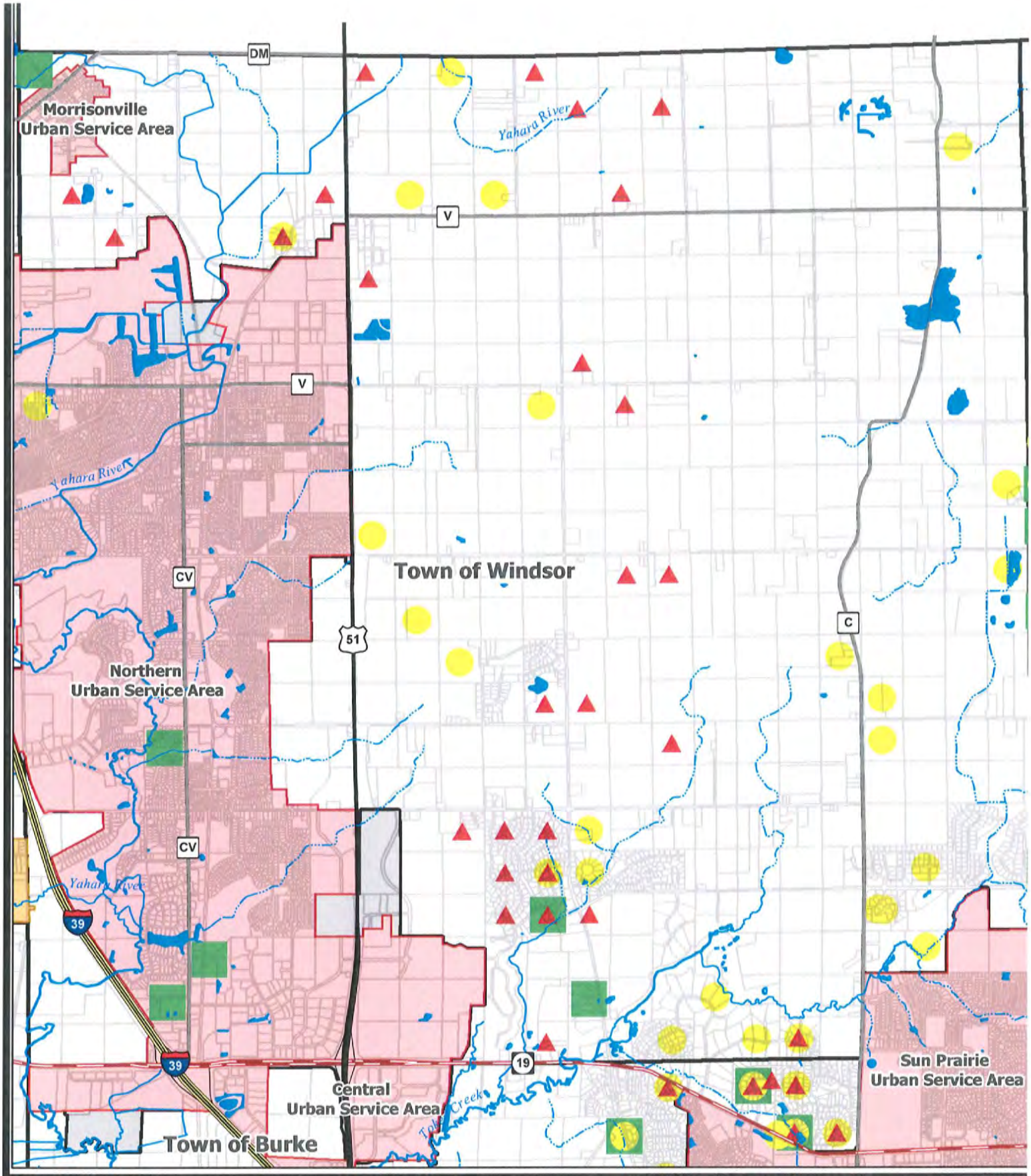

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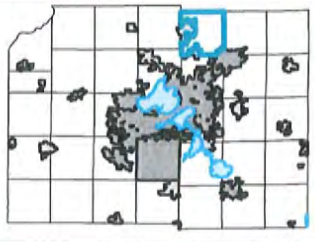

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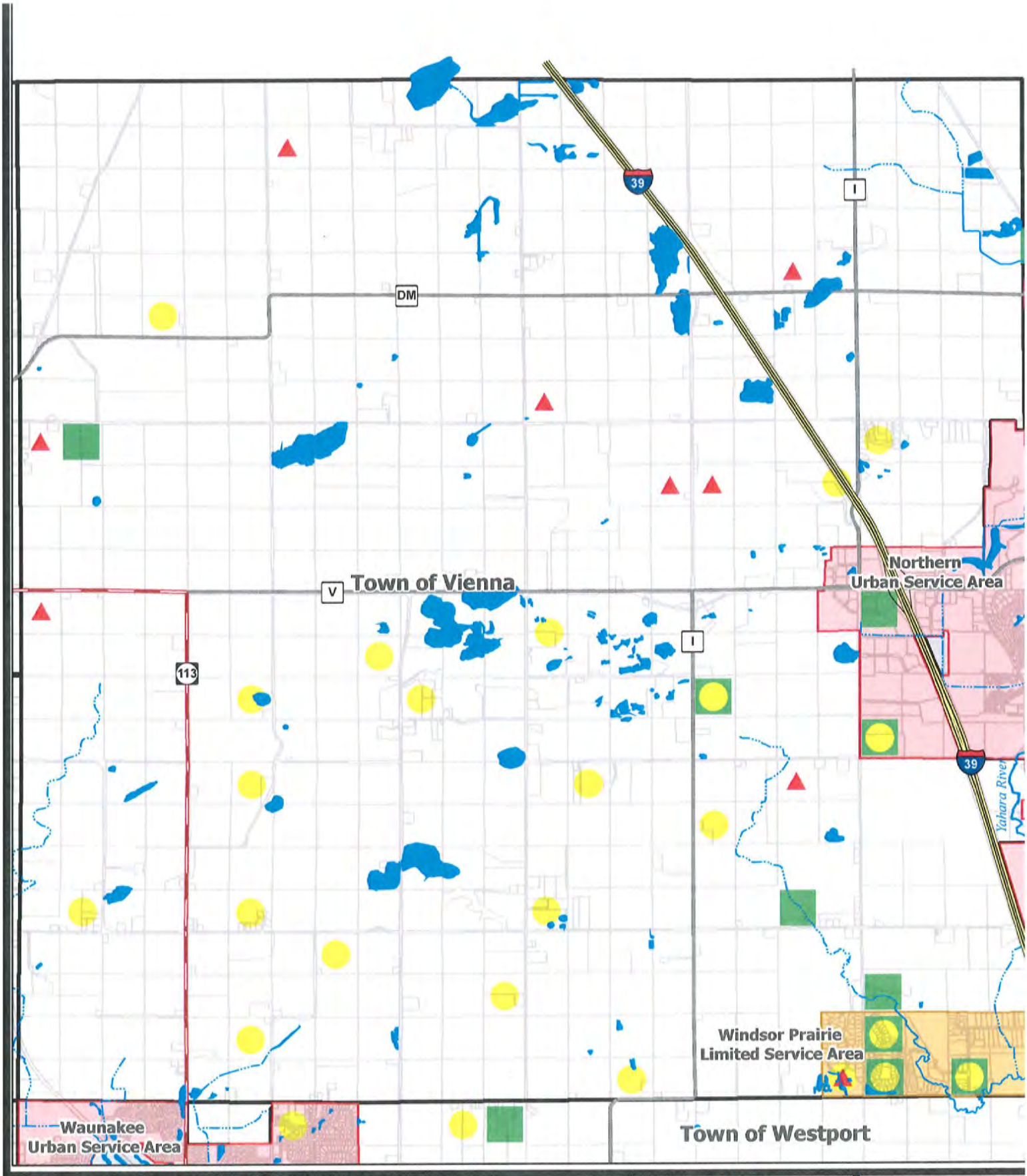

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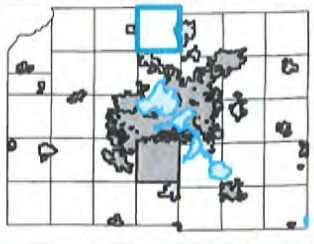

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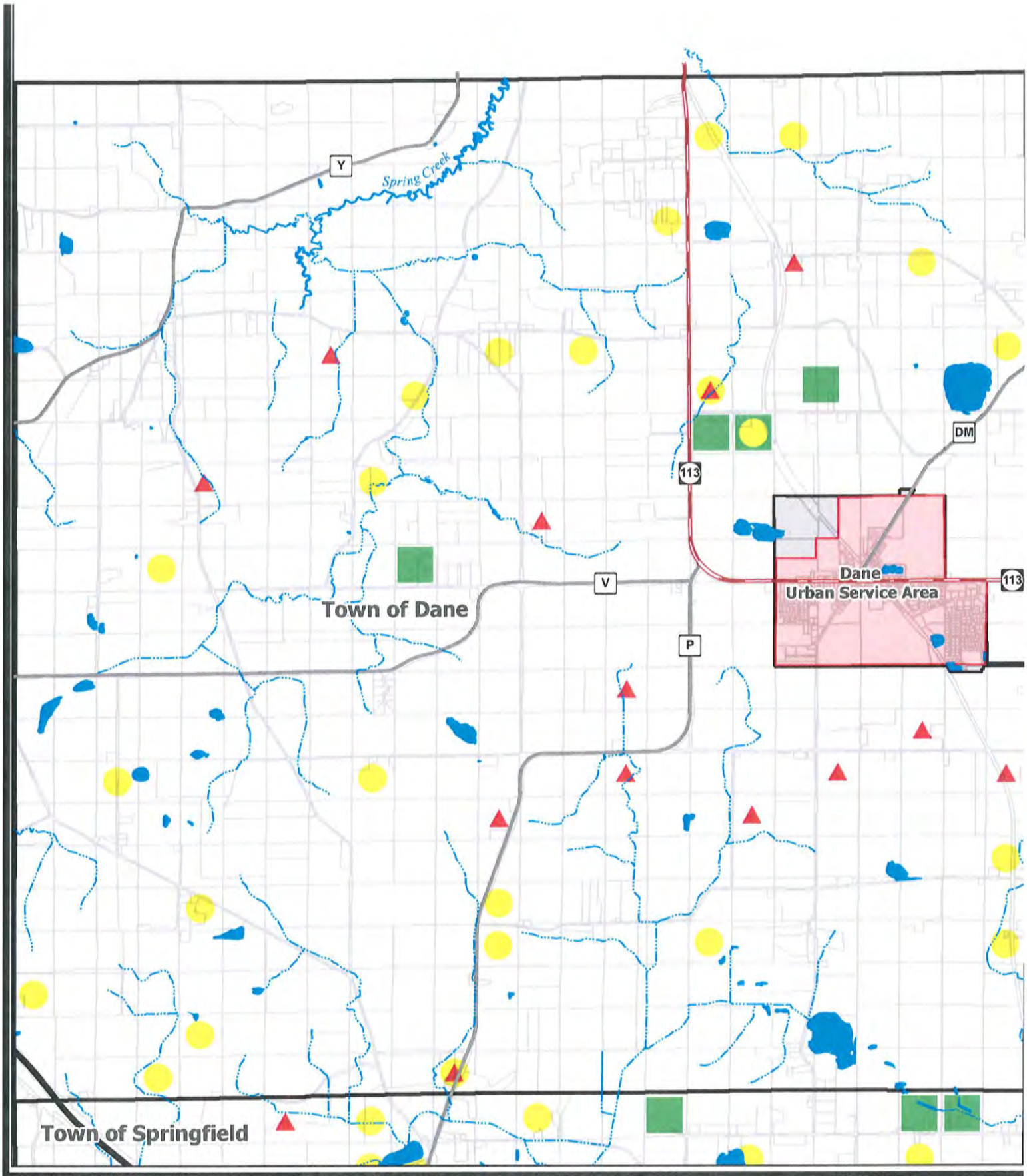

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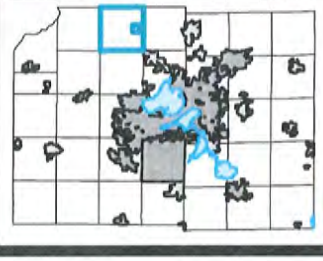

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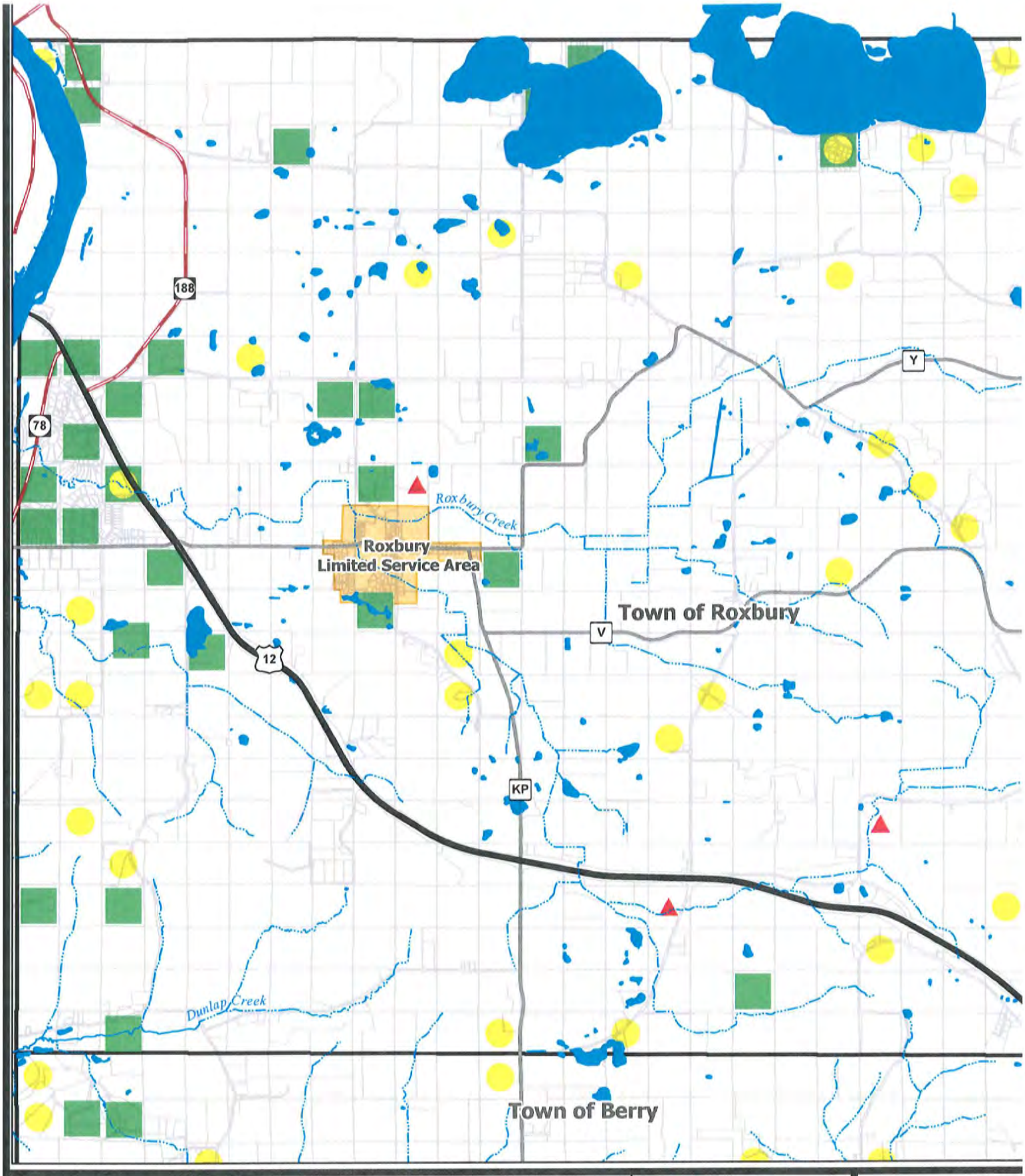

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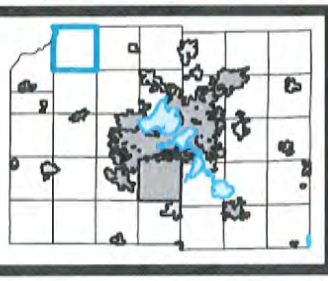

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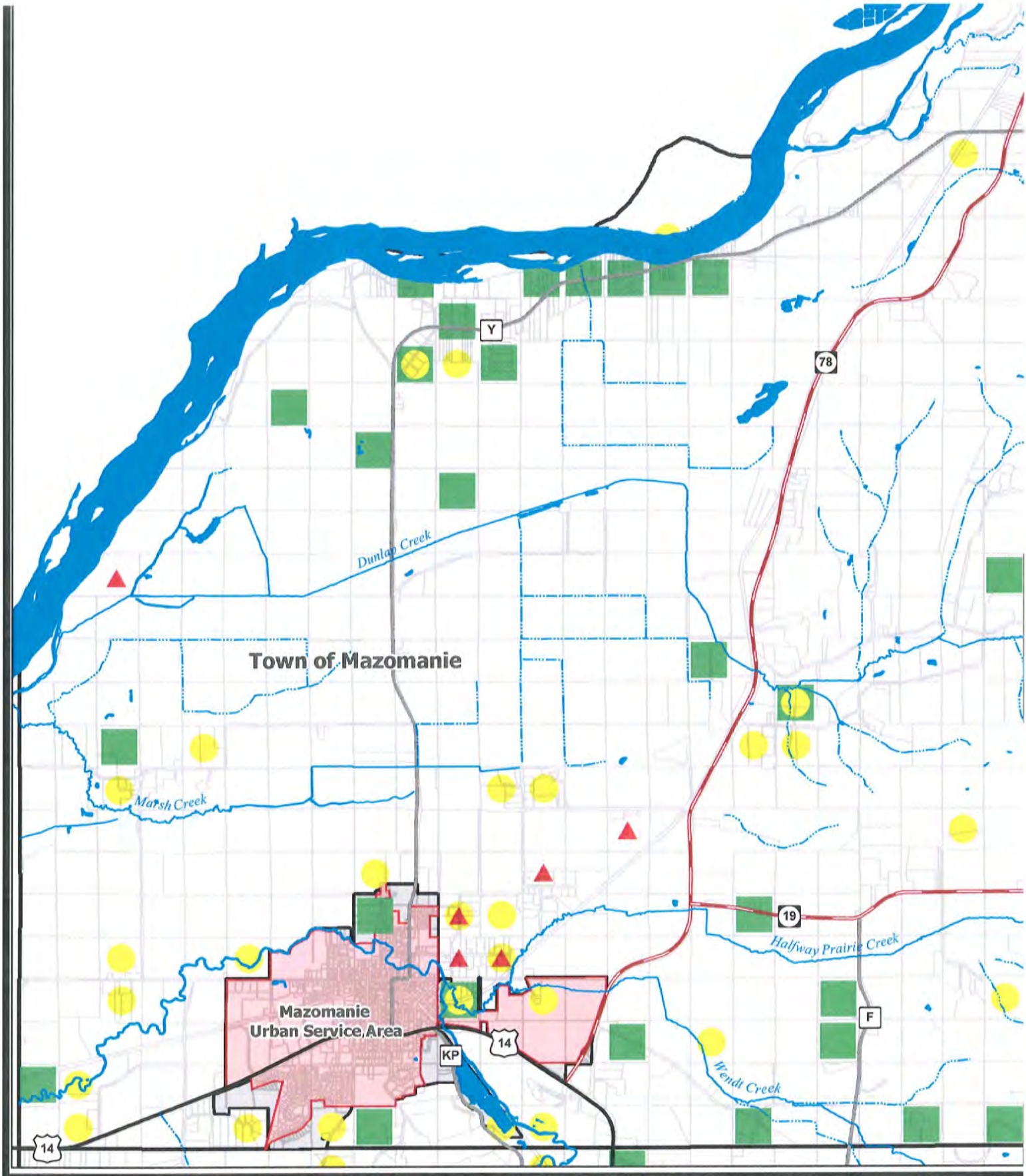

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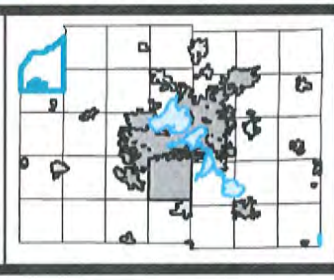

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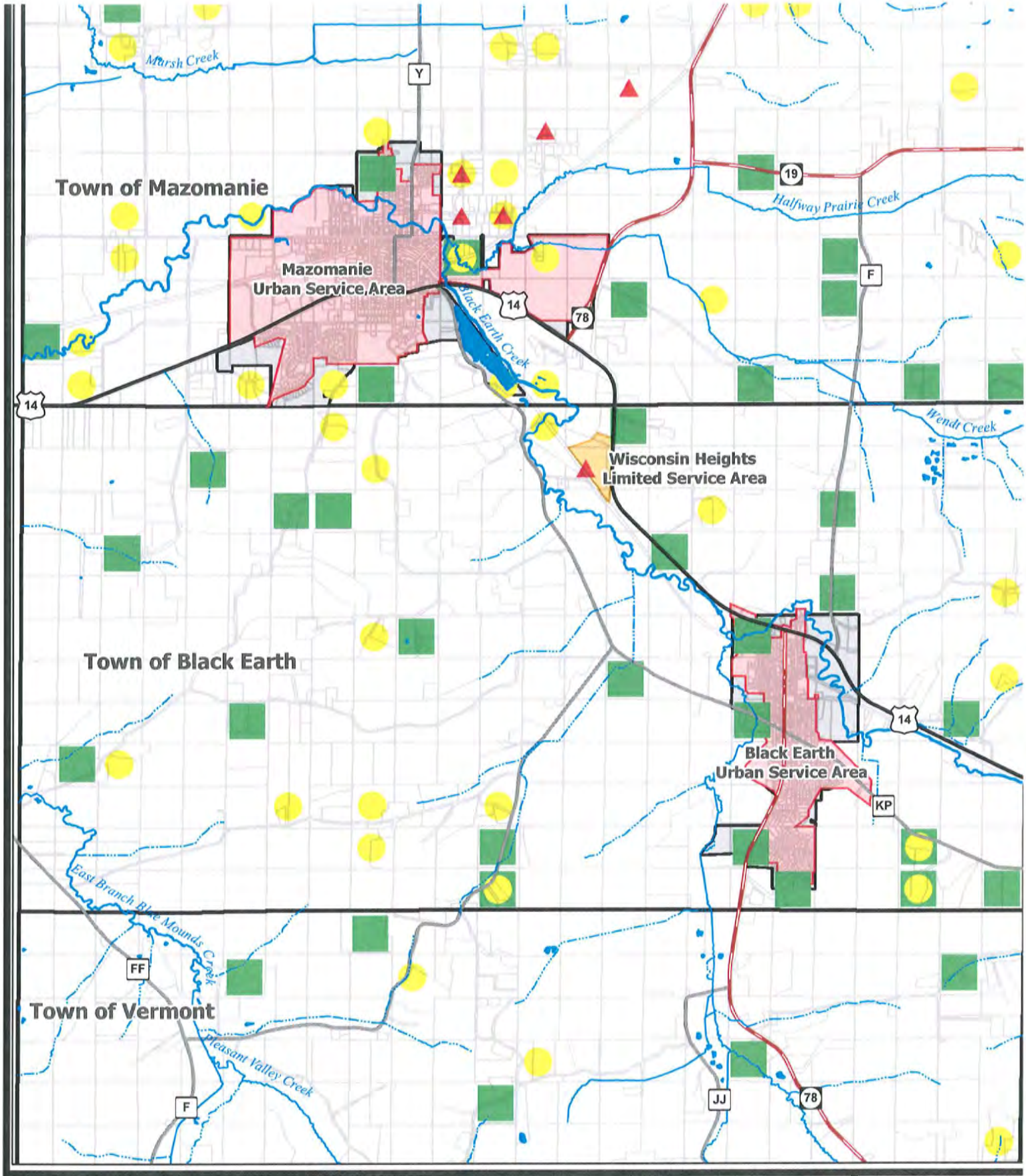

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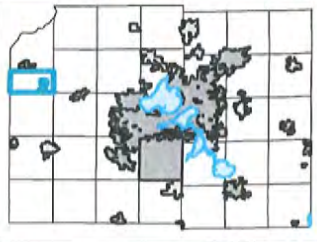

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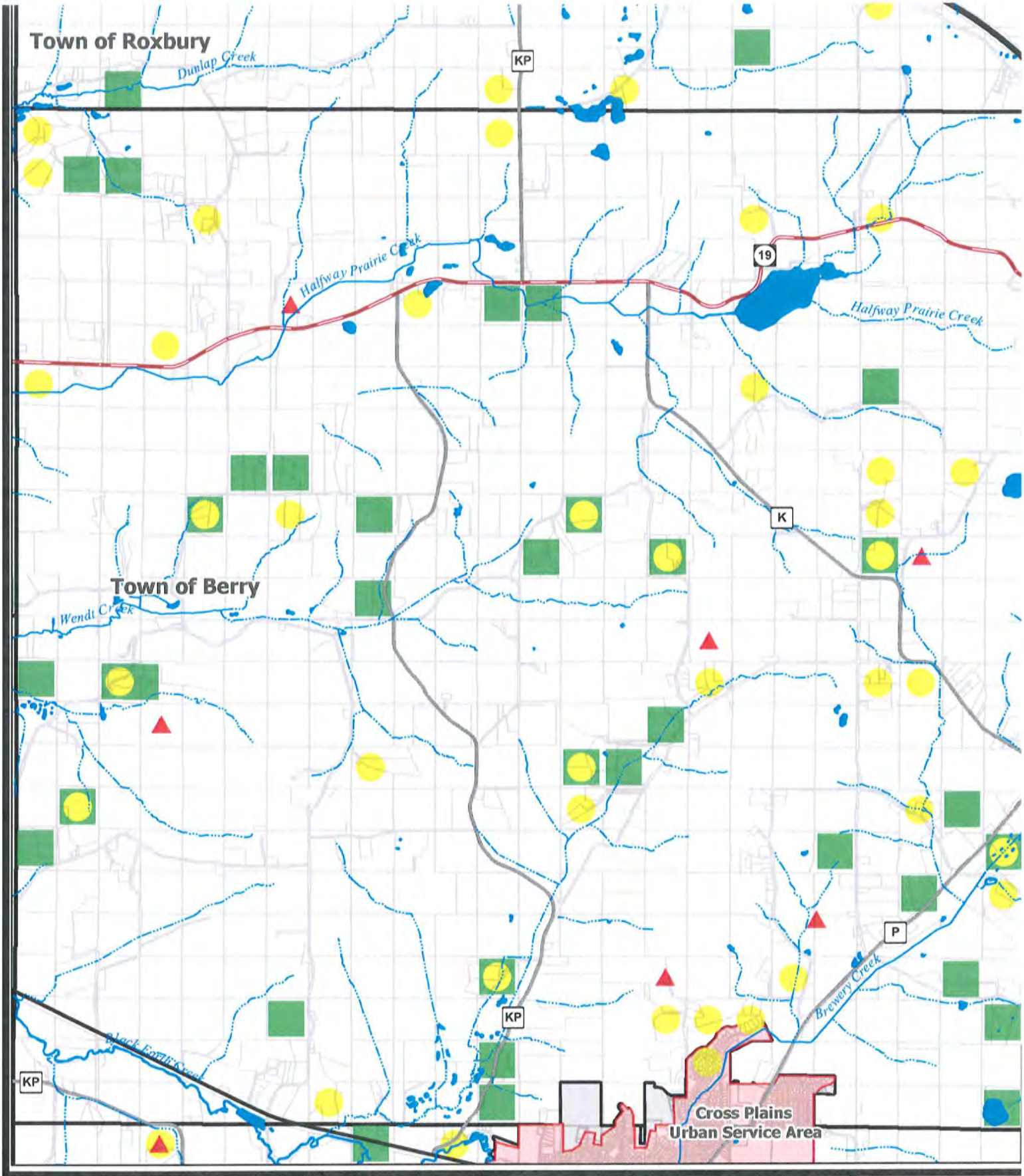

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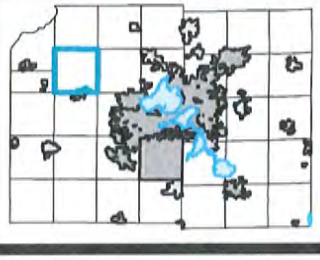

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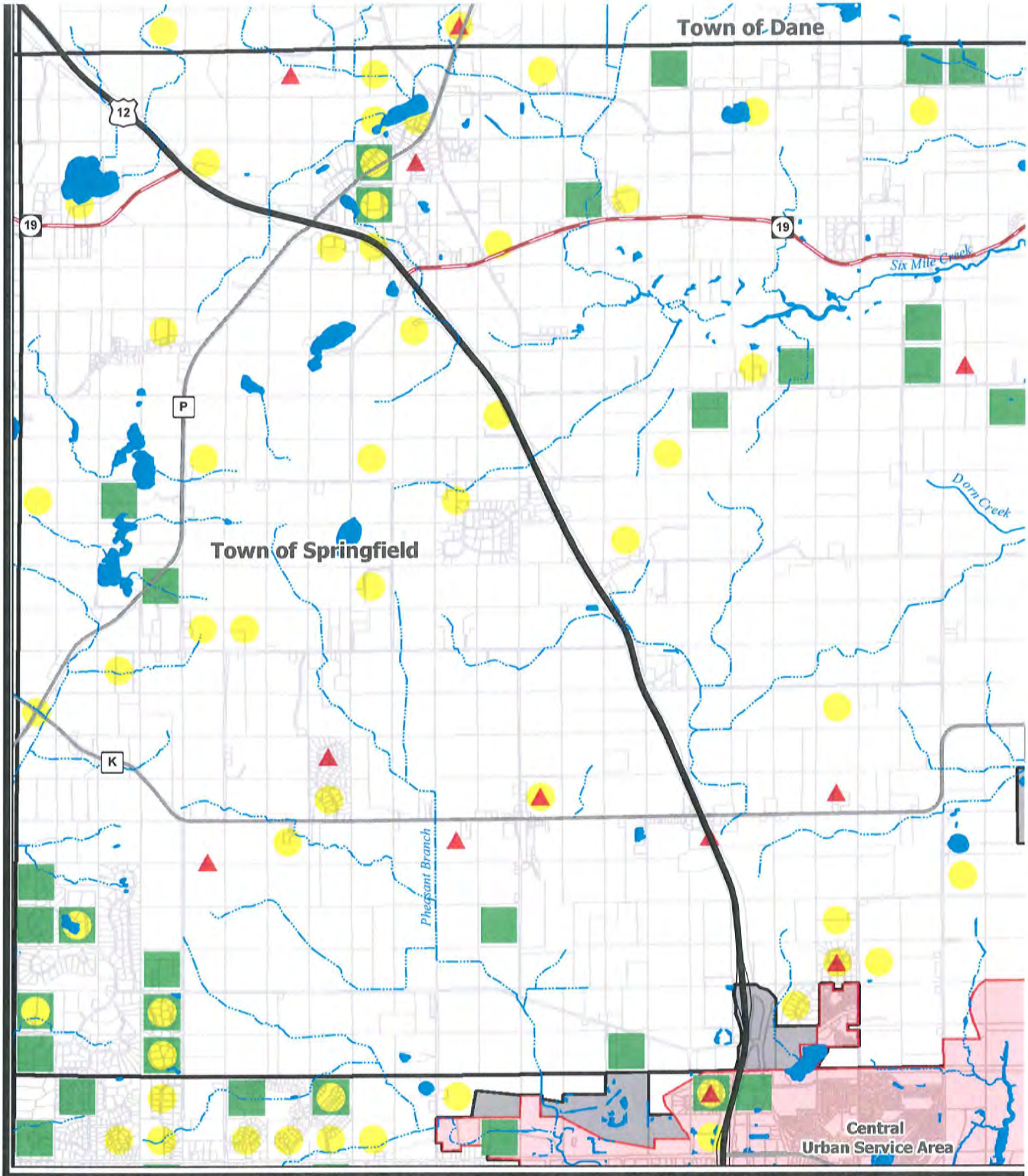

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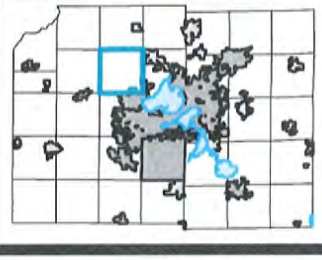

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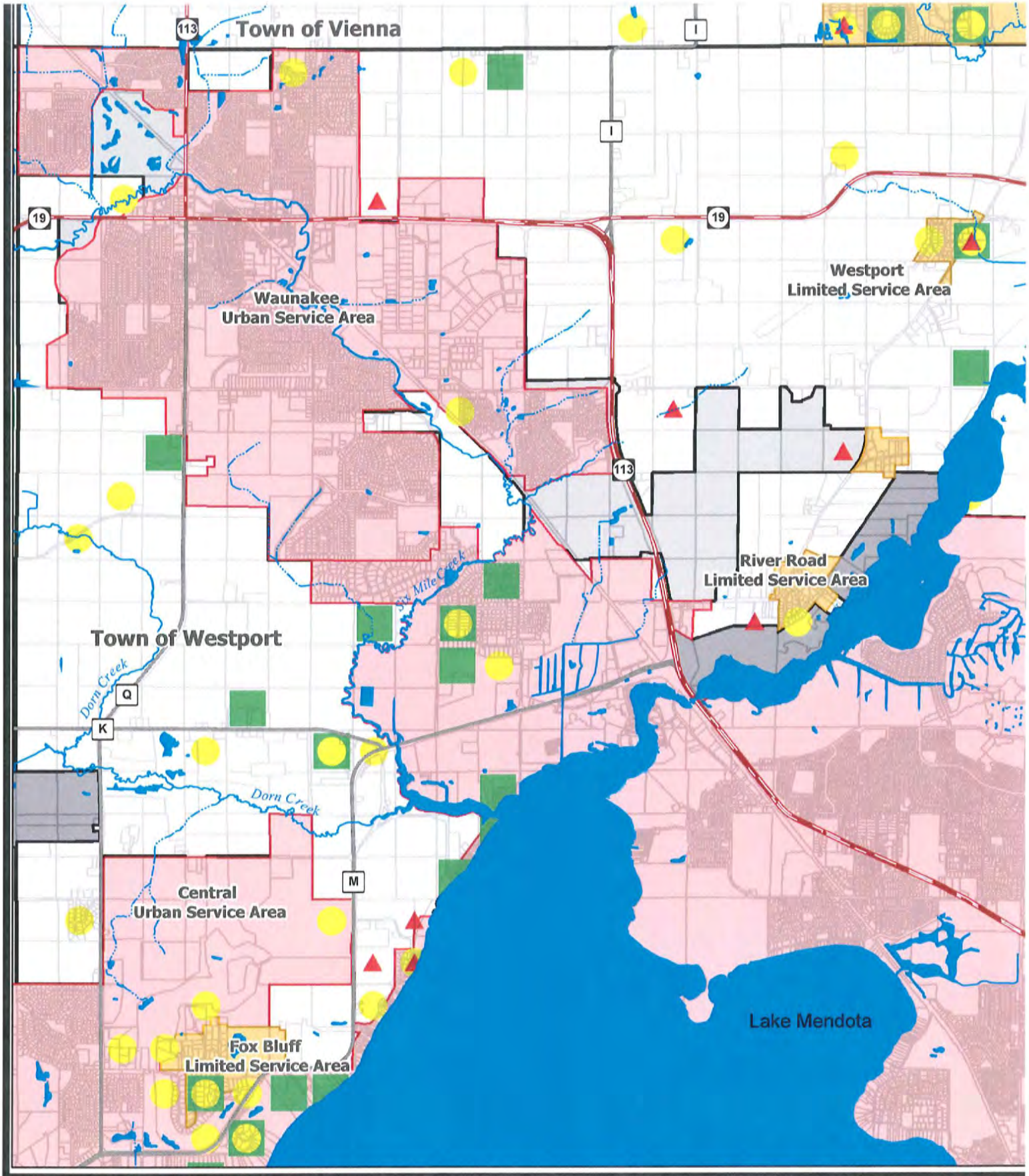

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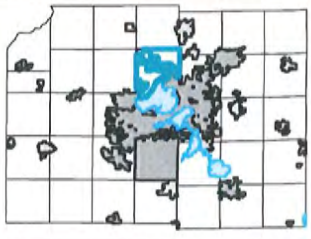

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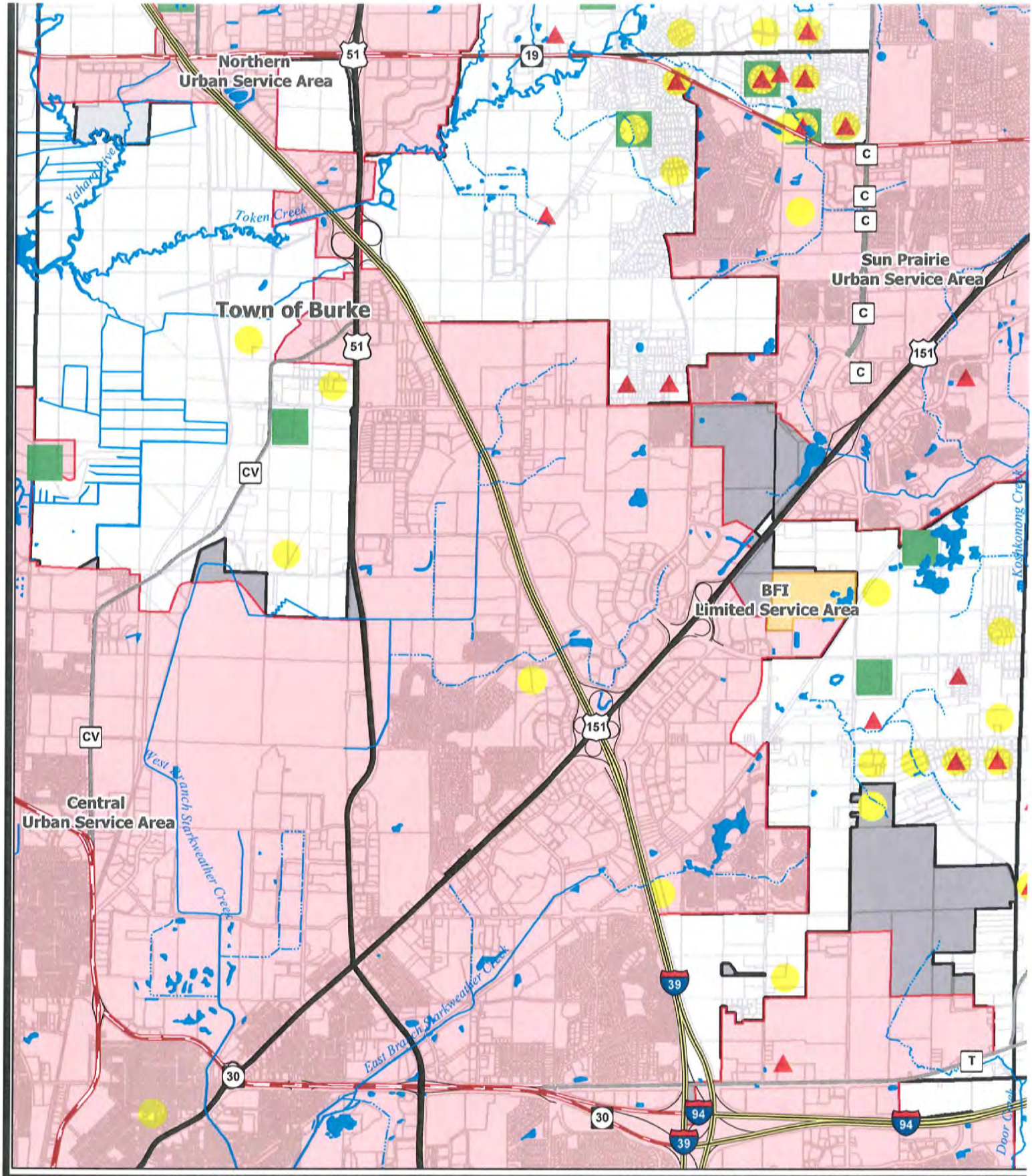

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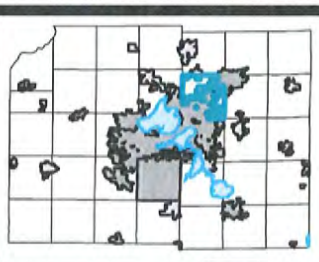

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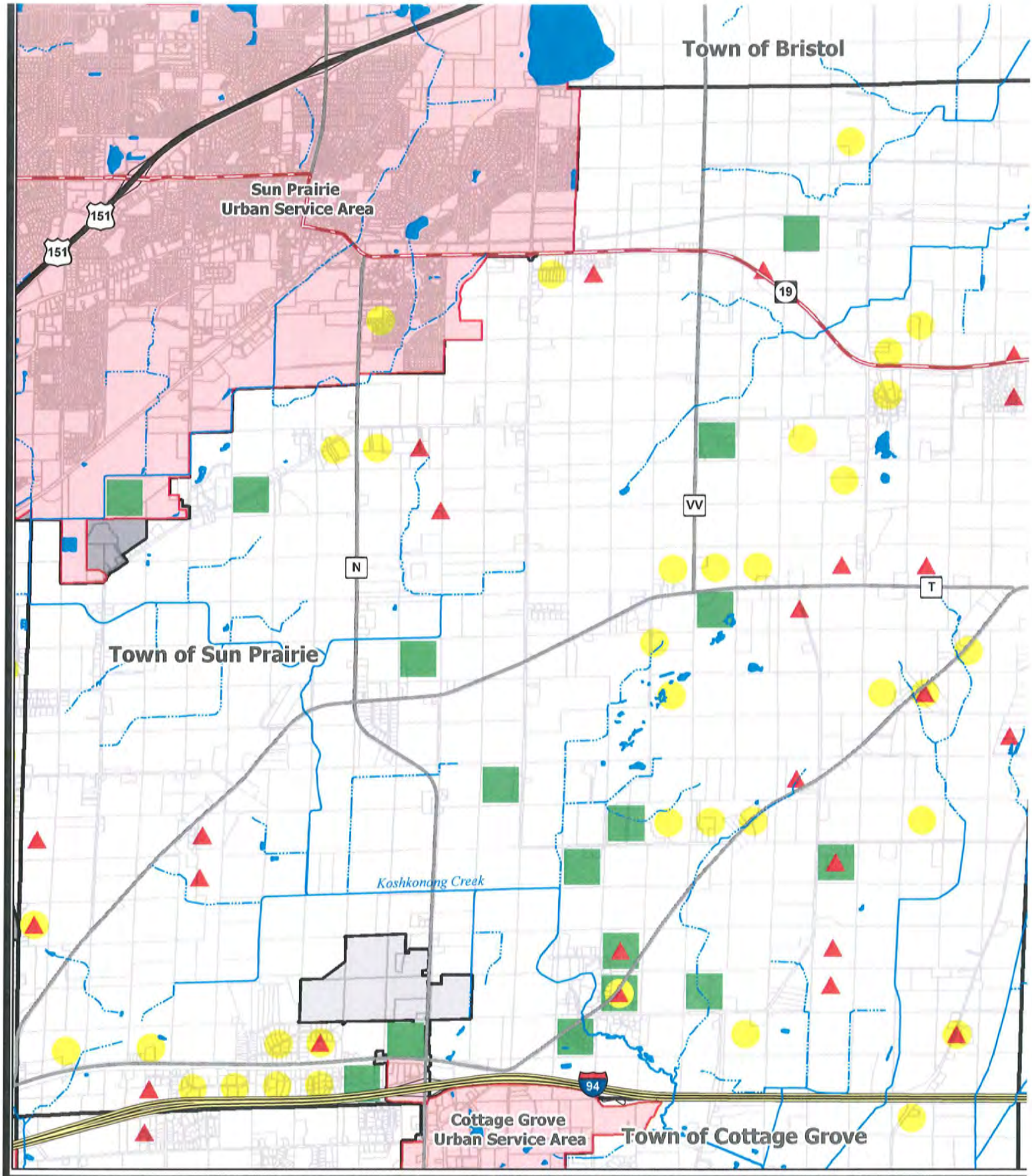

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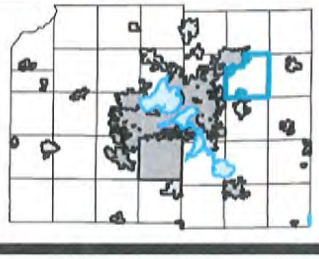

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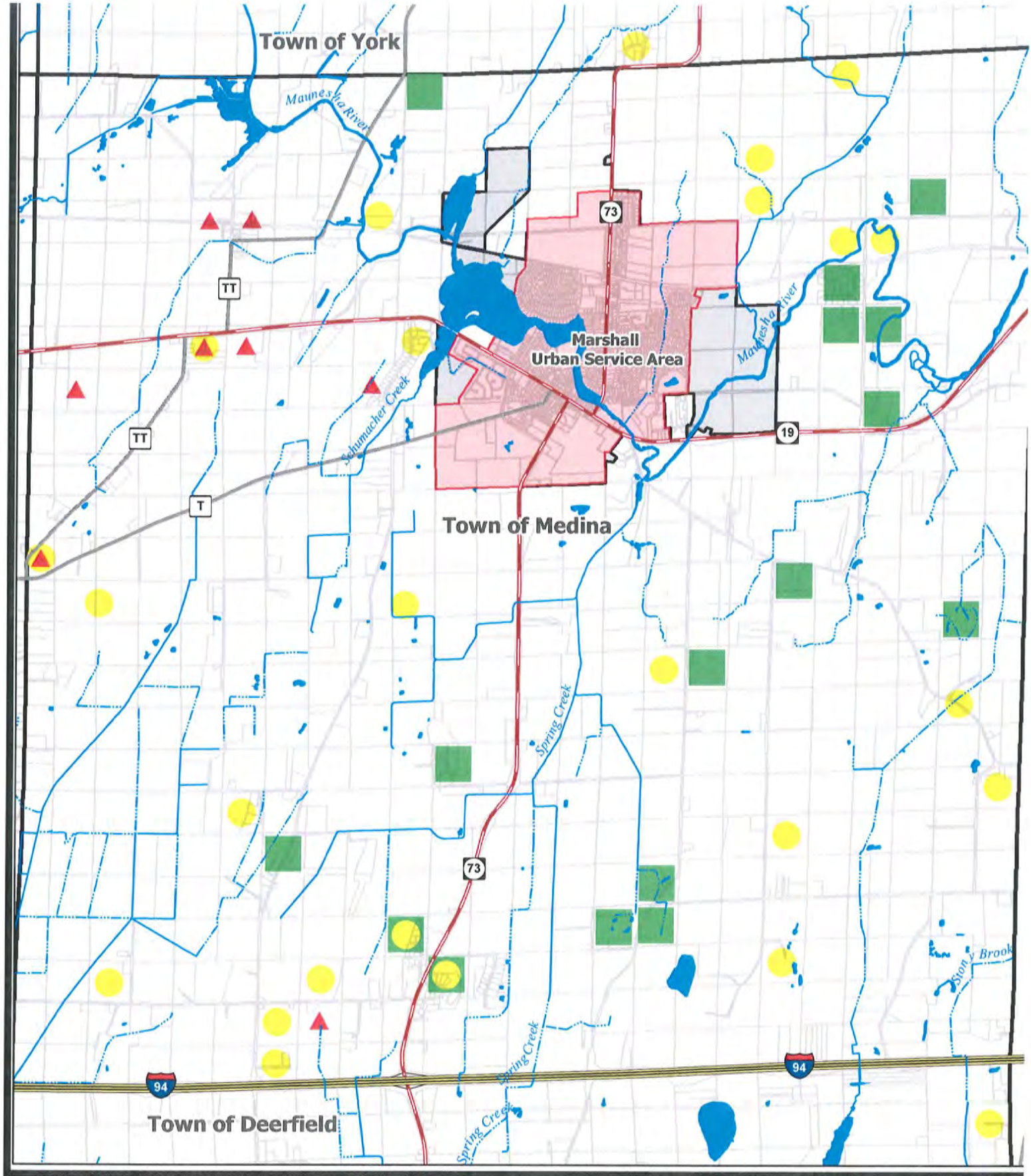

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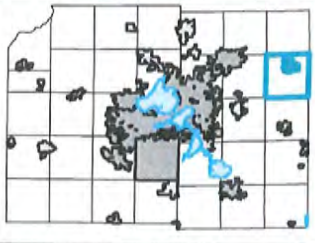

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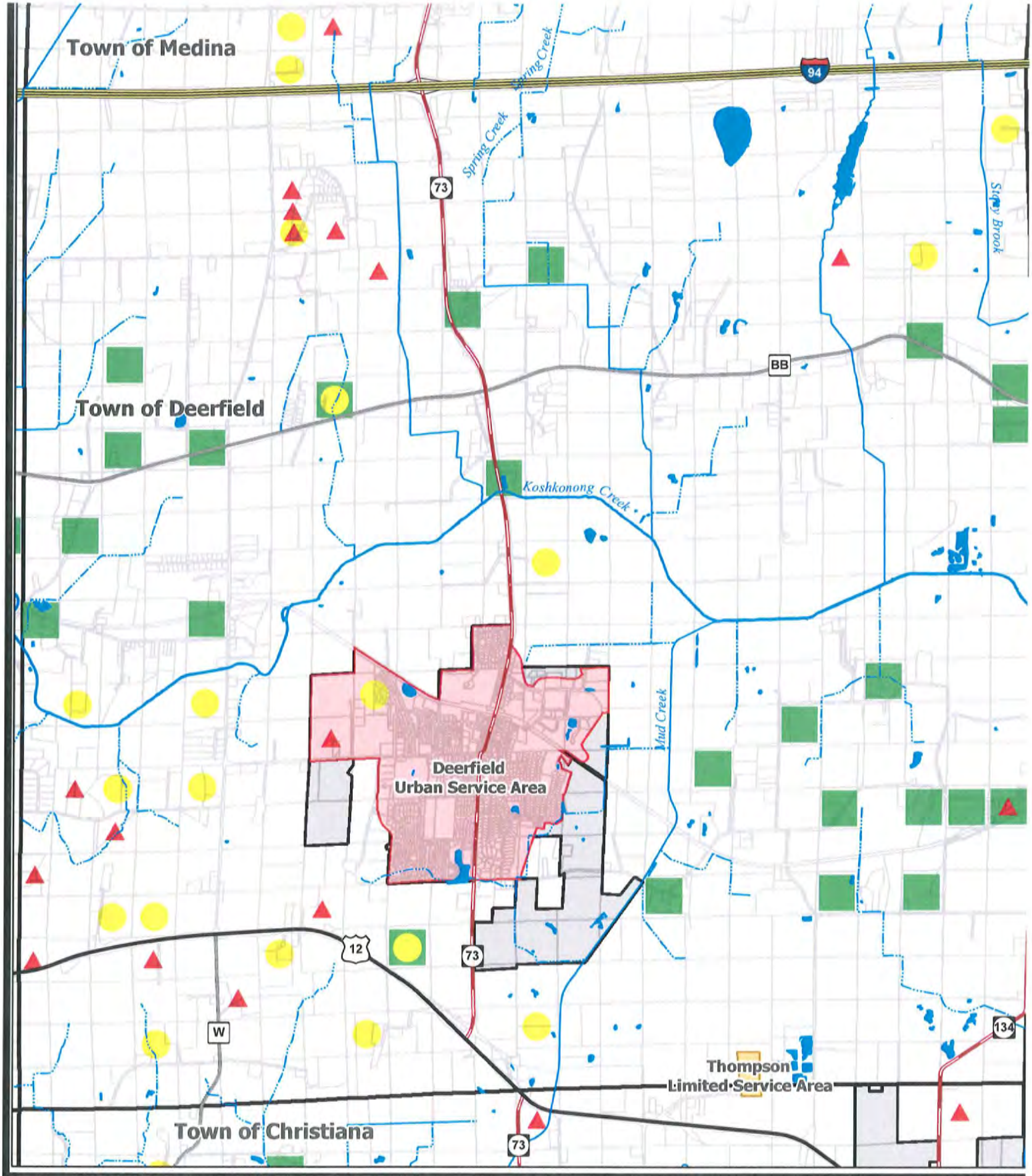

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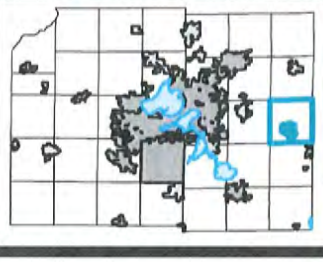

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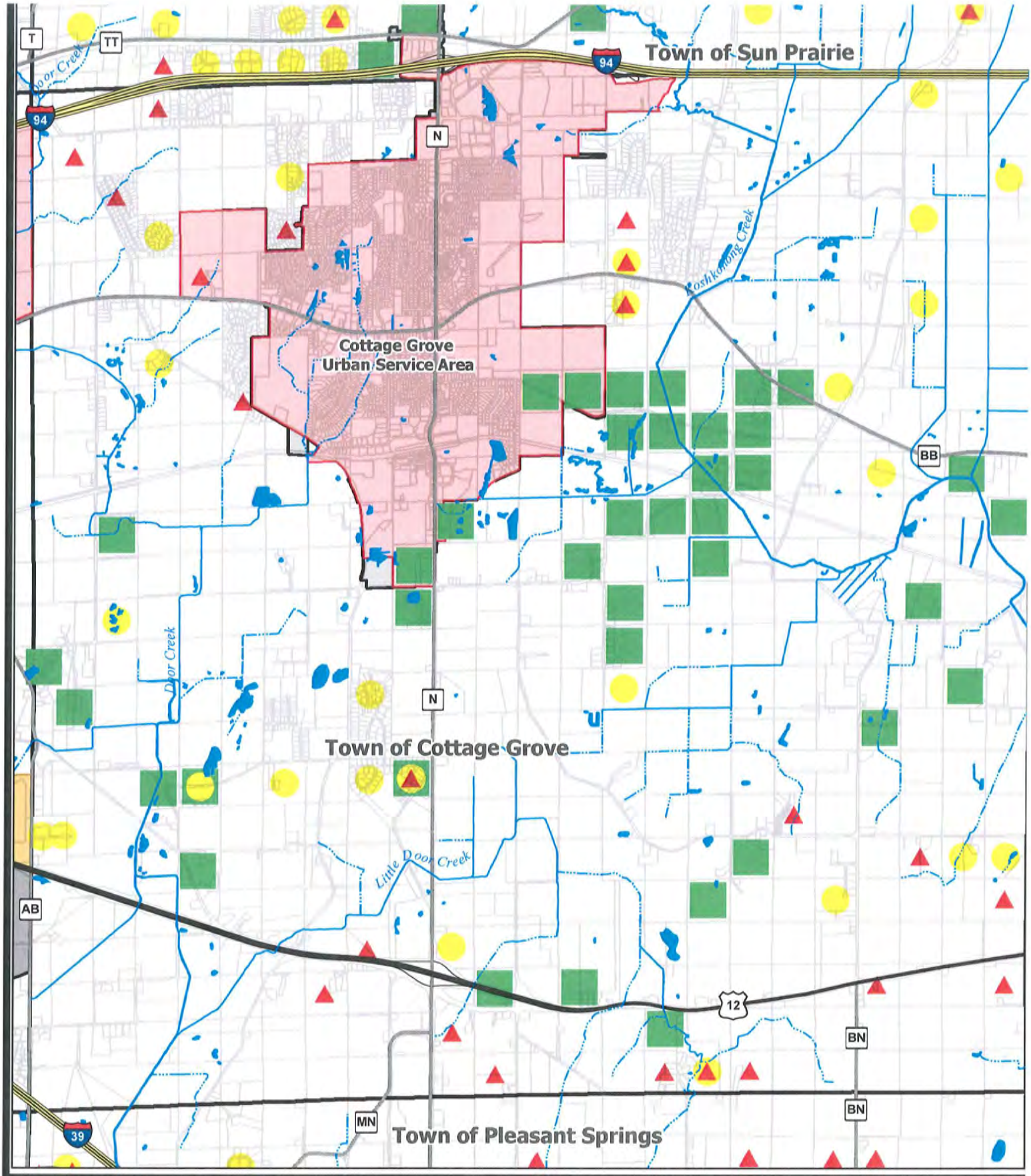

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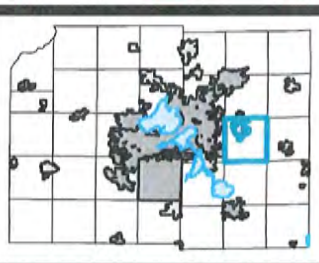

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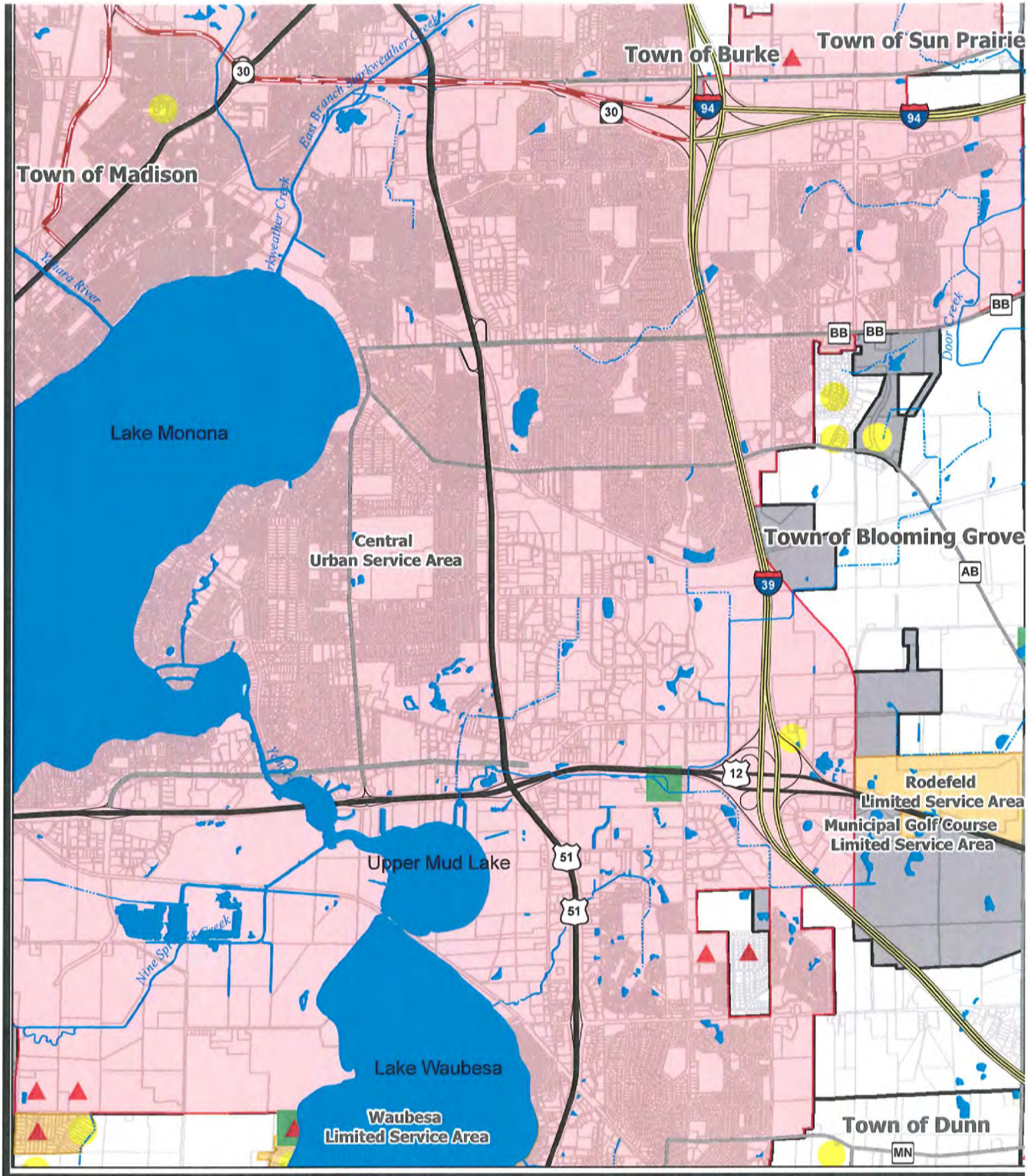

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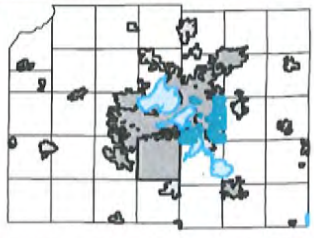

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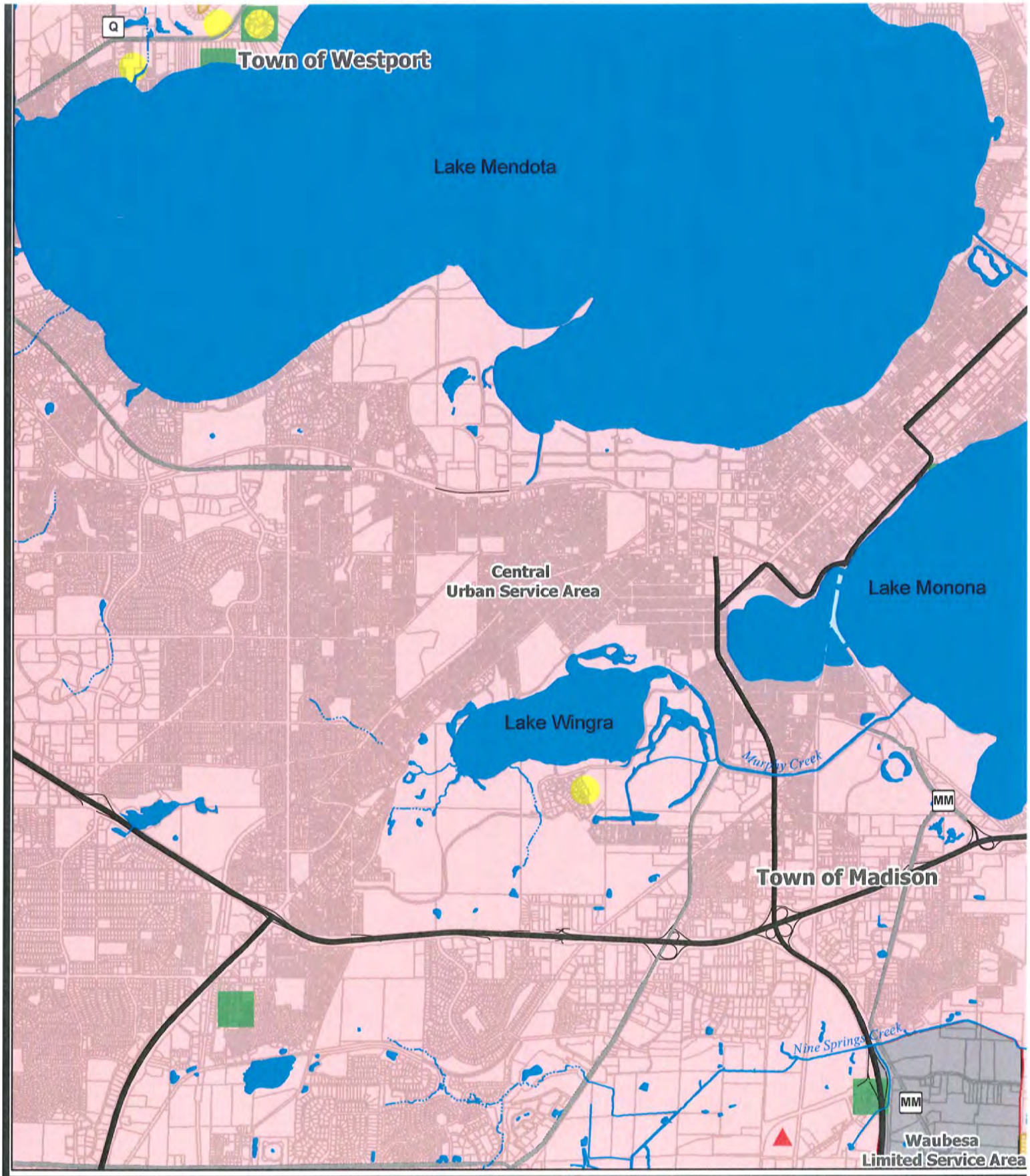

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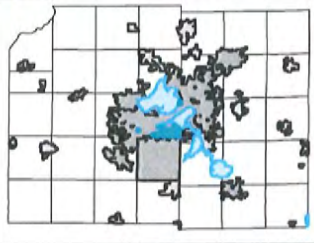

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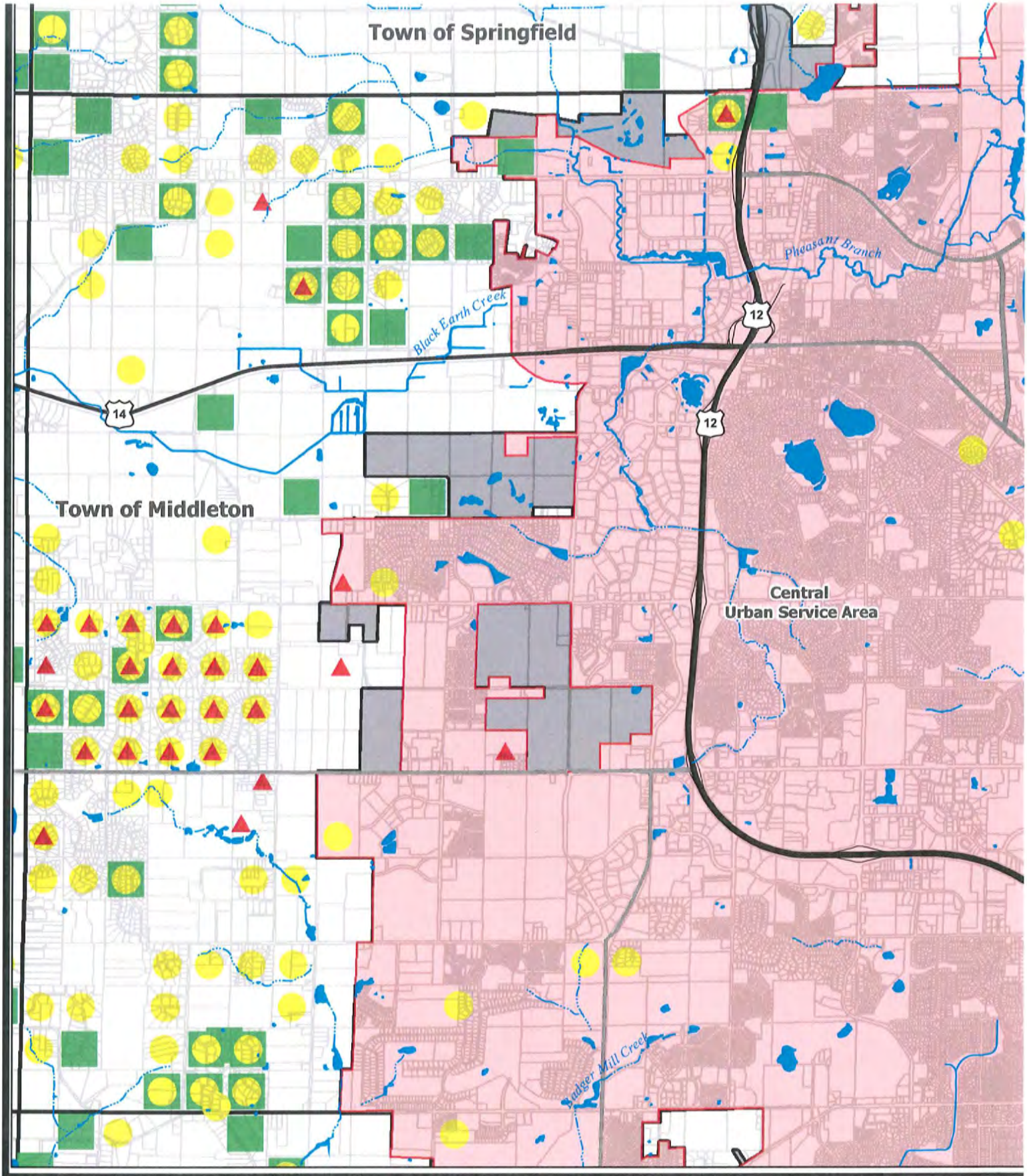

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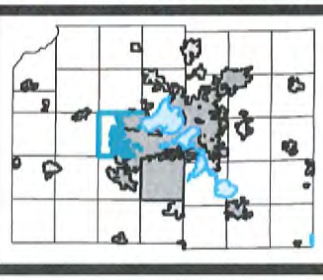

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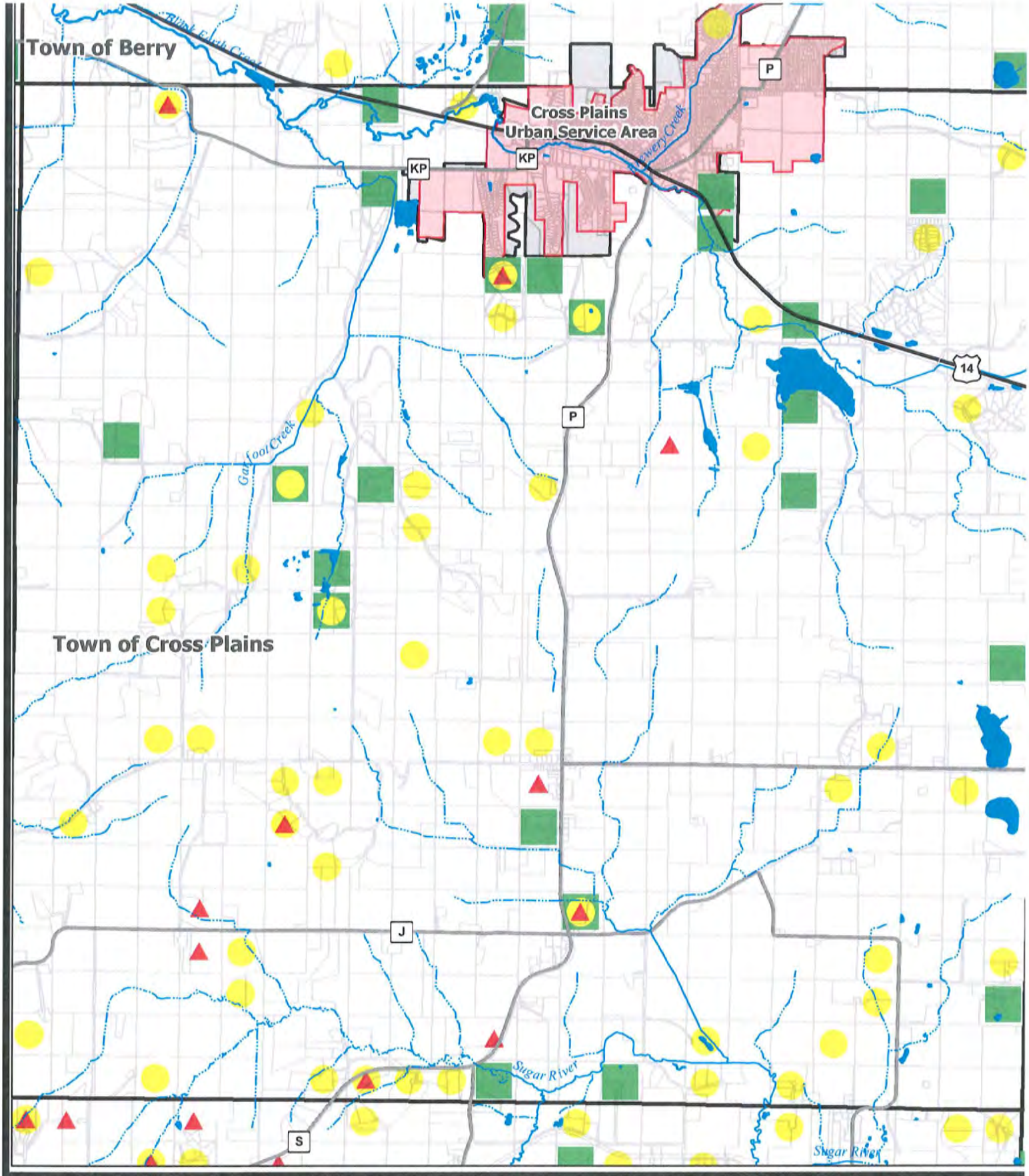

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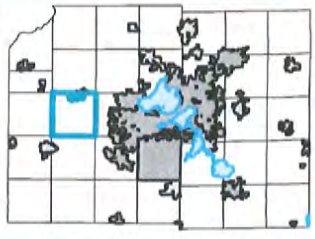

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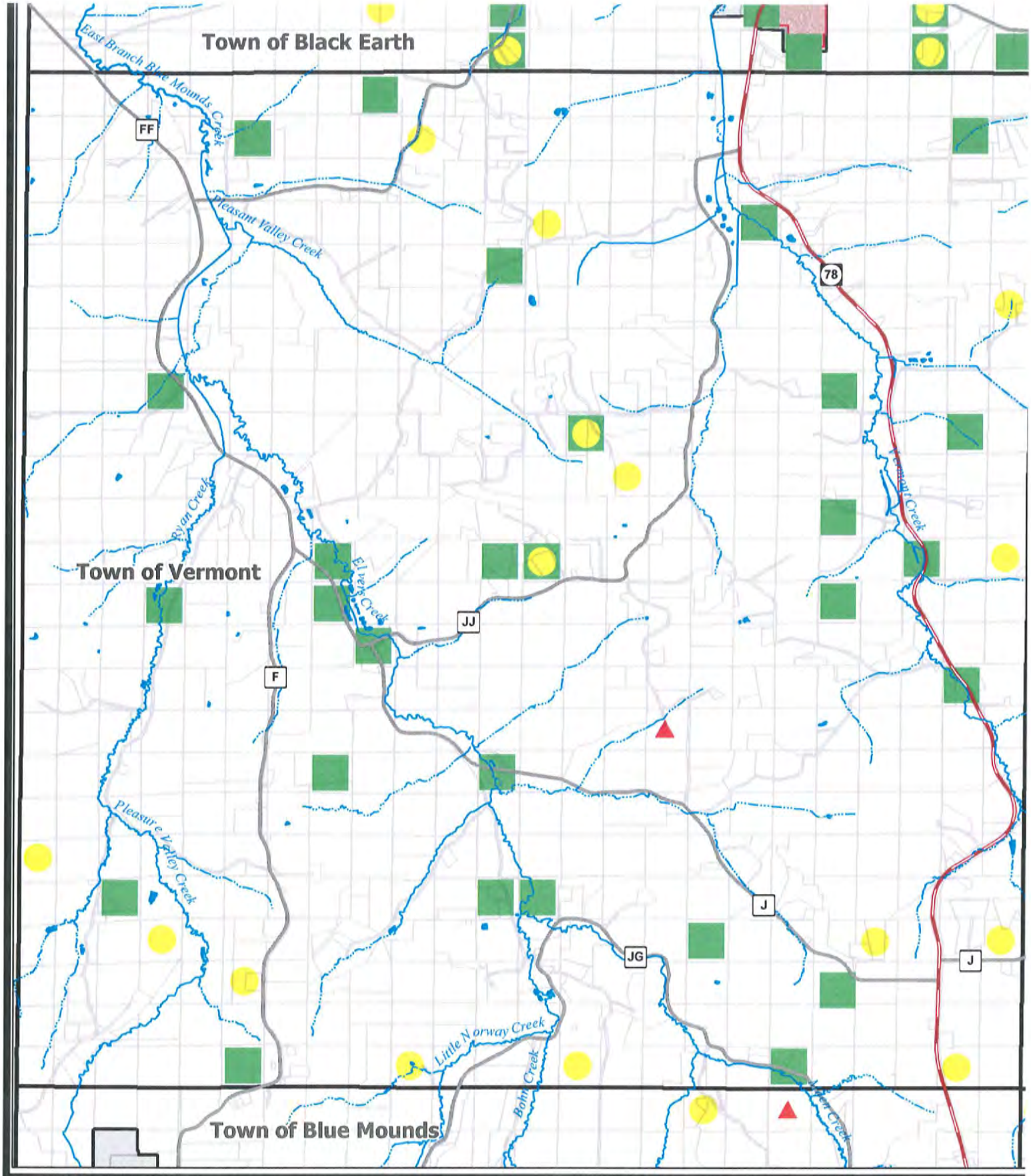

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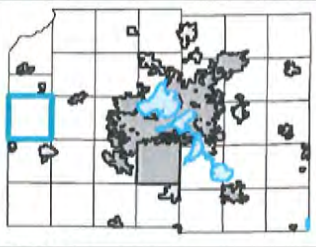

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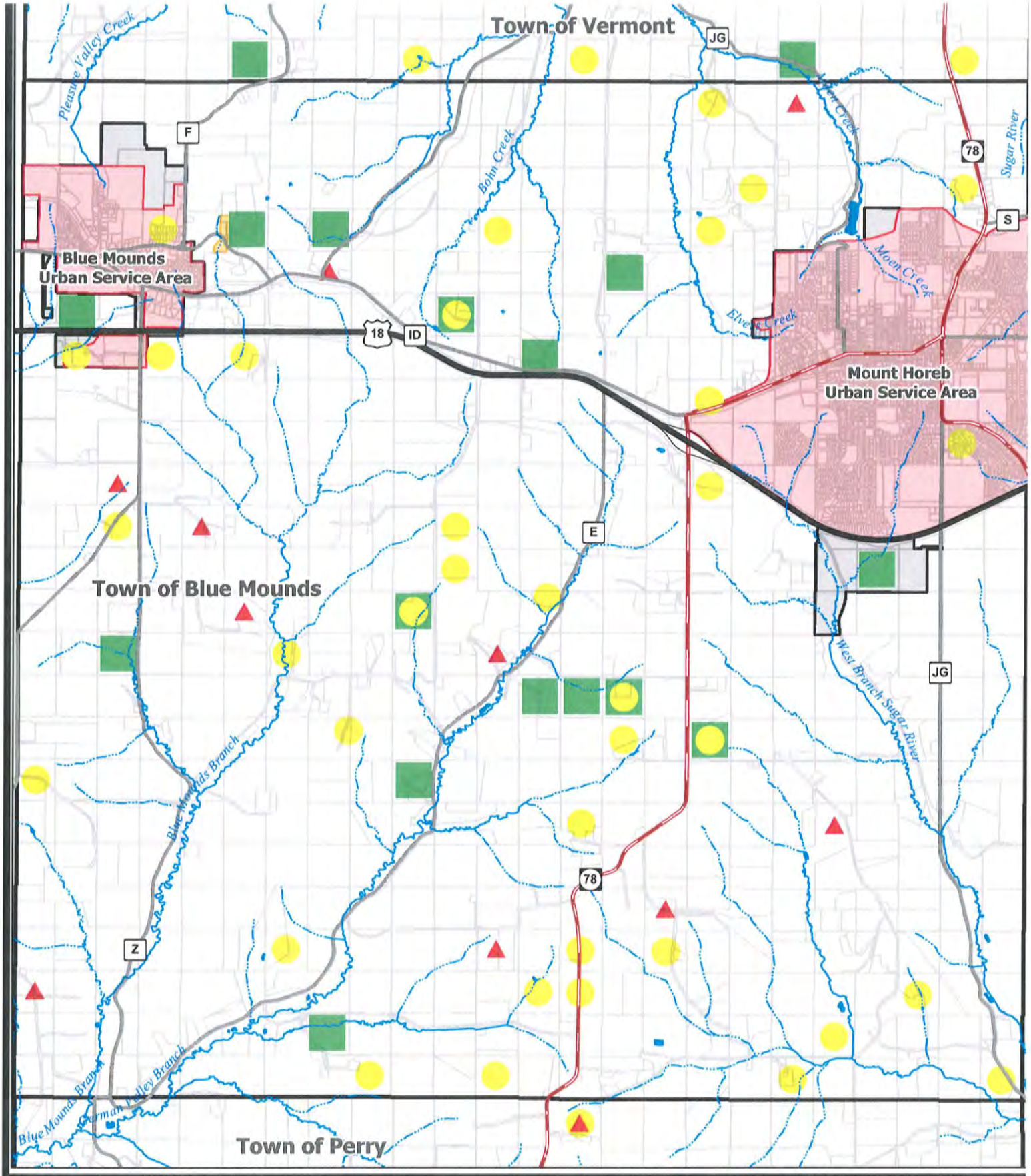

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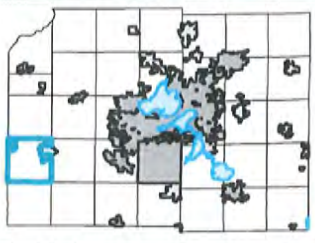

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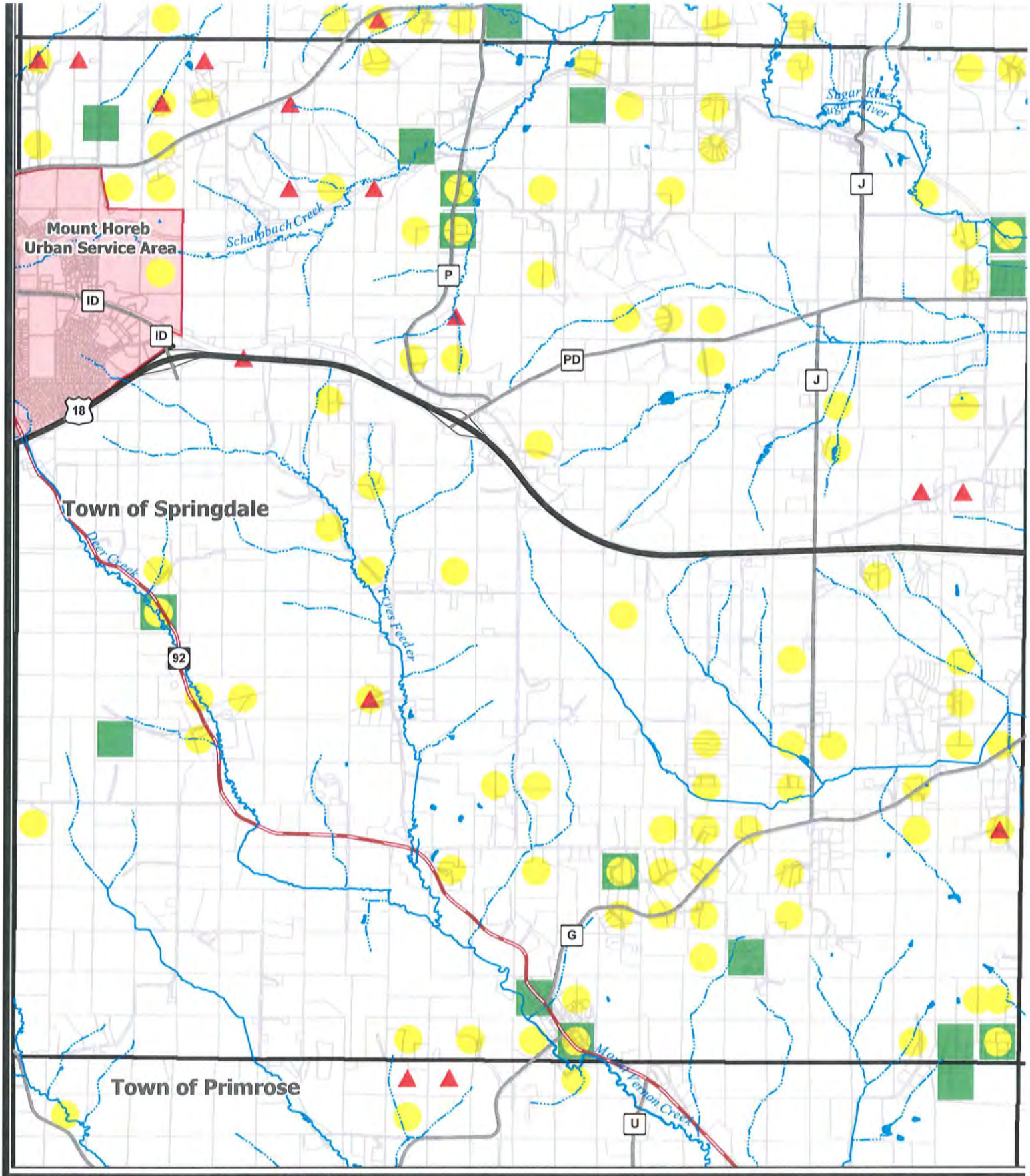

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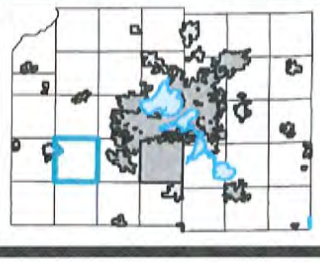

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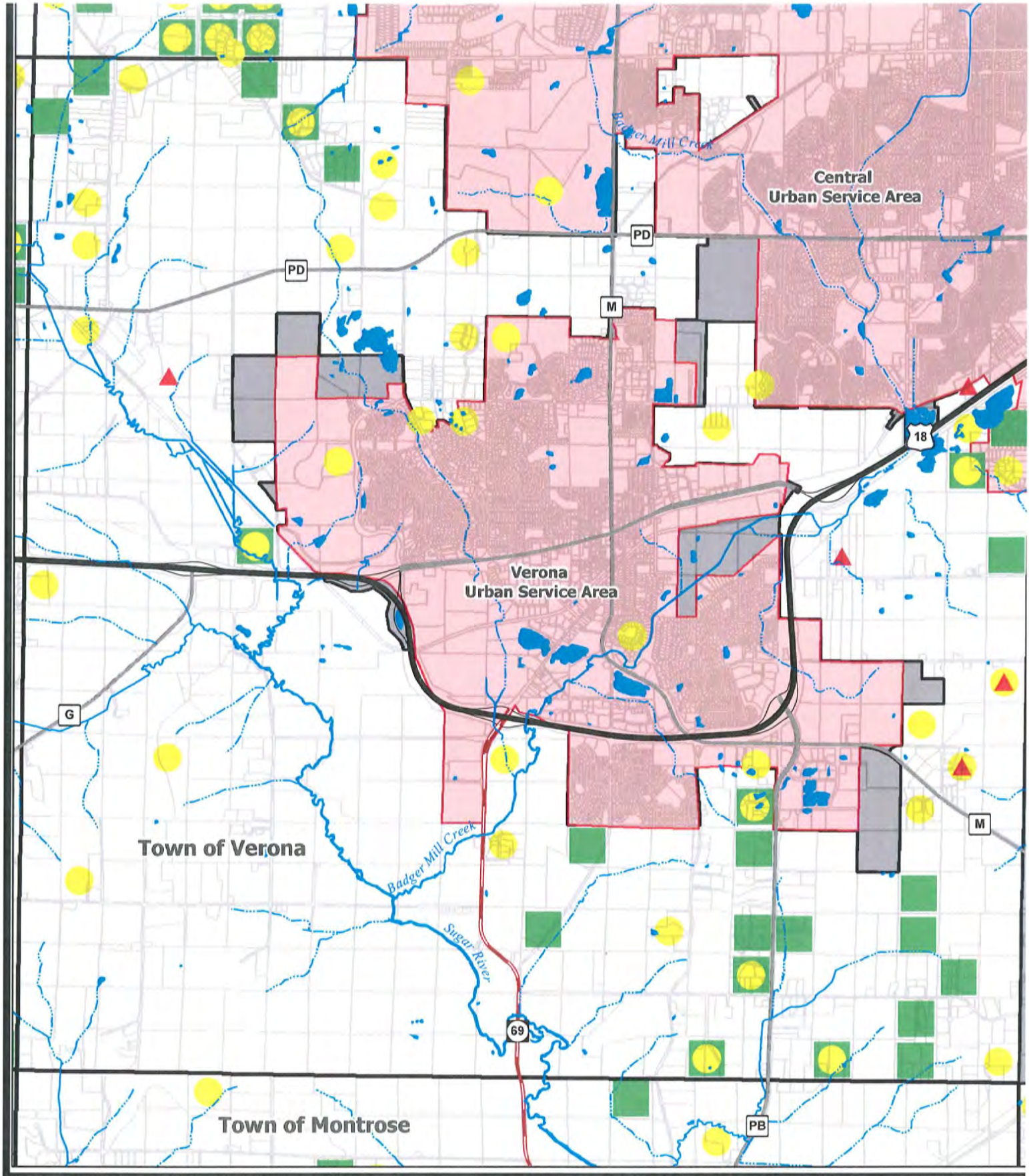

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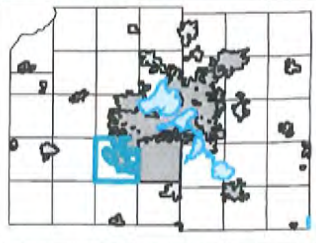

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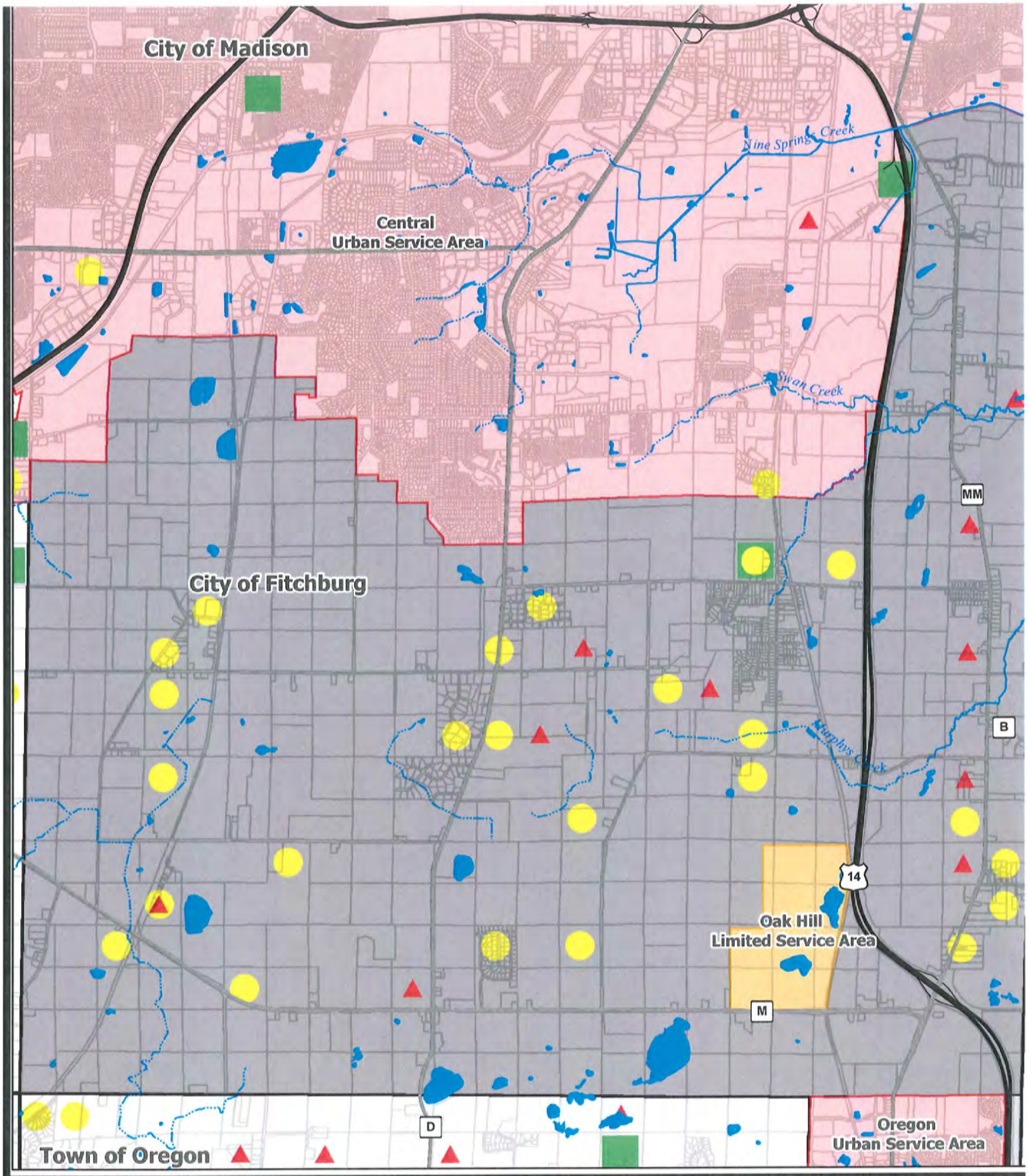

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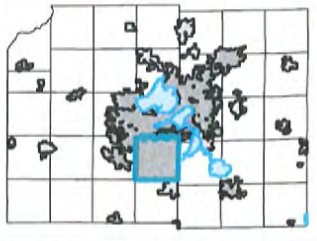

