

2040

MANITOWOC- TWO RIVERS- MISHICOT SEWER SERVICE AREA PLAN

Water Quality Management Plan

Approved July 13, 2016



Manitowoc-Two Rivers-Mishicot Sewer Service Area Technical Advisory Committee

As of March 2016:

Municipality	Representative	Alternate	2nd Alternate	3rd Alternate
City of Manitowoc	Dan Koski	Greg Minikel		
City of Two Rivers	James McDonald	Scott Ahl	Marty Marchek	Ross Blaha
Village of Mishicot	Larry Hlinak	Adam Schanilec	Bernie Samz	
Manitowoc County	Tim Ryan	Andrea Raymakers	Pete Tarnowski	

Ex-officio members:

Organization	Representative
WDNR	David Gerdman
Bay-Lake RPC	Angela Kowalzek-Adrians

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July 2016

Prepared for:

City of Manitowoc, City of Two Rivers, Village of Mishicot, and the Wisconsin Department of Natural Resources

Prepared By:



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CHAPTER 1: INTRODUCTION

In 1972, the U.S. Congress passed amendments to the Federal Water Pollution Control Act (P.L. 92-500, known as the Clean Water Act). This act called for a national goal of fishable and swimmable waters to be achieved by July 1, 1983, through a comprehensive program of water quality planning, construction grants for municipal wastewater treatment facilities, and a national wastewater discharge permit program for municipal and industrial discharges.

Section 208 of the Clean Water Act requires local agencies, designated by the Governor, or the State Water Quality Agency (in Wisconsin, the Department of Natural Resources herein referred to as DNR), to prepare Areawide Water Quality Management Plans.

State and Federal regulations require that these plans indicate the most cost-effective and environmentally sound wastewater treatment configuration for a municipal sewage treatment facility for a 20-year planning period. This is accomplished with the development of a Section 208 Municipal Point Source Plan, more commonly known as a “Sewer Service Area (SSA) Plan.”

In addition to the preparation of the SSA plan, a second key element of the Clean Water Act is Section 201, which requires the preparation of a facility plan. A Section 201 Facility Plan is a detailed engineering analysis of the most cost-effective sewage collection and treatment system for a particular planning area. When approved, the facility plan and SSA plan form the municipal point source element of the *Areawide Water Quality Management Plan*.

After the plan is approved by the DNR, State and Federal regulations (NR 121, NR 110) require permits to be obtained for wastewater treatment facilities, facility plans, interceptors and sewer extensions; all of which must be in conformance with the *Areawide Water Quality Management Plan*.

NR121

The state's Areawide Water Quality Management Planning code, Wisconsin Administrative Code NR 121, establishes sewer service area planning. NR121 establishes regulations specifying policies, procedures, and requirements for Wisconsin's areawide water quality planning process. This process will result in the preparation of areawide plans for managing the quality of waters of the state, including consideration of the relationship of water quality to land and water resources and uses.

The DNR is responsible for working with regional planning commissions, county governments, municipalities, towns, and the public to develop SSA plans that guide publicly sewerage growth and protect water quality. NR121 requires permits for interceptors and sewer extensions to ensure that the projects conform to the *Areawide Water Quality Management Plan*.

PLAN HISTORY

The initial sewer service area plan was adopted in 1989 for a planning area that covered Manitowoc and Two Rivers. An update to the *Manitowoc-Two Rivers Sewer Service Area Plan* was adopted in 2002. In 2003, the plan was amended based on a request from the City of Two Rivers to change the Sewer Service Area boundary to add approximately 1,900 acres of land to encompass a section in the northwest corner of Two Rivers (166 acres) and the Village of

Mishicot (1,731 acres) connected by a right-of-way corridor running along State Highway 147. The 2005 Amendment supported an inter-municipal agreement between the Village of Mishicot and the City of Two Rivers for wastewater treatment service, which enabled the Village to meet its wastewater management needs by discharging it to the City of Two Rivers Wastewater Management System. With the 2005 Amendment, the sewer service area became the *Manitowoc-Two Rivers-Mishicot Sewer Service Area*.