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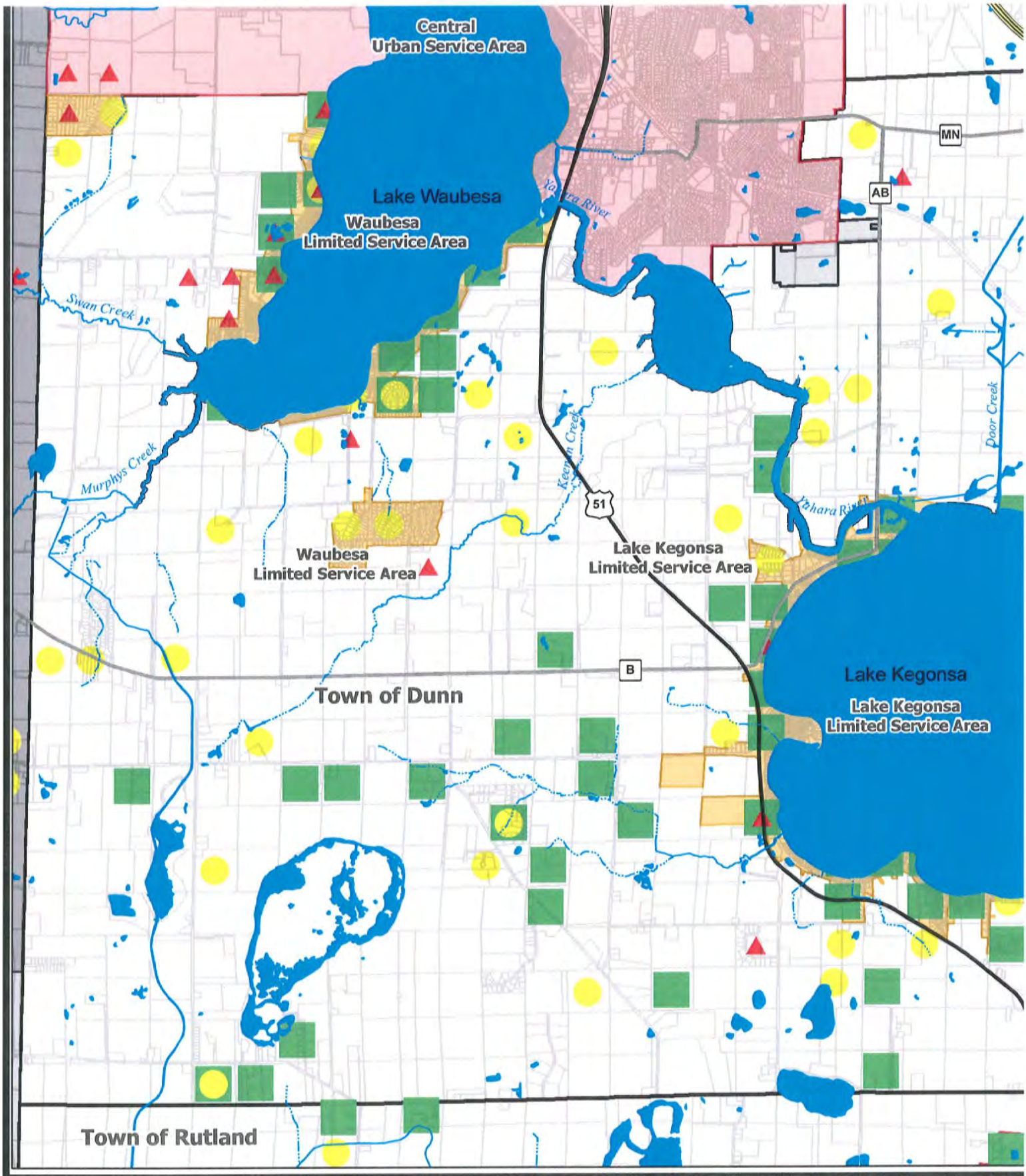

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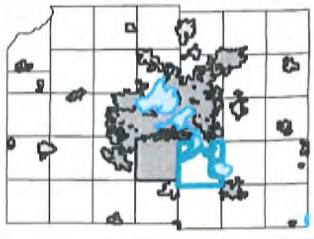

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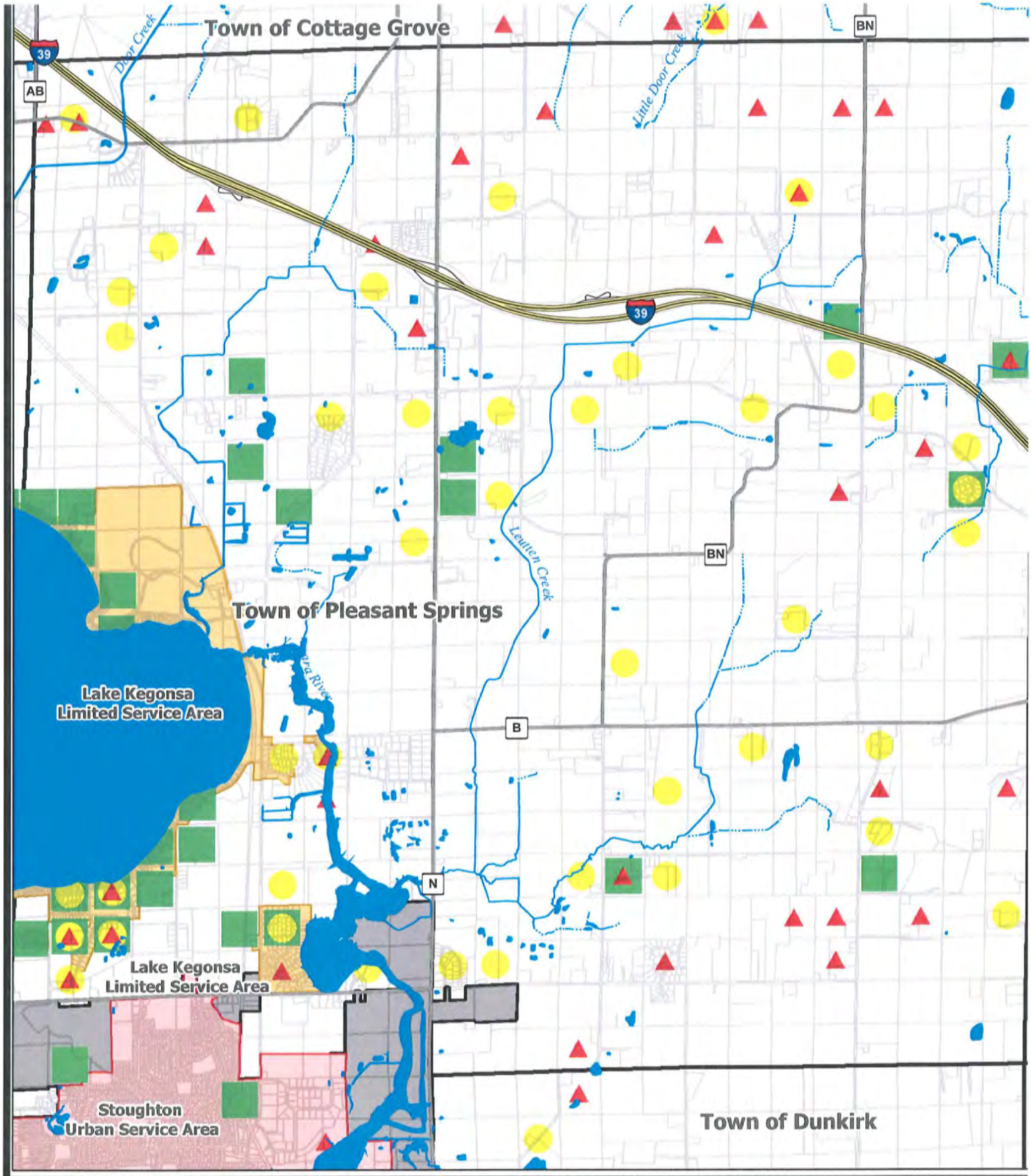

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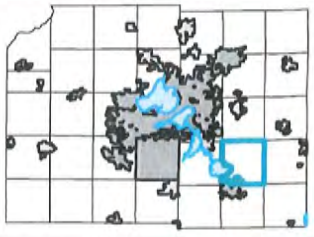

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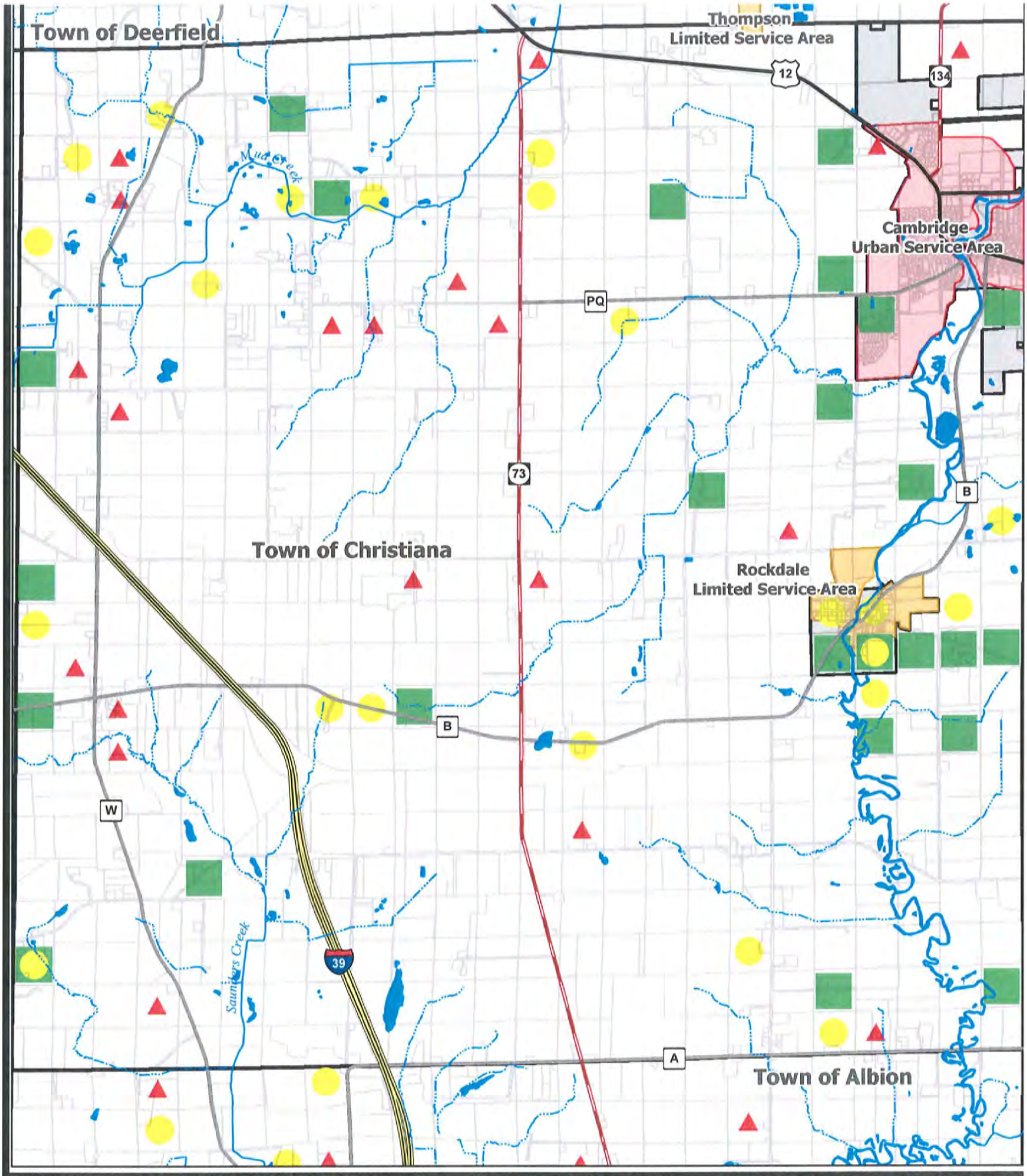

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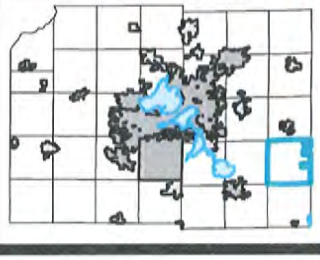

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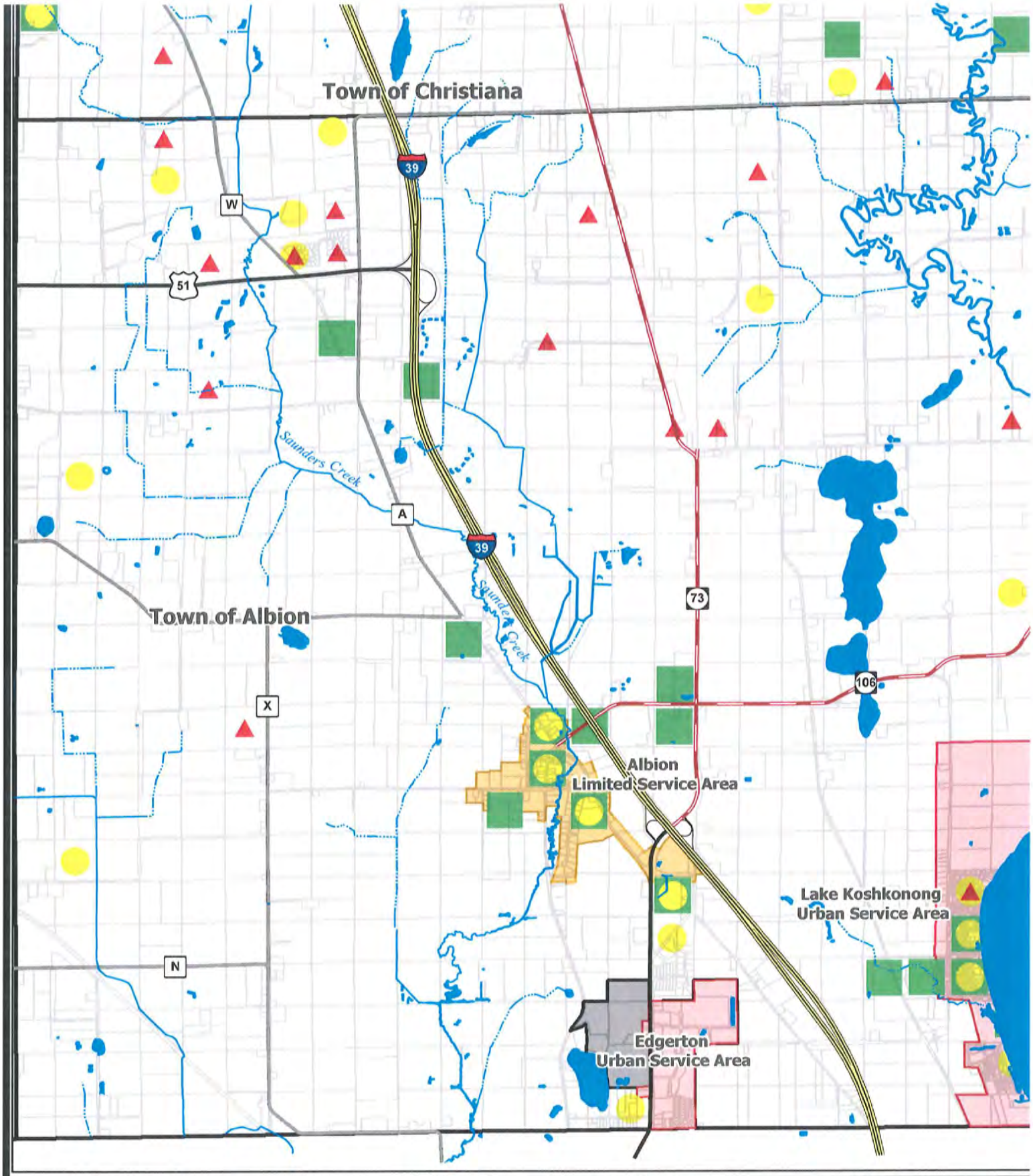

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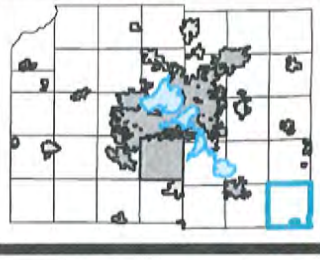

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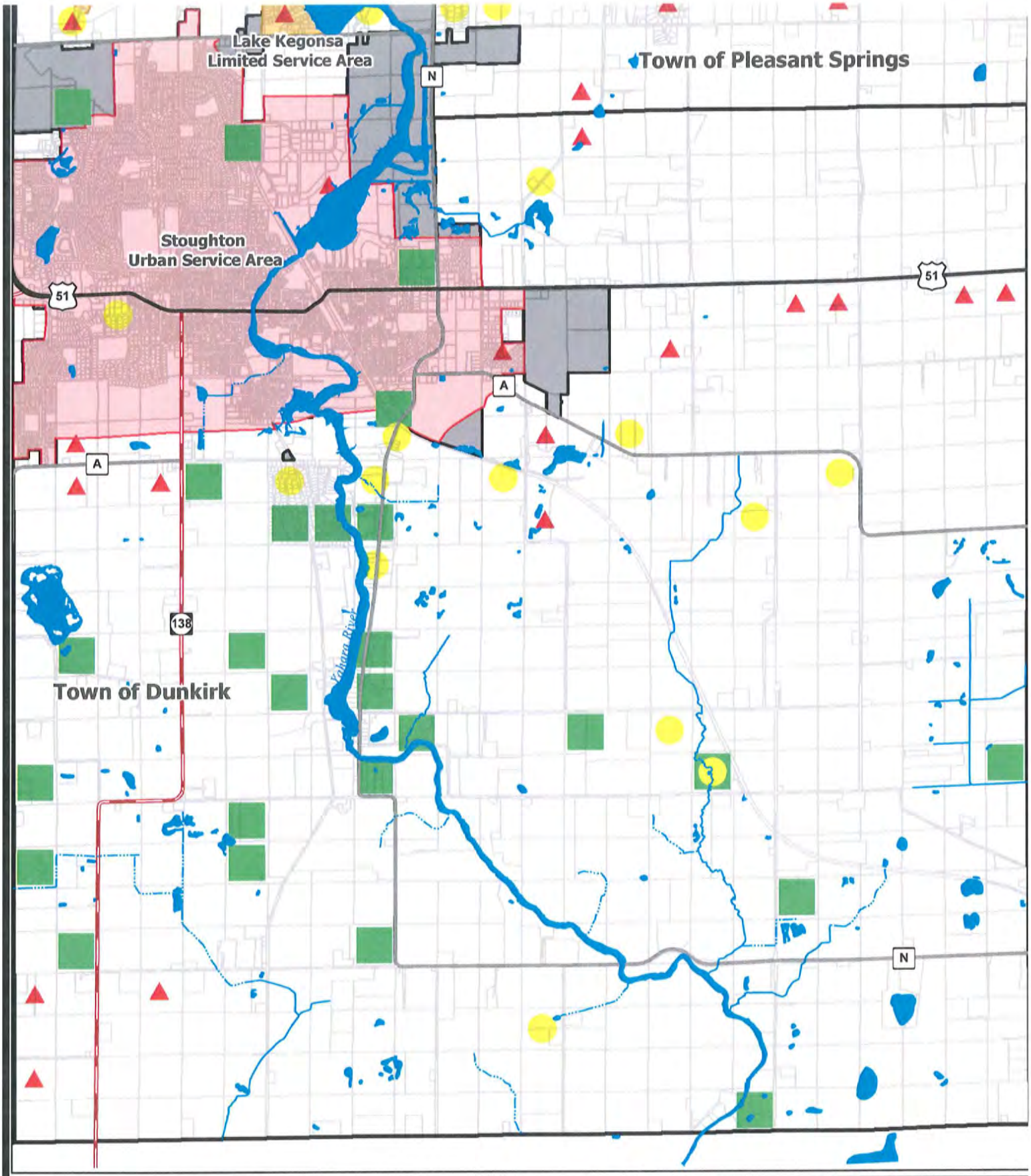

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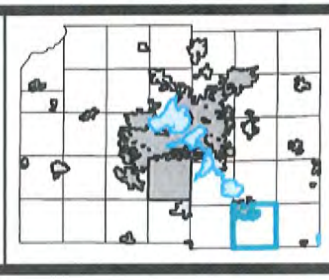

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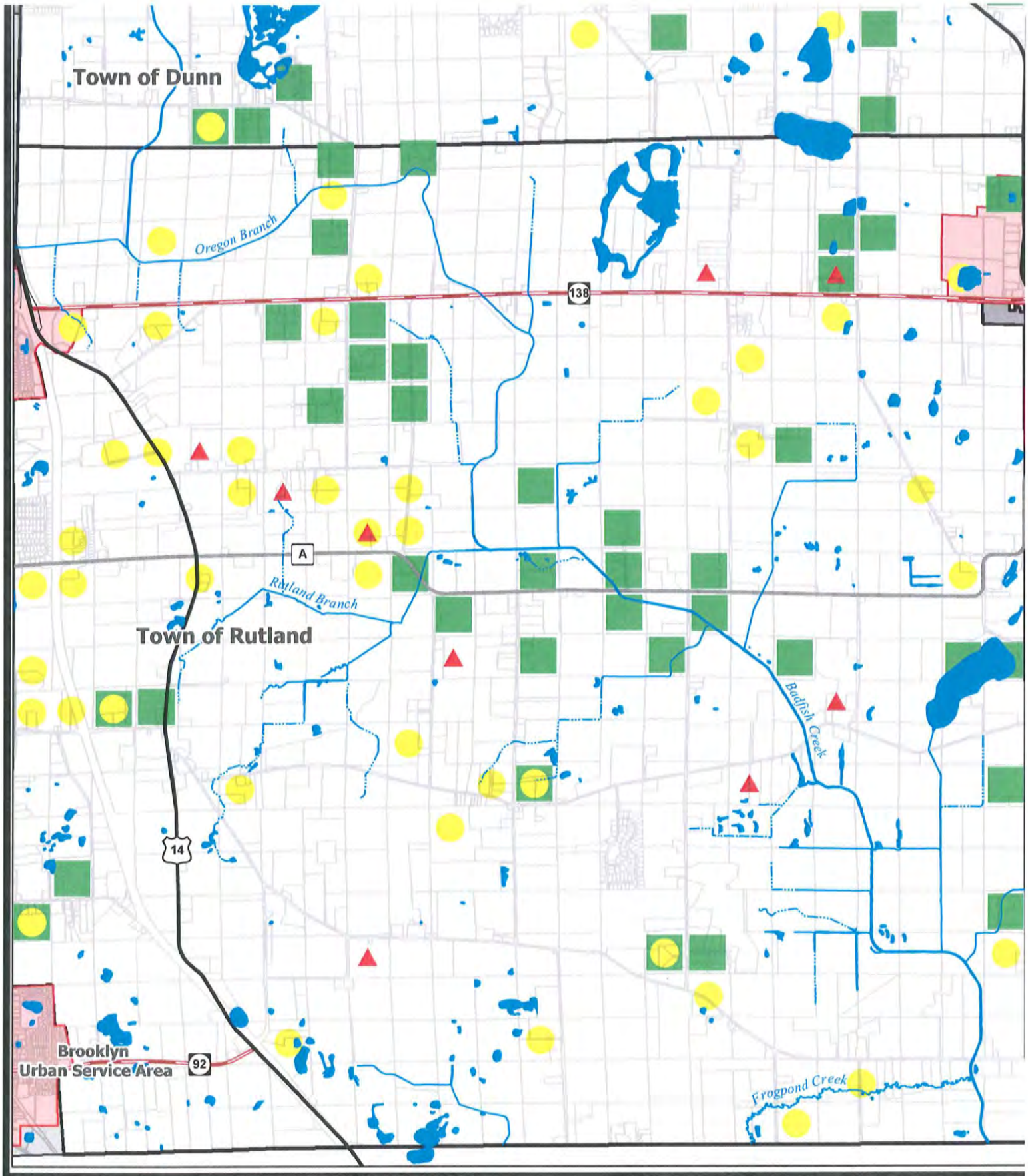

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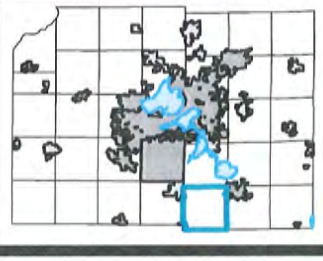

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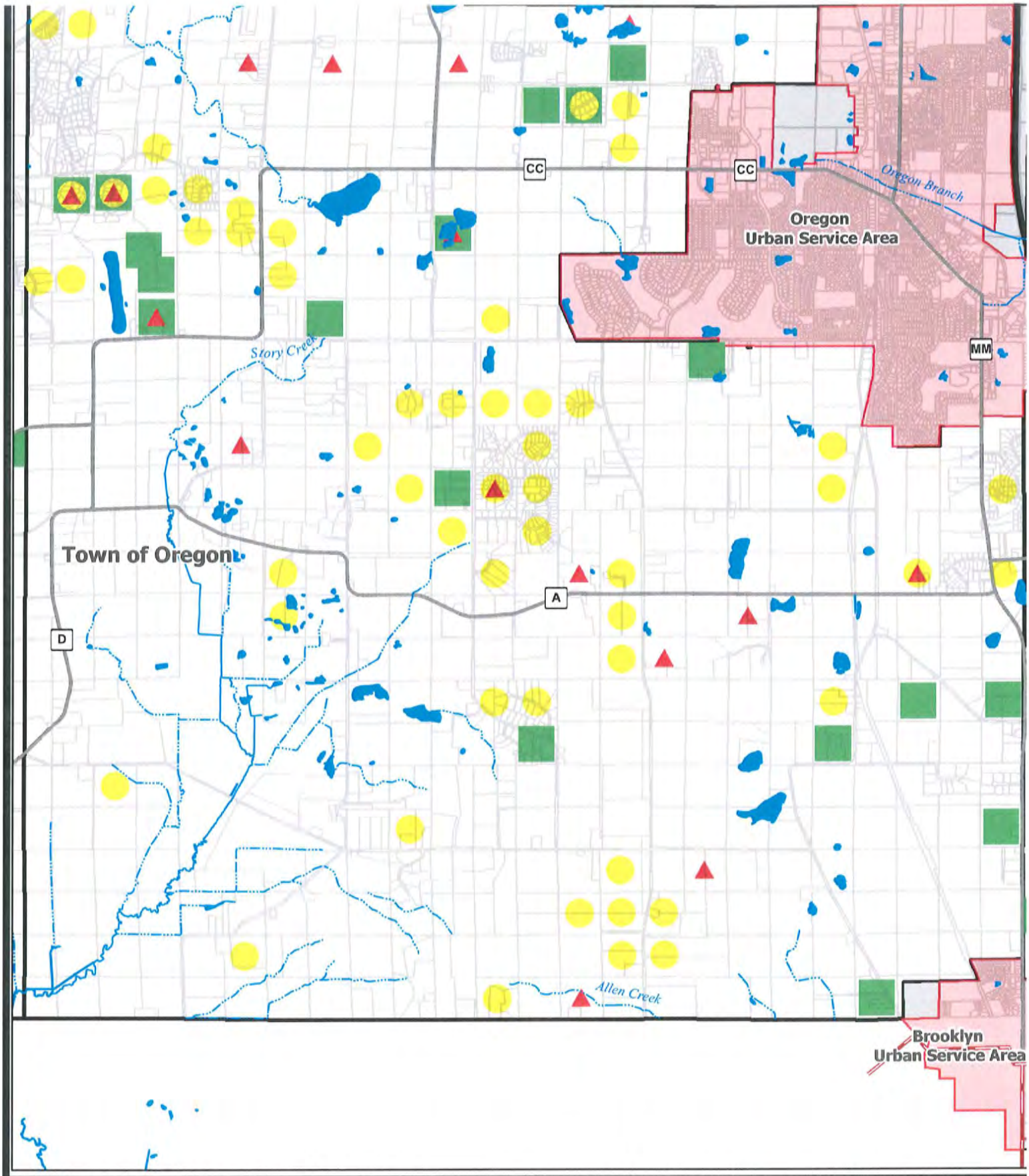

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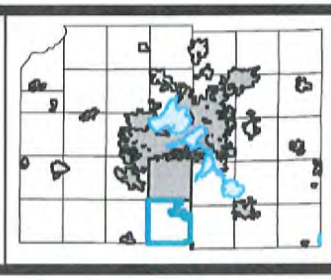

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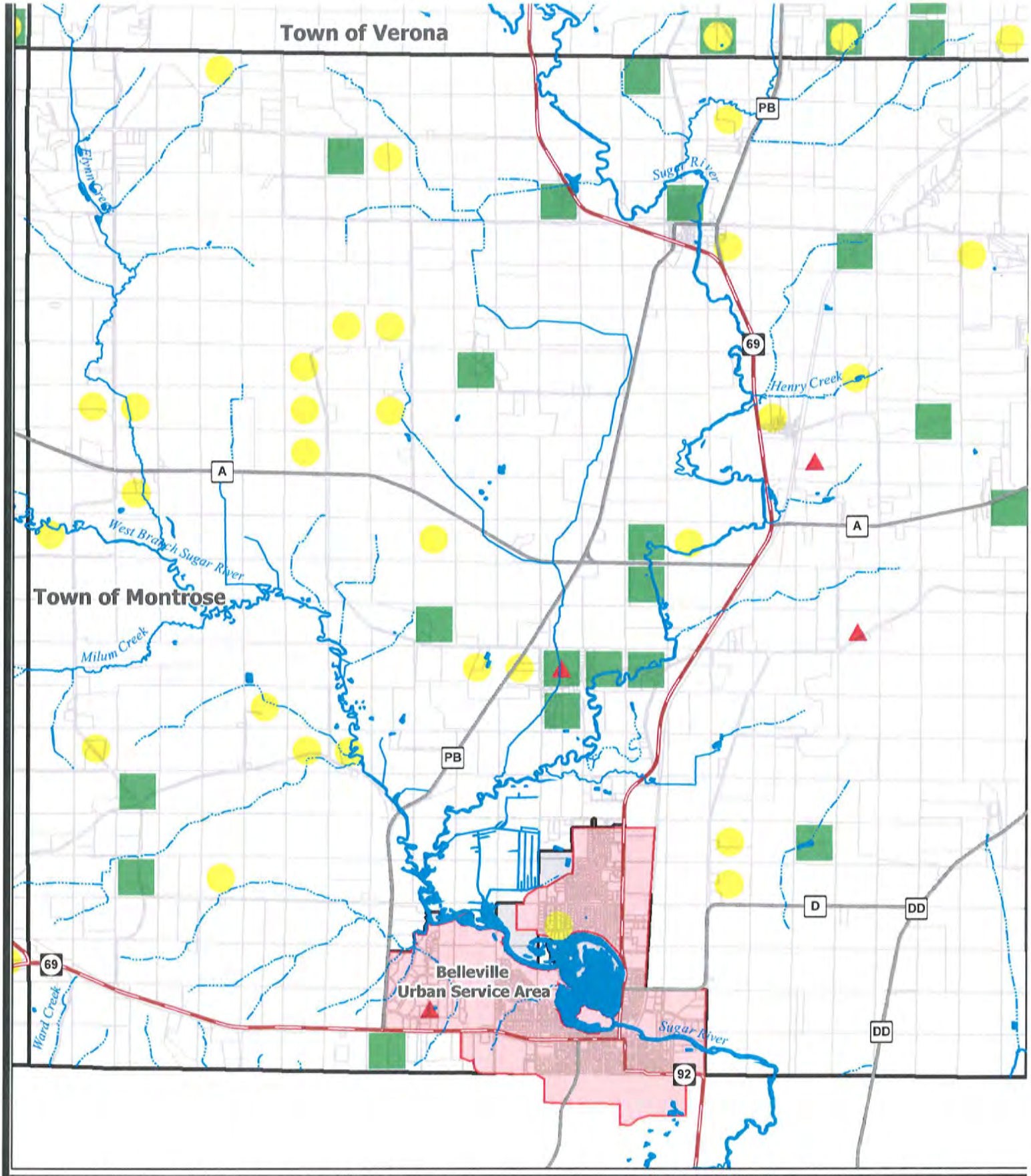

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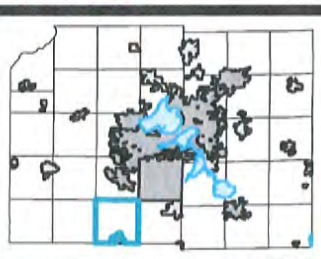

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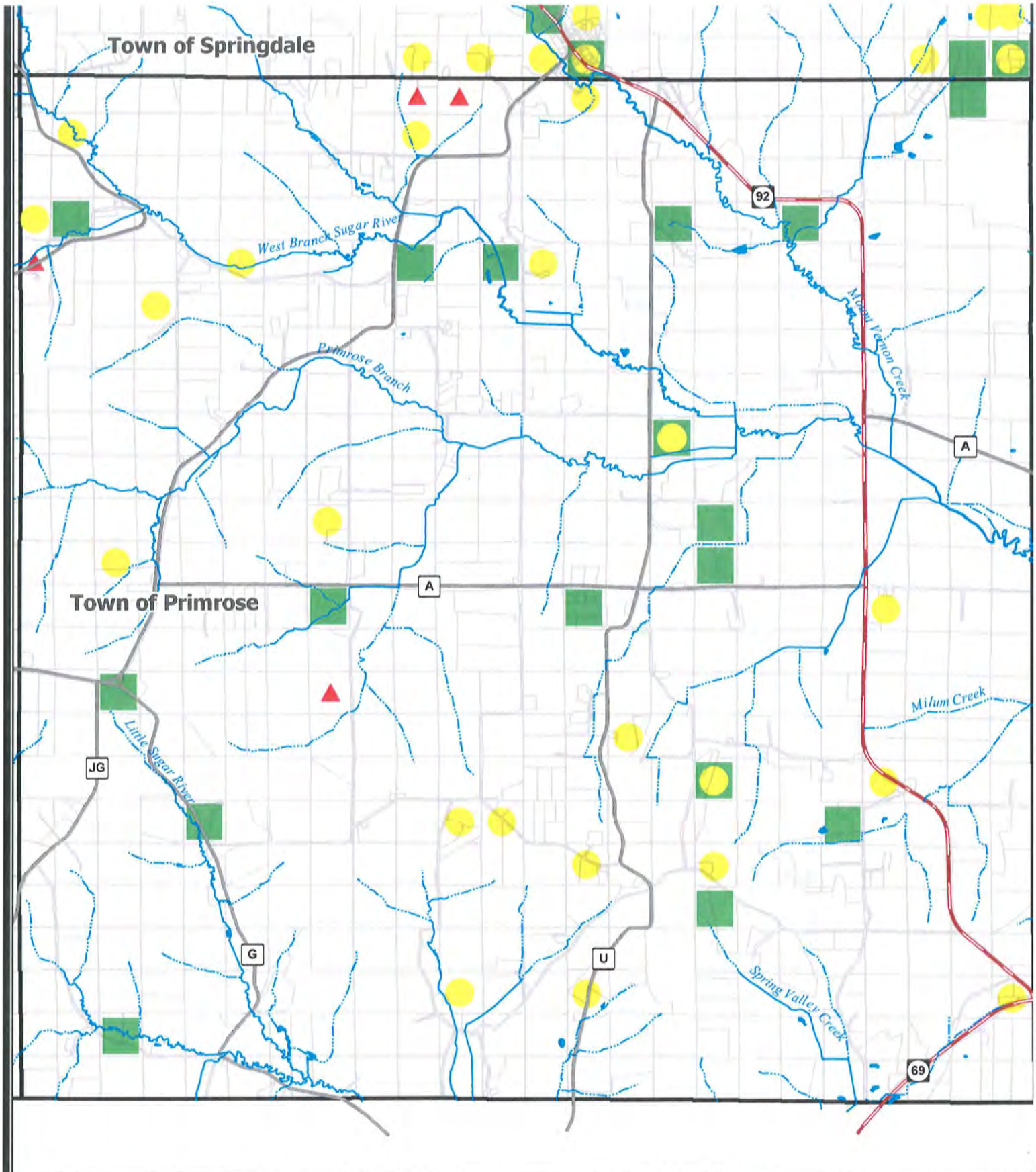

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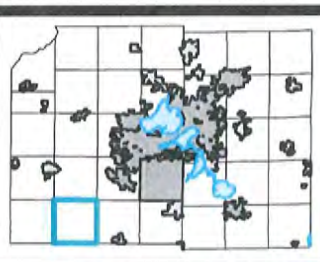

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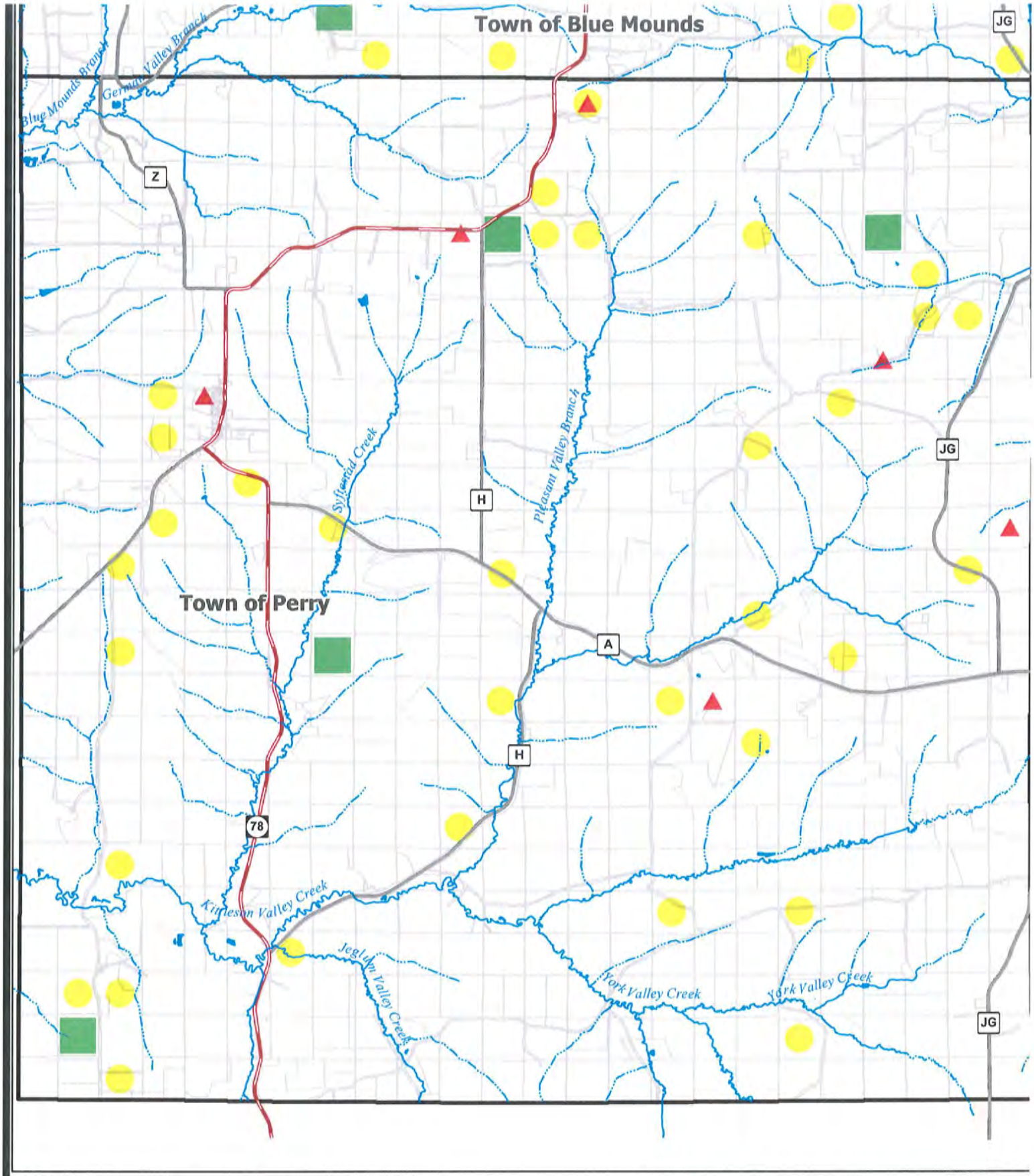

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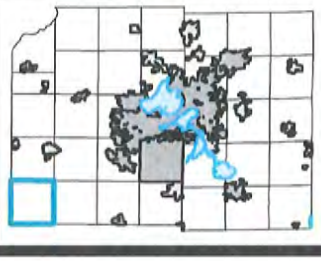

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ATTACHMENT B

MAPS - PRIVATE ON-SITE WASTEWATER TREATMENT SYSTEMS

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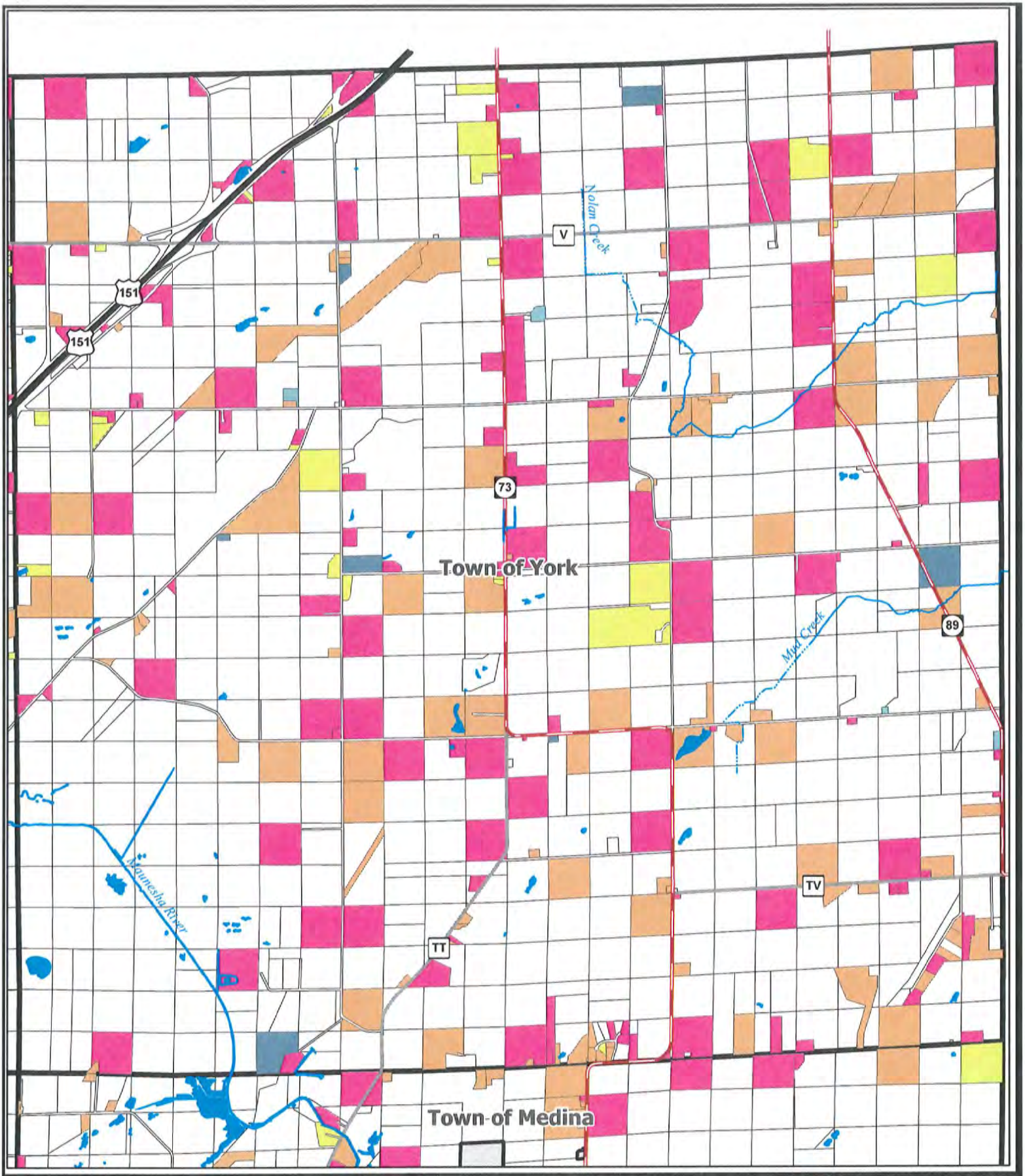

Parcels with On-Site Wastewater Systems

- Corrective Action Required
- Conventional Gravity-Fed System
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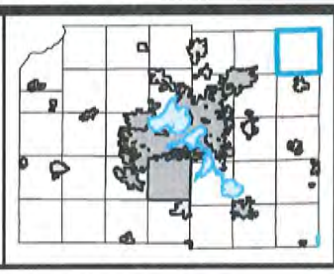
- Mound System
- At Grade
- In Ground Pressure
- Advanced Treatment Unit
- Holding Tank



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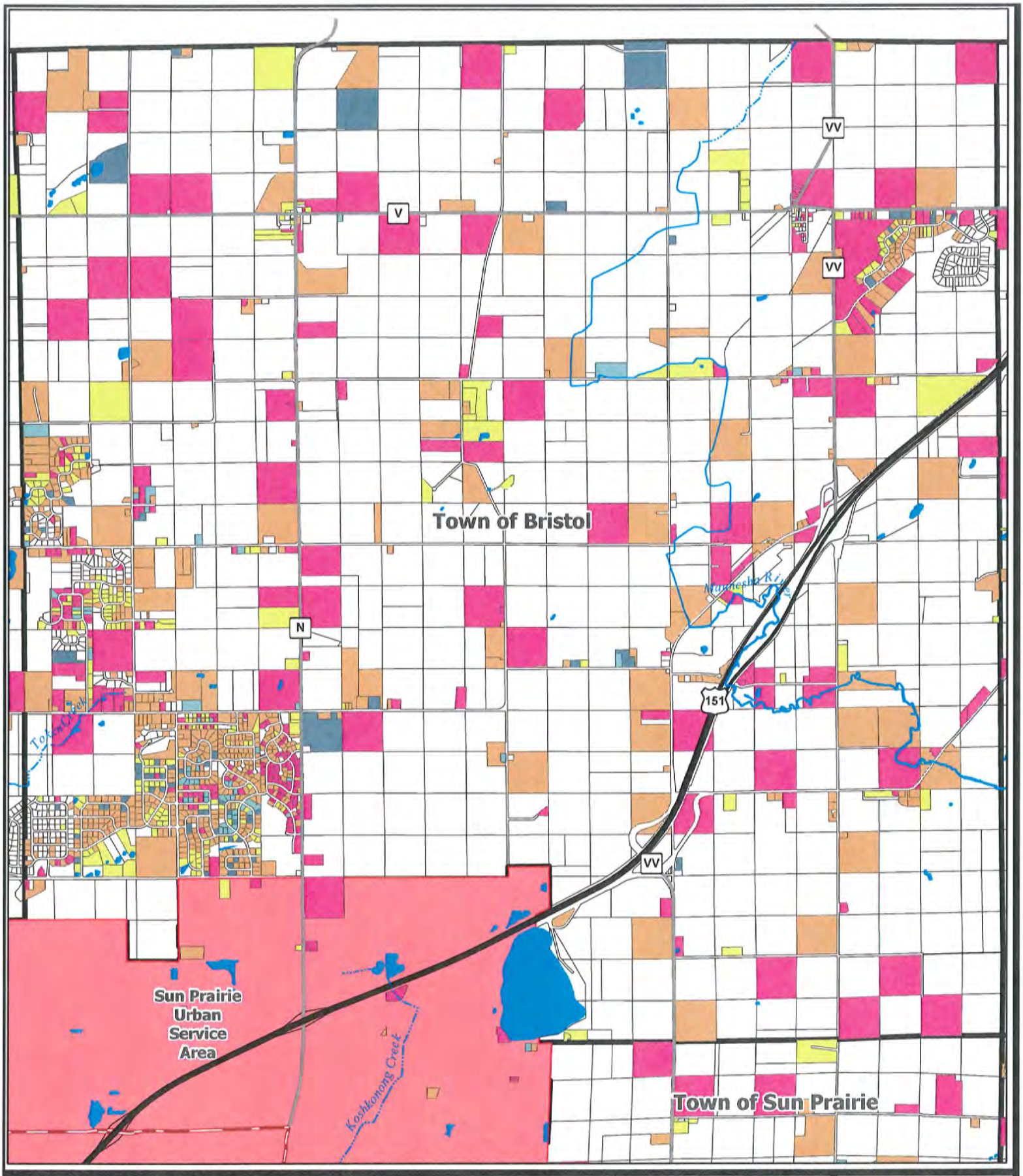

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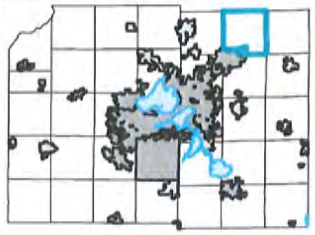

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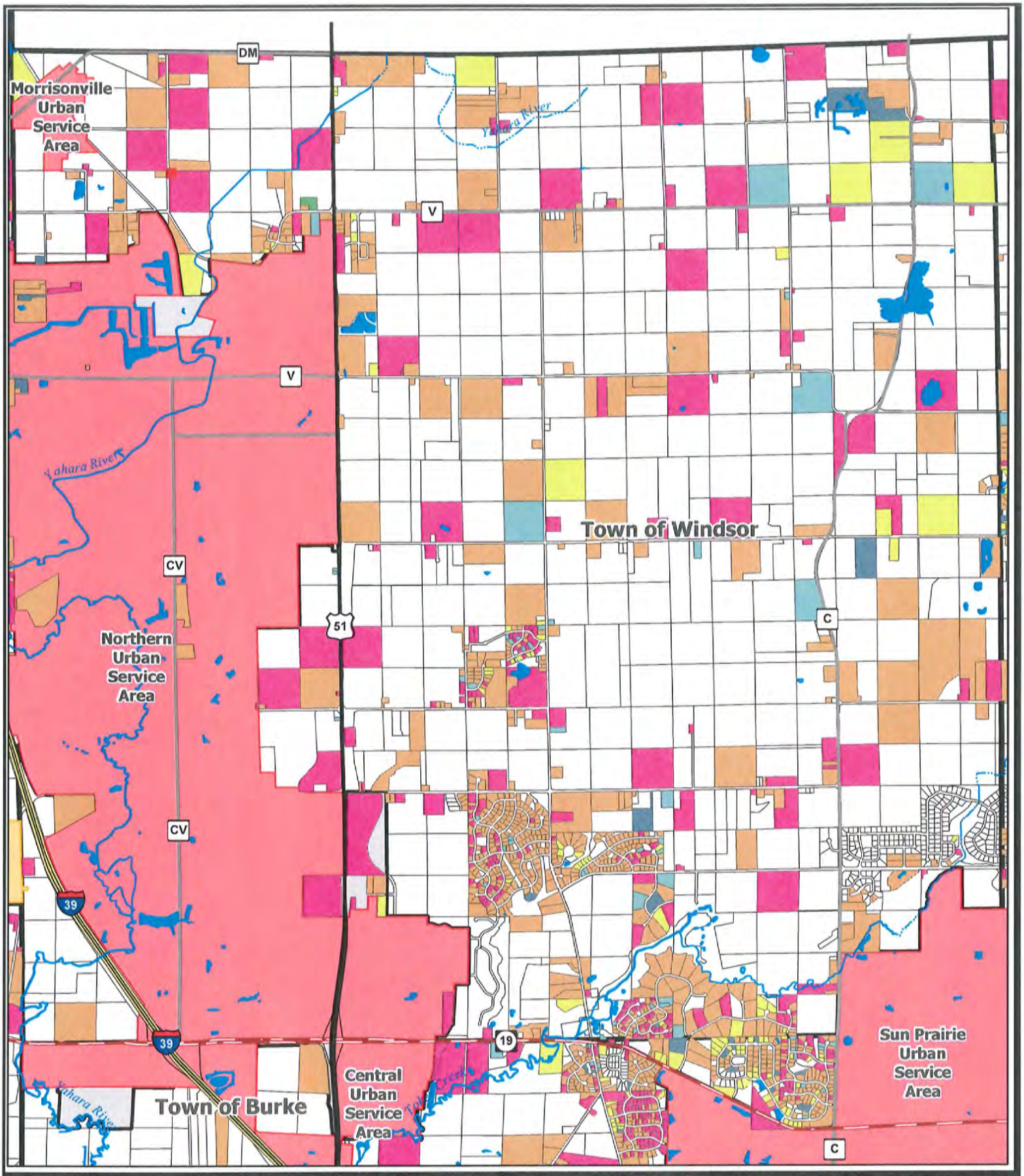

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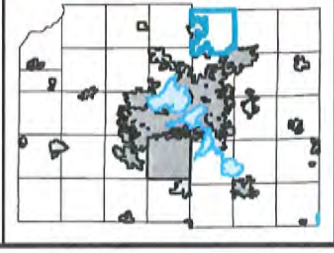

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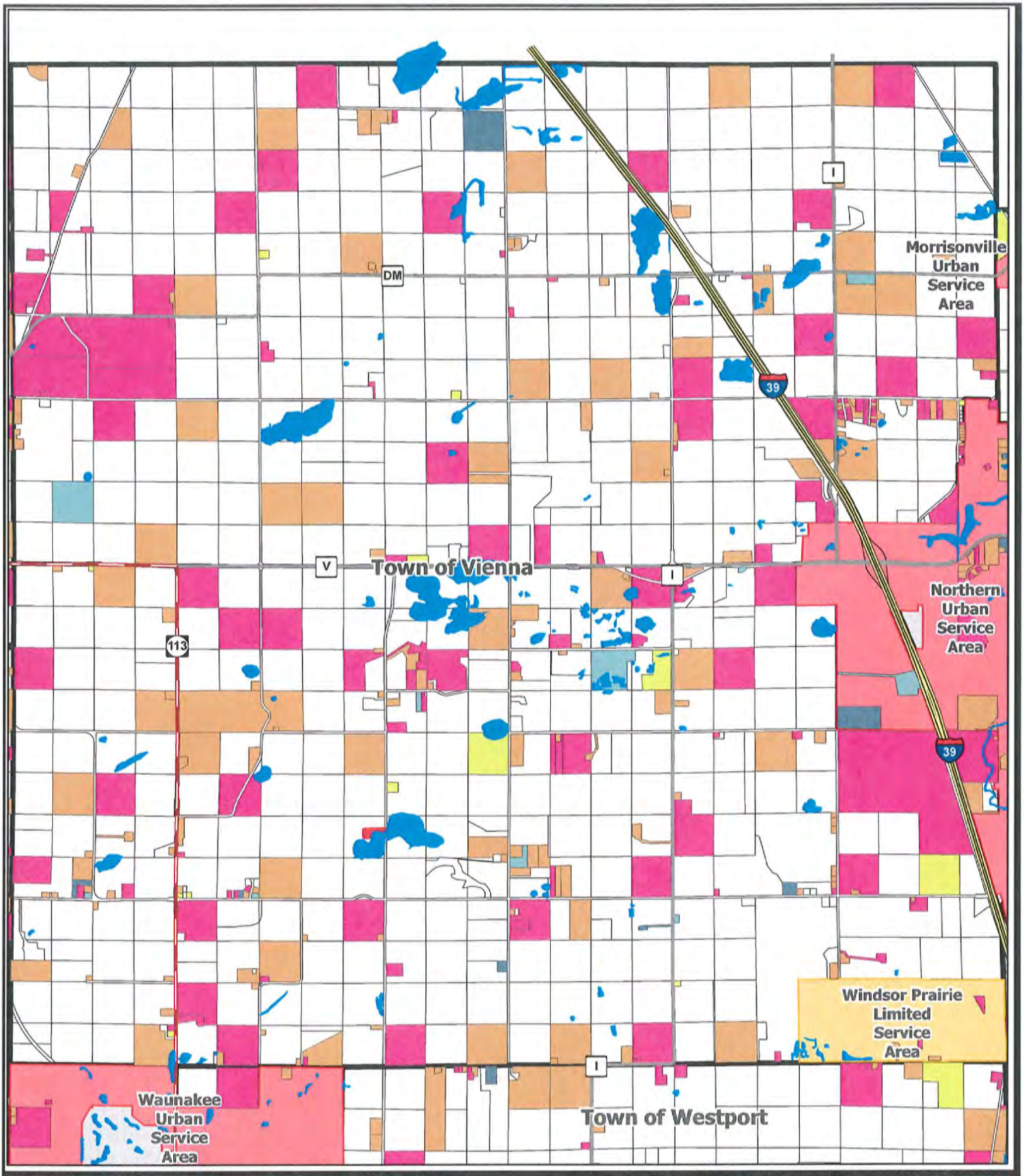

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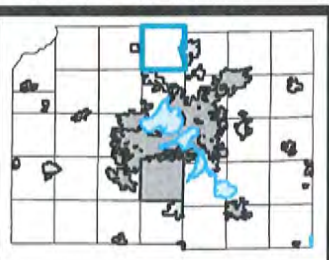

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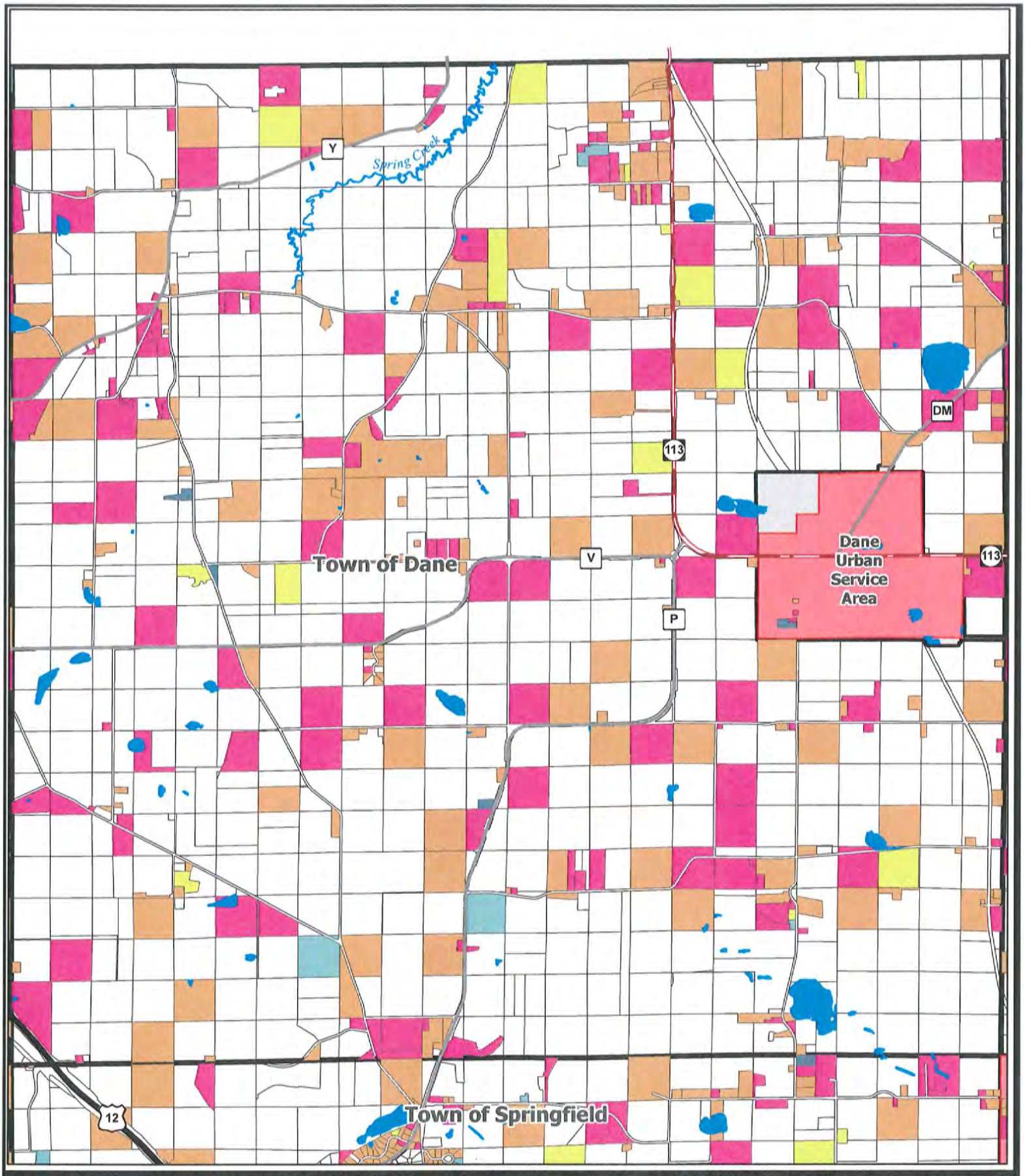

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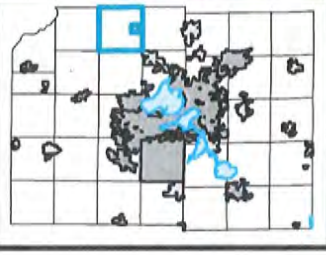

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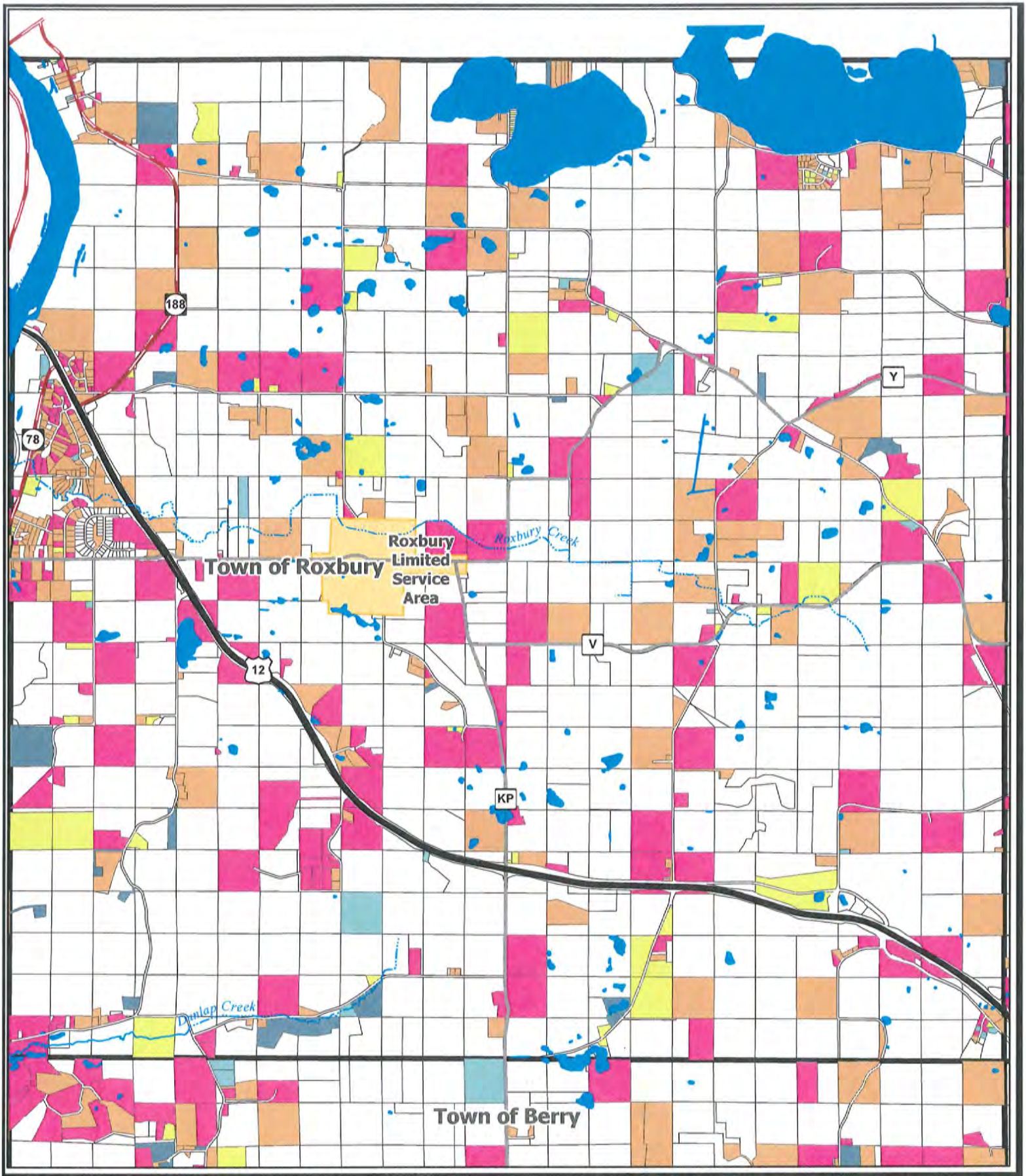

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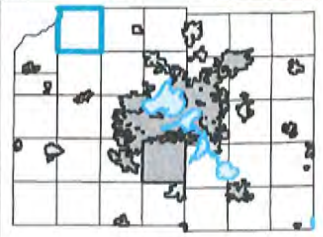

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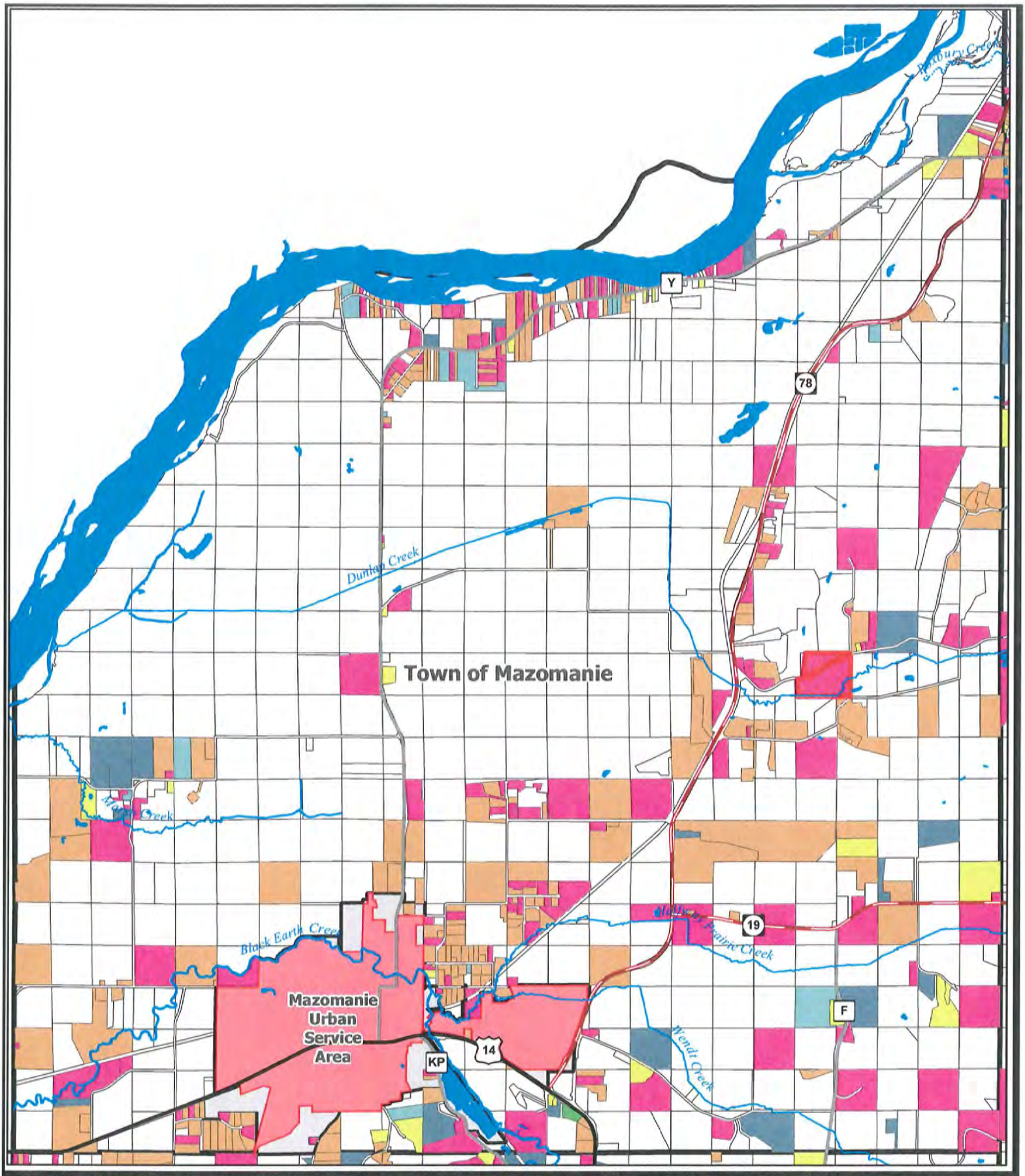

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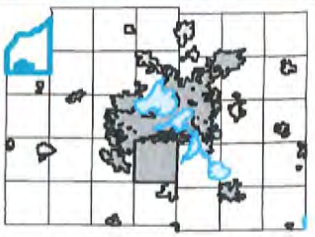

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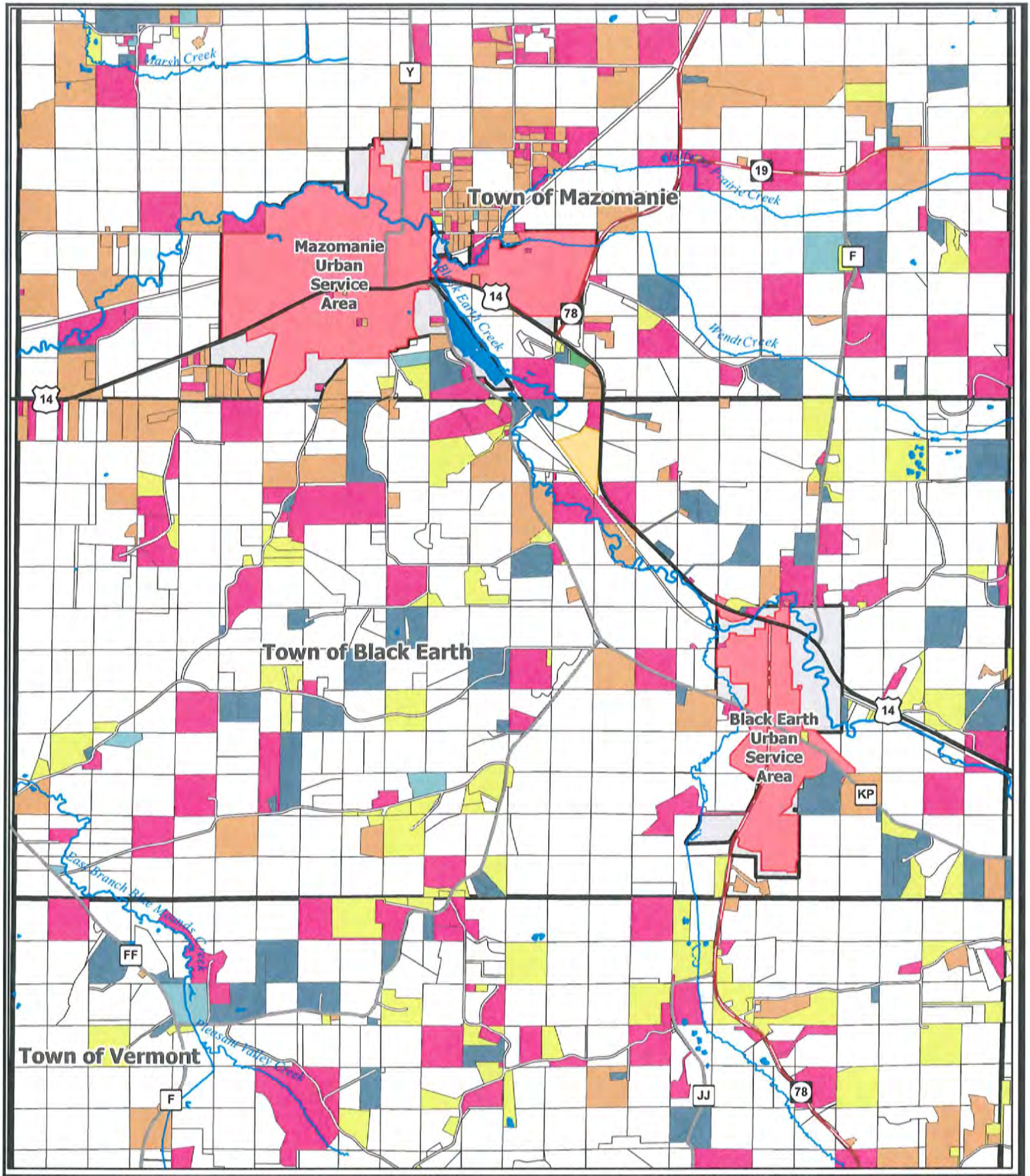

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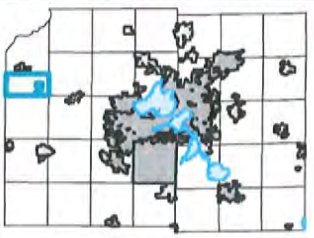

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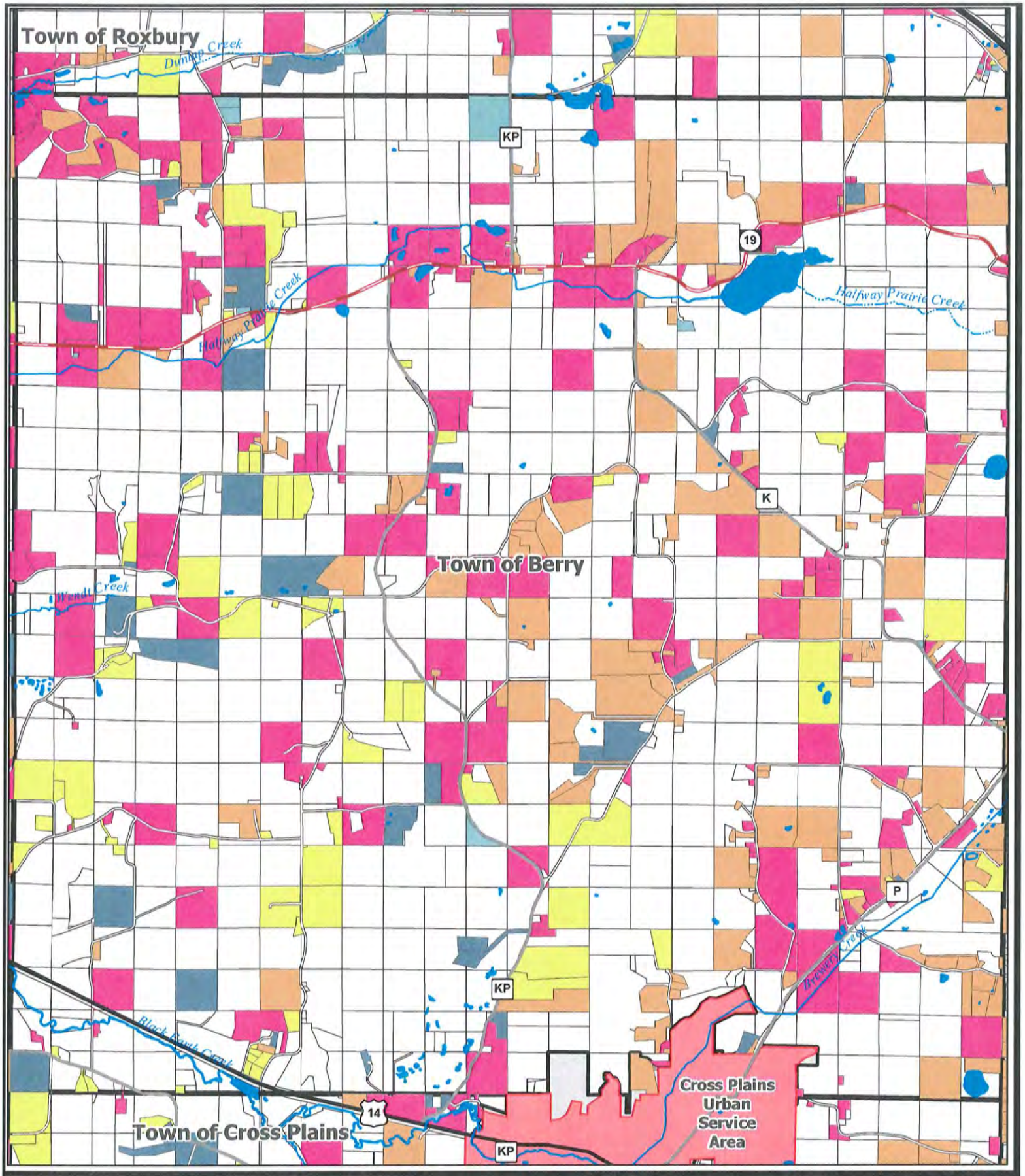

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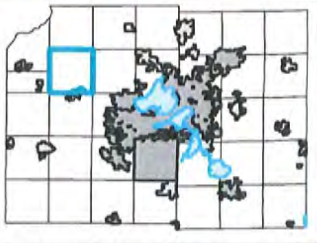

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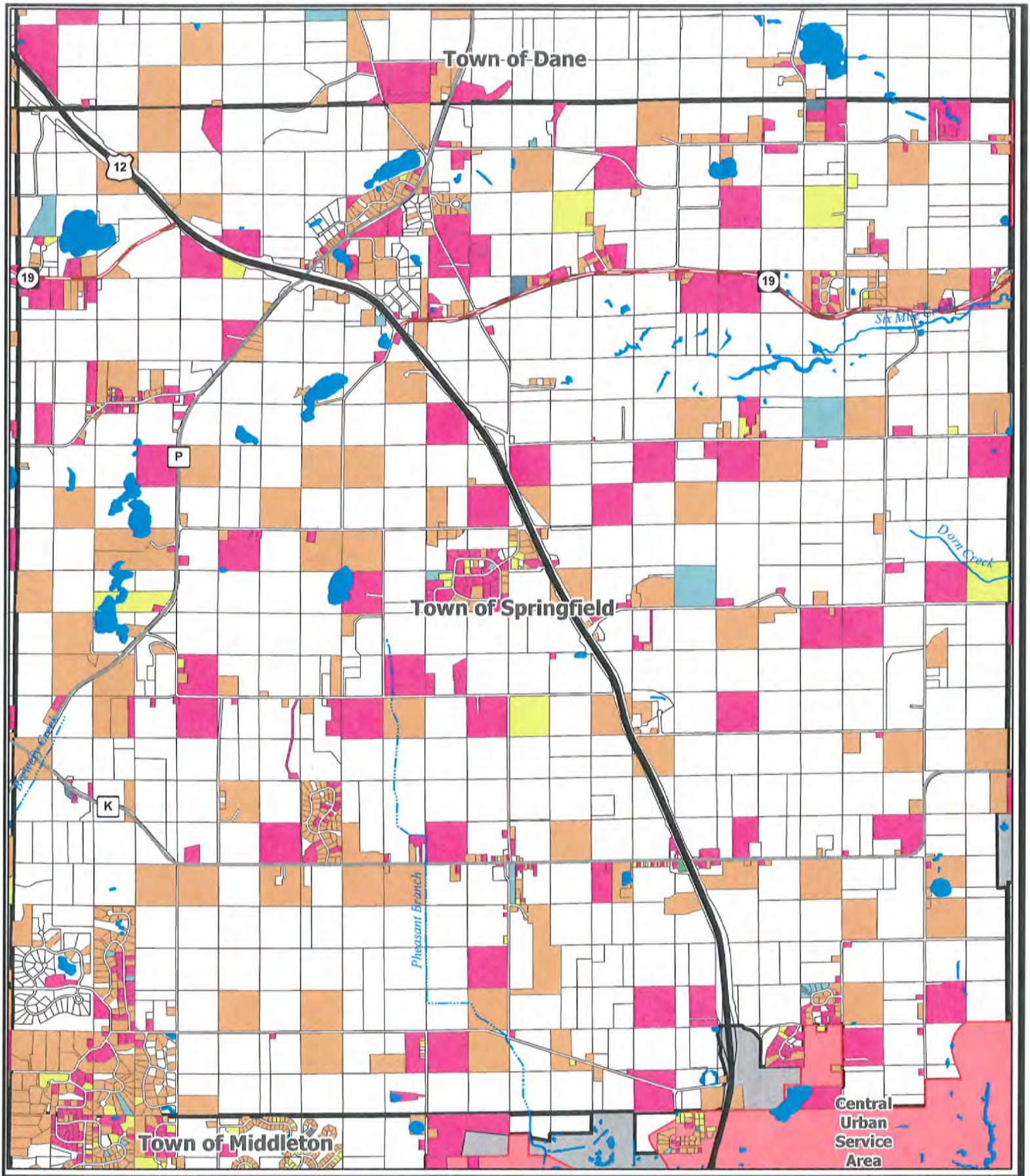

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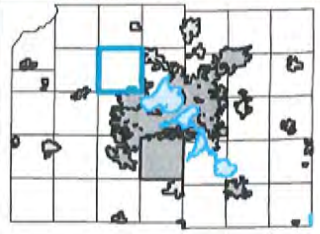

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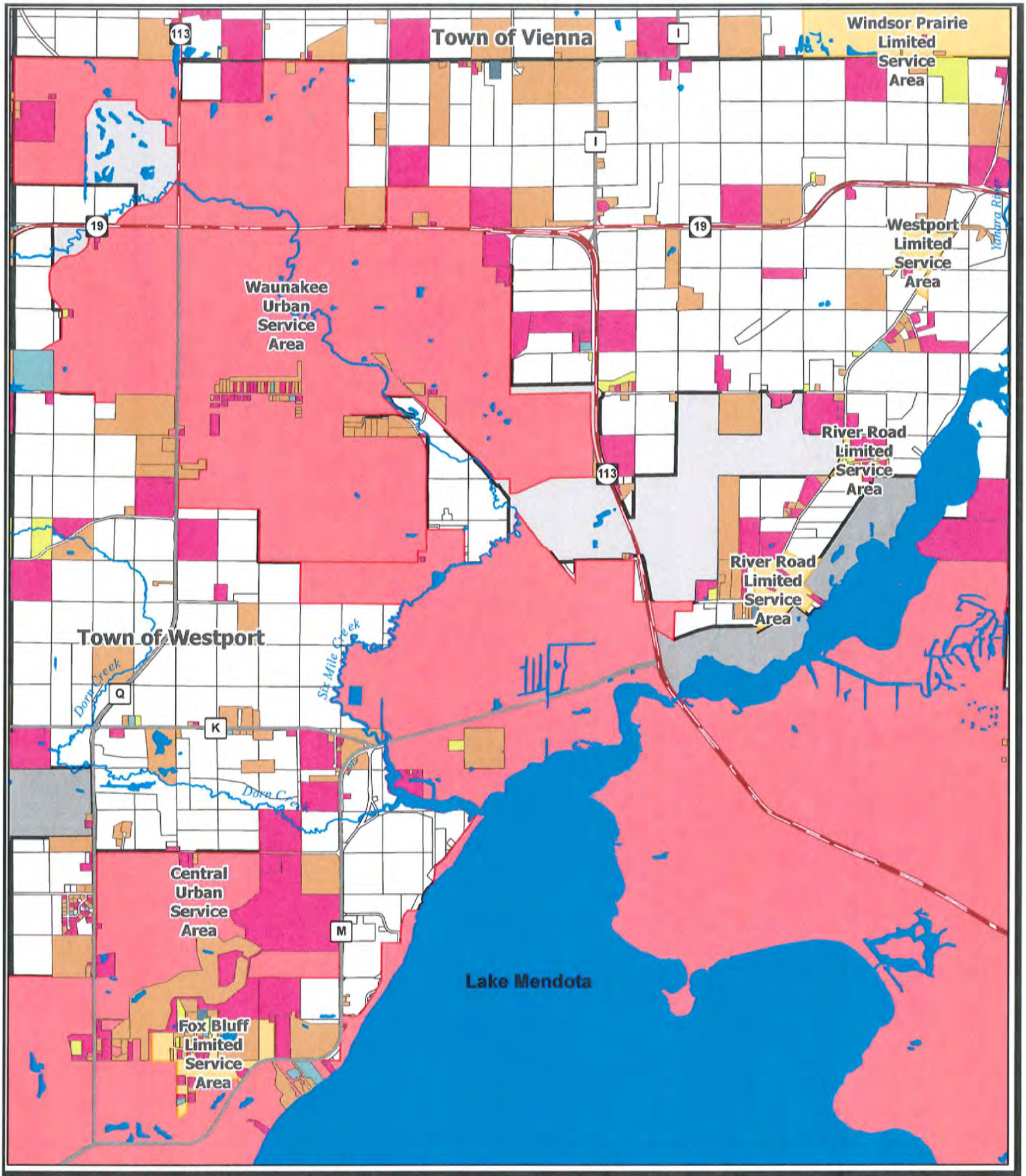

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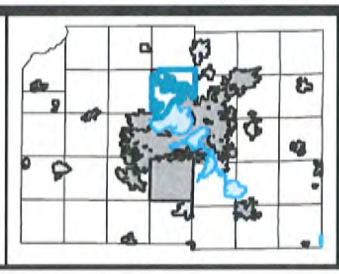

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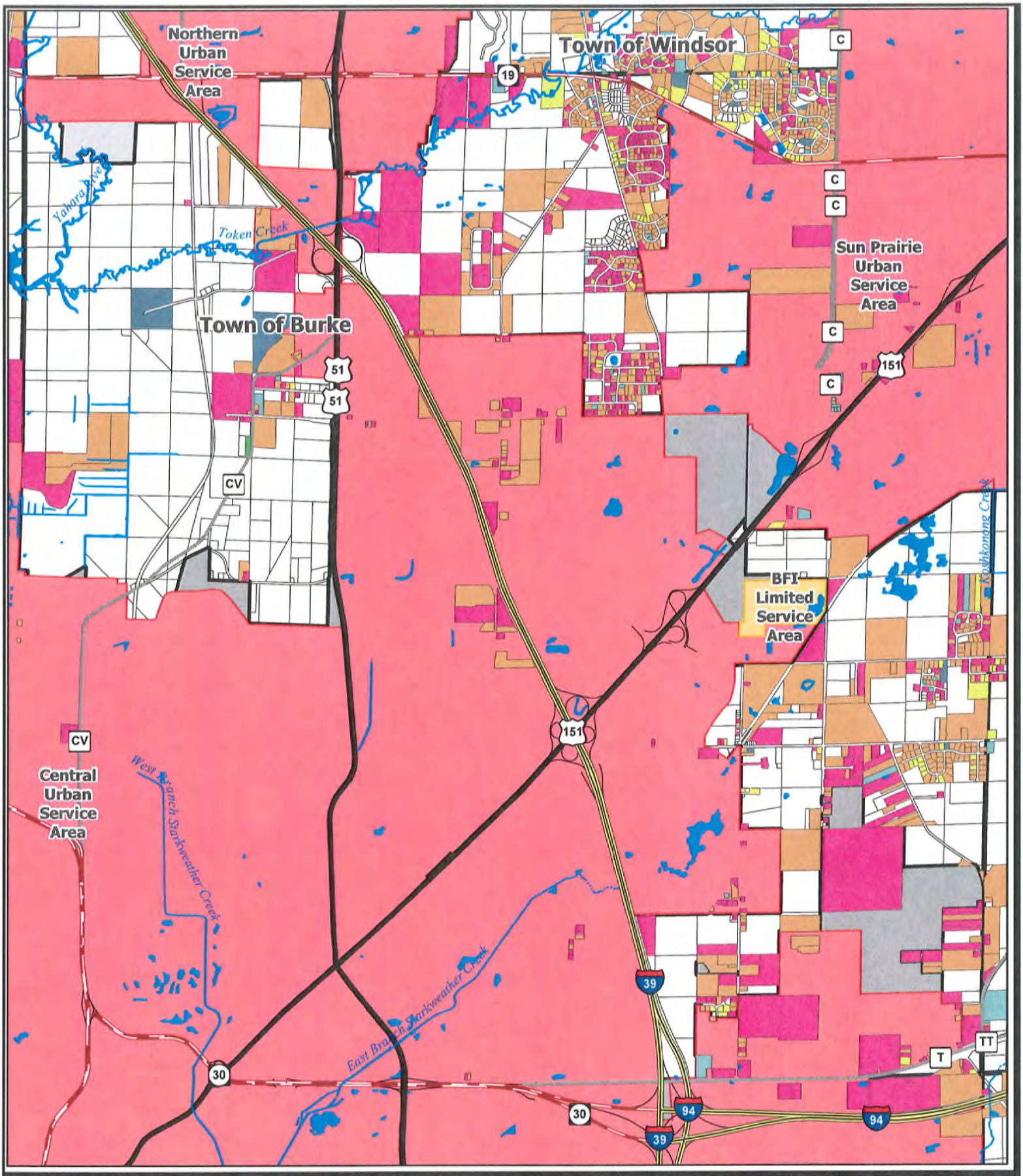

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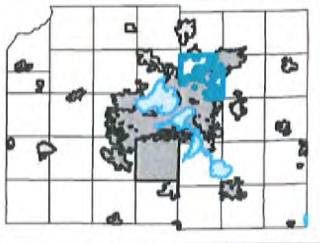

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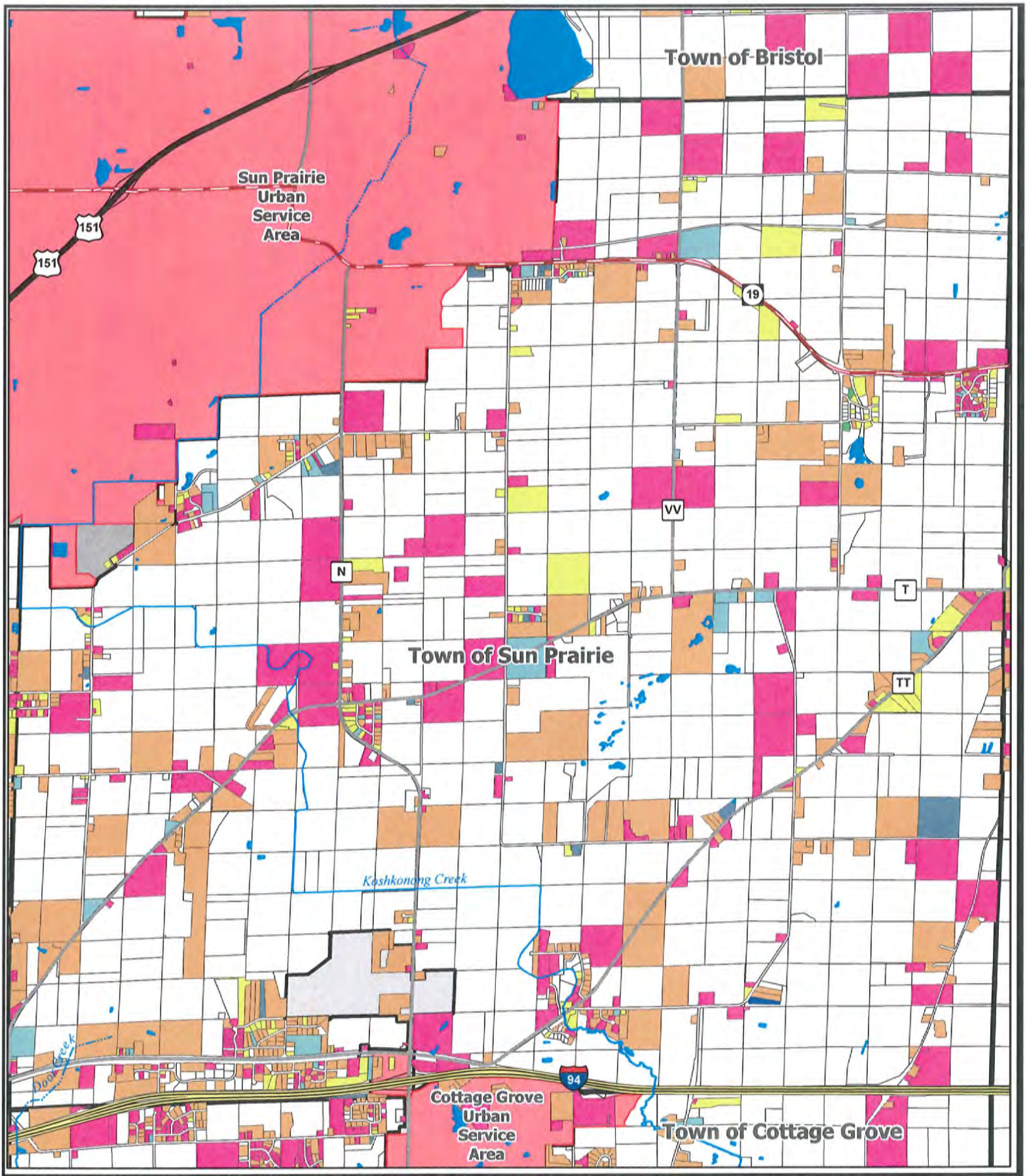

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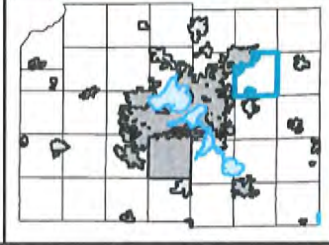

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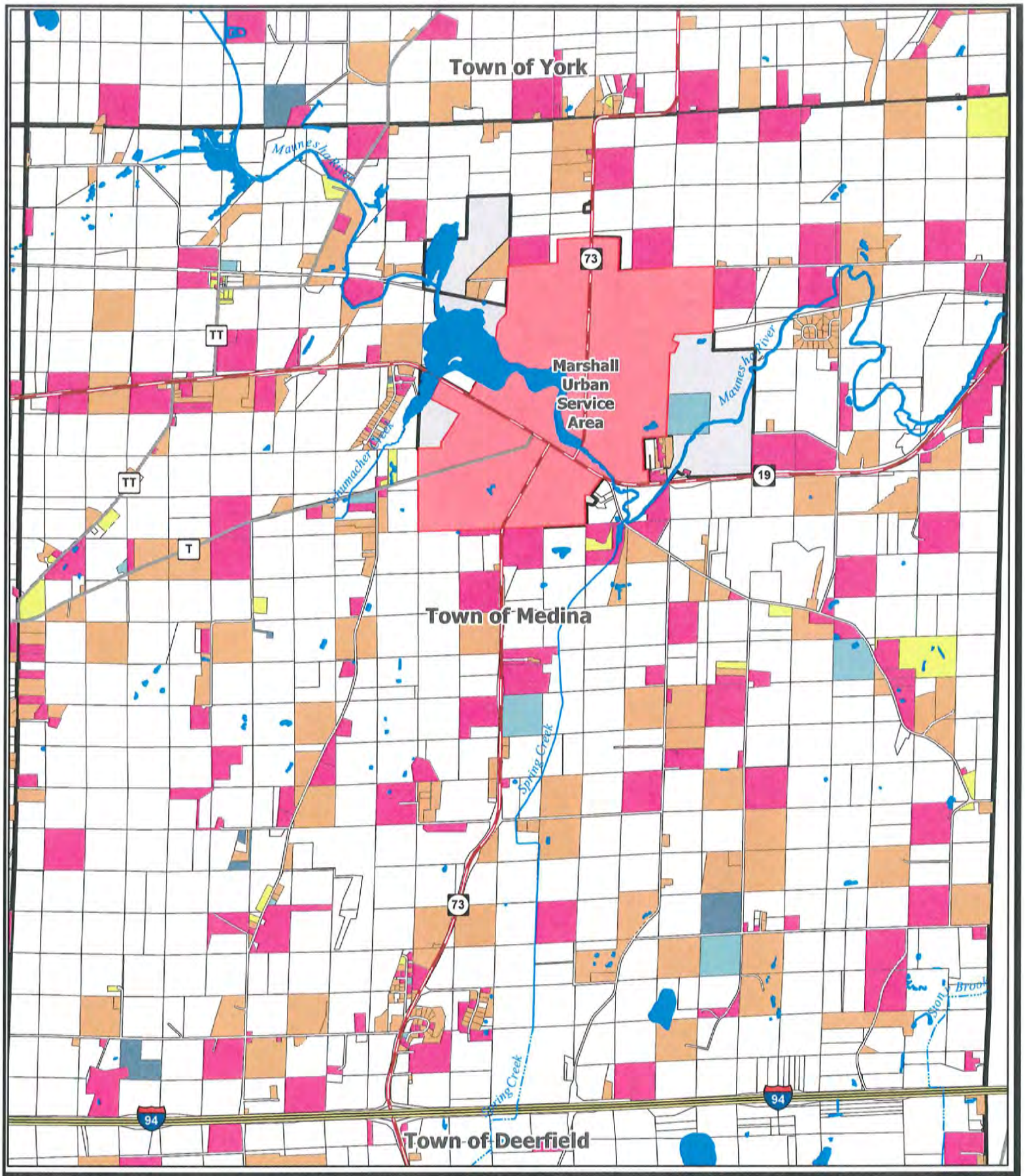

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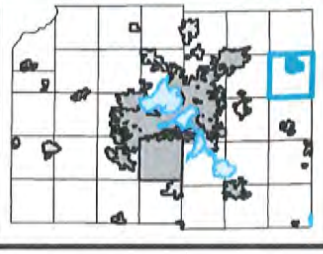

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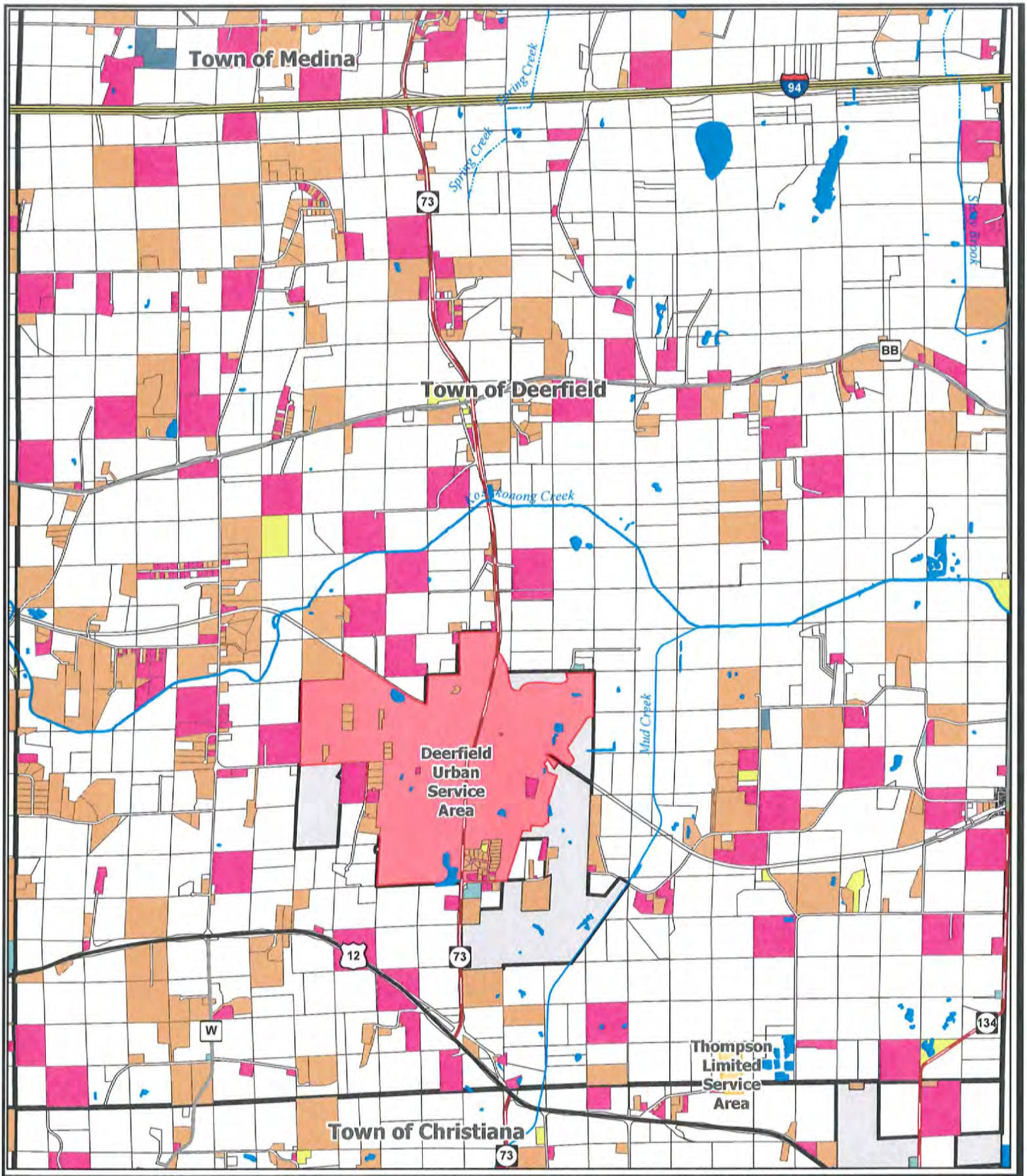

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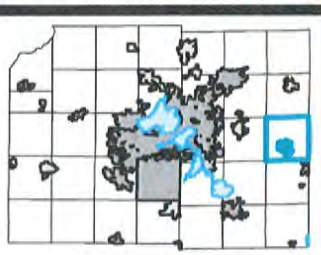

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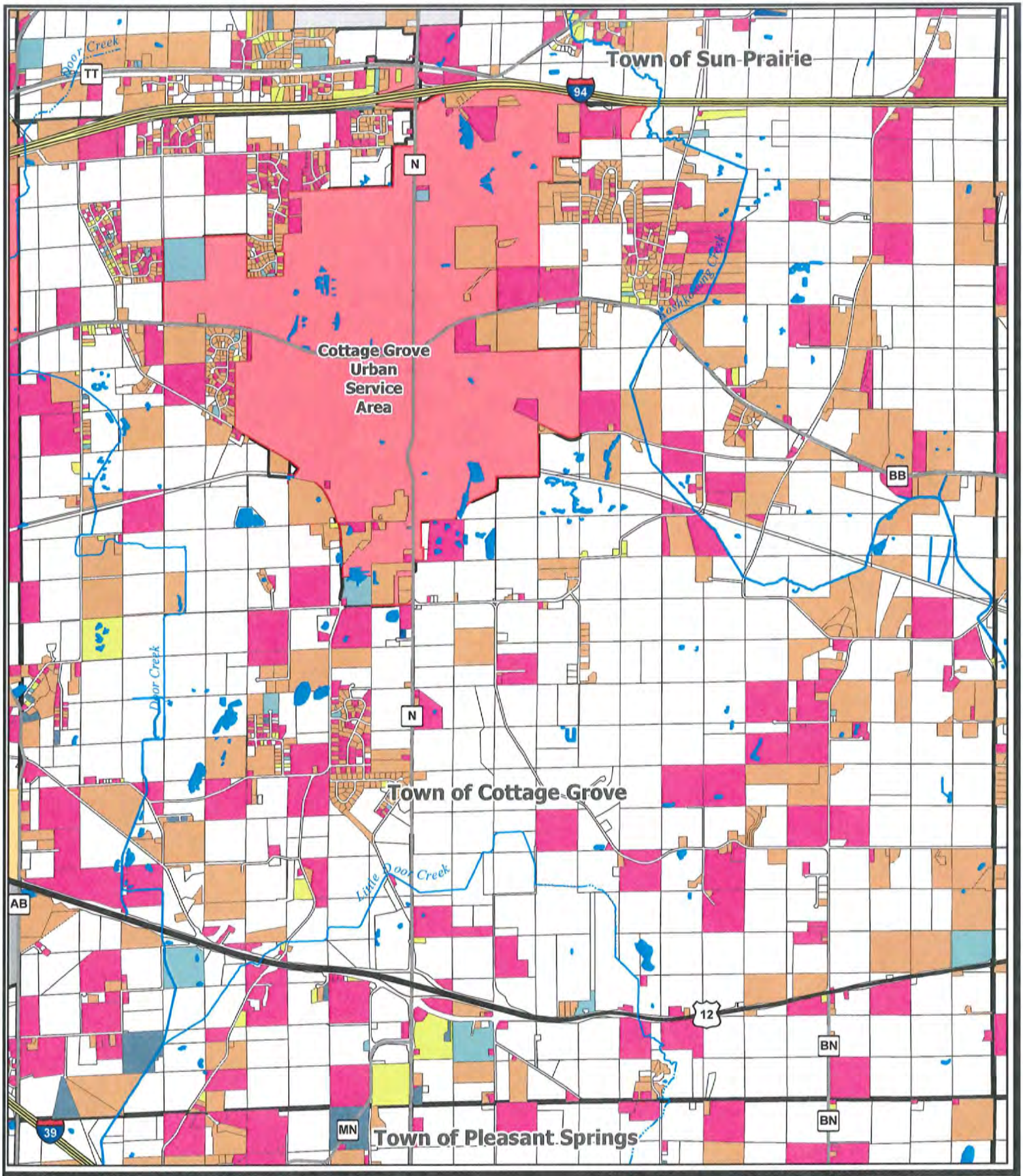

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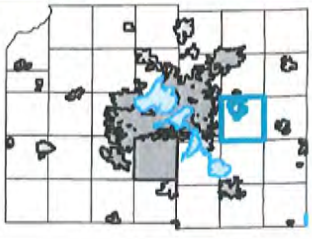

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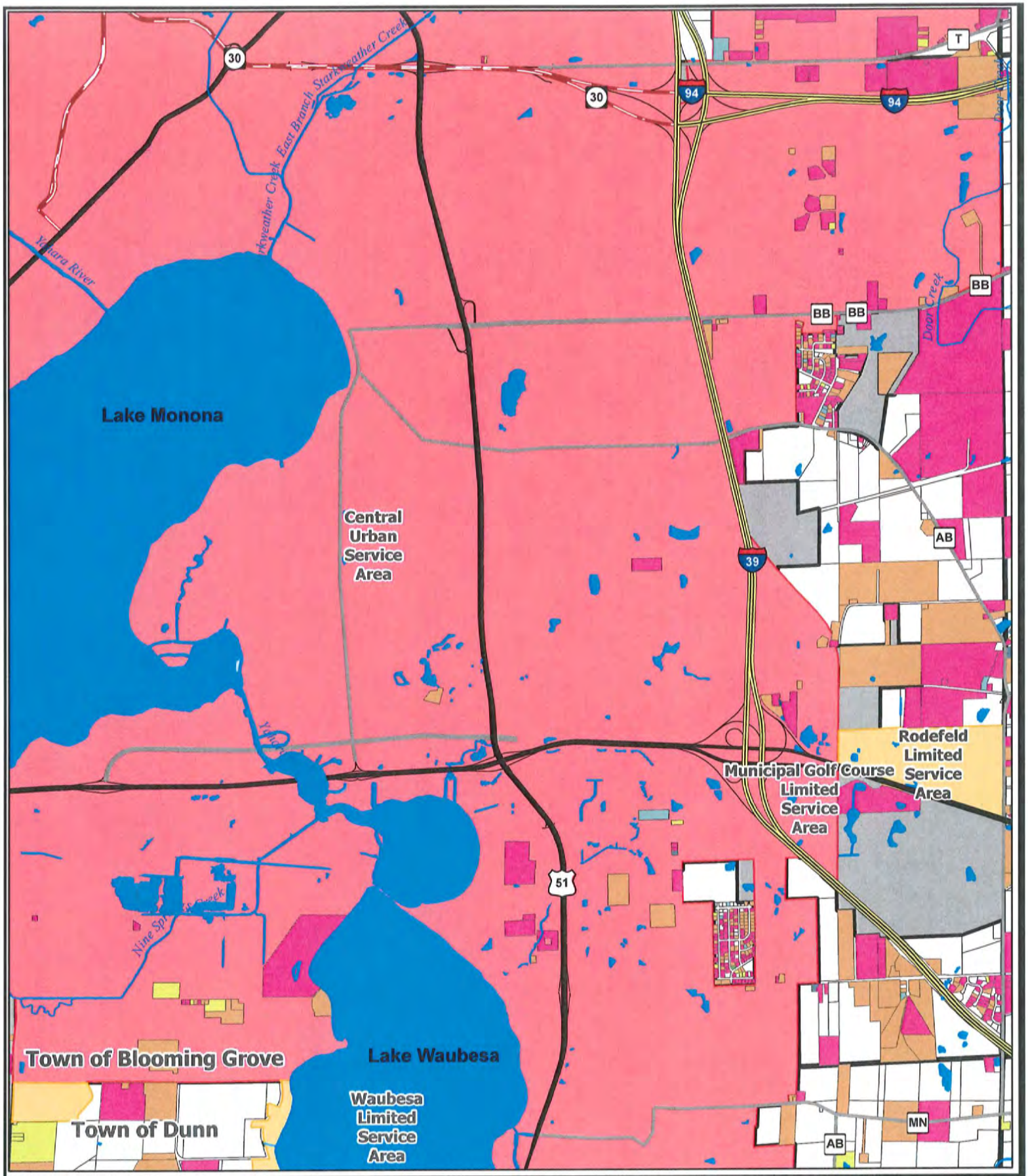

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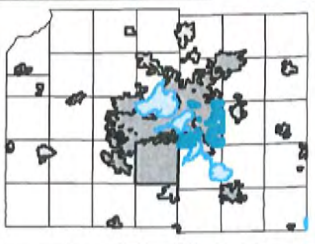

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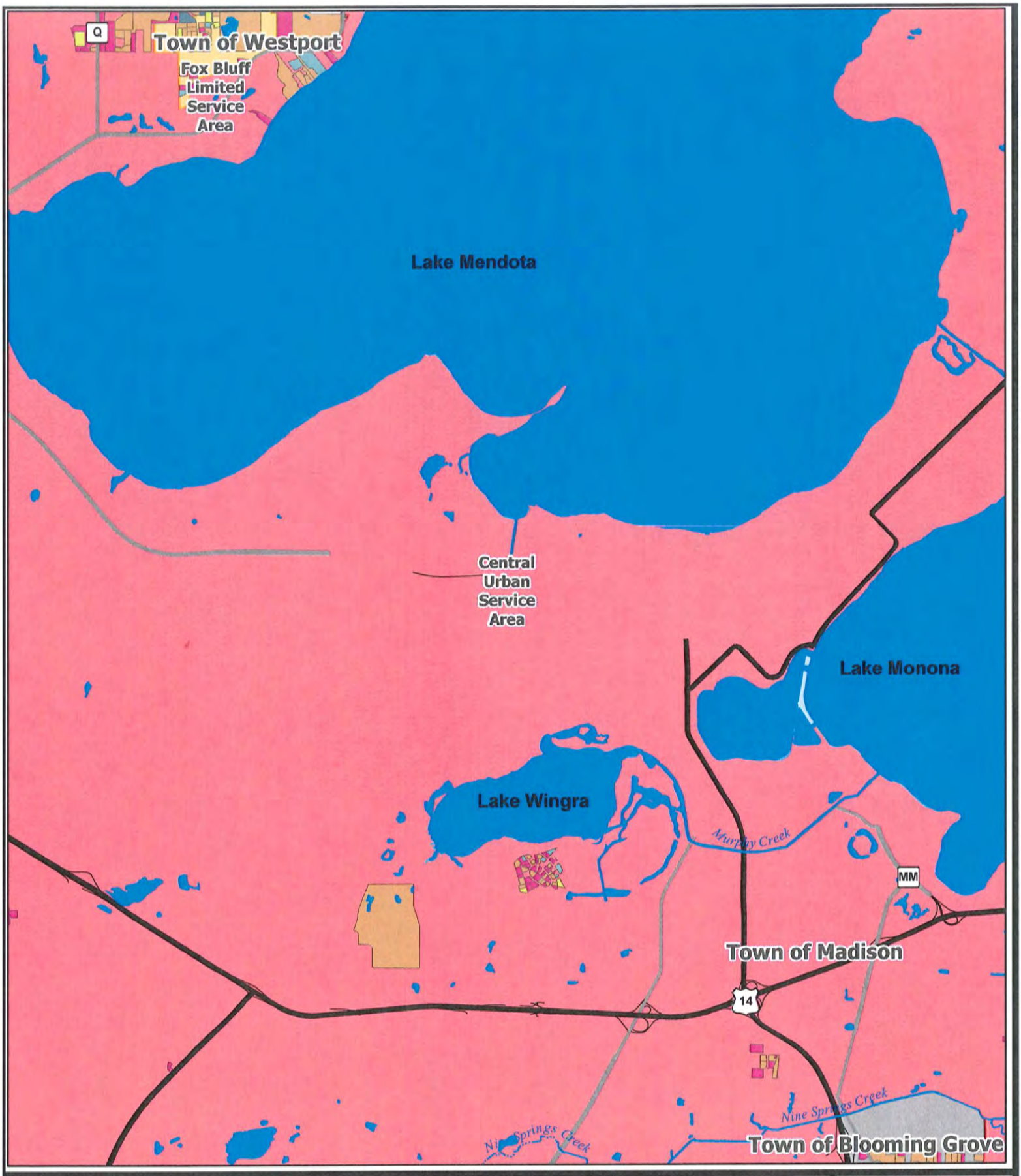

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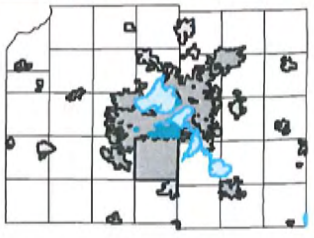

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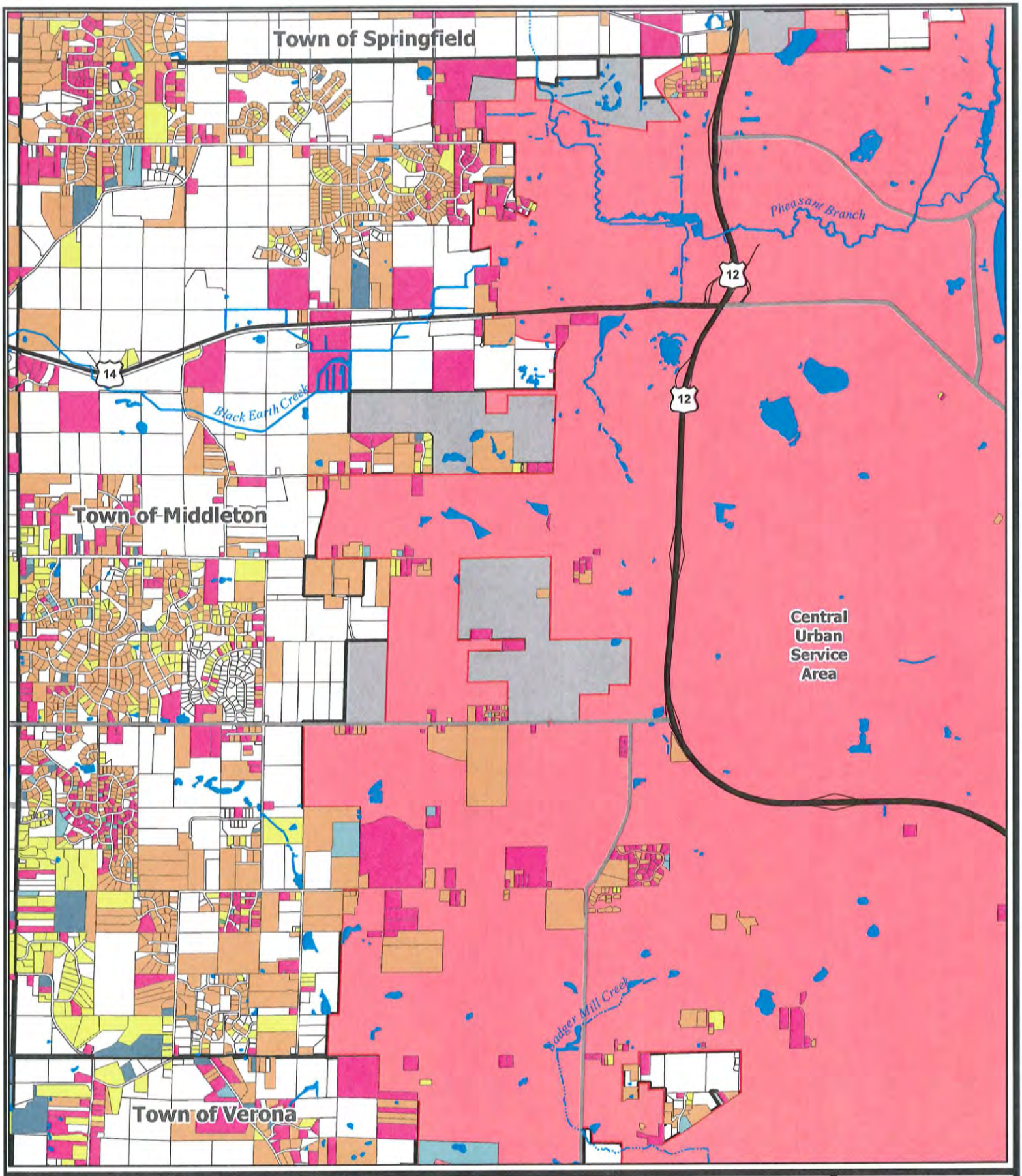

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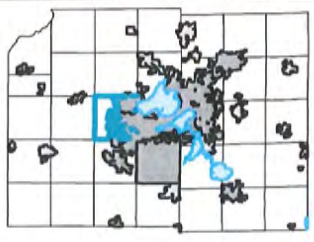

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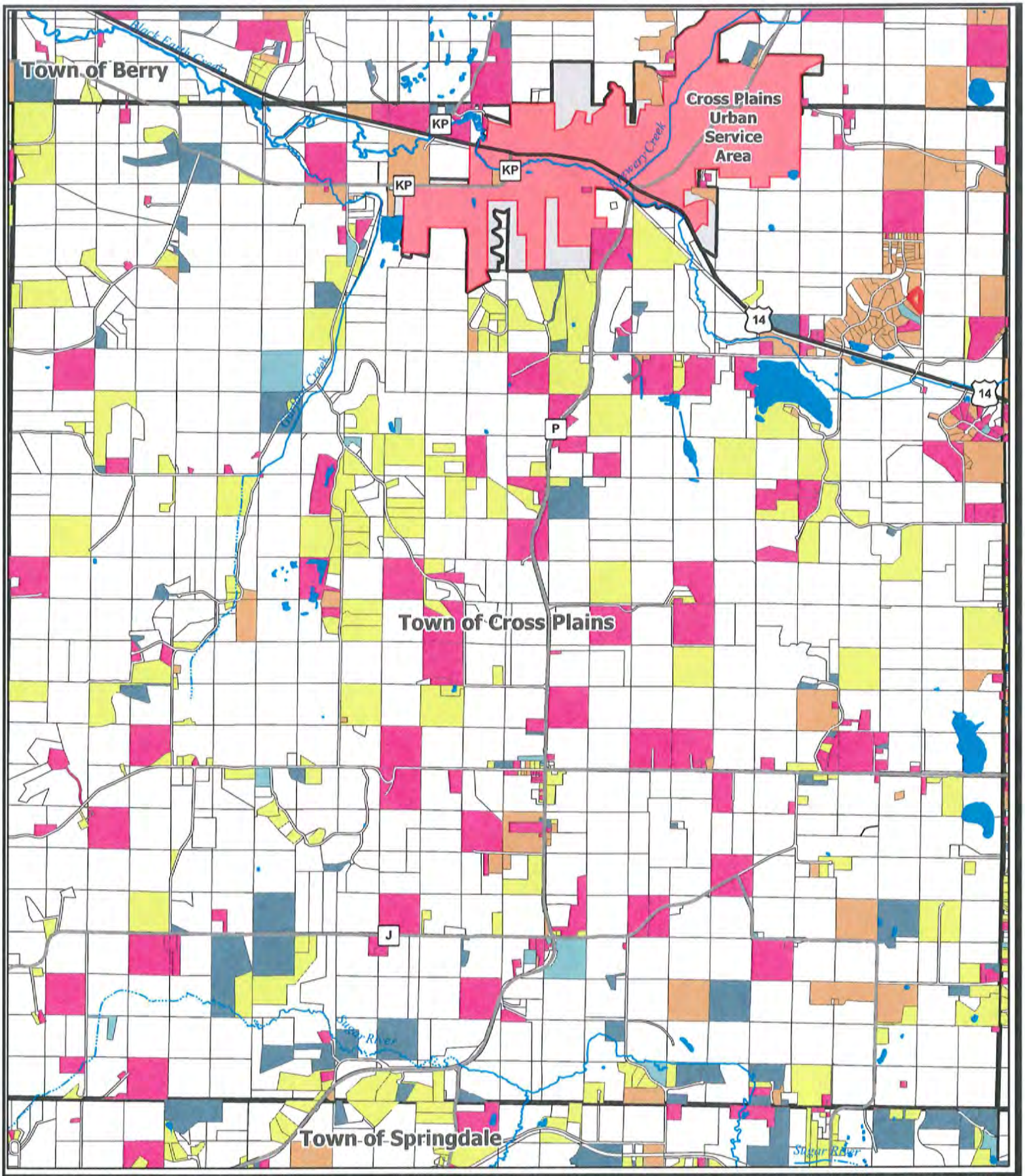

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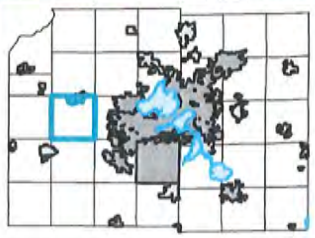

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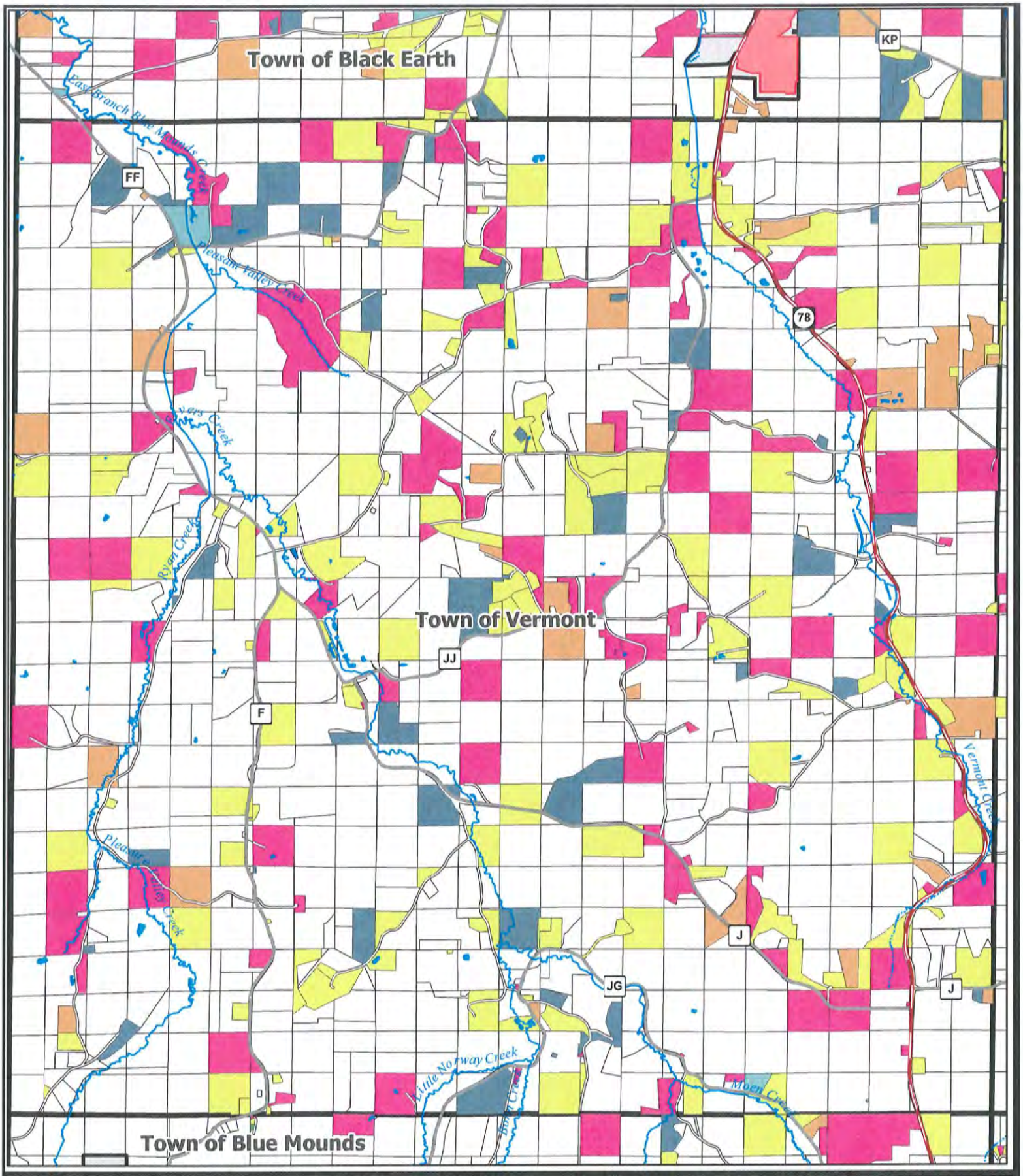

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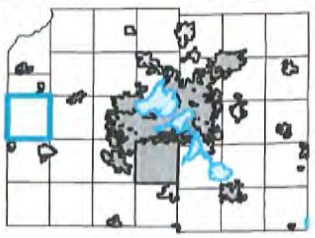

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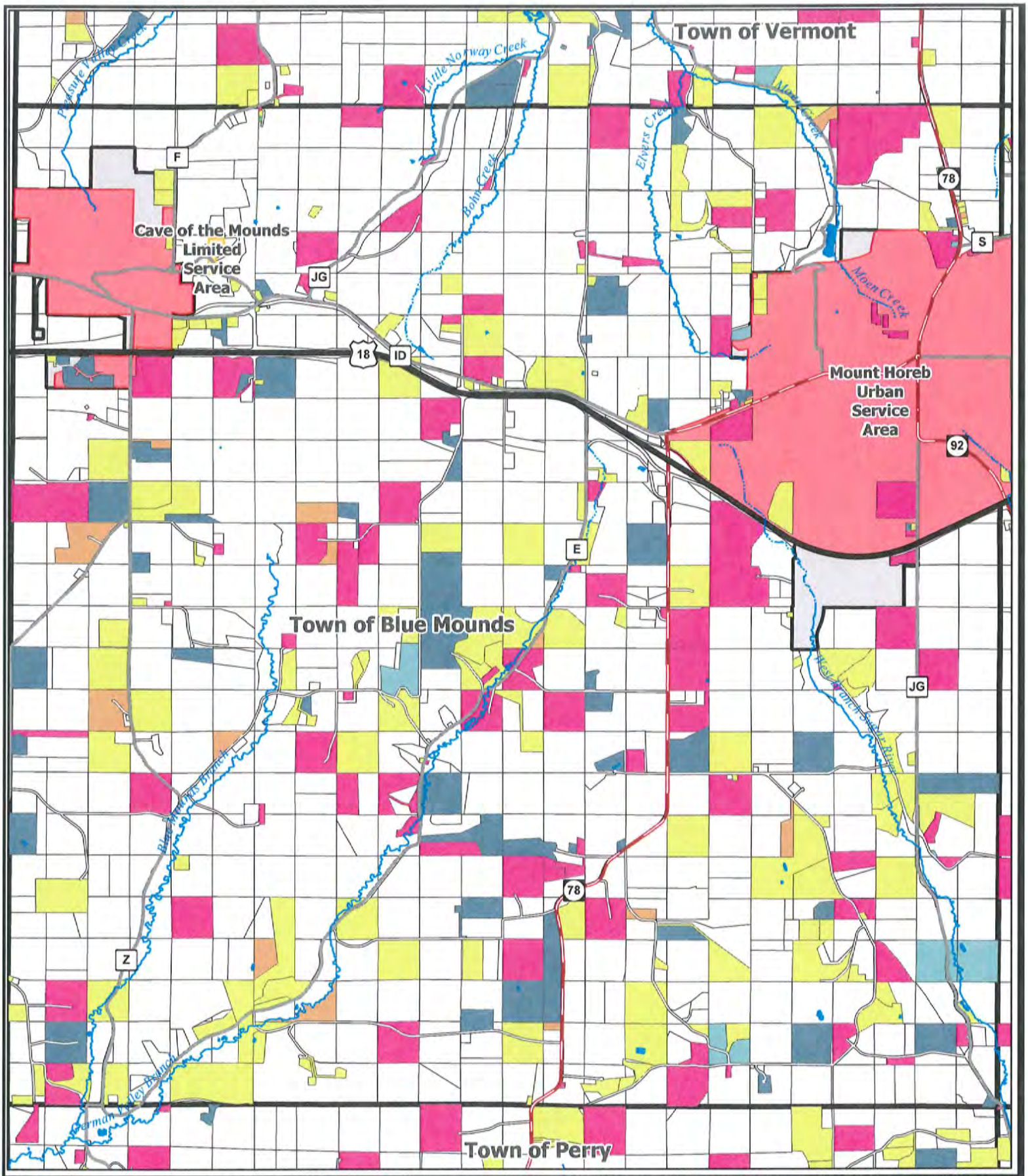

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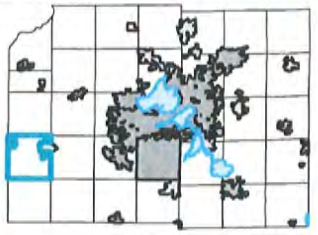

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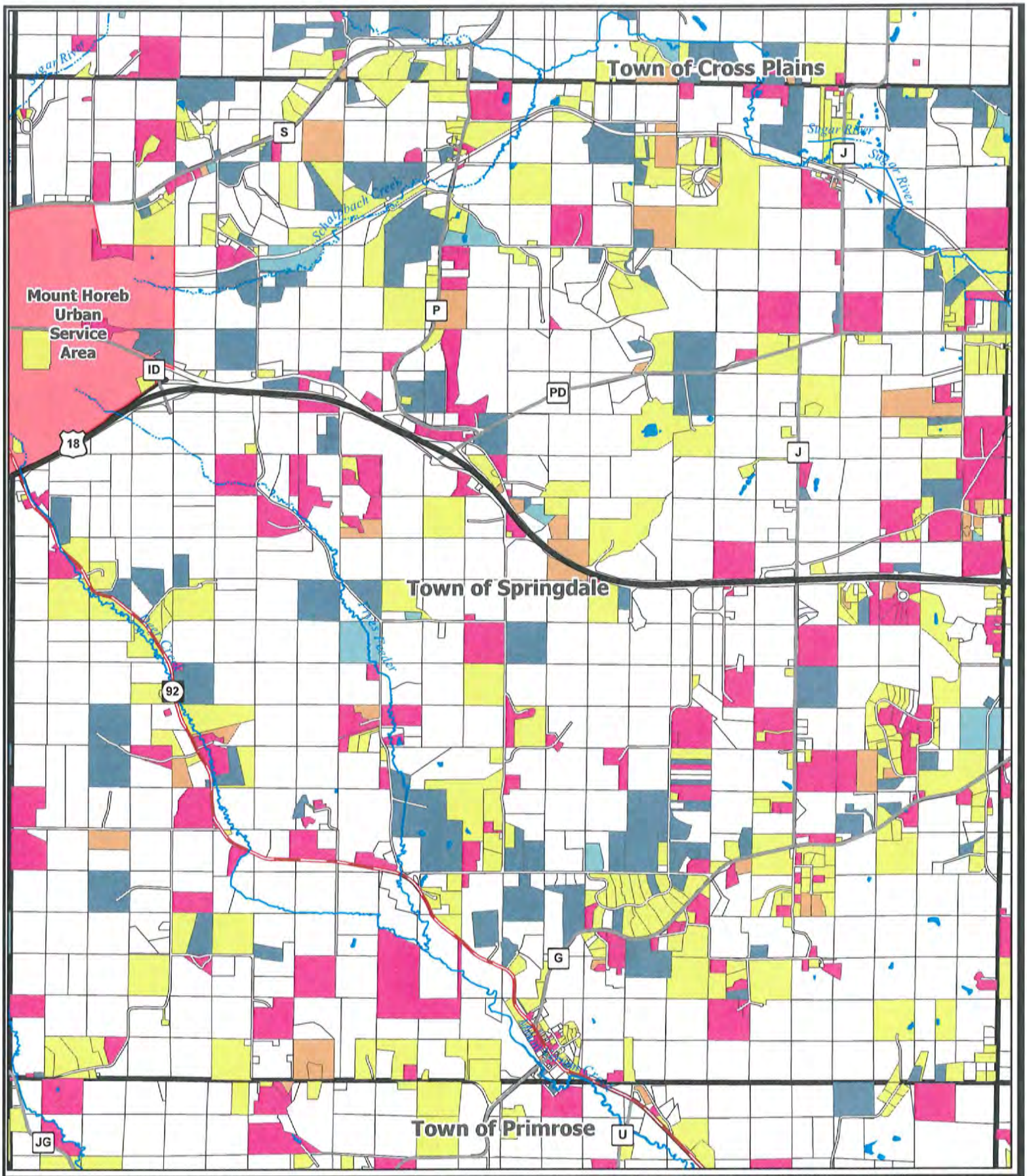

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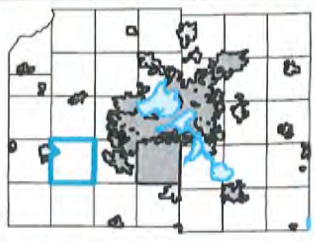

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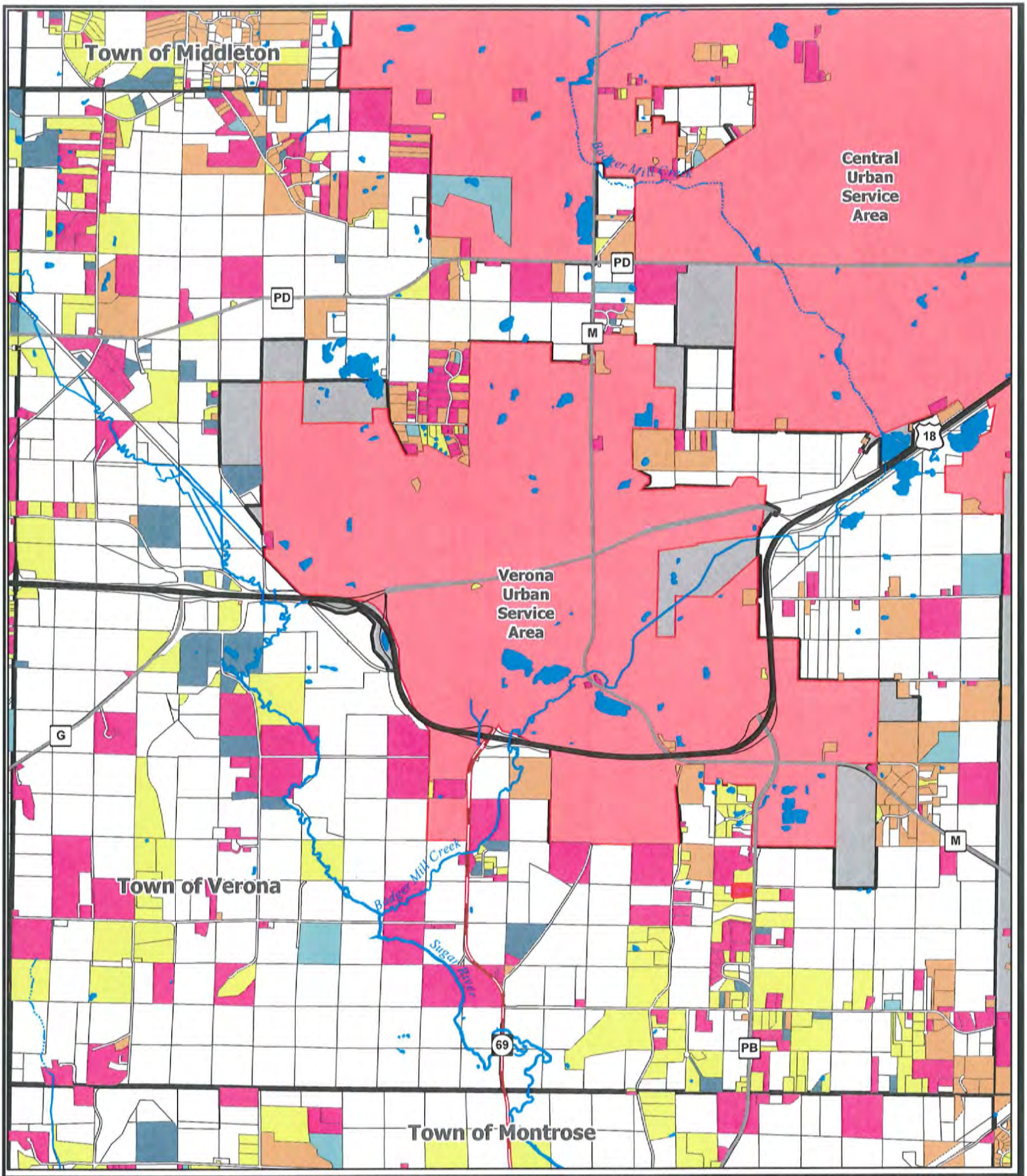

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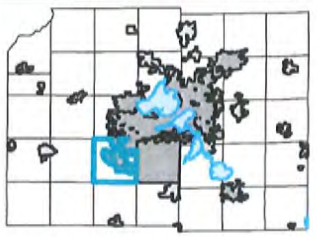

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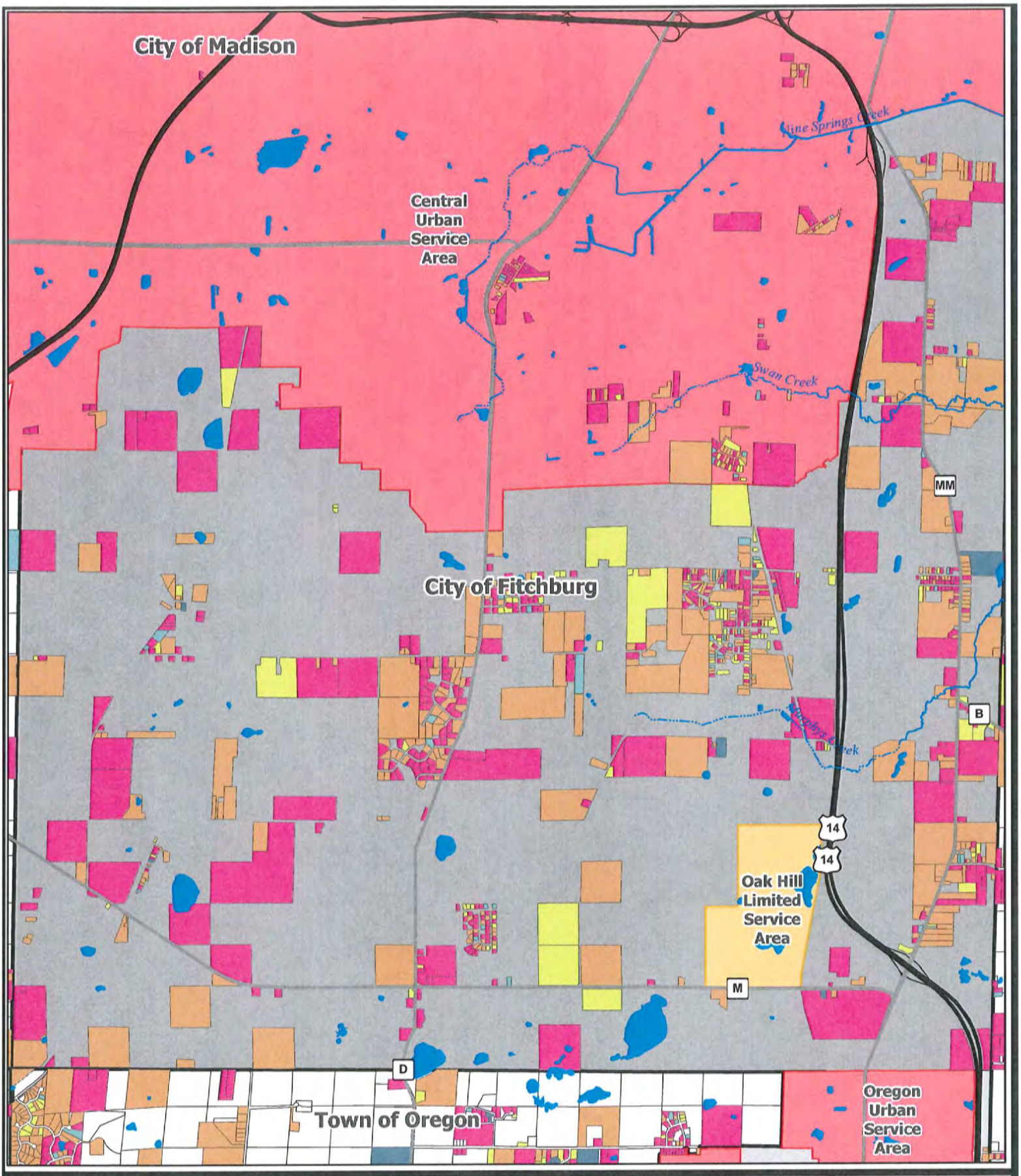

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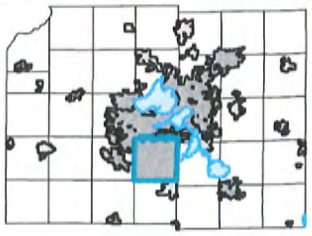

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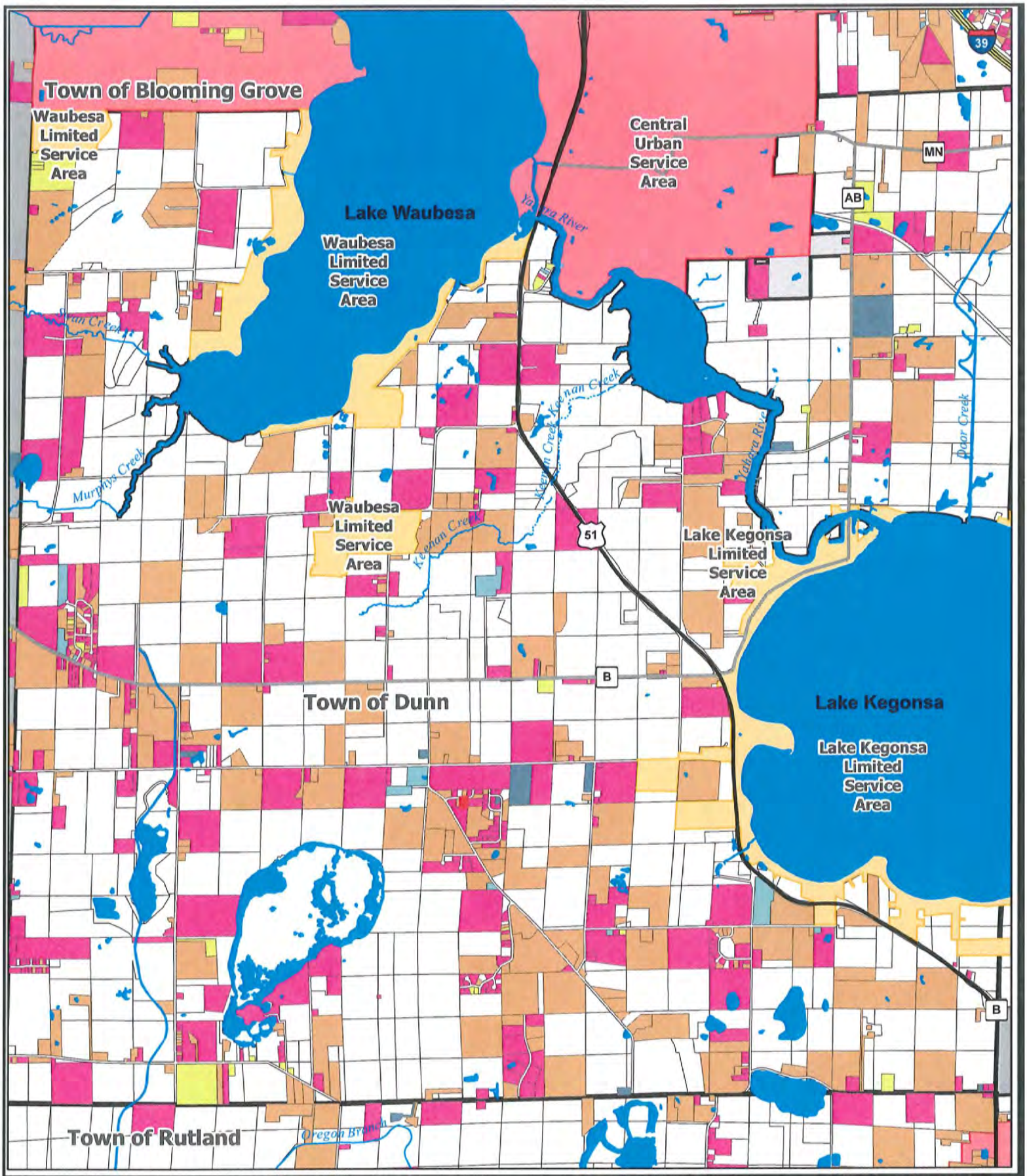

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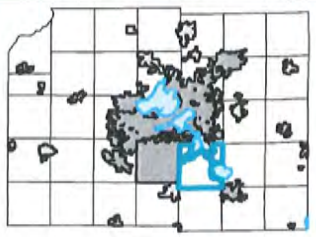

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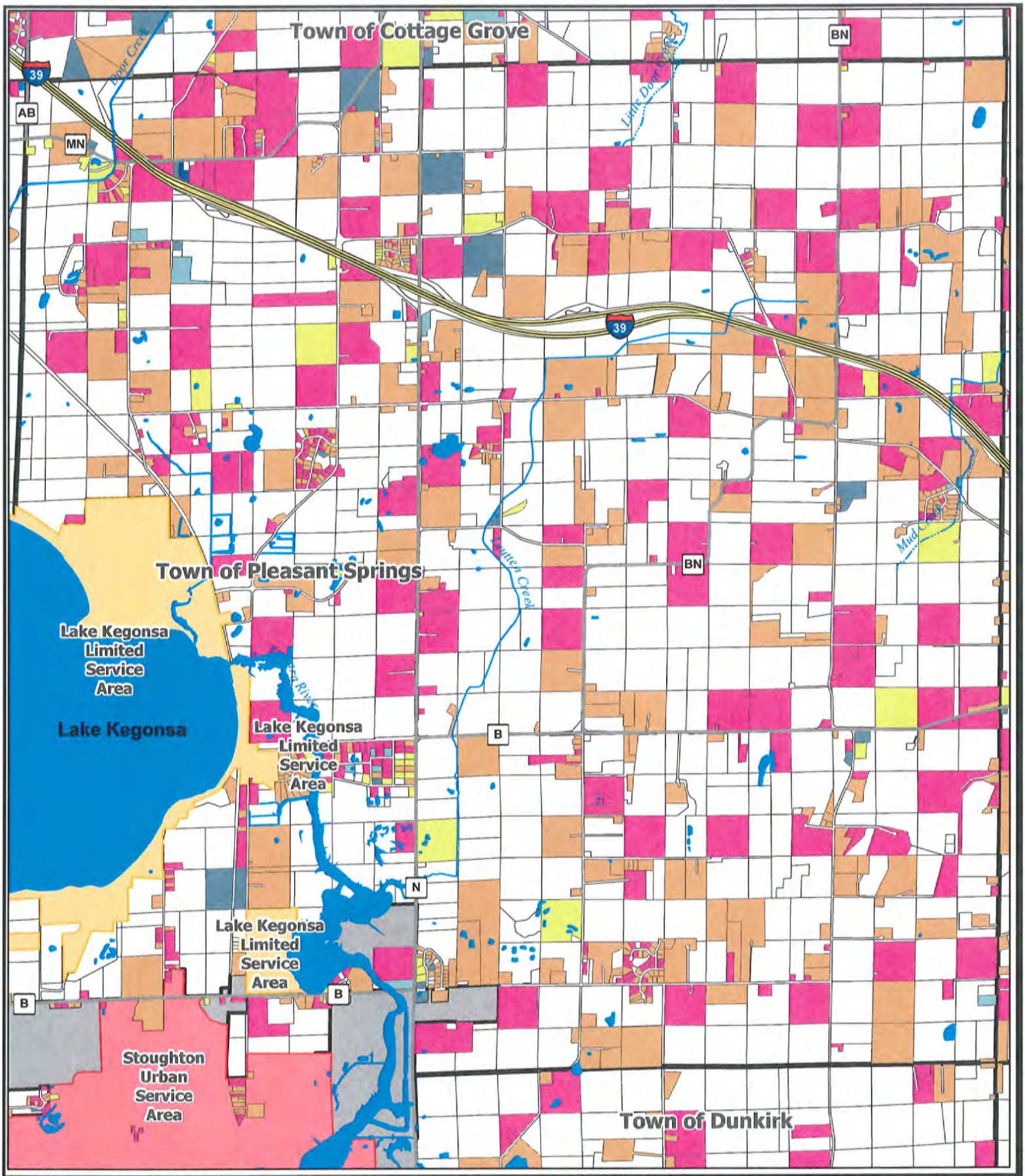

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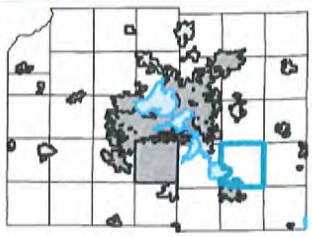

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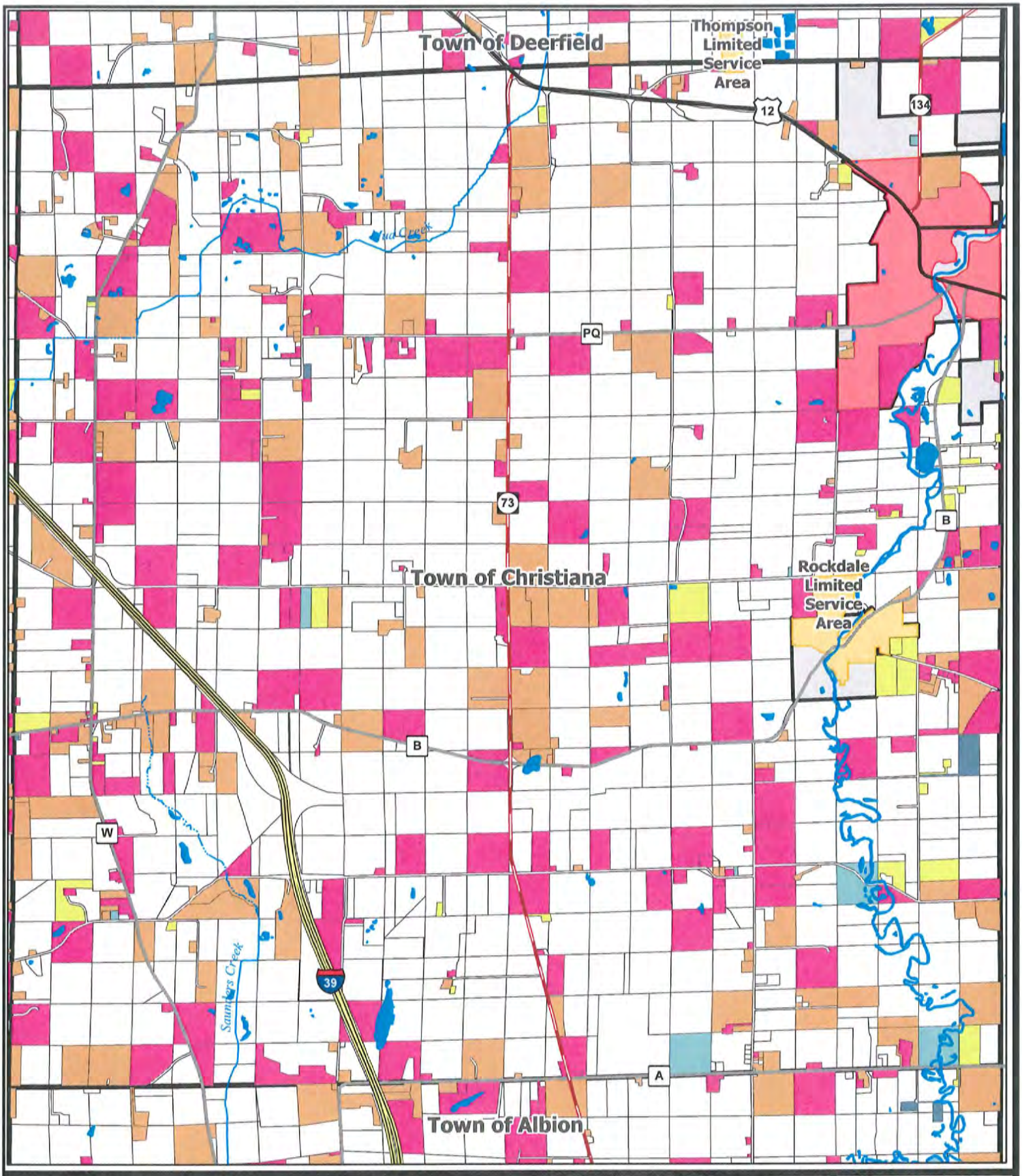

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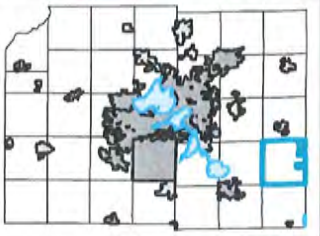

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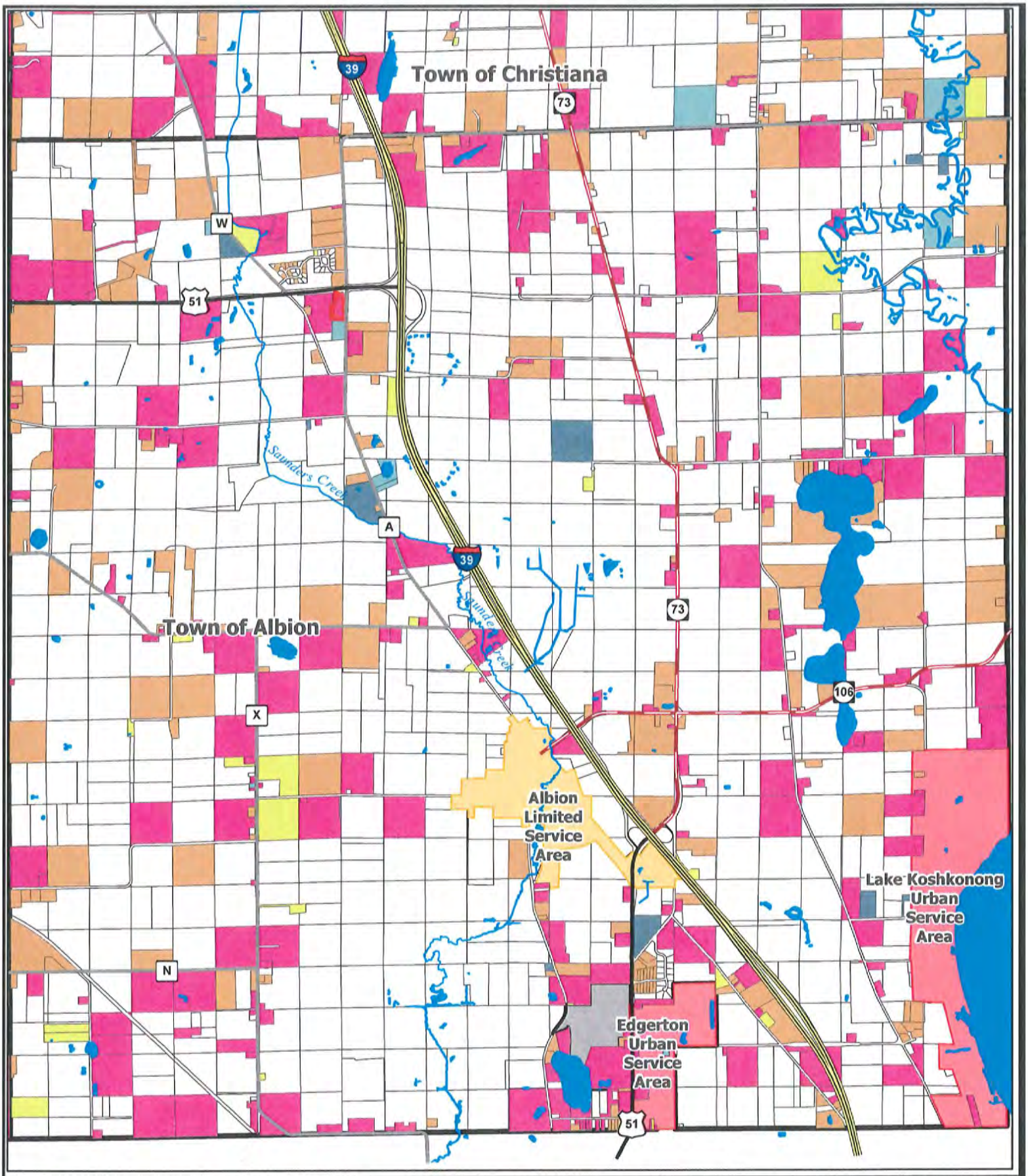

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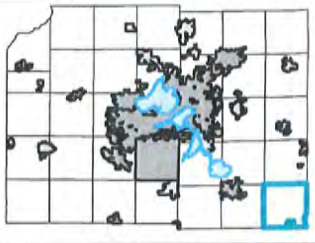

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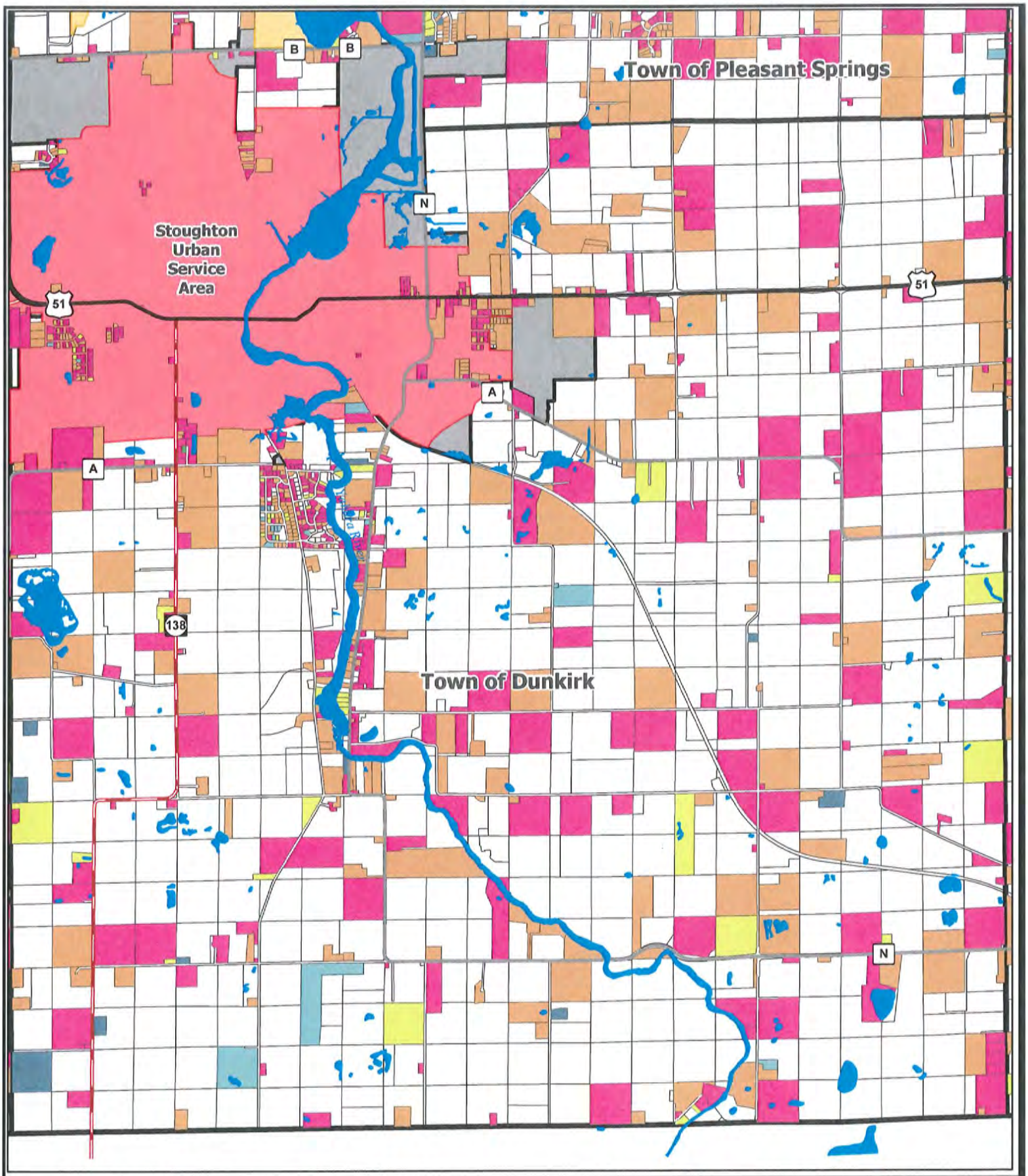

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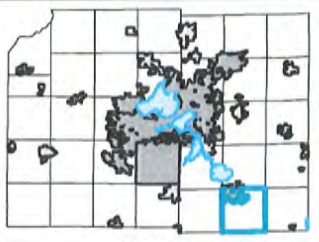

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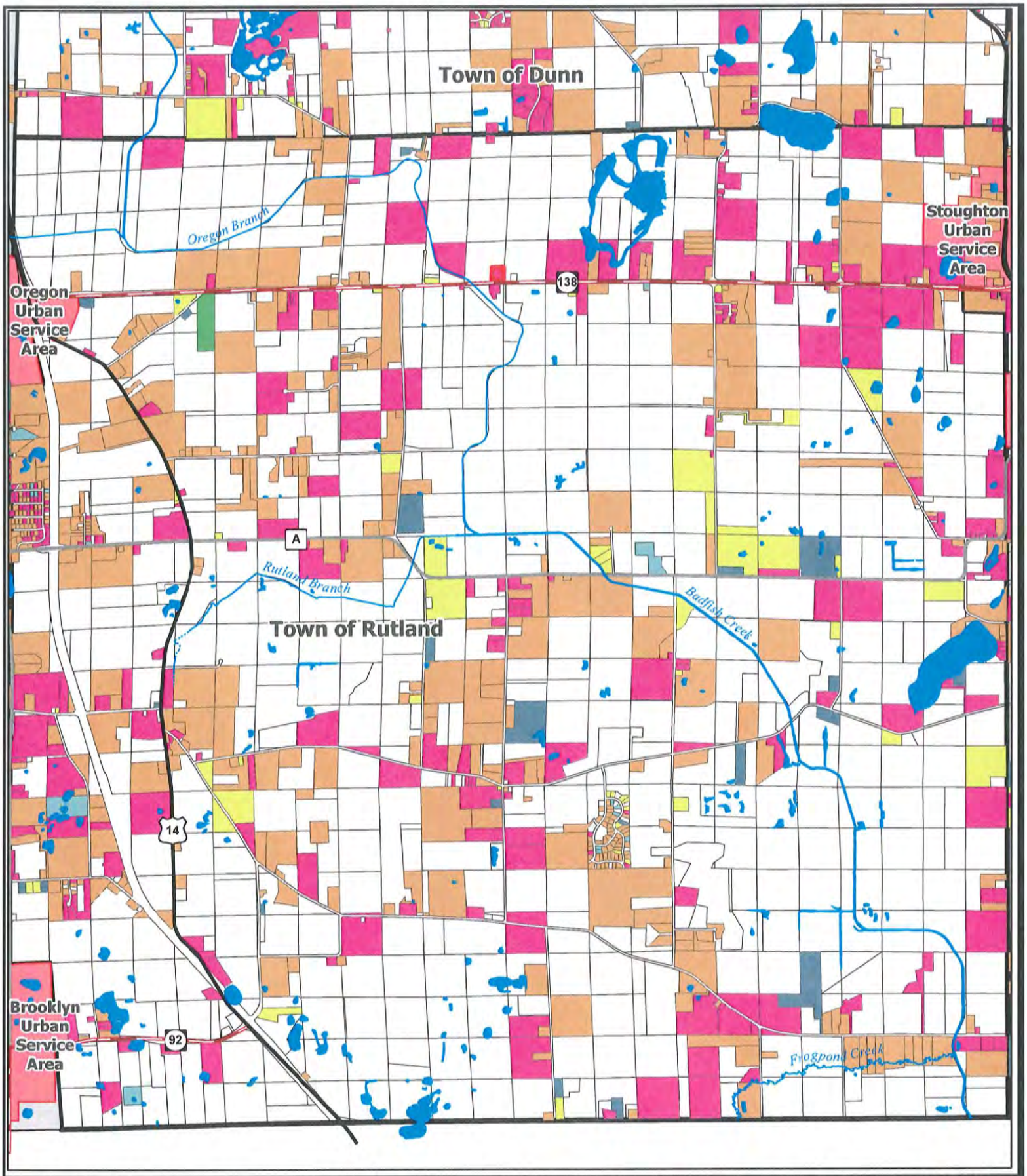

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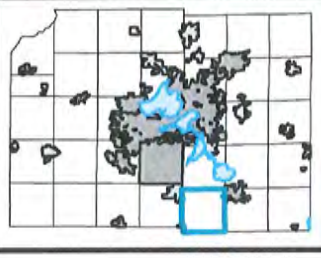

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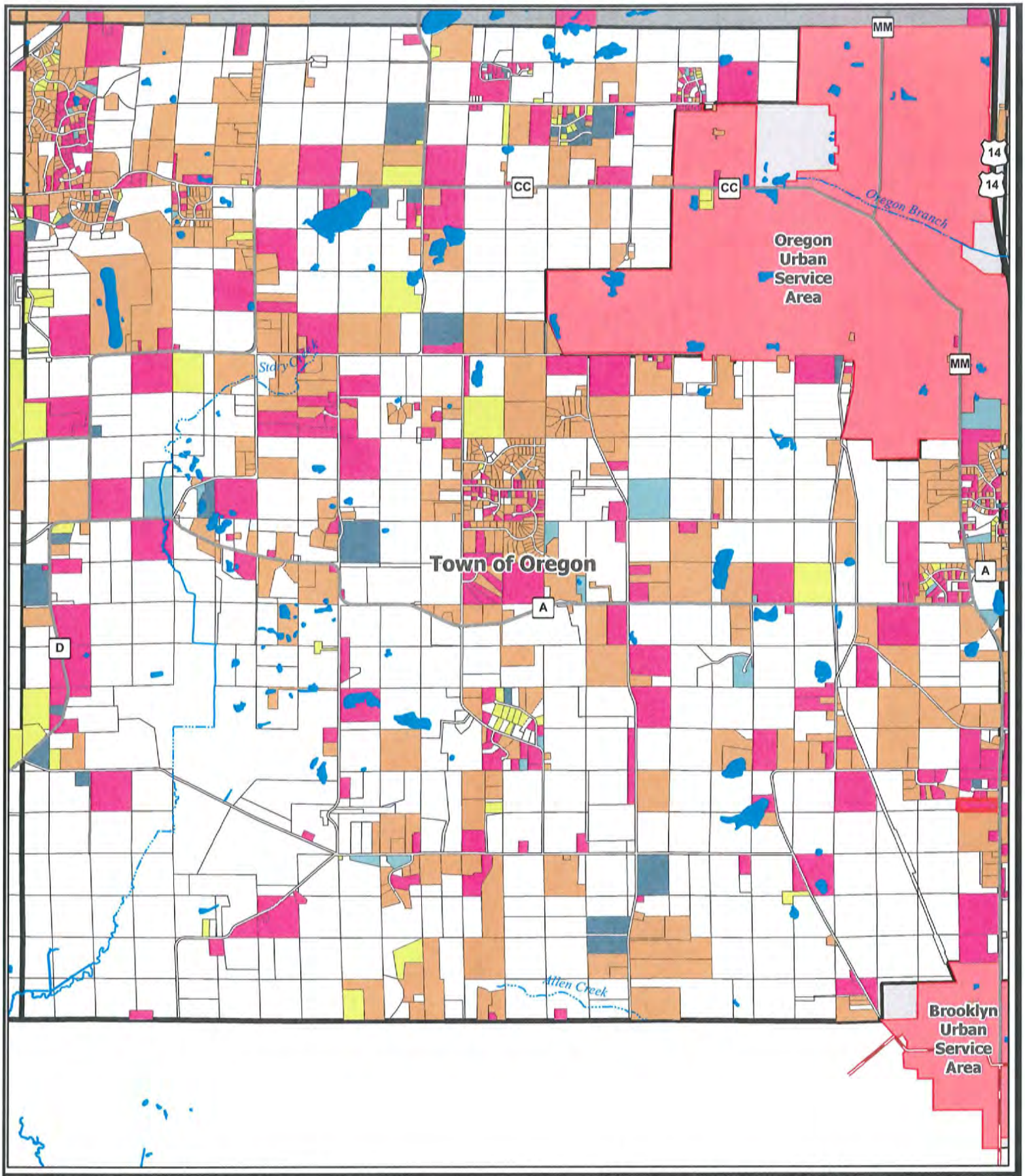

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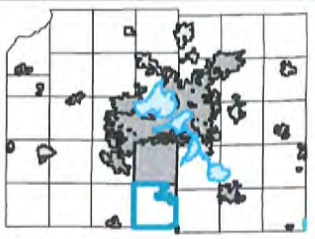

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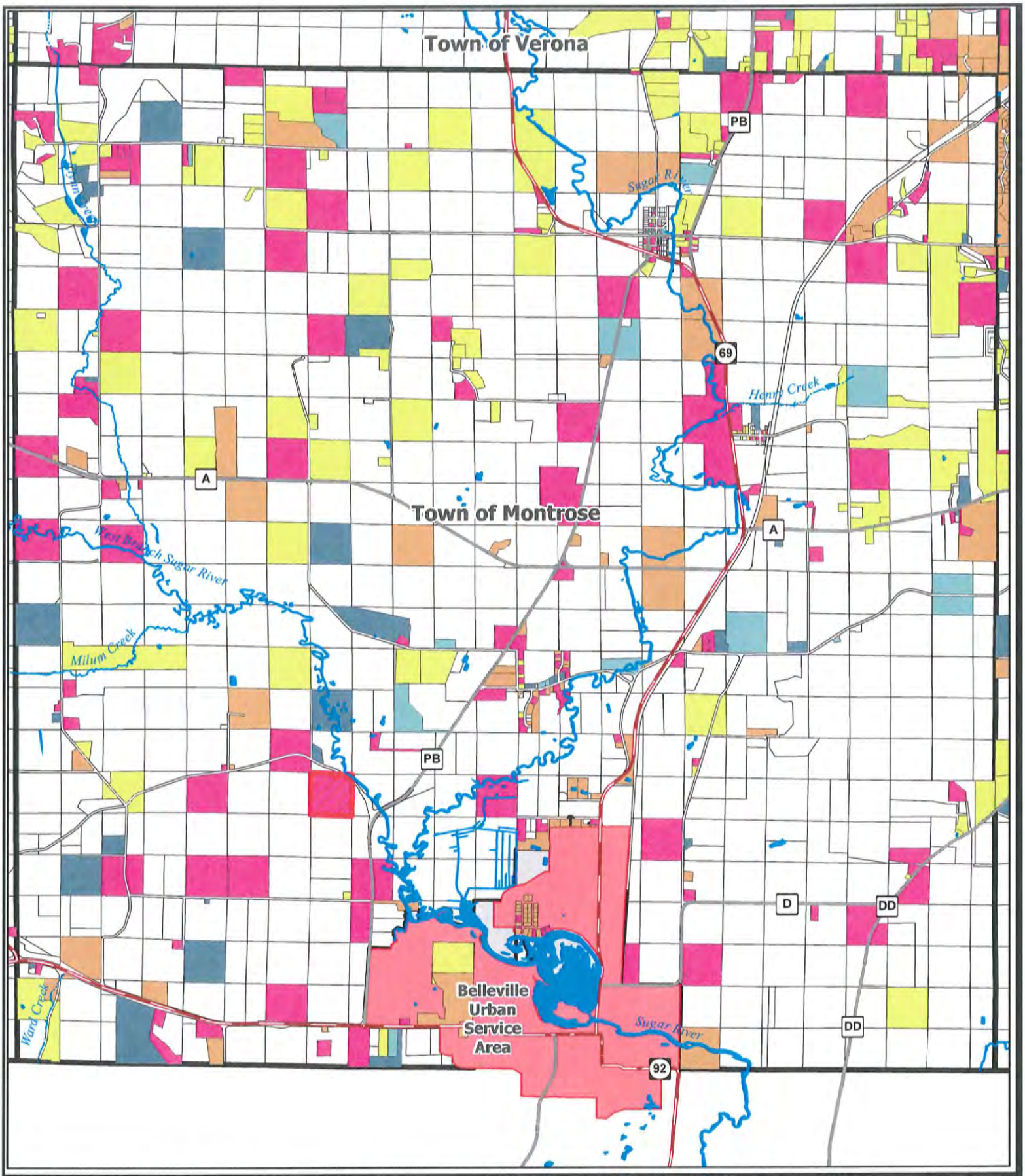

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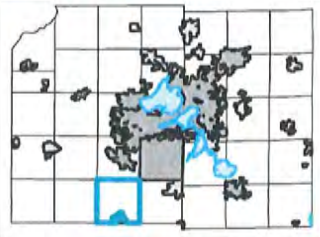

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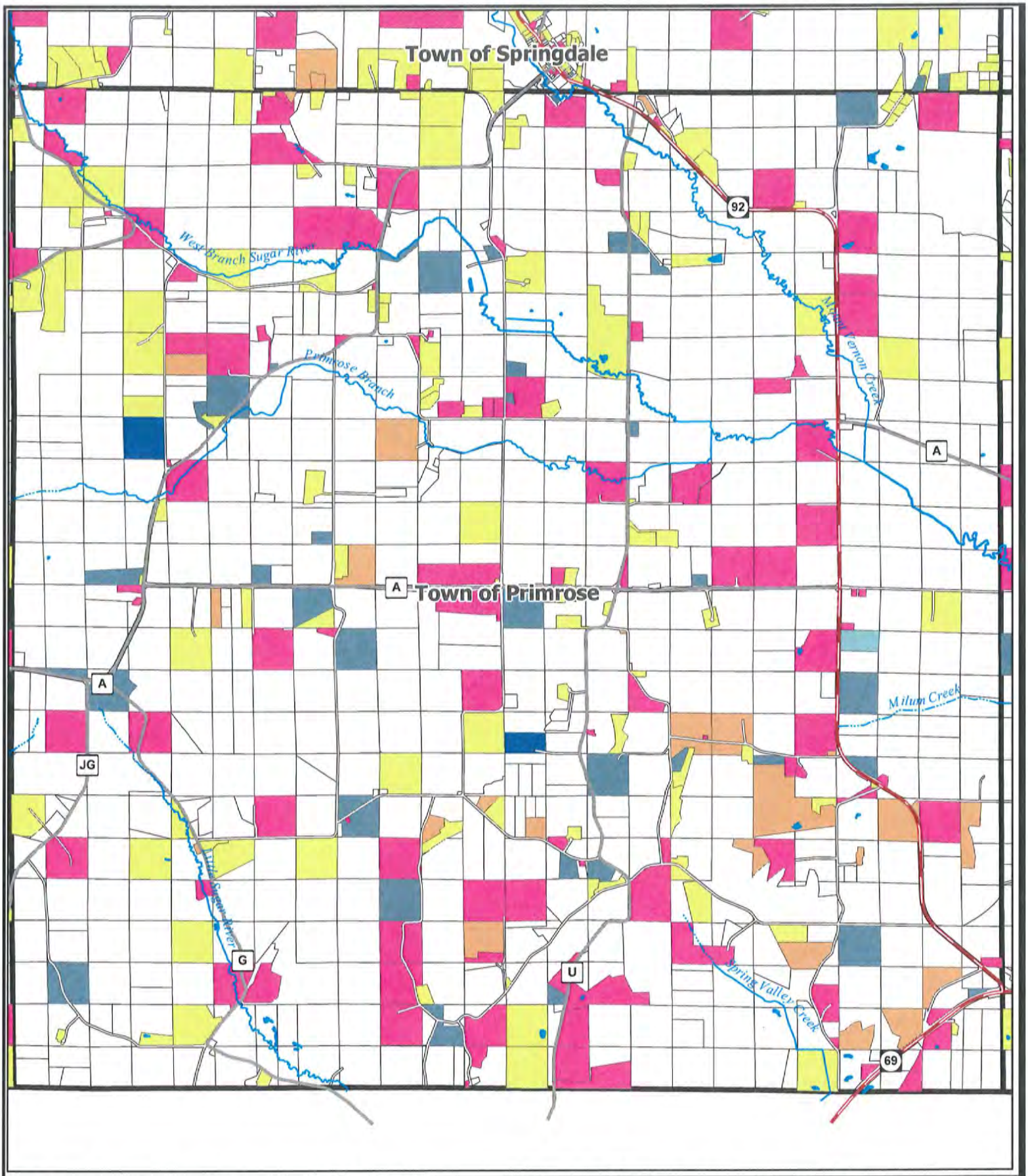

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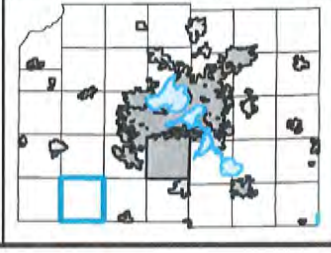

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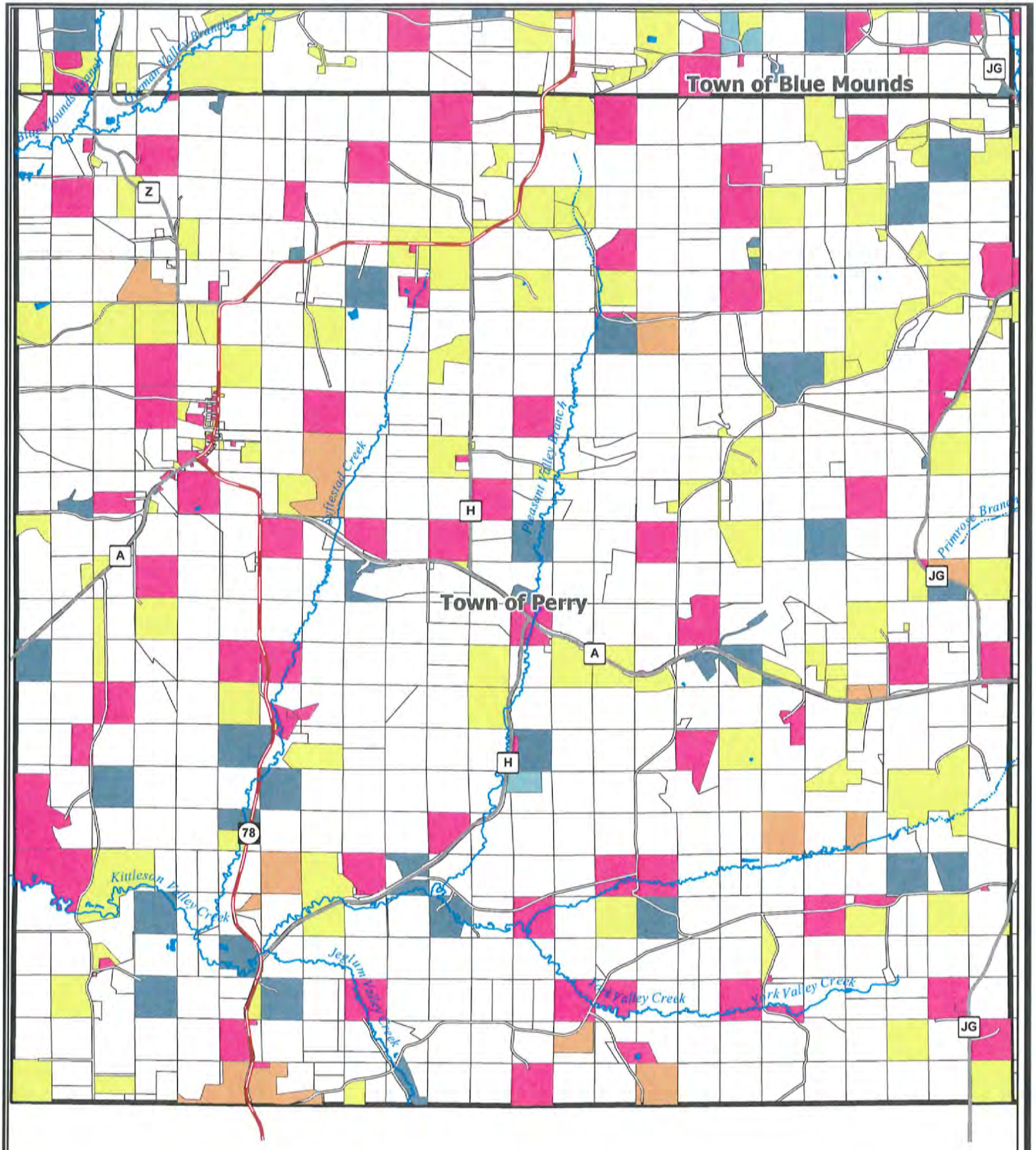

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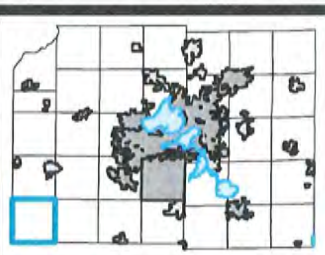

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ATTACHMENT C

FUNDAMENTALS OF WASTEWATER TREATMENT

ATTACHMENT C

FUNDAMENTALS OF WASTEWATER TREATMENT[1]

To better understand the issues and technologies related to private on-site wastewater treatment, it is helpful to understand some of the basics of wastewater treatment in general. Terms like BOD, total suspended solids, nitrification, and denitrification are frequently used when discussing wastewater treatment. It is important to understand what each of these terms mean and how each relates to the wastewater treatment process. The very basic processes of wastewater treatment are also briefly discussed. An understanding of the theory behind these basic treatment processes is useful for understanding how and why the processes are applied in private on-site wastewater treatment systems.

Basic Constituents of Wastewater

Biochemical Oxygen Demand

One of the most commonly measured constituents of wastewater is the biochemical oxygen demand, or BOD**.** Wastewater is composed of a variety of inorganic and organic substances. Organic substances refer to molecules that are based on carbon and include fecal matter as well as detergents, soaps, fats, greases and food particles (especially where garbage disposals are used). Bacteria easily decompose these large organic molecules. However, oxygen is required for this process of breaking large molecules into smaller molecules and eventually into carbon dioxide and water. The amount of oxygen required for this process is known as the biochemical oxygen demand or BOD. The Five-day BOD, or BOD_5, is measured by the quantity of oxygen consumed by microorganisms during a five-day period, and is the most common measure of the amount of biodegradable organic material in, or strength of, sewage.

BOD has traditionally been used to measure of the strength of effluent released from conventional sewage treatment plants to surface waters or streams. This is because sewage high in BOD can deplete oxygen in receiving waters, causing fish kills and ecosystem changes. Based on criteria for surface water discharge, the secondary treatment standard for BOD has been set at 30 mg BOD/L (i.e. 30 mg of O_2 are consumed per liter of water over 5 days to break down the waste).

[1] Adapted from Barnstable County Department of Health and Environment

The BOD content of sewage is also important for septic systems. Sewage treatment in the septic tank is an anaerobic (without oxygen) process. In fact, it is anaerobic because sewage entering the tank is so high in BOD that any oxygen present in the sewage is rapidly consumed. Some BOD is removed in the septic tank by anaerobic digestion and by solids that settle to the bottom of the septic tank, but much of the BOD present in sewage (especially detergents and oils) flows to the leaching field. Because BOD serves as a food source for microbes, BOD supports the growth of the microbial biomat that forms under the leaching field. This is both good and bad. On the one hand, a healthy biomat is desired because it is capable of removing many of the bacteria and viruses in the sewage so that they do not pass to the groundwater. The bacteria in a healthy biomat also digest most of the remaining BOD in the sewage. Too much BOD, however, can cause excessive growth of bacteria in the biomat. If the BOD is so high that all available oxygen is consumed (or if the leaching field is poorly aerated, as can be the case in an unvented leaching field located under pavement or deeply buried) the biomat can go anaerobic. This causes the desirable bacteria and protozoans in the biomat to die, resulting in diminished treatment of the sewage. Low oxygen in the biomat also encourages the growth of anaerobic bacteria (bacteria which do not require oxygen for growth). Many anaerobic bacteria produce a mucilaginous coating which can quickly clog the leaching field. Thus, excess BOD in sewage can cause a leaching field to function poorly and even to fail prematurely.

Many of the alternative treatment technologies discussed in this report are designed specifically to reduce BOD in treated sewage. BOD removal can be especially important where sewage effluent flows to a leaching field in tight soils. Tight soils are usually composed of silts and clays (particle size < 0.05 millimeter). These small soil particles are tightly packed and the pore space between them is small. Reducing BOD means that the sewage will support the growth of less bacteria and therefore the effluent will be better able to infiltrate tight soils.

BOD is fairly easy to remove from sewage by providing a supply of oxygen during the treatment process; the oxygen supports bacterial growth that breaks down the organic BOD. Most advanced treatment units incorporate some type of system that actively oxygenates the sewage to reduce BOD. This unit is often located between the septic tank and the leach field. Or, it can be located within the septic tank in a specific area where oxygen is supplied. Reduction of BOD is a relatively easy and efficient process, and results in sewage of low BOD flowing to the leaching field. It is important to note, however, that low BOD in sewage may result in a less effective biomat forming under the leaching field.

It is also important to note that BOD serves as the food source for the denitrifying bacteria that are needed in systems where bacterially mediated nitrogen removal takes place. In these situations BOD is desired, as the nitrification/denitrification process cannot operate efficiently without sufficient BOD to support the growth of the bacteria that accomplish the process.

Total Suspended Solids

Domestic wastewater usually contains large quantities of suspended solids that are organic and inorganic in nature. These solids are measured as Total Suspended Solids or TSS and are expressed as mg TSS/ liter of water. This suspended material is objectionable primarily because it can be carried with the wastewater to the leachfield. Because most suspended solids are small particles, they have the ability to clog the small pore spaces between soil grains in the leaching facility. There are several ways to reduce TSS in wastewater. The simplest is the use of a septic tank effluent filter. This type of filter fits on the outlet tee of the septic tank. It is made of PVC with various size slots fitted inside one another. The filter prevents passage of floating matter out of the septic tank and, as effluent filters through the slots, fine particles are also caught. Many types of alternative systems are also able to reduce TSS, usually by the use of settling compartments and/or filters using sand or other media.