PURPOSE OF THE PLAN

The 2040 Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan serves the following purposes:

1. Project future needs for sewer service and establish the geographic extent of the sewer service area to the year 2040.
2. Identify environmentally sensitive areas for protection from development to improve the quality of surface and ground waters in the planning area.
3. Provide information on sewerage system capacities in the planning area.
4. Define the procedures for reviewing boundary and plan amendments.
5. Serve as a guideline for government interaction and development of community plans.
6. Provide a basis for local officials to direct sustainable community growth by encouraging infill within the sewered planning area.

Delineation of the SSA not only identifies those areas suitable for sanitary sewer service, but also identifies and protects environmentally sensitive areas (ESAs) from future development and indiscriminate urban growth. ESAs include, but are not limited to, floodplains, shorelands, wetlands, waterway setbacks and adjoining steep slopes. Wastewater treatment facilities can then be designed to provide adequate treatment capacity for the anticipated population growth within the sewer service area, while protecting sensitive natural areas and water quality.

A sewer service area identifies the land area intended for sewer services that will be made available during the next 25-year planning period. Delineating a service boundary is critical in designing sewage collection and treatment facilities to serve existing and future residents of the Manitowoc-Two Rivers-Mishicot planning area in the most cost-effective and environmentally sound manner.

The service area in this plan is delineated using the 25-year population projection, an acceptable residential population density, and a forecast of non-residential (i.e. commercial and industrial) growth, all of which result in acreage demand and allocation. The service area excludes major areas found to be environmentally or physically unsuitable for sewered development, or where cost analyses show sewerage extensions would create financial burdens to the municipality. Land included in the service area is simply deemed eligible to receive sewer service; however, the governmental entities providing sewer service are not obligated to serve specific areas.

Sanitary sewerage represents perhaps the greatest catalyst to development within an area. Orderly land use and organized community growth are directly dependent upon the orderly and organized provision of such essential services. A sewer service plan should provide each of the

participating municipalities with a valuable tool to manage its growth in the most cost-effective and environmentally acceptable means possible.

The Manitowoc-Two Rivers-Mishicot Sewer Service Area Technical Advisory Committee (TAC) serves as the body that oversees the development of the sewer service area plan. The TAC is comprised of representatives from the cities of Manitowoc and Two Rivers, the Village of Mishicot, and Manitowoc County.

Once the DNR approves the sewer service area plan, permits for wastewater treatment facilities, facility plans, interceptors, and sewer extensions will need to be in conformance with the current plan. The Bay-Lake Regional Planning Commission serves as the body to review such projects and to ensure plan conformance.

In addition to delineating a sewer service area, the plan provides a framework for further planning among the individual municipalities. Much of the data, trends, and projections developed in this plan may be used for detailed community plans. The goals, objectives, and policy statements adopted in this plan will provide guidance in developing detailed statements of community direction through the local plans.

This plan also provides a framework for modifying the sewer service boundary, which amends the boundary to provide an equitable and logical means for responding to changing physical and economic conditions. Amendments are subject to DNR approval. In addition, an update of sewer service area plans should be undertaken every five years to address changing conditions in community growth patterns and incorporate new information into the SSA amendment process.

LOCATION AND DELINEATION OF THE PLANNING AREA

The Cities of Manitowoc and Two Rivers form an urbanized area located in the east-central portion of Manitowoc County, Wisconsin along Lake Michigan approximately 40 miles south of Green Bay, Wisconsin. The Village of Mishicot is approximately seven miles northwest of the City of Two Rivers.

The Manitowoc-Two Rivers-Mishicot *Planning Area* is comprised of a larger area around the sewer service area that consists of whole municipal boundaries to enable demographic data analyses. The planning area consists of approximately 124,205 acres, and is defined as containing the following municipalities:

- City of Manitowoc
- City of Two Rivers
- Village of Mishicot
- Village of Francis Creek
- Town of Two Rivers
- Town of Mishicot
- Town of Kossuth
- Town of Manitowoc
- Town of Manitowoc Rapids
- Town of Newton