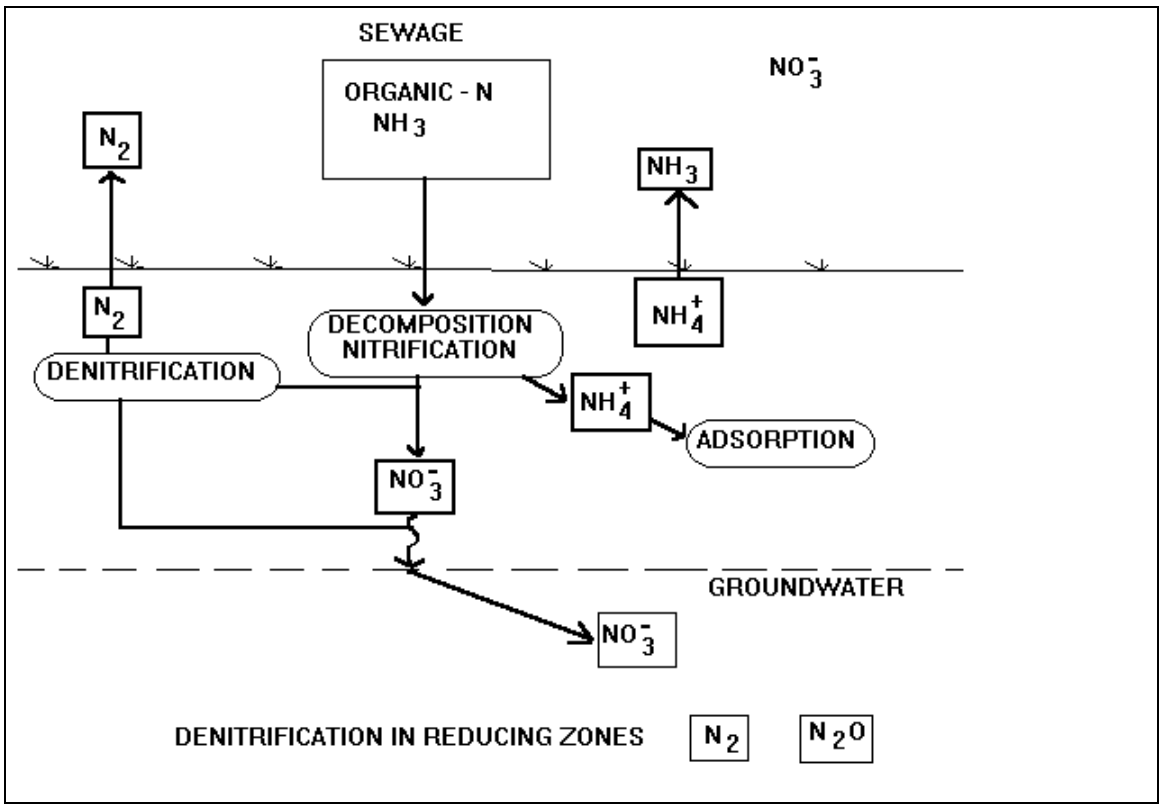
Total Nitrogen

Nitrogen is present in many forms in the septic system. Most nitrogen excreted by humans is in the form of organic nitrogen (dead cell material, proteins, amino acids) and urea. After entering the septic tank, this organic nitrogen is broken down fairly rapidly and completely to ammonia, NH_3, by microorganisms in the septic tank. Ammonia is the primary form of nitrogen leaving the septic tank. In the presence of oxygen, bacteria will break ammonia down to nitrate, NO_3. In a conventional septic system with a well-aerated leaching facility, it is likely that most ammonia is broken down to nitrate beneath the leaching field.

Nitrate can have serious health effects when it enters drinking water wells and is consumed. Nitrate and other forms of nitrogen can also have harmful effects on the environment, especially in coastal areas where excess nitrogen stimulates the process of eutrophication. For this reason, many alternative technologies have been designed to remove total nitrogen from wastewater. These technologies use bacteria to convert ammonia and nitrate to gaseous nitrogen, N_2. Nitrogen in this form is inert and is released to the air.

Biological conversion of ammonia to nitrogen gas is a two-step process. Ammonia must first be oxidized to nitrate; nitrate is then reduced to nitrogen gas. These reactions require different environments and are often carried out in separate areas in the wastewater treatment system.

Figure C-1: The Nitrogen Cycle



Nitrification Process

The first step in the process, conversion of ammonia to nitrite and then to nitrate, is called nitrification. The process is summarized in the following equations:

$$NH_4 + {}^3/_2\ O_2 \rightarrow NO_2^- + 2\ H^- + H_2O$$

$$NO_2^- + \tfrac{1}{2}\ O \rightarrow NO_3^-$$

It is important to note that this process requires and consumes oxygen. This contributes to the BOD or biochemical oxygen demand of the sewage. The process is mediated by the bacteria *Nitrosomonas* and *Nitrobacter,* which require an aerobic (presence of oxygen) environment for growth and metabolism of nitrogen. Thus, the nitrification process must proceed under aerobic conditions.

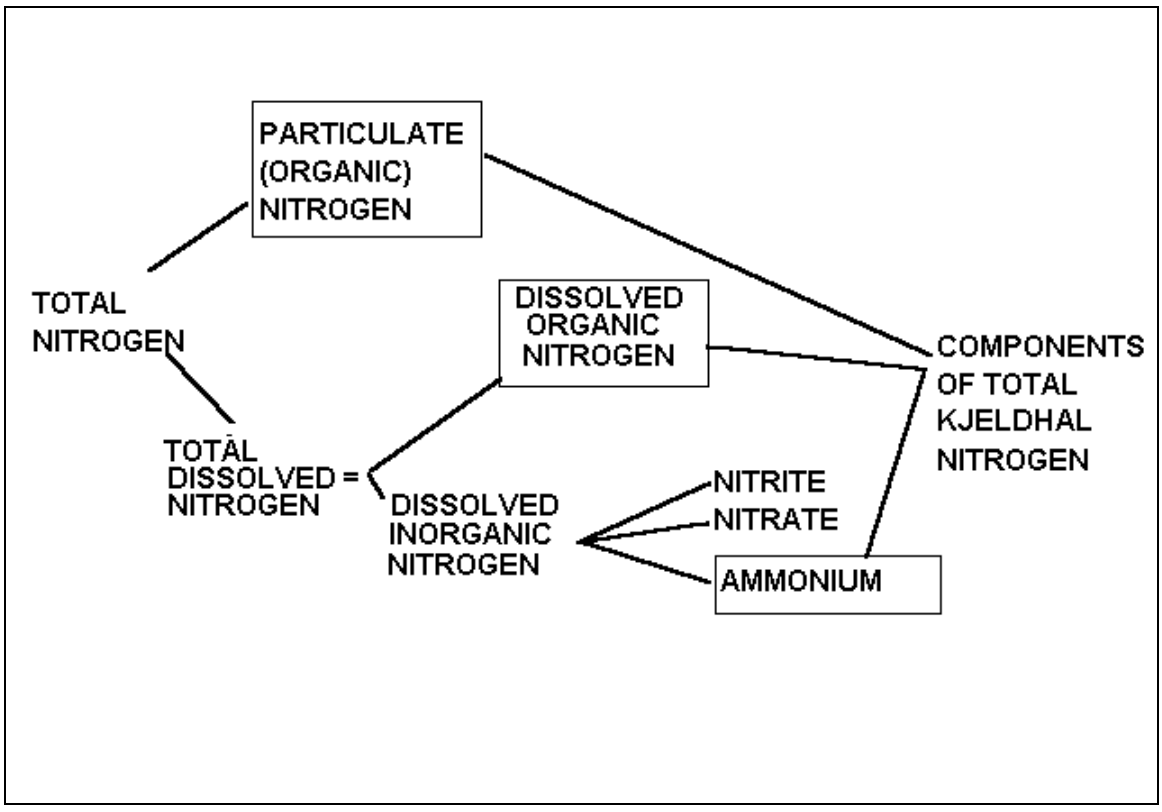
Denitrification Process

The second step of the process, the conversion of nitrate to nitrogen gas, is referred to as denitrification. This process can be summarized as:

$$NO_3^- + {}^5/_6\ CH_3OH \rightarrow \tfrac{1}{2}\ N_2 + {}^5/_6\ CO_2 + {}^7/_6\ H_2O + OH^-$$

Bacteria also mediate this process. For the reduction of nitrate to nitrogen gas to occur, the dissolved oxygen level must be at or near zero; the denitrification process must proceed under anaerobic conditions. The bacteria also require a carbon food source for energy and conversion of nitrogen. The bacteria metabolize the carbonaceous material or BOD in the wastewater as this food source, metabolizing it to carbon dioxide. This in turn reduces the BOD of the sewage, which is desirable. However, if the sewage is already low in BOD, the carbon food source will be insufficient for bacterial growth and denitrification will not proceed efficiently.

Figure C-2: Denitrification



Clearly, any wastewater treatment unit that is going to remove nitrogen by the nitrification/denitrification process must be designed to provide

both aerobic and anaerobic areas so that both nitrification and denitrification can proceed. Nitrogen removal technologies utilize various designs to solve this problem.

Phosphorus

Phosphorus is a constituent of human wastewater, averaging around 10 mg/liter in most cases. The principal forms are organically bound phosphorus, polyphosphates, and orthophosphates. Organically bound phosphorus originates from body and food waste and, upon biological decomposition of these solids, is converted to orthophosphates. Polyphosphates are used in synthetic detergents, and used to contribute as much as one-half of the total phosphates in wastewater. Wisconsin Statutes 100.28 prohibits the retail sale of any residential cleaning agent that contains more than 0.5% phosphorus by weight, so phosphorus levels in household wastewater have been reduced significantly. Most household phosphate inputs now come from human waste. Polyphosphates can be hydrolyzed to orthophosphates. Thus, the principal form of phosphorus in wastewater is assumed to be orthophosphates, although the other forms may exist. Orthophosphates consist of the negative ions PO_4^{3-}, HPO_4^{2-}, and $H_2PO_4^{-}$. These may form chemical combinations with cations (positively charged ions).

It is unknown how much phosphorus is removed in a conventional septic system. Some phosphorus may be taken up by the microorganisms in the septic system and converted to biomass (of course, when these microorganisms die the phosphorus is re-released, so there really is no net loss of phosphorus by this mechanism). Any phosphorus that is removed in the septic system probably is removed under the leaching facility by chemical precipitation.

At slightly acidic pH (as is found in some soils), orthophosphates combine with tri-valent iron or aluminum cations to form the insoluble precipitates $FePO_4$ and $AlPO_4$.

$$Fe^{3+} + (H_nPO_4)^{(3-n)} \rightarrow FePO_4 + nH^+$$

$$Al^{3+} + (H_nPO_4)^{(3-n)} \rightarrow AlPO_4 + nH^+$$

Domestic wastewater usually contains only trace amounts of iron and aluminum. However, where the soils contain significant amounts of iron or aluminum, it is likely that these metals bind with the phosphorus and causes some removal of total phosphorus.

One caveat must be noted. If the soil below the leaching facility becomes anaerobic, iron may become chemically reduced (changed to the Fe^{2+} form), which is soluble and able to travel in groundwater. In this case,

the iron phosphate compounds may breakdown and phosphorus may also become soluble. Anaerobic conditions under the leaching facility can occur when the leaching facility is not well aerated, when there is a small vertical separation to groundwater, or when BOD in the sewage is so high that all oxygen present is depleted to oxidize BOD. Currently, the best method for maximizing phosphorus removal is to locate the leaching facility well above groundwater (>5 feet vertical separation) thereby providing a well-aerated area under the leaching field.

Basics of Sewage Treatment

The treatment of sewage is largely a biochemical operation, where living microorganisms carry out chemical transformations of the sewage. Different environments favor the growth of different populations of microorganisms and this in turn affects the efficiency, end products, and completeness of treatment of the sewage. Sewage treatment systems, whether they are standard septic systems or more advanced treatment technologies, attempt to create specific biochemical environments to control the sewage treatment process.

Three basic types of biochemical transformations occur as sewage is treated. The first is the removal of soluble organic matter. This is composed of dissolved carbon compounds such as detergents, greases, and body wastes, which make up much of the BOD content of the sewage. The second is the digestion and stabilization of insoluble organic matter. These are the sewage solids, such as body wastes and food particles, which make up the remainder of the BOD. The third is the transformation of soluble inorganic matter such as nitrogen and phosphorus.

The two major biochemical environments in which sewage treatment is carried out are termed aerobic and anaerobic environments. An aerobic environment is one in which dissolved oxygen is available in sufficient quantity that the growth and respiration of microorganisms is not limited by lack of oxygen. An anaerobic environment is one in which dissolved oxygen is either not present or its concentration is low enough to limit aerobic metabolism. The biochemical environment has a profound effect upon the ecology of the microbial population that treats the sewage. Aerobic conditions tend to support entire food chains from bacteria up to rotifers and protozoans. These microbes beak down organic matter using many metabolic pathways based on aerobic respiration with carbon dioxide as the main end product. Anaerobic conditions favor the growth of primarily bacterial populations and produce a different variety of end products, which are discussed below.

Anaerobic Digestion of Sewage

Solids in sewage contain large amounts of readily available organic material that would produce a rapid growth of microorganisms if treated aerobically. Anaerobic decomposition is able to degrade this organic material while producing much less (approximately one-tenth) biomass than an aerobic treatment process. The principal function of anaerobic digestion is to stabilize insoluble organic matter and to convert as much of these solids as possible to end products such as liquids and gases (including methane) while producing as little residual biomass as possible. It is for this reason that sewage treatment in a conventional septic tank is designed to be an anaerobic process. Organic matter treated anaerobically is not broken down to carbon dioxide; final end products are low molecular weight acids and alcohols. These may be further converted anaerobically to methane or, if sent to an environment (such as the leaching field) where aerobic bacteria are present, further broken down to carbon dioxide. Anaerobic digestion of organic matter is also a much slower process than aerobic digestion of organics and where rapid digestion of organic matter is needed an aerobic treatment process must be used.

As discussed above, an anaerobic environment is also necessary for denitrification, as the bacteria that carry out this process require anaerobic conditions to reduce nitrate to nitrogen gas. Many nitrogen-removal technologies are designed to provide an anaerobic treatment chamber as part of the treatment process.

Aerobic Treatment of Sewage

As the name implies, this process utilizes aerobic bacteria to break down sewage. The principal advantage of aerobic sewage treatment is its ability to rapidly and completely digest sewage, reducing BOD to low levels. Most of the alternative treatment technologies described in this report utilize some form of aerobic treatment of sewage. This process is used primarily to reduce BOD and, in systems that remove nitrogen, to nitrify the waste so that it can later be denitrified. Because the BOD in raw sewage is usually high, and available oxygen is rapidly consumed by the sewage, most aerobic treatment units are designed to supply supplemental oxygen to the sewage to keep the treatment process aerobic. Some system use extended aeration to more completely digest the sewage solids. Most aerobic treatment units provide some type of artificial medium as a surface on which the sewage-digesting bacteria can grow. A variety of basic designs can be used for this purpose.

Attached culture systems are designed so that wastewater flows over microbial films attached to surfaces in the treatment unit. Placing some type of artificial media, such as foam cubes or various plastic shapes with high surface area, in the treatment chamber, increases the surface

area for growth of the biofilm. The artificial media can sit in the treatment chamber with the effluent circulating through it, usually with supplemental air supplied so that treatment remains aerobic. Alternately, the media may be located outside the treatment chamber and wastewater is passed over the biofilm in intermittent doses. These designs are known as trickling filters and are one of the most common types of on-site treatment unit using attached cultures. Intermittent and recirculating sand filters, while located in separate chambers, can also be considered a form of trickle filter where sand is used as the media for bacterial growth. Because attached culture systems are generally aerobic, a complex community of microorganisms, including aerobic bacteria, fungi, protozoa, and rotifers, develops. These systems are capable of efficient removal of BOD. Being aerobic they will support the growth of nitrifying bacteria and can be used to nitrify wastewater, the first step in nitrogen removal.

Other aerobic systems utilize suspended culture of microorganisms to aerobically treat the sewage. This type of treatment assumes that a resident population of bacteria are present in the solids and sludge in the treatment unit. Vigorous mixing of the sewage in the treatment compartment causes these bacteria to stay in suspension where they can aerobically digest the sewage. This principle is used as part of a batch reactor treatment process. It is also used in many large municipal sewage treatment plants.

The activated sludge process is similar to suspended culture in that it also utilizes the resident population of bacteria in the solids and sludge in the treatment unit, again, usually by mixing of the sewage so that the bacteria are kept in suspension. In the activated sludge process, however, there are usually periods where mixing ceases, and the solids are allowed to settle. It is then assumed that the sludge will become anaerobic and the anaerobic bacteria in the sludge will denitrify the waste. This is the principle used by batch reactors. As the name implies, batch reactors treat sewage in batches. A batch of sewage is allowed to settle so that solids are removed; the batch of sewage is then aerated and mixed and then allowed to settle for a period of anaerobic treatment (this process may be repeated several times on the same batch). When treatment is complete, the finished batch of sewage is pumped out and the next batch enters the unit to begin treatment.

ATTACHMENT D

MAPS – SEPTAGE DISPOSAL SITES

ATTACHMENT D

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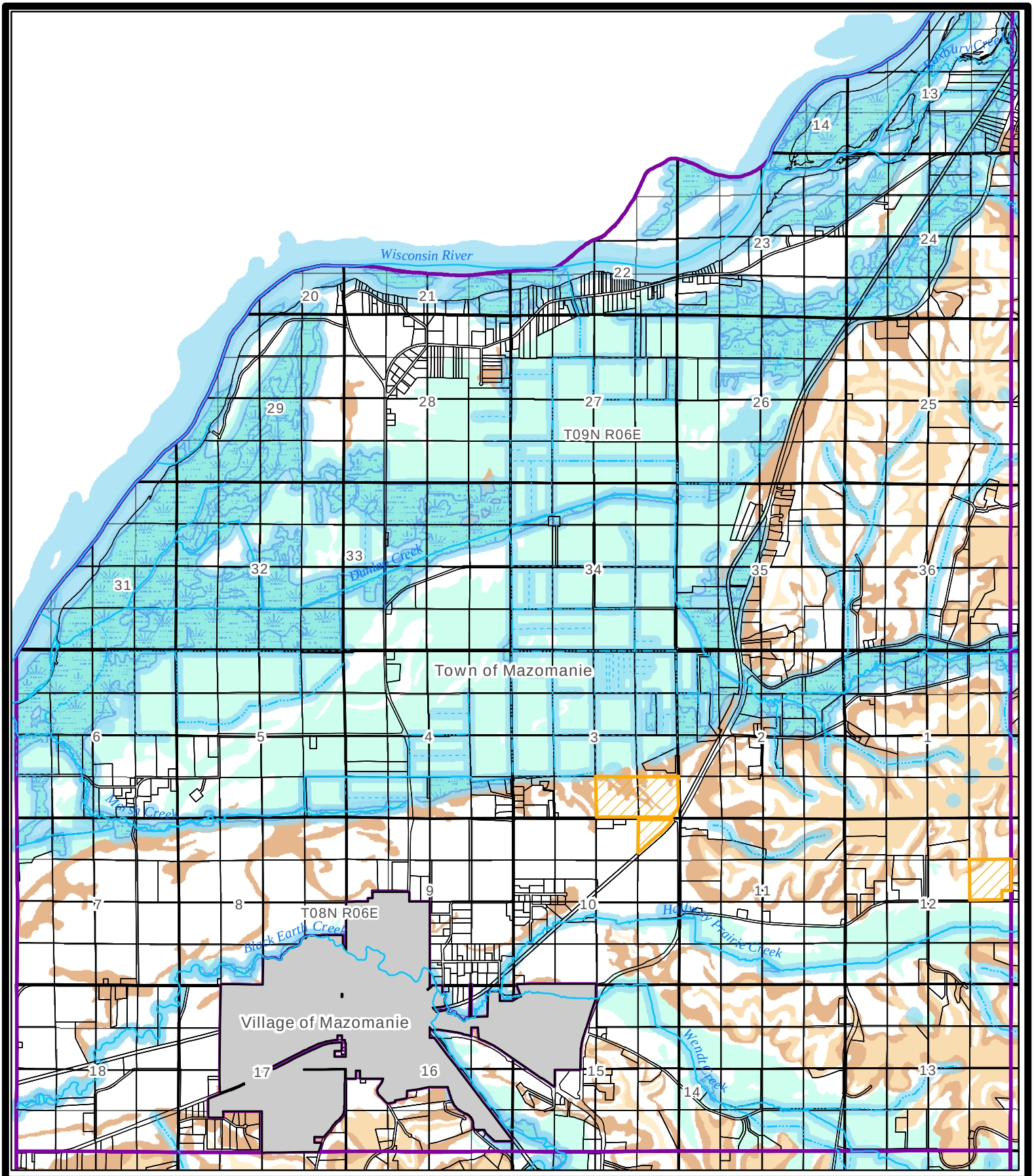

Septage Disposal Sites

- Previously Approved
- Used in 2010
- 200' Water Resource Buffer
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- Groundwater < 3'
- Slopes > 6%

19 Oct. 2011

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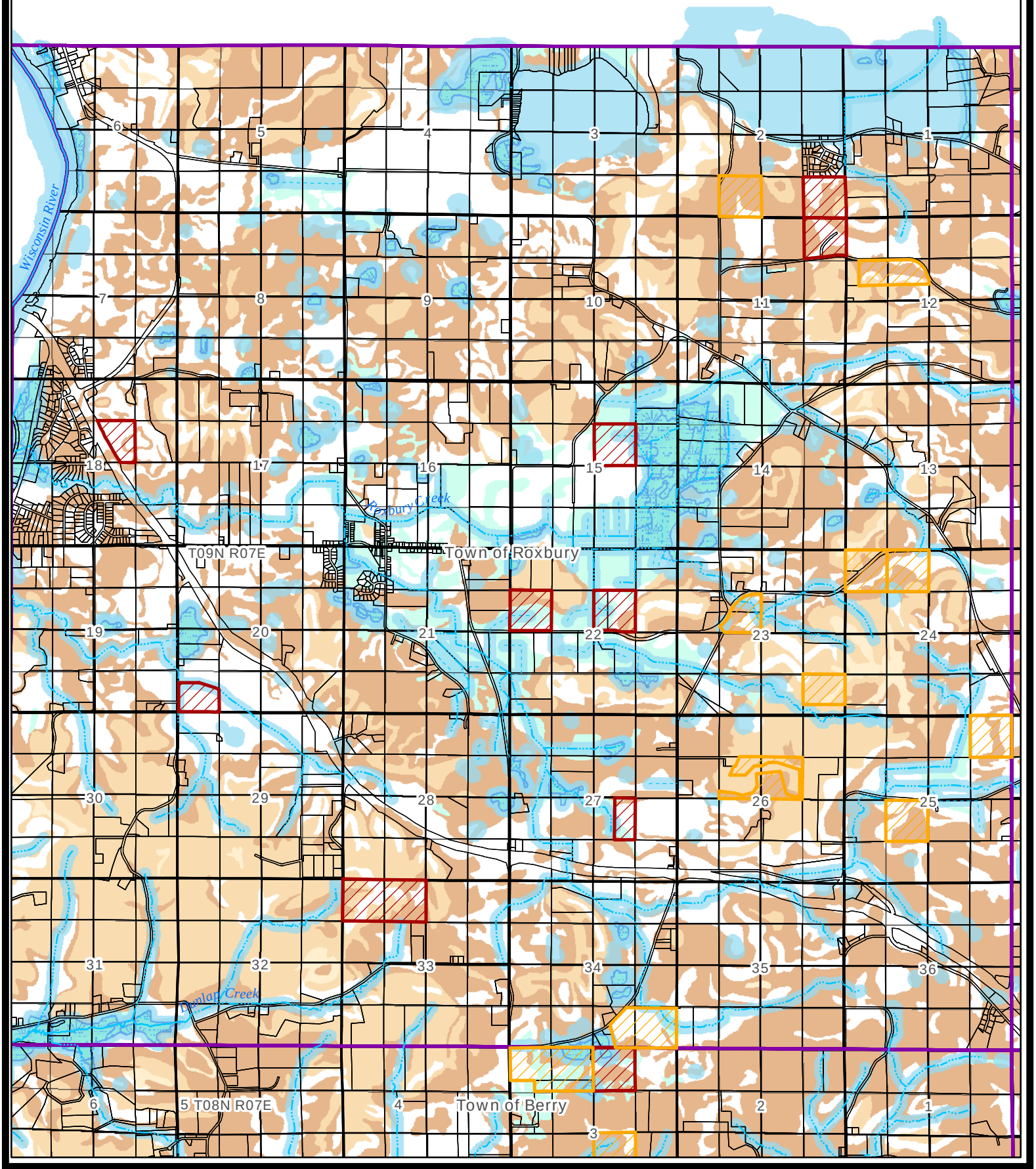
Feet

Prepared by staff of the CARPC.



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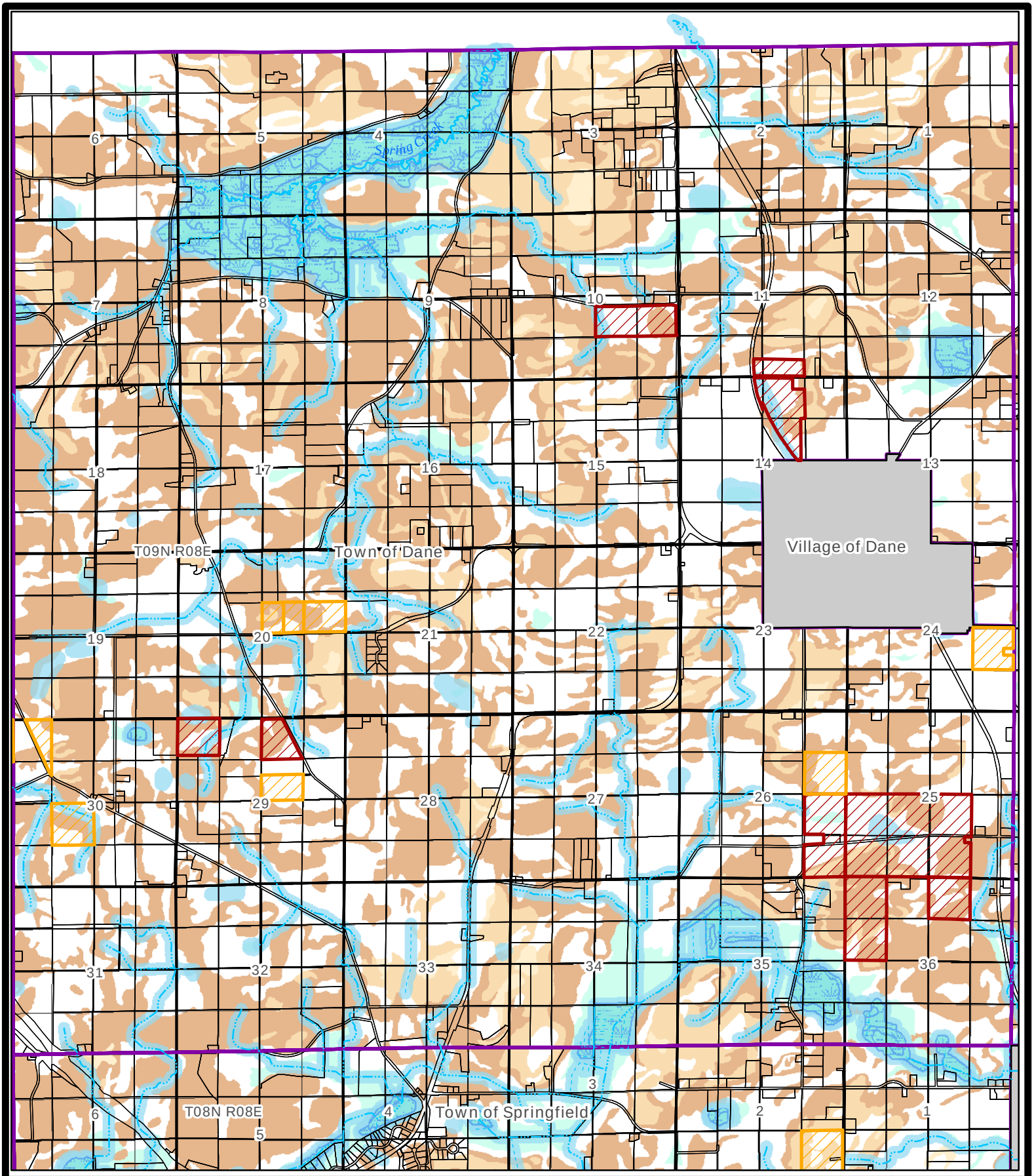

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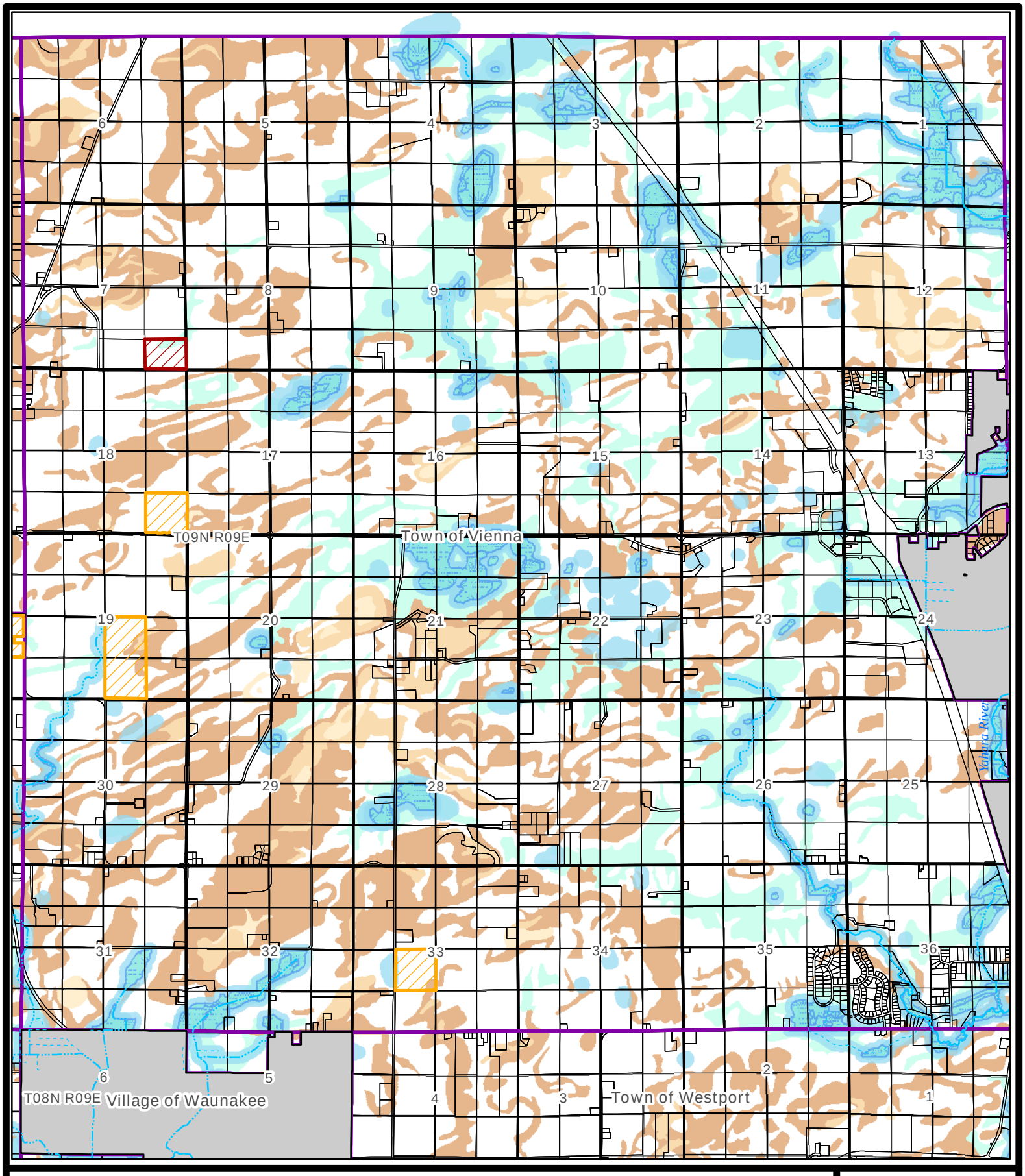

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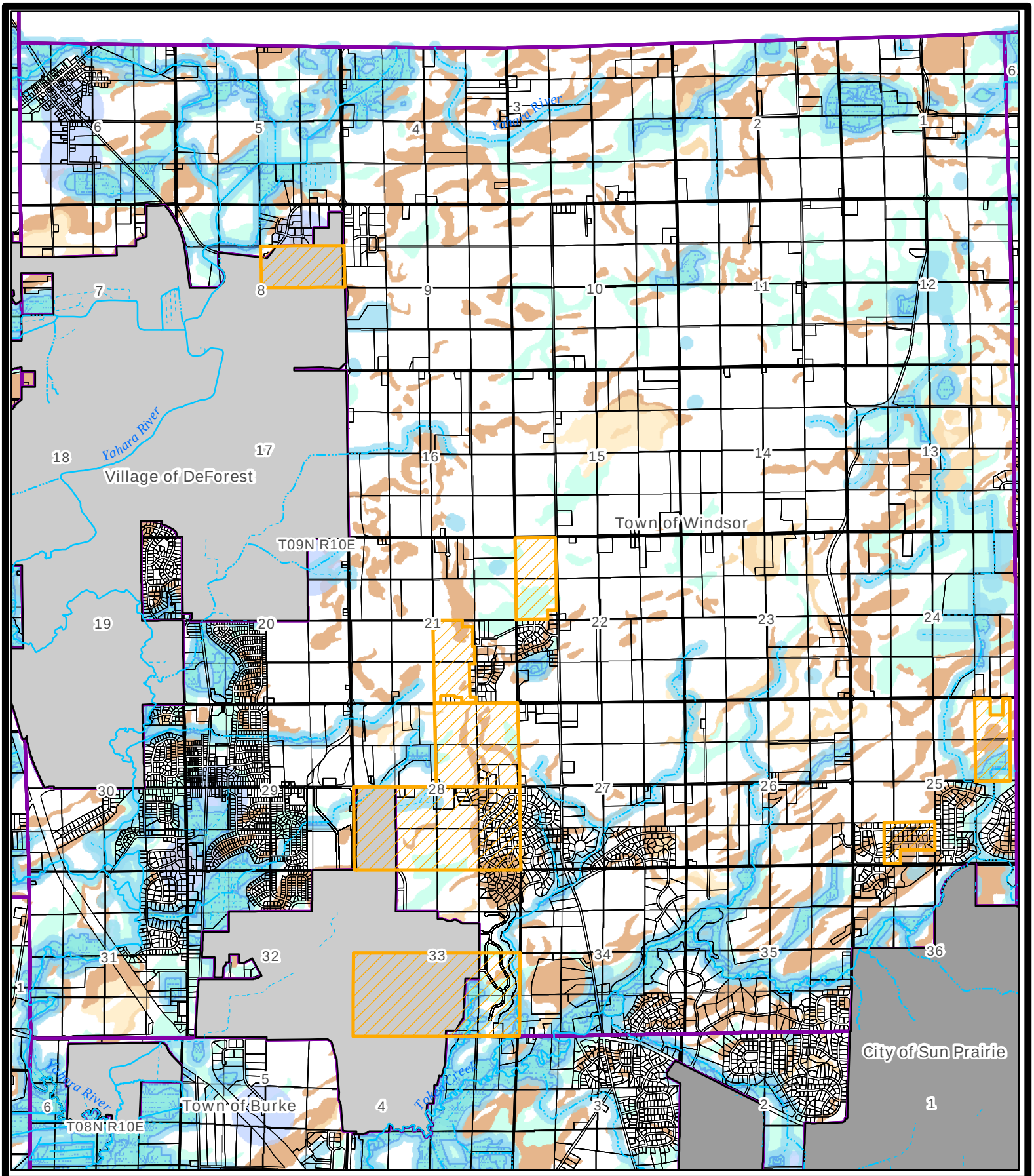

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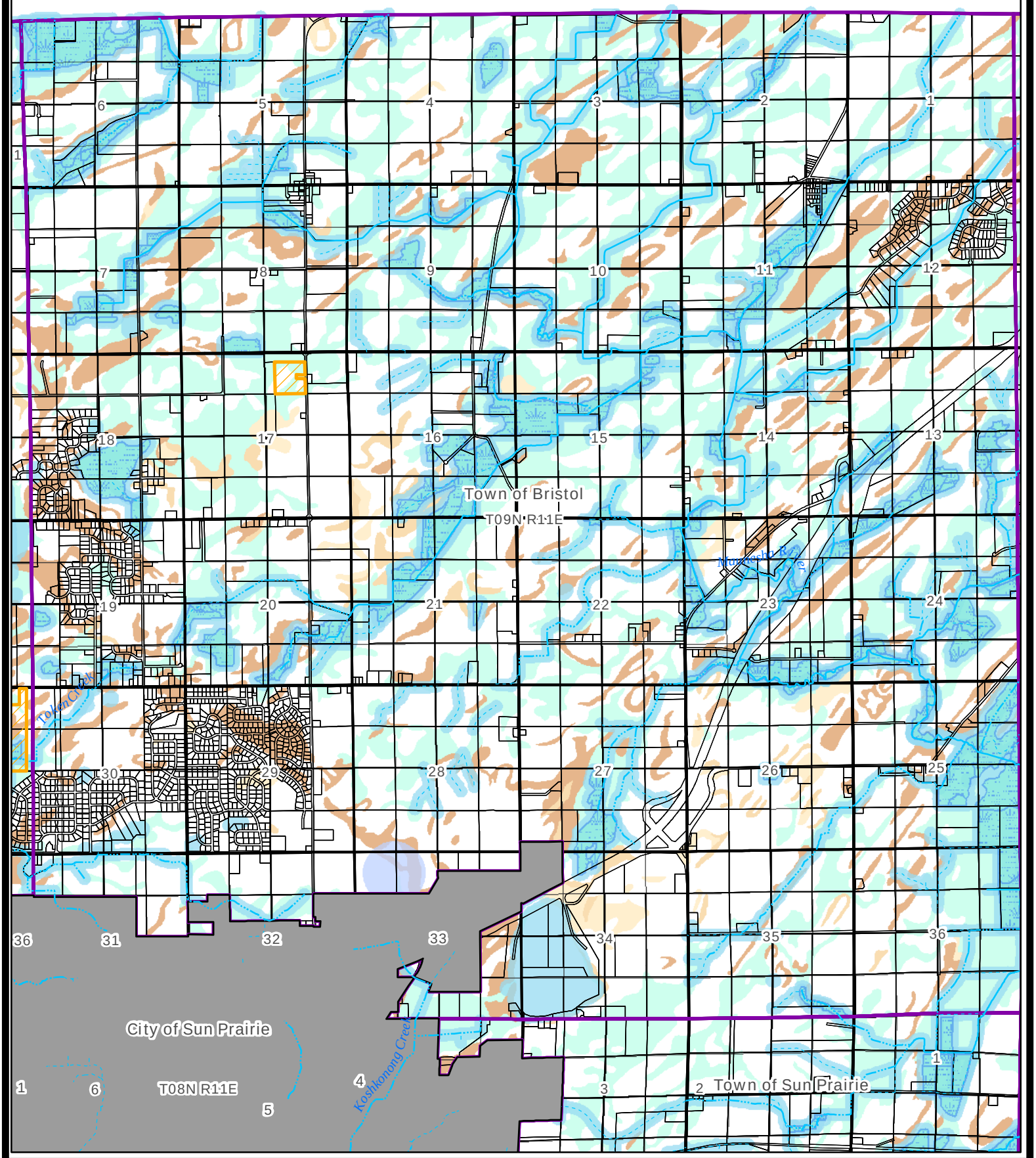

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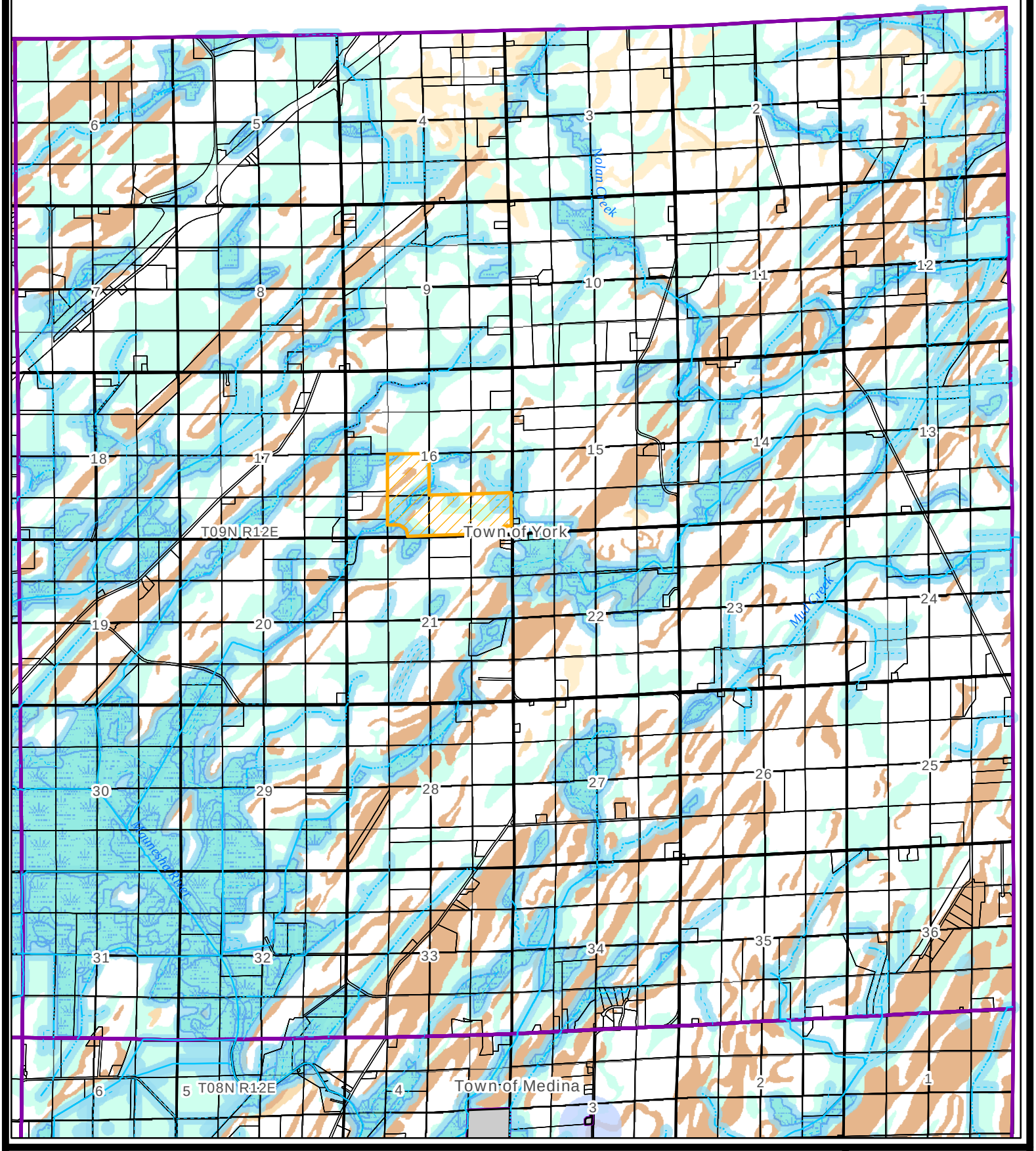

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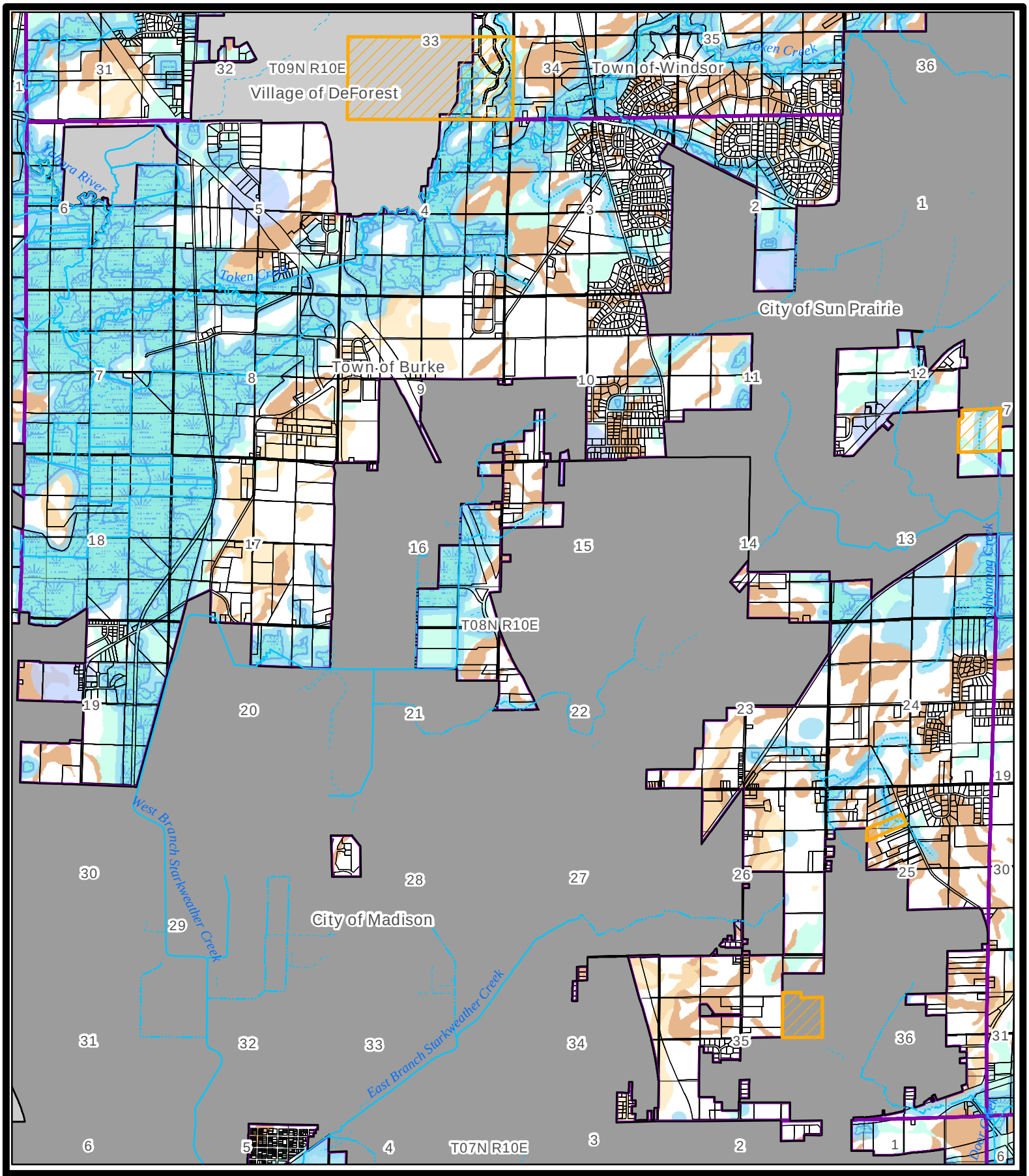

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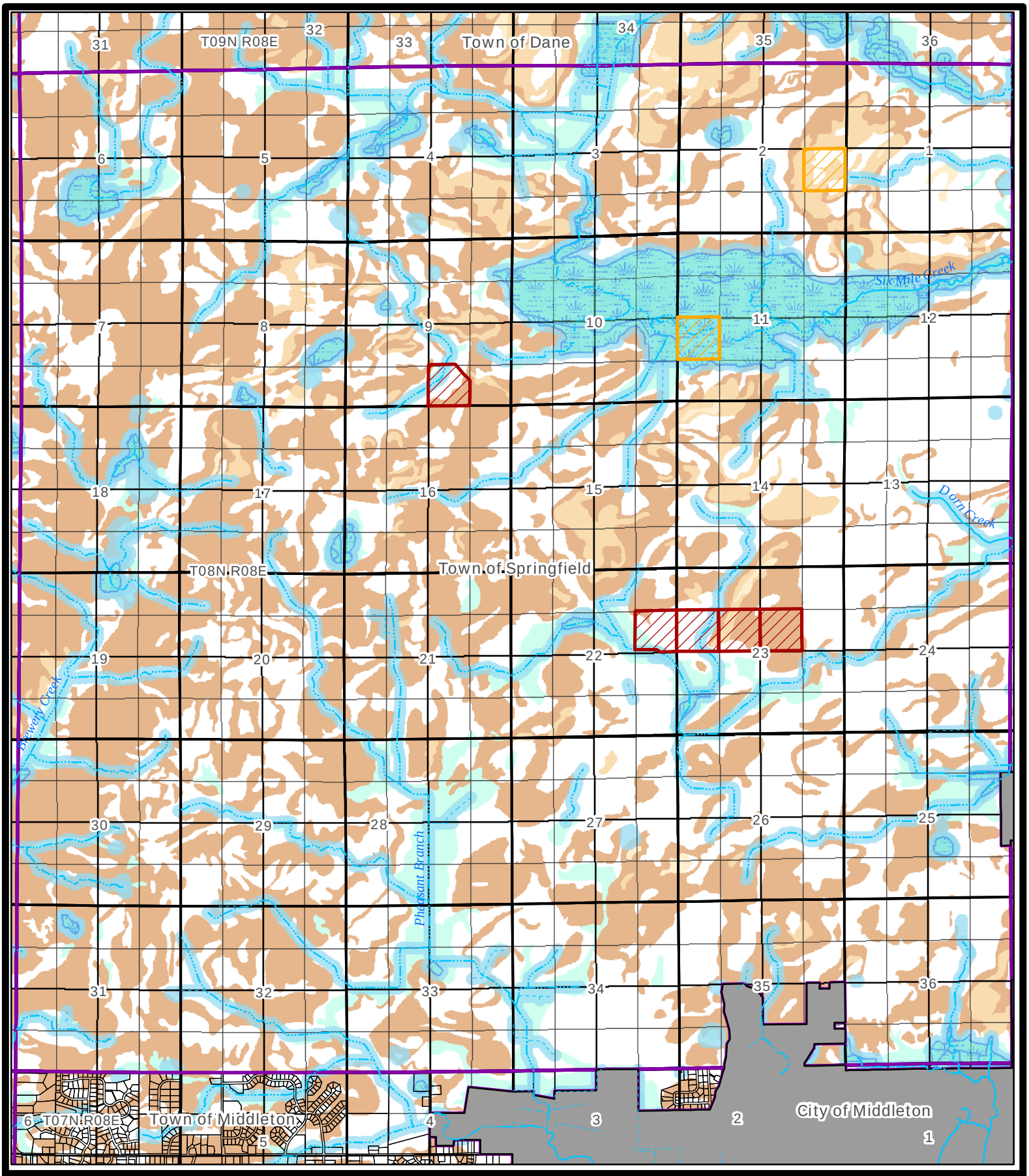

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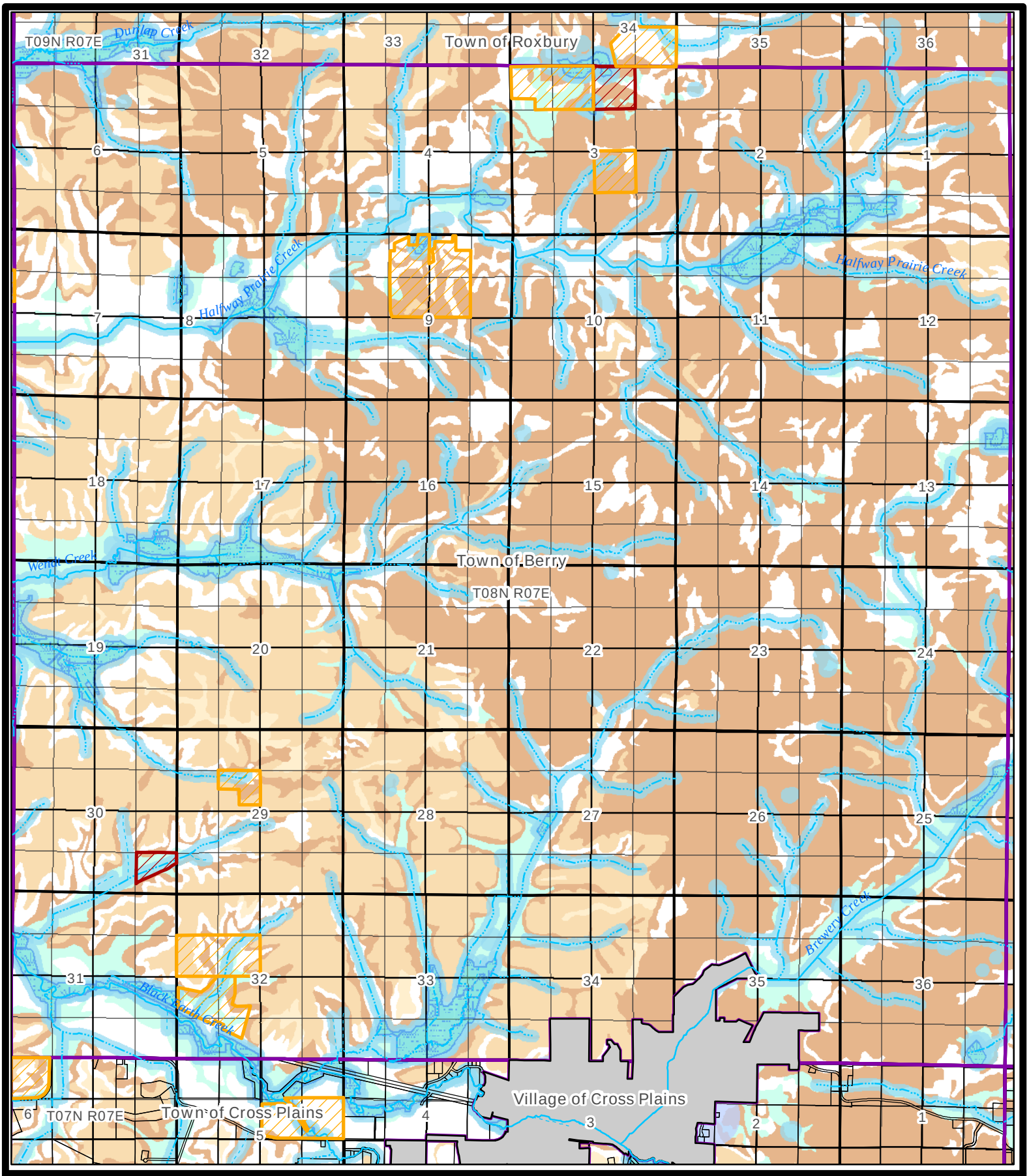

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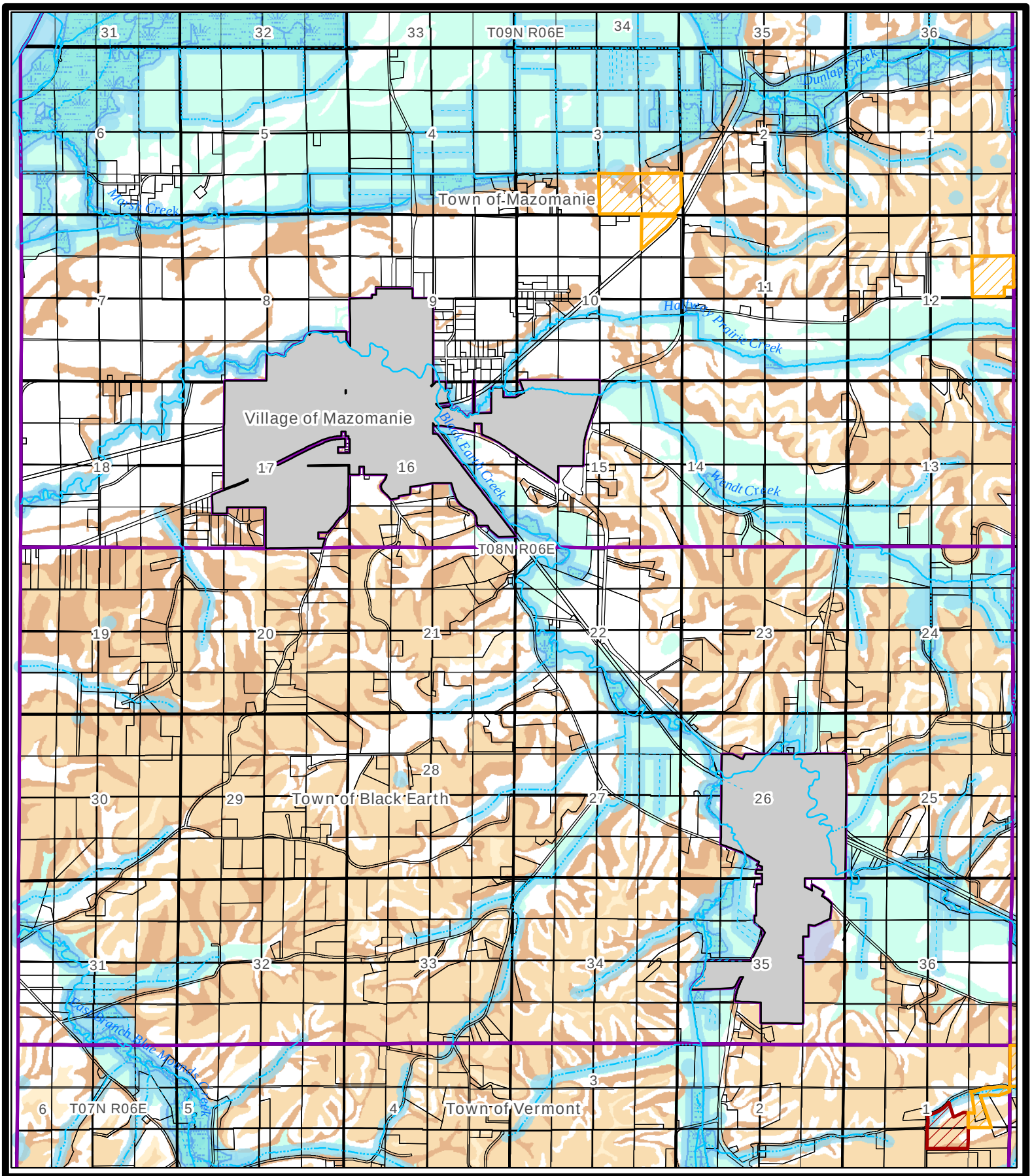

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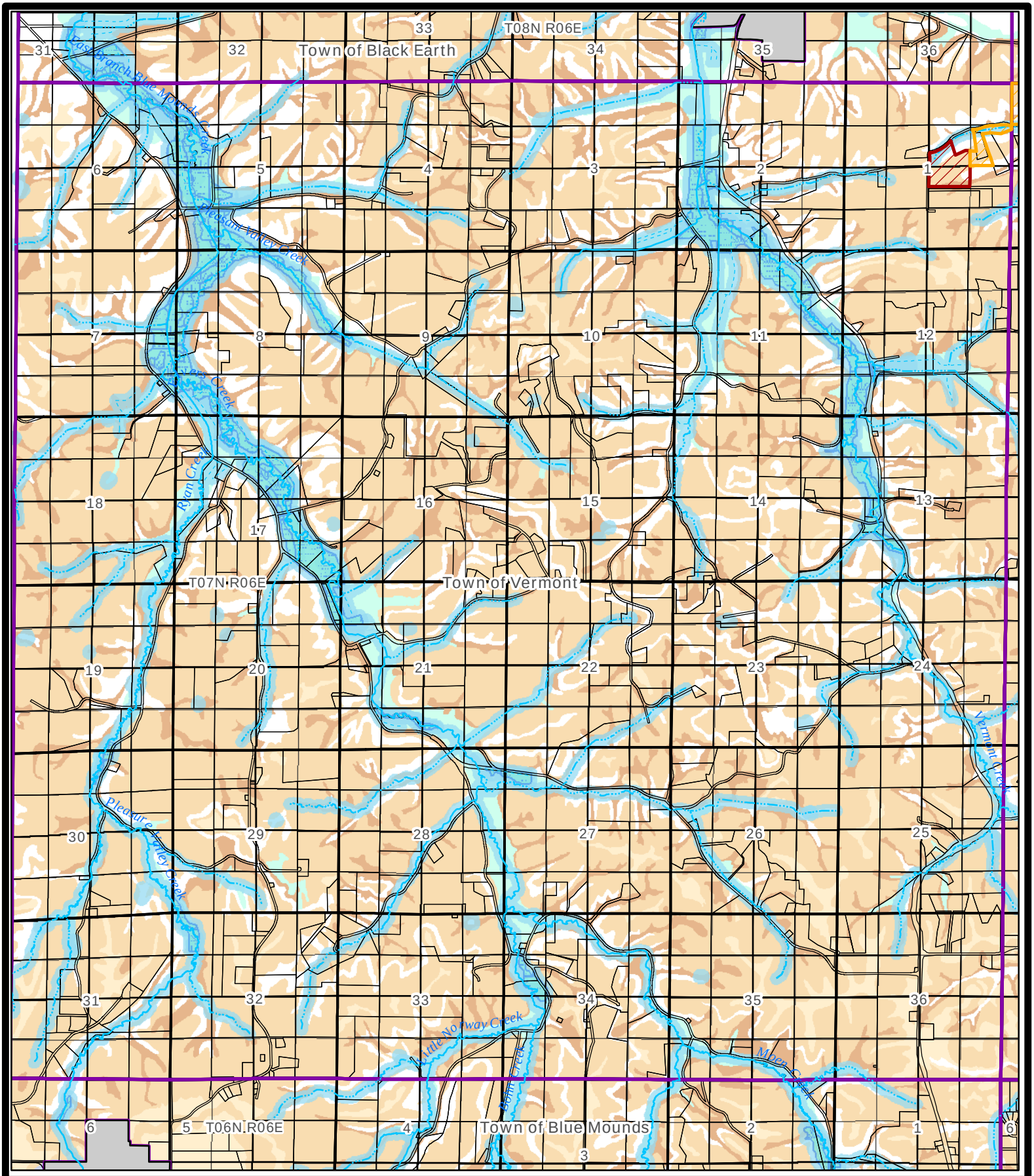

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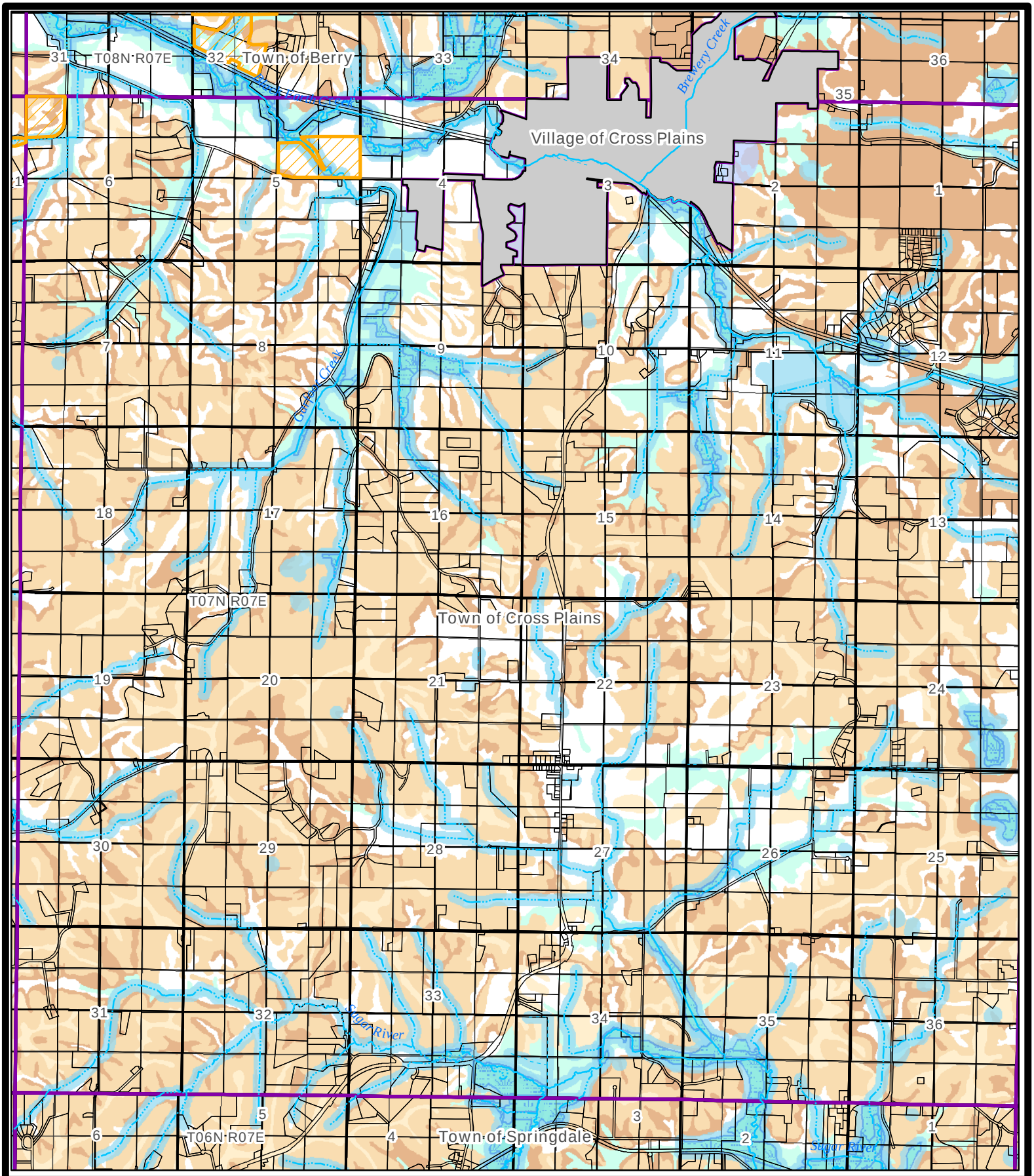

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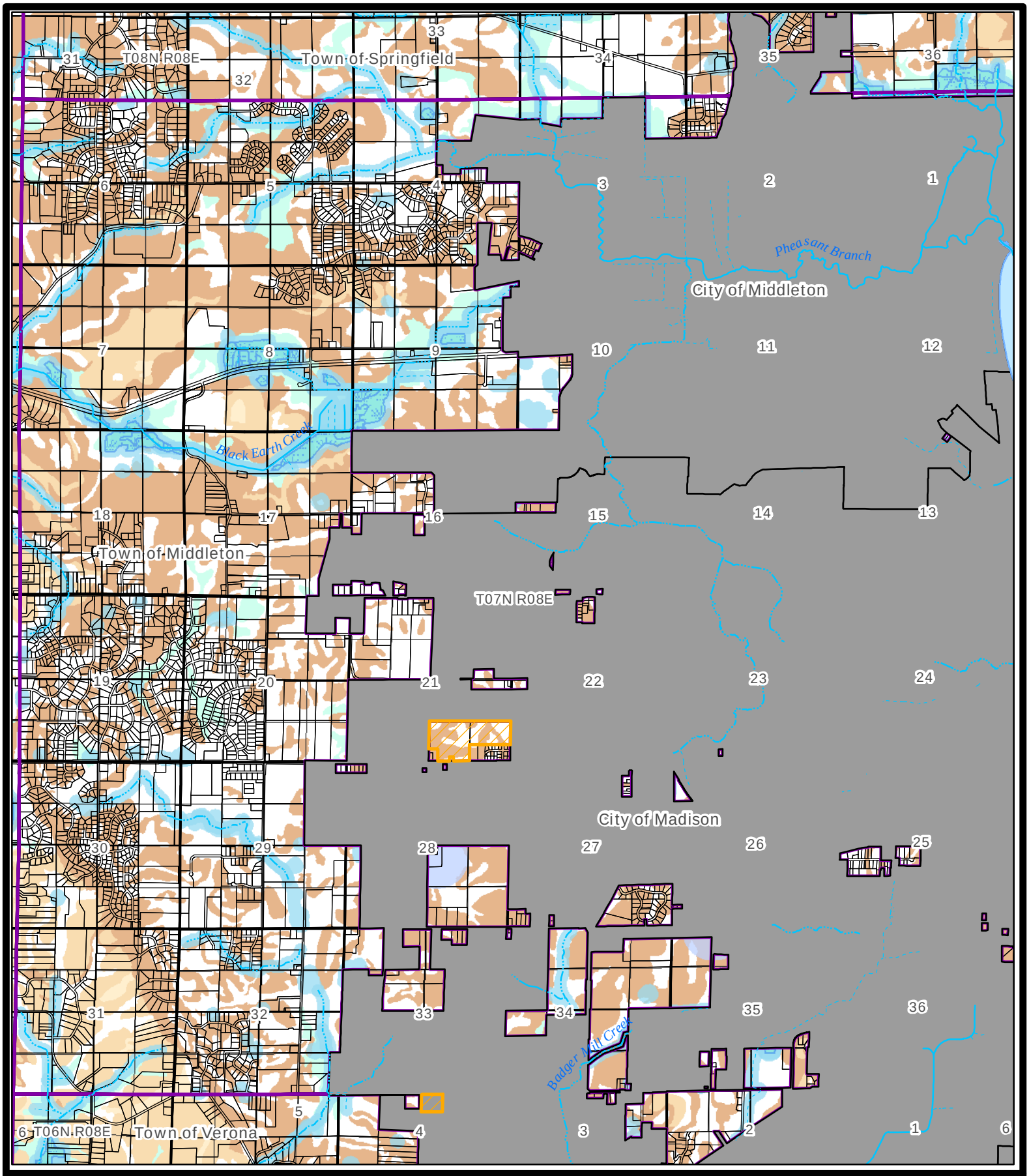

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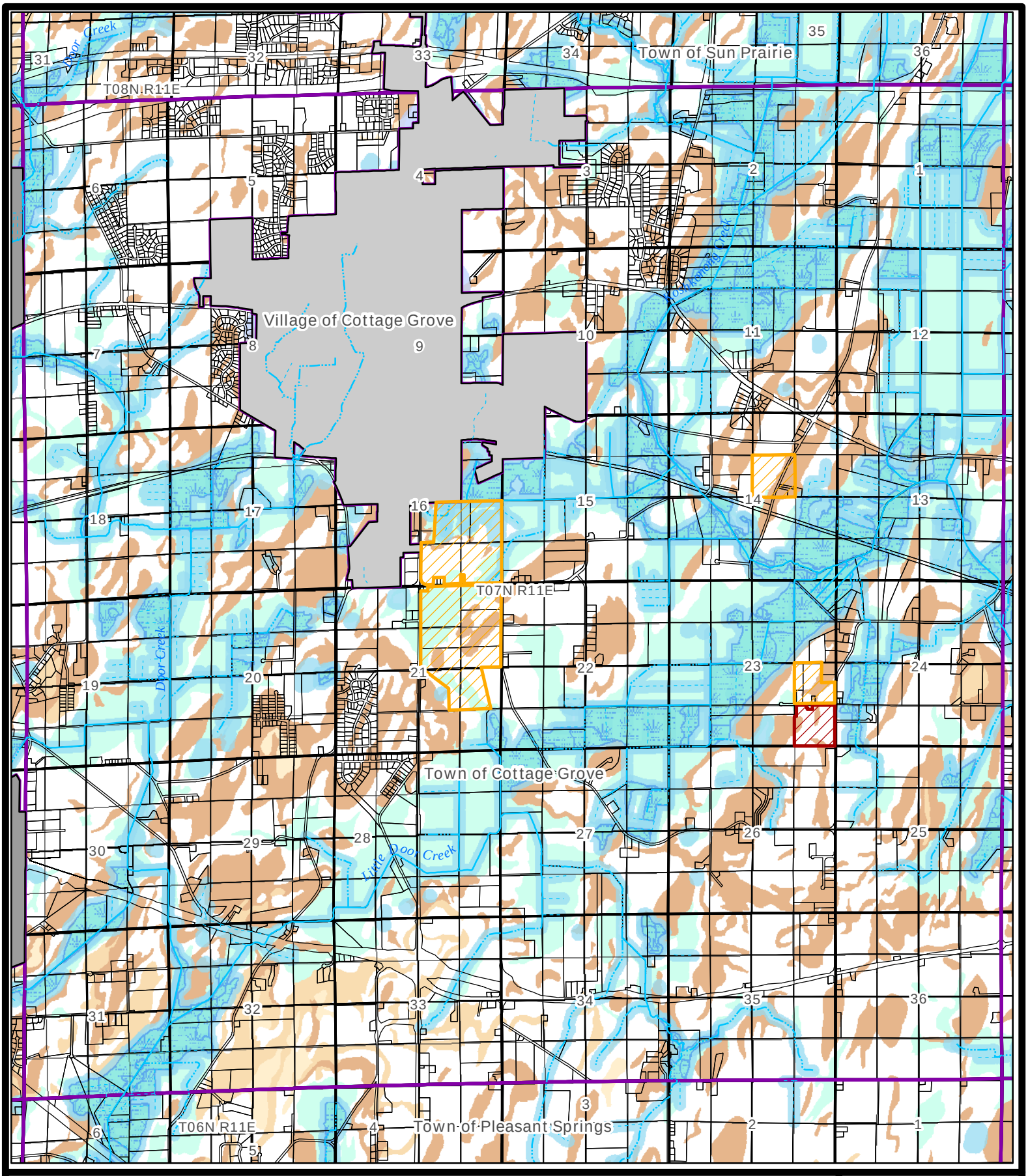

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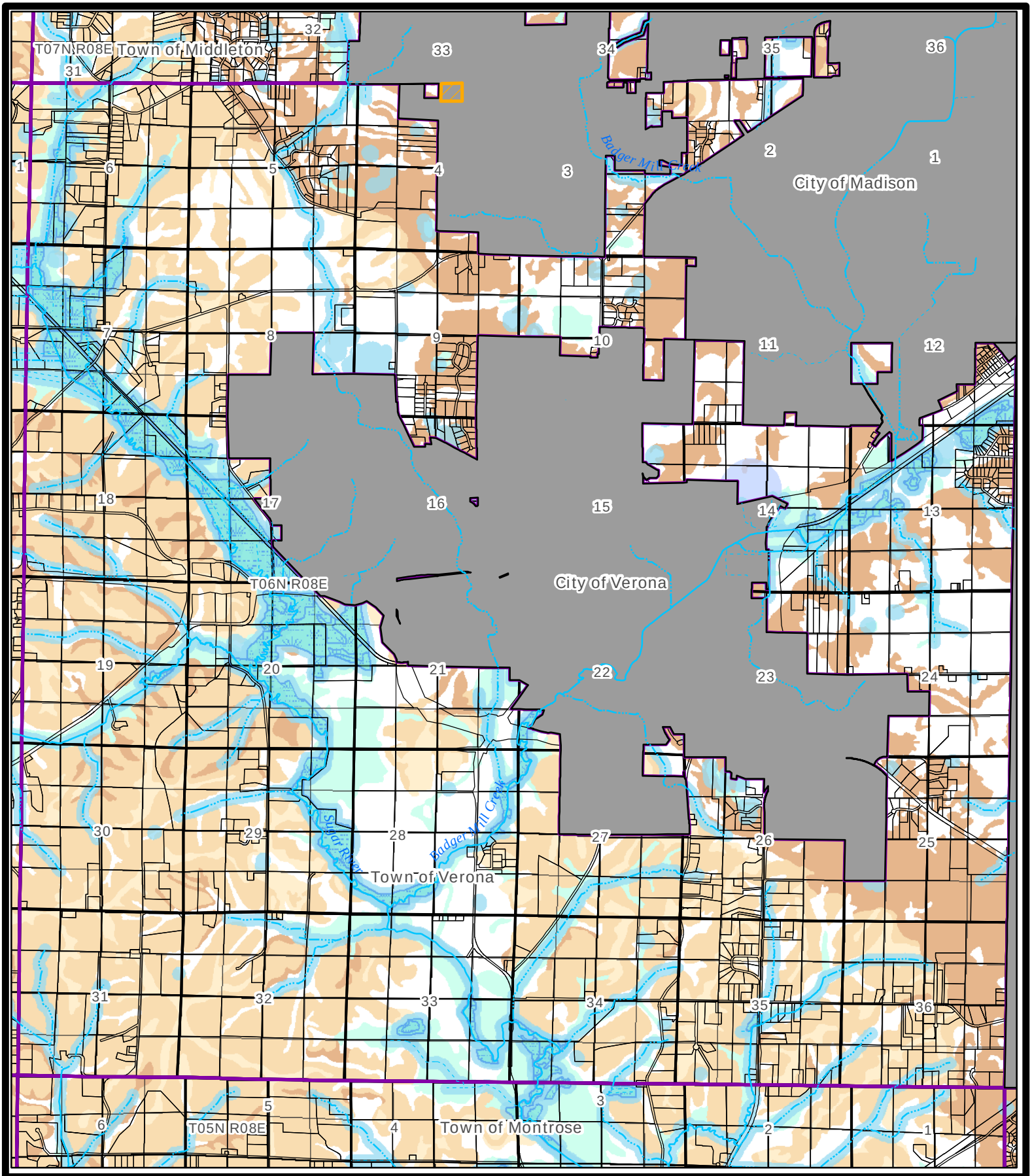

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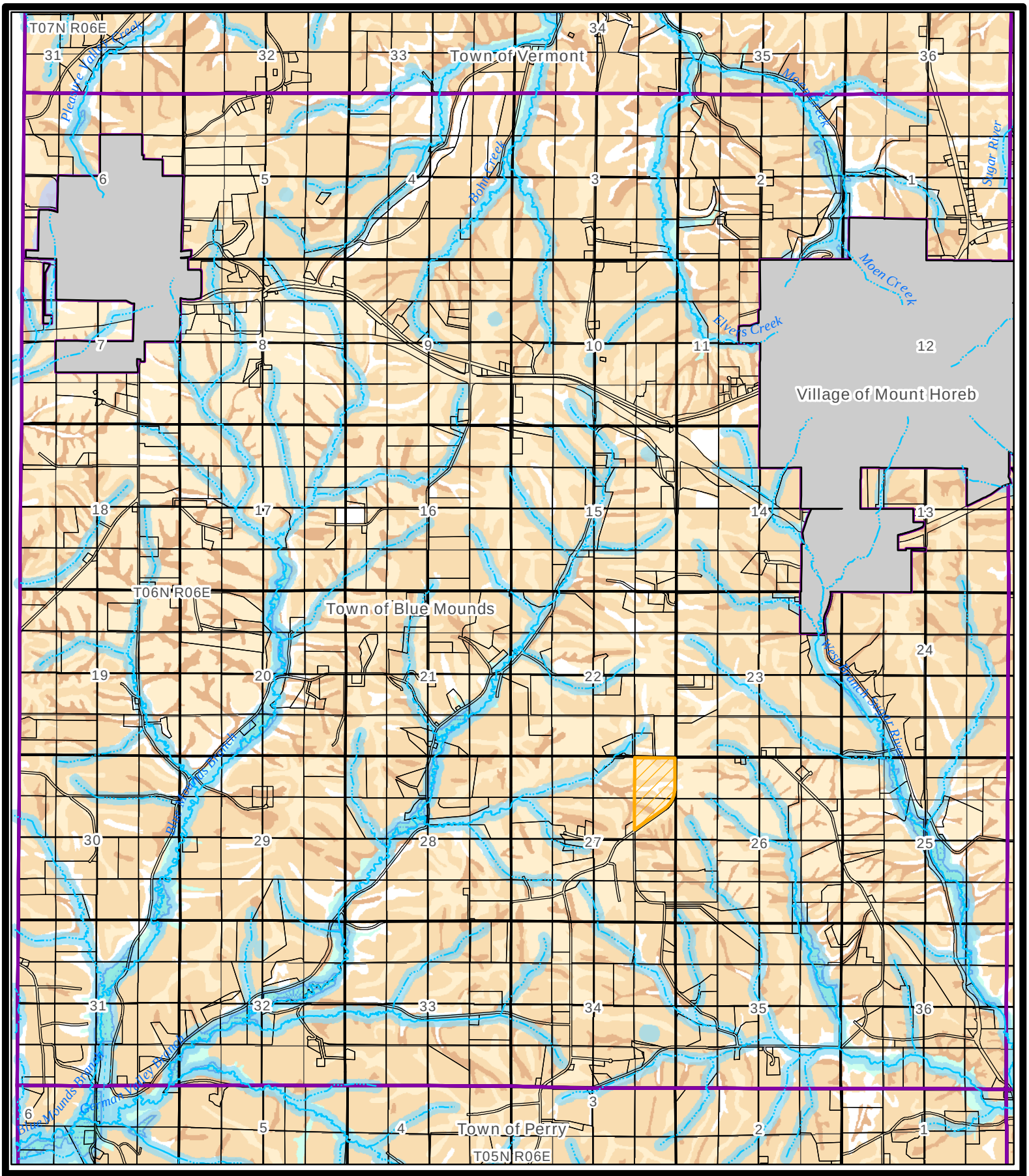

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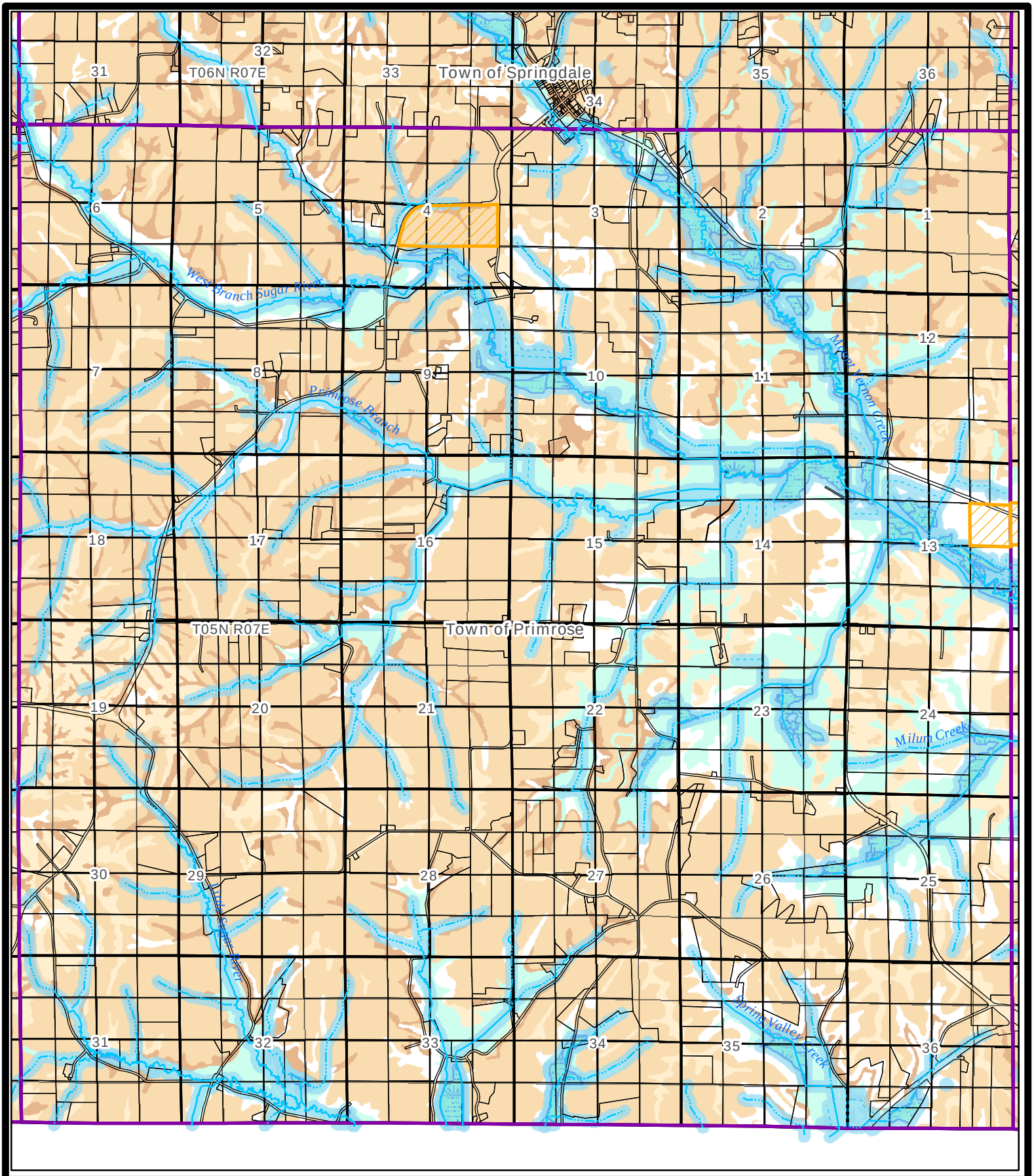

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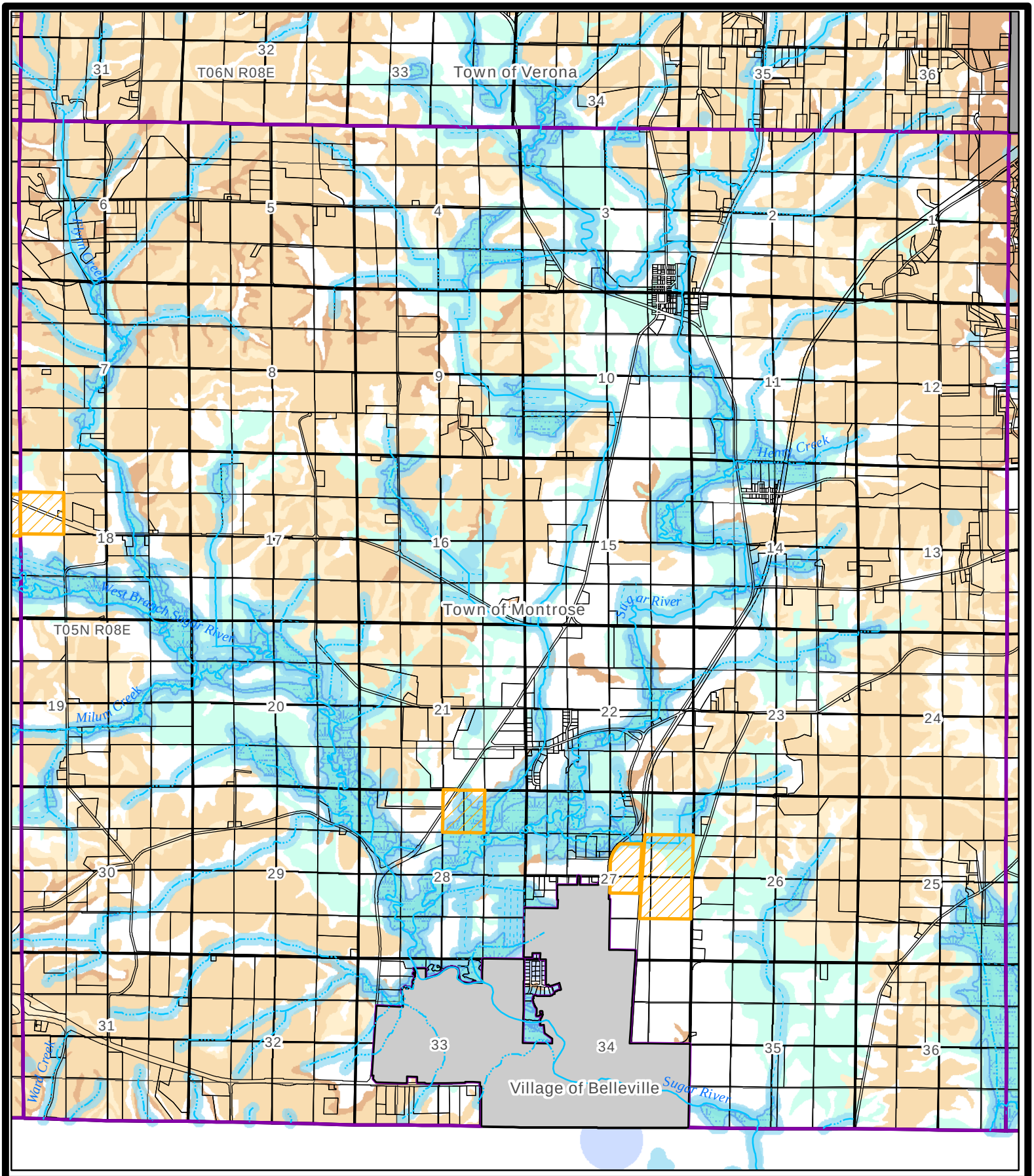

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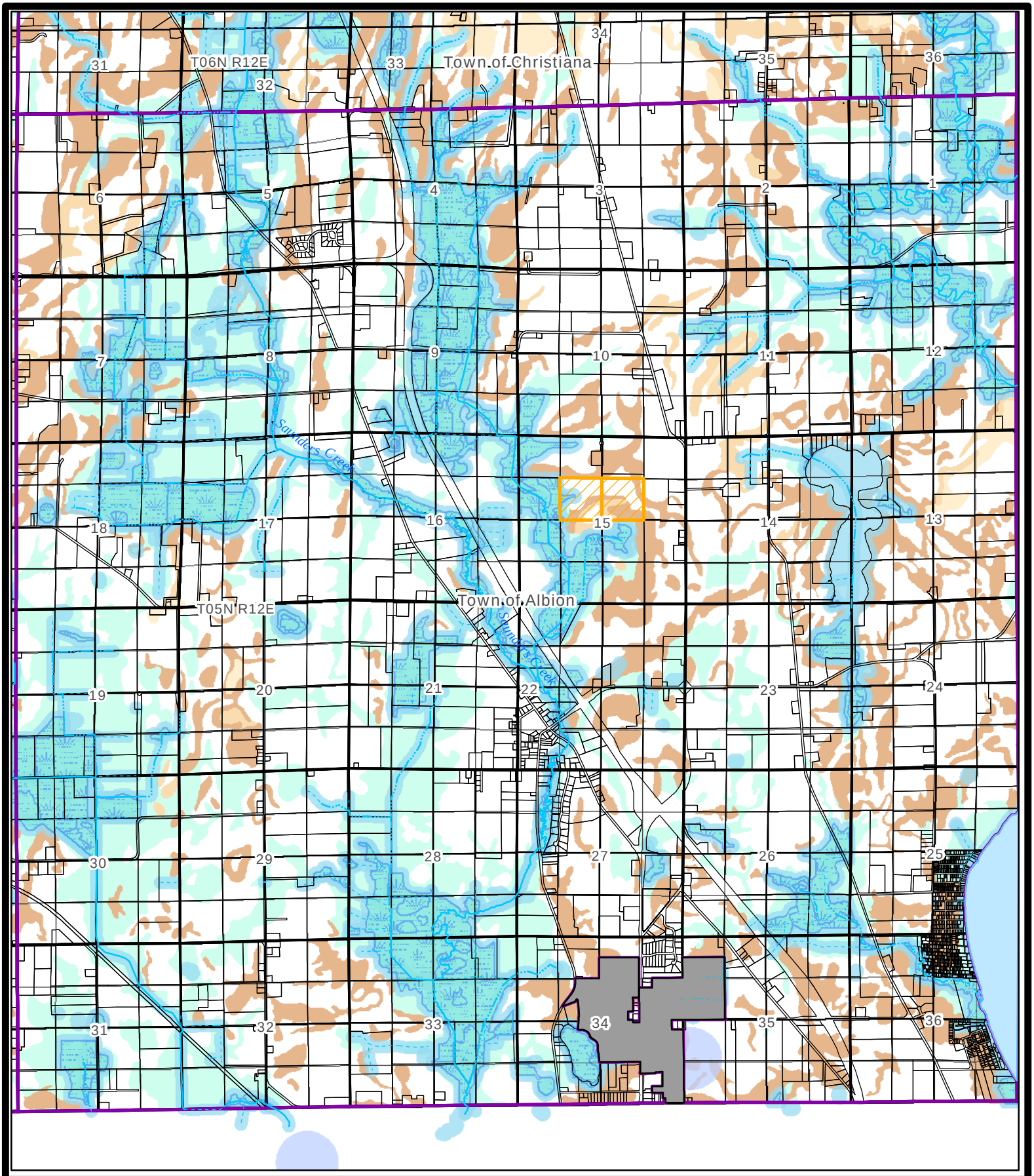
Feet

Prepared by staff of the CARPC.



Septage Disposal Sites

- Previously Approved
- Used in 2010
- 200' Water Resource Buffer
- 1000' Well Buffer
- Bedrock < 3'
- Groundwater < 3'
- Slopes > 6%

19 Oct. 2011

0 4,000

Feet

Prepared by staff of the CARPC.

ATTACHMENT E

PERTINENT REGULATIONS

Chapter SPS 383

PRIVATE ONSITE WASTEWATER TREATMENT SYSTEMS

Note: Chapter H 63 was created as an emergency rule effective 6−21−80; section H 62.20 as it existed on June 30, 1983 was renumbered to chapter ILHR 83. Chapter ILHR 83 was renumbered chapter Comm 83 under s. 13.93 (2m) (b) 1., Stats., and corrections made under s. 13.93 (2m) (b) 6. and 7., Stats., Register, February, 1997, No. 494. Chapter Comm 83 as it existed on June 30, 2000 was repealed and a new chapter Comm 83 was created, Register, April, 2000, No. 532, eff. 7−1−00. Chapter Comm 83 was renumbered chapter SPS 383 under s. 13.92 (4) (b) 1., Stats., Register December 2011 No. 672.

Subchapter I — Scope and Application

SPS 383.01 Purpose. The purpose of this chapter is to establish uniform standards and criteria for the design, installation, inspection and management of a private onsite wastewater treatment system, POWTS, so that the system is safe and will protect public health and the waters of the state.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. Register January 2004 No. 577, eff. 2−1−04.

SPS 383.02 Scope. (1) WASTEWATER GENERATION. Except as delineated in sub. (2), this chapter applies to all of the following:

(a) A situation where domestic wastewater is collected and conducted by means of plumbing drain systems and is not conveyed to a wastewater treatment facility regulated by the department of natural resources.

(b) A POWTS where domestic wastewater is treated and dispersed to the subsurface.

(c) A holding tank that is utilized as a POWTS or as part of a POWTS to collect and hold domestic wastewater for transport and treatment elsewhere.

Note: Section SPS 382.10 (2) (d) states that where plumbing fixtures exist in a building that is not connected to a public sewer system, suitable provision shall be made for treating, recycling, dispersing or holding the wastewater.

Note: The department of natural resources is responsible for establishing, administering and enforcing standards relative to domestic wastewater treatment systems which either disperse to the surface or to surface waters. The department of natural resources also establishes effluent limitations and monitoring requirements where the design daily influent wastewater flow to a POWTS exceeds 12,000 gallons per day for the purpose of fulfilling WPDES permit requirements under ch. 283, Stats.

Note: Pursuant to s. 281.17 (5), Stats., the department of natural resources may also restrict or specify the type of wastewater treatment necessary. Section 281.17 (5) reads:

> The department [department of natural resources] may prohibit the installation or use of septic tanks in any area of the state where the department finds that the use of septic tanks would impair water quality. The department shall prescribe alternate methods for waste treatment and disposal in such prohibited areas.

(2) EXEMPTIONS. This chapter does not apply to:

(a) A POWTS owned by the federal government and located on federal lands; and

(b) A POWTS located or to be located on land held in trust by the federal government for Native Americans.

(3) SUBDIVISION STANDARDS. This chapter does not establish minimum lot sizes or lot elevations under s. 145.23, Stats., for the purpose of the department reviewing proposed subdivisions which will not be served by public sewers under s. 236.12, Stats.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00.

SPS 383.03 Application. (1) INSTALLATIONS. (a) *New POWTS installations.* The design, installation and management of a new POWTS shall conform with this chapter.

Note: Pursuant to s. 145.135 (2) (b), Stats., the approval of a sanitary permit is based on the rules in effect on the date of the permit approval.

(b) *Modifications to existing POWTS.* A modification to an existing POWTS, including the replacement, alteration or addition of materials, appurtenances or POWTS components, shall require that the modification conform to this chapter.

Note: The modification of one part of a POWTS may affect the performance or the operation of other parts of the POWTS thereby necessitating further modifications for the 'other parts' to be or remain compliant with the appropriate edition of the state plumbing code; see sub. (2) (b) 1.

(c) *Modifications to existing structures served by existing POWTS.* When an addition or alteration is proposed to an existing building, structure or facility that is served by an existing POWTS and the proposed addition or alteration will result in a change that affects the wastewater flow or wastewater contaminant load beyond the minimum or maximum capabilities of the existing POWTS, the POWTS shall be modified to conform to the rules of this chapter.

Note: See s. SPS 383.25 (2) relating to the issuance of building permits.

(2) RETROACTIVITY. (a) This chapter does not apply retroactively to an existing POWTS installed prior to July 1, 2000, or for which a sanitary permit has been issued prior to July 1, 2000, except as provided in ss. SPS 383.32 (1) (a) and (c) to (g), 383.54 (4) and 383.55 (1) (b).

(b) 1. Except as provided in subd. 2. and ss. SPS 383.32 (1) (a) and (c) to (g), 383.54 (4) and 383.55 (1) (b), an existing POWTS installed prior to July 1, 2000, shall conform to the siting, design, construction and maintenance rules in effect at the time the

sanitary permit was obtained or at the time of installation, if no permit was issued.

2. a. An existing POWTS installed prior to December 1, 1969 with an infiltrative surface of a treatment and dispersal component that is located 2 feet or more above groundwater or bedrock shall be considered to discharge final effluent that is not sewage, unless proven otherwise.

b. An existing POWTS installed prior to December 1, 1969 with an infiltrative surface of a treatment and dispersal component that is located less than 2 feet above groundwater or bedrock shall be considered to discharge final effluent that is sewage, unless proven otherwise.

(c) An existing POWTS which conforms with this chapter shall be permitted to remain as installed.

(3) PLAT RESTRICTIONS. The department shall consider a restriction or a prohibition placed on a lot or an outlot prior to July 1, 2000, as a result of its plat review authority under s. 236.12, Stats., waived, if a POWTS proposed for the lot complies with this chapter.

Note: The waiving of a restriction or prohibition placed on a lot or outlot by the department is a review action. Pursuant to s. SPS 302.635, a fee is needed to initiate the review action.

Note: Under the provisions of ch. 236, Stats., the department of administration and local municipalities have review authority over lots in subdivisions not served by public sewers. A written release of a restriction or prohibition may be required by the department of administration and local municipality. A Correction Instrument may be required under the provisions of s. 236.295, Stats.

(4) GROUNDWATER STANDARDS. (a) Pursuant to s. 160.255, Stats., the design, installation, use or maintenance of a POWTS is not required to comply with the nitrate standard specified in ch. NR 140 Table 1, except as provided under sub. (5).

(b) Pursuant to s. 160.19 (2) (a), Stats., the department has determined that it is not technically or economically feasible to require that a POWTS treat wastewater to comply with the preventative action limit for chloride specified in ch. NR 140 Table 2 as existed on June 1, 1998.

Note: The prevention action limit for chloride as a performance standard relative to the design and management of a POWTS has been determined to be unfeasible because anion exchange is the only chemical process capable of removing chloride from water. The physical processes of removing chloride, such as through evaporation and reverse osmosis, would separate feedwater into two streams, one with a reduced chloride content and the other with an increased chloride content, and result in still having to treat and dispose of chloride contaminated wastewater. The design and management practice to address the enforcement standard for chloride as it relates to a POWTS is addressed under s. SPS 382.40 (8) (j).

(5) LOCAL ORDINANCES. (a) Pursuant to ss. 59.70 (5) (a), 145.02 (2) and 145.13, Stats., this chapter is uniform in application and a governmental unit may not enact an ordinance for the design, installation, inspection and management of a POWTS which is more or less stringent than this chapter, except as specifically permitted by rule.

(b) Except as provided in s. SPS 383.25 (1) (b), a governmental unit shall submit to the department any proposed ordinance or proposed ordinance revision relating to POWTS. The proposed ordinance or revision shall be submitted for review a minimum of 30 calendar days prior to the first scheduled public hearing date regarding the ordinance.

Note: Pursuant to ss. 59.69, 60.62, 61.35 and 62.23, Stats., this chapter does not affect municipal authority for zoning, including establishing nitrate standards as part of a zoning ordinance to encourage the protection of groundwater resources.

(6) DEPARTMENT AUTHORITY. A department interpretation of the requirements in this chapter shall supersede any differing interpretation by a lower level jurisdiction. A department decision on the application of the requirements in this chapter shall supersede any differing decision by a lower level jurisdiction.

Note: A decision of the department may be appealed. Section 101.02 (6) (e), Stats., outlines the procedure for submitting requests to the department for appeal hearings and the department procedures for hearing appeals.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. (2) (b) 1., r. and recr. (5) Register January 2004 No. 577, eff. 2−1−04; CR 07−100: renum. (5) to be (5) (a), cr. (5) (b) and (6) Register September 2008 No. 633, eff. 10−1−08; correction in (2) (a), (b), (5) (b) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.04 Implementation. (1) For the purpose of facilitating inspection responsibilities and services, a governmental unit may not issue a sanitary permit for the construction or use of a POWTS that utilizes any of the technologies, designs or methods delineated in Table 383.04−1 and that has been recognized under s. SPS 384.10 (3) or 383.22, unless the governmental unit utilizes one or more individuals, who have obtained approved training under s. SPS 383.05 for the POWTS technology, design or method, to provide the inspections under s. SPS 383.26 (2) to (4), except as provided in sub. (2).

(2) A governmental unit may issue a sanitary permit for the construction or use of a POWTS that utilizes any of the technologies, designs or methods delineated in Table 383.04−1 and that has not been recognized under s. SPS 384.10 (3), but has been approved by the department under s. SPS 383.22, provided that governmental unit has arranged with the department to provide the inspections under s. SPS 383.26 (2) to (4).

Table 383.04−1
Restricted Technologies

	Technology
1.	Pressurized distribution component with less than 1/8 inch orifice diameter.[a]
2.	Mechanical POWTS treatment component.[b]
3.	Disinfection unit.[c]
4.	Sand, gravel or peat filter as a POWTS treatment component.[d]

[a] Includes drip distribution.
[b] Includes an aerobic treatment tank or a complete treatment unit within a tank.
[c] Includes a chlorinator, ozonation unit, and ultraviolet light unit.
[d] Does not include a mound system.

Note: The provisions of this section relating to a governmental unit's ability to limit the issuance of sanitary permits for new development does not dictate a specific strategy as to the scope of the limitation. Therefore, limitation options include, but are not limited to, a prohibition for all new development or in certain geographical areas, a quota system for new development, a requirement for a permit to operate for a specific POWTS method or technology, or a service/performance bond for a specific POWTS method or technology.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. Table 83.04−1 footnote [a], r. (2) and Table 83.04−2, renum. (3) to be (2) Register January 2004 No. 577, eff. 2−1−04; CR 07−100: renum. (1) (a) and (b) to be (1) and (2), r. (2) Register September 2008 No. 633, eff. 10−1−08; correction in (1) made under s. 13.92 (4) (b) 7., Stats., Register September 2008 No. 633; correction in (1), (2) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.05 Installation and inspection training. (1) PROGRAM SPECIFICATIONS. Only courses, programs and seminars approved in writing by the department shall be used to fulfill the required training for the POWTS technologies and methods under ss. SPS 383.04 (1) and 383.21 (2) (c) 4.

(2) EVIDENCE OF COMPLIANCE. An individual who has completed the installation and inspection training shall be responsible for retaining evidence of achieving the training in order to fulfill the obligations under ss. SPS 383.04 (1) and 383.21 (2) (c) 4.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 07−100: renum. (1) (a) to be (1) and am., r. (1) (b) to (e) Register September 2008 No. 633, eff. 10−1−08; correction in (1), (2) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

Subchapter II — Administration and Enforcement

SPS 383.20 Purpose. (1) This subchapter establishes the following:

(a) Regulatory processes and procedures which are to be followed when designing, installing or maintaining a POWTS; and

(b) Responsibilities and actions of the various governmental agencies involved with the administration and enforcement of this chapter

Note: Section 145.20 (1) (a), Stats., states that the governing body of the governmental unit responsible for the regulation of private sewage systems may assign the duties of administering the private sewage system program to any office, department, committee, board, commission, position or employee of that governmental unit.

(2) Except as provided in this chapter nothing shall limit the authority and power of a governmental unit in exercising administration and enforcement responsibilities regarding a POWTS, including requiring and issuing other types of permits for activities not covered under this subchapter relating to sanitary permits.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 07−100: am. (2) Register September 2008 No. 633, eff. 10−1−08.

SPS 383.21 Sanitary permits. (1) GENERAL. (a) Pursuant to ss. 145.135 and 145.19, Stats., the installation or construction of a POWTS may not commence or continue unless all of the following have been fulfilled:

1. The owner of the property on which the POWTS is to be installed possesses a valid sanitary permit.

2. Plan approval for the POWTS has been obtained in accordance with s. SPS 383.22.

(b) The modification of an existing POWTS may not commence or continue unless the owner of the property on which the POWTS is located possesses a valid sanitary permit and has obtained plan approval for the modification under s. SPS 383.22, if the modification involves the addition or replacement of any of the following:

1. A POWTS holding component.

2. A POWTS treatment component.

3. A POWTS dispersal component.

(2) APPLICATION. (a) The application for a sanitary permit shall be made in a format prescribed by the department.

Note: Department forms required in this chapter are available for a nominal fee at telephone 800−DOC−SALE or Contact Through Relay or at doc-sales@doa.state.wi.us, or at no charge at the Department's Web site http://dsps.wi.gov through links to Safety and Buildings Division forms.

(b) 1. Except as provided in subd. 2., the application for a sanitary permit shall be submitted to the appropriate governmental unit where the POWTS is located or will be located.

2. The application for a sanitary permit shall be submitted to the department for a POWTS that is located or will be located on property owned by the state.

Note: Section 145.20 (2) (b), Stats., states that the governmental unit responsible for regulation of private sewage systems shall approve or disapprove applications for sanitary permits and assist applicants in preparing an approvable application.

(c) The application for a sanitary permit to the governmental unit shall be accompanied by all of the following:

1. At least one set of clear and legible plans and specifications delineating the information under s. SPS 383.22 (2) (a) 3. and (c).

2. A set of plans bearing the department's conditional approval and the approval letter issued by the department, if required to be reviewed by the department under s. SPS 383.22 (1).

3. Sufficient supporting information to determine whether the proposed design, installation and management of the POWTS or the proposed modification to an existing POWTS conforms with this chapter.

4. Documentation that the master plumber or the master plumber−restricted service who is to be responsible for the installation or modification of the POWTS has completed approved training or has documentation that approved training will be provided during the installation of the POWTS, if the application for the sanitary permit involves one or more of the technologies or methods specified in s. SPS 383.04 (1).

5. Documentation that maintenance requirements for the proposed POWTS technology or method have been recorded with the deed for the property, if the management plan for the installation or modification under s. SPS 383.54 (1) involves one or more of the following:

a. Evaluating or monitoring any part of the system at an interval of 12 months or less.

b. Servicing or maintaining any part of the system at an interval of 12 months or less.

6. Any other information as specified by local ordinance relating to POWTS installations.

7. A fee as specified by the governmental unit.

Note: Section 145.19 (2) to (6) reads:

"(2) FEE. No fee for a sanitary permit may be less than $61, or the amount determined under department rule. The governing body for the governmental unit responsible for the regulation of private sewage systems may establish a fee for a sanitary permit which is more than $61, or the amount determined under department rule. [Pursuant to s. SPS 302.67 (1), the minimum sanitary permit fee is $116.]

(3) COPY OF PERMIT FORWARDED TO THE DEPARTMENT. The governmental unit responsible for the regulation of private sewage systems shall forward a copy of each valid sanitary permit and $20, or the amount determined under department rule, of the fee to the department within 90 days after the permit is issued. [Pursuant to s. SPS 302.67 (2), $50 of the sanitary permit fee is to be forwarded to the department.]

(4) USE OF FEE. The portion of this fee retained by the governmental unit responsible for the regulation of private sewage systems shall be used for the administration of private sewage system programs.

(5) FEE ADJUSTMENT. The department, by rule promulgated under ch. 227, may adjust the minimum permit fee under sub. (2) and the fee portion forwarded under sub. (3).

(6) GROUNDWATER FEE. In addition to the fee under sub. (2), the governmental unit responsible for the regulation of private sewage systems shall collect a groundwater fee of $25 for each sanitary permit. The governmental unit shall forward this fee to the department together with the copy of the sanitary permit and the fee under sub. (3). The moneys collected under this subsection shall be credited to the environmental fund for environmental management."

(3) PROCESSING. (a) A sanitary permit may not be issued until the plans and specifications have been approved by the department or governmental unit having jurisdiction.

(b) A governmental unit may not issue a sanitary permit for the installation or modification of the POWTS that involves one or more of the technologies or methods specified in s. SPS 383.04 (1) unless the master plumber or the master plumber−restricted who is to be responsible for the installation or modification has completed approved training or has documentation that approved training will be provided during the installation of the POWTS.

(c) A governmental unit shall review and make a determination on the submission of an application for a sanitary permit within 30 days after receiving all the required information and fees under sub. (2) (c).

(d) 1. If upon review of the application and the supporting information, the governmental unit or the department determines that the proposed design, installation and management of the POWTS or the proposed modification of an existing POWTS conforms with this chapter, a sanitary permit shall be issued.

2. a. If upon review of the application and the supporting information, the governmental unit or the department determines that the proposed design, installation and management of the POWTS or the proposed modification of an existing POWTS does not conform with this chapter, a sanitary permit may not be issued.

b. When the issuance of a sanitary permit is denied, the governmental unit or department reviewing the application shall provide in writing to the applicant the reasons for denial, a notice for the right to appeal and the procedures for appeal.

c. An applicant denied a sanitary permit by a governmental unit may appeal the decision in accordance with ch. 68, Stats.

d. The appeal of the denial by the department for a sanitary permit shall be made in writing within 30 days from the date of the decision.

(e) A sanitary permit shall be issued by the appropriate governmental unit or the department in a format prescribed by the department.

Note: See appendix for further information relative to the permit format.

(f) A governmental unit may deny the issuance of a sanitary permit only if the application does not comply with the requirements of chs. SPS 383, 384 or 385.

(4) TRANSFERS. A sanitary permit may be transferred from an owner to a subsequent owner, pursuant to s. 145.135 (1), Stats.

Note: Section 145.135 (1), Stats., reads in part:

"A sanitary permit may be transferred from the holder to a subsequent owner of the land, except that the subsequent owner must obtain a new copy of the sanitary permit from the issuing agent."

(5) EXPIRATION. Pursuant to s. 145.135 (1), Stats., a sanitary permit shall expire 2 years from the date of issuance unless renewed in accordance with sub. (6).

(6) RENEWALS. (a) 1. The application for renewal of a sanitary permit shall be made in a format prescribed by the department.

2. The application for renewal of a sanitary permit shall be submitted to the department or the appropriate governmental unit in accordance with sub. (2) (b).

(b) The renewal of a sanitary permit shall be contingent upon the proposed POWTS or the proposed modification of an existing POWTS conforming with the rules of this chapter in effect at the time the sanitary permit is renewed.

(6m) SUSPENSION. (a) A governmental unit may temporarily suspend a sanitary permit issued under this section if it is determined prior to construction that a POWTS cannot be installed based on the information that was available when the permit was issued.

(b) The suspension of the sanitary permit shall terminate no later than the date the sanitary permit expires.

(7) REVOCATION. (a) The department may revoke a sanitary permit issued under this section for any false statements or misrepresentation of facts on which the sanitary permit was issued.

(b) A governmental unit may revoke a sanitary permit that the governmental unit has issued under this section for any false statements or misrepresentation of facts on which the sanitary permit was issued.

(c) The revocation of a sanitary permit and the reasons for revocation shall be conveyed in writing to the individual to whom the sanitary permit was issued or transferred.

(d) If a sanitary permit is revoked, the installation or modification of a POWTS may not commence or continue until another sanitary permit is obtained.

(8) POSTING. When a sanitary permit is obtained under sub. (2), the sanitary permit shall:

(a) Be posted in such a location and manner on the proposed site where the POWTS is to be installed or modified so that the information on the permit is visible for inspection; and

(b) Remain posted until:

1. The POWTS installation or modification is completed; and

2. An opportunity for a final inspection occurs in accordance with s. SPS 383.26.

(9) PERMIT STORAGE. A governmental unit shall maintain a permanent record of each sanitary permit and permit application supporting information listed in s. SPS 383.21 (2) (c) until the property is no longer served by a POWTS.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. (2) (c) 4., (3) (b) and (c) Register January 2004 No. 577, eff. 2−1−04; CR 07−100: am. (2) (c) 4., cr. (3) (f), (6m) and (9) Register September 2008 No. 633, eff. 10−1−08; correction in (1) (a) 2., (b) (intro.), (2) (c) 1., 2., 4., 5., (3) (b), (f), (8) (b) 2., (9) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.22 Plan review and approval. (1) SUBMISSION OF PLANS. (a) Plans shall be submitted to the department, a designated agent or the governmental unit in accordance with this section for all of the following types of installations or modifications:

1. The installation or construction of a POWTS.

2. The replacement or addition of a POWTS treatment component.

3. The replacement or addition of a POWTS holding component.

4. The replacement or addition of a POWTS dispersal component.

(b) Plans for the types of POWTS delineated in Table 383.22−1 shall be submitted to the department for review.

(c) Plans for the types of POWTS delineated in Table 383.22−2 shall be submitted for review to the department or a designated agent.

Note: See s. SPS 383.23 for more information relative to designated agents.

(d) Plans for the types of POWTS delineated in Table 383.22−3 shall be submitted for review to the appropriate governmental unit where the POWTS is located or will be located.

Table 383.22−1
Plan Submissions to Department

	Type of Installation
1.	POWTS owned by the state.
2.	Facilities owned by the state and served by POWTS.
3.	POWTS that will not completely utilize treatment and dispersal technologies or methods either approved under s. SPS 384.10 (2) or (3) or recognized under s. SPS 383.60 (1).
4.	POWTS treating domestic wastewater combined with industrial wastes.[a]
5.	Experiments under s. SPS 383.27.

[a] See s. SPS 383.32 (3) (a).

Table 383.22−2
Plan Submissions to Department or Designated Agent

	Type of Installation
1.	POWTS that will completely utilize treatment and dispersal technologies or methods either approved under s. SPS 384.10 (2) or (3) or recognized under s. SPS 383.60 (1).
2.	POWTS that collect and hold all wastewater of the facilities served and utilize holding components designed based on ≥3,000 gpd estimated flow either recognized under s. SPS 384.10 (2) or (3) or recognized under s. SPS 383.60 (1).

Note: Pursuant to s. 145.19 (2), Stats., governmental units may require separate plan examination fees or include these fees in the cost of the sanitary permit.

Table 383.22−3
Plan Submissions to Governmental Unit

	Type of Installation
1.	POWTS that will serve not more than two one− or 2−family dwellings and their accessory buildings utilizing technologies or methods either recognized under s. SPS 384.10 (2) or (3) or recognized under s. SPS 383.60 (1), and using gravity distribution of the effluent to an in−ground distribution cell.
2.	POWTS that collect and hold all wastewater of the facilities served and utilize holding components designed based on <3,000 gpd estimated flow either recognized under s. SPS 384.10 (2) or (3) or recognized under s. SPS 383.60 (1).

Note: Pursuant to s. 145.19 (2), Stats., governmental units may require separate plan examination fees or include these fees in the cost of the sanitary permit.

(2) PLANS AND SPECIFICATIONS. (a) 1. When plans are submitted to the department for review, at least 3 sets of plans and one set of specifications shall be provided.

Note: Specifications for a project do not have to be a separate document but may be delineated on the plans.

2. When plans are submitted to a designated agent or governmental unit for review, at least 2 sets of plans and one set of specifications shall be provided.

3. Plans and specifications submitted for review shall be clear, legible and permanent copies.

4. Plans submitted for review shall include all of the following:

a. Details and configuration layouts depicting how the design is to be constructed and how the design is to accomplish the treatment in accordance with ss. SPS 383.43 and 383.44 and dispersal that is claimed or the holding of wastewater.

b. Specifications, including a description of the materials for the project and the installation or construction practices and methods to be employed.

c. A site plan with a bench mark either scaled or dimensioned, delineating all treatment and dispersal components and their relationship to any items listed in Table 383.43−1.

(b) 1. All plans submitted for review shall be accompanied by sufficient data and information to determine if the proposed POWTS or modification of an existing POWTS and their performance will conform with chs. SPS 382 to 384 including, but not limited to all of the following:

a. A plan review application form specified by the department.

Note: Department forms required in this chapter are available for a nominal fee at telephone 800−DOC−SALE or Contact Through Relay or at docsales@doa.state.wi.us, or at no charge at the Department's Web site http://dsps.wi.gov through links to Safety and Buildings Division forms.

b. The minimum and maximum wastewater flow and load of the proposed project and the method or rationale for determining the flow and load.

c. Documentation to support treatment and dispersal claims.

d. A management plan for the proposed design reflecting conformance to subch. V.

e. A soil and site evaluation report in accordance with s. SPS 385.40 for those POWTS components that consist in part of in situ soil.

f. A description of a contingency plan in the event the proposed POWTS fails and cannot be repaired.

2. In addition to the information required under subd. 1., plans for one or more holding tanks serving a large commercial, industrial, recreational or residential development with an estimated daily wastewater flow of 3,000 gallons or more shall include information pursuant to s. NR 113.07 (1) (e).

Note: Section NR 113.07 (1) (e) reads as follows:

Large commercial, industrial, recreational or residential development holding tank systems that singly or when added together or increased by successive additions generate 3000 gallons of septage per day or greater shall contract with a wastewater treatment facility for treatment of the septage. The contract terms shall provide assurance that the septage from the system will continually be conveyed to, and accepted, at the wastewater treatment facility. If a service area designation exists, the wastewater treatment facility shall amend the service area to include the commercial, industrial, recreational or residential development. The department may not indicate sufficient disposal capacity to the department of safety and professional services, until the service area adjustments have been completed and approved.

3. In addition to the information required under subd. 1., plans for a POWTS that is to serve a dwelling where the design of the POWTS is not based upon the number of bedrooms within the dwelling shall be accompanied by information documenting that design condition on the deed for the property.

4. In addition to the information required under subd. 1., plans for an experimental POWTS shall be accompanied by information required under s. SPS 383.27 (3).

5. In addition to the information required under subd. 1., plans for a POWTS which is to serve more than one structure or building, other than two one− or 2−family dwellings and their accessory buildings located on a single parcel of land, shall be accompanied by information that does all of the following:

a. Describes the legal entity, public or private, that has responsibility for the operation and maintenance of the POWTS.

b. Includes a copy of a recorded legal document that identifies all the parties that have ownership rights and are responsible for the operation and maintenance of the POWTS.

6. a. In addition to the information required under subd. 1., plans for a POWTS with a design wastewater flow exceeding 12,000 gallons per day shall not be approved until documentation has been submitted to the department indicating that the department of natural resources has concurred with the design of the POWTS.

Note: The Wisconsin department of natural resources requires that a Wisconsin Pollutant Discharge Elimination System (WPDES) permit must be obtained prior to the start of operation for a POWTS with a design flow exceeding 12,000 gallons per day pursuant to ch. 283, Stats.

b. Solely for the purpose of determining the applicability of subd. 6. a., the design wastewater flow of 12,000 gpd shall be deemed equivalent to 85 bedrooms for residential dwellings, including one− and 2−family dwellings, multi−family dwellings and mobile homes.

c. Solely for the purpose of determining the applicability of subd. 6. a., the design wastewater flow of 12,000 gpd for commercial facilities shall be calculated using the estimated wastewater flows specified in A−383.43 (6) of the appendix.

d. Solely for the purpose of determining the applicability of subd. 6. a., for residential dwellings combined with commercial facilities the design wastewater flow of 12,000 gpd shall be calculated by prorating the number of bedrooms on the basis of 85 bedrooms equaling 12,000 gpd for the residential dwellings and using the estimated flow under s. SPS 383.43 (3) (a) and A−383.43 (6) of the appendix to calculate the design flow for the commercial facilities.

e. For the purpose of determining the applicability of subd. 6. a., the design wastewater flow of 12,000 gpd shall include the design wastewater flow of all POWTS that are located on the same property or on properties under the same ownership and where the perimeter of a distribution cell of a POWTS dispersal component for one POWTS is less than 1,500 feet from the perimeter of a distribution cell of a POWTS dispersal component of any other POWTS under the same ownership.

f. For the purpose of determining the applicability of subd. 6. a., the combined design wastewater flow shall include that of any existing POWTS which falls within the parameters of subd. 6. e.

g. Under subd. 6. a., the same ownership is defined to be a person, group of persons or a corporation which owns a majority interest in the properties where majority ownership is based upon a majority of the issued voting stock, a majority of the members if no voting stock is issued, a majority of the board of the directors or comparable governing body or participation of each general partner in the profits of a partnership.

(c) Plans and specifications which are required to be submitted for review under sub. (1) shall be one of the following:

1. Signed and sealed in accordance with s. A−E 2.02 by an individual who is registered by the department as an architect, engineer, designer of plumbing systems or designer of private sewage systems.

2. Signed, including license number, and dated by an individual who is responsible for the installation of the POWTS and who is licensed by the department as a master plumber or master plumber−restricted service.

(d) Plans submitted to the department for review shall be accompanied by a fee in accordance with ss. SPS 302.61 and 302.65.

(3) PLAN REVIEW PROCESS. (a) *Time limits.* Pursuant to s. SPS 302.07 (3), the department shall review and make a determination on an application for plan review within 15 business days.

(b) *Conditional approval.* 1. If, upon review, the applicable reviewing agency determines that the plans conform to this chapter and chs. SPS 382 and 384, a conditional approval shall be granted in writing.

2. All conditions indicating nonconformance to this chapter and chs. SPS 382 and 384 shall be corrected before or during installation.

(c) *Denial of approval.* If, upon review, the applicable reviewing agency determines that the plans do not conform to this chapter or chs. SPS 382 and 384, the request for conditional approval shall be denied in writing.

(4) REVISIONS. (a) A modification to the design of a POWTS for which a plan has been previously granted approval under sub. (3) (b) shall be submitted to the applicable reviewing agency for

review in accordance with this section, if the proposed modification involves any of the following:

1. A change in wastewater flow or contaminant load.

2. The replacement or addition of a POWTS component listed in Table 383.04−1.

3. The addition of a POWTS dispersal component.

4. A change to one or more dispersal components involving any of the following:

a. Location outside suitable evaluated areas or proposed depths or elevations.

b. Dimensions of any distribution cell or basal area.

c. Type of dispersal component.

d. Design of a pressure distribution component, except for changes to pumps, forcemain lengths, total dynamic head, (TDH), or pump control settings.

(b) A modification to the design of a POWTS for which a plan has been previously granted approval under sub. (3) (b) may be submitted to the governmental unit which issued the sanitary permit, if the proposed modification involves a change which is not listed in par. (a) and if the governmental unit agrees to review the proposed minor revision.

(c) The installer of a POWTS may not implement or undertake the proposed revisions under par. (a) or (b) until written approval is obtained from the applicable reviewing agency.

(d) Revisions to previously approved plans shall be reviewed in accordance with sub. (3).

(e) If revisions under par. (a) are submitted to and approved by the department, the owner of the site for the POWTS or the owner's agent shall file the revisions with the governmental unit which issued the sanitary permit.

(5) LIMITATION OF RESPONSIBILITY. A conditional approval of a plan by the department may not be construed as an assumption by the department of any responsibility for the design of the POWTS or any component of the system. The department does not hold itself liable for any defects in construction, or for any damages that may result from a specific installation.

(6) REVOCATION OF APPROVAL. (a) The department may revoke any plan approval issued under this section for any false statements or misrepresentation of facts on which the approval was based.

(b) The designated agent or governmental unit may revoke any plan approval issued by the designated agent or governmental units for any false statements or misrepresentation of facts on which the approval was based.

(c) The revocation of a plan approval and the reasons for revocation shall be conveyed in writing to the submitter of the plans as noted on the application.

(d) If a plan approval is revoked, the installation or alteration of a POWTS may not continue until another plan approval is obtained.

(7) EVIDENCE OF APPROVAL. (a) When plans are required to be approved by the department, designated agent or governmental unit under sub. (1), the plumber responsible for the installation of a POWTS or the modification of an existing POWTS shall keep at the construction site at least one set of plans bearing evidence of approval by the department, designated agent or governmental unit and at least one copy of specifications.

(b) The plans and specifications shall be maintained at the construction site until the POWTS installation or modification is completed and an opportunity for a final inspection occurs in accordance with s. SPS 383.26.

(c) The plans and specifications shall be made available to the department or the governmental unit upon request.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. (2) (b) 6. a. and e. and (4) (a) (intro.), r. (4) (a) 4. c., renum. and am. (4) (a) 4. d. to be (4) (a) 4. c., cr. (4) (e) Register January 2004 No. 577, eff. 2−1−04**;** CR 06−119: am. (3) (a) Register July 2007 No. 619, eff. 8−1−07; CR 07−100: am. Tables 83.22−1 to 3, (2) (a) 1., (b) 5. (intro.), (4) (a) and (7) (a), renum. (2) (a) 2. and 3. and (4) (b) to (d) to be (2) (a) 3. and 4. and (4) (c) to (e) and am. (4) (c) and (e), cr. (2) (a) 2. and (4) (b), r. (4) (e) Register September 2008 No. 633, eff. 10−1−08; correction in (1) (b), (c), (d), (2) (a) 4. a., c., (b) 1. (intro.), e., 4., 6. c., d., (c) 1., (d), (3) (a), (b) 1., 2., (c), (4) (a) 2., (7) (b), Table 383.22−1, Table 383.22−2, Table 383.22−3 made under s. 13.92 (4) (b) 6., 7., Stats., Register December 2011 No. 672.

SPS 383.23 Review agent status. (1) Upon request from a governmental unit, the department may delegate to the governmental unit the responsibility to review plans for one or more of the types of POWTS delineated in Table 383.22−2 which are to be or are located within the jurisdiction of that governmental unit.

(2) A request by a governmental unit to review plans for the types of POWTS delineated in Table 383.22−2 shall be made in writing. The request shall include all of the following:

(a) The types of POWTS for which delegation is desired.

(b) Information delineating how the plans are to be processed and reviewed.

(c) Information on how plan review decisions are to be recorded and maintained.

(3) The delegation of plan review by the department shall be contingent upon a governmental unit's request demonstrating sufficient capabilities to complete the reviews, including all of the following:

(a) The utilization of one or more individuals who are certified by the department as a POWTS inspector to perform the plan review.

(b) The utilization of one or more individuals, who are certified soil testers, to provide assistance in the plan review process.

Note: The requirements of this subsection do not require the utilization of 2 individuals to perform plan review. A single individual who holds a certification as a certified POWTS inspector and as a certified soil tester may fulfill the requirements under pars. (a) and (b).

(4) (a) The department shall provide the governmental unit with a written decision of delegation or denial of delegation relative to a request under this section concerning plan review.

(b) The department may deny a request for plan review delegation, if the governmental unit has not completed a POWTS inventory or is not operating a maintenance program required under s. SPS 383.255.

(c) The delegation for plan review shall be contingent upon the governmental unit acknowledging that the submission and review of plans under s. SPS 383.22 (1) may, at the discretion of the submitter, be made to the department or the designated agent.

(5) The department shall include as part of governmental unit audits conducted under s. 145.20 (3) (b), Stats., an evaluation of the plan review functions which are delegated to a governmental unit under this section.

(6) A governmental unit that wishes to discontinue the delegated plan review function under this section shall notify the department in writing at least 30 days prior to the discontinuance.

(7) (a) The recognition as a review agent may be revoked by the department in accordance with s. 145.20 (3) (a) 2., Stats.

(b) The department may revoke the delegation as a plan review agent, if the governmental unit has not completed a POWTS inventory or is not operating a maintenance program required under s. SPS 383.255.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. (3) (a) and (b) Register January 2004 No. 577, eff. 2−1−04; CR 07−100: renum. (4) (b) and (7) to be (4) (c) and (7) (a), cr. (4) (b) and (7) (b) Register September 2008 No. 633, eff. 10−1−08; correction in (1), (2) (intro.), (4) (b), (c), (7) (b) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.24 Petitions for variance. (1) The department shall consider and may grant a variance to a provision of this chapter in accordance with ch. SPS 303.

Note: The petition for variance process is to allow the owner of a proposed or existing POWTS to ask the department's recognition of an alternative method or means for complying with the intent of a specific rule.

(2) (a) Pursuant to s. 145.24, Stats., the department may not approve a petition for variance for an existing POWTS which is

determined to be a failing private onsite wastewater treatment system.

(b) For the purposes of this subsection, the department shall consider a petition for variance if the existing POWTS is not considered a failing private onsite wastewater treatment system.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; correction in (1) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.25 Governmental programs. (1) DELEGATION OF RESPONSIBILITIES. (a) Pursuant to s. 145.20 (1) (am), Stats., the delegation by a governmental unit of the administration and enforcement of this chapter to a town sanitary district or public inland lake protection and rehabilitation district shall be by ordinance.

(b) A copy of an ordinance delegating administration and enforcement of this chapter to a town sanitary district or public inland lake protection and rehabilitation district shall be forwarded to the department at least 30 days prior to the effective date of the ordinance.

(2) ISSUANCE OF BUILDING PERMITS. (a) *General.* Pursuant to s. 145.195, Stats., the issuance of building permits by a municipality for unsewered properties shall be in accordance with this subsection.

Note: See appendix for a reprint of s. 145.195, Stats.

(b) *New construction.* A municipality may not issue a building permit to commence construction or installation of a structure that necessitates the use of a POWTS to serve the structure, unless:

1. The owner of the property possesses a sanitary permit for the installation of a POWTS in accordance with s. SPS 383.21; or

Note: Section SPS 383.21 outlines the procedures for the issuance of sanitary permits. Sections 145.135 and 145.19, Stats., mandate that no private sewage system may be installed unless the owner of the property holds a valid sanitary permit.

2. A POWTS of adequate capability and capacity to accommodate the wastewater flow and contaminant load already exists to serve the structure.

Note: See ss. SPS 383.02 and 383.03 concerning the application of current code requirements to existing POWTS.

(c) *Construction affecting wastewater flow or contaminant load.* 1. A municipality may not issue a building permit to commence construction of any addition or alteration to an existing structure when the proposed construction will modify the design wastewater flow or contaminant load, or both, to an existing POWTS, unless the owner of the property:

a. Possesses a sanitary permit to either modify the existing POWTS or construct a POWTS to accommodate the modification in wastewater flow or contaminant load, or both; or

b. Provides documentation to verify that the existing POWTS is sufficient to accommodate the modification in wastewater flow or contaminant load, or both.

2. For the purpose of this paragraph, a modification in wastewater flow or contaminant load shall be considered to occur:

a. For commercial facilities, public buildings, and places of employment, when there is a proposed change in occupancy of the structure; or the proposed modification affects either the type or number of plumbing appliances, fixtures or devices discharging to the system; and

b. For dwellings, when there is an increase or decrease in the number of bedrooms.

(d) *Documentation of existing capabilities.* Documentation to verify whether an existing POWTS can accommodate a modification in wastewater flow or contaminant load, or both, shall include at least one of the following:

1. A copy of the plan for the existing POWTS that delineates minimum and maximum performance capabilities and which has been previously approved by the department or the governmental unit.

2. Information on the performance capabilities for the existing POWTS that has been recognized through a product approval under ch. SPS 384.

3. A written investigative report prepared by an architect, engineer, designer of plumbing systems, designer of private sewage systems, master plumber, master plumber−restricted service or certified POWTS inspector analyzing the proposed modification and the performance capabilities of the existing POWTS.

(e) Where the performance capability of the existing POWTS serving a dwelling is not based on the number of bedrooms within the dwelling, information documenting that design condition shall be recorded as a covenant running with the deed for the property.

(f) *Setbacks.* 1. A municipality may not issue a building permit for construction of any structure or addition to a structure on a site where there exists a POWTS, unless the proposed construction conforms to the applicable setback limitations under s. SPS 383.43 (8) (i).

2. The applicant for a building permit shall provide documentation to the municipality issuing the building permit showing the location and setback distances for the proposed construction relative to all of the following:

a. Existing POWTS treatment components.

b. Existing POWTS holding components.

c. Existing POWTS dispersal components.

Note: A municipality that issues building permits may delegate to the governmental unit responsible for issuing sanitary permits the determination of whether the proposed construction will affect or interfere with an existing POWTS relating to capability or location of the existing POWTS.

Note: See appendix for further information regarding setbacks.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. (2) (a) Register January 2004 No. 577, eff. 2−1−04; CR 07−100: renum. (2) (e) to be (2) (f), cr. (2) (e) Register September 2008 No. 633, eff. 10−1−08; correction in (2) (b) 1., (d) 2., (f) 1. made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.255 Governmental inventory and maintenance program. (1) (a) 1. A governmental unit shall conduct, complete and maintain an inventory of all POWTS located in their jurisdictional area within 3 years after October 1, 2008.

2. The inventory shall be updated as existing POWTS are identified and new POWTS are installed or constructed.

(b) At a minimum, a POWTS inventory shall consist of all of the following elements:

1. Legal description of all properties including tax parcel number where a POWTS is located within the governmental unit jurisdictional area.

2. Name and address of the owner of each POWTS located within the governmental unit jurisdictional area.

Note: The inventory does not require site visits, identification of the type of POWTS or an evaluation of the POWTS.

(2) (a) A governmental unit shall develop and implement a comprehensive POWTS maintenance program within 5 years after October 1, 2008.

(b) At a minimum, a POWTS maintenance program shall consist of all of the following elements:

1. An inventory of all POWTS located within the governmental unit jurisdictional area.

2. A process that accepts and records inspection, evaluation, maintenance and servicing reports submitted by the POWTS owner or the owner's agent for POWTS listed in the governmental unit inventory.

3. A process that accepts and creates a record for each inspection, evaluation, maintenance and servicing report for a POWTS within the governmental unit jurisdictional area but not listed in the governmental unit inventory that is submitted by the POWTS owner or the owner's agent.

4. A process that notifies POWTS owners that are delinquent in submitting reports for inspection, evaluation, maintenance and servicing activities listed in ss. SPS 383.54 (3) and (4) and 383.55.

5. A process that includes measures meant to ensure that required inspection, evaluation, maintenance and servicing is performed and the results are reported to the governmental unit.

6. Reports summarizing the results of the maintenance program on an annual basis in a format requested by the department.

Note: Pursuant to s. 145.245 (9) (a), Stats., a governmental unit must comply with the maintenance provisions of this section as a condition for obtaining Wisconsin Fund grants.

(3) A governmental unit shall make available to the department, upon request, any and all records necessary to ascertain compliance with this chapter and the provisions as specified in s. 145.20 (2) (i), Stats.

History: CR 07−100: cr. Register September 2008 No. 633, eff. 10−1−08; correction in (2) (b) 4. made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.26 Inspections and testing. (1) (a) Pursuant to s. 145.02 (3) (c), Stats., the department or governmental unit may inspect the construction, installation, operation or maintenance of a POWTS to ascertain whether the POWTS conforms to plans approved by the department or governmental unit, the conditions of approval and this chapter.

(b) The department may issue an order directing an immediate cessation of the installation of a POWTS or the modification to an existing POWTS for failure to comply with a corrective order.

(c) Pursuant to ss. 145.02 (3) (f) and 145.20 (1) (a) and (2) (f), Stats., an individual authorized by the department or a governmental unit to administer and enforce this chapter may issue orders to abate human health hazards relating to this chapter.

Note: Section SPS 305.66 delineates qualifications and responsibilities for POWTS inspectors.

(d) Pursuant to s. 145.20 (2) (e) and (g), Stats., nothing in this chapter shall limit a governmental unit's authority and power to inspect or require an evaluation of a POWTS, including an existing POWTS at times or for activities not covered under this section.

(2) (a) When a sanitary permit is required under s. SPS 383.21 (1), no part of a POWTS component may be covered nor any POWTS component put into service until the governmental unit or the department has had an opportunity to inspect the system in accordance with this subsection.

Note: Pursuant to s. 145.20 (2), Stats., an individual authorized by a governmental unit to administer and enforce the provisions of chs. SPS 382 to 387 relative to POWTS is required to be a certified POWTS inspector under s. SPS 305.66.

(b) The master plumber or the master plumber−restricted service responsible for the installation of a POWTS or the modification to an existing POWTS shall notify the governmental unit when the work will be or is ready for inspection. The notification shall be in person, in writing or by telephone or other electronic communication in a format acceptable to the governmental unit performing the inspection.

(c) The master plumber or the master plumber−restricted service responsible for the installation of a POWTS or the modification shall maintain records of the inspection notifications. The records shall include the date and time of notification and the name of the person contacted.

(d) The master plumber or master plumber−restricted service responsible for the POWTS installation or modification shall provide the necessary equipment and properly licensed personnel required for the inspection as requested by the governmental unit or department.

(e) If an inspection is not made by the end of the next workday, excluding Saturdays, Sundays and holidays, after the requested inspection day, the master plumber or the master plumber−restricted service may proceed with the installation of the POWTS, including backfilling and covering.

(3) Pursuant to s. 145.20 (2) (g), Stats., a governmental unit by ordinance may require other inspections in addition to that specified under this section.

(4) A governmental unit shall maintain a written record of each inspection conducted for a POWTS. The record shall include information relative to all of the following:

(a) The location of the POWTS.

(b) The date of the inspection.

(c) The nature and findings of the inspection.

(5) Before being put into service, components of a POWTS shall be tested in accordance with the manufacturer's specifications or as specified as a condition of approval under ss. SPS 383.22 and 384.10.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; correction in (2) (a), (5) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.27 Experiments. (1) The provisions of this chapter or ch. SPS 384 are not intended to prevent the design and use of an innovative method or concept for the treatment or dispersal of domestic wastewater which is not specifically addressed by this chapter, provided the experiment has been first approved by the department in accordance with s. SPS 384.50 (3).

(2) The department shall review a submittal of an experiment under this section with input from the technical advisory committee assembled under s. SPS 384.10 (3) (d).

(3) The protocol for a proposed experiment submitted to the department for consideration shall include all of the following:

(a) The experiment shall be supervised by a professional who has experience in small−scale wastewater treatment.

(b) The professional shall submit a vita of training and experience relative to small−scale wastewater treatment along with the application for the experiment.

(c) A proposal shall be submitted for the experiment that includes at least all of the following:

1. The purpose of the experiment.

2. The theory and science behind the proposed experiment including a description of the systems or processes to be used as part of the experiment.

3. The number of systems or components to be installed or modified as part of the experiment.

4. The identification of the initial sites, if known, that will take part in the experiment.

5. A letter of comment from the governmental unit or units where the experiment is to be conducted.

6. The data to be collected and the method to be employed to collect the data.

7. The duration of the proposed experiment.

(d) The experiment may not involve less than 5, and not more than 50 individual installations.

(e) An experiment shall be designed to provide definitive results within 5 years from the start of the experiment.

(f) An experiment on a site not previously developed shall include a contingency plan that provides for a code complying replacement POWTS, if the experiment fails to meet the required performance standards of this chapter.

(g) If the experiment is approved, the experimenter shall execute a signed agreement with the department setting forth the obligations of the parties.

(h) Within 6 months of the completion of the experiment, the results or conclusions shall be forwarded to the department.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; correction in (1), (2) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.28 Penalties. Penalties for violations of this chapter shall be assessed in accordance with s. 145.12, Stats.

Note: Section 145.12 (4), Stats., indicates that any person who violates any order under s. 145.02 (3) (f) or 145.20 (2) (f) or any rule or standard adopted under s. 145.13 shall forfeit not less than $10 nor more than $1,000 for each violation. Each violation

of an order under s. 145.02 (3) (f) or 145.20 (2) (f) or any rule or standard adopted under s. 145.13 constitutes a separate offense and each day of continued violation is a separate offense.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00.

SPS 383.29 Range of responses. (1) (a) Pursuant to s. 160.21, Stats., the department shall respond with any one or more of the actions delineated under Table 383.29 if the preventive action limits or enforcement standards enumerated in ch. NR 140 Tables 1 and 2 are exceeded at a point of standards application as a result of the performance of a POWTS, including a POWTS existing prior to July 1, 2000, except as provided in par. (b).

(b) Pursuant to s. 160.255, Stats., the design, installation, use or maintenance of a POWTS is not required to comply with the nitrate standard specified in ch. NR 140 Table 1, except as provided under s. SPS 383.03 (5).

Table 383.29
Department Range of Responses

- Gather more data relative to the cause and significance of the exceedance.
- Determine whether the situation is a human health hazard.
- Issue orders to change or comply with the management or maintenance plan of a specific POWTS or type of onsite wastewater system.
- Issue orders to conform with this chapter, including the prohibition of an activity or practice.
- Determine whether the exceedance is an isolated problem, or is likely to recur.
- Revise or revoke a product approval issued under ch. SPS 384 for a treatment or dispersal component.
- Revise the rules of this chapter or ch. SPS 381, 382, 384 or 385.

(2) Pursuant to s. 160.21 (2), Stats., the point of standards application relative to the performance of POWTS shall be:

(a) Any point of present groundwater use for potable water supply; and

(b) Any point beyond the boundary of the property on which the facility, practice or activity is located.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. (1) (a) Register January 2004 No. 577, eff. 2−1−04; correction in (1) (a), (b), Table 383.29 made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

Subchapter III — General Requirements

SPS 383.30 Purpose. This subchapter establishes parameters for the types of POWTS that may be used and how a POWTS may be used.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00.

SPS 383.31 Principles. A POWTS shall be operated and used in such a manner so as not to render the POWTS inoperative or beyond its capabilities, and thereby, create a human health hazard.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00.

SPS 383.32 Prohibitions and limitations. (1) PROHIBITIONS. (a) Except as provided in s. SPS 383.03 (4), the introduction of wastewater or substances in such quantities or concentrations to a POWTS, including a POWTS existing prior to July 1, 2000, that results in exceeding the enforcement standards and preventive action limits specified in ch. NR 140 Tables 1 and 2 at a point of standards application shall be prohibited.

Note: Section SPS 383.03 (4) reads:

(4) GROUNDWATER STANDARDS. (a) Pursuant to s. 160.255, Stats., the design, installation, use or maintenance of a POWTS is not required to comply with the nitrate standard specified in ch. NR 140 Table 1, except as provided under sub. (5).

(b) Pursuant to s. 160.19 (2) (a), Stats., the department has determined that it is not technically or economically feasible to require that a POWTS treat wastewater to comply with the preventive action limit for chloride specified in ch. NR 140, Table 2, as existed on June 1, 1998.

(c) Substances deleterious to a POWTS shall be intercepted, diluted or treated in accordance with s. SPS 382.34 prior to the substance discharging into a POWTS.

(d) The use of a cesspool as a POWTS is prohibited, including any cesspool existing prior to July 1, 2000.

(e) The final discharge of domestic wastewater or POWTS effluent to open bodies of water is prohibited, including by means of plumbing outfall pipes existing prior to July 1, 2000.

(f) The final discharge of domestic wastewater or POWTS effluent to the ground surface is prohibited, including by means of plumbing outfall pipes existing prior to July 1, 2000.

(g) The infiltrative surface of a treatment or dispersal component of a POWTS existing prior to December 1, 1969, which consists in part of soil may not be located in bedrock or groundwater.

(h) The use of camping unit transfer containers as a POWTS holding component shall be restricted to any of the following sites:

1. Campgrounds permitted by the department of health services under ch. DHS 178.

2. Properties where the use of the camping unit transfer container is permitted by an adopted governmental unit ordinance and monitored by the governmental unit.

(2) LOCAL PROHIBITIONS. (a) A municipality may by ordinance prohibit or limit the installation and use of the following technologies, designs or methods as POWTS components:

1. A holding tank.

2. A constructed wetland as a POWTS treatment component.

3. An evapotranspiration bed as a POWTS treatment component.

(b) A municipality may enact ordinances that are more restrictive than the applicable state minimum standards for those POWTS existing prior to December 1, 1972, except as provided in s. SPS 383.03 (2) (b) 2.

Note: The date, December 1, 1972, reflects the point in time at which the state plumbing code became a state−wide uniformly applied code rather than just a minimum standard. Since December 1, 1969 to July 1, 2000, the state plumbing code required 36 inches of soil between the infiltrative surface of a POWTS and high groundwater or bedrock.

(c) A municipality may by ordinance restrict the ownership of a POWTS to a governmental entity or agency when the POWTS is to serve 2 or more structures or buildings that are located on more than one property.

(3) LIMITATIONS. (a) Industrial wastes and wastewater may not, unless approved by the department of natural resources, be introduced into a POWTS.

Note: The department of natural resources regulates the discharge of industrial wastes to land treatment systems under ch. NR 214. Section NR 214.02 reads in part:

"This chapter applies to those discharges of industrial wastes to land treatment systems not regulated under ch. NR 518. This includes but is not limited to liquid wastes, by−product solids and sludges generated by: fruit and vegetable processing, dairy products processing, meat, fish and poultry products processing, mink raising operations, aquaculture, commercial laundromat and motor vehicle cleaning operations and any other industrial, commercial or agricultural operation which results in a point source discharge that has no detrimental effects on the soils, vegetation or groundwater of a land treatment system."

(b) Storm and clear water may be introduced into a POWTS, if the POWTS is designed to accept that wastewater. A POWTS may accept wastewater permitted under s. SPS 382.36 (3).

Note: Section SPS 382.36 (3) (a) permits the discharge of a maximum of 50 gallons per day of clear water wastes to a sanitary drain system connected to a publicly owned treatment works.

(c) Except as provided in ss. NR 116.12 (1) (e) and 116.15 (2) (b), no part of a POWTS may be installed in a floodway.

Note: See s. SPS 383.45 (6) for installations in a floodfringe.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. (1) (e) and (f), (3) (a) and (b) Register January 2004 No. 577, eff. 2−1−04; CR 07−100: renum. (1) (h) to be (1) (h) (intro.) and am., cr. (1) (h) 1. and 2., am. (3) (c) Register September 2008 No. 633, eff. 10−1−08; correction in (1) (h) 1. made under s. 13.92 (4) (b) 6., Stats., Register September 2008 No. 633; correction in (1) (h) 1. made under

s. 13.92 (4) (b) 7., Stats., Register December 2010 No. 660; correction in (1) (a), (c), (2) (b), (3) (b) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.33 Abandonment. A subsurface tank or pit that is no longer used as a POWTS component shall be abandoned by complying with all of the following:

(1) Disconnecting all piping to the tanks and pits.

(2) Sealing all disconnected piping to the tanks and pits in accordance with s. SPS 382.21 (2) (h).

(3) Pumping and disposing of the contents from all tanks and pits.

Note: The disposal of the contents from treatment tanks, distribution tanks, seepage pits and holding components is addressed in ch. NR 113 which is administered by the department of natural resources.

(4) Removing all tanks or removing the covers of the tanks or pits and filling the tanks and pits with soil, gravel or an inert solid material.

Note: Pursuant to s. 281.45, Stats., municipalities and sanitary districts may determine the availability of, and require connection to, public sewers. Section 281.45, Stats., reads in part:

"HOUSE CONNECTIONS. To assure preservation of public health, comfort and safety, any city, village or town or town sanitary district having a system of waterworks or sewerage, or both, may by ordinance require buildings used for human habitation and located adjacent to a sewer or water main, or in a block through which one or both of these systems extend, to be connected with either or both in the manner prescribed. If any person fails to comply for more than 10 days after notice in writing the municipality may impose a penalty or may cause connection to be made, and the expense thereof shall be assessed as a special tax against the property."

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; correction in (2) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

Subchapter IV — Design and Installation

SPS 383.40 Purpose. This subchapter establishes minimum parameters for the design and installation of a POWTS for the purpose of:

(1) Safeguarding public health;

(2) Minimizing the level of substances which have a reasonable probability of entering waters of the state; and

(3) Delineating measures, conditions and performance standards by which to evaluate designs.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00.

SPS 383.41 Principles. (1) A POWTS shall be designed to hold wastewater or reduce the contaminant load and disperse the flow of wastewater as specified in this subchapter.

Note: See s. SPS 382.34 (15) for requirements relating to special wastewater or mixed wastewater treatment or containment devices.

(2) A POWTS shall be designed to have sufficient capacity to accommodate the anticipated quantities of wastewater that will be discharged into the system.

(3) A POWTS intended to treat and disperse wastewater shall be designed to have sufficient ability to treat or separate out the anticipated types, quantities and concentrations of wastewater contaminants to be discharged into the system so that the dispersed wastewater will not create a human health hazard.

(4) A POWTS shall be designed to disperse wastewater below the surface of the ground at a rate that promotes long term assimilation into the soil and limits the possibility of surfacing.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00.

SPS 383.42 Application. (1) DESIGN BASIS. The design of a POWTS shall be based on the methods and limitations outlined in this subchapter or on other documented data acceptable to the department.

(2) DESIGN RELATION TO ACTUAL FLOWS AND CONTAMINANT LOADS. For any situation where it is known that the wastewater flow or contaminant load exceeds the parameters of this subchapter, the POWTS shall be designed in relation to the known flow or load.

(3) DESIGN CONSIDERATIONS. The evidence to support assertions relative to contaminant reduction and hydraulic dispersal shall include at least all of the following:

(a) The flow and contaminant load of the influent wastewater.

(b) The ability of all treatment and dispersal components to reduce contaminant load and disperse hydraulic flow into the environment.

(c) The flow velocities and friction losses throughout the system based upon accepted engineering practice.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00.

SPS 383.43 General requirements. (1) MATERIALS. The components of a POWTS shall be constructed of materials and products that are of a type recognized under this chapter or ch. SPS 384.

(2) DESIGN FLOW. In order to accommodate peak wastewater flow, the design wastewater flow of a POWTS shall equal at least 150% of the estimated daily flow generated from the source or sources, unless otherwise approved by the department.

(3) ESTIMATED DAILY COMBINED FLOW FOR A POWTS SERVING A DWELLING. The estimated daily wastewater flow of combined graywater, clear water and blackwater from a dwelling shall be based on one or more of the following:

(a) The following equation:

100 gallons x B = F

Where: B = number of bedrooms, based on 2 persons per bedroom, unless otherwise approved by the department.

F = Estimated daily wastewater flow per dwelling per day (in gallons), excluding storm water discharges.

(b) A detailed estimate of wastewater flow based upon per capita occupancy or usage of the dwelling or per function occurrence within the dwelling.

(4) ESTIMATED DAILY SEGREGATED GRAYWATER FLOW FOR A POWTS SERVING A DWELLING. The estimated daily wastewater flow of graywater and clear water from a dwelling shall be based on one or more of the following:

(a) The following equation:

60 gallons x B = F

Where: B = number of bedrooms, based on 2 persons per bedroom, unless otherwise approved by the department.

F = Estimated daily graywater flow per dwelling per day (in gallons), excluding storm water discharges.

(b) A detailed estimate of graywater flow based upon per capita occupancy or usage of the dwelling or per function occurrence within the dwelling.

(5) ESTIMATING SEGREGATED BLACKWATER FLOW FOR A POWTS SERVING A DWELLING. The estimated daily wastewater flow of blackwater from a dwelling shall be based on one or more of the following:

(a) The following equation:

40 gallons x B = F

Where: B = number of bedrooms, based on 2 persons per bedroom, unless otherwise approved by the department.

F = Estimated daily blackwater flow per dwelling per day (in gallons).

(b) A detailed estimate of blackwater flow based upon per capita occupancy or usage of the dwelling or per function occurrence within the dwelling.

(6) ESTIMATING WASTEWATER FLOW FOR COMMERCIAL FACILITIES. The estimated daily wastewater flow of clear water, graywater, blackwater, or combined graywater−blackwater flow from

public buildings and places of employment shall be based on one or more of the following:

(a) Measured daily wastewater flow over a period of time representative of the facility's use or occupancy.

(b) A detailed estimate of wastewater flow based upon per capita occupancy or usage of the facility or per function occurrence within the facility.

Note: See appendix for further information.

(7) ESTIMATING CONTAMINANT LOADS. Estimates of contaminant loads from dwellings and public facilities shall be based on a detailed analysis including all contaminants listed in s. SPS 383.44 (2) (a).

Note: See appendix for further information.

Note: See Note under s. SPS 383.32 (3) for information relative to industrial wastes.

(8) GENERAL DESIGN REQUIREMENTS. (a) *Flow velocity.* 1. Piping within a POWTS shall be designed and installed to supply wastewater to POWTS treatment and dispersal components while maintaining the velocity required to ensure operation of the POWTS.

2. Gravity flow piping between POWTS components shall be installed at a pitch that produces a computed flow velocity of at least one foot per second when flowing half full.

3. Pressurization equipment or devices and piping to be utilized upstream of a POWTS treatment or dispersal component consisting in part of in situ soil shall be designed and installed to produce a computed velocity of at least 2 feet per second.

4. Gravity piping within a POWTS treatment or dispersal component consisting in part of in situ soil shall be installed level or pitched downstream a maximum 4 inches per 100 feet.

(b) *Distribution and drain pipe sizing.* The piping within a POWTS shall be of a diameter to permit the operation of the POWTS.

(c) *Frost protection.* All POWTS components shall be protected from freezing temperatures that could detrimentally affect component operation to provide wastewater conveyance, treatment or dispersal.

(d) *Component placement.* The orientation of a POWTS treatment or dispersal component consisting in part of in situ soil shall take into account landscape variations in elevation, slope orientation, and other conditions that could affect component performance relative to dispersal or aeration.

(e) *Alarms or warning systems.* 1. a. A POWTS component utilizing a mechanical device to treat wastewater or to distribute effluent shall be provided with an automatic visual or audible means of notifying the user of the POWTS of the failure of the mechanical device.

Note: In accordance with s. SPS 316.300 (1) (a), an alarm that is electrically powered is to be on a separate circuit from the circuit supplying power to the mechanical device.

b. An alarm indicating the failure of a pump shall remain audible or visible until manually turned off.

c. Where duplex pumping equipment is employed to provide continuous component operation in the event that one pump fails, the pumps shall be installed in such a manner so as to provide the continuous operation automatically.

2. A POWTS holding tank shall be provided with an automatic visual or audible means of notifying the user of the POWTS of the necessity for servicing.

(f) *Accessibility.* The design of a POWTS shall include provisions to provide access to all components that require maintenance or observation.

(g) *Anchoring system components.* An exterior subsurface POWTS treatment tank or POWTS holding component to be installed in an area subject to saturated conditions shall be installed so as to prevent flotation of the tank or component.

Note: See appendix for further information.

(h) *Treatment byproducts.* 1. All treatment byproducts discharged from or as a result of operating a POWTS shall be disposed of so as not to create a human health hazard.

Note: The disposal of the contents of holding tanks and the sludge, scum, and contaminated liquids from treatment tanks and components is regulated by the department of natural resources under chs. NR 113 and NR 204.

2. Deleterious or hazardous materials segregated out from effluent flows shall be disposed of in a manner conforming with the rules of the state agency having jurisdiction.

3. Effluent from a POWTS shall be dispersed so as not to create a human health hazard.

4. All POWTS components within a building or structure shall be gas tight unless provisions are made assuring the safety of individuals entering the building or structure.

(i) *Site parameters and limitations.* POWTS treatment, holding and dispersal components shall be located so as to provide the minimum horizontal setback distances as outlined in Table 383.43−1 as safety factors for public health, waters of the state and structures in the event of component failure.

Note: Chapter NR 812 establishes upslope location criteria for wells relative to contamination sources.

Table 383.43−1

Horizontal Setback Parameters

Physical Feature	POWTS Treatment Component Consisting in Part of In Situ Soil or Dispersal Component	Exterior Subsurface Treatment Tank or Holding Tank Component	Servicing, Suction Lines and Pump Discharge Lines
Building	10 feet	5 feet[a]	none[b]
Property Line[c]	5 feet	2 feet	2 feet
Swimming Pool	15 feet	none[b]	none[b]
OHWM of Navigable Waters	50 feet	10 feet	10 feet
Water Service and Private Water Main	10 feet	10 feet	10 feet
Public Water Main	ch. NR 811	ch. NR 811	ch. NR 811
Well	chs. NR 811 & 812	chs. NR 811 & 812	chs. NR 811 & 812

OHWM = Ordinary High−Water Mark

[a] Except camping unit transfer containers.

[b] See s. SPS 383.43 (8) (f) relative to accessibility.

[c] Road−right−of−way lines may be more restrictive than property lines.

Note: See s. SPS 382.365, Table 382.365−4 relative to horizontal setback distances to subsurface infiltrative systems.

Note: The department of transportation under s. Trans 233.08 establishes setback limits from the centerline of state trunk highways or connecting highways to structures and improvements which include septic systems.

(j) *Service suction and discharge lines.* 1. A suction line or discharge line serving a holding tank for servicing purposes shall comply with all of the following:

a. A pipe serving as the suction or discharge line shall be of an acceptable type in accordance with ch. SPS 384.

b. A suction or discharge line shall terminate with a service port consisting of a quick disconnect fitting with a removable plug.

c. The service port of a suction or discharge line shall terminate at least 2 feet above final grade.

d. The service port of a suction or discharge line shall be identified as such with a permanent sign with lettering at least ½ inch in height.

e. The service port of a suction or discharge line shall be secured to a permanent support that is capable of withstanding the loads and forces placed on the port.

f. A suction or discharge line shall be at least 3 inches in diameter.

2. A suction line serving a holding tank may not be installed in such a manner or arrangement that the tank can be drained by gravity or siphonic action.

3. Where a lift station is employed for servicing a holding tank, the pump discharge line shall conform with subd. 1., except as provided in subd. 3. a. and b.

a. A discharge line from the lift station shall be at least 2 inches in diameter.

b. The lift station pump shall be activated by means of a keyed−switch at the service port.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. (2), (6) (intro.), and Table 83.43−1 Register January 2004 No. 577, eff. 2−1−04; CR 07−100: am. Table 83.43−1 Register September 2008 No. 633, eff. 10−1−08; correction in (1), (7), (8) (i), (j) 1. a., Table 383.43−1 made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.44 Parameters for POWTS components consisting of in situ soil. (1) EVALUATION. POWTS treatment and dispersal components consisting in part of in situ soil shall be evaluated in accordance with ch. SPS 385.

(2) INFLUENT QUALITY. (a) The quality of influent discharged into a POWTS treatment or dispersal component consisting in part of in situ soil shall be equal to or less than all of the following:

1. A monthly average of 30 mg/L fats, oil and grease.

2. A monthly average of 220 mg/L BOD_5.

3. A monthly average of 150 mg/L TSS.

(b) The monthly average under par. (a) shall be calculated as the sum of all measurements taken over 30 consecutive days, with at least 6 measurements occurring on 6 separate days, and divided by the number of measurements taken during that period.

(c) Influent discharged to a POWTS treatment or dispersal component that consists in part of unsaturated soil may not contain any solid or suspended solid exceeding 1/8 inch in diameter.

Note: Under s. SPS 383.03 (1) (b), the replacement of a POWTS anaerobic treatment tank (septic tank) in conjunction with this rule would limit any solids within the effluent leaving the tank to a maximum of 1/8−inch diameter.

(3) INFILTRATIVE SURFACE. (a) The infiltrative surface of unsaturated soil to which influent is discharged shall be located at least 24 inches above the estimated highest groundwater elevation and bedrock.

(b) 1. A POWTS designed utilizing a component manual recognized under s. SPS 383.60 (1) shall have at least 6 inches of the soil separation required under par. (a) consisting of an in situ soil type for which soil treatment capability has been credited under Table 383.44−3.

2. The purpose of the 6 inches of in situ soil under subd. 1. shall be to assure that the influent will be assimilated into the original subsurface soils without ponding on the ground surface.

(c) The infiltrative surface of unsaturated soil to which influent is discharged shall be located at least one inch below the finished grade.

(4) CAPABILITIES. (a) 1. a. Except as provided under subd. 2., the dispersal capability of a POWTS treatment or dispersal component consisting in part of unsaturated soil shall be limited to that specified in Table 383.44−1 or Table 383.44−2 based upon the influent quality concentrations being applied.

b. Under subd. 1. a., the influent quality parameter with the highest concentration shall determine the maximum application rate.

c. Except as provided in par. (c), the soil conditions at the infiltrative surface of unsaturated soil to which influent is to be discharged shall be used to establish the maximum application rate for a POWTS dispersal design.

d. The moist soil consistence of the soil horizon in which the infiltrative surface of a POWTS treatment or dispersal component will be located may not be stronger than firm or any cemented classification.

e. The maximum soil application for soil with moderate to strong platy structure shall not exceed 0.2 gals./sq. ft./day for effluent concentrations of ≤30 mg/L BOD_5 and TSS and shall be 0.0 gals./sq. ft./day for effluent concentrations of > 30 mg/L BOD_5 and TSS.

f. The application rates specified under Table 383.44−1 shall only be recognized where the percolation results have been filed with the governmental unit before July 2, 1994.

2. Maximum soil application rates other than those specified in Tables 383.44−1 or 383.44−2 may be employed for the design of a POWTS treatment or dispersal component consisting in part of in situ soil if documentation is submitted and approved under s. SPS 383.22 and is based on soil permeability and evapotranspiration estimates correlated to specific soil characteristics described in a detailed morphological soil evaluation.

(b) The treatment capability of a POWTS treatment component consisting of unsaturated soil shall be limited to that specified in Table 383.44−3, unless otherwise approved by the department.

(c) The design of a treatment or dispersal component consisting in part of in situ soil shall reflect restrictive soil horizons that affect treatment or dispersal.

(5) EFFLUENT DISTRIBUTION. (a) 1. Except as provided in subd. 2., the distribution of effluent to a treatment or dispersal component shall be by means of pressure distribution as specified in Tables 383.44−2 and 383.44−3.

2. Pressure distribution is not required when rehabilitating an existing non−pressurized in situ soil treatment or dispersal component that is persistently ponded and that has at least 24 inches of unsaturated soil beneath the infiltrative surface of the component.

(b) Each dose of effluent by means of pressurized distribution into a treatment or dispersal component consisting in part of in situ soil may not be less than 5 times the void volume of the POWTS distribution laterals.

Table 383.44−1
Maximum Soil Application Rates Based Upon Percolation Rates

Percolation Rate (minutes per inch)	Maximum Monthly Average	
	BOD_5 > 30mg/L ≤ 220 mg/L TSS > 30 mg/L ≤ 150 mg/L (gals/sq ft/day)	BOD_5 ≤ 30 mg/L TSS ≤ 30 mg/L (gals/sq ft/day)
0 to less than 10	0.7	1.2
10 to less than 30	0.6	0.9
30 to less than 45	0.5	0.7
45 to less than 60	0.3	0.5
60 to 120	0.2	0.3
greater than 120	0.0	0.0

Note: > means greater than
≤ means less than or equal to

Table 383.44−2
Maximum Soil Application Rates Based Upon Morphological Soil Evaluation (in gals./sq. ft./day)

Soil Characteristics			Maximum Monthly Average			
Texture[d]	Structure[e]		BOD_5 >30 ≤220mg/L TSS >30 ≤150mg/L		BOD_5 ≤30 mg/L[c] TSS ≤30 mg/L[c]	
	Shape	Grade				
COS, S, LCOS, LS	−−−	0	0.7[a]	0.5[b,c]	1.6[a]	0.5[b]
FS, LFS	−−−	0	0.5		1.0	
VFS, LVFS	−−−	0	0.4		0.6	
COSL, SL	−−−	0M	0.2		0.6	
	PL	1	0.4		0.6	
		2, 3	0.0		0.2	
	PR, BK, GR	1	0.4		0.7	
		2, 3	0.6		1.0	
FSL, VFSL	−−−	0M	0.2		0.5	
	PL	2, 3	0.0		0.2	
	PL, PR, BK, GR	1	0.2		0.6	
	PR, BK, GR	2, 3	0.4		0.8	
L	−−−	0M	0.2		0.5	
	PL	2, 3	0.0		0.2	
	PL, PR, BK, GR	1	0.4		0.6	
	PR, BK, GR	2, 3	0.6		0.8	
SIL	−−−	0M	0.0		0.2	
	PL	2, 3	0.0		0.2	
	PL, PR, BK, GR	1	0.4[c]		0.6	
	PR, BK, GR	2, 3	0.6		0.8	
SI	−−−	−−−	0.0		0.0	
SCL, CL, SICL	−−−	0M	0.0		0.0	
	PL	1, 2, 3	0.0		0.2	
	PR, BK, GR	1	0.2		0.3	
		2, 3	0.4		0.6	
SC, C, SIC	−−−	0M	0.0		0.0	
	PL	1, 2, 3	0.0		0.0	
	PR, BK, GR	1	0.0		0.0	
		2, 3	0.2		0.3	

Note a: With ≤60% rock fragments
Note b: With >60 to <90% rock fragments
Note c: Requires pressure distribution under sub. (5) (a)

Note d: COS − Coarse Sand; S−Sand; LCOS − Loamy Coarse Sand; LS − Loamy Sand; FS − Fine Sand; LFS − Loamy Fine Sand; VFS − Very Fine Sand; LVFS − Loamy Very Fine Sand; COSL − Coarse Sandy Loam; SL − Sandy Loam; FSL − Fine Sandy Loam; VFSL − Very Fine Sandy Loam; L − Loam; SIL − Silt Loam; SI − Silt; SCL − Sandy Clay Loam; CL − Clay Loam; SICL − Silty Clay Loam; SC − Sandy Clay; C − Clay; SIC − Silty Clay

Note e: PL − Platy; PR − Prismatic; BK − Blocky; GR − Granular; M − Massive; 0 − Structureless; 1 − Weak; 2 − Moderate; 3 − Strong

Table 383.44−3

Minimum Depth of Unsaturated Soil for Treatment Purposes[a] (in inches)

Soil Characteristics	Influent Quality[e] and Percent Coarse Fragments					
Texture[d]	Fecal Coliform >10^4 cfu/100mL			Fecal Coliform ≤10^4 cfu/100mL[b]		
	≤35%	>35 to ≤60%	>60 to ≤90%[b,c]	≤35%	>35 to ≤60%	>60 to ≤90%[c]
COS, S, LCOS, LS	36	60	60	24	36	60
FS, VFS, LFS, LVFS	36			24		
COSL, SL	36			24		
FSL, VFSL	36			24		
L	36			24		
SIL	36			24		
SI	36			24		
SCL, CL, SICL	36			24		
SC, C, SIC	36			24		

Note a: Influent quality as per s. SPS 383.44 (2)

Note b: Requires pressure distribution under sub. (5) (a)

Note c: All coarse fragment voids must be filled with fine earth

Note d: COS − Coarse Sand; S−Sand; LCOS − Loamy Coarse Sand; LS − Loamy Sand; FS − Fine Sand; LFS − Loamy Fine Sand; VFS − Very Fine Sand; LVFS − Loamy Very Fine Sand; COSL − Coarse Sandy Loam; SL − Sandy Loam; FSL − Fine Sandy Loam; VFSL − Very Fine Sandy Loam; L − Loam; SIL − Silt Loam; SI − Silt; SCL − Sandy Clay Loam; CL − Clay Loam; SICL − Silty Clay Loam; SC − Sandy Clay; C − Clay; SIC − Silty Clay

Note e: The values for fecal coliform are reported as a monthly geometric mean. The geometric mean shall be determined on the basis of measurements taken over 30 consecutive days, with at least 6 measurements occurring on 6 separate days.

(6) ORIENTATION. (a) 1. The infiltrative surface of a distribution cell within a POWTS treatment or dispersal component consisting in part of in situ soil and located in fill material above original grade shall be level.

2. The longest dimension of a POWTS treatment or dispersal component consisting in part of in situ soil shall be oriented along the surface contour of the component site location unless otherwise approved by the department.

(b) The infiltrative surface of a distribution cell within a POWTS treatment or dispersal component consisting in part of in situ soil and located below the surface of the original grade shall be level.

(c) POWTS treatment or dispersal components consisting in part of in situ soil shall be so located as to minimize the infiltration of storm water into the component.

(7) GEOMETRY. The geometry of a subsurface treatment or dispersal component consisting in part of the in situ soil shall take into account linear loading rates that are based on soil texture, structure, consistence and distance to seasonal soil saturation and restrictive soil horizons.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: (3) (b) and (4) (c), r. and recr. (5) (a) and Tables 83.44−2 and 83.44−3 Register January 2004 No. 577, eff. 2−1−04; CR 07−100: am. (3) (b) 1. and Tables 83.44−2 and 3, r. (5) (b), renum. (5) (c) to be (5) (b) Register September 2008 No. 633, eff. 10−1−08; correction in (1), (3) (b) 1., (4) (a) 1. a., f., 2., (b), (5) (a) 1., Table 383.44−3 made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.45 Installation. (1) GENERAL. A POWTS shall be constructed and installed in such a manner to hold wastewater or reduce the contaminant load and disperse the flow of wastewater in accordance with this subchapter and the plan approval under s. SPS 383.22.

(2) FROZEN SOIL. POWTS treatment and dispersal components consisting in part of in situ soil may not be installed if the soil is frozen at the infiltrative surface of the component.

(3) SNOW COVER. Snow cover shall be removed before excavating or installing POWTS treatment and dispersal components consisting in part of in situ soil.

(4) MOISTURE. The soil moisture content for a POWTS treatment or dispersal component consisting in part of in situ soil shall be evaluated immediately prior to installation of the component. If the soil at the infiltrative surface can be rolled into a ¼−inch wire, the installation may not proceed.

(5) BEDDING. All vessels and pipes of a POWTS shall be bedded in accordance with a product approval under s. SPS 384.10 or a plan approval under s. SPS 383.22.

(6) FLOODPLAIN. (a) All POWTS treatment tanks, holding and dispersal tanks that are located in floodplain areas shall be made and maintained watertight to prevent infiltration.

(b) Vent pipes and observation pipes serving POWTS components that are located in floodplain areas shall terminate at least 2 feet above regional flood levels.

Note: See s. SPS 383.43 (8) (g) relative to anchoring provisions.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 07−100: am. (6) Register September 2008 No. 633, eff. 10−1−08; correction in (1), (5) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

Subchapter V — Management

SPS 383.50 Purpose. The purpose of this subchapter is to accomplish all of the following:

(1) Establish monitoring, inspection, evaluation, maintenance and servicing requirements for all POWTS, in order to ensure that the POWTS will operate as designed and thereby protect the public health and waters of the state.

(2) Establish maintenance programs operated by governmental units to ensure that all POWTS will be inspected, evaluated, maintained and serviced so that the POWTS will operate as designed and thereby protect the public health and waters of the state.

(3) Provide the department with data by which to make regulatory decisions.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 07−100: r. and recr. Register September 2008 No. 633, eff. 10−1−08.

SPS 383.51 Principles. (1) A POWTS, including a POWTS existing prior to July 1, 2000, shall be maintained at all times so as not to create a human health hazard.

(2) When upon inspection of a POWTS, including a POWTS existing prior to July 1, 2000, any part of the system that is found to be defective in conformance with the applicable provisions of this chapter, the installation or modification plan, or the approvals, the part shall be repaired, renovated, replaced or removed.

Note: Section SPS 387.04 (2) (a) to (e) also establishes management and maintenance requirements for a POWTS that is located in a governmental unit which participates in the replacement and rehabilitation program under s. 145.245, Stats.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00.

SPS 383.52 Responsibilities. (1) (a) 1. The owner of a POWTS shall be responsible for ensuring that the operation and maintenance of the POWTS occurs in accordance with this chapter and the approved management plan under s. SPS 383.54 (1).

2. The owner of a POWTS shall be responsible for ensuring that access opening covers remain locked or secured except for inspection, evaluation, maintenance or servicing purposes.

(b) The owner of a POWTS existing prior to July 1, 2000, shall be responsible for ensuring that the maintenance of the POWTS occurs in accordance with s. SPS 383.54 (4).

(c) 1. The owner of a POWTS, including a POWTS existing prior to July 1, 2000, shall maintain a maintenance contract with a POWTS maintainer or a business utilizing a POWTS maintainer for the POWTS as long as the POWTS is utilized and, if the management plan for the POWTS under s. SPS 383.54 (1) involves one or more of the following:

a. Evaluating or monitoring any part of the system at an interval of 12 months or less.

b. Maintaining any part of the system at an interval of 12 months or less.

2. The owner of a POWTS, including a POWTS existing prior to July 1, 2000, shall maintain a maintenance or service contract with a certified septage servicing operator under ch. NR 114 for the POWTS as long as the POWTS is utilized and, if the management plan for the POWTS under s. SPS 383.54 (1) involves the servicing of any holding, treatment or dispersal component at an interval of 12 months or less.

(2) A POWTS, including a POWTS existing prior to July 1, 2000, that is not maintained in accordance with the approved management plan or as required under s. SPS 383.54 (4) shall be considered a human health hazard.

(3) The activities relating to evaluating, monitoring and maintaining POWTS components after the initial installation of the POWTS in accordance with an approved management plan or as required by s. SPS 383.54 (4) (c) shall be conducted by a person who holds registration issued by the department as a registered POWTS maintainer.

Note: See s. SPS 305.36 concerning the application and qualification requirements to become a registered POWTS maintainer.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. (3) Register January 2004 No. 577, eff. 2−1−04; CR 07−100: renum. (1) (a) to be (1) (a) 1., cr. (1) (a) 2., am (1) (b), (c) 1. (intro.) and (3) Register September 2008 No. 633, eff. 10−1−08; correction in (1) (a) 1., (b), (c) 1. (intro.), 2., (2), (3) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.53 General. (1) No product for chemical or physical restoration or chemical or physical procedures for POWTS, including a POWTS existing prior to July 1, 2000, may be used unless approved by the department in accordance with ss. SPS 384.10 and 384.14.

(2) Nothing in this subchapter shall limit a governmental unit's authority and power in establishing a mandatory POWTS maintenance program that is more restrictive than what is specified in this subchapter, including management or maintenance undertaken by the governmental unit.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 07−100: am. Register September 2008 No. 633, eff. 10−1−08; correction in (1) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.54 Management requirements. (1) MANAGEMENT PLAN. (a) The management plan for each POWTS shall include information and procedures for maintaining the POWTS to operate and function within the standards of this chapter and as designed and approved.

(b) The management plan for a POWTS shall be a part of the plan submittal under s. SPS 383.22 or 384.10.

(c) The management plan for POWTS shall specify all necessary maintenance and servicing information which may include, but is not limited to all of the following:

1. Accumulated solids or byproduct removal requirements.

2. Influent quantities and qualities and effluent quantities and qualities.

3. Metering, sampling and monitoring schedules and requirements.

4. Load and rest schedules.

5. Servicing frequency requirements.

6. Installation and inspection checklists.

7. Evaluation, monitoring and maintenance schedules for mechanical POWTS components.

8. Start up and shutdown procedures.

9. Procedure for abandonment.

(d) If the owner of the POWTS wishes to operate or maintain a POWTS differently than that specified in the approved management plan, a written request for approval to amend the management plan shall be submitted to the agency that initially reviewed the installation plan under s. SPS 383.22.

(e) The management plan for a POWTS shall specifically address the servicing mechanics of an aerobic or anaerobic treatment tank or a holding tank where either of the following conditions exist:

1. The bottom of the tank is located more than 15 feet below the elevation where the servicing pad is located.

2. The bottom of the tank is located more than 150 feet horizontally from where the servicing pad is located.

(2) METERING AND MONITORING. (a) *General.* The management plan specified in sub. (1) shall include the metering or monitoring of POWTS influent or effluent as specified in this subsection.

(b) *Department option.* The department may require the metering or monitoring of any POWTS to evaluate the operation of the POWTS.

(c) *Governmental unit option.* A governmental unit may require the metering or monitoring of a POWTS holding component as part of a maintenance and monitoring tracking program.

(d) *Metering influent flows.* 1. When and where the metering of a POWTS is required, influent flows to POWTS shall be metered by one of the following methods:

a. Installing event counters and elapsed time meters.

b. Installing water meters to meter the water distribution system flow to the POWTS.

c. Metering wastewater flow from all parts of the plumbing system discharging to the POWTS.

d. Metering the water distribution system and metering exterior hydrant use, except as provided in subd. 2.

2. Where meters are installed on water distribution systems existing prior to July 1, 2000, the entire water distribution system may be metered and the exterior hydrant usage estimated and subtracted from the total flow to meet the requirements of this paragraph.

(e) *Monitoring influent and effluent loads.* 1. When and where the monitoring of groundwater is required, groundwater monitoring wells constructed in accordance with ch. NR 141 shall be utilized.

2. When influent or effluent contaminants are to be monitored, samples shall be collected in accordance with the requirements of the approved management plan or, where no procedures are specified, in accordance with published sampling procedures accepted by the department.

Note: Acceptable sampling procedures include those contained in the following sources:

"Procedures Manual for Ground Water Monitoring at Solid Waste Disposal Sites," EPA SW−611, Office of Water and Waste Management, U. S. Environmental Protection Agency, December 1980, Washington, D. C.

"Techniques of Water Resources Investigations of the United States Geological Survey, Guidelines for Collection and Field Analysis of Ground Water Samples for Selected Unstable Constituents," Book I, Chapter D2, U.S. Geological Survey, Washington, D. C.

"Procedures for the Collection of Representative Water Quality Data from Monitoring Wells," Cooperative Groundwater Report 7, Illinois State Water Survey, 1981, Champaign, Illinois.

"Manual of Ground Water Sampling Procedures," NWWA/EPA Series, Robert S. Kerr Environmental Research Laboratory, 1981, Ada, Oklahoma.

"Groundwater Sampling Procedures Guidelines," Wisconsin DNR, PUBL−WR−153, February 1987.

"Groundwater Sampling Procedures Field Manual," Wisconsin DNR, PUBL−WR−168, September 1987.

3. All groundwater samples collected to evaluate influent or effluent quality, except samples collected for total coliform bacteria analysis and the field analyses for pH, specific conductance and temperature, shall be analyzed by a laboratory certified under s. 299.11, Stats., and rules adopted under that section.

4. The results of the analysis required under subd. 2. shall be maintained and reported as required in the approved management plan and in accordance with s. SPS 383.55 (1) (a).

(3) SERVICING REQUIREMENTS. (a) The management plan specified in sub. (1) shall reflect the servicing schedules of POWTS components as specified in this subsection

(b) The servicing frequency of an anaerobic treatment tank for a POWTS shall occur at least when the combined sludge and scum volume equals 1/3 of the tank volume.

(c) The servicing frequency of a holding tank for a POWTS, except for camping unit transfer containers, shall occur at least when the wastewater of the tank reaches a level of one foot below the inlet invert of the tank.

Note: The servicing of POWTS holding and treatment components, including septic tanks and holding tanks, is required to be performed by licensed pumpers under chs. NR 113 and NR 114.

(4) EXISTING POWTS. (a) The servicing frequency of an anaerobic treatment tank for a POWTS existing prior to July 1, 2000, shall occur at least when the combined sludge and scum volume equals 1/3 of the tank volume.

(b) The servicing of a holding tank for a POWTS existing prior to July 1, 2000, except for camping unit transfer containers, shall occur at least when the wastewater of the tank reaches a level of one foot below the inlet invert of the tank.

(c) The inspection, evaluation, or maintenance or servicing of POWTS treatment components other than those under pars. (a) and (b) existing prior to July 1, 2000, shall be provided in accordance with the requirements specified by the manufacturer or designer of the component.

(d) 1. Except as provided in subd. 3., a POWTS that exists prior to July 1, 2000, and that utilizes a treatment or dispersal component consisting in part of in situ soil shall be visually inspected at least once every 3 years to determine whether wastewater or effluent from the POWTS is ponding on the surface of the ground.

2. The inspection required by subd. 1. shall be performed by one of the following:

a. A licensed master plumber.

b. A licensed master plumber−restricted service.

c. A certified POWTS inspector.

d. A certified septage servicing operator under ch. NR 114.

e. A registered POWTS maintainer.

3. A governmental unit that has completed the inventory required under s. SPS 383.255 (1) (a) may, by ordinance, extend the visual inspection interval required under subd. 1., to a maximum period of 5−years for a POWTS serving an occasionally occupied structure or facility.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: cr. (1) (e) and (4) (d) 2. e., r. and recr. (2) (c), am. (2) (d) 1. (intro.) Register January 2004 No. 577, eff. 2−1−04; CR 07−100: am. (4) (c) and (d) 1., cr. (4) (d) 3. Register September 2008 No. 633, eff. 10−1−08; correction in (1) (b), (d), (2) (e) 4., (4) (d) 3. made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.55 Reporting requirements. (1) (a) The owner of a POWTS or the owner's agent shall report to the governmental unit or designated agent at the completion of each inspection, evaluation, maintenance or servicing event specified in the approved management plan, except for camping unit transfer containers.

(b) The owner of a POWTS existing prior to July 1, 2000 or the owner's agent shall report to the governmental unit or designated agent at the completion of each inspection, evaluation, maintenance or servicing event required under s. SPS 383.54 (4), except for camping unit transfer containers.

(c) The owner of a POWTS is responsible for fulfillment of the reporting requirements under this section.

(2) The inspection, evaluation, maintenance and servicing reports required under sub. (1) shall be submitted to the governmental unit or designated agent in accordance with all of the following:

(a) In a manner specified by the governmental unit or designated agent.

(b) Within 30 calendar days from the date of inspection, evaluation, maintenance or servicing.

(c) By the owner or the owner's agent.

(3) The inspection, evaluation, maintenance and servicing reports required under sub. (1) shall include the following information:

(a) A POWTS identifying number.

(b) The location of the POWTS.

(c) The date of inspection, evaluation, maintenance or servicing.

(d) The license, certification or registration number of the individual performing the inspection, evaluation, maintenance or servicing.

(e) Other information required by the approved management plan.

(4) The department, governmental unit or designated agent may require verification of any information contained in an inspection, evaluation, maintenance and servicing report.

Note: This subsection does not require the maintaining of test data which is collected voluntarily and which is not being collected to determine compliance with this chapter.

(5) (a) The governmental unit or designated agent shall maintain records relating to the inspection, evaluation, maintenance and servicing of POWTS as specified in this section for a period of not less than 6 years.

(b) Upon request by a governmental unit and the agreement of the department, the governmental unit may delegate to the department the responsibility to maintain records relating to the inspection, evaluation, maintenance and servicing of POWTS as specified in this section.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. (1), (2), and (5) Register January 2004 No. 577, eff. 2−1−04; CR 07−100: am. (1), (2) (intro.), (b), (3) (intro.), (c), (d), (4) and (5), cr. (1) (c) Register September 2008 No. 633, eff. 10−1−08; correction in (1) (b) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

Subchapter VI — Recognized Methods and Technologies

SPS 383.60 Purpose. (1) Specific types of methods and technologies may be recognized by the department under the voluntary product approval process in s. SPS 384.10 (3) as conforming with subchs. IV and V and may be utilized in the design of POWTS for a specific project.

Note: Subsection SPS 384.10 (3) delineates a process for the voluntary submittal of specific methods and technologies that are proposed to be utilized as POWTS holding, treatment or dispersal components and for the department's evaluation of such submittals. Methods and technologies recognized under this process may be utilized in any POWTS within the specifications and parameters of the method or technology. Methods and technologies recognized under this process do not require the submittal of data at the time of plan review and approval process under s. SPS 383.22 to substantiate the performance of the specific method or technology.

Note: Information regarding recognized methods and technologies may be downloaded at: http://dsps.wi.gov/SB/SB−PubsPlumbProdReg.html.

(2) This subchapter does not limit the use of other methods and technologies for POWTS or POWTS components the performance of which has been recognized under the plan review and approval process of s. SPS 383.22 or the voluntary product approval process of s. SPS 384.10 (3) or both.

Note: Section SPS 383.22 delineates the process for the submittal of a plan for a POWTS design to be utilized for a specific project at a specific site. Under this section methods and technologies for POWTS holding, treatment or dispersal components that have not been recognized under s. SPS 384.10 (3), require the submittal to the department of data or information to substantiate performance claims. The approval of a POWTS plan by the department under this section covers only a specific project at a specific site, and does not constitute the recognition of a method or technology for other projects or sites.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 07−100: am. (1) Register September 2008 No. 633, eff. 10−1−08; correction in (1), (2) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

SPS 383.61 Parameters for using acceptable methods and technologies. When a design of a POWTS for a specific project utilizes a method or technology recognized under s. SPS 384.10 (3), a deviation from the specifications and limitations relative to the installation and maintenance of that method or technology shall constitute a violation of this chapter.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 07−100: renum. from Comm 83.62 Register September 2008 No. 633, eff. 10−1−08; correction made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

Subchapter VII — Department Performance Monitoring

SPS 383.70 Purpose. (1) To address the desire for an ongoing source of information on the performance of POWTS system designs, the department shall maintain an ongoing performance−monitoring program for the various POWTS methods and technologies. The monitoring program shall be in addition to the periodic inspection and monitoring of POWTS under subch. V. The monitoring program shall be coordinated by the department in conjunction with the ongoing POWTS experimental and research program.

(2) The purpose of the performance monitoring program is to:

(a) Provide additional information on the long−term performance of the various POWTS methods and technologies, to confirm their reliability, and to provide data for improvements; and

(b) Monitor the various methods and technologies relative to long−term compliance with the groundwater standards.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00.

SPS 383.71 Department procedures. (1) Both currently installed POWTS and newly installed POWTS may be included in the performance monitoring program conducted by the department.

(2) The department may include both the performance of individual POWTS treatment components as well as the output of components at the edge of the design treatment zone as part of the monitoring program.

(3) The department shall support the performance−monitoring program from Wisconsin Fund allocations and program revenue funds generated from POWTS plan review and sanitary permits. If funds for this purpose become available from other sources, those funds may be used to support the monitoring program.

(4) The department shall utilize the technical advisory committee assembled under s. SPS 384.10 (3) (c) 2. to advise the department on the performance−monitoring program. The committee shall advise the department in at least the following areas:

(a) Development of performance monitoring protocols.

(b) Selection of the POWTS methods and technologies to be monitored.

(c) Identification of funding sources.

(d) The interpretation of the results of the monitoring program.

(5) The decision by the department on the number, types and locations of methods and technologies to be monitored shall take into consideration at least the following factors:

(a) The availability of other scientific data on the performance of a specific method or technology.

(b) The number times of each method or technology may be utilized annually.

(c) The likelihood that the method or technology will be adapted for soil and site conditions not previously utilized.

(d) The availability of funds.

(e) The risk factors associated with public health concerns and groundwater and surface water standards.

(6) The initial performance monitoring program undertaken by the department shall emphasize at least the following two circumstances:

(a) Monitoring where there is a high density of systems.

Note: The initial focus would be on subdivisions with lots of 1.5 acres or less.

(b) Monitoring where the depth of suitable in situ soil is near the minimum 6 inches specified under s. SPS 383.44 (3) (b) 1.

(7) (a) The department shall prepare an annual written report of performance−monitoring activities undertaken and the results of those activities.

(b) The report under par. (b) shall be prepared annually and provided to the groundwater coordinating council assembled under s. 160.50, Stats.

(c) The department shall prepare the first report no later than December 31, 2001.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; correction in (4) (intro.), (6) (b) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.

Chapter SPS 383

APPENDIX

The material and information contained in this appendix is for clarification purposes only. Appendix material and information are numbered to correspond to the rule number as it appears in the text of the code. Material and information included in this appendix is subject to change without notice, including names, addresses, phone numbers and forms, and reflects information known at the time of publication.

A−383.21 (3) PROCESSING. The specific format of a sanitary permit application is specified by the department and may change depending on the data tracking needs of the department. The uniform application form issued by the department is to be used by all permit issuing agents. It may consist of a paper or electronic format, or both. The sanitary permit application form will require the applicant to report information pertinent to the ownership, use, location, system type, maintenance schedule, and responsible installer. Additionally, plans and specifications for the project must also be submitted with, and are part of, the permit application. Fees for the sanitary permit are based on a statutory minimum as cited in s. 145.19 (2), Wis. Stats., and any additional costs levied by the issuing agent.