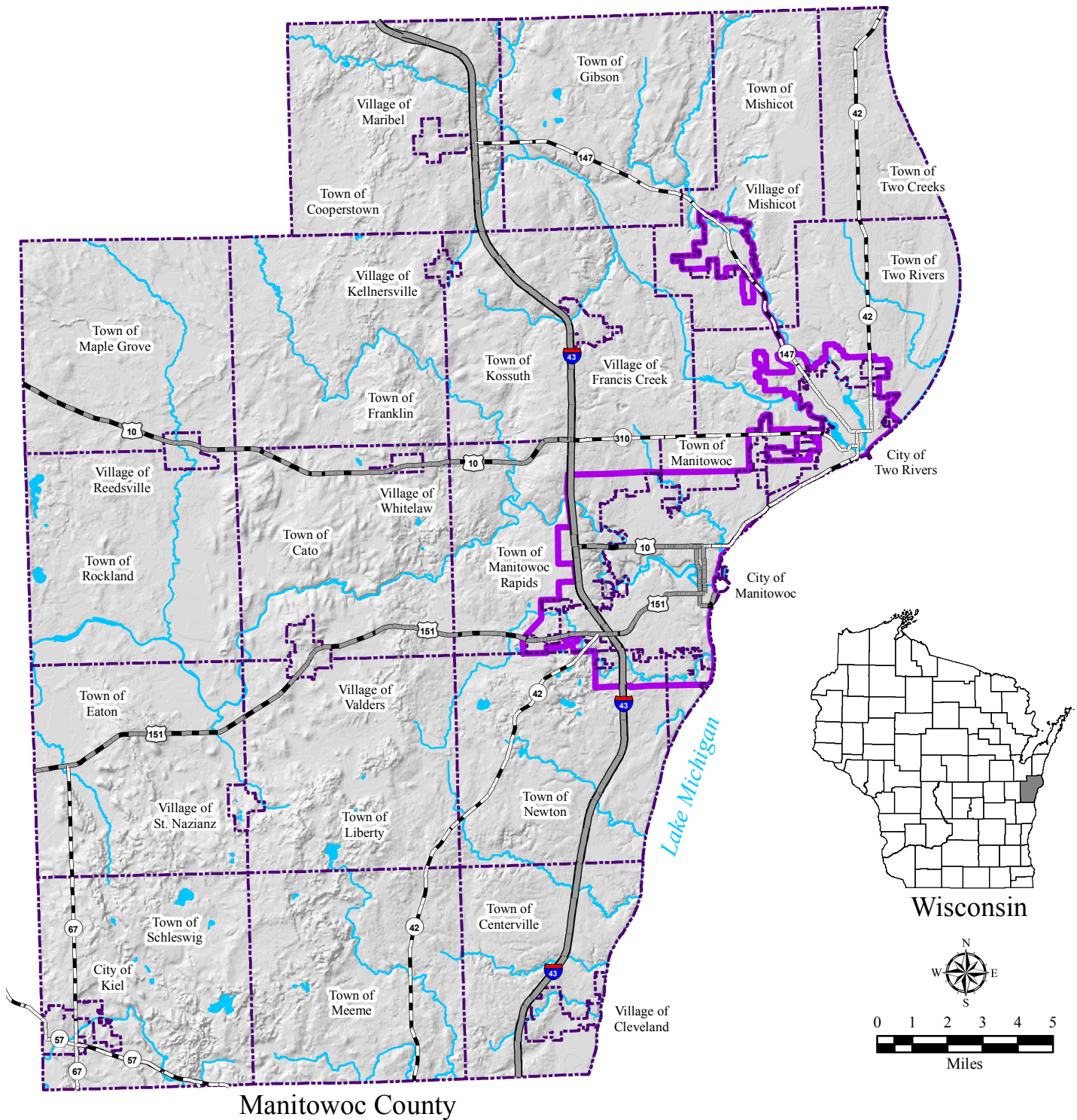
Map 1 illustrates the location of the Manitowoc-Two Rivers-Mishicot Planning Area, while Map 2 displays the SSA boundary within the Manitowoc-Two Rivers-Mishicot Planning Area. The Manitowoc-Two Rivers-Mishicot Sewer Service Area (SSA) boundary encompasses approximately 26,468 acres of land within the overall planning area.

The delineation of the planning area assists in focusing the study efforts on a clearly-defined geographic area and facilitates a comprehensive examination of available demographic data needed in the planning effort. The criteria that were examined in delineating the *Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan* include:

1. The area that potentially could be provided with public sewer service.
2. The recognition of extraterritorial powers for subdivision review, and official mapping.
3. The recognition of formally adopted comprehensive plans and other land use related studies or reports.
4. The recognition of areawide land use trends and patterns.
5. The recognition of water quality concerns.
6. The delineation of planning areas in previous water quality-related planning efforts.

Location Map

Manitowoc-Two Rivers-Mishicot SSA







G:\Manitowoc\Manitowoc County\SSA\2015
Source: WDNR, 2009; Manitowoc County, 2009;
Bay-Lake Regional Planning Commission, 2016.

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. Bay-Lake RPC is not responsible for any inaccuracies herein contained.


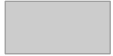
 Sewer Service Area

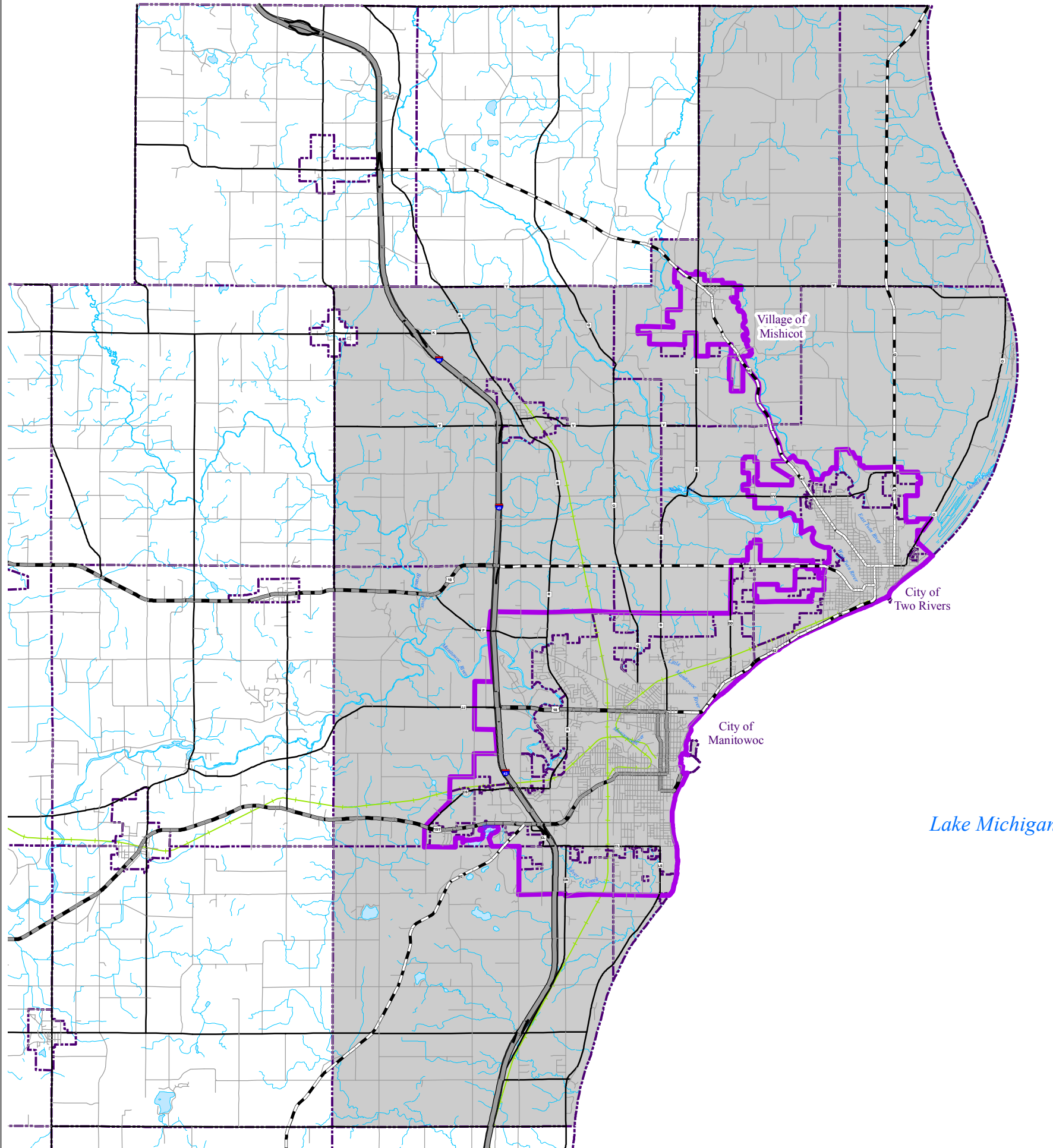
Base Map Features

-  Interstate Highway
-  U.S. Highway
-  State Highway
-  Surface Water

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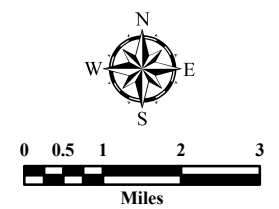
Planning Area Manitowoc-Two Rivers-Mishicot SSA

-  Sewer Service Area
-  Planning Area



Base Map Features

-  Community Boundary
-  Interstate Highway
-  U.S. Highway
-  State Highway
-  County Highway
-  Local Road
-  Surface Water



CHAPTER 2: GOALS, OBJECTIVES, AND POLICIES

The planning process establishes goals and objectives to provide a direction and a framework for the development of policies which assist plan implementation. *Goals* are a statement of direction; *objectives* identify measurable results that determine if the goals are being attained; and *policies* are guidelines for action that achieve the goals and objectives.

The diversity of local community interest requires that common concepts are established for the SSA plan. Establishing common concepts, such as goals, objectives, and policies provides a framework for cooperative planning efforts in other areas of inter-community interest such as transportation, recreation, public safety, and economic development. These goals and objectives are based on regionwide goals and objectives that the Bay-Lake RPC uses as a base to ensure consistency in its planning efforts on a local and regional scale. On April 14, 2015, the TAC finalized and approved the following goals, objectives, and policies:

GOAL 1:

Guide future growth within the defined sewer service area and beyond in an efficient and orderly manner to promote contiguous and compact development or incorporate areas with large scale failing septic systems following locally adopted comprehensive planning documents, balancing private property rights with the highest and best land use criteria, and above all considering the best interests of the public.

OBJECTIVE 1:

Provide sanitary sewer to those existing subdivisions or areas with failing systems, and to those areas where needs are documented and which are economically and environmentally feasible, and is in the best interests of public health and safety.

POLICIES:

1. The *Manitowoc-Two Rivers-Mishicot Urbanized Area Sewer Service Plan* should be reviewed and updated as needed based on population, household, and land use conditions and trends.
2. Sewer extensions that conform to the sewer service area plan and the municipality's sanitary system master plans, and integrate into the plan for compact and contiguous development shall be given priority.
3. Sewer extensions should not be made beyond the 25-year urban sewer service area unless the plan is amended.
4. Sewer service should be adequately sized to handle projected sewage and water volumes for the immediate area and for the upstream volumes based upon a fifty year build out, if applicable.

OBJECTIVE 2:

Provide sufficient land area for reasonable future development of municipalities.

POLICIES:

1. Comprehensive plans should be updated every 10 years to reflect changing economic and physical conditions.

OBJECTIVE 3:

Encourage utilization of vacant lands within municipalities that are currently provided with urban services.

POLICIES:

1. Promote in-fill development and redevelopment.
2. Use financial incentives, such as Tax Incremental Financing to promote in-fill development.

GOAL 2:

Encourage future adjacent rural development in an efficient, orderly, and compatible manner.

OBJECTIVE 1:

Encourage development that is consistent with city, village, town, and county plans.

POLICIES:

1. Planning should be addressed on an area wide basis by the representatives of the participating governing units; however, specific plans should be implemented by the local units of government employing local zoning, subdivision review, urban services standards, and environmental standards.
2. When adjoining local government plans exist, cooperation should be fostered to ensure compatibility.

OBJECTIVE 2:

Encourage the county and towns to locate future rural development in areas that are suitable for on-site sewage disposal systems and compatible with comprehensive plans. However, future rural development should be encouraged to develop such that it will be easily served with public sewer as soon as it is available.

POLICIES:

1. Rural development shall be encouraged to locate adjacent to existing rural development where adequate facilities and services are available and soils are suitable for on-site disposal systems.
2. Development in areas with soils that are marginal for septic systems shall be analyzed for its ability to prohibit low density residential development.
3. Holding tank systems are only appropriate as a system where all other systems are not appropriate, consistent with the Manitowoc County Code and sanitary regulations.