The state sanitary permit is issued when evidence and documentation is presented by the owner of the property that minimum code standards have been or will be met.

_____COUNTY NO._____

STATE SANITARY PERMIT

☐TRANSFER/RENEWAL PREVIOUS NO._____

OWNER _____

PLUMBER_____LIC.#_____
TOWN OF_____
SEC____,T____N, R____E/W
AND/OR LOT_____BLOCK_____
_____SUBDIVISION

CHAPTER 145.135 (2) WISCONSIN STATUTES

(a) The purpose of the sanitary permit is to allow installation of the private sewage system described in the permit.
(b) The approval of the sanitary permit is based on regulations in force on the date of approval.
(c) The sanitary permit is valid and may be renewed for a specified period.
(d) Changed regulations will not impair the validity of a sanitary permit.
(e) Renewal of the sanitary permit will be based on regulations in force at the time renewal is sought, and that changed regulations may impede renewal.
(f) The sanitary permit is transferable.
History: 1977 c. 168; 1979 c. 34,221; 1981 c. 314

Note: If you wish to renew the permit, or transfer ownership of the permit, please contact the county authority.

_____AUTHORIZED ISSUING OFFICER – DATE_____

THIS PERMIT EXPIRES_____UNLESS RENEWED BEFORE THAT DATE

POST IN PLAIN VIEW

VISIBLE FROM THE ROAD FRONTING THE LOT DURING CONSTRUCTION

SBD-06499 (R. 7/00)

Chapter 145 Wisconsin Statutes provides some direction as to the issuance of sanitary permits as follows:

145.135 Sanitary permits.

(1) Validity. In this section, "sanitary permit" means a permit issued by the department or any governmental unit responsible for the regulation of private sewage systems for the installation of a private sewage system. No person may install a private sewage system unless the owner of the property on which the private sewage system is to be installed holds a valid sanitary permit. A sanitary permit is valid for 2 years from the date of issue and renewable for similar periods thereafter. A governmental unit responsible for the regulation of private sewage systems may not charge more than one fee for a sanitary permit or the renewal of a sanitary permit in any 12−month period. A sanitary permit shall remain valid to the end of the established period, notwithstanding any change in the state plumbing code or in any private sewage system ordinance during that period. A sanitary permit may be transferred from the holder to a subsequent owner of the land, except that the subsequent owner must obtain a new copy of the sanitary permit from the issuing agent. The results of any percolation test or other test relating to the disposal of liquid domestic wastes into the soil shall be retained by the governmental unit responsible for the regulation of private sewage systems where the property is located. The governmental unit responsible for the regulation of private sewage systems shall make the test results available to an applicant for a sanitary permit and shall accept the test results as the basis for a sanitary permit application unless the soil at the test site is altered to the extent that a new soil test is necessary.

(2) Notice. A sanitary permit shall include a notice displayed conspicuously and separately on the permit form, to inform the permit holder that:

(a) The purpose of the sanitary permit is to allow installation of the private sewage system described in the permit.

(b) The approval of the sanitary permit is based on regulations in force on the date of approval.

(c) The sanitary permit is valid and may be renewed for a specified period.

(d) Changed regulations will not impair the validity of a sanitary permit.

(e) Renewal of the sanitary permit will be based on regulations in force at the time renewal is sought, and that changed regulations may impede renewal.

(f) The sanitary permit is transferable.

145.19 Sanitary permit.

(1) Requirement; information; forms. No septic tank may be purchased and no private sewage system may be installed unless the owner of the property on which the private sewage system is to be installed holds a valid sanitary permit from the governmental unit responsible for the regulation of private sewage systems in which the property is located. The department shall prescribe the information to be included in the sanitary permit and furnish sanitary permit forms to the governmental unit. The applicant shall submit the completed sanitary permit to the governmental unit. The governmental unit shall approve or disapprove the sanitary permit according to the rules promulgated by the department under this chapter. No person may sell at retail, as defined under s. 100.201 (1) (d), a septic tank for installation in this state unless the purchaser holds a valid sanitary permit issued under this section.

(2) Fee. No fee for a sanitary permit may be less than $61, or the amount determined under department rule. The governing body for the governmental unit responsible for the regulation of private sewage systems may establish a fee for a sanitary permit which is more than $61, or the amount determined under department rule.

(3) Copy of permit forwarded to the department. The governmental unit responsible for the regulation of private sewage systems shall forward a copy of each valid sanitary permit and $20, or the amount determined under department rule, of the fee to the department within 90 days after the permit is issued.

(4) Use of fee. The portion of this fee retained by the governmental unit responsible for the regulation of private sewage systems shall be used for the administration of private sewage system programs.

(5) Fee adjustment. The department, by rule promulgated under ch. 227, may adjust the minimum permit fee under sub. (2) and the fee portion forwarded under sub. (3).

(6) Groundwater fee. In addition to the fee under sub. (2), the governmental unit responsible for the regulation of private sewage systems shall collect a groundwater fee of $25 for each sanitary permit. The governmental unit shall forward this fee to the department together with the copy of the sanitary permit and the fee under sub. (3). The moneys collected under this subsection shall be credited to the environmental fund for environmental management.

A−383.22 (3) PLAN REVIEW PROCESS. All proposed POWTS installations require plan review prior to sanitary permit issuance. Projects subject to department review include all projects under Table 383.22−1, and many of the projects under Table 383.22–2. Designated agents may review projects included in Table 383.22−2.

A−383.25 (2) ISSUANCE OF BUILDING PERMITS. A building permit is defined in s. SPS 381.01 (43), Wis. Adm. Code, as any written permission from a municipality that allows construction to commence on a structure. In effect, this means that land use and zoning permits, as well as other similar permits that constitute permission to construct are considered building permits.

Prior to building permit issuance, the issuing agent has a statutory responsibility, under s. 145.195, Wis. Stats., to consider whether or not the proposed structure requires connection to a private onsite wastewater treatment system (POWTS), or if the construction will interfere with the operation of an existing POWTS.

> Section 145.195, Stats. Building on unsewered property. (1) No county, city, town or village may issue a building permit for construction of any structure requiring connection to a private domestic sewage treatment and disposal system unless a system satisfying all applicable regulations already exists to serve the proposed structure or all permits necessary to install such a system have been obtained.
>
> (2) Before issuing a building permit for construction on any structure on property not served by a municipal sewage treatment plant, the county, city, town or village shall determine that the proposed construction does not interfere with a functioning private domestic sewage treatment and disposal system. The county, city, town or village may require building permit applicants to submit a detailed plan of the owner's existing private domestic sewage treatment and disposal system.

A−383.25 (2) (f) Setbacks. Horizontal setbacks from encumbrance for new POWTS installations are in conformance with Table 383.43−1 or the rules in effect at the time the system was installed, which ever is less. For setback distances associated with previous administrative codes refer to the previous code issue or the following table.

10/01/08	Code Comparison - POWTS Code Setback Encumbrances (ft)																
	Vertical Separation SAS		Horizontal Separation Soil Absorption System (SAS)								Horizontal Separation Treatment Tank[a]						
Effective Date	Ground-water	Bedrock	Well	Lake[b]	Cistern	Building	Lot Line	Swimming Pool	Water Service	Public W Main	Well	Lake[c]	Cistern	Building	Lot Line	Swimming Pool	Water Service
2/1/04	2/3/5	2/3/5	50[l]	50[m]		10	5	15	10	25[n]	25[l]	10[m]		5	2	0	10
7/1/00	2/3/5/10	2/3/5/10	50[l]	50[m]		10	5	15	10	25[n]	25[l]	10[m]		5	2	0	10
3/1/97	3/6[k]	3/6[k]	50	50	25	25/15/10[h]	5	15	10	25	25	25	10	5	2	5	10
3/1/94	3/6[k]	3/6[k]	50	50	25	25/15/10[h]	5	15	10	25	25	25	10	5	2	5	10
3/1/92	3/6[k]	3/6[k]	50	50	25	25/15/10[h]	5	15	10	25	25	25	10	5	2	5	10
7/1/91	3/6[k]	3/6[k]	50	50	25	25/15/10[h]	5	15	10	25	25	25	10	5	2	5	10
10/1/85	3	3	50	50	25	25/15/10[h]	5	15	10	25	25	25	10	5	2	15	10
7/1/83	3	3	50	50	25	25/15/10[h]	5	15	10	25	25	25	10	5	2	15	10
1/1/81	3	3	50	50	25	25/15/10[h]	5	15	10	25	25	25	10	5	2	15	10
6/21/80	3	3	50	50	25	25/15/10[h]	5	15	10	25	25	25	10	5	2	15	10
2/1/79	3	3	50	50	25	25/10[l]	5	25/15[l]	10	25	25	25	10	5	2	25	10
8/1/77	3[d]	3[d]	50	50	25	25/10[l]	5	25/15[l]	10	25	25	25	10	5	2	25	?
8/1/76	3[d]	3[d]	50	50	25	25/10[l]	5	25/15[l]	10	25	25	25	10	5	2	25	?
12/1/72	3	3	50	50	25	25	5	50	25		25	25	10	5	2	25	?
11/1/71	3	3	50	50	25	25	5	50	25		25	25	10	5	2	25	?
12/1/69	3	3	50	50	25	25	5	50	25		25	25	10	5	2	25	?
3/1/63		0[e]	50	25	25	25[g]	5				25		10		2		
5/1/62		0[e]	50	25	25	25[g]	5				25		10		2		
3/1/57		0[e]	50	25	25	25[g]	5				25		10		2		
9/1/54		0[e]	50	25	50	50[g]	5				25		10		2		
1948			50	25	50	50[g]					25		10		2		
1941			150[f]		50	50[g]					25		10		2		
1937			150[f]		50	50[g]					25		10		2		
1932			150[f]		50	50[g]					25		10		2		
1925			150[f]		50	50[g]					25		10		2		
1917			150[f]		50	50[g]					25		10		2		
1916			150[f]		50	50[g]					25		10		2		
1914			150[f]		50	50[g]					25		10	10	2		
Effective Date	Ground-water	Bedrock	Well	Lake[b]	Cistern	Building	Lot Line	Swimming Pool	Water Service	Public W Main	Well	Lake[c]	Cistern	Building	Lot Line	Swimming Pool	Water Service

Footnotes:
a. Includes water−tight cesspools, sewage tanks, septic tanks, dosing chambers.
b. Lake category includes lakes, streams or other watercourses.
c. Lake category includes lakes, streams, rivers, ponds, flowages and reservoirs.
d. The code required 5 feet of soil over GW or BR. It is assumed that a 3 foot separation was maintained.
e. Seepage pits shall not extend into creviced rock formations.
f. May be reduced to 50 feet if well is drilled and cased to 100 ft.
g. Means a dwelling.
h. Refers to habitable or occupied bldg with below grade foundation/habitable bldg on slab/uninhabited bldg on slab.
I. Refers to habitable buildings/uninhabited buildings.
j. Refers to below ground/above ground swimming pools.
k. Refers to normal soil/very coarse textured soil.
l. Distance listed is an example typical for residential application. Code references NR 811 and NR 812.
m. Code references Ordinary High Water Mark (OHWM) of navigable waters
n. Distance listed is an example of a typical setback. Code references NR 811.

A−383.43 (6) COMMERCIAL FACILITIES. Table A−383.43−1 may be used to estimate wastewater flows from a commercial building.

Table A−383.43−1
Public Facility Wastewater Flows

Source	Unit	Estimated Wastewater Flow (gpd)
Apartment or Condominium	Bedroom	100
Assembly hall (no kitchen)	Person (10 sq. ft./person)	1.3
Bar or cocktail lounge (no meals served)	Patron (10 sq. ft./patron)	4
Bar or cocktail lounge* (w/meals – all paper service)	Patron (10 sq. ft./patron)	8
Beauty salon	Station	90
Bowling alley	Bowling lane	80
Bowling alley (with bar)	Bowling lane	150
Camp, day and night	Person	25
Camp, day use only (no meals served)	Person	10
Campground or Camping Resort	Space, with sewer connection and/or service building	30
Campground sanitary dump station	Camping unit or RV served	25
Catch basin	Basin	65
Church (no kitchen)	Person	2
Church* (with kitchen)	Person	5
Dance hall	Person (10 sq. ft./person)	2
Day care facility (no meals prepared)	Child	12
Day care facility* (with meal preparation)	Child	16
Dining hall* (kitchen waste only without dishwasher and/or food waste grinder)	Meal served	2
Dining hall* (toilet and kitchen waste without dishwasher and/or food waste grinder)	Meal served	5
Dining hall* (toilet and kitchen waste with dishwasher and/or food waste grinder)	Meal served	7
Drive−in restaurant* (all paper service with inside seating)	Patron seating space	10
Drive−in restaurant* (all paper service without inside seating)	Vehicle space	10
Drive−in theater	Vehicle space	3
Employees (total all shifts)	Employee	13
Floor drain (not discharging to catch basin)	Drain	25
Gas station / convenience store	Patron	3
Gas station (with service bay) Patron Service bay	 Patron Service bay	 3 50
Hospital*	Bed space	135
Hotel, motel or tourist rooming house	Room	65
Medical office building Doctors, nurses, medical staff Office personnel Patients	 Person Person Person	 50 13 6.5
Migrant labor camp (central bathhouse)	Employee	20
Mobile Home (Manufactured home) (served by its own POWTS)	Bedroom	100
Mobile home park	Mobile home site	200

Table A−383.43−1 (Continued)
Public Facility Wastewater Flows

Source	Unit	Estimated Wastewater Flow (gpd)
Nursing, Rest Home, Community Based Residential Facility	Bed space	65
Outdoor sport facilities (toilet waste only)	Patron	3.5
Parks (toilets waste only)	Patron (75 patrons/acre)	3.5
Parks (toilets and showers)	Patron (75 patrons/acre)	6.5
Public shower facility	Shower taken	10
Restaurant*, 24−hr. (dishwasher and/or food waste grinder only)	Patron seating space	4
Restaurant*, 24−hr. (kitchen waste only without dishwasher and/or food waste grinder)	Patron seating space	12
Restaurant, 24−hr. (toilet waste)	Patron seating space	28
Restaurant*, 24−hr. (toilet and kitchen waste without dishwasher and/or food waste grinder)	Patron seating space	40
Restaurant*, 24−hr. (toilet and kitchen waste with dishwasher and/or food waste grinder)	Patron seating space	44
Restaurant* (dishwasher and/or food waste grinder only)	Patron seating space	2
Restaurant* (kitchen waste only without dishwasher and/or food waste grinder)	Patron seating space	6
Restaurant (toilet waste)	Patron seating space	14
Restaurant* (toilet and kitchen waste without dishwasher and/or food waste grinder)	Patron seating space	20
Restaurant* (toilet and kitchen waste with dishwasher and/or food waste grinder)	Patron seating space	22
Retail store	Patron (70% of total retail area ÷ 30 sq. ft. per patron)	1
School* (with meals and showers)	Classroom (25 students/ classroom)	500
School* (with meals or showers)	Classroom (25 students/ classroom)	400
School (without meals or showers)	Classroom (25 students/ classroom)	300
Self−service laundry (toilet waste only)	Clothes washer	33
Self−service laundry (with only residential clothes washers)	Clothes washer	200
Swimming pool bathhouse	Patron	6.5

* = May be high strength waste

A−383.43 (6) (a) Actual meter readings may be used to calculate the combined estimated design wastewater flow from a dwelling. To calculate the estimated design wastewater flow use the following formula and compare the answer to the peak metered flow. Choose the larger of the two estimated design flows.

(total meter flow/number of readings)(1.5) = estimated design wastewater flow

The frequency of meter readings should be daily for commercial.

A−383.43 (6) (b) A detailed per capita and per function flow may be established for commercial facilities. The per function flow ratings shall be substantiated by manufactures data of the per function flow and detailed use data from the facility in question or a similar facility under similar conditions of use. Estimated design wastewater flow shall be at least 1.5 times the total estimated daily flow calculated from the per capita and per function flow information.

A−383.43 (7) ESTIMATING CONTAMINANT LOADS.

Pathogenic contaminant load may be estimated based on data collected by a reputable testing or research facility.

Typical Data on the Unit Loading Factors and Expected Wastewater Contaminant Loads from Individual Residences

Contaminant	Unit Loading Factor lb/capita per day	Value		
		Unit	Range	Typical
BOD_5	0.180	mg/L	216−540	392
SS	0.200	mg/L	240−600	436
NH3 as N	0.007	mg/L	7−20	14
Org. N as N	0.020	mg/L	24−60	43
TKN as N	0.027	mg/L	31−80	57
Org P as P	0.003	mg/L	4−10	7
Inorg. P as P	0.006	mg/L	6−17	12
Grease		mg/L	45−100	70
Total Coliform		cfu/100mL	10^7−10^{10}	10^8

A−383.43 (8) (g) ANCHORING SYSTEM COMPONENTS.

The anchoring of components to counter buoyant forces due to saturated soil conditions can be determined using the following formula:

Weight of the component plus the weight of the anchor = 1.5 times (volume of water the component displaces) times [the weight of water (62.4 pounds/cubic foot at 39ºF)]

Chapter SPS 385

SOIL AND SITE EVALUATIONS

Note: Chapter H 65 as it existed on May 31, 1983 was repealed and a new Chapter ILHR 85 was created effective June 1, 1983. Chapter ILHR 85 was renumbered Chapter Comm 85 under s. 13.93 (2m) (b) 1., Stats., and corrections made under s. 13.93 (2m) (b) 7., Stats., Register, February, 1997, No. 494. Chapter Comm 85 as it existed on June 30, 2000 was repealed and a new chapter Comm 85 was created, Register, April, 2000, No. 532, eff. 7−1−00. **Chapter Comm 85 was renumbered chapter SPS 385 under s. 13.92 (4) (b) 1., Stats., Register December 2011 No. 672.**

SPS 385.01 Purpose. The purpose of this chapter is to establish the minimum requirements for evaluating and reporting soil and site characteristics that may affect treatment or dispersal of wastewater, treated wastewater, final effluent or nonwater−carried human wastes.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00.

SPS 385.02 Scope. (1) Pursuant to s. 145.02, Stats., this chapter applies to all soil and site evaluations conducted relative to the treatment or dispersal of wastewater, treated wastewater, final effluent or nonwater−carried human wastes into soil.

(2) A department interpretation of the requirements in this chapter shall supersede any differing interpretation by a lower level jurisdiction. A department decision on the application of the requirements in this chapter shall supersede any differing decision by a lower level jurisdiction.

Note: A decision of the department may be appealed. Section 101.02 (6) (e), Stats., outlines the procedure for submitting requests to the department for appeal hearings and the department procedures for hearing appeals.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 07−100: renum. to (1), cr. (2) Register September 2008 No. 633, eff. 10−1−08.

SPS 385.10 Qualifications. (1) SOIL EVALUATION. A soil evaluation for treatment or dispersal of wastewater, treated wastewater, final effluent or nonwater−carried human wastes regulated by chs. SPS 383 and 391 shall be performed by an individual who is a certified soil tester. A soil evaluation for the treatment or dispersal of stormwater regulated under ch. SPS 382 shall be performed by an individual who is either a certified soil tester or one who holds a professional soil scientist license under ch. GHSS 4.

Note: Section SPS 305.33 delineates the qualifications and certification procedures for certified soil testers.

(2) SITE EVALUATION. A site evaluation, relative to the installation of a POWTS treatment, holding or dispersal component location, or to determine land slope or setback distances to topographic or other site features shall be performed by a Wisconsin registered architect, professional engineer, designer of plumbing systems, designer of private sewage systems or land surveyor; a certified soil tester or POWTS inspector; or a licensed master plumber or master plumber−restricted service.

(3) SOIL SATURATION DETERMINATIONS. Soil saturation determinations may only be conducted and reported by an individual who is a certified soil tester.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 04−035: am. (1) Register November 2004 No. 587, eff. 12−1−04; **correction in (1) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.**

SPS 385.20 Soil evaluations. (1) GENERAL. (a) Soil boring methods and procedures shall comply with this section.

(b) Maximum soil application rates shall be determined relative to the soil texture, structure and consistence for each soil horizon or layer.

Note: Section SPS 383.44 establishes maximum soil application rates and soil treatment capability for the design of POWTS treatment or dispersal components consisting in part of in situ soil.

(2) NUMBER, TYPE AND DEPTH OF EVALUATIONS. (a) *General.* The number, type, depth and location of soil profile evaluations shall be sufficient to delineate the area under investigation and to assure consistency of the data within that area.

(b) *Number and area.* 1. a. Except as provided in subd. 1. d. and subd. 2., a minimum of 3 soil profile evaluation excavations shall be used to delineate a site within which POWTS treatment or dispersal components consisting in part of in situ soil are to be located.

b. For estimated daily flows of 1,000 gallons per day or less, at least one soil profile evaluation excavation per treatment or dispersal site shall be constructed as a soil pit, and described in accordance with s. SPS 385.30 (1) (c).

c. For estimated daily flows greater than 1,000 gallons per day, at least 3 soil profile evaluations per treatment or dispersal site shall be constructed as soil pits, and described in accordance with s. SPS 385.30 (1) (c).

d. The department or governmental unit may require additional soil profile evaluation excavations to be constructed where soil variability considerations may not be adequately addressed. The department or governmental unit may specify that soil profile descriptions in accordance with s. SPS 385.30 (1) (c) be conducted for any additional soil profile evaluation excavations.

2. At least one soil pit or soil boring shall be used to establish soil suitability for a pit privy.

Note: Sections SPS 383.44 (3) and 391.12 (1) (b) 1. contain further information regarding privy siting and soil requirements.

(c) *Type.* 1. Soil profile evaluations used to determine soil application rates shall be conducted using soil pits.

2. Soil profile evaluations used to determine or identify soil horizon depths, soil color, soil texture, redoximorphic feature colors or depth to groundwater or bedrock shall be conducted using either soil pits or soil borings.

(d) *Depth.* Soil profile evaluations shall extend an adequate depth below the land surface to identify soil properties critical to soil treatment or dispersal of wastewater, treated wastewater, final effluent or nonwater−carried human waste.

(3) EXCAVATION METHODS. (a) *Soil profile excavations.* A soil profile excavation shall be of such size and construction to allow accurate determination of soil characteristics.

(b) *Soil borings.* 1. Soil borings shall be created by means of a soil bucket auger, soil probe, split−spoon sampler or Shelby tube having at least a 2 inch diameter.

2. A soil boring may not be created by means of a power auger.

(c) *Soil pits.* A soil pit shall be of adequate size, depth and construction to enable a person to safely enter and exit the pit and to complete a morphological soil profile description.

Note: Occupational safety and health administration regulations (29 CFR 1926, Subpart P) apply to certain types of excavations, and the persons entering such excavations need to be familiar with those regulations.

(4) SOIL EVALUATION CONDITIONS. (a) Soil color evaluations shall be performed on days when light conditions permit accurate color determinations.

(b) Frozen soil material shall be thawed prior to conducting evaluations for soil color, texture, structure and consistence.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; **correction in (2) (b) 1. b., c., d. made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.**

SPS 385.30 Soil profile description and interpretations. (1) GENERAL. (a) A soil profile description shall be prepared for each soil profile excavation constructed.

(b) Soil profile descriptions shall be written in accordance with the descriptive procedures, terminology and interpretations found in Chapter 3 of the *Soil Survey Manual*, USDA, October, 1993, except where modified by, or in conflict with, this chapter.

(c) A soil profile description to substantiate soil application rates shall include at least all of the following morphological information for each soil horizon or layer:

1. Thickness in inches or decimal feet.

2. Munsell soil color notation.

3. Soil mottle or redoximorphic feature color, abundance, size and contrast.

4. United States Department of Agriculture, USDA, soil textural class with rock fragment modifiers.

5. Soil structure grade, size and shape.

6. Soil consistence.

7. Root abundance and size.

8. Soil boundary.

9. Occurrence of saturated soil, groundwater, bedrock or disturbed soil.

(d) A soil profile description to substantiate soil characteristics other than for application rates shall include the information specified in par. (c) 1. to 4. and 9.

(2) SOIL INTERPRETATIONS. (a) Redoximorphic features or mottles shall be interpreted as zones of seasonal or periodic soil saturation or groundwater, except as provided under sub. (3).

(b) Unless otherwise determined under s. SPS 385.60, the highest elevation of seasonal soil saturation shall be the ground surface where redoximorphic features are present within 4 inches of any of the following:

1. An A horizon that extends to the ground surface.

2. The lower boundary of overlying fill material where no buried A horizon exists.

3. An A horizon buried by overlying fill material.

(3) SOIL COLOR PATTERN EXEMPTIONS. (a) Without filing a report under s. SPS 385.60 (2), a certified soil tester may discount the following conditions, not limited by enumeration, as indicators of seasonally saturated soil:

1. Fossilized soil color patterns formed by historic periodic soil saturation.

2. A soil profile where redoximorphic features are confined within 12 inches of tension saturated silt loam or finer textured soil immediately overlying unsaturated coarse sandy loam or coarser textured soil that has a depth in the coarser material adequate to accommodate a distribution cell and dispersal zone.

3. A soil profile where redoximorphic features are confined within 24 inches of tension saturated silt loam or finer textured soil immediately overlying unsaturated coarse loamy sand or coarser textured soil that has a depth in the coarser material adequate to accommodate a distribution cell and dispersal zone.

4. Residual sandstone colors.

5. Unevenly weathered glacially deposited material, glacially deposited material naturally gray in color, or concretionary material in various stages of decomposition.

6. Deposits of lime.

7. Light colored silt or fine sand coatings on soil ped surfaces.

(b) Without filing a report under s. SPS 385.60 (2) for a specific site, the department may accept the results of soil saturation determinations or of the hydrograph procedure under s. SPS 385.60 previously conducted for areas adjacent to the site, provided that the soil profile descriptions and interpretations confirms that the soil and site conditions are similar for the specific site and the adjacent areas.

(4) SOIL COLOR PATTERN REPORTS. The certified soil tester shall report and describe any soil color pattern exemptions encountered.

(5) DETERMINATION REQUESTS. A certified soil tester may request assistance by the governmental unit or department staff in evaluating the significance of unusual soil color patterns as indicators of soil saturation that may not indicate saturated soil conditions. The governmental unit or department may decline to provide such assistance, and defer to the use of soil saturation determinations pursuant to s. SPS 385.60 or some other method.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: r. and recr. (2) (b) and (3) (a) 2. and 3. Register January 2004 No. 577, eff. 2−1−04; CR 07−100: am. (5) Register September 2008 No. 633, eff. 10−1−08; **correction in (2) (b) (intro.), (3) (a) (intro.), (b), (5) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.**

SPS 385.40 Evaluation reports. (1) GENERAL. A soil evaluation report shall be prepared and submitted to the governmental unit having jurisdiction upon the completion of the evaluation and associated report form.

(2) SOIL REPORT CERTIFICATION AND FORMAT. (a) *Soil evaluation reports.* Soil evaluation reports shall be prepared in a format specified by the department and this chapter.

Note: Department forms required in this chapter are available for a nominal fee at telephone 800−DOC−SALE or Contact Through Relay or at docsales@doa.state.wi.us, or at no charge at the Department's Web site http://dsps.wi.gov through links to Safety and Buildings Division forms.

(b) *Certification.* 1. Except as provided in subd. 2., each page of a soil evaluation report shall bear:

a. The original signature of the certified soil tester who collected the data;

b. The certified soil tester's identification number; and

c. The date the report is signed.

2. When more than one sheet of a soil evaluation report is bound together into one volume, only the title sheet shall:

a. Be required to be signed, dated and bear the identification number of the certified soil tester who collected the data; and

b. Clearly identify all other sheets comprising the bound volume.

(3) REPORT CONTENTS. (a) *Site report.* A site evaluation report shall include at least all of the following:

1. The site's legal description to within 40 acres.

2. The date the data was collected.

3. A legible and permanent site plan that complies with all of the following:

a. Is presented on paper no smaller than 8 ½ inches by 11 inches in size.

b. Is drawn to scale or fully dimensioned.

c. Shows the extent of the site evaluated for soil dispersal or treatment.

4. Location information for all points under investigation including structures, property lines and other encumbrances to the treatment or dispersal component placement on the site.

5. Pertinent elevation data, such as:

a. A reference to, and description of, a permanent vertical and horizontal reference point or bench mark from which all distances and elevations are delineated on the site plan;

b. The natural, undisturbed surface grade elevation for all soil profile excavations;

c. The percent and direction of land slope for the site under evaluation;

d. Ground surface contour lines at an interval appropriate for the conditions present;

e. The floodplain elevation, if established, and current surface elevation of any adjacent navigable waters or reservoir; and

f. The existing grade adjacent to the groundwater elevation observation pipe, the top of the observation pipe, and the bottom of the observation pipe.

(b) *Soil report.* A soil evaluation report shall include at least all of the following:

1. A site evaluation report pursuant to par. (a).

2. The date soil evaluations were conducted.

3. The site's legal description to within 40 acres.

4. Soil profile descriptions pursuant to s. SPS 385.30 for all soil profile evaluation excavations.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: am. (3) (a) 3. (intro) Register January 2004 No. 577, eff. 2−1−04; **correction in (3) (b) 4. made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.**

SPS 385.50 Governmental unit review. (1) GENERAL. (a) A governmental unit shall review all soil evaluation reports and site evaluation reports within 6 months of receipt.

(b) Upon completing the review of a soil evaluation report a governmental unit shall accept the report, reject the report, request additional information or clarification, or require verification under sub. (2).

(c) When a report is deemed acceptable, a governmental unit shall so indicate on the report and file the report for future reference.

(d) If the report is not acceptable, a governmental unit shall notify the submitter in writing and shall state the deficiencies or actions, or both, necessary to bring the report into compliance with this chapter or ch. SPS 383.

(2) VERIFICATION. (a) *Soil.* 1. The governmental unit or the department may require the property owner or the certified soil tester to provide soil pits in accordance with s. SPS 385.20 (3) for verification of soil profile evaluation data.

2. The certified soil tester who is responsible for the soil report shall be present at the site during the verification of soil profile evaluation data if so requested by the governmental unit or the department.

3. Soil verifications may not be conducted under adverse weather or light conditions that may lead to inaccurate results.

(b) *Site.* 1. The governmental unit or the department may require the property owner or certified individual who prepared the site report to provide assistance and equipment to verify site conditions.

2. The certified individual who is responsible for the site report shall be present at the site during the verification of site conditions if so requested by the governmental unit or department.

(c) *Report.* The governmental unit or the department shall complete a written report for each soil or site verification completed, and the results or findings of the report shall be filed with the soil and site evaluation report for future reference.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; **correction in (1) (d), (2) (a) 1. made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.**

SPS 385.60 Soil saturation determinations. (1) GENERAL. (a) A property owner, or the owner's agent, may submit documentation to prove that redoximorphic features, or other soil color patterns, at a particular site are not indicative of periodically saturated soil conditions or high groundwater elevation.

(b) Documentation shall be in the form of an interpretive determination, soil saturation determination, hydrograph procedure or artificially controlled navigable water determination pursuant to this section.

(2) INTERPRETIVE DETERMINATIONS. (a) A written report by a certified soil tester evaluating and interpreting redoximorphic soil features, or other soil color patterns, may be submitted to the department in lieu of high groundwater determination data. The written report shall conclusively demonstrate that the existing soil morphological features or color patterns are not indicative of current conditions of periodic soil saturation.

(b) The department shall make a determination on the validity of the data, results and conclusions set forth in the report.

(c) The written report shall include, but is not limited to, all of the following information:

1. A soil evaluation report pursuant to s. SPS 385.40.

2. An interpretive review of the site including, but not limited to, all of the following:

a. Local hydrology.

b. A historical interpretation of the local geomorphology.

c. Soil disturbance and hydraulic modification.

d. The landscape position and local topography in the area under investigation.

3. Soil series and mapping units, if available, for the immediate area, as listed in the USDA soil survey.

4. Data, if any, from previous soil saturation determinations in similar soil conditions and landscape position.

5. Any written reports, comments or recommendations by the governmental unit or department staff.

(3) SOIL SATURATION DETERMINATION. (a) *General.* Actual elevations of soil saturation may be determined at specific sites in accordance with the soil saturation determination procedures in par. (c).

(c) *Precipitation.* 1. Precipitation data reported for soil saturation determination purposes shall include monthly totals for September through May, and daily totals for February through May.

2. Precipitation data totals under subd. 1. shall be from either the closest local station to the site where the observation pipe is installed, or the average from the 3 closest local stations to the site. If averaging is used, the totals under subd. 1. shall be submitted for all 3 stations.

(d) *Regional water tables.* 1. Where sites are subject to a broad, relatively uniform, regional water table, the fluctuation observed over a several year cycle shall be considered.

2. At such sites, and where free water levels are more than 5 feet below grade, determinations shall be made using the hydrograph procedures contained in sub. (4).

3. Areas affected by a regional water table shall be delineated by the department in consultation with the affected counties and the Wisconsin Geological and Natural History Survey.

(e) *Fine textured soil.* 1. The department may prohibit soil saturation determinations in fine textured soil with high matric potentials where determination results may be inconclusive.

2. In such cases, the department may approve alternative methods to address the direct determination of saturated or near saturated soil conditions not enumerated in this section.

(f) *Groundwater elevation observation pipe installation and construction.* 1. Number of observation pipes. a. At least 3 groundwater elevation observation pipes shall be installed to delineate the area under investigation.

b. The governmental unit or department may require more than 3 observation pipes to adequately evaluate potential soil saturation conditions.

2. Observation pipe depth. a. At the request of the department or governmental unit, at least one observation pipe shall be constructed to a depth of 15 feet below the ground surface to determine if high groundwater elevation conditions are due to a perched water table and the possible extent of the saturated zone.

b. Other observation pipes shall terminate at specific depths below grade that will serve to evaluate where shallow perched zones of soil saturation occur within the soil profile.

c. The governmental unit or department may designate specific observation pipe depths and locations based on soil and site conditions, or experience in a particular geographic area or topographic position.

d. An observation pipe may not be less than 24 inches deep.

3. Observation pipe construction. The direct observation of soil saturation conditions shall be accomplished by means of observation pipes conforming to this subdivision and Figure 385.60−1.

a. The observation pipe shall be of a material meeting the standards in s. SPS 384.30 Table 384.30−1, except that lead pipe may not be used.

b. The inside diameter of an observation pipe may not be less than 2 inches or more than 4 inches nominal size.

c. The borehole diameter shall be 2 to 4 inches larger than the outside diameter of the observation pipe.

d. The top of the observation pipe shall terminate at least 18 inches above grade and be provided with a vented cap.

e. The bottom of the observation pipe shall terminate with a slotted, or screened pipe. The slots or screen shall extend 6 to 18 inches above the bottom of the pipe and be at least 4 inches below the filter pack seal. The slots or screen shall not be hand cut and shall be designed to retain soil particles with a diameter of greater than 0.02 inch.

f. Except for the vented end cap, joints between lengths of pipe and fittings shall conform to s. SPS 384.40.

g. Finished grade around the observation pipe shall be sloped away from the observation pipe using soil material.

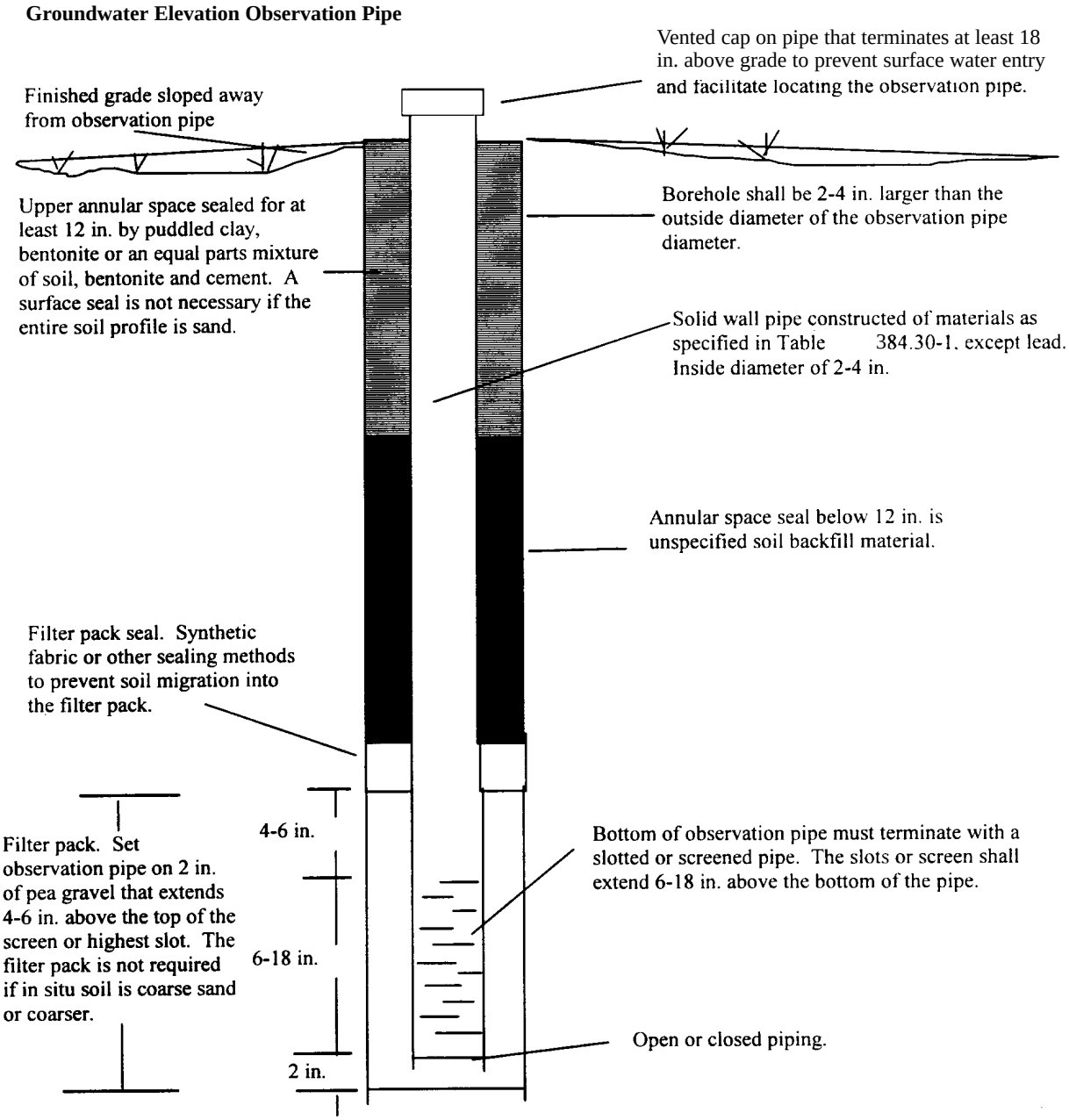
h. At a minimum, the upper 12 inches of annular space surrounding the observation pipe shall be sealed by puddled clay, bentonite, or an equal−parts mixture of soil, bentonite and cement. A surface seal may not be necessary if the entire soil profile is sand.

i. The annular space seal below 12 inches and to the top of the filter pack seal may be of unspecified soil material.

j. A filter pack seal shall be installed above the filter pack to prevent soil migration downward into the filter pack.

k. The observation pipe shall be set on at least 2 inches of pea gravel that extends 4 to 6 inches above the top of the screen or highest slot. The gravel filter pack is not necessary if the natural soil is coarse sand or coarser.

Figure 385.60−1



(g) *Observations.* 1. Observation period. The observation period for soil saturation determinations shall begin on or before the appropriate date specified in Figure 385.60−2, and end June 1.

2. Alternate observation period. The department may approve an alternate observation period if the data presented conclusively demonstrates equivalency to conditions encountered during a normal spring observation period.

3. Minimum frequency. Observations shall be made on the first day of the observation period and at least every 7 days thereafter until the observation period is complete.

(h) *Conclusions.* 1. The highest level of soil saturation shall be considered the highest level of free water observed in an observation pipe on 2 occasions 7 days apart during the observation period.

2. The results of soil saturation determinations under this section shall be considered inconclusive if the precipitation totals under par. (c) do not equal or exceed:

a. 8.5 inches from September 1 through the last day of February; and

b. 7.6 inches from March 1 through May 31.

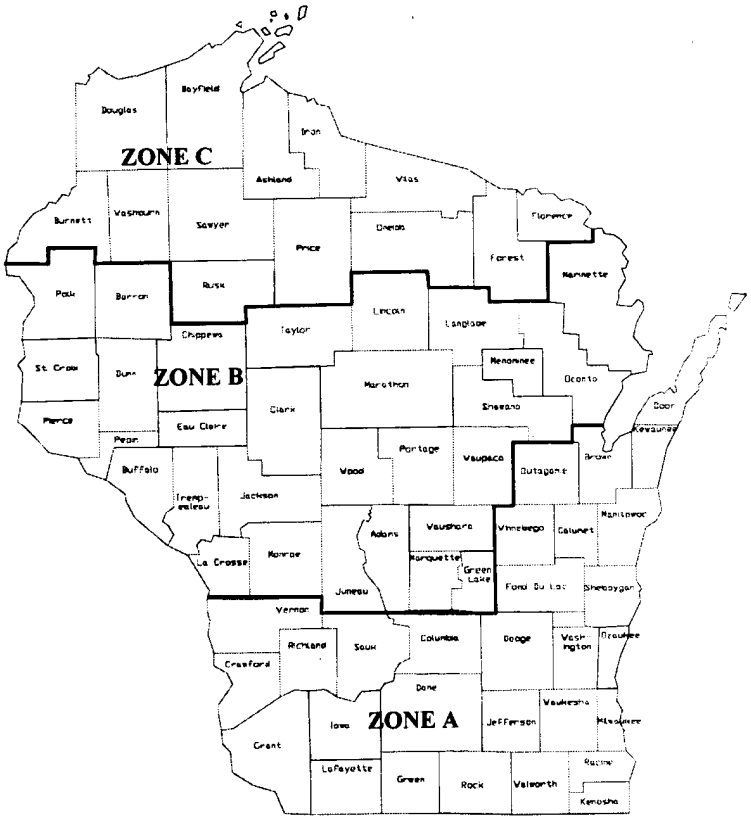


Figure 385.60−2
Latest Date to Begin Spring Soil Saturation Monitoring

Zone A	**February 15**
Zone B	**March 1**
Zone C	**March 15**

(i) *Reporting data.* 1. Within 180 days of the completion of the observations, 3 copies of the following data shall be submitted to the department for review:

a. A soil and site evaluation report pursuant to s. SPS 385.40.

b. Observation pipe installation, depth, location and elevation information.

c. Precipitation data and name of any local station used.

d. Observation dates.

e. Current and any prior observation results.

f. Any governmental unit observations or reports pertaining to the soil saturation determination observations, observation pipe construction or soil/site conditions.

2. Within 180 days of the completion of the observations, one copy of the data specified in subd. 1. shall be filed with the governmental unit having jurisdiction.

(j) *Report forms.* Soil saturation determination results shall be reported on forms specified by the department.

Note: Department forms required in this chapter are available for a nominal fee at telephone 800−DOC−SALE or Contact Through Relay or at docsales@doa.state.wi.us, or at no charge at the Department's Web site http://dsps.wi.gov through links to Safety and Buildings Division forms.

(k) *Failure to report.* Failure to file soil saturation determination results with the governmental unit and department within 60 days may disqualify the site from future soil saturation or interpretive determinations.

(4) HYDROGRAPH PROCEDURE. (a) 1. Except as provided in subd. 3., where regional water table fluctuations are considered in deep sandy soil, the predicted high groundwater elevation shall be established using hydrograph documentation.

2. Except as provided in subd. 3., the highest groundwater elevation shall be determined by direct observation during the soil profile evaluation or by one of the hydrograph methods outlined in pars. (b) to (d), whichever is highest.

3. The department or governmental unit may accept use of the hydrograph procedure to predict regional water table levels on sites where inclusions of sandy loam or finer soil material, or massive conditions exist.

(b) 1. If there is less than 5 feet to free water below original grade, the procedures detailed in sub. (2) or (3) shall be used to determine the highest predicted groundwater elevation at the site.

2. If there is 5 feet or more to free water below original grade, the hydrograph procedure may be used to determine the highest predicted groundwater elevation at the site.

(c) When free water at the site is 5 to 10 feet below grade, all of the following procedures apply:

1. A completed soil and site evaluation report pursuant to s. SPS 385.40 that confirms the elevation of free water, if observed, shall be prepared.

2. a. A slotted or screened groundwater elevation observation pipe shall be installed at the proposed system location to a depth of at least 12 inches below the free water elevation.

b. The observation pipe shall be installed pursuant to sub. (3) (f) 3.

3. a. The water level in the observation pipe shall be recorded after completion of the observation pipe installation and 7 days later.

b. The highest of the 2 water levels shall be used to complete the hydrograph procedure.

4. The permanent USGS groundwater elevation well or wells as assigned by the governmental unit or department shall be read within 24 hours of establishing the actual free water elevation at the site.

5. The hydrograph procedure shall be completed and the results shall be submitted for review to the governmental unit having jurisdiction in a format specified by the department.

Note: Department forms required in this chapter are available for a nominal fee at telephone 800−DOC−SALE or Contact Through Relay or at docsales@doa.state.wi.us, or at no charge at the Department's Web site http://dsps.wi.gov through links to Safety and Buildings Division forms.

(d) When free water at the site is more than 10 feet below grade, all of the following procedures apply:

1. A completed soil and site evaluation report pursuant to s. SPS 385.40 that confirms the elevation of free water, if observed, shall be prepared.

2. The permanent USGS groundwater elevation well or wells assigned to the project by the governmental unit or department shall be read within 24 hours of the actual free water determination at the site.

3. The hydrograph procedure shall be completed and the results shall be submitted for review to the governmental unit having jurisdiction in a format specified by the department.

Note: Department forms required in this chapter are available for a nominal fee at telephone 800−DOC−SALE or Contact Through Relay or at docsales@doa.state.wi.us, or at no charge at the Department's Web site http://dsps.wi.gov through links to Safety and Buildings Division forms.

(e) The governmental unit or the department may request more than one USGS groundwater well or other wells assigned by the governmental unit or the department be used to complete the hydrograph procedure.

(f) The governmental unit or the department may reject or suspend use of the hydrograph procedure when erratic groundwater tables are present due to recent, significant recharge events.

(5) ARTIFICIALLY CONTROLLED NAVIGABLE WATERS DETERMINATION. (a) If the groundwater elevation at a site is influenced by the artificial control of navigable waters by a recognized management entity, all of the following conditions shall be addressed:

1. If loamy sand or coarser soil textures prevail at a site, the groundwater elevation at the site shall be compared to the current and highest controlled navigable water elevation.

2. The highest normal groundwater elevation at such sites shall be the higher of either the observed elevation or an adjusted elevation based on the controlled water.

(b) An artificially controlled navigable waters determination report shall be prepared and submitted for review to the governmental unit having jurisdiction upon completion of the determination and associated report.

(6) SOIL SATURATION OBSERVATION PIPE REMOVAL. The following requirements shall apply to all groundwater elevation observation pipes installed pursuant to this section:

(a) *Removal timeline.* Unless specifically approved by the governmental unit or department, all groundwater elevation observation pipes shall be removed within 60 days after the completion of soil saturation determination.

(b) *Contamination conduit.* Any groundwater elevation observation pipe found by the department or governmental unit to be acting as a conduit for groundwater contamination shall be ordered removed immediately.

(7) VERIFICATION. (a) *Verification.* 1. The governmental unit or department may request verification of soil saturation determinations pursuant to s. SPS 385.50 (2), and proper observation pipe installation pursuant to this section.

2. The governmental unit or the department may require any groundwater elevation observation pipe deemed by the governmental unit or the department to be in poor contact with the surrounding soil to be reinstalled pursuant to this section.

(b) *On−site visits.* 1. The governmental unit or department may visit sites during soil saturation determination periods or at other reasonable times to determine the accuracy of data.

2. A written record of on−site visits in subd. 1. shall be maintained by the agency conducting the visits.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 02−129: r. and recr. (1) and (3) (h) 1., am. (2) (c) (intro.), (2) (c) 2. b., (3) (i) 1. (intro.) and 2., (4) (a) 1. and 2., (4) (c) (intro.), 2. b., 5., (d) (intro.) and 3., r. (3) (b), cr. (4) (a) 3., (4) (e) and (f), and (5), renum. (5) and (6) to be (6) and (7) Register January 2004 No. 577, eff. 2−1−04; corrections in (3) (a) and (h) made under s. 13.93 (2m) (b) 7., Stats., Register January 2004 No. 577; CR 07−100: am. (4) (c) 5., (d) 3. and (5) (b) Register September 2008 No. 633, eff. 10−1−08; **correction (2) (c) 1., (f) 3. (intro.), a., f., (g) 1., (i) 1. a., (4) (c) 1., (d) 1., (7) (a) 1. made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.**

Chapter SPS 391

SANITATION

Note: Chapter Comm 91 was renumbered chapter SPS 391 under s. 13.92 (4) (b) 1., Stats., Register December 2011 No. 672.

SPS 391.01 Purpose. This chapter has the following purposes:

(1) This chapter establishes minimum standards and criteria for the design, installation and maintenance of sanitation systems and devices which are alternatives to water−carried waste plumbing fixtures and drain systems so that these sanitation systems and devices are safe and will safeguard public health and the waters of the state.

(2) This chapter establishes criteria for equal speed of access to toilets for each gender in restrooms serving an amusement facility and a specialty event center where the public congregates.

Note: Chapter SPS 361 to 366 relating to commercial buildings and structures specifies the minimum number of toilet facilities for women and men.

Note: Chapter SPS 390 relating to swimming pools and water attractions contains minimum number of toilet facilities for women and men.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 04−072: am. Register July 2005 No. 594, eff. 1−1−06.

SPS 391.02 Scope. (1) This chapter has the following applications:

(a) This chapter applies to all composting toilet systems, incinerating toilets, pit privies and vault privies installed or constructed on or after the effective date of this chapter.

(b) This chapter applies to separate−gender restrooms serving an amusement facility and a specialty event center where the public congregates that are constructed or altered as specified in s. SPS 391.14.

(2) The provisions of this chapter are not retroactively applied to existing installations unless specifically stated in the administrative rule.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 04−072: am. (1) Register July 2005 No. 594, eff. 1−1−06; **correction in (1) (b) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.**

SPS 391.03 Definitions. In this chapter:

(1) "Amusement facility" has the meaning given in s. 101.128 (1) (a), Stats.

Note: Section 101.128 (1) (a), Stats., reads as follows:
"Amusement facility" means any zoo, state or local park, amusement or theme park, state fair park, county or other local fairgrounds, or any similar facility, as determined by department rule.

(2) "Composting toilet system" means a method that collects, stores and converts by bacterial digestion nonliquid−carried human wastes or organic kitchen wastes, or both, into humus.

(3) "Department" means the department of safety and professional services.

(4) "Facility where the public congregates" has the meaning given in s. 101.128 (1) (b), Stats.

Note: The relevant portions of section 101.128 (1) (b), Stats., read as follows:
"Facility where the public congregates" means any of the following that has a general capacity or a seating capacity of 500 or more persons:
1. An amusement facility
3. A specialty event center.

(5) "Incinerating toilet" means a self−contained device for the treatment of nonliquid carried wastes that deposits the wastes directly into a combustion chamber, reduces the solid portion to ash and evaporates the liquid portion.

(6) "Pit privy" means an enclosed nonportable toilet into which nonwater−carried human wastes are deposited to a subsurface storage chamber that is not watertight.

(7) "Portable restroom" means a self−contained portable unit that includes fixtures, incorporating holding tank facilities, designed to receive human excrement.

(8) "Specialty event center" has the meaning given in s. 101.128 (1) (g), Stats.

Note: Section 101.128 (1) (g), Stats., reads as follows:
"Specialty event center" means an open arena used for rallies, concerts, exhibits or other assemblies, with no permanent structure for such assembly.

(9) "Vault privy" means an enclosed nonportable toilet into which nonwater−carried human wastes are deposited to a subsurface storage chamber that is watertight.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 04−072: renum. (1) to (6) to be (2), (3), (5) to (7) and (9), cr. (1), (4) and (8), Register July 2005 No. 594, eff. 1−1−06; **correction in (3) made under s. 13.92 (4) (b) 6., Stats., Register December 2011 No. 672.**

SPS 391.04 Registrations. The installation of a vault privy or a pit privy to serve a state−owned facility shall be registered with the department prior to installation. The registration of a vault privy shall be accompanied by sufficient information to determine compliance with s. SPS 384.25. The registration of a pit privy shall be accompanied by sufficient soil information to determine compliance with s. SPS 383.44 (4) (b).

History: CR 02−129: cr. Register January 2004 No. 577, eff. 2−1−04; **correction made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.**

SPS 391.10 Composting toilet systems. (1) The materials, design, construction and performance of a composting toilet system shall conform to NSF Standard 41.

(2) All composting toilet systems shall be listed by a testing agency acceptable to the department.

Note: Listing agencies acceptable to the department include the American Gas Association; Canadian Standards Association; NSF International; Underwriter's Laboratories; and Warnock Hersey.

(3) (a) Components for the storage or treatment of wastes shall be continuously ventilated.

(b) Ventilation ducts or vents for the composting toilet system shall conform to s. SPS 382.31 (16).

Note: See appendix for a reprint of portions of s. SPS 382.31 (16).

(4) (a) The disposal of the compost shall be in accordance with EPA part 503.

(b) The disposal of any liquid from a composting toilet system shall be either to a public sanitary sewer system or a POWTS conforming to ch. SPS 383.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; **correction in (3) (b), (4) (b) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.**

SPS 391.11 Incinerating toilets. (1) The design, construction and installation of a gas−fired incinerating toilet shall conform to ANSI Z21.61.

(2) The materials, design, construction and performance of an electric−fired incinerating toilet shall conform to NSF Standard 41.

(3) All electric and gas−fired incinerating toilets shall be listed by a testing agency acceptable to the department.

Note: Listing agencies acceptable to the department include the American Gas Association, Canadian Standards Association, NSF International, Underwriter's Laboratories, and Warnock Hersey.

(4) (a) The disposal of the end product shall be of in accordance with 40 CFR Part 503, Standards for the Use or Disposal of Sewage Sludge.

Note: EPA materials relating to EPA 503, including, "Domestic Septage Regulatory Guidance: A Guide to the EPA 503 Rule", are available from the Office of Water Resource, US EPA, 401 M Street SW, Washington D.C. 20460.

(b) The disposal of any liquid from an incinerating toilet shall be either to a public sanitary sewer system or a POWTS conforming to ch. SPS 383.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; **correction in (4) (b) made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.**

SPS 391.12 Privies. (1) (a) The storage chamber of a vault privy shall conform with the requirements of s. SPS 384.25 relating to holding tanks, and shall have a minimum storage capacity of 200 gallons or one cubic yard.

(b) 1. The storage chamber of a pit privy shall be sited and located in soil recognized to provide treatment and dispersal in accordance with s. SPS 383.44 (4) (b).

Note: Chapter SPS 385 establishes procedures for conducting soil evaluations and preparing soil evaluation reports. Section SPS 305.33 delineates the qualifications and certification procedures for individuals who conduct soil evaluations.

2. Governmental units may set standards for the structure above the vault or pit for one− and two−family dwellings.

3. Privies for public use shall meet the requirements of this section and chs. SPS 361 to 366.

Note: Chapters NR 811 and 812 establish minimum separation distances between a pit or vault privy and a potable well. Chapters NR 811 and 812 are administered by the department of natural resources.

(c) The storage chamber of a vault privy shall be anchored to prevent flotation caused by saturated soil conditions.

(2) (a) The storage chamber of a pit or vault privy shall be provided with a vent for the purpose of relieving explosive gases.

(b) The vent serving the storage chamber of a privy shall be:

1. At least 3 inches in diameter;

2. Installed in accordance with s. SPS 382.31 (16) (a) to (f); and

3. Fabricated or provided with screening to prevent insects from entering the storage chamber.

(3) The servicing of a vault privy relative to the pumping, transporting and disposal of the contents shall be in accordance with ch. NR 113.

(4) The abandonment of a vault privy shall be accomplished by:

(a) Having the contents of the storage chamber pumped and disposed of in accordance with ch. NR 113;

(b) Removing the entire top of the chamber; and

(c) Filling the remaining portion of the emptied storage chamber with soil or other inert material to an elevation equal to or above the surrounding grade.

(5) The abandonment of a pit privy shall be accomplished by filling the storage chamber with soil or other inert material to an elevation equal to the surrounding grade.

Note: The requirements of the commercial building code, chs. SPS 361 to 366, apply to the structures built over those privies serving public buildings and places of employment.

(6) (a) A privy may not be installed in a floodway.

(b) A privy may be installed in the floodfringe provided that the area is filled to remove it from the floodfringe designation or the vault is flood−proofed.

Note: The department of natural resources determines if filling or flood−proofing is in accordance with current rules in effect for development in a floodfringe area.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; CR 01−139: am. (1) (b) 3. Register June 2002 No. 558, eff. 7−1−02; **correction in (1) (a), (b) 1., 3., (2) (b) 2. made under s. 13.92 (4) (b) 7., Stats., Register December 2011 No. 672.**

SPS 391.13 Portable restrooms. (1) The storage chamber of a portable restroom into which human waste is to be deposited shall be watertight.

(2) The entire floor and the side walls to a height of not less than 4 inches of a portable restroom shall be of a material impervious to water.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00.

SPS 391.14 Equal speed of access to toilets. (1) APPLICATION. This section applies to the toilet fixtures in separate−gender restrooms serving an amusement facility and a specialty events center where the public congregates that are constructed or renovated on or after January 1, 2006 only if one of the following occurs:

(a) New separate−gender restrooms are constructed or separate−gender toilets are provided, in which case this section applies only to the new restrooms.

(b) More than 50% of the square footage of an existing separate−gender restroom is renovated, in which case this section applies only to the renovated portion.

Note: Under section 101.128 (1) (d), Stats., " 'renovation' means any structural remodeling, improvement or alteration of an existing facility where the public congregates. 'Renovation' does not include any of the following:

1. Reroofing.

2. Cosmetic remodeling, including painting or the installation of wall covering, of paneling, of floor covering or of suspended ceilings.

3. An alteration to an electrical or mechanical system."

(2) NUMBER OF TOILET FACILITIES. When separate public restrooms or other toilet facilities are provided for males and females at an amusement facility and a specialty event center where the public congregates, the number of toilets for the females shall be provided at a ratio of 2 for every toilet and every urinal provided for the males.

History: CR 04−072: cr. Register July 2005 No. 594, eff. 1−1−06.

SPS 391.20 Incorporation of standards by reference. (1) CONSENT. Pursuant to s. 227.21, Stats., the attorney general and the revisor of statutes have consented to the incorporation by reference of the standards listed in sub. (3).

(2) COPIES. Copies of the adopted standards are on file in the offices of the department, the secretary of state and the legislative reference bureau. Copies of the standards may be purchased through the respective organizations listed in sub. (3).

(3) ADOPTION OF STANDARDS. The standards referenced in pars. (a) and (b) are hereby incorporated by reference into this chapter.

(a) American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018, GAS−FIRED TOILETS, Z21.61−1983.

(b) NSF International, 3475 Plymouth Road, P.O. Box 130140, Ann Arbor, Michigan 48113−0140, NON−LIQUID SATURATED TREATMENT SYSTEMS, NSF 41−1998.

History: Cr. Register, April, 2000, No. 532, eff. 7−1−00; **correction in (2) made under s. 13.92 (4) (b) 6., Stats., Register December 2011 No. 672.**

Chapter SPS 391

APPENDIX

The material and information contained in this appendix is for clarification purposes only. Appendix material and information are numbered to correspond to the rule number as it appears in the text of the code. Material and information included in this appendix is subject to change without notice, including names, addresses, phone numbers and forms, and reflects information known at the time of publication.

A−391.10 (3) (b) Section SPS 382.31 (16) (a) to (f) reads as follows:

382.31 (16) VENT TERMINALS. All vents and vent systems shall terminate in the open air in accordance with this subsection.

(a) *Extension above roofs.* Extensions of vents through a roof shall terminate at least 8 inches above the roof. Where the roof is to be used for any purpose other than weather protection, the vents shall extend at least 7 feet above the roof.

(b) *Waterproof flashings.* The penetration of a roof system by a vent shall be made watertight with an approved flashing.

(c) *Prohibited uses.* Vent terminals shall not be used as flag poles, support for antennas or other similar purposes.

(d) *Location of vent terminals.* 1. A vent shall not terminate under the overhang of a building.

2. All vent terminals shall be located:

a. At least 10 feet from an air intake;

b. At least 5 feet from a power exhaust vent;

c. At least 10 feet horizontally from or 2 feet above roof scuttles, doors and openable windows; and

d. At least 5 feet from or 2 inches above parapet walls.

3. Where a structure has an earth covered roof extending from surrounding grade, the vent extension shall run at least 7 feet above grade and terminate with an approved vent cap. The portion of vent pipe outside the structure shall be without joints, except one fitting may be installed where the pipe leaves the top or side of the structure.

(e) *Extension through wall.* Where approved by the department, a vent may terminate through an exterior wall. Such a vent shall terminate at least 10 feet horizontally from any lot line and shall terminate downward. The vent shall be screened and shall comply with par. (d).

(f) *Extensions outside buildings.* Drain or vent pipe extensions shall not be located or placed on the outside of an exterior wall of any new building, but shall be located inside the building.

Chapter NR 113

SERVICING SEPTIC OR HOLDING TANKS, PUMPING CHAMBERS, GREASE INTERCEPTORS, SEEPAGE BEDS, SEEPAGE PITS, SEEPAGE TRENCHES, PRIVIES, OR PORTABLE RESTROOMS

Note: Chapter NR 113 as it existed on September 30, 1987 was repealed and a new chapter NR 113 was created effective October 1, 1987. Chapter NR 113 as it existed on December 31, 1996, was repealed and a new chapter NR 113 was created effective January 1, 1997; corrections made under s. 13.93 (2m) (b) 7., Stats., Register, January, 1999, No. 517.

NR 113.01 Purpose. The purposes of this chapter are to establish standards for the servicing of private sewage systems including septic and holding tanks, dosing chambers, grease interceptors, seepage beds, seepage pits, seepage trenches, privies and portable restrooms; to provide for the use and disposal of wastewaters from these sources while protecting public health from unsanitary and unhealthful practices and conditions; and to protect surface waters and groundwaters of the state from contamination by septage.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97.

NR 113.02 Applicability. This chapter applies to licensed haulers, owners and any person servicing private sewerage systems including septic and holding tanks, dosing chambers, grease interceptors, seepage beds, seepage pits, seepage trenches, privies and portable restrooms. The following services are exempt from these rules:

(1) The transport of industrial wastes which are regulated under ch. NR 214.

(2) The transport of animal excrement and associated bedding.

(3) The use or disposal of hazardous waste which is regulated under chs. NR 660 to 670.

(4) The use or disposal of solid waste which is regulated under chs. NR 500 to 538.

(5) The use or disposal of POTW sludge which is regulated under ch. NR 204.

(6) The use or disposal of septage that has been treated by facilities which are operated under a Wisconsin pollutant discharge elimination system (WPDES) discharge permit, including centralized septage treatment facilities, which are regulated under ch. NR 204.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97; corrections in (3) and (4) made under s. 13.92 (4) (b) 7., Stats., Register February 2010 No. 650.

NR 113.03 Definitions. In addition to the definitions and abbreviations in s. 281.48, Stats., the following definitions apply to terms used in this chapter:

(1) "Agricultural land" means land on which a food crop, a feed crop or fiber crop will be grown within 12 months after septage is applied to the land. This includes range land and land used as pasture.

(2) "Agronomic rate" means the total septage application rate (dry weight basis) designed to provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop or other vegetation grown on the land and designed to minimize the amount of nitrogen in the septage that passes below the root zone of the crop or vegetation grown on the land to the ground water.

(3) "Application rate" means the hydraulic loading limits placed on a landspreading site or field normally expressed as gallons/acre/week.

(4) "Approved site" means property approved by the department or its agent for the disposal, recycling or storage of septage.

(5) "Available nitrogen" means the nitrogen present in the septage in the NH_3−N form and the nitrogen that is mineralized from the organic nitrogen in the septage, both of which can then be absorbed and assimilated by growing plants in the cropping year.

(6) "Available water capacity" means the amount of water which is readily held by the soil and available for plant uptake. Available water holding capacity shall be calculated using the following table or other method acceptable to the department:

Textural Classification System		Factor for Use in Calculation of Available Water Capacity
Commerce	**USDA**	**(inch/inch)**
Sand	Sand	0.02
	Loamy Sand	
Sandy Loam	Sandy Loam	0.10
Loam	Loam	0.20
Silt Loam	Silt Loam	0.22
	Silt	
Clay Loam	Sandy Clay Loam	0.19
	Clay Loam	
	Silty Clay Loam	
Clay	Sandy Clay	0.17
	Silty Clay	
	Clay	

Note: The following method can be used to show that the soil has 5 inches of available water capacity:

Multiply the number of inches of each soil texture in the soil profile (above groundwater and bedrock) by the appropriate factor given above.

Example:

10 inches of sandy loam	10 × .1	= 1
20 inches of loam	20 × .2	= 4
10 inches of silt loam	10 × .22	= 2.2
Calculated available water table		7.2

(7) "Bedrock" means the rocks that underlie soil material. Bedrock is present at the earth's surface when the weathered in−place consolidated material, larger than 2mm in size, is greater than 50% by volume.

(8) "Business" means any individual, partnership, corporation or body politic that does servicing.

(9) "Certified operator" means any person servicing private sewage systems such as septic and holding tanks, dosing chambers, grease interceptors, seepage beds, seepage pits, seepage trenches, privies or portable restrooms who holds a valid Wisconsin septage servicing operator's certificate under ch. NR 114.

(10) "Community well" means a public well which serves at least 15 service connections used by year−round residents or regularly serves at least 25 year−round residents. Any public well serving 7 or more homes, 10 or more mobile homes, 10 or more apartment units, or 10 or more condominium units shall be considered a community well unless information is available to indicate that 25 year−round residents will not be served.

(11) "Complete application" means the uniform spreading of septage over the entire site at a rate not to exceed 12,800 gallons per acre per week of septic tank wastewater or holding tank wastewater or 4,400 gallons per acre per week of grease interceptor wastewater.

(12) "Department" means the department of natural resources.

(13) "Disposal" means the controlled discharge of septage to a POTW, treatment or storage lagoon, or to an agricultural field for the purpose of recycling nutrients back into the environment.

(14) "Dormant field" means a field that is not currently used or will not be used within 12 months after septage has been applied to the field for the harvesting of a crop. A field may have a vegetative cover crop grown on it, and a need for increased organic matter.

(15) "Dosing chamber" means a water tight receptacle that employs a pump or automatic siphon to elevate or distribute effluent to the private sewage system.

(16) "Dry run" means a drainage pathway, either natural or artificial, with definable banks, which contains a confined flow during periods of runoff.

(17) "Farmer" means a person who owns or leases a contiguous parcel of land of 40 acres or more that the person is using for agricultural purposes.

(18) "Field" means a subset of a site.

(19) "Floodplain" has the meaning specified in s. NR 116.03 (16).

(20) "Food crops" means tobacco and crops grown for human consumption.

(21) "Grease interceptor" means a water tight receptacle designed to intercept and retain grease or fatty substances contained in kitchen and other food wastes. Grease interceptor and grease trap mean the same thing.

(22) "Groundwater" means any of the waters of the state, as defined in s. 299.01 (5), Stats., occurring in a saturated subsurface geological formation of permeable rock or soil.

(23) "High groundwater level" means the higher of either the elevation to which the soil is saturated as observed as a free water surface in an unlined hole, or the elevation to which the soil has been seasonally or periodically saturated as indicated by soil color patterns throughout the soil profile.

(24) "High use field" means a field that receives more than 3 complete applications of septage per year and the number of applications are limited to the crop nutrient requirements.

(25) "Historical site" means any property designated as a historical site under s. 44.40 (2) (a), Stats.

(26) "Holding tank" means an approved watertight receptacle for the collection and holding of sewage.

(27) "Hydraulic loading rate" means the volume of waste discharged per unit area per unit time.

(28) "Incorporation" means the mixing of septage with topsoil, by methods such as discing, mold−board plowing, chisel plowing or rototilling to a minimum depth of 4 inches.

(29) "Industrial wastes" means industrial wastes which are biodegradable and of animal or plant origin, and includes suspended solids which are in a fluid or semifluid or solid state and are not regulated by chs. NR 214, 500 to 538 or 660 to 670.

(30) "Injection" means the subsurface placement of septage to a depth of 4 to 12 inches.

(31) "Land application" or "landspreading" means the spraying or spreading of septage onto the land surface, the injection of septage below the land surface, or the incorporation of septage into the soil, so that the septage can either condition the soil or fertilize crops or vegetation grown in the soil.

(32) "Land with a high potential for public exposure" means land that the public uses frequently or may readily come in contact with and has received land application of septage or septage byproducts within the last 12 months. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms and golf courses.

(33) "Litter free" means the absence of nonbiodegradable material such as plastics or glass of 2 inches or greater in length on the soil surface.

(34) "Low use field" means a field that receives 3 or less complete applications of septage per year.

(35) "Nuisance" means any source of filth or probable cause of sickness not in compliance with this rule.

(36) "Parcel of land" means property that is contiguous and under the same ownership interest.

Note: If a farmer owns a parcel of land that is split or divided by a public or private road or a railroad, the land on the other side of the road will be considered part of the same parcel of land.

(37) "Pasture crop" means a crop such as legumes, grasses, grain stubble or stover which is consumed by animals while grazing.

(38) "Pathogens" means disease causing organisms. This includes, but is not limited to, certain bacteria, protozoa, viruses and viable helminth ova.

(39) "Permeability" means the rate of movement of liquid through the soil.

(40) "Ponding" means the presence of free liquid over an area of 4 square feet or more, visible 2 hours after application of the septage. An example of a 4 square foot area would be an area 4 feet by 1 foot.

(41) "Portable restroom" means fixtures, incorporating holding tank facilities, designed to directly receive human excrement. Portable restrooms are self−contained units, may be designed for one or more person's use at a given time and are readily transportable.

(42) "Posting" means the placement of signs on the perimeter of a site or field that contain a notice of septage application, name, address and telephone number of the hauler spreading the septage and are spaced not more than 500 feet apart.

(43) "Privy" means a cavity in the ground or a portable above−ground device constructed for toilet uses which receives human excrement either to be partially absorbed directly by the surrounding soil or stored for decomposition and periodic removal.

(44) "Public contact site" means land with a high potential for contact by the public. Some examples include public parks, ball fields, cemeteries, plant nurseries, turf farms and golf courses.

(45) "Publicly owned wastewater treatment work" or "POTW" has the meaning specified in s. NR 211.03 (11).

(46) "Publicly owned treatment works holding tank service area" means the area outside the POTW's sewer service area, where the area has a contract for service with the POTW to pro-

vide permanent service and the area has been added to the POTW's service area.

(47) "Publicly owned treatment works planning area" means the area delineated in map form in which the service area delineation for a specific POTW is being or has been prepared to cover.

(48) "Publicly owned treatment works sewer service area" means the area presently served and anticipated to be served by a sewage collection system as approved under ch. NR 121 or as a facility planning effort done under ch. NR 110, if no ch. NR 121 designation has been made.

(49) "Reclamation site" means drastically disturbed land that is reclaimed. This includes, but is not limited to, strip mines and construction sites.

(50) "Recreational site" means a designated area clearly identified and maintained for the purpose of providing an opportunity for recreational activity.

(51) "Restricted public access" means private property or the limiting of entry for a period of time by means such as signs, traditional agricultural fencing or remote location.

(52) "Seepage bed" means an excavated area larger than 5 feet in width which contains a bedding of aggregate and has more than one distribution line so constructed as to allow disposal of effluent by soil absorption.

(53) "Seepage pit" means an underground receptacle so constructed as to allow disposal of effluent by soil absorption through its floor and walls.

(54) "Seepage trench" means an area excavated one to 5 feet in width which contains a bedding of aggregate and a single distribution line so constructed as to allow disposal of effluent by soil absorption.

(55) "Septage" means the wastewater or contents of septic or holding tanks, dosing chambers, grease interceptors, seepage beds, seepage pits, seepage trenches, privies or portable restrooms.

(56) "Septic tank" means a tank which receives and partially treats sewage through processes of sedimentation, oxidation, flotation and bacterial action so as to separate solids from the liquid in the sewage and discharges the liquid to a soil absorption system.

(57) "Servicing" means removing the scum, liquid, sludge or other wastes from a private sewage system such as septic or holding tanks, dosing chambers, grease interceptors, seepage beds, seepage pits, seepage trenches, privies or portable restrooms and properly disposing or recycling of the contents as provided in this chapter.

(58) "Site" means property consisting of one or more fields used for the recycling, disposal or storage of septage.

(59) "Site management" means the physical manipulation of site characteristics to minimize the potential of septage runoff during the spring thaw or rainfall events.

(60) "Soil" means the unconsolidated material which overlies bedrock.

(61) "Soil conservation practice" means a measure used to retain surface water and soil on agricultural fields including, but not limited to, contour strip cropping, terracing and grassed waterways.

(62) "Soil conservation service" or "SCS" means United States department of agriculture, soil conservation service, or natural resources conservation service (NSRC).

(63) "Soil profile" means the vertical arrangement of unconsolidated materials into distinct layers or horizons which overlie the bedrock.

(64) "Soil saturation" means that the soil pore space is filled with water.

(65) "Spill" means the uncontrolled discharge, dumping or leaking of any septage so that 50 gallons or more of septage or any of its constituents may be admitted into the air, be discharged into any waters of the state or otherwise enter the environment.

(66) "Surface application" means spreading septage on the surface of the land without mixing the septage with the soil.

(67) "Surface water" means those portions of Lake Michigan and Lake Superior within the boundaries of Wisconsin, all lakes, bays, rivers, streams, springs, ponds, impounding reservoirs, marshes, water courses, drainage systems and other surface water, natural or artificial, public or private within the state or under its jurisdiction, except those waters which are entirely confined and completely retained upon the property of a facility.

(68) "Threatened or endangered species" are those species defined under ch. NR 27.

(69) "Vector attraction" means the characteristics of septage that attract rodents, flies, mosquitos or other organisms capable of transporting infectious agents.

(70) "Violation" means a failure to comply with any provision of this chapter.

(71) "Wetlands" means those areas where water is at, near or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation, and which have soils or vegetation indicative of wet conditions.

(72) "Wisconsin pollutant discharge elimination system permit" or "WPDES permit" or "permit" means a permit issued by the department under ch. 283, Stats., for the discharge of pollutants.

(73) "Wisconsin soil testing program" means the soil analysis and fertilizer recommendation program established by the university of Wisconsin−extension through the soil science department.

(74) "Wisconsin sanitary license" means a license to service private sewage systems such as septic and holding tanks, dosing chambers, grease interceptors, seepage beds, seepage pits, seepage trenches, privies or portable restrooms, issued by the department pursuant to s. 281.48 (3), Stats.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97; correction in (29) made under s. 13.92 (4) (b) 7., Stats., Register February 2010 No. 650.

NR 113.04 General requirements. (1) LICENSE REQUIREMENTS. No business, unless exempted by statute, may engage in servicing unless the vehicle and equipment used have been initially inspected by the department and issued a license indicating conformity with all requirements of this chapter. A business license fee is based on the number of vehicles used by the business.

Note: Farmers are exempted from the above business licensing requirements by s. 281.48, Stats., however, servicing by farmers shall be in conformity with this chapter.

(2) CHANGES. Every business required to be licensed by this chapter shall notify the department in writing within 15 days of any change in address, change of servicing vehicle or change of owner.

(3) DISPOSAL. No vehicle operator or person may dispose of or recycle septage unless done in accordance with this chapter or under county authority approved by the department under s. 281.48 (5m), Stats.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97.

NR 113.05 Licensing. (1) INITIAL LICENSURE; APPLICANT REQUIREMENTS. Applicants for licensure shall meet the following requirements:

(a) Every business, before engaging in servicing in this state, shall submit an application on forms prepared by the department. The application shall designate an operator−in−charge for the business in accordance with ch. NR 114. License fees in par. (b) shall accompany each application.

Note: Application forms are available at department offices.

(b) All licenses issued under this section for a period beginning before July 1, 1997, are issued on an annual basis and shall expire June 30 each year. All licenses issued under this section for a

period beginning after June 30, 1997, are issued on a biennial basis and shall expire June 30 in every odd−numbered year. For a license to a state resident, for each vehicle used for servicing, the fee is $25 if the license period begins before July 1, 1997, and $50 if the license period begins after June 30, 1997. For a license to a nonresident, for each vehicle used for servicing, the fee is $50 if the license period begins before July 1, 1997, and $100 if the license period begins after June 30, 1997. In addition to the initial license fee, a groundwater fee of $50 for each business for a period beginning before July 1, 1997, or $100 for a period beginning after June 30, 1997, shall be submitted for credit to the groundwater fund. The fee schedule is as follows:

TABLE 1
COMMERCIAL HAULER
FEE SCHEDULE SUMMARY

	Initial Licensing NR 113.05 (1)	Renewal of Licensing NR 113.05 (3)
1. Business Fee		
Resident		
Before July 1997	$25/vehicle	$25/vehicle
After June 1997	$50/vehicle	$50/vehicle
Nonresident		
Before July 1997	$50/vehicle	$50/vehicle
After June 1997	$100/vehicle	$100/vehicle
2. Groundwater Fee		
Before July 1997	$50/business	$50/business
After June 1997	$100/business	$100/business
3. Late Filing Fee	N/A	$25

(2) INITIAL LICENSURE; DEPARTMENT REQUIREMENTS. Prior to issuance of a license, the department shall assure that the following requirements are met:

(a) The department shall inspect the servicing equipment and operating procedures. The vehicle business license sticker may not be issued if the equipment is not in compliance with this chapter.

(b) Each designated operator in charge shall pass an oral or written operator certification examination under ch. NR 114.

(c) Businesses using more than one vehicle shall be issued the same license number and a business license sticker for each vehicle.

(d) Within 30 working days of receipt of a complete business license application, the department shall take action by either approving or denying the license application.

(3) LICENSE RENEWAL. Prior to July 1, 1997, all licenses expire on June 30 on an annual basis. On or after July 1, 1997, all licenses expire on June 30 on a biennial basis. Businesses seeking license renewal shall meet the following renewal requirements:

(a) Application for renewal shall be filed with the department on or before June 1, at least one month prior to expiration, and if filed after that date, a late fee of $25 shall be charged in addition to the renewal fee. Anyone servicing systems without a current business license under this section, unless exempt by statute, is subject to the penalties in s. NR 113.14 and s. 281.48, Stats. Payment of a late fee does not relieve a violator from being subject to penalties. The renewal application shall designate an operator−in−charge for the business who is properly certified under ch. NR 114.

(b) The renewal fee and the groundwater fee shall accompany the renewal application. The renewal fee and groundwater fee are the same as for initial licensure in accordance with sub. (1) (b).

(c) Prior to renewal, servicing equipment shall be made available at least once every 2 years for an inspection by the department or by a department approved inspector. A vehicle sticker may not be issued if the equipment is found to be unsatisfactory or is not in compliance with this chapter. The department may not renew a business license for a business that does not have at least one vehicle meeting these requirements.

(d) The department may not issue or renew a license for a business which has violations, as summarized in the following table, for the following; ss. NR 113.04 (1) and (2), 113.05 (3), 113.06 (1), (2) and (3), 113.07 (1) and (3), 113.09, 113.11 (1) and (3), 113.12 and s. 29.601, Stats., during the last license period. The department may not reissue a license for a period of at least one year after revocation.

Number of vehicle stickers issued to the business	Number of violations that result in the nonrenewal of the business license
1 to 3	6
4 to 9	12
Greater than 9	18

(e) Within 30 working days of the receipt of a completed license renewal application, the department shall take action by either approving or denying the license renewal application.

(4) EXEMPTION. A farmer, or his or her designee, who disposes of septage on land owned or leased by the farmer, is exempt from the licensing requirements of this section if all of the following apply:

(a) The septage is removed from a septage system that is located on the same parcel of land on which the septage is disposed.

(b) No more than 3,000 gallons of septage per week are disposed of on the same parcel of land.

(c) The farmer, or his or her designee, complies with all statutes and rules applicable to servicing.

(d) The farmer has sufficient land that is suitable for septage disposal.

Note: Farmers eligible for the farmer exemption are still required to meet all land application and servicing requirements of this chapter.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97; am. (3) (d), Register, January, 1999, No. 517, eff. 2−1−99.

NR 113.06 Vehicle inspections and servicing.

(1) INSPECTION. Any business engaged in servicing shall allow the equipment to be used for servicing to be inspected upon request and at any reasonable time and place, as may be designated by the department.

(2) EQUIPMENT REQUIREMENTS. Vehicles and operations shall conform to this chapter and vehicles shall display a license sticker in accordance with par. (m) 1. All vehicles and equipment used in servicing shall conform to the following:

(a) All vehicles and all equipment used in servicing shall be maintained in operational condition and in conformance with this chapter at all times during use in servicing.

(b) The vehicles and implements used in servicing shall routinely be used for no other purpose except the hauling or servicing of septage, grease interceptors, municipal wastewater treatment sludges or animal wastes. However, use of the vehicle for fire protection service, oil recovery and industrial wastes not regulated under chs. NR 660 to 670 or 500 to 538 is permissible if the tank is flushed or cleaned as necessary prior to and after use.

(c) Vehicles and equipment shall be stored in a manner which will not cause a nuisance.

(d) The minimum allowable tank size is 1000 gallons, with the following exceptions:

1. Tanks used for servicing only portable restrooms;

2. Tanks put into service prior to October 1, 1987;

3. A smaller tank may be used where found necessary and adequate by the department.

(e) Department approval of any trailer−mounted servicing equipment shall be on an individual basis for specific uses only.

(f) Portable tanks or containers used for servicing, other than approved trailer−mounted servicing equipment, are prohibited. All approvable tanks or containers shall be attached to the vehicle by welding or bolts and cannot be used for containing liquids that are intended for direct contact with humans or animals.

(g) Each tank shall be strong enough for all conditions of operation, leakproof, contain inertia baffles and be designed to be kept tightly closed to prevent spillage or escape of odors while in transit or storage. Tanks shall be constructed of suitable metal or materials approved by the department and mounted permanently on a truck chassis, except where trailer−mounted equipment is approved.

(h) Pumps shall be adequate for the required service. The installation shall be designed to prevent backflow or leakage. Connections shall be provided with caps or seals.

(i) Discharge valves on tanks shall be watertight, capped when not in use, and constructed and located so as to permit unobstructed discharge at the place of disposal.

(j) All servicing equipment used for surface spreading of septage shall have a splash plate or some other department approved method or device to facilitate uniform septage application.

(k) Hoses and piping, when not in actual use, shall be stored so as to prevent leakage or dripping of septage in transit, or the ends of hoses and pipes shall be connected or sealed with tightly fitted caps or covers, or the hoses and pipes shall be cleaned with water between uses so as not to cause a nuisance by leakage or dripping of septage during transit.

(L) Any business subject to the requirements of this chapter shall provide or have available facilities for washing the vehicles, tanks, implements and tools. Facilities shall be designed to prevent a nuisance to the general public.

(m) Vehicles, with the exception of vehicles used by farmers, used in servicing shall meet the following identification requirements:

1. No person, unless exempt by statute or this chapter, may operate a vehicle used for servicing unless a valid business license sticker is prominently displayed on the rear of the vehicle servicing tank.

2. Every licensee is required to paint on the side of each vehicle the words "Wisconsin Sanitary Licensee" and immediately under these words "License No. " with the number of its license in the space provided with letters and numbers at least 2 inches high with 1/2−inch minimum brush strokes and in a color distinct from its background.

3. The capacity of the tank in gallons, in lettering and numbers at least 2 inches high with 1/2−inch minimum brush strokes, shall be painted in a color distinct from the background and readily visible on the rear of any vehicle used in servicing.

(n) Starting July 1, 1997, all servicing equipment used for surface spreading of septage, including equipment in service prior to January 1, 1997, shall have a vehicle cab controlled discharge valve. New servicing equipment put into operation after January 1, 1997 shall be in conformance with this paragraph prior to use.

(3) SERVICING REQUIREMENTS. Every business engaged in servicing shall conform to the following:

(a) The vehicles, implements and containers shall be operated in a manner that does not cause a nuisance or health hazard.

(b) Any accidental spillage shall be cleaned up and the area restored to render it harmless to humans and animals. Spills of 50 gallons or greater shall be reported, within 24 hours, to the department or the county, if the county has been delegated septage regulation by the department.

(c) A written procedure for spill and accident cleanup shall be developed and a copy of the written procedure and a copy of the current ch. NR 113 shall be placed in each vehicle cab.

Note: Discharge, accidental or otherwise, of wastes from servicing vehicles may violate s. 29.601 (3) or 346.94 (5) to (7), Stats., and may subject the violator to the penalties imposed by s. 346.95 (2) and (3), Stats., or other penalties. In addition, the transport of certain materials may violate s. 347.49 (2), 348.10 (2), Stats., or ch. Trans 302.

(d) Any property serviced shall be left in a sanitary condition.

(e) All businesses servicing portable restrooms shall empty the septage from the portable restroom prior to transporting the portable restroom for any purpose. An exception may be granted by the department for portable toilets that are permanently affixed to a trailer or other mobile structure where the design and intent is to transport the toilet with materials contained in the integral holding tank to a POTW.

(f) Water used for flushing servicing tanks or containers shall be disposed of in the same manner as the septage.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97; correction in (2) (b) made under s. 13.92 (4) (b) 7., Stats., Register February 2010 No. 650.

NR 113.07 Disposal of domestic septage. Every business engaged in servicing or authorizing servicing shall comply with the following requirements for disposal of septage:

(1) DISPOSAL. (a) Disposal of septage shall be by discharge into a POTW or other facility for treatment or storage under a WPDES permit or to approved agricultural lands. Septage from systems that have contracted for reserved capacity at a POTW shall be taken to that specific POTW.

(b) The following restrictions apply to the land application of wastes from septic systems on frozen or snow covered ground:

1. Land application of waste removed from septic systems due to emergencies, including but not limited to situations such as freeze−ups, is allowed if no other reasonable disposal methods are available. Reasonable disposal options include but are not limited to, hauling the waste to a nearby treatment plant which will accept the septage in accordance with sub. (2). Land appliers shall obtain special written approval in advance from the department for specific sites which may be used for emergency situations. In addition, the following restrictions, at a minimum, will apply:

a. Sites or fields used shall have slopes less than or equal to 2%.

b. Waste shall be applied at a rate of less than 10,000 gallons per acre.

c. Application is not allowed within 750 feet of any surface water or wetland.

d. Application is not allowed in a floodplain.

2. Waste removed from septic systems due to a routine pumping may not be land applied during months when the ground is frozen or snow covered. Waste removed in these pumping situations shall be taken to a POTW.

3. Except as provided in par. (f), waste removed from septic tanks which are regularly pumped more frequently than once every 6 months may be land applied during the months when the ground is frozen or snow covered. The restrictions in par. (c) apply to the land applications of this waste.

Note: During months when the ground is frozen or snow covered, the land application of waste from septic systems is strongly discouraged. During these months, hauling waste from septic tanks to a POTW is the preferred method of disposal.

(c) Except as provided in par. (f), holding tank waste may be land applied during months when the ground is frozen or snow covered, on approved sites. The following restrictions, at a minimum, apply:

1. Sites or fields used shall have slopes less than or equal to 6%. If slopes are greater than 2% but less than or equal to 6%, a site management plan is required.

2. Waste shall be applied at a rate of less than 10,000 gallons per acre.

3. Application is not allowed within 750 feet of any surface water or wetland.

4. Application is not allowed in a floodplain.

Note: During months when the ground is frozen or snow covered, the land application of wastewater from holding tank systems is strongly discouraged. During these

months, hauling wastewater from holding tanks to a POTW is the preferred method of disposal.

(d) Any land application of holding tank waste or septic tank waste on frozen or snow covered ground is also subject to restrictions in sub. (3). Injection or incorporation may be utilized while the depth of frost is less than 4 inches.

(e) Large commercial, industrial, recreational or residential development holding tank systems that singly or when added together or increased by successive additions generate 3000 gallons of septage per day or greater shall contract with a wastewater treatment facility for treatment of the septage. The contract terms shall provide assurance that the septage from the system will continually be conveyed to, and accepted, at the wastewater treatment facility. If a service area designation exists, the wastewater treatment facility shall amend the service area to include the commercial, industrial, recreational or residential development. The department may not indicate sufficient disposal capacity to the department of safety and professional services, until the service area adjustments have been completed and approved.

Note: By agreement and administrative code, the department of safety and professional services will not issue a plan approval for a 3000 gallons per day or greater holding tank system without the department's approval of the method of wastewater disposal as provided in s. SPS 383.22 (2) (b) 2.

(f) Disposal of wastewater from small holding tank and septic tank systems that generate less than 3000 gallons of septage per day shall be by discharge into a POTW if the following conditions apply:

1. The holding tank is located in the POTW's sewer service or holding tank service areas.

2. The septic tank is located in the POTW's sewer service area.

3. The holding tank is located outside the POTW's sewer service and holding tank service areas if the POTW will accept the wastewater and if the cost to the hauler is less than or equal to the costs in Table 2.

4. The holding tank or septic tank is located outside of Wisconsin and the point at which the wastewater is conveyed into the state is within 20 miles (shortest direct route by road) of a POTW that is willing to accept, treat and dispose of the wastewater at a cost of less than or equal to the amount in Table 2.

TABLE 2

Years	Maximum Fee/1000 Gallons
1996−1998	$16.00
1999−2001	$18.00
2002−2004	$20.00

5. The holding tank is located within 20 miles (shortest direct route by road) of a POTW that is willing to accept, treat and dispose of the wastewater at a cost of less than or equal to the amount in Table 2. This provision only applies to those holding tank systems located in the following counties:

a. Brown
b. Calumet
c. Dane
d. Dodge
e. Door
f. Fond du Lac
g. Jefferson
h. Kenosha
i. Kewaunee
j. Manitowoc
k. Milwaukee
L. Outagamie
m. Ozaukee
n. Racine
o. Rock
p. Sheboygan
q. Walworth
r. Washington
s. Waukesha
t. Winnebago

(g) The requirement in par. (f) does not apply if storage has been utilized and the wastewater from small holding tank and septic tank systems will be landspread or treated and disposed of in accordance with a WPDES permit, or if the owner of the holding or septic tank is exempt from licensing under s. 281.48, Stats.

(2) DISPOSAL OF SEPTAGE AT A POTW. (a) The following shall apply to disposal of septage for the period between April 16 and November 14:

1. Licensed businesses may apply to a POTW for permission to discharge septage.

2. A POTW may deny or approve an application for disposal of septage at that facility. If approved, the POTW may set conditions for disposal.

3. The only requirements that licensed disposers discharge to POTWs or that POTWs accept and treat septage during nonwinter months are those in sub. (1) (e) and (f).

(b) The following shall apply to disposal of septage for the period between November 15 and April 15:

1. Each year, prior to September 1, licensed disposers may apply to POTWs for permission to dispose of septage during winter.

2. Applications submitted to POTWs by licensed disposers are subject to review by POTWs pursuant to s. 281.49, Stats.

Note: Section 281.49, Stats. requires that POTW's shall:

1. Review septage applications and provide a written denial or approval to the licensed disposer by October 1 of each year.

2. Develop a disposal plan for each licensed disposer approved for septage acceptance. A disposal plan, at a minimum, shall contain the following terms and conditions:

a. Specific quantities, locations, times, and methods for discharge of septage into the sewerage system.

b. Requirements to report the source and amount of septage placed in the sewerage system.

c. Requirements for the licensed disposer to pay to analyze other than residential septage.

d. Actual and equitable disposal fees based on the septage introduced into the sewerage system and calculated at the rate applied to other users of the sewerage system, and including the costs of additional facilities or personnel necessary to accept septage at the point of introduction into the sewerage system.

e. All the terms and conditions imposed on the disposer of septage.

f. A formal approval that the licensed disposer has permission to discharge septage to a specific POTW under specific conditions.

3. Accept and treat septage from licensed disposers unless:

a. Treatment of the septage would cause the POTW to exceed its operating design capacity or to violate any applicable effluent limitations or standards, water quality standards or any other legally applicable requirements, including court orders or state or federal statutes, rules, regulations or orders; or

b. The septage is not compatible with the sewerage system; or

c. The disposer has not applied for and received approval to dispose of septage in the sewerage system or the disposer fails to comply with the disposal plan; or

d. The licensed disposer fails to comply with septage disposal rules promulgated by the POTW or the conditions of the disposal plan in subd. 2.

(c) Licensed disposers shall cooperate with POTW's in the implementation of a septage acceptance priority system pursuant to s. NR 205.07 (2) (e).

Note: The priority system for septage acceptance at POTW's in s. NR 205.07 (2) (e) is as follows:

1. 'First priority.' Wastes from existing or new holding and septic tanks within the POTW's sewer service area and holding tanks within the POTW's holding tank service area.

2. 'Second priority.' Wastes from existing holding tanks for residential or commercial establishments outside the POTW's sewer service area and holding tank service area but inside the POTW's planning area where the holding tank was installed to replace an inadequate private sewerage system.

3. 'Third priority.' Wastes from existing septic tanks and holding tanks that were installed not as a replacement to an inadequate sewer system for residential or commercial establishments outside the POTW's sewer service and holding tank service areas but inside the POTW's planning area.

4. 'Fourth priority.' Wastes from new or existing septic and holding tanks for residential or commercial establishments outside the POTW's planning area.

(3) LAND DISPOSAL OF SEPTAGE. (a) No business may dispose of septage by a landspreading method unless the spreading is done in accordance with this chapter.

Note: Any business disposing of septage by a land disposal method may be subject to the provisions of ch. 160, Stats., and ch. NR 140, if an analysis of the groundwater beneath the disposal field indicates groundwater contamination.

(b) 1. Septage may not be landspread on soils which have a permeability rate greater than 6 inches per hour within the top 36 inches, unless it is demonstrated that the soil has a water holding capacity of greater than 5 inches above the groundwater and bedrock. In no case may greater than the top 60 inches in a soil profile be used to determine the 5 inches of water holding capacity. Permeability shall be calculated using the following table or other method acceptable to the department:

Textural Classification System

Commerce	USDA	Permeability Inches/Hour
Sand	Sand Loamy Sand	Greater Than 6
Sandy Loam	Sandy Loam	2.0 − 6.0
Loam	Loam	0.6 − 2.0
Silt Loam	Silt Loam Silt	0.6 − 2.0
Clay Loam	Sandy Clay Loam Clay Loam Silty Clay Loam	0.6 − 2.0
Clay	Sandy Clay Silty Clay Clay	0.1 − 2.0

2. Septage may not be surface applied on soils that have a permeability of less than 0.2 inches per hour within the top 6 inches of soil.

3. Septage may not be landspread or discharged into or on any wetlands or in areas subject to ponding, including any ditch, dry run, pond, lake, stream, flowage, floodplain, cave, sinkhole, mine, gravel pit or quarry.

4. Septage may not be landspread on any land without the owner's permission.

5. Septage shall be landspread in a manner to prevent surface runoff. Septage may not be landspread on saturated soils during rainfall events or in areas of ponded water. All landspreading fields shall be left in a litter free condition.

6. Landspreading vehicles shall be moving forward at all times while septage is being spread. Ponding of septage is prohibited.

7. Septage may not be landspread on fields that are receiving or have received POTW sludges in the last crop year.

8. Septage that is land applied based on the agronomic crop requirements may not be applied more than 10 months prior to the planting of the crop.

9. A minimum 2−foot wide grass strip shall be maintained at the property line down slope from all land application sites.

10. Fields that are discontinued for more than one year of crop production shall be revegetated with grass or other appropriate cover.

11. Each business proposing to use a high use field shall establish the nitrogen need of the crop to be grown as determined by the analysis of soil samples. The nitrogen recommendations shall be based on sampling done in accordance with the University of Wisconsin − extension bulletin A−2100, dated April 1991 ("soil information sheet"), or soil sampling guidance approved by the department.

Note: Copies of Bulletin A−2100 are available for inspection in the offices of the department of natural resources, secretary of state and legislative reference bureau, Madison, Wisconsin, or may be purchased from the UW Soil and Plant Analysis Lab, 5711 Mineral Point Road, Madison, WI 53705 or the Soil and Forage Analysis Lab, 8396 Yellowstone Dr., Marshfield, WI 54449.

12. Any person who land applies septage shall comply with the minimum separation distances and maximum slope requirements in Table 3.

TABLE 3

	Spreading	Incorporation	Injection
Minimum depth from surface to bedrock and groundwater	3.0 ft	3.0 ft	3.0 ft
Maximum allowable slope (nonwinter)	6.0%	12.0%	12.0%
Maximum allowable slope (winter)(3)	2.0%	N/A(4)	N/A
Minimum distance to a community well	1000 ft	1000 ft	1000 ft
Minimum distance to other well(5)	250 ft	250 ft	250 ft
Minimum distance to a residence, business or recreational area without permission from the owner or occupant	500 ft	500 ft(1) 200 ft(2)	200 ft
Minimum distance to a residence or business with written permission from the owner or occupant	250 ft	200 ft(1) 100 ft(2)	100 ft
Minimum distance to rural schools and health care facilities	1000 ft	1000 ft	500 ft
Minimum distance to a stream, river, pond, lake, sinkhole, flowage, ditch or wetland (greater than 6% to 12% slope)	N/A	200 ft	150 ft
Minimum distance to a stream, river, pond, lake, sinkhole, flowage, ditch or wetland (0% to 6% slope; nonwinter)	200 ft	150 ft	100 ft
Minimum distance to a stream, river, pond, lake, sinkhole, flowage or wetland (0% to 2% slope; winter)(3)	750 ft	N/A	N/A
Minimum distance to a dry run			
Slope 0−6%	100 ft	50 ft	25 ft
Slope 6−12%	N/A	100 ft	50 ft
Minimum distance to a property line(6)	50 ft	25 ft	25 ft

(1) If not lime stabilized but incorporated within 6 hours.

(2) If lime stabilized and incorporated within 6 hours.

(3) See sub. (1) (b) for further limitations on winter application.

(4) "N/A" means not allowed.

(5) Separation distances to non−potable wells used for irrigation or monitoring may be reduced to 50 ft. if the septage is incorporated or injected and the department does not determine that a greater distance to the wells is required to protect the groundwater.

(6) The distances to property lines may be reduced with the written permission of both property owners.

13. Septage may not be landspread where it is likely to adversely affect a threatened or endangered species or its designated critical habitat or a historical site.

(c) 1. Septage may be landspread seasonally on or into soils with a seasonal high groundwater level at a depth greater than one foot but less than 3 feet from the surface if the landspreading is limited to times when the soil is not saturated within 3 feet of the surface.

2. Septage may be surface applied to hay fields after the hay has been harvested but not after the new growth of hay has reached a height of 6 inches.

3. All sites that are approved by the department or by a county and meet all the separation requirements at the time of approval may not have the site approval rescinded for separation distance encroachment by residences, businesses or recreational areas for a period of 5 years. This 5−year period shall run from the date of the last department or county site approval.

4. Site management plans may not allow surface spreading of septage on disposal sites with a slope greater than 6%.

5. Surface application on snow covered fields requires plowed spreading lanes (snow removal) perpendicular to the slope when the snow depth is greater than 6 inches. Plowed lanes may not be wider than 20 feet and no closer than 40 feet.

(d) 1. Pathogens shall be reduced by one of the following methods:

a. The site restrictions in subd. 2. shall be met when septage is applied to agricultural land, forest or a reclamation site; or

b. The pH of septage applied to agricultural land, forest or a reclamation site shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 30 minutes and the site restrictions in subd. 2. a. to d. shall be met. When this option is utilized, each container of septage which is applied shall be monitored for compliance.

2. Pathogen reduction is achieved by the following site restrictions:

a. Food crops with harvested parts that touch the septage/soil mixture and are totally above the land surface may not be harvested for 14 months after application of septage.

b. Food crops with harvested parts below the surface of the land may not be harvested for 20 months after application of septage when the septage remains on the land surface for 4 months or longer prior to incorporation into the soil.

c. Food crops with harvested parts below the surface of the land may not be harvested for 38 months after application of septage when the septage remains on the land surface for less than 4 months prior to incorporation into the soil.

d. Food crops, feed crops and fiber crops may not be harvested for 30 days after application of septage.

e. Animals may not be allowed to graze on the land for 30 days after application of septage.

f. Turf grown on land where septage is applied may not be harvested for one year after application of the septage when the harvested turf is placed on either land with a high potential for public exposure or a lawn, unless otherwise specified by the department.

g. Public access to land with a high potential for public exposure shall be restricted for one year after application of septage.

h. Public access to land with a low potential for public exposure shall be restricted for 30 days after application of septage.

(e) One of the following vector attraction reduction requirements shall be met when septage is applied to agricultural land, forest or a reclamation site.

1. Septage is injected below the surface of the land such that no significant amount of the septage shall be present on the land surface within one hour after the septage is injected.

2. Septage applied to the land surface shall be incorporated into the soil within 6 hours after application to or placement on the land.

3. The pH of septage shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 30 minutes. When this option is utilized, each container of septage which is applied shall be monitored for compliance.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97; r. and recr. (1) (b), (c), am. (1) (d) and (3) (b) 1., Register, January, 1999, No. 517, eff. 2−1−99; corrections in (1) (e), (g) and (2) (b) 2. made under s. 13.93 (2m) (b) 6. and 7., Stats., Register September 2001 No. 549; **correction in (1) (e) made under s. 13.92 (4) (b) 6., Stats., Register January 2012 No. 673.**

NR 113.08 Site evaluation. (1) GENERAL. Site evaluation, when required by s. NR 113.07 (3) (b) 11., shall be conducted by a soil scientist. Site evaluations are required for high use fields. Low use fields, where detailed soil conservation or survey maps are not available, shall have a site evaluation conducted. The evaluation shall include soil conditions, properties and permeability, depth of zones of soil saturation, depth to bedrock, slope, topography, all setback requirements and the potential for flooding. Evaluation data shall be reported on forms acceptable to the department and signed by the soil scientist. Reports shall be filed with the department for all sites investigated within 30 days of completion of testing.

Note: Soil scientist includes, but is not limited to, the possession of a certified soil tester classification (CSTM or CSTS) from the department of safety and professional services, a bachelor of science degree in soil science from a 4 year accredited college, or a certified professional soil scientist in good standing with the American society of agronomy.

(2) SOILING BORINGS; HIGH AND LOW USE FIELDS. Soil borings are required for all high use fields. Low use fields are not required to have soil borings as long as reliable detailed soil conservation or survey maps are available except as follows:

(a) Low use fields in which no soil information is available are required to have soil borings.

(b) For all low use fields that have a high degree of variability or where a detailed soil conservation or survey maps are known to be unreliable, the department or a delegated county may require soil borings.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97.

NR 113.09 Application rates. (1) GENERAL. Septage shall be applied only to agricultural lands and may not be applied at rates which will supply available nitrogen at amounts greater than the agronomic need for the crop grown as calculated by sub. (4). Yearly loading rates listed in Table 4 may be used if the crop grown on a low use field requires 100 lbs−N/ac or more. If the crop requires less than 100 lbs−N/ac, the loadings shall be reduced in accordance with the equation in sub. (4).

(2) HIGH USE FIELDS. The volume of septage applied annually on a high use field may not exceed the amount calculated in sub. (4) which is necessary to supply the nitrogen needs of the crop to be grown, as determined by the analysis of soil samples. The nitrogen crop needs shall be based on the university of Wisconsin extension bulletin A−2100, dated April 1991 (”soil information sheet”), or soil sampling guidance approved by the department, except as allowed in sub. (3).

(3) SPECIFIC CROPS ON HIGH USE FIELDS. Septage may be applied to most leguminous crops at a volume sufficient to supply 200 lbs/ac of available nitrogen. If septage is applied to soybeans, the loading shall be limited to 140 lbs/ac of available nitrogen.

(4) ANNUAL AGRONOMIC RATE. For the purpose of implementing this section, septage may not be applied at a rate that exceeds the following:

$$\text{Annual Agronomic Rate (Gallons per acre per year)} = \frac{\text{Pounds of Nitrogen Required For the Expected Crop Yield per Acre}}{0.0026}$$

(5) MAXIMUM LOADING. The hydraulic loading rate of application shall be limited by soil characteristics but under no conditions may it exceed 13,000 gallons per acre per week for holding tank or septic tank contents or a combination of the 2. Ponding of septage shall be prohibited.

(6) GREASE INTERCEPTORS. Waste from grease interceptors shall be disposed of at a department licensed sanitary landfill, land applied or through some other department approved method.

(a) Contents of grease interceptors that are land applied to agricultural lands shall be incorporated, injected or mixed with septage at a level not to exceed 25% grease interceptor wastewater and applied in accordance with sub. (5).

(b) The hydraulic loading rate for land application shall be limited by soil characteristics but under no conditions may exceed 4,300 gallons per acre per application for grease interceptor contents. Ponding of the grease interceptor wastewater is prohibited.

Table 4
Summary of Maximum Loading Rates

	Maximum Weekly Hydraulic Loading		Low Use Field[2] Yearly Hydraulic Loading		High Use Field Yearly Hydraulic Loading
	Gal/Ac	Inches	Gal/Ac	Inches	
Septic Tank Wastewater	13000	1/2	39000	1−1/2	Loading is based on crop requirements[1]
Septic Tank Wastewater (75% or More) with Grease Trap Wastewater (25% or Less)	13000	1/2	39000	1−1/2	”
Holding Tank Wastewater	13000	1/2	39000	1−1/2	”
Holding Tank Wastewater (75% or More) Grease Trap Wastewater (25% or Less)	13000	1/2	39000	1−1/2	”
Grease Trap Wastewater (All or Greater than 25% of a Mixed Load of Septage)	4300	1/6	12900	1/2	N/A

1 The maximum annual hydraulic loading that will be permitted for any high use field will be based on the annual agronomic application rate computed by using the formula in sub. (4).

2 If the crop grown on a low use field requires less than 100 lbs N/ac, the max. annual hydraulic loading that is permitted is based on the annual agronomic application rate in sub. (4).

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97.

NR 113.10 County regulation. (1) A county may request the authority from the department to regulate land disposal of septage under this chapter.

(2) A county request shall include:

(a) A complete description of the proposed county−wide program;

(b) The proposed county−wide septage ordinance and regulations, which shall be consistent with this chapter and s. 281.48, Stats., and shall be applied uniformly to the entire county.

(c) Plans for personnel, budget, equipment, records system and forms;

(d) Authority and capability to regulate and enforce the proposed regulatory program;

(e) A description of the mechanism for generating money to finance the regulatory program;

(f) A description of the records system, which shall include field locations, field tests, field owners, field users, loading rates, county inspection, annual field licenses and enforcement actions; and

(g) Enforcement mechanisms with penalties identical to those in s. 281.98, Stats.

(3) The department shall:

(a) Investigate the capability of the county to successfully implement the proposed regulatory program;

(b) Approve, conditionally approve or deny the proposed county regulatory program. Department action shall be based on the county's capability to successfully implement the proposed regulatory program;

(c) In no case delegate authority for the issuance of WPDES permits for the management of septage storage facilities, under s. NR 113.12 or centralized septage treatment facilities under ch. NR 204; and

(d) Monitor and evaluate the performance of any county that implements an approved county−wide land disposal regulation program. Evaluation of county efforts shall be conducted after the first 12 months but before 18 months of approval of the county program. If the county is found to be performing satisfactorily, then future evaluations shall be once every 2 years. If a county fails to adequately enforce the septage disposal ordinance, the department shall conduct a public hearing in the county seat upon 30 days' notice to the county clerk. As soon as practicable after the hearing, the department shall issue a written decision regarding compliance. If the department determines that the county has failed to adequately enforce the septage disposal ordinance, the department shall by order require modifications of the county program administration or revoke the authority of the county to adopt and enforce a septage disposal ordinance. At any time after the department issues an order under this paragraph, a county may submit a new application under sub. (1). The department may enforce this section and rules adopted under this section in any county which has adopted a septage disposal ordinance.

(4) No county septage ordinance may void existing contracts between a holding tank system owner and a POTW.

(5) No county may direct the disposal of wastewater from large holding tank systems from a POTW that is presently accepting the wastewater for treatment to another POTW without the consent of both POTW's and the owner of the holding tank system.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97**;** correction in (2) (g) made under s. 13.93 (2m) (b) 7., Stats., Register September 2001 No. 549.

NR 113.11 Department regulation. (1) SITE INFORMATION. Each business disposing of septage shall, at least 7 days prior to using a disposal field, submit the following information to the department or its designee:

(a) Plat map or aerial photograph or U.S. geologic survey topographic map with the field outlined and a scale attached for easy reference.

(b) Detailed soil survey map with the field outlined, if available, or soil investigation data as required in s. NR 113.08. Soil investigation data as required in s. NR 113.08 shall be collected, validated and signed by a soil scientist.

(c) Completed department landspreading site evaluation form.

(d) Any other information required by the department to make a determination on the adequacy of the proposed site.

(2) EXCEPTION TO THE 7−DAY SUBMITTAL REQUIREMENT FOR FARMS. (a) A licensed business may service and spread wastewater on the farm where the septage was generated without prior field approval.

(b) A business may spread only on soils that meet the requirements of this chapter.

(c) Each vehicle operator shall record in the log book all information required by the department under sub. (3) (b).

(3) RECORD KEEPING AND REPORTING INFORMATION. Each business engaging in septage servicing shall submit or keep the following information on department approved forms, as indicated in this subsection, and submit it to the department or its designee:

(a) *Annual submittals for land application.* An annual land application report shall be submitted annually by January 31, following the year in which land application occurs. Information to be submitted includes, but is not limited to, the following:

1. Completed records of the fields used, gallons and type of septage applied on each field and number of acres used.

Note: Department form 3400−55 shall be used for this purpose. Form 3400−55 will be mailed to each licensed business on an annual basis. Forms may also be obtained at no charge by writing: Department of Natural Resources, Bureau of Watershed Management, P. O. Box 7921, Madison, WI 53707−7921.

2. Crop grown on each field used and its yearly nitrogen requirement.

3. For high use fields, actual annual nitrogen application rate in pounds per acre. Application of nutrients from all sources shall be documented.

4. In addition, agricultural soil analysis for each high use field once every 4 years of use when required by s. NR 113.07 (3) (b) 11.

(b) *Annual submittals for other methods of septage disposal.* An other method of disposal or distribution report shall be submitted annually to the department by January 31, following the year in which the disposal of septage occurs. Information to be submitted includes, but is not limited to, the following:

1. The method of disposal utilized.

2. The name and permit or license number of the receiving facility, if applicable.

3. The type and volume of waste disposed.

Note: Department form 3400−52 shall be used for this purpose. Form 3400−52 will be mailed to each licensed business on an annual basis. Forms may also be obtained at no charge by writing: Department of Natural Resources, Bureau of Watershed Management, P. O. Box 7921, Madison, WI 53707−7921.

(c) *Vehicle log book or invoice records system.* Each licensed business and any person who services a septage system shall keep the following records and make these records available to department representatives upon request.

1. Each vehicle operator shall have and maintain a daily log book or invoice records system for that vehicle.

2. Daily log books and invoice records systems shall be kept in the vehicle for a minimum of 2 days after servicing a system.

3. Daily books and invoice records systems shall, at a minimum, contain the following information:

a. Name and address or location of system serviced.

b. Date and time of servicing.

c. Type of system and description of all wastes pumped.

d. Gallons collected.

e. Disposal location.

f. Date and time of disposal.

g. Written certification by the designated operator−in−charge regarding the pathogen and vector attraction reduction requirements. The certification statement shall read as follows: ''I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements [insert either NR 113.07 (3) (d) 1. a. or NR 113.07 (3) (d) 1. b.] and the vector attraction reduction requirement in [insert NR. 113.07 (3) (e) 1., NR 113.07 (3) (e) 2., or NR 113.07 (3) (e) 3.] has been prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification.'' This requirement may be satisfied by having the certification statement on annual year−to−date loading summaries for each site.

h. A description of how the pathogen reduction requirements are met.

i. A description of how the vector attraction reduction requirements are met.

4. Lime purchase receipts if surface spreading with alkaline stabilization is the selected method for meeting the pathogen and vector attraction reduction requirements.

5. Actual annual hydraulic and nitrogen application rates shall be retained.

6. All servicing records (log book or invoice records) shall be kept on file and available for inspection for a period of 5 years.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97; am. (3) (intro.), (a) and 1., 3., renum. (3) (b) to be (3) (c), (3) (c) 4. to be (3) (c) 6. and (3) (c) 3.j. to be (3) (c) 4., cr. (3) (b) and (c) 5., Register, January, 1999, No. 517, eff. 2−1−99.

NR 113.12 Septage storage facilities. (1) LARGE EXISTING FACILITIES. Existing in−ground or above−ground septage storage facilities constructed before September, 1987 and with a capacity of greater than 25,000 gallons shall be allowed as long as they meet the provisions of ch. NR 110, the department has accepted in writing the plans and specifications and the storage facility has received a specific WPDES permit. Storage facilities installed under ch. SPS 383 are allowed if the owner obtains a specific WPDES permit.

(2) NEW LARGE FACILITIES. No person may construct any septage storage facility, which singly or when added together, provides capacity equal to or greater than 25,000 gallons without first obtaining department plan and specification approval. All storage facilities shall be designed in accordance with the appropriate requirements of ch. NR 110. No storage facility with a capacity equal to or greater than 25,000 gallons may operate until a specific WPDES permit is issued and an inspection and adequacy of sealing report is submitted and accepted by the department.

(3) SMALL FACILITIES. New or existing septage storage facilities with a capacity of less than 25,000 gallons are allowed if they have been approved under ch. SPS 383 or meet the standards in ch. NR 110 and the department is notified of their use through form 3400−137, revised in July 1988.

Note: There is no intent to issue WPDES permits to all small storage facilities although the department reserves the ability to do so on a case by case basis in the event it is determined necessary to protect public health or the environment.

(4) OTHER STORAGE FACILITIES. Septage may be stored at sites such as, but not limited to, manure storage facilities and sludge storage lagoons. The mixture resulting from any combination of septage and domestic wastewater sludge will all be classified as domestic sludge and its use or disposal will be governed by ch. NR 204. Septage may not be stored in manure storage facilities if the storage facilities are located under a building where animals are housed. Prior to use of a combined septage and other wastes facility, the department shall review an operations report for the facil-

ity. The facility may be used to store septage upon approval by the department. This report shall include at a minimum:

(a) The location of the storage facility;

(b) The type and volume of the storage facility including construction and sealing details;

(c) Sufficient site characteristics information to evaluate the environmental impact and suitability of such waste storage;

(d) The name and address of the owner of the storage facility;

(e) Any contractual arrangements involved;

(f) The type and composition of any wastes other than septage to be stored at the facility;

(g) Annual sampling and analysis of the combined wastes in accordance with requirements in the permit;

(h) The methods to be used for landspreading the septage or septage mixture; and

(i) If septage makes up 10% or more of the mixture in the storage facility or if there are 25,000 gallons or more of septage in the mixture, a certification statement that the entire contents of the storage facility shall be landspread in accordance with this chapter.

(5) EXTENDED STORAGE. No person may store a batch of septage for longer than 2 years.

(6) DEPARTMENT REQUIREMENTS. The department shall satisfy the time requirements for all permits and plan approvals in s. NR 108.03.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97; **correction in (1) and (3) made under s. 13.92 (4) (b) 7., Stats., Register January 2012 No. 673.**

NR 113.13 Suspension and revocation. Any licensed business which engages in improper servicing or violates any provision of this chapter may be subject to suspension or revocation as provided in s. 281.48 (5), Stats., and penalties or forfeitures provided in s. NR 113.14, or both.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97.

NR 113.14 Enforcement. (1) CITATIONS. Pursuant to s. 281.48 (5s), Stats., the department may follow the procedures for the issuance of a citation under ss. 23.50 to 23.99, Stats., to collect a forfeiture for a violation of this chapter. Deposit amounts are listed in sub. (2).

(2) DEPOSIT SCHEDULE. Deposit amounts, not including applicable court costs, surcharges and assessments, for violations of ch. NR 113 sections are as follows:

Section	Deposit
113.04 (1) & (3)	$500.00
113.04 (2)	$100.00
113.05	$300.00
113.06	$300.00
113.07	$500.00
113.08	$300.00
113.09	$500.00
113.11	$500.00
113.12	$300.00

(3) PENALTIES. Any person or business who engages in improper servicing or violates any section of this chapter shall be subject to penalties as provided in s. 281.98, Stats.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97**;** correction in (3) made under s. 13.93 (2m) (b) 7., Stats., Register September 2001 No. 549.

NR 113.15 Variances. (1) GENERAL. The department may approve a variance from the requirements of this chapter when it determines that special circumstances make compliance impractical or not in the best interests of the state and the department is satisfied that issuance of a variance will not be detrimental to public health or the environment.

(2) APPLICABILITY. A variance may be requested from any requirement in this chapter that is not based on state statutes or federal statutes or regulations. A variance may not be issued for a statutory requirement.

(3) REQUEST FOR VARIANCE. A request for a variance shall be submitted in writing to the department. Each request for a variance shall contain the following:

(a) The name of the applicant;

(b) The section of this chapter from which a variance is sought and a statement explaining why the variance is necessary;

(c) An adequate description of the variance and the circumstances in which it will be used, including any pertinent background information which is relevant to making a determination on the justification of granting the variance; and

(d) A statement as to whether the same or similar variance has been requested previously, and if so, circumstances of the previous request.

History: Cr. Register, September, 1996, No. 489, eff. 1−1−97.

CHAPTER 46

PRIVATE SEWAGE SYSTEM ORDINANCE AND HEALTH ORDINANCE

State Law Reference: Section 59.70, Wis. Stats.

46.01 JURISDICTION. The provisions of this chapter shall apply to all lands and waters within Dane County except as otherwise provided by Wis. Stats.

46.015 AUTHORITY. This ordinance is enacted under the authority of sections 59.70(1), 59.70(5), 97.30, and chapters 145, 250 through 254 and 281, Wis. Stats., and provisions of the Wisconsin Administrative Code adopted pursuant thereto.
[**History:** am., OA 36, 1996-97, pub. 03/03/97; am., Sub. 1 to OA 8, 2007-08, pub. 10/04/07.]

46.02 INTENT. It is the intent of this chapter to regulate the location, construction, installation, alteration, design and use of all private sewage systems, to further the maintenance of safe and healthful conditions within the county, to prevent and control pollution of surface and subsurface

waters and to provide for the administration and enforcement of this chapter.

46.025 PURPOSE. (1) *General.* The underlying principles of this chapter are basic goals in environmental health and safety accomplished by proper siting, design, installation, inspection, and maintenance of private sewage systems. The prerequisites necessary for the essential protection of the public health and the environment are the same everywhere. As unforeseen situations arise which are not specifically covered in this chapter, the basic principles enumerated in this section shall serve to define the intent.

(2*) Basic principles*. **(a)** *Approved* s*anitary systems required*. Every building that has or is required to have plumbing fixtures and that is intended for human habitation or occupancy shall be provided with an approved method of treatment and disposal of domestic sewage and sanitary wastewater. This may be through connection to a public sewer system, a private sewage system or other means approved by the division.

(b) *Discharges prohibited*. Every private sewage system shall be designed, located, constructed and maintained to prevent any discharge of sewage, partially treated sewage or effluent into drain tiles, onto the ground surface, into the structure served, into the surface or subsurface waters of the state (including zones of seasonal saturation) or into zones of bedrock.

(c) *Maintenance*. Every private sewage system shall be maintained so as to prevent prohibited discharges designated in par. (b). Notice of maintenance requirements for each system requiring servicing more than once every three years shall be recorded with the register of deeds office prior to sanitary permit issuance.

(d) *Use and disposal of septage.* Wastes removed from every private sewage system shall be discharged into a publicly owned wastewater treatment work or other licensed facility for treatment or storage under a Wisconsin Pollution Discharge Elimination System permit or applied to agricultural lands as allowed or permitted under this chapter.

[**History:** 46.025 cr., Sub. 1 to OA 8, 2000-01, pub. 04/30/01; (2)(d) cr., Sub. 1 to OA 8, 2007-08, pub. 10/04/07.]

46.03 DEFINITIONS. (1) *Agricultural land* shall mean land on which a food crop, feed crop or fiber crop will be grown within 12 months after septage is applied to the land. *Agricultural land* also includes range land and land used as pasture.

(1a) *Agronomic rate* shall mean the total septage application rate (dry rate basis) designed to provide the amount of nitrogen needed by the food crop, feed crop, fiber crop, cover crop or other vegetation grown on land and designed to minimize the amount of nitrogen in the septage that passes below the root zone of the crop or vegetation grown on the land to the ground water.

(1b) *Applicant* shall mean a landowner or the authorized agent of a landowner.

(1m) *Approved installation* shall mean a private sewage system constructed and installed in compliance with technical standards and requirements of this chapter, the Wis. Stats., and the Wis. Admin. Code. *Approved installation* does not imply that the system will perform satisfactorily for any specified period of time.

(2) *Board* shall mean the duly appointed Board of Health for Madison and Dane County.

(2m) *Dcomm* means the Department of Commerce of the State of Wisconsin.

(3) *Department* shall mean the Dane County Department of Human Services or Department of Public Health for Madison and Dane County, if created pursuant to statute.

(4) *Division* shall mean the environmental health section of the public health division of the Dane County Department of Human Services or the environmental health section of the Department of Public Health for Madison and Dane County.

(4m) *Farmer* shall mean a person who owns or leases a contiguous parcel of land of 40 acres or more that is used for agricultural purposes.

(5) *Food* shall have the meaning given in chapter DHS 196 of the Wis. Admin. Code.

(5d) *High use field* shall mean a field that receives more than 3 complete applications of septage per year and the number of applications are limited to the crop nutrient requirements.

(5m) *Human habitation* means the act of occupying a structure as a dwelling or sleeping place, whether intermittently or as a principal residence.

(5n) *Incorporation* shall mean the mixing of septage with topsoil by means such as disking, mold-board plowing, chisel plowing or rototilling to a minimum depth of 4 inches.

(5p) *Injection* shall mean the subsurface placement of septage to a depth of 4 to 12 inches.

(5r) *Landspreading* shall mean the spraying or spreading of septage onto the land surface, the injection of septage below the land surface, or the incorporation of septage into the soil, so that

the septage can either condition the soil or fertilize crops or vegetation grown in soil.

(5v) *Litter free* shall mean the absence of nonbiodegradable material such as plastics or glass of 2 inches or greater in length on the soil surface.

(6) *Local health officer* shall mean the duly appointed Director of Public Health for Madison and Dane County.

(6m) *Parcel of land* shall mean property that is contiguous and under the same ownership interest. If a farmer owns a parcel of land that is split or divided by a public or private road or a railroad, the land on the other side of the road or railroad will be considered part of the same parcel of land.

(7) *Parties-in-interest* shall mean all abutting property owners within two hundred (200) feet of the subject site.

(7m) *Permeability* shall mean the rate of movement of liquid through soil.

(8) *Person* shall mean any individual or group of individuals associated in any form and for any purpose whatsoever, and shall include the plural as well as the singular.

(9) *Premises* shall mean any tract or parcel of land with or without habitable buildings, and shall include those buildings normally open to the public for the purpose of conducting business.

(10) *Private dwelling* shall mean any building used only for living purposes and occupied by not more than two families.

(11) *Private sewage system* shall mean a sewage treatment and disposal system serving a single structure with a septic tank and soil absorption field located on the same parcel as the structure. It shall also mean an alternative sewage system approved by the safety and buildings division of the department of commerce, including a substitute for the septic tank or soil absorption field, a holding tank, a system serving more than one structure or a system located on a different parcel than the structure. A system may be owned by the property owner or by special purpose district.

(11m) *POWTS* means a "private onsite waste treatment system".

(11n) *Private onsite waste treatment system* shall have the same meaning as "private sewage system".

(12) *Privy* means a structure, not connected to a plumbing system, which is used by persons for the deposition of human body wastes.

(13) *Public beach* means any designated body of water or portion thereof not contained in a pool structure, basin, chamber or tank and which is used for wading, swimming, diving, water recreation, therapy or bathing. The term includes natural lakes, artificial water impoundments, ponds, rivers, streams and similar outdoor facilities that are partially natural in character and partially artificial. A public beach includes the associated land area and appurtenances designated for bather usage and serving one or more of the following: a licensed campground; a recreational camp; hotel; motel; club; association; housing development; school; religious, charitable or youth organization; and includes such designated body of water with associated land area controlled by a local government or political subdivision thereof.

(14) *Public buildings* shall mean any structure used in whole or in part as a place of resort, assemblage, lodging, trade, traffic, occupancy or use by the public or by three or more tenants.

(15) *Public swimming pool* has the meaning set forth in Wis. Admin. Code s. COMM 90.93(23).

(16) *Restaurant* shall have the meaning given in chapter DHS 196 of the Wis. Admin. Code.

(16m) *Restricted public access* shall mean private property or the limiting of entry for a period of time by means such as signs, traditional agricultural fencing or remote locations.

(17) *Sanitarian* shall mean a county employee operating under the jurisdiction and supervision of the board, registered and duly licensed by the State of Wisconsin and responsible for the enforcement of this chapter.

(17e) *Septage* shall mean the wastewater or contents of septic or holding tanks, dosing chambers, grease interceptors, seepage beds, seepage pits, seepage trenches, privies or portable restrooms.

(17m) *Surface water* means those portions of lakes, bays, rivers, streams, springs, ponds, impounding reservoirs, marshes, water courses, drainage systems, and other surface water, natural or artificial, public or private, within the boundaries of Dane County but excluding puddles and bodies of water having an area of less than .25 of an acre.

(18) *Wastes* shall mean any materials, such as explosives, fuel, litter, paper, garbage, sewage, gas, inflammables, oil, refuse, rubbish, tar, wood ashes or other solid or liquid materials, that may cause or contribute to health hazards or a reduction in surface or subsurface water quality.

[**History**: (3) am., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; (2m) cr., OA 41, 1988-89, pub. 06/05/89; (2m) and (3) am., and (2n) and (3m) cr., Sub. 1 to OA 7, 1990-91, pub. 07/18/90; (2n) am., OA 33, 1992-93, pub. 04/14/93; (2m), (2n), (3m), (4) - (14) renum., (11) am. and (6) cr., Sub. 2 to

OA 1, 1997-98, pub. 07/18/97; (2m), (5m), (11m), (11n) and (17m) cr., Sub. 1 to OA 8, 2000-01, pub. 04/30/01; 46.03 am., sub. 1 to OA 8, 2007-08, pub. 10/04/07; (5), (15), and (16) am., OA 31, 2010-11, pub. 12/30/10.]

46.04 ADMINISTRATION. (1) The board shall provide and exercise general supervisory powers over the administration of this chapter and shall, in addition, act as an appeal body as hereinafter set forth.

(2) The department, under the direction of its director, shall exercise day to day control over the operation of this chapter and shall, in addition, exercise the powers set forth in sections 59.70(1), 59.70(5), 97.30, chapters 145, 250 through 254 and 281, Wis. Stats., and the provisions of the Wisconsin Administrative Code adopted thereto.

(3) The terms of this chapter are intended to be minimum standards; wherever higher standards are set by any other law or regulation, such standards shall prevail.

(4) Chapters COMM 81-87, COMM 91, COMM 90, DHS 175, ADM 60, DHS 178, DHS 195, DHS 196, DHS 197, DHS 198, ATCP 75, NR 812, NR 113, and NR 845 of the Wisconsin Administrative Code are hereby adopted by reference and made a part of this chapter as if fully set forth herein.

[**History**: (4) am., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; (4) am., Sub. 2 to OA 1, 1997-98, pub. 07/18/97; (4) am., Sub. 1 to OA 8, 2000-01, pub. 04/30/01; (2) am., Sub. 1 to OA 8, 2007-08, pub. 10/04/07; (4) am., OA 31, 2010-11, pub. 12/30/10.]

46.05 COOPERATION WITH OTHER UNITS. The department shall cooperate with all other government units and agencies thereof in the enforcement of all state and local laws and regulations pertaining to matters related in this chapter.

46.06 TYPES OF PRIVATE SEWAGE SYSTEMS. (1) Only the private sewage systems conforming to all requirements of this chapter and all other applicable laws, regulations and restrictions of this state shall hereafter be installed in Dane County.

(2) *Allowable use*. Private sewage systems or other treatment tank and effluent disposal systems may be constructed when no public sewer is available to the property to be served. The wastewater disposal system of each building shall be entirely separate from and independent of that of any other structure or building unless a common system is specifically approved. A private sewage system may be owned by the property owner or by a special purpose district. Approval for the use of a common system or a system on a different parcel than the structure will be subject to recorded deed restrictions or easements that specify the rights and obligations of the system owner(s) and the property owner.

(3) *Domestic waste*. All water-carried wastes derived from ordinary living uses shall enter the septic or treatment tank unless otherwise specifically exempted by Wis. Admin. Code Ch. COMM 83 or this chapter.

(4) *Industrial wastes*. The department of natural resources shall be contacted for approval of systems used for the treatment and disposal of all industrial wastes including those combined with domestic waste.

(5) *Holding tanks*. **(a)** Approval. 1. Holding tanks shall only be allowed when there are no options for any other type of POWTS as permitted under this chapter, sec. COMM 83.61, Wis. Admin. Code or Ch. 145, Wis. Stats. Plans shall be submitted in accordance with the approved package or design for each application to install a holding tank.

2. An application for a holding tank shall not be approved if the property contains an area of soil suitable for any other type of private sewage system as permitted under this chapter or sec. COMM 83.61, Wis. Admin. Code. Soil evaluation data reported to the division that indicates the site is unsuitable for a POWTS or an onsite waste dispersal system other than a holding tank is subject to a division verification inspection to confirm that there is no suitable area for a POWTS or an onsite waste dispersal system on the parcel.

(b) Servicing contracts. 1. Prior to the issuance of a sanitary permit for the installation of a holding tank the owner of the property shall, except as provided by s. 146.20(3)(d), Wis. Stats., contract with a person who is licensed under Ch. NR 113, Wis. Admin. Code, to have the holding tank serviced. The owner shall file a copy of the contract or their registration with the local governmental unit that has signed the service agreement under sub. (c) and with the division. The owner shall file a copy of any changes to the service contract or a copy of a new service contract with the division within 10 business days from the date of any change to the service contract.

2. The person responsible for servicing a holding tank under sub. 1. shall submit to the local government unit which has signed the service agreement under sub. (c), and to the

division, a report of servicing on a semiannual basis. The service report shall include:

a. The name and address of the person responsible for servicing the holding tank;

b. The name of the owner of the property;

c. The location of the property on which the holding tank is installed;

d. The sanitary permit number issued for the holding tank;

e. The dates on which the holding tank was serviced;

f. The volumes in gallons of the contents pumped from the holding tank for each servicing; and

g. The disposal site(s) to which the contents from the holding tank were delivered.

(c) A holding tank shall not be approved for a building or facility that will discharge more than 3,000 gallons of wastewater per day, as determined by Ch. COMM 83, Wis. Admin. Code, until the owner files with the division a statement describing the method of final disposal of the septage and the written approval of the department of natural resources.

(d) Temporary holding tanks. A sanitary permit may be issued for the use of a temporary holding tank if circumstances warrant including, but not limited to:

1. Weather or soil conditions that do not allow the installation of the entire approved system prior to the target occupancy date for the structure.

2. A structure being built, altered, modified or repaired in an area where public sewer will be provided or extended within 12 months. A written agreement between the property owner and the sanitary district specifying when the structure will be connected to the public sewer must be provided to the division prior to issuance of a sanitary permit.

(6) *Non-plumbing sanitation systems*. **(a)** Non-plumbing sanitation systems are devices regulated under Ch. COMM 91, Wis. Admin. Code, which are alternatives to water carried sanitation systems. These systems are not connected to a water supply and are not connected to a plumbing system. Structures served solely by a privy shall not contain any plumbing and shall not be connected to a water supply. The property owner must obtain a county sanitary permit before installing any privy or similar device regulated by Ch. COMM 91, Wis. Admin. Code.

(b) In structures intended for human habitation or occupancy that are connected to a water supply and which have plumbing fixtures, at least one water closet shall be provided in addition to sanitary facilities approved under Ch. COMM 91 if such facilities are installed.

(7) *Accessibility*. Septic tanks and other treatment tanks shall be located so as to not exceed 25 feet of vertical separation between the bottom of any treatment tank and the access point for the septage hauling vehicle. If the system design cannot accommodate this requirement, the applicant must submit an alternative plan that shows how servicing, as may be necessary due to anticipated as well as unanticipated causes, can be achieved at any time of year.

[History: 46.06 am., Sub. 1 to OA 8, 2000-01, pub. 04/30/01; (7) cr., OA 6, 2002-03, pub. 08/13/02.]

46.07 PERMITS REQUIRED. (1)(a) No person shall install, repair, modify, extend, enlarge, convert, reconnect or structurally alter a private sewage system or any component thereof unless the owner of the property on which the private sewage system is located holds a valid sanitary permit.

(b) Delayed connection. No person shall connect a private sewage system to a structure more than one year after installation of the private sewage system without first obtaining a new sanitary permit under sub. (a).

(2) Work that cannot, for valid safety or sanitary reasons, be delayed pending application for a permit may be done without first obtaining a permit provided:

(a) such work is reported to the department no later than the next working day;

(b) necessary soil work and inspections are completed as soon as practicable; and

(c) application for a valid permit is actually completed within 10 working days of such emergency work first being performed.

(3) If the system evaluation process initiated by an emergency septic tank replacement reveals the need for a replacement of the soil absorption area, the system owner shall submit a permit application within 10 working days. The department may grant additional time for compliance where a state plan approval is required.

[**History**: (1) am., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; am., Sub. 2 to OA 1, 1997-98, pub. 07/18/97; (1) am. and (1)(b) cr., OA 6, 2002-03, pub. 08/13/02.]

State Law Reference: Sections 145.135, 145.19 (sanitary permit), 145.185 (septic tank permit), Wis. Stats., and section NR 113.07, Wis. Adm. Code (dumping of sewage).

46.08 SANITARY PERMITS. (1)(a) Applications for state sanitary permits shall be made on forms supplied and approved by the State of Wisconsin.

(b) Applications for county sanitary permits shall be made on forms supplied and approved by the division.

(2) Any permit issued under this subsection shall be void if any false or inaccurate statement is made or if any inaccuracy is shown on any application for such permit.

(3) If any permit is disapproved for reason of the applicant's failure to correct an inaccurate or incomplete application in a timely manner and as required by subsections (1) and (2), one-half of the application fee shall be retained by the department. Any re-application shall require the same fee as a new application.

(4) If an application is disapproved, the department shall issue written notice to the applicant stating the reasons for disapproval and the amendments to the application, if any, which would render the application approvable.

(5) Any permit issued under this section shall be valid for a period of two years. Renewals shall be granted upon application and tender of the required renewal fee, the department reserving the right to require a new on-site inspection upon such renewal application, at applicant's cost. Such permits may be transferred from one person to another and may be revised from one licensed master plumber to another licensed master plumber upon approval of an amended application and payment of the fee required under section 46.23 of this chapter.

(6) *Sanitary permits*. **(a)** The division shall establish administrative procedures for the approval, disapproval or issuance of state sanitary permits in accord with s. 145.135 and s. 145.19, Wis. Stats. A county sanitary permit shall be required for the connection or reconnection of any structure to any POWTS, any procedure or process that does not require a state sanitary permit that is intended to restore the permeability of the soil absorption or dispersal area, for any device regulated under Ch. COMM 91, Wis. Admin. Code, and for any work done on sewer piping, building sewer, system components or materials of a private on-site waste treatment system not included in the state sanitary permit requirements in s. COMM 83.21, Wis. Admin. Code.

(b) Enforcement. The division shall administer the private sewage system ordinance in accordance with s. 145.20, Wis. Stats., and Ch. COMM 83, Wis. Admin. Code, and this chapter.

(c) Application. The application for a sanitary permit shall be made on forms furnished by Dcomm for permits required by Ch. COMM 83, Wis. Admin. Code, and on forms furnished by the division for permits required by this chapter. Before a private sewage system is installed, repaired, altered, enlarged, extended, converted or re-connected, a licensed master plumber or master restricted plumber (sewer) shall sign an application for permit and assume responsibility for the work being done.

(d) Review of applications. The division shall approve or disapprove applications for sanitary permits and assist applicants in preparing an application that can be approved.

(e) Notice of denial. The division shall issue a written notice to each applicant whose sanitary permit application is denied. Each notice shall state the specific reasons for denial. The notice shall also specify any amendments to the plan that will render it acceptable. A denial notice involving other than minor drafting or technical errors shall also advise the applicant of the right to appeal under Ch. 68, Wis. Stats., and Ch. 46 of the Dane County Code of Ordinances.

(f) Permit transfer or revision due to a change of plumber only. 1. When there is a change of ownership, a permit transfer form shall be submitted to the division for approval prior to the installation of a private sewage system. Failure to submit transfer forms to the division shall invalidate the sanitary permit in accordance with s. 145.135(1), Wis. Stats.

2. When there is a change of master plumber, a permit revision application shall be submitted to the division for approval prior to the installation of a private sewage system. Any work on a POWTS system that requires a plumber revision without first obtaining such approval from the division is prohibited.

(g) *Posting*. The sanitary permit issued by the division, together with any forms furnished by Dcomm, shall be displayed conspicuously so as to be visible from the road fronting the lot during construction and must remain in place until after final approval has been given by the division.

(7) *Revocation or suspension.* The division may revoke or suspend any sanitary permit issued under this section for any false statements or misrepresentations of fact or any factual inaccuracy on any application that served

as the basis for issuance of the permit. The owner of the property shall be notified in writing of the reasons for revocation or suspension. No work may be done on any private sewage system after permit revocation or during a suspension. When a permit is revoked a new permit must be obtained before any work may resume.

(8) *Expiration*. A sanitary permit issued pursuant to the provisions of this section shall expire two years from the date of issuance if the system is not installed and approved within that time. A sanitary permit may be renewed if the system has not been installed if the renewal application is received by the division at least two working days prior to the expiration date. The time allowed for use of the permit shall not be construed as an extension of any corrective order requiring the repair or replacement of a private onsite waste treatment system. A renewal permit application must conform to the code in effect at the time of renewal.

[**History**: (3) and (4) am., Sub. 2 to OA 1, 1997-98, pub. 07/18/97; (1) and (5) am., (1)(b), (6), (7) and (8) cr., Sub. 1 to OA 8, 2000-01, pub. 04/30/01.]

State Law Reference: Section 145.135, Wis. Stats.

46.09 EXAMINATION OF PLANS AND SPECIFICATIONS. (1) Complete plans and specifications shall be submitted to the division with the application for a sanitary permit. Plans shall be submitted in triplicate, on paper not less than 8½ by 11 inches in size and shall be clear, legible and permanent copies.

(2) (a) Plans and specifications for variances or for private sewage systems as set forth in Table 83.22-1 or Table 83.22-2 of Wis. Admin. Code sec. Comm 83.22(1), shall be submitted to Dcomm, or another authorized review agent and written approval must be received before a sanitary permit is issued.

(b) The issuance of a county permit shall not be construed as plan approval or as approval for any design or installation that is non-code complying. All non-code complying portions of the plumbing and private sewage system installed prior to complete plan review shall be subject to corrective action. Corrective action includes, but is not limited to, removal of non-complying materials and replacement with approved materials and re-assembly of non-complying joints or connections.

(3) *Plan submission*. **(a)** Stamping and signing plans. All plans and specifications shall be sealed or stamped in accordance with Ch. A-E 1, Wis. Admin. Code, by a registered architect, engineer or registered plumbing designer. A master plumber may design and submit for approval plumbing plans and specifications for a private sewage system which the designer/ submitter will install. Each sheet of plans and specifications the master plumber submits shall be signed, dated and include his or her Wisconsin master plumber license number. When more than one sheet is bound together into one volume, only the title sheet or index sheet needs to be signed and dated by the master plumber responsible for the plan preparation, provided the signed sheet clearly itemizes each of the other sheets comprising the bound volume by content and page number.

(b) Submitting data. All plans, preliminary or complete, shall be submitted in triplicate. Work shall not commence until written approval for the preliminary or complete plans is received from the approving agency and the sanitary permit is issued by the division. The plans submitted shall be prints that are clear, legible and permanent. All pertinent data shall be a part of or shall accompany all plans submitted for review. Plans will be examined in the order of receipt.

(c) *Plan details*. All plans shall include the following:

1. Plot plan. Detailed plot plan, dimensioned or drawn to scale, showing the lot size, the location of all septic tanks, holding tanks or other treatment tanks, building sewers, sanitary and storm sewers, wells, water mains or water service, streams and lakes, dosing or pumping chambers, distribution boxes, effluent systems, dual disposal systems, replacement system areas and the location of the building served. Adjoining properties shall be checked to insure that the site location setback distances in Ch. COMM 83, Wis. Admin. Code, are complied with. All separating distances and dimensions shall be shown on the detailed plot plan. For large parcels, the proposed system site must be shown on a small scale diagram that includes all property boundaries and roads in addition to the large scale site plan showing the system details.
2. Reference points. A permanent vertical elevation reference point and a horizontal reference point must be established and shown on the plot plan.
3. Soil data. Soil boring and system elevation data shall be related to the undisturbed and finished grade elevations, vertical and horizontal elevation reference points. Surface elevations shall be given for all soil borings.
4. Occupancy. The type of occupancy the private onsite waste treatment system is

designed to accommodate shall be indicated, along with the estimated daily wastewater flow and design wastewater flow.

5. Other specifications. a. Complete specifications for pumps and controls including dose volume, elevation differences (vertical lift), pipe friction loss, pump performance curve, pump model and pump manufacturer.

b. Details and configuration layouts depicting how the system is to be constructed. This includes specifications and procedures for testing of all system components in compliance with s. COMM 83.26(5), Wis. Admin. Code.

(d) Plan examination fees. Fees shall be charged in accordance with s. 46.23, Dane County Code of Ordinances.

(e) Revisions. Every installer of a private sewage system who modifies or changes the design of a system must submit a revised plan to Dcomm or to the designated approval agency. A copy of the approved revision must be submitted to the division within 5 working days after approval is obtained. All changes or modifications must be approved by the division authority prior to installation. After written approval is granted, plans and specifications of pumping or pressurized systems shall not be changed without written consent of the division.

(f) Limitations. In granting approval of plans, specifications, products, devices or materials, Dane County assumes no liability for any defects in design or construction, nor for any damages that may result from specific installation.

(g) Plan availability. The architect, professional engineer, registered designer, owner or plumbing contractor shall keep one original set of plans bearing the stamp of approval from the authorized reviewing agent at the construction site.

[**History**: 46.09 rep., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; 46.09 cr., Sub. 1 to OA 8, 2000-01, pub. 04/30/01; (2) am., OA 19, 2002-03, pub. 03/04/03.]

46.10 SITE EVALUATION. (1) The department shall make on-site verification inspections of soils. Inspections shall be made by staff members certified by the State of Wisconsin. Such inspections shall be made only upon the filing of the appropriate forms, which shall include plan diagrams as required by sub. (a), and also indicate the applying soil tester's opinion of the soil's suitability. The failure to supply said forms or to indicate the soil tester's opinion shall release the department from any obligation whatsoever to make such inspections or to issue a sanitary permit.

(a) *Plan diagrams*. All plan diagrams submitted along with the soil evaluation report shall be submitted on paper not less than 8 ½ x 11 inches in size nor more than 8 ½ x 14 ½ inches and shall be clear, legible and permanent copies. The plan diagrams shall include:

1. Plot plan. Detailed plot plan, dimensioned or drawn to scale, showing the lot size, the location of the nearest road, the location of the driveway or site access roadway, the location of any septic tanks, holding tanks or treatment tanks, building sewer location (if known), wells, water main or water service, streams and lakes, dosing or pumping chambers, distribution boxes, any existing soil absorption cells, replacement system areas, the location of the building served and other structures on the property. Adjoining properties shall be checked to ensure that the site location setback distances in Ch. COMM 83, Wis. Admin. Code, are complied with. All separating distances and dimensions shall be shown on the detailed plot plan.

2. For any parcel with boundaries that cannot be completely shown on a diagram on a sheet of paper not larger than 8 ½ x 11 inches at a scale not smaller than 1 inch to 100 feet, the proposed system site must be shown on a small scale diagram that includes all property boundaries and roads in addition to the large scale site plan showing the test site details.

(b) *Reference points*. A permanent vertical elevation reference point and a permanent horizontal reference line must be established and shown on the plot plan. If the horizontal reference line is not a lot line, the line must be established using two points that can reasonably be expected to endure as originally identified for a prolonged period of time (i.e., a tree, fence line or water well).

(c) *Elevation data*. Soil boring and system elevation data shall be related to the undisturbed and finished grade elevations and vertical elevation reference points. Surface elevations shall be given for all soil borings. In flood plain areas, site elevations must be related to local flood plain elevation data to ensure compliance with Ch. COMM 83.

(2) After making such inspections, the department shall indicate, in writing, the suitability of the soils evaluated for the installation of a sanitary system. Such approval or nonapproval shall in no way bind the department to grant a sanitary permit which may be thereafter applied for.

(3) Any applicant for a preliminary soils approval shall be deemed to know that such approval or nonapproval is only preliminary and in no way binds the department, Dane County, its officers, employees or agents in any way whatsoever.

(4) (a) *General.* Site evaluation shall be conducted in accordance with Ch. COMM 85, Wis. Admin. Code, or acts amendatory thereto, by a certified soil tester. The evaluation shall include soil conditions, properties and permeability, depth to zones of soil saturation, depth to bedrock, slope, landscape position, all setback requirements and the potential for flooding. Soil test data shall relate to the undisturbed elevations and a vertical reference point shall be reported on forms provided by the division and signed by the certified soil tester. Reports shall be filed for all sites investigated within 30 days of the completion of the fieldwork for the soil evaluation.

(b) *Replacement system area.* 1. On each parcel of land initially developed for below grade disposal or dispersal of wastewater discharge, sufficient area of suitable soils for one replacement system shall be established based on the soil evaluation, estimated permeability, system location and site requirements contained in this chapter and Ch. COMM 85, Wis. Admin. Code. A minimum of three soil pits are required to delineate each proposed system area. One pit may be shared in common between adjacent system areas located on the same parcel.

2. The replacement system area shall not be disturbed to the extent that it is no longer a suitable system area. The replacement system area shall not be used for the following:

a. Construction of building;

b. Parking lots or parking areas;

c. Below ground swimming pools;

d. Any other use that may adversely affect the replacement area.

(5) *Specific system designs.* Where a more restrictive land slope is to be observed for a soil absorption system other than a conventional system, the more restrictive land slope specified in the approved design sections or approved design packages of Ch. COMM 83 or COMM 84, Wis. Admin. Code, shall apply.

(6) *Soil absorption site location.* The surface grade of all soil absorption systems shall be located so that surface water drainage from the site is not directed toward a well or reservoir. The soil absorption area shall be located not less than 5 feet from any lot line; 10 feet from a water service swimming pool or any building or dwelling, or any water main or cistern; 50 feet from the high water mark of any lake, reservoir, stream or other water course. Setbacks from wells are specified in Ch. NR 812, Wis. Admin. Code. Soil absorption areas shall not be located in compacted areas such as parking lots or driveways. Surface drainage shall be diverted away from soil absorption areas on the same or adjacent lots.

(7) *Groundwater or bedrock.* There shall be a minimum of three feet of suitable soil between the bottom of the soil absorption area and any groundwater or bedrock for all systems that rely solely on soil treatment of effluent. There shall be a minimum of 48 inches of suitable soil from original grade for a below grade gravity flow soil treatment system.

(8) *Soil permeability.* Permeability and infiltration rates used to size private sewage systems shall be derived using procedures specified in Ch. COMM 85, Wis. Admin. Code. Existing sites with division approved percolation tests must utilize the sizing criteria in Table 83.44, Ch. COMM 83, Wis. Admin. Code.

(9) *Soil evaluation.* **(a)** A soil evaluation shall be conducted on all sites regardless of the type of private sewage system planned. The evaluation shall extend to a depth of 3 feet below the bottom of the proposed soil absorption or dispersal area. Bore pit data shall be used to determine the suitability of the soils at the site in respect to permeability, zones of permanent or seasonal saturation and the depth to bedrock. At least three soil pits large enough to allow visual evaluation of the in situ soil profile shall be constructed for each proposed soil absorption or dispersal area.

(b) Soil evaluations are prohibited when the soil in or immediately adjacent to the soil evaluation pit is frozen within 4 inches above or below the proposed infiltrate surface.

[**History**: (3) am., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; (1) and (2) am., Sub. 2 to OA 1, 1997-98, pub. 07/18/97; caption am. and (4) – (9) cr., Sub. 1 to OA 8, 2000-01, pub. 04/30/01; (1) am., OA 6, 2002-03, pub. 08/13/02.]

State Law Reference: Section 145.20, Wis. Stats. (Chapter 34, Laws of 1979, section 994p).

46.11 INSPECTIONS. (1) The division shall inspect all private sewage systems and non-plumbing sanitary systems after construction but before backfilling no later than the end of the next workday, excluding Saturdays, Sundays and holidays, after receiving notice from the plumber in charge. Notice from the plumber in charge shall be given by 9:00 A.M. of the day

the system is anticipated to be ready for inspection. Inspections shall be reported on forms furnished by the division or on forms included as part of the approved system design. The plumber in charge or an authorized journeyman plumber must be present during the inspection. The plumber in charge must provide all necessary equipment to conduct the inspection and provide assistance to the inspector as requested. The inspection shall not proceed if a properly licensed master or journeyman plumber is not present on the site.

(2) Notification of testing for system components as required by Ch. COMM 82, 83 or 84, Wis. Admin. Code, or as a condition of plan approval, shall be made to the division in the same manner as notification for system inspections. Verification of testing shall be accomplished by means of inspection during the test, written verification of testing and test results from the master plumber or responsible person, or both.

(3) Testing of systems components that is required by s. COMM 83.26(5) and Chs. COMM 82 and 84, Wis. Admin. Code, or as a condition of plan approval shall be performed by a properly licensed individual in accordance with Ch. COMM 5, Wis. Admin. Code.

(4) No private sewage system shall be used until the proper sanitary permit, inspection and a revised plan, if required, have been accepted and filed by the division.

(5) 1. The department shall place all septic tanks on a periodic maintenance program. Private sewage systems including aerobic treatment units or other technology intended to treat wastewater shall be placed on an inspection program cycle appropriate to the component per Ch. COMM 83.54(4), Wisconsin Administrative Code. Pumping reports for holding tanks shall be submitted semi-annually per s. 46.06(5)(b). All other private sewage systems shall be placed on a three-year inspection program in conformance with WIS. ADMIN. CODE s. COMM 83.54(4). Notices of the maintenance due shall be sent by the department to the system owner at least 30 days prior to the due date. All such owners, or their successors or assigns, shall demonstrate compliance with this chapter by returning report forms prepared by the department, or certifications approved by the department, prior to the due date identified in the notice, duly signed by a person authorized in s. 145.245(3), Wis. Stats., or Ch. COMM 5, Wis. Admin. Code.

2. *Final reports*. When a private sewage system that is subject to the requirements of this section is abandoned, the property owner shall file a final report that includes verification that the contents of the septic tank were removed by a properly licensed septic waste hauler, that the tank was crushed and filled or was removed in accordance with Ch. COMM 83, Wis. Admin. Code, along with the fee required by sec. 46.23(12).

[**History**: (3) rep., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; (4) am., OA 41, 1988-89, pub. 06/05/89; (4) am., Sub. 1 to OA 1, 1992-93, pub. 07/01/92; (4) am., OA 36, 1996-97, pub. 03/03/97; (2) am., (3) and (3m) cr., Sub. 2 to OA 1, 1997-98, pub. 07/18/97; (4) am., Sub. 1 to OA 1, 1999-2000, pub. 06/01/99; 46.11 am., Sub. 1 to OA 8, 2000-01, pub. 04/30/01; (5) am. and (5)2. cr., OA 6, 2002-03, pub. 08/13/02; (5)1. am, OA 38, 2009-10, pub. 11/25/09, eff. 01/01/10.]

State Law Reference: s. 145.20, Wis. Stats.

46.12 RANDOM INSPECTIONS. The department may make random inspections of all information reported on sanitary permit applications and shall report errors found to the state agency in charge of licensing the person making the error.

46.13 ACCESS TO PREMISES: SPECIAL INSPECTION WARRANTS. The department shall have access to premises during reasonable hours to make necessary inspections. In the event any owner or occupant of any premises shall refuse entry for inspection purposes, the department may obtain a special inspection warrant under section 66.122, Wis. Stats.

46.14 ISSUANCE OF BUILDING PERMITS.

(1) Pursuant to s. 66.036, Wis. Stats., building permits issued by any municipality for the construction of any structure not served by a public sewer and requiring connection to a private sewage system shall be issued in accordance with the provisions of this section.

(2) New construction. A city, village or town may not issue a building permit for construction of a new structure that requires the installation of a private sewage system unless a sanitary permit for the installation of the private sewage system has been obtained by the owner.

(3) Reconnections. **(a)** The owner of a property shall obtain approval from the division for the following conditions prior to applying for a zoning or building permit and shall provide all documentation required prior to receiving an approval for:

1. Construction of a structure to be connected to an existing private sewage system;

2. Disconnection of a structure from an existing private sewage system and connection of another structure to the system;
3. Reconstruction of a structure that is connected to a private sewage system and that has been damaged as a result of fire, wind or other manmade or natural disasters.
4. Addition, alteration or remodeling of a structure that involves 25% or more of the existing living space.
(b) Documentation shall be provided to verify:
1. That the existing private sewage system is not a failing system and has sufficient size and soil conditions to accommodate the wastewater flow or contaminant load as specified in s. 46.175(4)(c); and
2. That the structure meets the set back requirements as specified in Ch. COMM 83, Wis. Admin. Code.
(c) Determinations of approved documentation shall be in the form of a sanitary permit or in writing from the division.
(4) Construction affecting wastewater flow or contaminant load. **(a)** General. Prior to obtaining a building permit for any addition, alteration, remodeling or other construction for any structure connected to a private sewage system that will affect the wastewater flow to an existing private sewage system or that may interfere with a functioning system as specified in this subsection, the property owner shall:
1. Obtain a sanitary permit to either modify the existing private sewage system or construct a new private sewage system to accommodate the modification of wastewater flow or contaminant load; or
2. Provide written documentation verifying that the existing private sewage system has sufficient size and soil conditions to accommodate the increased wastewater load, as in sub. (c).
(b) Determination of modified wastewater flow or contaminant load. For the purpose of this section:
1. Modified wastewater flow or contaminant load in public buildings and places of employment results from any change in use of the structure from the original use that results in a change in the volume of wastewater above or below that for which the system was originally designed.
2. Modified wastewater flow or contaminant load in dwellings results from a change in the number of bedrooms or from any addition, alteration or remodeling that exceeds 25% of the total gross area of the existing dwelling unit. Modified wastewater load in dwellings does not result from construction of decks, patios, garages, porches, re-roofing, painting, wiring, re-siding, window replacement or replacement of equipment or appliances.
3. Additional criteria for determining modified wastewater flow or contaminant load are as set forth in the Appendix to Ch. COMM 83, Wis. Admin. Code.
(c) Documentation. Documentation to verify whether the size and condition of the existing private sewage system can accommodate the modified wastewater flow or contaminant load and to verify whether the system is installed in suitable soils shall include all of the following:
1. Information on the soil conditions of the soil absorption system. The information may consist of a valid existing soil report or new soil evaluation report for the system, prepared by a certified soil tester showing conformance with the applicable vertical separation above bedrock and groundwater for the POWTS;
2. Information provided by a licensed master plumber or master plumber-restricted sewer, a certified soil tester, or plumbing inspector II for:
a. Sizing of the system relative to the existing usage, existence of an evaluated replacement area, the proposed construction usage and the type of system; or
b. A copy of an affidavit signed by the owner and recorded with the register of deeds indicating that the existing private sewage system capacity serving a one or two family dwelling is undersized and indicating whether a replacement area is available;
3. A plan prepared by a licensed master plumber or master plumber-restricted sewer, certified soil tester or plumbing inspector II setting forth the dimensions of the existing soil absorption area, tank location and related setbacks;
4. Information provided by a licensed master plumber or master plumber-restricted sewer, septic hauler or plumbing inspector II relative to the construction, structural condition, capacities, baffles and manhole covers for the existing treatment tanks and the capacity of any additional treatment tanks required to accommodate the increased wastewater load; and
5. Information provided by a certified soil tester, a licensed master plumber, master plumber–restricted sewer or plumbing inspector II showing that the system is not causing backup of sewage into the structure served, nor discharge of sewage to the surface of the

ground or to a drain tile, nor discharge of sewage to any surface waters of the state.

(d) Determination on soil conditions. 1. If the existing private sewage system is a failing system, the division shall order the system to be replaced.

2. If the existing private sewage system is installed in mottled soils, the owner may request a variance to use the existing system and perform groundwater monitoring to verify seasonal saturation conditions under Ch. COMM 85, Wis. Admin. Code.

3. If the construction affects the only available soil replacement area, a notice shall be recorded with the county register of deeds notifying any future owner of the wastewater disposal options they may have available.

(e) Determination on tanks. 1. If the existing treatment tank(s) have no manhole opening, are cracked, deteriorated or constructed of materials that are not watertight or are not approved materials listed in Ch. COMM 84, then the tanks shall be ordered replaced.

2. If the baffles in the tank(s) are deteriorated or missing, the baffles shall be ordered replaced.

3. If any exposed manhole opening has no manhole cover or the cover is not locked or labeled, the cover shall be ordered replaced, locked and labeled.

4. If the treatment tank services a 1 or 2 family dwelling and the capacity is:

a. Less than 500 gallons, the tank shall be ordered replaced or additional tank capacity shall be ordered;

b. At least 750 gallons, the existing tank may be used provided there are no more than 3 bedrooms total;

c. At least 750 gallons, additional tank capacity shall be ordered if there are more than 3 bedrooms or 2 or more bedrooms are added.

5. For any tank serving any structure other than a 1 or 2 family dwelling, additional tank capacity shall be ordered if the tank is less than 750 gallons.

(f) Setback determinations. All determinations on setbacks involving an increase in wastewater loads shall conform to Ch. COMM 83, Wis. Admin. Code.

(5) Construction not affecting wastewater loads. **(a)** No sanitary permit shall be required for construction that conforms to the setback requirements and that does not affect wastewater flow or contaminant load.

(b) The county, a city, village or town may issue a building permit for construction of:

1. Any structure on a property with an existing private sewage system, if the construction does not increase the wastewater load as specified in sub. (4)(b); or

2. An accessory structure not intended for human habitation or occupancy and not connected to a private sewage system.

(c) The completed construction of structures referred to in sub. (a) shall conform to the setback requirements of Ch. COMM 83, Wis. Admin. Code.

(d) Documentation shall be provided by the owner, licensed master plumber or master plumber-restricted sewer, certified soil tester or POWTS inspector showing the location and setback distances for the proposed construction of any structure relative to the components of the private sewage system.

(e) Determination of whether the location and setback distances of a proposed structure will interfere with an existing private sewage system shall be made by the division. On-site inspections may be made to verify the location and setback distances. Determinations shall be made in writing by the division and provided to the agency responsible for issuing the zoning and/or building permit.

(f) No building permit may be issued where setback requirements cannot be met unless:

1. A petition for variance is obtained from the Department of Commerce after review and approval by the division; or

2. The owner agrees in writing to correct any deficiencies discovered during construction for a system that cannot be located before construction begins.

[**History:** 46.14 cr., Sub. 1 to OA 8, 2000-01, pub. 04/30/01.]

46.15 PUBLIC SEWER AVAILABILITY. (1) Every building intended for human habitation or occupancy, for which public sewer is available, shall be connected to the public sewer by means of individual connections or private interceptor mains. The local sanitary district shall determine whether public sewer is available.

(2) When connection to a public sewer is required by sub. (1), the use of a private sewage system shall be discontinued within the period required by order of the sewer district or the division.

[**History:** 46.15 am., Sub. 1 to OA 8, 2000-01, pub. 04/30/01.]

46.16 STOP WORK ORDERS. Whenever the department finds that any activity regulated by the department under this chapter is in progress

without the issuance of the required permit, the department shall post, in a conspicuous place on the premises, a stop work order which shall cause all activity to cease until the required permit is issued. Such order shall also be issued if the department determines that there is in progress any significant deviation from the requirements of an otherwise valid permit, and no further activity, as otherwise authorized by the permit, shall continue until the order is removed by the department.
[**History:** am., Sub. 1 to OA 8, 2007-08, pub. 10/04/07.]

46.17 APPEALS. Any person who feels that enforcement of this ordinance is detrimental to him or her or would create a severe hardship, or any person denied a permit by the department, may appeal such enforcement or denial to the director of environmental health who shall then hold an informal hearing, make findings of fact and either direct enforcement or the issuance of a permit or confirm its denial. The findings may be appealed to the director of the department whose review shall be confined to the record made before the director of environmental health. The appellant may appeal the decision of the director of the department to the board which may then decide the matter on the record or hold an informal hearing, make findings of fact and either direct the issuance of a permit or confirm its denial. The findings of the board shall be final. In making such determinations, the director of environmental health, the director of the department and the board shall at all times consider the best interests of the public, Dane County and public health.
[**History:** am., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; am., OA 41, 1988-89, pub. 06/05/89.]

46.175 PERFORMANCE STANDARDS. (1) *General*. The division shall implement procedures to ensure that discharges from private sewage systems are in compliance with groundwater law contamination limits. The implementation steps will follow the parameters in this section. See s. A-83.43 (7) *Estimating contaminant loads* in Ch. COMM 83, Wis. Admin. Code.
(2) The final effluent quality standards for effluent discharging from a POWTS may not exceed the limits established in this section. The standards shall be applied downstream of the last treatment component that is upstream of any further treatment unit not capable of removing the specified contaminant.
(3) *Application*. Application for a sanitary permit for all POWTS systems must include information on the design and maintenance provisions that will achieve the quality standards, as well as the monitoring procedures that will assure proper operation of the system. Permit applications with designs that do not include this information are subject to denial.
(4) *Management*. The owner of a POWTS shall operate and maintain the system in compliance with the approved system design and maintenance provisions that were submitted with the permit application.
(a) Any POWTS that is not maintained in accordance with the approved management plans shall be considered a failing private sewage system. The use, maintenance or operation of a failed private sewage system is prohibited.
(b) Each POWTS design shall include a management plan for maintaining the design performance and operational standards required by this chapter. The management plan shall be a part of the sanitary permit application. The plan shall include all necessary information, which may include:
1. Accumulated solids or byproduct removal;
2. Influent and effluent volume and characteristics;
3. Groundwater monitoring well location(s);
4. Monitoring well construction requirements and sample procedures;
5. Monitoring/sampling port location;
6. Metering, sampling and monitoring schedules;
7. Site vegetative cover maintenance;
8. Load and rest schedules;
9. Contingency plans for events involving component or operational failure;
10. Alarms or other systems to alert owner when system is not operating properly;
11. Odor and nuisance control;
12. All maintenance requirements in terms of processes and their frequency;
13. Reporting frequency and designated reporting agent;
14. Septage disposal plan;
15. Other pertinent information as deemed necessary.
(c) Monitoring influent and effluent loads.
1. The influent loads discharging to a POWTS and/or the effluent loads from a POWTS shall be sampled and evaluated for contaminants as required in the approved package or design. The results of the analysis shall be reported to the division by the POWTS owner or their

designated agent as specified in the management plan. Dane County reserves the right to require sampling and evaluation criteria in addition to the criteria in a plan approved by the Wisconsin Department of Commerce.

2. The division may require monitoring of additional constituents not originally included in the management plan.

3. The samples shall be collected and handled in accordance with the requirements of the approved management plan or when no procedure is specified, in accordance with published sampling procedures.

(d) Systems that do not utilize the natural in-situ soil for final treatment shall not be approved unless the maintenance and monitoring criteria include a special assessment by the city, village or town where the system is located. The special assessment shall be sufficient to cover the anticipated or known costs related to the maintenance and monitoring of the system on an annual basis. The funds will be transferred to a special account maintained by the division. Payment will be authorized to the contracted service provider upon proof of the maintenance or monitoring event from the provider.

(5) *Contingency plan*. All applications for a sanitary permit shall include a contingency plan that describes the procedures that must be followed at any time when the POWTS is not operating in accordance with the approved design. The plan must include specifics about the system characteristics or other safeguards that will assure that the system will not discharge untreated or partially treated effluent during any component malfunction.

(6) *Service reports*. **(a)** Reports of system servicing or maintenance shall be submitted to the division by the owner or owner's agent within 10 business days from the date of service.

(b) Reports shall include, but are not limited to, the following information:

1. The system owner's name, address and legal description;
2. The name and certification number of the licensed individual performing the service;
3. Information of any malfunction of system components and any repairs that were made;
4. Meter readings;
5. Pumping information;
6. Results of analysis of any effluent sampling;
7. General observations of overall system condition and performance; and
8. Amount of septage pumped and the time, date, location and method of disposal.

[**History:** 46.175 cr., Sub. 1 to OA 8, 2000-01, pub. 04/30/01; (4)(b) and (6)(b) am., Sub. 1 to OA 8, 2007-08, pub. 10/04/07; (7) rep., OA 4, 2008-09, pub. 06/19/08.]

46.18 MALFUNCTIONING SYSTEMS. (1) The department may order any person owning, using, operating or installing any malfunctioning system, or any unsafe system, to repair, modify, replace or otherwise place such system in safe operating condition, provided however, that the department shall give thirty (30) days advance written notice before any such person shall be deemed in violation of this section. Failure to take substantial steps to effect a cure within the thirty (30) day period shall operate to cause a violation from the date of delivery of the notice. The thirty (30) day notice period shall be computed as beginning on the date of mailing of the required notice.

(2) Any malfunctioning system which results, or may reasonably be expected to result, in the pollution of any navigable body of water shall be rendered non-polluting within ten (10) days of actual notice by the department.

(3) In addition to the provisions of subsections (1) and (2) above, the department may issue a stop-usage order on any malfunctioning system which order shall take effect upon issuance. Issuance of such an order shall not relieve any violator from complying with orders issued under subsections (1) and (2) above. A stop-usage order shall only be issued after the department determines that a significant health hazard is presented by the malfunctioning system.

(4) A malfunctioning system is one which causes or results in any of the following conditions:

(a) The failure to accept sewage discharges and backup of sewage into the structure served by the system.

(b) The discharge of sewage to the surface of the ground or to a drain tile.

(c) The discharge of sewage to any waters of the state.

(d) The introduction of sewage into zones of saturation which adversely affects the operation of a system.

[**History:** (1) am., OA 44, 1987-88, pub. 05/28/88; (1) and (2) am., Sub. 2 to OA 1, 1997-98, pub. 07/18/97.]

46.19 WATER SAMPLES. (1) Upon the request of any person or governmental agency, the department may collect water samples and deliver the same to the Wisconsin State Laboratory of Hygiene for analysis. A fee as provided for in 46.23(14) may be charged for the collection of water samples under this section.

(2) The department shall forward the results obtained from the Wisconsin State Laboratory of Hygiene to the requesting person or agency, along with a report indicating the department's observation on the well system when also requested.
(3) The department shall not evaluate or rate the quality of the construction or physical condition of any water supply system, in any manner whatsoever, except that the department may perform a survey related to such system. Such system survey shall not involve any judgment on the quality or fitness of any water supply system. Such survey shall only be reported in a format prescribed by the board whose approvals shall be recorded in its minutes.
[**History**: (2) and (3) am., Sub. 2 to OA 1, 1997-98, pub. 07/18/97.]

46.195 WATER SUPPLY. (1) Water closets, urinals, dishwashers, clothes washers, lavatories, sinks, food waste grinders and other plumbing fixtures shall be served by public water system where available. Where such public water system is not available and will not be available within a reasonable time, a private water supply system may be used.
(2) All premises intended for human occupation or occupancy shall be provided with a supply of pure and wholesome water; such supply shall not be cross-connected with an unsafe water supply nor with a waste pipe. Buildings in which water closets and other plumbing fixtures exist shall be provided with a supply of water adequate in volume and pressure for flushing purposes.

46.20 CONSUMER INFORMATION REQUESTED. The department shall at all times actively seek to inform the private sewage users of required maintenance standards for such systems. In so doing, the department shall have personnel available for such public service programs, panels or other means of disseminating information to the public.
[**History**: (1) rep., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; (2) am. (unnumbered), OA 6, 2002-03, pub. 08/13/02.]

46.21 FACILITIES REGULATED. (1) Restaurants, public swimming pools and water attractions, beaches, campgrounds, hotels, motels, recreational and educational camps, tourist rooming houses, bed and breakfasts; retail food establishments, manufactured home communities; wells; servicing of septic tanks, seepage pits, grease traps or privies; and vending machines shall be constructed, operated, performed and maintained in accordance with chapters DHS 195, DHS 196, DHS 197, DHS 198, DHS 172, DHS 175, DHS 178, ATCP 75, COMM 90, COMM 26, NR 812, NR 113 and NR 845 of the Wis. Admin. Code, as appropriate. Each facility identified herein shall be considered a regulated facility under this chapter.
(2) Facilities regulated shall be inspected at least once every license year or as required by the applicable provisions of the Wisconsin Administrative Code, by PHMDC for compliance with the applicable Wisconsin Administrative Code and/or County Ordinance. Violations shall be noted and compliance dates set. A reinspection shall be made for all critical violations. Repeat violations shall be grounds for fines, legal action or suspension of permit. The board is authorized to adopt reasonable regulations from time to time pursuant to s. 251.135, Wis. Stats., which shall have the force of ordinance. Regulations so adopted shall be referred to the county board for incorporation into this ordinance as soon as practicable.
(3) Public beaches shall be considered to be regulated facilities under this chapter and shall be subject to the requirements hereof.
[**History**: (1) am., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; (1) through (4) am., OA 41, 1988-89, pub. 06/05/89; (1) and (4) am., Sub. 1 to OA 7, 1990-91, pub. 07/18/90; (1) am., Sub. 2 to OA 1, 1997-98, pub. 07/18/97; 46.21 am., OA 31, 2010-11, pub. 12/30/10.]

46.22 NUISANCES. (1) A nuisance under this section is any condition of lands or buildings which:
(a) has resulted in or has the potential to result in harm to any individual, whether by accident, disease or sickness occurring as a result of contact with such conditions, and
(b) is not required to be maintained in order to support any useful activities of the owner or user of said lands or buildings.
(2) Every owner, tenant or other user of property within Dane County shall maintain his or her lands and buildings in such a condition that they shall not become a nuisance.
(3) The department shall notify the owner, occupant or other user of lands or buildings where a nuisance is located to abate or remove such nuisance within thirty (30) days of receipt of said notice. Said notice shall be either hand delivered or be deemed given as of the second attempted delivery date as to those letters not actually delivered.

(4) Whenever after investigation a sanitarian determines that a nuisance poses imminent danger to the health of persons unless ameliorated promptly, the department may order remedial action by the owner or occupant of the premises within 48 hours. Notice of any hazardous nuisance shall be by personal service and the department may request the services of the Dane County Sheriff's Department. A notice under this section shall clearly state the facts upon which it is based, identify the property involved and specify the remedial action to be taken.

46.225 HUMAN HEALTH HAZARDS. (1) The department may declare housing that is dilapidated, unsafe or unsanitary to be a human health hazard.

(a) For purposes of this section, *human health hazard* has the definition set forth in s. 254.01(2), Wis. Stats.

(2) If the local health officer finds a human health hazard, he or she shall follow the procedures set forth in s. 254.59, Wis. Stats., and the procedures set forth in said section of the statutes, and acts amendatory thereto, are adopted by reference as though fully set forth herein.

[**History**: cr., Sub. 2 to OA 1, 1997-98, pub. 07/18/97.]

46.23 FEES. (1) (a) The county fee for each inspection block required for the installation of a POWTS shall be $172. Inspection blocks for POWTS will be assigned according to the following:

1. A POWTS system reconnection, septic tank or pump chamber only, a repair of an existing POWTS system, a process or activity intended to restore the absorptive capacity of the soil treatment or dispersal surface, or similar technologies, requires a 0.71 inspection block for the installation or process inspection.

2. A holding tank, a gravity fed or dosed below grade soil treatment POWTS system that does not include any other treatment or dispersal component, or similar technology, requires one inspection block for the system installation.

3. A POWTS system incorporating pressurized in-ground soil treatment or the repair or reconstruction of an existing mound, requires 2 inspection blocks for the system installation. This subsection shall not apply to a drip line effluent dispersal component.

4. A single pass sand filter, recirculating sand filter, split bed sand filter or similar technology requires 4 inspection blocks for the system installation.

5. A POWTS system incorporating a pressurized mound, any at-grade mound, a drip-line effluent dispersal component, or similar technology, requires 4 inspection blocks for the system installation.

6. A nonpressurized POWTS system incorporating chemical or mechanical treatment or disinfection component(s) with discharge into a soil treatment or soil dispersal component or similar technology requires 2 inspection blocks for the system installation.

7. A system component authorized in Ch. COMM 91, non-plumbing sanitation units (NPSU) or similar technology requires 1 inspection block for installation of the component.

8. A POWTS system that utilizes a technology that is added to the approved system list under s. COMM 83.61 after July 1, 2000 shall require the number of inspection blocks included as part of the approved system design, approved system package or the number of inspection blocks necessary to provide adequate assurance of proper installation as established in procedures approved by the Dane County Board of Health.

9. A POWTS system that incorporates a design for wastewater discharge less than 2,000 gallons per day shall qualify for a county fee equal to the sum of the permit review and processing fee plus the associated inspection block fee.

10. A POWTS system that incorporates a design for wastewater discharge between 2,001 and 12,000 gallons per day shall qualify for a county fee equal to the sum of the permit review fee plus the associated inspection block fee plus one additional inspection block fee for each 2,000 gallon per day increment in wastewater discharge.

(b) The county fee for the review and processing of a sanitary permit application shall be assigned according to the following:

1. The county fee for review and processing of a sanitary permit application for a POWTS system reconnection, septic tank/pump chamber only, repair of existing POWTS system, a holding tank, a gravity fed below grade soil treatment POWTS system that does not include any other treatment or dispersal component, a system component authorized in Ch. COMM 91, non-plumbing sanitation units, or other similar technologies or activities shall be $122.

2. The county fee for review and processing of a sanitary permit application with a POWTS design incorporating a drip line effluent dispersal component, aerobic treatment unit, dosing apparatus not connected to a pressurized distribution network or similar technology shall be $143.

3. The county fee for review and processing of a sanitary permit application with a POWTS design incorporating a pressurized distribution network shall be $164.

4. The county fee for review and processing of a sanitary permit application with a POWTS design incorporating a component claiming nitrate reduction credit, chemical or mechanical sewage treatment credit, sewage discharge disinfection credit or any treatment component that will allow final discharge into soil that is not intended to be part of the final sewage treatment process shall be $257.

5. The county fee for review and processing of a sanitary permit application with a POWTS design incorporating a technology that is added to the approved system list under s. COMM 83.61 after July 1, 2000, shall be $143 in addition to the fee for the review and processing category closest to the POWTS design the technology is incorporated into.

(2) Fees for the issuance or renewals of sanitary permits shall not be reduced below the sum specified by s. 145.19(2), Wis. Stats., or acts amendatory thereto.

(3) There shall be a county fee of $145 for the transfer of permits under section 46.08(5), when such transfers do not involve any site changes relating to the location of the private sewage system, and for the revision of a sanitary permit due to a change in plumber.

(4) There shall be a county fee of $164 for the preliminary on-site inspections of soils by the department as provided for in sections 46.10 and 46.45. Fees paid under this subsection shall not be used to reduce or offset the fee for the issuance of any permit under this chapter.

(5) There shall be a county fee of $172 for any private sewage system inspections or re-inspections which are either not included in the sanitary permit fee or are not specifically required by the plumbing code, or both.

(6) There shall be a county fee of $54 for a verification from the department's files of data relating to water and private sewage systems.

(7) There shall be an additional county fee of $145 for any inspection performed after normal work hours and at the request of any person for whom performed.

(8) There shall be a county fee of $107 for an on-site verification of a private sewage system when requested in connection with securing financing of the subject property.

(9) The county fee for the collection of a water sample for bacteriological analysis shall be $107 plus the current analysis fee charged by the Department laboratory.

(10) The county fee for the collection of a water sample for fluoride and nitrate chemical analysis shall be $107 plus the current analysis fee charged by the Department laboratory.

(11) The county fee for all services listed in subsections (8) through (10) above, when requested to be performed in one site visit, shall be $214 plus the current analysis fee charged by the Department laboratory.

(12) Each owner of a private sewage system shall annually be charged a fee of $8.67 for administration of the inspection programs required by s. 46.11(5). Such fee is authorized by WIS. STAT. s. 145.20(4) and will be collected in the same manner that municipalities may make property assessments pursuant to WIS. STAT. s. 66.0703.

(13) There shall be a county fee of $159 for the application for a Wisconsin Fund grant from the department of commerce.

(14) (a) There shall be a county fee of $114 for the revision of an issued sanitary permit that has been reviewed and approved by the department as part of a sanitary permit application. The fee in sub. (3) shall apply when the revision is due to a change of plumber.

(b) There shall be a county fee of $85 for the review of revisions to a previously approved plan that is submitted to the county pursuant to Wis. Admin. Code s. COMM 83.22(1)(c).

(15) The fee for the review of a holding tank plan shall be as follows:

Holding tank capacity:	Fee
0-5,000 gallons	$ 90.00
5,001-10,000 gallons	$ 150.00
more than 10,000 gallons	$ 225.00

(16) (a) The fee for review and processing of a plan that is submitted to the county pursuant to Wis. Admin. Code sec. COMM 83.22(1)(c), shall be as follows:

Design wastewater flow	Fee
1,000 gpd or less	$ 250.00
1,001-2,000 gpd	$ 325.00
2,001-5,000 gpd	$ 400.00

(b) There shall be a fee of $80 per hour for review and processing of a plan to replace a septic tank, add effluent filters or other pretreatment devices, or otherwise alter an

existing system that was approved under Wis. Admin. Code s. COMM 83.22(1)(c).

(17) The fee for the review and processing of an application for an annual septage landspreading permit shall be $65.

[**History:** (1) through (18) am., (22) cr., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; (3) am., OA 41, 1988-89, pub. 06/05/89; (19) am., Sub. 1 to OA 7, 1990-91, pub. 07/18/90; (6) am., Sub. 1 to OA 1, 1992-93, pub. 07/01/92; (1), (2), (4) - (18) and (22) am., and (19) - (21) rep., OA 24, 1994-95, pub. 01/18/95; (17) am., OA 36, 1996-97, pub. 03/03/97; (9) - (12) am., Sub. 2 to OA 1, 1997-98, pub. 07/18/97; 46.23 am., OA 24, 1997-98, pub. 03/17/98; 46.23 am., OA 33, 2000-01, pub. 04/17/01; 46.23 rep. & recr., Sub. 1 to OA 8, 2000-01, pub. 04/30/01; (15) cr., OA 6, 2002-03, pub. 08/13/02; (15) (see footnote below) cr., OA 19, 2002-03, pub. 03/04/03; (15) am. and error of Art. 3 of OA 19, 2002-03, corrected to correctly reference 46.23(16) instead of duplicating (15) and readopted as (16), OA 8, 2003-04, pub. 09/12/03; 46.23 am., OA 37, 2003-04, pub. 04/28/04; 46.23 am., OA 25, 2006-07, pub. 12/29/06, eff. 01/01/07; (4) am. and (17) cr., Sub. 1 to OA 8, 2007-08, pub. 10/04/07; 46.23 am., OA 31, 2009-10, pub. 11/25/09, eff. 01/01/10; (12) am., OA 38, 2009-10, pub. 11/25/09, eff. 01/01/10.]

46.24 REDUCED FEES. (1) All fees required by this chapter are to be paid in advance. The department may require payment by cash, certified check or money order in the event of any prior adverse credit experience with any applicant.

(2) Any person may apply to the board to have any fees reduced or waived under this section. No reduction of fees or waiver of fees shall be made unless the board shall find that the imposition of the fees required by this chapter will work an unnecessary hardship upon the applicant.

(3) Fees for the issuance or renewals of sanitary permits shall not be reduced below the sum specified by s. 145.19(2), Wis. Stats., or acts amendatory thereto.

[**History**: (3) am., OA 41, 1988-89, pub. 06/05/89.]

46.25 PROHIBITED PRACTICES. It shall be a violation of this chapter to:

(1) Refuse or neglect to obey any lawful order of the department.

(2) Construct, install, extend, enlarge, convert, reconnect, structurally alter or modify any private sewage system without first obtaining a sanitary permit, except as provided in section 46.07(2).

(3) Construct, extend, enlarge, convert, reconnect, structurally alter, modify or maintain any private sewage system in such a manner that untreated sewage enters any surface or subsurface waters or flows onto any surface land.

(4) Continue construction or alteration of any private sewage system after a stop work order has been issued under section 46.16.

(5) Install a private sewage system or use or maintain a private sewage system when public sewer is available.

(6) Construct or maintain any private sewage system within any area designated as a floodplain within Dane County.

(7) Install or permit or direct others to install any private sewage system unless such installer or person acting under his or her direction is properly licensed by the State of Wisconsin to install such systems.

(8) Leave exposed and unfilled any on-site bore pits for more than thirty (30) days, regardless of request for on-site soil evaluation, or after notification of approval or disapproval of the site by the department, with possible extension, after application, at the discretion of the department.

(9) Remove or mutilate any stop work orders signed and posted on any premises by the department.

(10) Continue to use any malfunctioning system after issuance of a stop-usage order, under section 46.18(3).

(11) Fail to remove or abate any nuisance within thirty (30) days after receipt of a notice from the department.

(12) Fail to have a private sewage system inspected and/or serviced as required by section 46.11(4).

(13) Operate any facility licensed by the State of Wisconsin without first obtaining the required license.

(14) Operate any facility licensed by the County of Dane without first obtaining the required license.

(15) Fail to pump any septic tank or holding tank when required to do so by an order of the department.

(16) Fail to maintain adequate pumping records when required to do so by order of the department.

[**History**: (5) am., OA 33, 1992-93, pub. 04/14/93; (2), (3) and (8) am., Sub. 2 to OA 1, 1997-98, pub. 07/18/97.]

46.26 COMPLAINTS. The department shall inspect any premises complained of and shall keep a written record of all such complaints except that the name of any complaining individual shall not be noted therein if such individual requests anonymity.

46.27 PENALTIES. (1) Except as provided in sub. (2), any person violating any provision of this chapter shall forfeit not less than $50 nor more than $200 for each day that a violation exists.
(2) Any person violating any provision of section 46.45(7) shall forfeit not less than $10 nor more than $5,000 for each day that a violation exists.
(3) Any person who has the ability to pay any forfeiture entered against him or her under this chapter but refuses to do so may be confined in the county jail until such forfeiture is paid, but in no event to exceed thirty (30) days. In determining whether an individual has the ability to pay a forfeiture imposed under this section all items of income and all assets may be considered regardless of whether or not such income or assets are subject to garnishment, lien or attachment by judgment creditors under the laws of this state.
[**History:** (1) am., OA 17, 2000-01, pub. 01/16/01, eff. 01/17/01; am., sub. 1 to OA 8, 2007-08, pub. 10/04/07.]

46.28 ENFORCEMENT. (1) The corporation counsel shall prosecute all violations of this chapter at the request of the department or of the board.
(2) The corporation counsel may seek an injunction in any case it deems appropriate, in addition to an action to collect a forfeiture.

46.29 ABROGATION AND GREATER RESTRICTIONS. It is not intended by this chapter to repeal, abrogate, annul, impair or interfere with any existing easements, covenants, deed restrictions, agreements, ordinances, rules, regulations or permits previously adopted or issued pursuant to law. However, wherever this chapter imposes greater restrictions, the provisions of this chapter shall govern.

46.30 INTERPRETATION. In their interpretation and application, the provisions of this chapter shall be held to minimum requirements and shall be liberally construed in favor of the county and shall not be deemed a limitation or repeal of any other power granted by the Wisconsin Statutes.

46.31 CONFLICTS WITH OTHER REGULATIONS. In any case where a provision of these regulations is found to be in conflict with a provision of any other regulation of the County of Dane or the State of Wisconsin, the provision which establishes the higher standard for the promotion and protection of the health and safety of the people shall prevail. These regulations shall be construed liberally in favor of the County of Dane and for the utmost protection of the public health.

46.32 NON-LIABILITY. The county does not guarantee, warrant or represent the safe and proper operation of waste disposal systems located, constructed and maintained in accordance with this chapter, and hereby asserts that there is no liability on the part of the board of supervisors, its agencies or employees for any health hazards or damages that may occur as a result of reliance upon, and compliance with, this chapter.

46.33 PUBLIC POOLS AND BEACHES, CAMPGROUNDS, MOBILE HOME PARKS AND RECREATIONAL AND EDUCATIONAL CAMPS. (1) *Introduction.* Dane County does hereby adopt the following regulations governing the inspection, maintenance and operation of vending machines, restaurants, swimming pools and water attractions, beaches, manufactured home communities, campgrounds, hotels, motels, recreational and educational camps, tourist rooming houses, bed and breakfasts, retail food establishments, construction of wells; servicing of septic tanks, seepage pits, grease traps or privies; and the issuance, suspension and revocation of permits to operators of such facilities or persons engaging in such activities.
(2) *Types of facilities and activities regulated.* All vending machines, restaurants, swimming pools and water attractions, beaches, manufactured home communities, campgrounds, hotels, motels, recreational and educational camps, tourist rooming houses, bed and breakfasts, retail food establishments, construction of wells and the servicing of septic tanks, seepage pits, grease traps or privies, subject to the provisions of the Wisconsin Administrative Code, shall also be governed by this section. Hereafter, in this section, such facilities are referred to as regulated facilities and regulated activities, respectively.
(3) *Effect of regulations.* The inspection and examination of regulated facilities within the County of Dane, the issuance and revocation of permits for regulated facilities, and the fixing of penalties shall be done in accordance with the terms of this section.
(4) *Permits required.* From and after the date on which this section takes effect, no operator of any regulated facility shall operate, maintain or

establish any such facility unless he or she first has in his or her possession a valid permit issued by the health officer. Within 30 days after receiving a completed application, the department shall either approve the application and issue a permit or deny the application. If the application for a permit is denied, the department shall give the applicant reasons, in writing, for the denial. Any applicant denied a permit may appeal such denial to the panel established by subsection (7) of this section and according to the procedures specified therein.