4. Certified surveys, land divisions, and subdivision development plans shall be designed to allow for future in-fill and shall locate septic fields and holding tanks such that they allow for simple integration into a future underground conveyance system. Compatibility of future in-fill can be accommodated by creating conceptual land divisions for the future within existing parcel divisions and locating structures and sanitary facilities accordingly.

GOAL 3:

Protect water quality, natural resources, and sensitive natural areas from the encroachment of urban development.

OBJECTIVE 1:

Delineate environmentally sensitive areas (ESAs) and encourage future development to locate in areas that result in minimal environmental impacts.

POLICIES:

1. Local land use plans and zoning ordinances should be adopted or revised by the county, cities, villages, and towns as needed to guide urban development away from encroaching upon the designated ESAs.
2. Developers shall follow Wisconsin best management practices for stormwater management, as well as local ordinance, policy and applicable State of Wisconsin regulations such as NR 216 (Storm Water Discharge Permits).
3. Sewer extensions to natural areas not included in ESAs should conform to applicable rules and regulations, which include Wisconsin Administrative Codes NR 116 (Wisconsin's Floodplain Management Program) for shorelands and floodplains, NR 115 (Wisconsin's Shoreland Protection Program) and 117 (Wisconsin's City and Village Shoreland–Wetland Protection Program) for wetlands and NR 121 (Areawide Water Quality Management Plans) for ESAs, and should be reviewed on a case by case basis.
4. Sanitary sewer extensions into areas identified as containing prime agricultural and forestland shall be placed with a greater level of care and shall meet a higher standard of necessity when approval is considered by the governing body.
5. Sewer extensions shall not be permitted in areas identified as being in an ESA unless the extension is to serve uses which are compatible with the ESA designation, such as public parks and outdoor recreation facilities, or unless the extension must pass through the ESA to serve areas that lie beyond.
6. Development should be avoided in outdoor recreation and open space resource areas identified in Manitowoc County and the local governments' outdoor recreation and open space plans.

GOAL 4:

Eliminate health hazards associated with failing wastewater disposal systems and protect the quality of the water and land resources in the planning area.

OBJECTIVE 1:

Correct inadequate sewage collection and treatment facilities, which result in potential threats to the health and welfare of the public.

POLICIES:

1. Investigate alternative methods that may be used to oversee the installation, maintenance and cleaning of on-site sewage systems.
2. Identified health hazard areas that are contiguous to existing sewered development should be given priority for sanitary sewer extensions.
3. The installation of cluster on-site disposal systems, which may be easily connected to municipal collection systems should be encouraged to eliminate health hazards and pollution problems.
4. Development in non-sewered areas should be based on the capacity of the soil to accommodate on-site wastewater treatment, as well as on local plans and zoning ordinances.
5. All private and public sewage collection and treatment facilities shall be designed and constructed employing the local municipality's engineering standards, and shall be consistent with water quality and environmental criteria of the State of Wisconsin.

GOAL 5:

Minimize public sanitary sewerage service costs.

OBJECTIVE 1:

Plan sewer service extensions.

POLICIES:

1. Discourage the duplication of sanitary sewer facilities.
2. Maintain a system for review of the installation of public sewerage systems within the planning area.

OBJECTIVE 2:

Stage the installation of new or expanding facilities.

POLICIES:

3. Plan sewerage extensions and treatment facilities so that they can be installed incrementally as needed in a cost-effective manner.

CHAPTER 3: LAND CHARACTERISTICS

Examining the existing land characteristics within the planning area will assist in defining development patterns which have occurred in recent years. This, in turn, can be utilized to project where and how future growth and development may occur. The land characteristics that affect development can be identified, and elected officials, property owners, and developers, need to consider these factors in development proposals to eliminate costly mistakes, and construction and environmental problems. Some of the factors that should be considered include existing land uses, soil types, steep slopes, construction site erosion, distance to surface waters, stormwater runoff, high groundwater, wetlands, floodways and floodplains, bedrock geology, wildlife habitats, scientific area, forested lands, and prime agricultural lands.