(5) *Revocations*. Whenever any regulated facility or regulated activity fails to meet the standards established by chapters DHS 195, DHS 196, DHS 197, DHS 198, COMM 26, COMM 90, DHS 172, DHS 175, DHS 177, DHS 178, ATCP 75, NR 812, of the Wisconsin Administrative Code or any provision of the Dane County Ordinances, the health officer is authorized to seek revocation of the operator's permit. In addition, the health officer is authorized to initiate legal action against the operator, in conjunction with the corporation counsel's office.

(6) *Notice required*. Prior to seeking revocation the health officer shall give a notice to the operator of the officer's intention to seek revocation, specifying the basis for the proposed revocation and the remedies which may be undertaken by the operator to avoid revocation. Said notice shall also specify the date, time and place of the revocation hearing which shall be at least twenty (20) days from the date of the notice. Issuance of a revocation notice does not preclude suspension under subsection (8) of this section and suspension may be imposed during the pendency of revocation proceedings.

(7) *Revocation hearing.* All revocation proceedings shall be conducted before a three (3) member panel comprised of members of the board of health appointed by the board's chairperson. The health officer and the operator may present evidence in the form of testimony and exhibits, may cross-examine witnesses, make objections and make argument to the panel. The panel shall receive evidence having a reasonable bearing upon the case and may give such weight to the evidence as is warranted under all the facts of the case. Any operator aggrieved by a decision of the panel may appeal such decision in the manner provided for by law.

(8) *Suspensions for imminent danger.* In cases where the continued operation of any regulated facility poses a threat of imminent danger to the health or safety of the public, the health officer may immediately suspend the operator's permit and such a suspension shall require that the regulated facility be immediately closed to the public. Any operator of a regulated facility whose permit has been suspended may request a reinspection at any time when he or she believes that his or her facility no longer poses a threat of imminent danger to the public health or safety. The health officer shall maintain adequate records specifying the facts and reasons for his or her actions in suspending the operating permit of any regulated facility and such record shall be available to the operator upon request. No suspension shall remain in effect longer than reasonably necessary to protect the public health and safety.

(9) *Hearing on suspension.* Any operator aggrieved by an order of suspension issued by the health officer may appeal such a decision to the board of health. The chairperson of the board of health is authorized to appoint a three (3) member panel to hear such appeal in the same manner as appeals under subsection (6) above. Such appeals shall be heard as quickly as possible and in any event not later than ten (10) days, exclusive of Saturdays, Sundays and legal holidays, of the date of receipt of a request for such appeal, or within such extension thereof as the operator may request.

(10) *Violations, how prosecuted.* In addition to the suspension and revocation provisions of this section, violations of this section and pertinent state and county laws shall be prosecuted and punished as provided by the Wisconsin Statutes or by any ordinances passed by Dane County adopting this section by reference. When an act is a violation of both this section, any ordinance or an applicable statute, the person committing such act may be prosecuted under not more than one provision. Each and every violation of this section shall constitute a separate offense. Each day of violation shall constitute a separate offense.

(11) *Repeal of inconsistent regulations.* All regulations and parts of regulations in conflict with this section are hereby repealed, and this section shall be in full force and effect immediately upon adoption and publication, as provided by law.

[**History**: (1), (2) and (5) am., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; (4) am., Sub. 1 to OA 1, 1992-93, pub. 07/01/92; (1), (2), and (5) am., OA 31, 2010-11, pub. 12/30/10]

46.34 COUNTY FEES. The following shall be the county fees for the various permits authorized under section 46.33:

(1) Public beaches.....$167
(2) Public swimming pools:
(a) Indoor pool .....$ 900
(b) Each additional indoor pool .....$ 450
(c) Outdoor pool.....$ 475
(d) Each additional outdoor pool .....$ 300

(3) Recreational and educational camps:

Number of Camps	*Fee*
1-5	$300
6-10	$400
11 or more	$700

(4) Mobile home parks:

Number of Spaces	*County Fee*
1-20	$102
21-50	$179
51-100	$223
101-175	$285
More than 175	$285

(5) Campgrounds and camping resorts:

Number of Spaces	*County Fee*
1-25	$200
26-99	$350
100 or more	$500

(6) Food and Drink Establishments:
(a) Food establishments are defined as retail or mobile food stores and restaurants.
(b) Temporary establishments are defined as food establishments at a fixed location for no more than fourteen (14) consecutive days in conjunction with a single event, celebration or occasional sales promotion.

(c) With regard to permanent establishments:

Gross sales per year	*Fee*
$0-$10,000	$ 175
$10,001-$100,000	$ 390
$100,001-$250,000	$ 500
$250,001-$1,000,000	$ 700
$1,000,001-$5,000,000	$ 865
More than $5,000,000	$ 960

(d) With regard to temporary establishments, $60 for the first day of the first event and $25 for each day thereafter.
(e) Re-inspection of food and drink establishments $150
(f) Notwithstanding this subsection, there shall be no county fee for temporary food establishment operations, as defined in s. 254.61(5)(b), Wis. Stats., by churches, religious, fraternal, youth, or patriotic organizations; service clubs and civic organizations that occasionally prepare, serve, or sell meals to transients or to the general public. Occasional means not more than 3 days during any 12 month period.

(7) Hotel & Motel (Units):

No. of Units	*County Fee*
1-30	$ 190
31-99	$ 270
100-199	$ 390
200 or more	$ 440

(8) Tourist rooming houses: .....$ 190
(9) Bed and breakfast:.....$ 95
(10) Pre-inspections.....$350
(11) *Fees for operating without a license.* Any operator of an enterprise requiring a food and drink license; a hotel, motel, tourist rooming house, bed and breakfast establishment license; a public swimming pool license; or recreational, educational camp or campground license; a tattooing and body piercing license, found to be operating without a license, shall pay to the department a forfeiture of $250.00, in addition to applicable fees.
(12) *Fee for operating without a Wisconsin certified food manager.* The department shall charge the operator of a restaurant a forfeiture of $150.00 for operating without a Wisconsin certified food manager.
[**History**: (1)-(13) am., sub. 1 to OA 11, 1987-88, pub. 10/03/87; (6) am., OA 44, 1987-88, pub. 05/28/88; (6), (6)(a), (13) and (14)(a) & (b) am., OA 41, 1988-89, pub. 06/05/89; (13) and (14)(a) am., OA 2, 1990-91, pub. 06/01/90; (1) am., Sub. 1 to OA 7, 1990-91, pub. 07/18/90; (1)-(13) am., OA 24, 1994-95, pub. 01/18/95; (1)-(9), (11) and (13) am., OA 24, 1997-98, pub. 03/17/98; (6), (7) and (13) am., Sub. 1 to OA 1, 1999-2000, pub. 06/01/99; 46.34 am., OA 33, 2000-01, pub. 04/17/01; (4) am., OA 6, 2002-03, pub. 08/13/02; (6) and (6)(a) am., OA 9, 2003-04, pub. 09/12/03; 46.34 am., OA 37, 2003-04, pub. 04/28/04; 46.34 am., (11) and (12) rep., OA 25, 2006-07, pub. 12/29/06, eff. 01/01/07; 46.34 am., OA 40, 2007-08, pub. 02/01/08; (6)(f) am., (11) and (12) cr., OA 31, 2010-11, pub. 12/30/10.]

46.345 FEE ADJUSTMENTS. Whenever the combined state-county fee charged for a permit or service under s. 46.34 results in a total fee in other than whole dollar amounts, the county portion of the fee shall be adjusted so that the total fee is expressed in the nearest whole dollar amount.
[**History**: cr., Sub. 1 to OA 1, 1999-2000, pub. 06/01/99.]

46.35 LATE CHARGES, PERMIT RENEWALS, DUPLICATE PERMITS. (1) In each instance where a fee required under subsections (1) through (5), inclusive, of section 46.34 is not paid

when due, the director of environmental health shall collect a late fee equal to 15% of the applicable permit fee.

(2) In each instance where a fee required under subsections (6) through (10), inclusive, of section 46.34 is not paid when due, the director of environmental health shall collect a late fee equal to 15% of the applicable permit fee.

(3) As used in this subsection, permit refers to any annual permit required by section 46.34 and permitted facility refers to any facility the operation of which requires any such permit. Between June 30 and July 31 of any year, the department shall not issue a permit unless the applicant submits payment of the required renewal fee and penalty. After July 31, the department shall not renew expired permits and all applications for permits received after that date shall be treated as applications for new permits. Any person who conducts, maintains, manages or operates any permitted facility between June 30 and July 31 is obligated to pay the appropriate permit fee, and the corporation counsel is authorized to commence an action for the recovery of the fee. After July 31 no person may conduct, manage, maintain or operate any permitted facility unless a current permit is in effect. In order to assist permittees in the renewal of permits, the department shall annually, on or before July 15, send notice of delinquent status to permittees who have not renewed expired permits, however, failure to send such notice shall not create any right to continued operation of the facility after July 31.

(4) A $5.00 fee shall be collected for issuing a duplicate permit to any facility that has previously been issued an operating permit during the current permit year.

[**History**: cr., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; (3) cr., OA 44, 1987-88, pub. 05/28/88; (1) - (4) am., Sub. 1 to OA 1, 1992-93, pub. 07/01/92, am. of (1) and (2) eff. 01/01/93; 46.35 am., OA 37, 2003-04, pub. 04/28/04; (1), (3) and (4) am., OA 25, 2006-07, pub. 12/29/06, eff. 01/01/07; (1) – (4) am., OA 40, 2007-08, pub. 02/01/08.]

46.36 RELATIONSHIP OF COUNTY FEES TO OTHER FEES. (1) The fees set forth in sections 46.23, 46.34 and 46.35 are county fees and are in addition to any state fees which may be imposed for the same activity or subject matter. No part of any state fee which is refunded to the county or which is allowed to be retained by the county shall be included in calculating the county fee under this ordinance.

[**History**: cr., Sub. 1 to OA 11, 1987-88, pub. 10/03/87.]

46.37 TEMPORARY OPERATIONS; REGISTRATION REQUIRED. (1) A temporary restaurant operation or a temporary retail food operation, including any bakery and confectionery, shall register with the department prior to commencing operations in any twelve-month period between July 1 and June 30 of the succeeding year. Failure to register a temporary restaurant or temporary retail food operation shall be a violation of this ordinance punishable by a forfeiture of not less than $50 nor more than $100 for the first offense and not less than $100 nor more than $500 for a second or subsequent offense in any five-year period. Registration under this section shall be required without regard to the number of days of operation anticipated by the owner or operator of the facility and without regard to whether the facility is exempt from the requirement to obtain a license under state law.

(2) Without regard to whether a temporary restaurant or temporary retail food operation is required to obtain a license under state law, the department is authorized to inspect any such operation at any time and to issue a cease operations order if unsanitary conditions are found to exist. The department shall cause any such order to be posted in a prominent and conspicuous place on the premises.

[**History**: cr., Sub. 1 to OA 11, 1987-88, pub. 10/03/87; (1) am., OA 17, 2000-01, pub. 01/16/01, eff. 01/17/01.]

46.38 RETURNED CHECKS. In the event a check accepted in payment of a fee is returned as NSF (insufficient funds in account) or because the account is closed, the applicant shall pay a Twenty Dollar ($20.00) handling fee. Failure to reimburse the county for the returned check or to pay the handling fee shall result in the revocation of the applicant's license effective ten (10) days after mailing, by certified mail, of a revocation notice to the applicant at his or her last known address. A permittee whose license is revoked under this section shall submit an application for and obtain a new license before recommencing operations.

[**History**: cr., OA 44, 1987-88, pub. 05/28/88.]

[46.39 – 46.44 reserved.]

[**History**: 46.40 cr., Sub. 2 to OA 1, 1997-98, pub. 07/18/97; (2)(b) and (4) am., Sub. 1 to OA 1, 1999-2000, pub. 06/01/99; (1) am., OA 6, 2002-03, pub. 08/13/02; 46.40 rep., OA 38, 2009-10, pub. 11/25/09, eff. 01/01/10.]

[**History**: 46.42 cr., Sub. 1 to OA 1, 1999-2000, pub. 06/01/99; 46.42 rep., OA 38, 2009-10, pub. 11/25/09, eff. 01/01/10.]

46.45 LAND DISPOSAL OF SEPTAGE. This section is enacted under the authority of section 281.48(5m), Wis. Stats.

(1) Except as provided in sub. (3), no person may dispose of septage by landspreading unless the person is certified as an operator of a septage servicing vehicle by the Wisconsin Department of Natural Resources.

(2) Except as provided in sub. (3), no person may dispose of septage by landspreading except upon lands for which an annual septage landspreading permit has been issued by the department.

(3) A farmer may dispose of septage by spreading it upon land owned or leased by the farmer if all of the following criteria are met:

(a) The septage is removed from a septic tank that is located on the same parcel where the septage is landspread;

(b) Prior to landspreading the septage, the farmer provides the department with documentation that there is sufficient land area available for disposal; and

(c) The removal and disposal of the septage complies with all applicable statutes, administrative rules and the provisions of this chapter governing the removal and landspreading of septage including, but not limited to, soil requirements, the set back, timing and seasonal restrictions, and pathogen control and vector reduction requirements included therein.

(4) *Site approval application*. Except as provided in sub. (3), at least seven days prior to disposing of septage by landspreading, the following information shall be provided to the department:

(a) A map delineating property boundaries or aerial photograph or U.S. geological survey topographic map with the field outlined and a scale attached for easy reference.

(b) A soil evaluation report. The soil evaluation report must be in writing and completed by a certified soil tester. The soil evaluation report shall include, at a minimum:

1. A report on soil conditions, properties and permeability, depth to zones of soil saturation, depth to bedrock, and potential for flooding;

2. Soil borings for all high use fields and for low use fields that have a high degree of variability or where detailed and reliable soil conservation or survey maps are not available. Department staff shall be notified at least three working days prior to the scheduled borings and shall be on-site to verify that the process by which the soil borings are obtained is in accordance with the requirements of Chapter Comm. 85, Wis. Admin. Code; and

3. Soil investigation data must be collected, validated and signed by a certified soil tester and submitted to the department within 30 days of the completion of soil testing.

(c) A site evaluation report that complies with the requirements of Chapter Comm. 85.40(3)(a), Wis. Admin. Code, and also includes the location of any designated critical habitat where there are or may be endangered or threatened species and the location of any designated historical sites. The site evaluation shall be completed by a certified soil tester.

(d) Completed department landspreading site evaluation form.

(e) Any other information or documentation determined necessary by the department to adequately evaluate the suitability of a proposed site for the land spreading of septage.

(5) *Septage landspreading permit*. Within seven days after receipt of the forms and documents described in sub. (4), the department shall either issue a septage landspreading permit, issue a written decision denying the permit or, if the reports are not acceptable, notify the applicant in writing of the deficiencies in the report and the actions necessary to bring the report into compliance with this chapter. Failure of the department to respond as set forth in this subsection within seven days indicates that landspreading is allowed until and unless the permit is denied by the department under this section. The department's determination shall be based upon the criteria established by Wisconsin Statutes, administrative rules and the provisions of this chapter. If the permit is denied, the department shall mail written notice of the denial to the permit applicant explaining the reasons for the denial and notifying the person or business of the procedure for seeking a review of the denial decision, as provided in §46.055 of this chapter.

(6) *Pathogen and vector attraction reduction requirements*. **(a)** Pathogens shall be reduced by one of the following methods:

1. At least 30 minutes prior to landspreading, the pH of the septage in each container that will be spread shall be raised to 12 or higher by the addition of alkali, and without the addition of more alkali, the pH shall remain at 12 or higher for at least 30 minutes prior to spreading; or

2. The following harvesting time and site restrictions shall be followed:

a. Food crops with harvested parts that touch the septage/soil mixture and are totally above the

land surface may not be harvested for 14 months after application of septage.

b. Food crops with harvested parts below the surface of the land may not be harvested for 20 months after application of septage when the septage remains on the land surface for four months or longer prior to incorporation into the soil.

c. Food crops with harvested parts below the surface of the land may not be harvested for 38 months after application of septage when the septage remains on the land surface for less than four months prior to application into the soil.

d. Animals may not be allowed to graze on the land for 30 days after application of septage.

e. Fiber crops and feed crops may not be harvested for 30 days following application of septage.

f. Turf grown on land where septage is applied may not be harvested for one year after application of the septage when the harvested turf is placed either on land with a high potential for public exposure or a lawn.

g. Public access to land with a high potential for public exposure shall be restricted for one year after the application of septage.

h. Public access to land with a low potential for public exposure shall be restricted for 30 days after the application of septage.

(b) One of the following vector attraction reduction requirements shall be met when septage is applied to land:

1. Septage is injected below the surface of the land such that no significant amount of the septage shall be present on the land surface within one hour after septage is injected; or

2. Septage applied to the land surface shall be incorporated into the soil within six hours after application to, or placement on, the land; or

3. At least 30 minutes prior to landspreading, the pH of the septage in each container that will be spread, shall be raised to 12 or higher by the addition of alkali, and without the addition of more alkali, the pH shall remain at 12 or higher for at least 30 minutes prior to spreading.

(7) *Prohibited practices*. **(a)** Septage may not be landspread except as permitted or allowed under the authority of this chapter.

(b) Septage may not be landspread except on agricultural land.

(c) Septage may not be spread on any land without the owner's permission.

(d) Septage may not be landspread on soils that fail to meet the permeability rates or water holding capacities provided in Chapter NR 113, Wis. Admin. Code.

(e) Septage may not be landspread or discharged into or on any wetlands or areas subject to ponding, including any ditch, dry run, pond, lake, stream, flowage, floodplain, cave, sinkhole, mine, gravel pit or quarry.

(f) Septage may not be landspread on or into soils with a seasonal high ground water level at a depth from the surface of less than one foot.

(g) Septage may not be landspead on or into soils with a seasonal high groundwater level of less than three feet from the land surface unless the landspreading is limited to times when the soil is not saturated within three feet of the surface.

(h) Septage may not be landspread on saturated soils during rainfall events or in areas of ponded waters.

(i) Septage may not be spread on frozen or snow covered ground.

(j) Septage may not be landspread except within the minimum separation and maximum slope requirements found in Chapter NR 113, Wis. Admin. Code.

(k) Septage may not be landspread unless there is maintained at least a two-foot wide grass strip at the property line down slope from the application site.

(L) Septage may not be landspread where it is likely to adversely affect a threatened or endangered species or its designated critical habitat.

(m) Septage may not be landspread where it is likely to adversely affect a designated historical site.

(n) Septage that is land applied based upon the agronomic crop requirements may not be applied more than ten months prior to the planting of the crop.

(o) Septage may not be landspread on hay fields after the new growth of hay has reached six inches.

(p) Landspreading vehicles shall be moving forward at all times while spreading septage.

(q) Septage shall not be permitted to pond on the surface of the land at any time.

(r) All litter from the landspreading of septage shall be removed immediately.

(s) Septage may not be landspread at rates which will supply available nitrogen at amounts greater than the agronomic need for the crop grown as calculated pursuant to Chapter NR 113, Wis. Admin. Code.

(t) The hydraulic loading rate of septage application shall be limited by soil characteristics but under no conditions shall it exceed 13,000 gallons per acre per week.

[**History:** 46.45 cr., Sub. 1 to OA 8, 2007-08, pub. 10/04/07.]

[46.46 - 46.49 reserved.]

46.50 DEFINITIONS. As used in sections 46.51 through 46.59, inclusive, the following words and phrases have the meanings indicated:
(1) *Sanitary survey* means an inspection and water sampling of the swimming area and the entire watershed contributing to the body of water on which the beach is located in order to determine the bacteriological, biological, chemical and physical quality of the water using generally accepted parameters and, specifically, those included in this ordinance.
[**History**: cr., Sub. 1 to OA 7, 1990-91, pub. 07/18/90.]

46.51 SANITARY SURVEY REQUIRED. (1) With respect to public beaches existing before the effective date of this subchapter, a sanitary survey may be conducted at any time and may be required when the water quality at the beach does not comply with s. 46.54(1) through (3), inclusive.
(2) A sanitary survey shall be conducted by the division or a person acceptable to the division before construction or development of a new beach is started.
(3) The sanitary survey shall include the entire watershed if possible. For a large watershed, the area to be surveyed shall be based on knowledge of the area. A complete survey may not be required if a lack of water quality has a known and verifiable source. In all cases, any source of discharge into the surface water in the shed which may have an effect on the water quality of the swimming area shall be included in the survey. Other agencies monitoring water in the watershed shall be contacted for information on possible contaminating discharges. Included shall be any other notable conditions in the watershed or swimming area which may contribute to unacceptable water quality or unsafe conditions as may be determined by the inspecting agency.
[**History**: cr., Sub. 1 to OA 7, 1990-91, pub. 07/18/90.]

[46.52 reserved.]

46.53 BEACH WATER SAMPLING. (1) At least one set of bacteriological samples shall be collected from representative locations throughout the swimming area one time per week during the swimming season and at periods of peak usage. The samples shall be submitted to the state laboratory of hygiene or other laboratory certified under chapter HSS 165 to perform water microbiological analysis. A set of samples shall be all samples collected during any one day. The required samples may be collected by the beach operator or the division.
(2) Samples shall be collected within one foot of the surface in water having a depth range of 3 to 6 feet.
[**History**: cr., Sub. 1 to OA 7, 1990-91, pub. 07/18/90; (1) am., OA 33, 1992-93, pub. 04/14/93.]

46.54 CLOSING OF PUBLIC BEACHES. When one or more of the following subsections are not complied with, the beach shall be closed to the public until compliance is achieved.
(1) *Microbiological quality.* The beach water fecal coliform density from the last five successive sets of samples collected on five different days within a 30-day period shall not exceed a geometric mean of 200 per 100 milliliters (ml) nor shall the fecal coliform density of any sample exceed 1,000 per 100 ml. When it is determined that a beach must be closed, daily samples shall be collected and analyzed during the period of closure. The beach may be reopened if the fecal coliform density in two successive daily samples is less than 200 per 100 ml.
(2) *Chemical quality.* The water shall be free of chemical substances capable of creating toxic reactions or irritations to the skin or membranes of swimmers.
(3) *Physical quality.* As determined by visual examination the water shall be free of excessive debris, growths, oils, greases, weeds, algae or other substances capable of creating a health or safety hazard or a nuisance to swimmers. A black and white disc 6 inches in diameter on a white field placed at a depth of at least 4 feet of water may be used as a guide when determining the visibility in the water.
[**History**: cr., Sub. 1 to OA 7, 1990-91, pub. 07/18/90; (1) and (3) am., OA 33, 1992-93, pub. 04/14/93.]

46.55 WATER TREATMENT. The application of chemicals for water treatment shall be approved by the department of health and social services and the department of natural resources and shall be applied by properly trained applicators.

46.56 REQUIREMENTS FOR NEW PUBLIC BEACHES. (1) Prior to development, the suitability of a beach shall be established by a sanitary survey.
(2) The land boundary of a beach shall be designated by the posting of signs.

(3) The total water surface area upon which a beach is established shall be at least one acre. When the area is less than 2 acres and natural flowthrough is lacking, a source of acceptable dilution water having at least the quality specified in subs. (5) through (7) above, of at least 100 gallons per day per patron, based on the maximum bather capacity, shall be provided.

(4) A minimum of 25 square feet of water surface per swimmer shall be provided in areas less than 4 feet in depth. At least 75 square feet per swimmer shall be provided in the areas over 4 feet in depth.

(5) At least 35 square feet of open land area per patron shall be provided.

(6) For depths up to 4 feet of water, the bottom slope of the beach shall be uniform and not drop more than one inch for every 12 inches. There shall be no underwater obstructions, dropoffs or radical changes between the depths of 4 feet and 7 feet.

(7) The bottom, to a water depth of at least 6 feet, shall consist of sand, pea gravel or other approved material.

(8) The perimeter of the beach shall be clearly designated by navigation buoys approved by the United States Coast Guard as a warning to water craft. The shallow part of the swimming area should be separated from the rest of the area by means of lines attached to buoys located at a depth of 3 to 4 feet.

(9) Floating and fixed diving platforms shall be constructed with a visible 12 inch air space under the platform at the maximum feasible patron load. There shall be as little underwater construction as is consistent with adequate support and all braces and struts shall be designed to prevent entrapment of patrons.

(10) The minimum water depth surrounding floating or fixed diving platforms without special diving apparatus shall be at least 8 feet within a distance of 12 feet from the platform. For platforms with special diving apparatus such as diving boards, towers or similar devices that are 3 feet or less above the water, the depth at the end of the device shall be at least 10 feet within a 12 foot radius. For heights above water greater than 3 feet, the depth at those locations shall be at least 12 feet. No diving apparatus may be installed more than 10 feet above the water.

(11) The maximum water depth for any swimming or diving area shall be 15 feet.

(12) A supply of potable water meeting the standards of the department of natural resources, including ss. NR 109 and NR 812, shall be provided at all beaches. The water shall be obtained from a municipal water supply if it is available. At least one drinking water supply outlet for every 1,000 patrons or fraction thereof shall be provided. The supply outlet shall be protected against backflow and backsiphonage.

(13) Waste water from a bathhouse or a related facility shall be discharged to a municipal sewerage system if one is available. If one is not available, discharge shall be to a system approved by the department of industry, labor and human relations.

(14) Toilet facilities shall be provided within 500 feet of all public swimming beaches.

(15) When a bathhouse is provided, construction shall be in accordance with chapters COMM 60 to 66 and COMM 90, Wisconsin Administrative Code.

[**History**: cr., Sub. 1 to OA 7, 1990-91, pub. 07/18/90; (8) rep. and recr., OA 33, 1992-93, pub. 04/14/93; (12) and (15) am., OA 31, 2010-11, pub. 12/30/10.]

46.57 SAFETY REQUIREMENTS FOR PUBLIC BEACHES. (1) At a beach designed to accommodate more than 25 swimmers where no lifeguard is on duty, a legible sign or signs reading "NO LIFEGUARD ON DUTY" shall be posted. Where lifeguards are provided, the requirements of subsections (1a), (2) and (3) shall apply.

(1a) Lifeguards shall not be in the water except in the line of duty. Lifeguards shall be isolated from beach crowds by occupying elevated seats on stands or towers, high enough to give them a complete and unobstructed view of the swimming and beach area for which they are responsible. All lifeguards on duty shall be identified by distinguishing apparel or emblem. Lifeguard stations shall be located as close as practical to the swimming area shoreline and within at least 30 feet of the shoreline.

(2) Lifeguards shall be certified in compliance with Wisconsin Administrative Code chapter HSS 172.05(2)(a)3, or acts amendatory thereto.

(3) Each lifeguard stand shall be provided with a whistle or megaphone and an umbrella.

(4) At least one 24 unit Red Cross first aid kit shall be provided at each swimming beach where a lifeguard is on duty.

(5) A spine board and 2 durable blankets shall be provided at each beach where a lifeguard is on duty.

(6) Each lifeguard stand shall be provided with at least one of the following: a ring buoy not less than 20 inches in outside diameter, a rescue buoy, a rescue tube or a torpedo buoy. The ring

buoy shall be attached to a 75 foot length of 1/4 inch rope.
(8) All lifesaving equipment shall be maintained in good repair and be readily available.
(9) No glass containers for beverages shall be permitted on the beach.
(10) Swimming or bathing shall not be permitted during inclement weather as determined by the responsible person in charge of the beach operation.
[**History**: cr., Sub. 1 to OA 7, 1990-91, pub. 07/18/90; (1) and (2) rep. and recr., (1a) cr., (4) and (5) am., and (7) rep., OA 33, 1992-93, pub. 04/14/93.]

[46.58 reserved.]

[**History**: 46.58 rep., OA 33, 1992-93, pub. 04/14/93.]

46.59 NIGHT SWIMMING REGULATED. Night swimming is not permitted unless the beach area is adequately lighted. All electrical facilities shall be in compliance with chapter ILHR 16, Wisconsin Electrical Code.
[**History**: cr., Sub. 1 to OA 7, 1990-91, pub. 07/18/90.]

46.595 VEHICLES. No motorized vehicles except emergency and maintenance vehicles shall be permitted on the beach.
[**History**: cr., Sub. 1 to OA 7, 1990-91, pub. 07/18/90.]

46.596 REGULATION OF NON-SWIMMING ACTIVITIES. No boating, water skiing, surfboarding or sailboarding shall be permitted in the swimming area.
[**History**: cr., Sub. 1 to OA 7, 1990-91, pub. 07/18/90.]

46.60 AUTHORITY; PURPOSE. Sections 46.60 through 46.71, inclusive, are created under the authority of section 251.135, Wis. Stats., for the purpose of promoting the public health.
[**History**: cr., OA 41, 1988-89, pub. 06/05/89; am., OA 31, 2010-11, pub. 12/30/10.]

46.61 MANUFACTURED HOME COMMUNITY PERMITS. **(1)** Before a manufactured home community is opened for public use, the operator shall obtain a permit from the department by application made upon a form furnished by the department.
(2) Within 30 days after receiving a completed application, the department shall either approve the application and issue a permit or deny the application. If the application for a permit is denied, the department shall give the applicant reasons, in writing, for the denial.
[**History**: cr., OA 41, 1988-89, pub. 06/05/89; (1) am., OA 31, 2010-11, pub. 12/30/10.]

46.62 PLAN APPROVAL. Plans and related specifications and calculations for a new or expanded mobile home park shall be submitted by the owner or operator to the department or its agent for examination in relation to this chapter and for approval before work is begun on the park. After the initial approval, no change in plans or specifications which is affected by any provision of this chapter may be made unless the change is approved and dated by the department or its agent.
[**History**: cr., OA 41, 1988-89, pub. 06/05/89.]
46.63 LOCATION. **(1)** Every manufactured home community and manufactured home within the community shall be located on a well-drained area, and shall be properly graded to prevent the accumulation of storm or other waters.
(2) No manufactured home community or manufactured home within the community may be located in any area that is situated so that drainage of contaminated liquids or solids can be deposited on its location.
[**History**: cr., OA 41, 1988-89, pub. 06/05/89; am., OA 31, 2010-11, pub. 12/30/10.]

46.64 PHYSICAL LAYOUT. **(1)(a)** Each site shall be clearly delineated on the plans submitted to the department or its agent for approval.
(b) The basic unit shall be so located on a site that there is at least a 10-foot side yard clearance from other basic units and a 10-foot rear yard clearance between basic units. The clearance requirements shall be exclusive of a parking area.
(c) The 10-foot clearance requirement applies to all 4 sides of the basic unit, that is, to both of the side yards and both of the rear yards. Rear yard is the area adjacent to each narrow end of the basic unit.
(d) No basic unit may be located closer than 10 feet to:
1. Any building such as a pump house, the office building for the park, a laundry building or a recreational building, except a garage belonging to the site;
2. Any property line of the park; or
3. The right-of-way line of a street within the park.
(2) Parking spaces in a ratio of one and one-half for each site shall be provided and maintained in good condition.
(3) For a 2-way street within the park, the width shall be at least 32 feet if parking is

permitted on both sides of the street; 24 feet if parking is permitted on one side of the street; and 18 feet if parking on the street is prohibited. A one-way street shall be at least 24 feet wide if parking is permitted on both sides; 18 feet wide if parking is permitted on one side; and 14 feet wide if parking on the street is prohibited. Streets shall be graveled or paved, maintained in good condition, have natural drainage and be adequately lighted at night.

(4) (a) Manufactured home communities which before February 1, 1986 either complied with existing codes or were in existence prior to 1962 shall be allowed to operate without being in compliance with subs. (1), (2) and (3) unless the department determines that non-compliance endangers the health or safety of occupants.

(b) Any manufactured home community expansion shall be in accordance with subs. (1), (2) and (3) and other applicable parts of this chapter.

(c) Any modification of a manufactured home community which existed prior to 1962 relating to the size of basic units, the separation between basic units, or the placement of basic units on a lot in relationship to streets and other buildings shall be permitted by the department unless the department determines that the modification endangers the health or safety of occupants. Any modification of a manufactured home community which did not exist prior to 1962 shall be in accordance with subs. (1), (2) and (3) and other applicable parts of this chapter.

[**History**: cr., OA 41, 1988-89, pub. 06/05/89; am., OA 31, 2010-11, publ. 12/30/10.]

46.65 WATER SUPPLY. **(1)** When a public water supply is available to the manufactured home community, connection and use are required.

(2) A private well is permitted as a source of water when a public water facility is not available to the premises. The well shall be located on the premises and shall be constructed and the pump installed in accordance with ch. NR 112 of the Wisconsin Administrative Code rules governing well drilling and pump installation. Whenever safe water cannot be obtained consistently from a well constructed in apparent compliance with ch. NR 112 of the Wisconsin Administrative Code, as evidenced by unsafe laboratory reports, the well shall be reconstructed or a new well constructed in accordance with the requirements of the department of natural resources. However, if the reconstruction or new construction is determined to be impractical or is found to be ineffective, the use of the well shall be discontinued and water transported on a temporary basis from a source and in a manner approved by the department.

(3) The water supply shall be sampled at least annually for microbiological and chemical contamination in accordance with ch. NR 109.

(4) Bottled and packaged potable water, if used, shall be obtained from a source that complies with all laws and shall be handled and stored in a way that protects it from contamination. Bottled and packaged potable water shall be dispensed from the original container.

[**History**: cr., OA 41, 1988-89, pub. 06/05/89; (1) am., OA 31, 2010-11, pub. 12/30/10.]

46.66 SEWAGE DISPOSAL. **(1)** When public sewage facilities are available to the manufactured home community, connection and use are required.

(2) Private sewage disposal systems as defined in s. 145.01(12), Stats., are permitted when a public sewer facility is not available to the premises. The system shall be located on the premises and shall be designed, constructed and operated in accordance with s. 144.245, Wis. Stats., and Chs. ILHR 82 and 83 of the Wisconsin Administrative Code. Failed on-site private waste disposal systems shall be replaced or rehabilitated. A failed system has the meaning prescribed for "failing private sewage system" in s. 144.245(4), Wis. Stats.

[**History**: cr., OA 41, 1988-89, pub. 06/05/89; (1) am., OA 31, 2010-11, pub. 12/30/10]

46.67 PLUMBING. **(1)** All plumbing shall meet the requirements of Chs. ILHR 82 and 83 of the Wisconsin Administrative Code, that are applicable to mobile homes and mobile home parks.

(2) A separate water service shall extend to each site.

[**History**: cr., OA 41, 1988-89, pub. 06/05/89.]

46.68 GARBAGE AND REFUSE. (1) All garbage not disposed of through a garbage disposal unit connected with the sewage system shall be kept in separate, leak-proof, non-absorbent containers equipped with tight-fitting covers unless otherwise protected from flies and insects, and the contents shall be disposed of as often as necessary to prevent decomposition or overflow.

(2) Garbage cans shall be maintained in a clean and sanitary condition.

(3) The use of wooden or paper containers for garbage is prohibited.
(4) Fly-tight containers with covers shall be used for cans, bottles and other rubbish. The contents shall be disposed of as often as necessary to prevent overflow.
[**History**: cr., OA 41, 1988-89, pub. 06/05/89.]

46.69 MANAGEMENT. **(1)** The operator or a designee in charge of the manufactured home community in the absence of the operator shall, during reasonable hours, be available in the community or in close proximity to the community.
(2) The operator shall keep a register of all owners of manufactured homes located in the manufactured home community, and shall permit the department to inspect the register at all reasonable times and upon reasonable notice.
(3) The operator shall maintain the manufactured home community in a clean, orderly and sanitary condition at all times.
(4) The operator shall cooperate with health officers in all cases of persons or animals infected or suspected of being infected with any reportable communicable disease under s. HSS 145.03(2) of the Wisconsin Administrative Code.
[**History**: cr., OA 41, 1988-89, pub. 06/05/89; am., OA 31, 2010-11, pub. 12/30/10.]

46.70 DUTIES OF OCCUPANTS. All owners and other occupants of manufactured homes in a manufactured home community shall:
(1) Register with the operator; and
(2) Maintain their site in a clean, orderly and sanitary condition at all times.
[**History**: cr., OA 41, 1988-89, pub. 06/05/89; am., OA 31, 2010-11, pub. 12/30/10.]

46.71 ENFORCEMENT. **(1)** Any employee of the department, upon presenting proper identification, shall be permitted to enter any manufactured home community at any reasonable time for the purpose of inspecting the manufactured home community to determine compliance with this chapter. The department's authorized employee or agent shall be permitted to examine the records of the manufactured home community including manufactured home community registration records.
(2) (a) If upon inspection of a manufactured home community the authorized employee or agent of the department finds that the manufactured home community is not planned, operated or equipped as required by this chapter, the employee or agent shall, except as provided under par. (b), notify the operator in writing and shall specify the changes required to make the manufactured home community conform to the standards established in this chapter and the time period within which compliance shall take place. If the order to correct violations is not carried out by the expiration of the time period stipulated in the order, or any extension of time granted for compliance, the department may issue an order suspending or revoking the permit to operate the manufactured home community. The suspension or revocation order shall take effect 15 days after the date of issuance unless a request for a hearing has been received under sub. (3).
(b) Where there is reasonable cause to believe that any construction, sanitary condition, operation or method of operation of the premises of a manufactured home community or of equipment used on the premises creates an immediate danger to health, the department may without advanced written notice, issue a temporary order to remove the immediate danger to health. That order shall take effect on delivery to the operator or other person in charge of the manufactured home community. The order shall be limited to prohibiting the continued operation or method of operation of specific equipment, requiring the premises to cease other operations or methods of operations, or a combination of these, except that if a more limited order will not remove the immediate danger to health the order may direct that all operations authorized by the permit shall cease. If, before scheduled expiration of the temporary order, the department determines that an immediate danger to health does in fact exist, the temporary order shall remain in effect. The department shall then schedule and hold a hearing under s. 46.17 unless the immediate danger to health is removed or the order is not contested and the operator and the department mutually agree that no purpose would be served by a hearing. The temporary order is effective for 14 days and may be extended for another 14 days to permit the department to complete its examination. The order expires at the end of the 14-day or 28-day period unless it is terminated by the department by notice to the operator within that period, or is kept in effect beyond that period, pending a hearing, by department notification to the operator. The hearing is to be held no later than 15 days after the notice is served on the operator unless the department and the operator agree on a later date, and the hearing officer or body must issue a final

decision on the matter within 10 days after the hearing.

(3) Any operator aggrieved by an order of the department under this section may request a hearing under this subsection to challenge the order. A request for a hearing under this subsection or for an appeal thereof shall be received by the director of environmental health within 15 days after issuance of the order. Procedures for the hearing shall be as set forth in section 46.17. After the hearing, the presiding officer or body shall affirm, set aside or modify the order.

[**History**: cr., OA 41, 1988-89, pub. 06/05/89; am., OA 31, 2010-11, pub. 12/30/10.]

[46.72 – 46.99 reserved.]

END OF CHAPTER

ATTACHMENT F

GLOSSARY

GLOSSARY

Absorption: The process by which one substance is taken into and included within another substance, such as the absorption of water by soil or nutrients by plants.

Activated Sludge: A biological wastewater treatment process that uses suspended microorganisms to digest the organic contents of wastewater by agitating and aerating biologically active sludge with incoming wastewater.

Adsorption: The increased concentration of molecules or ions at a surface, including exchangeable cations and anions on soil particles. The adherence of a dissolved solid to the surface of a solid.

Aerobic: Having molecular oxygen as a part of the environment, or growing or occurring only in the presence of molecular oxygen.

Alternative Onsite System: An onsite treatment system other than a conventional septic tank and leach field design. Alternative systems are used to accommodate a variety of site conditions (e.g., high ground water, low-permeability soil) and/or to provide additional treatment. Examples of alternative systems include alternative collection sewers, sand mounds, sand filters, anaerobic filters, disinfection systems, and cluster systems, among others.

Anaerobic: Characterized by the absence of molecular oxygen, or growing in the absence of molecular oxygen.

BOD: Biochemical Oxygen Demand (BOD) is the measure of the amount of oxygen required by bacteria for stabilizing material that can be decomposed under aerobic conditions. BOD is a commonly used determinant of the organic strength of a waste.

Biomat: The layer of biological growth and inorganic residue that develops at the wastewater-soil interface and extends up to about 1 inch into the soil matrix. The biomat controls the rate at which pretreated wastewater moves through the infiltrative surface/zone for coarse to medium textured soils. This growth may not control fluxes through fine clay soils, which are more restrictive to wastewater flows than the biomat.

Black Water: Wastewater from the toilet, which contains most of the nitrogen in sewage.

Centralized System: A wastewater collection and treatment system that consists of collection sewers and a centralized treatment facility. Centralized systems are used to collect and treat wastewater from entire communities.

Chemical oxygen demand (COD): A measure of oxygen use equivalent to the portion of organic matter that is susceptible to oxidation by a strong chemical oxidizing agent.

Clay: A textural class of soils consisting of particles less than 0.002 millimeters in diameter.

Cluster System: A wastewater collection and treatment system under some form of common ownership and management that provides treatment and dispersal/discharge of wastewater from two or more homes or buildings but less than an entire community.

Colloids: The solids fraction that is described as the finely divided suspended matter that will not settle by gravity and is too large to be considered dissolved matter.

Conventional Onsite System: A conventional onsite system includes a septic tank and a leach field.

Decentralized System: An onsite or cluster wastewater system that is used to treat and dispose of relatively small volumes of wastewater, generally from dwellings and businesses that are located relatively close together. Onsite and cluster systems are also commonly used in combination.

Denitrification: The biochemical reduction of nitrate or nitrite to gaseous molecular nitrogen or an oxide of nitrogen.

Digestion: The biological decomposition of organic matter in sludge, resulting in partial gasification, liquefaction, and mineralization.

Disinfection: The process of destroying pathogenic and other microorganisms in wastewater, typically through application of chlorine compounds, ultraviolet light, iodine, or ozone.

Dissolved oxygen (DO): The oxygen dissolved in water, wastewater, or other liquid, usually expressed in milligrams per liter (mg/L), parts per million (ppm), or percent of saturation.

Dissolved solids: The fraction of solids dissolved in water.

Drain field: Shallow, covered, excavation made in unsaturated soil into which pretreated wastewater is discharged through distribution piping for application onto soil infiltration surfaces through porous media or manufactured (gravelless) components placed in the excavations. The soil accepts, treats, and disperses wastewater as it percolates through the soil, ultimately discharging to groundwater.

Effluent: Partially or fully treated wastewater flowing from a treatment unit or facility.

Effluent filter (also called an effluent screen): A removable, cleanable device inserted into the outlet piping of the septic tank designed to trap excessive solids due to tank upsets that would otherwise be transported to the subsurface wastewater infiltration system or other downstream treatment components.

Eutrophication: A process by which nutrient-rich surface water or ground water contributes to stagnant, oxygen-poor surface-water environments that may be detrimental to aquatic life.

Evapotranspiration: The combined loss of water from a given area and during a specified period of time by evaporation from the soil or water surface and by transpiration from plants.

Fecal Coliform Bacteria: Common, harmless forms of bacteria that are normal constituents of human intestines and found in human waste and in wastewater. Fecal coliform bacteria counts are used as an indicator of presence of pathogenic microbes.

Gray Water: Wastewater drained from sinks, tubs, showers, dishwashers, clothes washers, and other non-toilet sources.

Leaching Field: See "Drain Field".

Management of Decentralized Systems: The centralized management and monitoring of onsite or cluster wastewater systems, including, but not limited to, planning, construction, operation, maintenance, and financing programs.

National Pollutant Discharge Elimination System (NPDES): A regulatory system that requires wastewater treatment systems discharging into surface waters to obtain a permit from the EPA which specifies effluent quality.

Nitrification: The biochemical oxidation of ammonium to nitrate.

Nonpoint Source Discharges: Relatively diffuse contamination originating from many small sources whose locations may be poorly defined. Onsite wastewater systems are one type of Nonpoint source discharge.

Onsite System: A natural system or mechanical device used to collect, treat, and discharge or reclaim wastewater from an individual dwelling without the use of community-wide sewers or a centralized treatment facility. A conventional onsite system includes a septic tank and a leach field. Other alternative types of onsite systems include at-grade systems, mound systems, sand filters and small aerobic units. These and other types of onsite systems are described in the "Description of Wastewater Systems" section.

Organic nitrogen: Nitrogen combined in organic molecules such as proteins and amino acids.

Package Plant: Prefabricated treatment units that can serve apartment buildings, condominiums, office complexes, and up to a few hundred homes. Package plants generally are used as cluster systems, but can also be used in an onsite wastewater treatment train. They are usually of the activated sludge or trickling filter type, and require skilled maintenance programs.

Point Source Discharges: Contamination from discrete locations, such as a centralized wastewater treatment facility or a factory.

Pressure Sewers: An alternative wastewater collection system in which household wastewater is pretreated by a septic tank or grinder and pumped through small plastic sewer pipes buried at shallow depths to either a conventional gravity sewer or a treatment system. Pressure sewers are used in areas with high groundwater or bedrock, low population density, or unfavorable terrain for gravity sewer collection. They require smaller pipes and less excavation than conventional sewers. Two types of pressure sewers include:

> *Septic Tank Effluent Pump (STEP).* A submersible pump located either in a separate chamber within a septic tank or in a pumping chamber outside the tank pumps the settled liquid through the collector main. Because the wastewater is treated in a septic tank, the treatment facility may be smaller and simpler than would otherwise be needed.

Grinder Pump. Household wastes flow by gravity directly into a prefabricated chamber located either in the basement of a house or outside the foundation wall. The chamber contains a pumping unit with grinder blades that shred the solids in the wastewater to a size that can pass through the small diameter pressure sewers.

Pumping Stations: A pumping facility is used to lift wastewater where topography is too flat or hilly to permit natural gravity flow to treatment facility.

Receiving Water: Streams (i.e., surface water bodies) into which treated wastewater is discharged.

Residuals: The by-products of wastewater treatment processes, including sludge and septage.

Secondary Treatment: Typical effluent quality achieved by a conventional centralized treatment facility, typically defined as 85% reduction of influent BOD and TSS or 30 mg/l or both; which ever is least.

Septage: The solid and semi-solid material resulting from onsite wastewater pretreatment in a septic tank, which must be pumped, hauled, treated, and disposed of properly.

Sludge: The primarily organic solid or semi-solid product of wastewater treatment processes. The term sewage sludge is generally used to describe residuals from centralized wastewater treatment, while the term septage is used to describe the residuals from septic tanks.

Small-Diameter Gravity Sewers: An alternative wastewater collection system consisting of small-diameter collection pipes (e.g., between three and six inches) that transport liquid from a septic tank to a treatment unit, utilizing differences in elevation between upstream connections and the downstream terminus to achieve gravity flow.

Subsurface Soil Absorption Field: A subsurface land area with relatively permeable soil designed to receive pretreated wastewater from a septic tank or intermediate treatment unit (e.g., sand filter). The soil further treats the wastewater by filtration, sorption, and microbiological degradation before the water is discharged to ground water.

Total Kjeldahl Nitrogen (TKN): An analytical method for determining total organic nitrogen, ammonia (NH_3), and ammonium (NH_{4+}) in the chemical analysis of soil, water, or wastewater. To calculate Total Nitrogen (TN),

the concentrations of nitrate-N and nitrite-N are determined and added to TKN.

Trickling Filter: A fixed-film (see "Fixed Growth Systems" in "Description" section below) biological wastewater treatment process used for aerobic treatment and nitrification.
Total Suspended Solids (TSS): A measure of the amount of suspended solids found in wastewater effluent.

Vacuum Sewers: An alternative wastewater collection system that uses vacuum to convey household wastewater from each connection to a vacuum station which includes a collection tank and vacuum pumps. Wastewater is then pumped to a treatment facility or conventional sewer interceptor.

ATTACHMENT G

PRESENT WORTH COST ANALYSIS

ATTACHMENT G

PRESENT WORTH COST ANALYSIS

As a planning tool, a present worth analysis was conducted to provide a comparison between the costs of various private on-site wastewater treatment systems and various distances of gravity sanitary sewer following the methodology used for Wastewater Facility Planning Studies.

Methodology

To provide valid monetary cost comparisons, all opportunity costs associated with each alternative over a 20-year planning period are presented on a total present worth basis. The costs are based on prevailing market prices. The analysis includes initial capital costs, future capital costs, annual operation and maintenance costs, and salvage values. Salvage values were determined by assigning a design service life to various components and then calculating the remaining service life and associated value of the component at the end of the planning period. Present worth factors were based on the current discount rate as established by the WDNR. The discount rate for the Federal Fiscal year 2011, which applies to facilities plans beginning on or after October 1, 2010, is 4 $^{1}/_{8}$ percent (4.125%).

Alternative costs within 10% of each other are should be considered essentially equal in monetary value due to normal cost estimating variability. Any final determination on cost-effectiveness should include consideration of monetary costs, fiscal impacts, environmental impacts, and possibly other non-monetary considerations.

Capital Costs

Capital construction costs for private on-site wastewater treatment systems will vary depending on local site and soil conditions. A cost range for each representative type of residential system in WI was provided by the Wisconsin Department of Safety and Professional Services (Finger, 2012). These systems were assumed to have a design service life of 20 years.

Capital construction costs for gravity sanitary sewer were estimated from an analysis of the bid tabs from 29 infrastructure replacement projects bid out by the City of Madison in 2011. The median cost of these projects was $170 per linear foot of sanitary sewer. This cost includes all work items associated with the project such as mobilization, traffic control, trench excavation and backfill, manholes, laterals, and pavement removal and replacement. A range of $150 to $190 per linear foot was

used in the analysis. The sanitary sewer was assumed to have a design service life of 50 years.

Operation and Maintenance Costs

The primary operating and maintenance cost for private on-site wastewater treatment systems is $150 every 3 years for septic tank pumping and system inspection. Holding tanks have much higher operation and maintenance since they require frequent pumping. Systems with an advanced treatment unit component, such as a sand filter or aerobic treatment unit, require an annual inspection at a cost of about $200. Mound, at-grade, or in ground pressure systems will require pumps. Annual electrical usage of the pump is estimated to be 272 kWh. This equates to an annual operating cost of about $35 per year using a current electricity cost of $0.13 per kWh.

The sole operating cost for public gravity sanitary sewer is annual sewer use charges. This is about $200 per year for a typical residence.

Cost Comparison

The results of the present worth cost analysis are shown in Tables G-1, G-2. Upper and lower ranges of probable costs are provided in recognition of the variability in costs due to site conditions and other factors. Graphical comparisons are also provided.

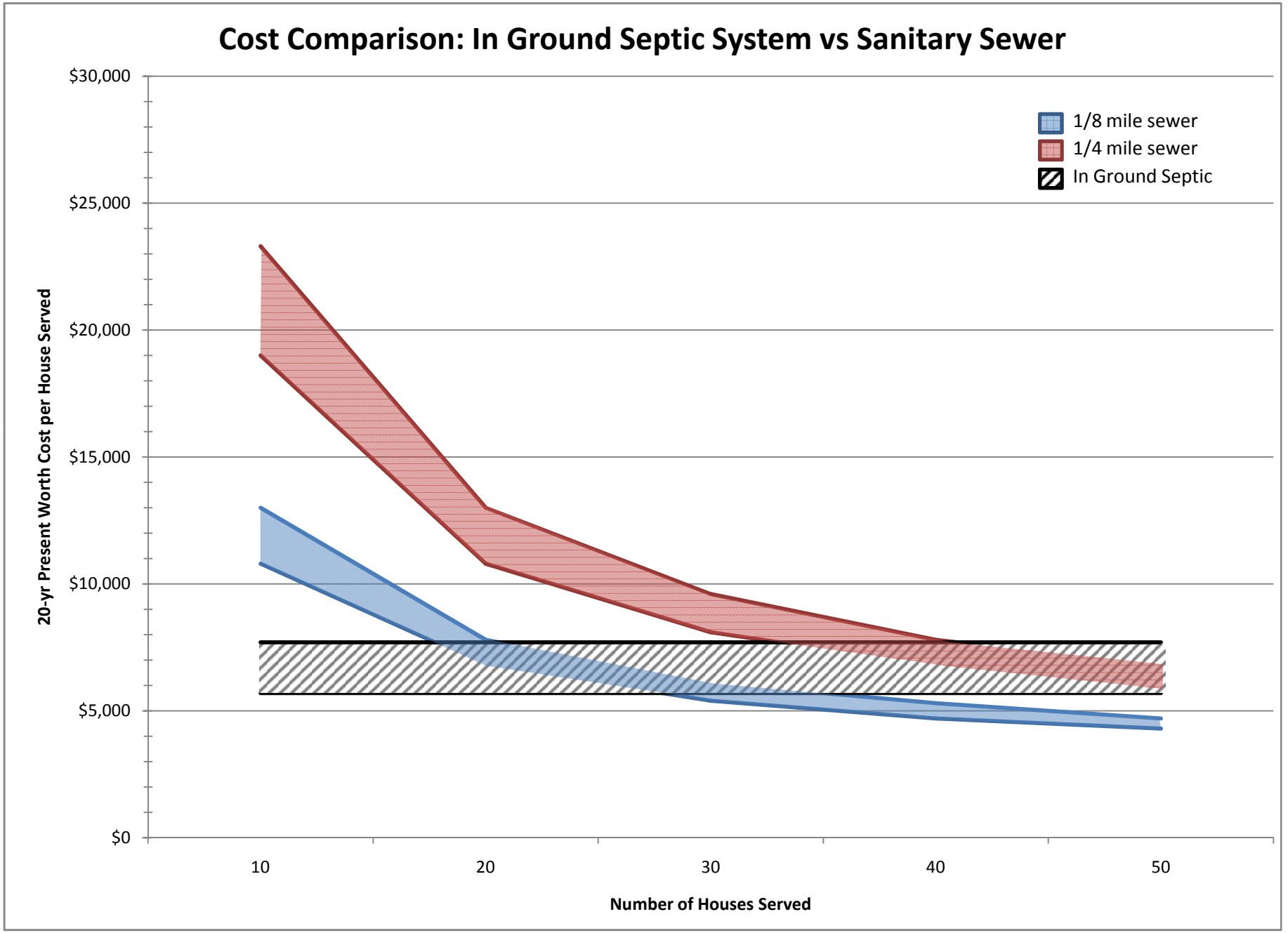
Table G-1: Private On-Site Wastewater Treatment System Cost Analysis

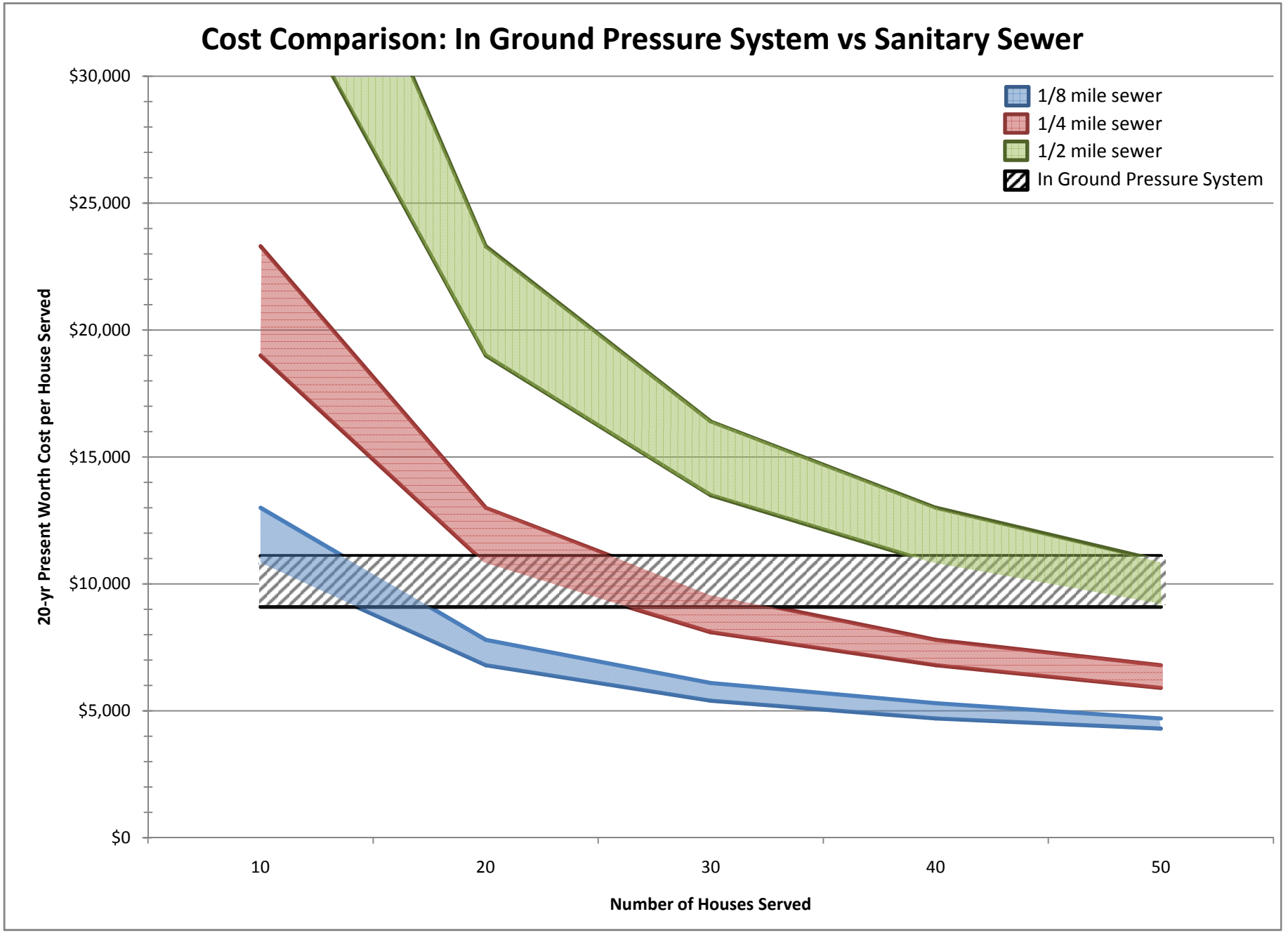
Private On-Site Wastewater Treatment System Type	Capital Cost		Annual Operation & Maintenance	20-Year Present Worth	
	Lower	Upper		Lower	Upper
Holding Tank (5,000 gallon)	$15,000	$20,000	$1,800	$39,200	$44,200
In Ground Septic Tank / Soil Absorption Field	$5,000	$7,000	$50	$5,700	$7,700
Mound System / Soil Absorption Field	$12,000	$15,000	$85	$13,100	$16,100
In Ground Pressure System / Soil Absorption Field	$8,000	$10,000	$85	$9,100	$11,100
At Grade System / Soil Absorption Field	$9,000	$11,000	$85	$10,100	$12,100
In Ground Septic Tank / Advanced Treatment Unit /Soil Absorption Field	$7,500	$12,900	$285	$11,300	$16,700
Mound System / Advanced Treatment Unit /Soil Absorption Field	$12,400	$18,500	$285	$16,200	$22,300
In Ground Pressure System / Advanced Treatment Unit /Soil Absorption Field	$9,600	$15,000	$285	$13,400	$18,800
At Grade System / Advanced Treatment Unit /Soil Absorption Field	$10,300	$15,700	$285	$14,100	$19,500
Constructed Wetland	$15,000	$30,000	$50	$15,700	$30,700

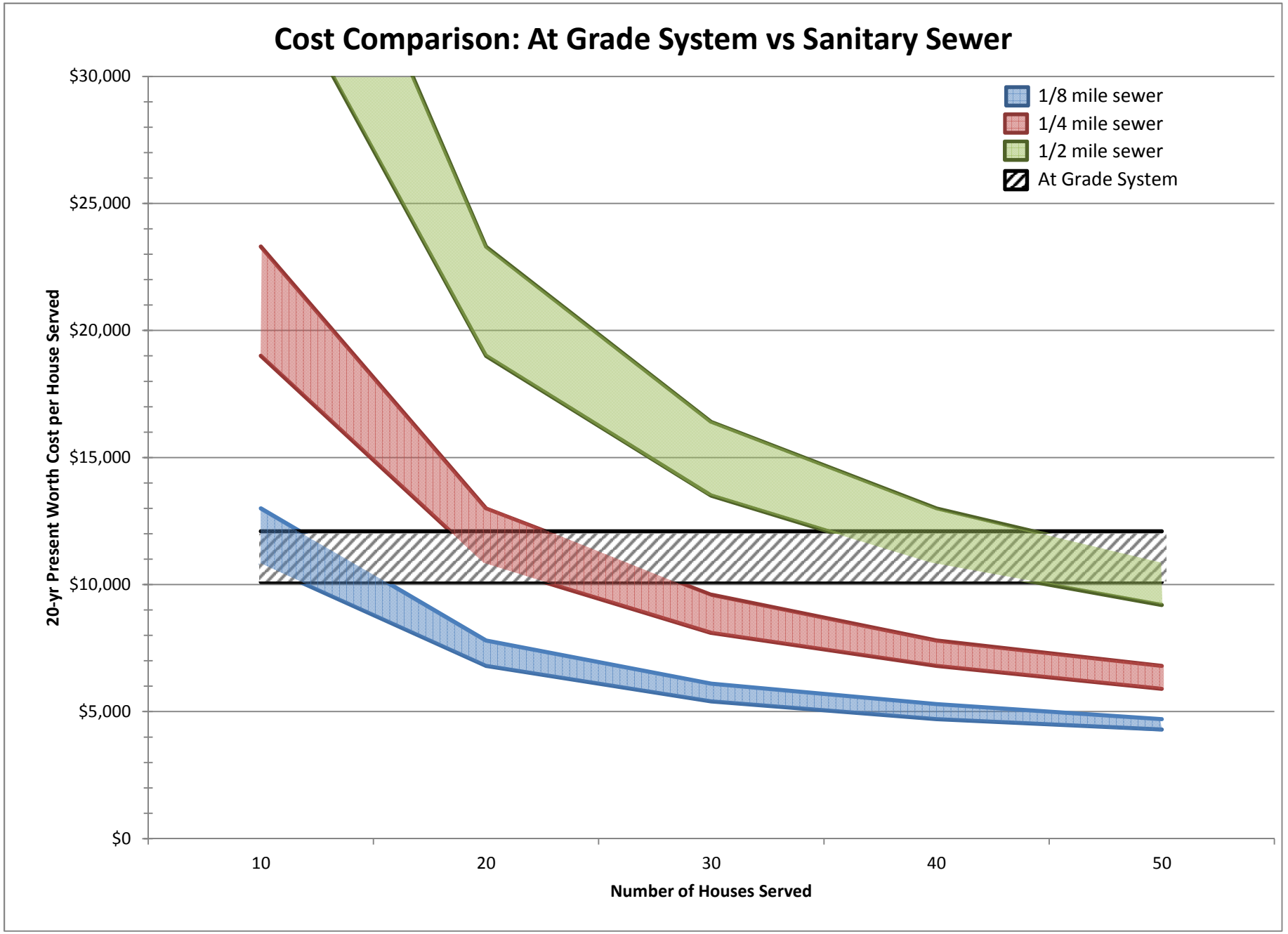
Table G-2: Sanitary Sewer Cost Analysis

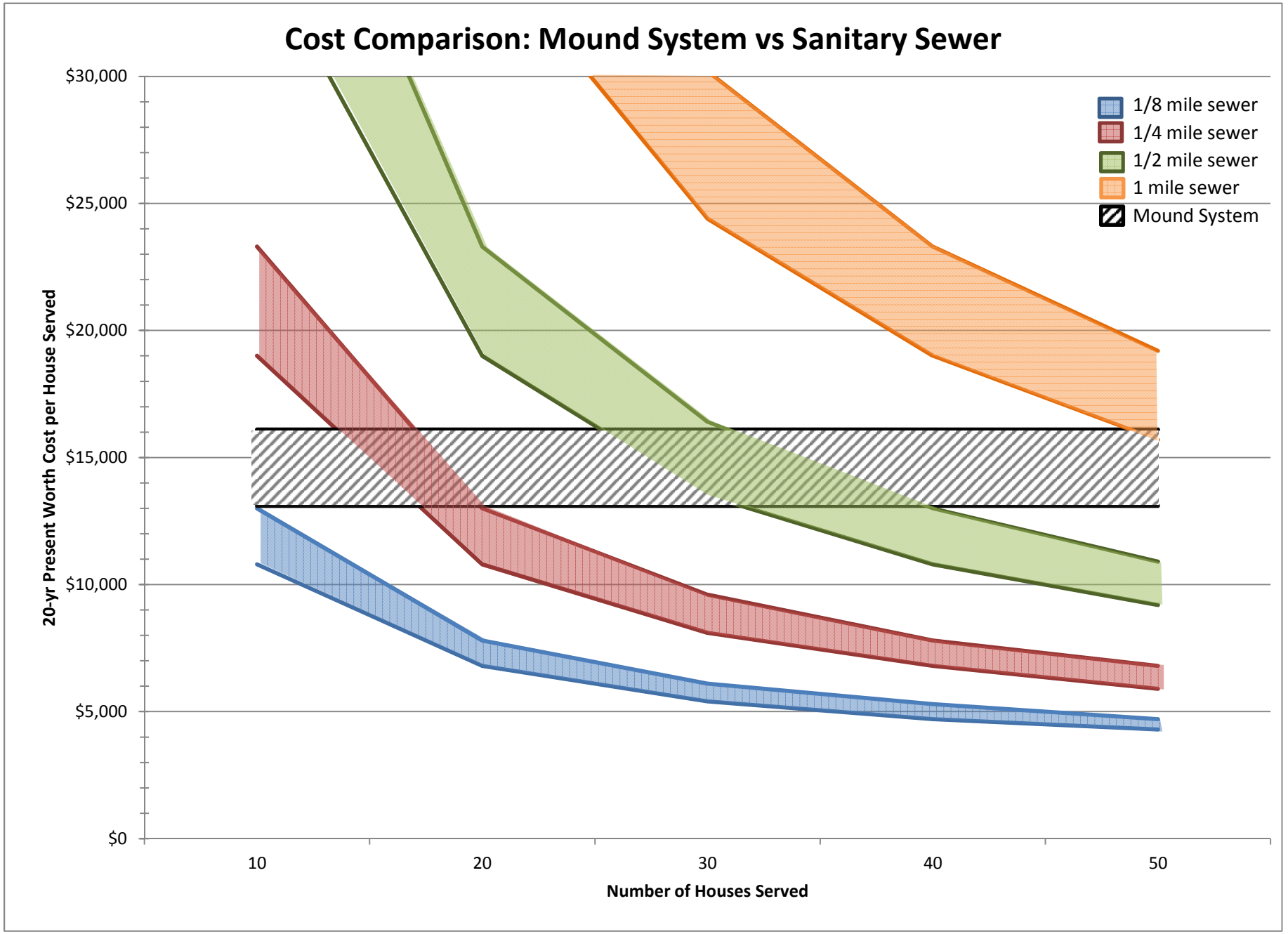
Sanitary Sewer Distance	Capital Cost		Annual Use Charges / HH	Lower 20-Year Present Worth per HH Served					
	Lower	Upper		1	10	20	30	40	50
1/8 mile	$99,000	$125,400	$200	$84,000	$10,800	$6,800	$5,400	$4,700	$4,300
1/4 mile	$198,000	$250,800	$200	$165,400	$19,000	$10,800	$8,100	$6,800	$5,900
1/2 mile	$396,000	$501,600	$200	$328,100	$35,200	$19,000	$13,500	$10,800	$9,200
1 mile	$792,000	$1,003,200	$200	$653,500	$67,800	$35,200	$24,400	$19,000	$15,700

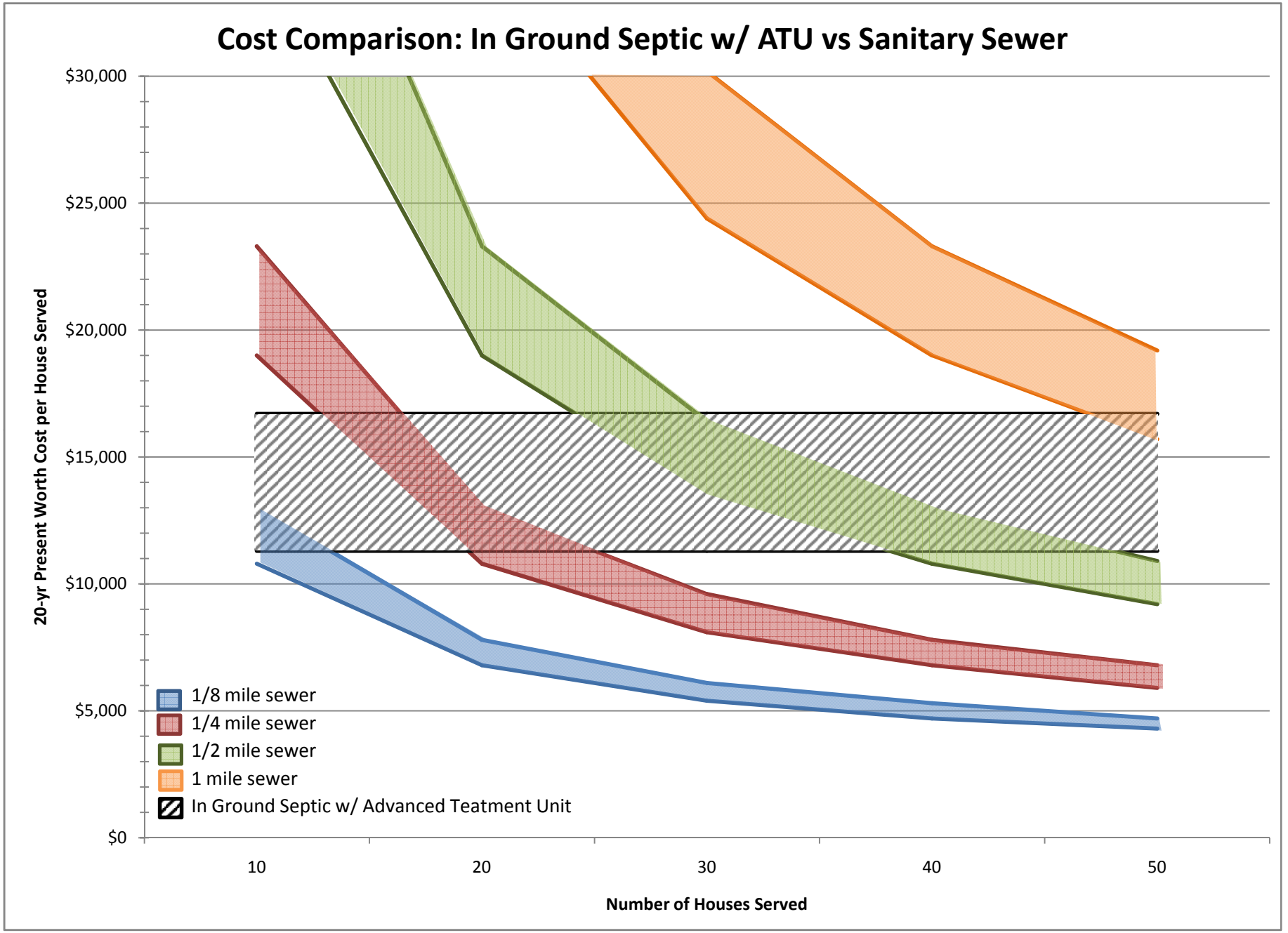
Sanitary Sewer Distance	Capital Cost		Annual Use Charges / HH	Upper 20-Year Present Worth per HH Served					
	Lower	Upper		1	10	20	30	40	50
1/8 mile	$99,000	$125,400	$200	$105,700	$13,000	$7,800	$6,100	$5,300	$4,700
1/4 mile	$198,000	$250,800	$200	$208,800	$23,300	$13,000	$9,600	$7,800	$6,800
1/2 mile	$396,000	$501,600	$200	$414,900	$43,900	$23,300	$16,400	$13,000	$10,900
1 mile	$792,000	$1,003,200	$200	$827,100	$85,100	$43,900	$30,200	$23,300	$19,200

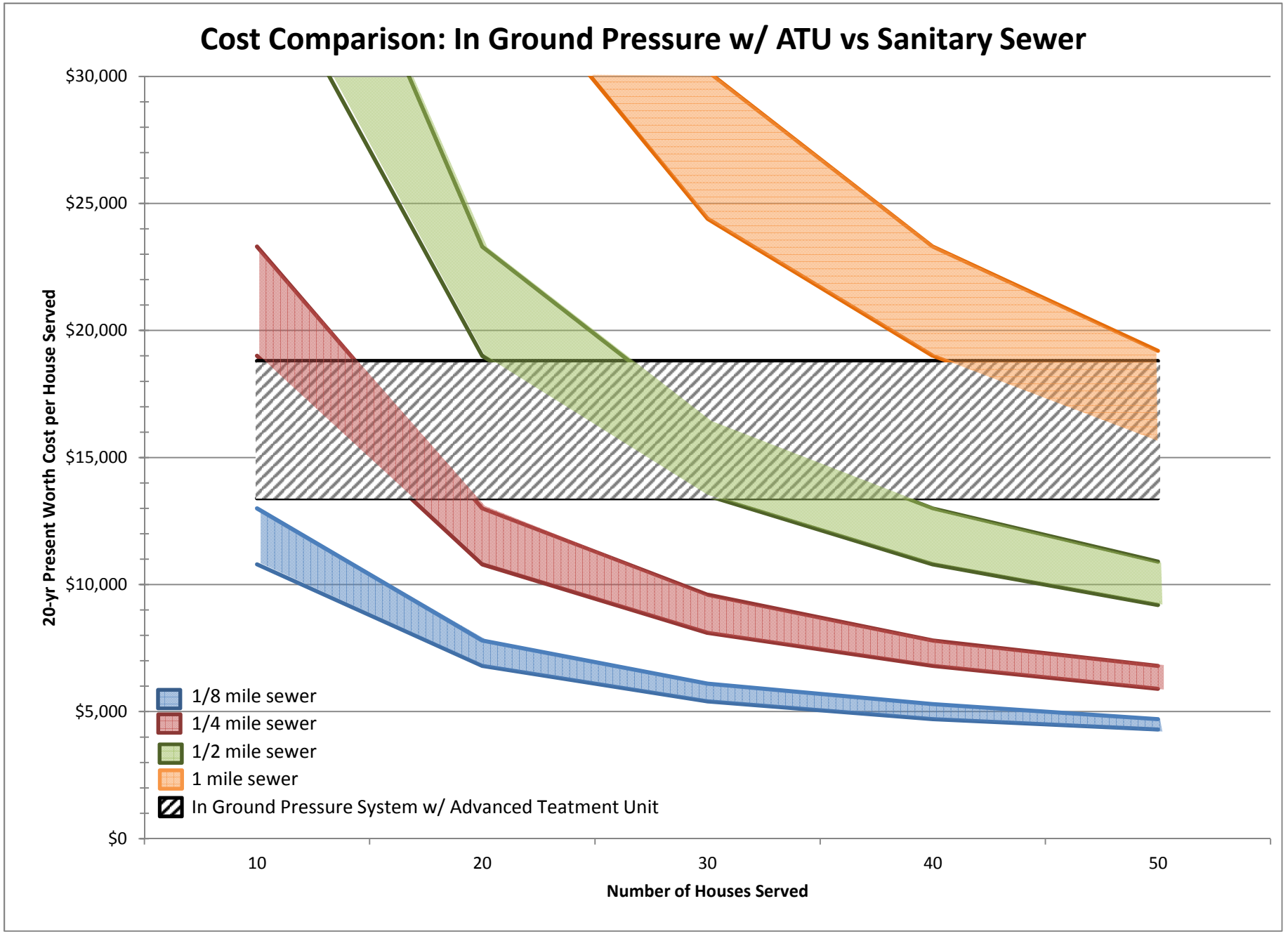

Cost Comparison: In Ground Septic System vs Sanitary Sewer
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
20-yr Present Worth Cost per House Served
1/8 mile sewer
1/4 mile sewer
In Ground Septic
10
20
30
40
50
Number of Houses Served

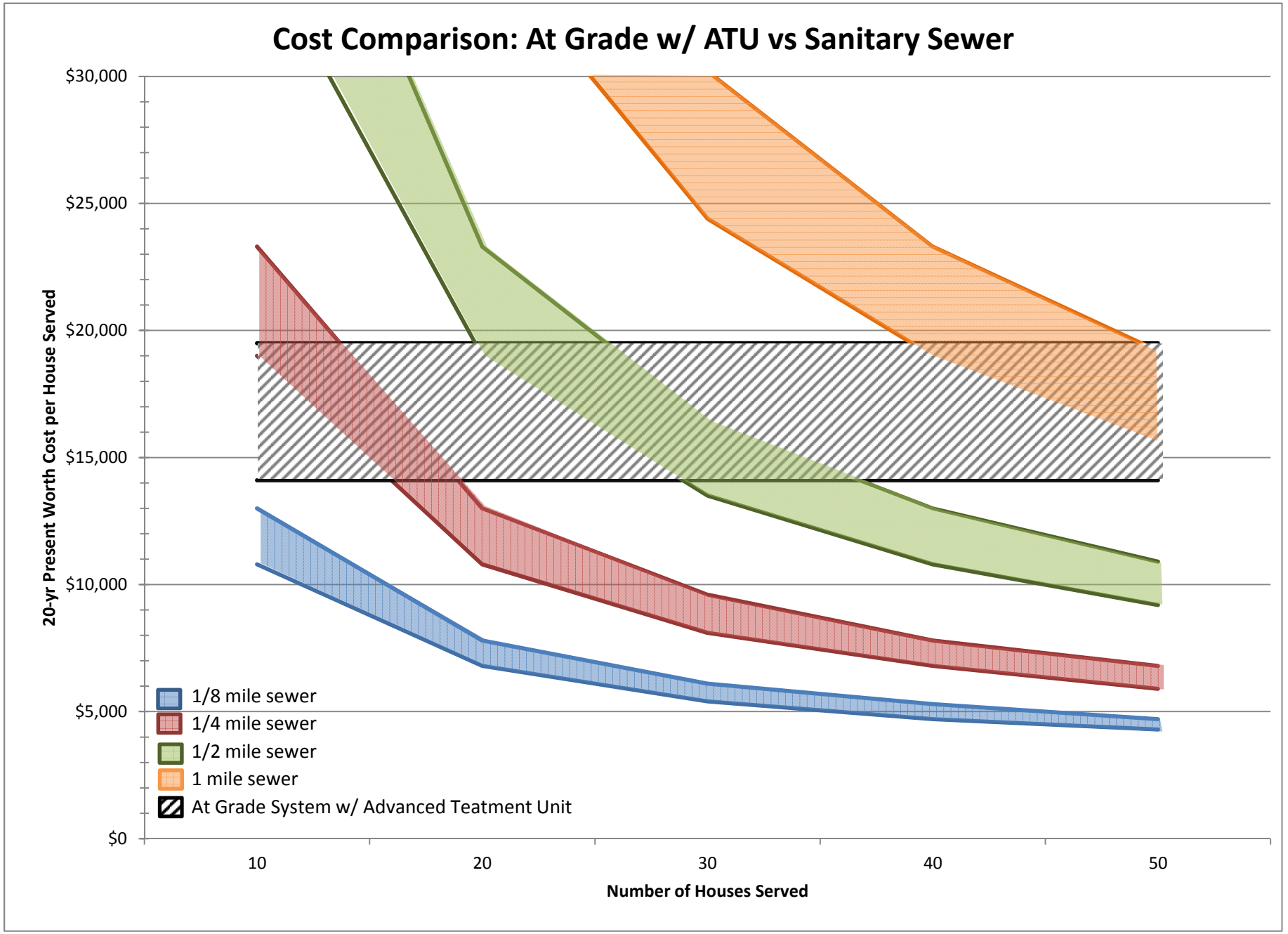

Cost Comparison: In Ground Pressure System vs Sanitary Sewer
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
20-yr Present Worth Cost per House Served
10
20
30
40
50
Number of Houses Served
1/8 mile sewer
1/4 mile sewer
1/2 mile sewer
In Ground Pressure System

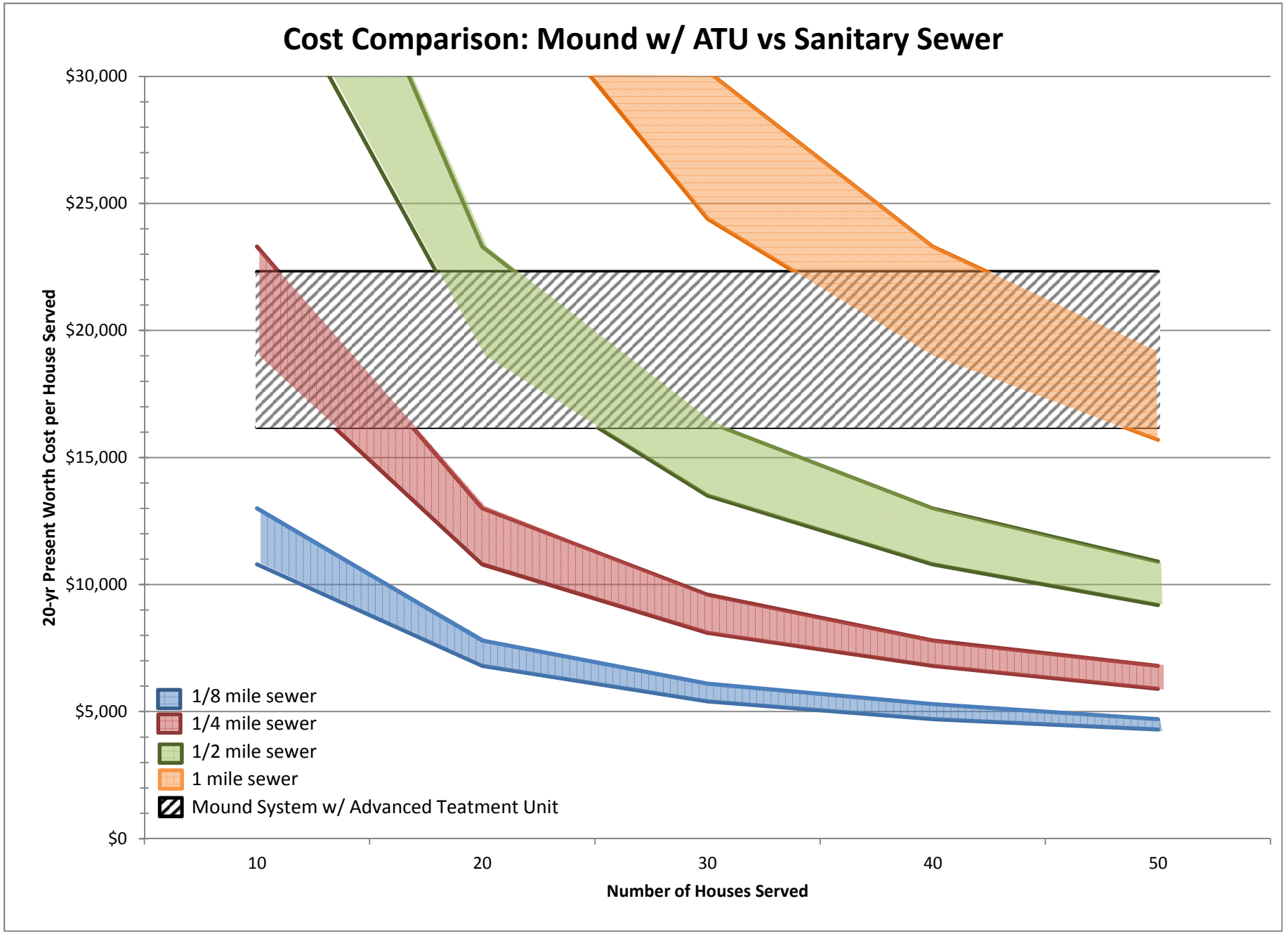

Cost Comparison: At Grade System vs Sanitary Sewer
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
20-yr Present Worth Cost per House Served
10
20
30
40
50
Number of Houses Served
1/8 mile sewer
1/4 mile sewer
1/2 mile sewer
At Grade System

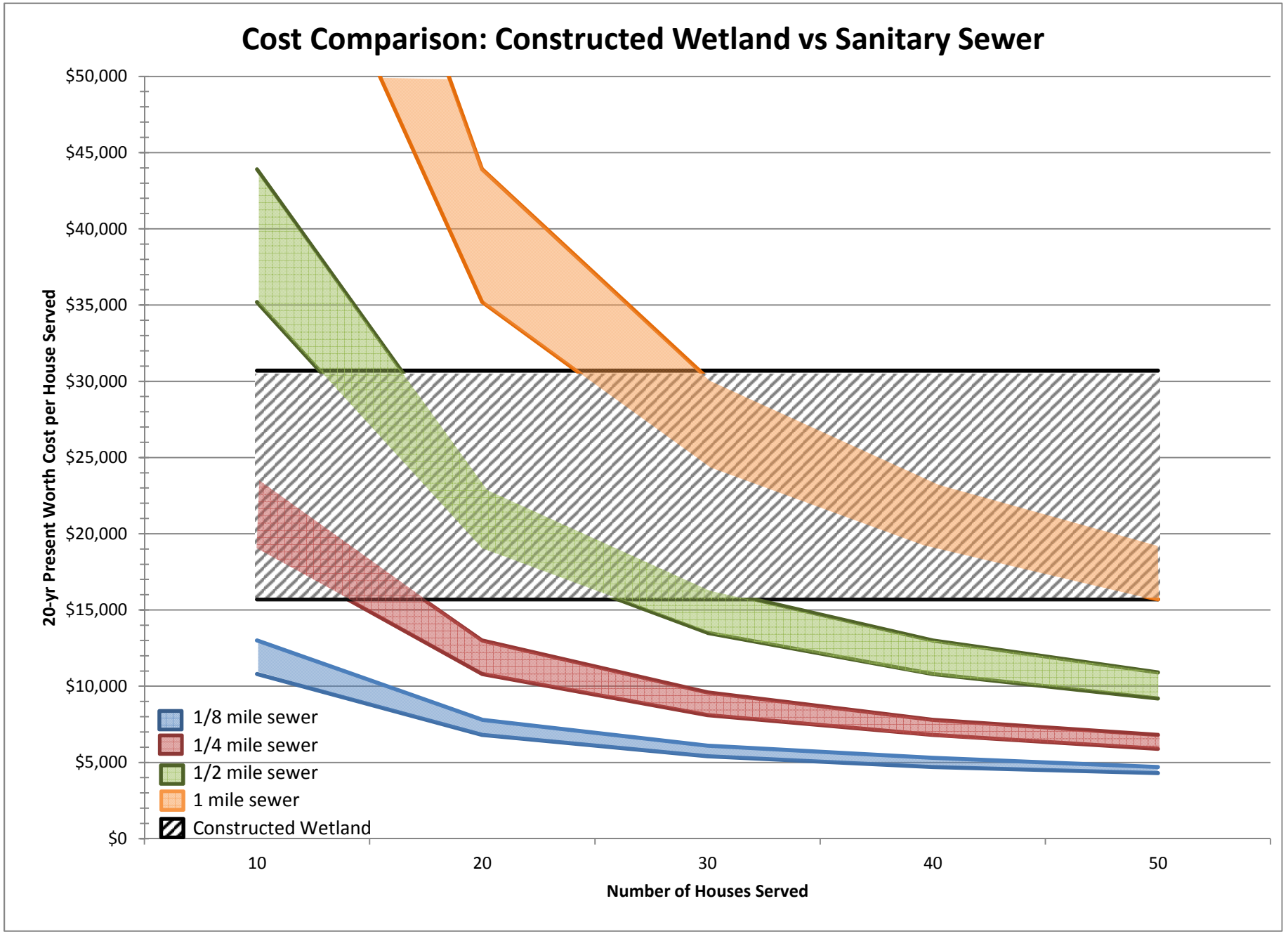

Cost Comparison: Mound System vs Sanitary Sewer
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
20-yr Present Worth Cost per House Served
10
20
30
40
50
Number of Houses Served
1/8 mile sewer
1/4 mile sewer
1/2 mile sewer
1 mile sewer
Mound System

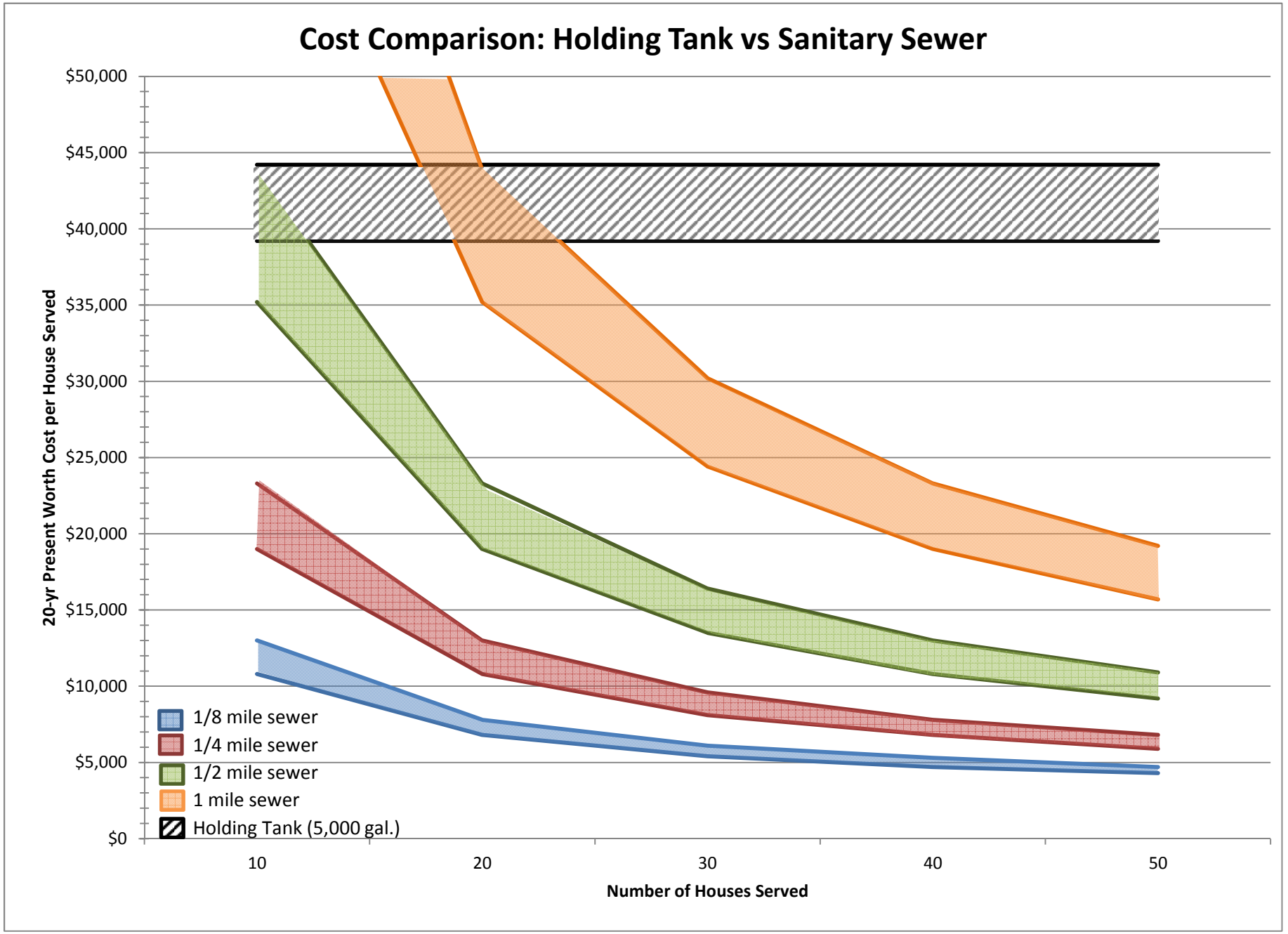

Cost Comparison: In Ground Septic w/ ATU vs Sanitary Sewer
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
20-yr Present Worth Cost per House Served
10
20
30
40
50
Number of Houses Served
1/8 mile sewer
1/4 mile sewer
1/2 mile sewer
1 mile sewer
In Ground Septic w/ Advanced Teatment Unit


Cost Comparison: In Ground Pressure w/ ATU vs Sanitary Sewer
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
20-yr Present Worth Cost per House Served
10
20
30
40
50
Number of Houses Served
1/8 mile sewer
1/4 mile sewer
1/2 mile sewer
1 mile sewer
In Ground Pressure System w/ Advanced Teatment Unit


Cost Comparison: At Grade w/ ATU vs Sanitary Sewer
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
20-yr Present Worth Cost per House Served
10
20
30
40
50
Number of Houses Served
1/8 mile sewer
1/4 mile sewer
1/2 mile sewer
1 mile sewer
At Grade System w/ Advanced Teatment Unit


Cost Comparison: Mound w/ ATU vs Sanitary Sewer
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
20-yr Present Worth Cost per House Served
10
20
30
40
50
Number of Houses Served
1/8 mile sewer
1/4 mile sewer
1/2 mile sewer
1 mile sewer
Mound System w/ Advanced Teatment Unit


Cost Comparison: Constructed Wetland vs Sanitary Sewer
$50,000
$45,000
$40,000
$35,000
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
20-yr Present Worth Cost per House Served
1/8 mile sewer
1/4 mile sewer
1/2 mile sewer
1 mile sewer
Constructed Wetland
10
20
30
40
50
Number of Houses Served


Cost Comparison: Holding Tank vs Sanitary Sewer
$50,000
$45,000
$40,000
$35,000
$30,000
$25,000
$20,000
$15,000
$10,000
$5,000
$0
20-yr Present Worth Cost per House Served
1/8 mile sewer
1/4 mile sewer
1/2 mile sewer
1 mile sewer
Holding Tank (5,000 gal.)
10
20
30
40
50
Number of Houses Served