NATURAL FEATURES

Areas of unique natural features and environmental significance in the Manitowoc-Two Rivers-Mishicot area have been identified by the DNR, the Wisconsin Coastal Management Program, the Manitowoc County Planning and Zoning Department, and Bay-Lake RPC. Many of these features are found in corridors that are located along rivers, creeks, shorelines and natural drainageways, and are essential to maintaining ecological value, and preserving the natural beauty of the area.

The delineation of sensitive environmental areas plays an important role in the sewer service planning process and assists in directing future urban development in order to protect these resources. The natural features found in the area are defined in the following sections.

Watersheds

There are 11 watersheds in the planning area, and all drain west to east to Lake Michigan. The East and West Twin Rivers and Molash Creek, which are part of the Twin, Door, Kewaunee Basin, drain the northern portion of the planning area; the Manitowoc River, which forms the Manitowoc River Basin, drains the central portion of the planning area, and several smaller creeks, which are directly tributary to Lake Michigan and which are part of the Sheboygan River Basin, drain the southern portion of the planning area.

Surface Waters

The principal water resources within the Manitowoc-Two Rivers planning area is Lake Michigan, forming the eastern boundary of the planning area. In addition to Lake Michigan, other lakes within the planning area are primarily located southwest of the City of Manitowoc, in the southern portion of the Town of Manitowoc Rapids and the northern portion of the Town of Newton. The lakes within this area include: Silver Lake, English Lake, Glonski Lake, Carstens, Lake, Grosschuesch Lake, Waack Lake, Weyer's Lake, and Kassbaum Lake.

A number of rivers traverse the planning area. The Manitowoc River flows from west to east across the planning area and through the City of Manitowoc. The East and West Twin Rivers flow from northwest to southeast through the City of Two Rivers. There are also a number of smaller rivers, which help to drain the planning area, including the Branch River, Little Manitowoc River, Silver Creek, Molash Creek, Calvin Creek, and Pine Creek.

Shorelands and Floodplains

Shorelands and floodplains are often viewed as valuable recreational and environmental resources in an urbanized area. These areas may also provide stormwater retention and habitat for various kinds of wildlife unique to the area.

Development may have an adverse effect on the ability of these areas to improve water quality, provide wildlife habitat, and protect from flooding. In addition, increased development and maintenance costs may be necessary due to the need for floodproofing, increased flood insurance premiums, extensive site preparation, and maintenance and repairs of roads, sewers, and water mains. As a result, the State of Wisconsin requires that counties adopt shoreland/floodplain zoning ordinances to address the problems associated with development in floodplain areas.

Development in shoreland and floodplain areas is strictly regulated, and in some instances is not permitted. The authority to enact and enforce these types of zoning provisions is set forth in Chapter 59.692 and Chapter 87.30 of the Wisconsin Statutes, and Wisconsin Administrative Codes NR 115 and NR 116, as well as Manitowoc County's Shoreland Zoning Ordinance (*Chapter 9, Manitowoc County Code of Ordinances*) and Floodplain Ordinance (*Chapter 31, Manitowoc County Code of Ordinances*).

The jurisdiction of the Manitowoc County shoreland zoning ordinance and floodplain zoning ordinance includes shorelands and shoreland-wetlands of navigable waters, which includes all lands in the County which are within 1,000 feet of a navigable lake, pond, or flowage or within 300 feet of a navigable river or stream or to the landward side of the floodplain, whichever distance is greater.

Wetlands

Wetlands are areas where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and which has soils indicative of wet conditions. [s. 23.32(1), Wis. Stats.].

Wetlands play an important role since they serve as a filter system of pollutants, and are invaluable in controlling flood waters, recharging groundwater, and retaining water during drought. They may also provide valuable habitat for waterfowl and other wildlife, excellent cover and migration corridors for wildlife, and may support spawning and nursery habitat for fish and sanctuaries for rare and endangered species. Wetlands also offer education, recreational, and aesthetic benefits and opportunities.

Wisconsin Administrative Codes NR 115 and NR 117 mandate that wetlands be protected in both the rural and urban areas of the state. In the unincorporated areas, NR 115 protects wetlands or portions of wetlands within the shoreland zone that are designated on Wisconsin Wetland Inventory maps prepared by WNDP. To protect wetlands in incorporated areas, NR 117 was enacted in 1983 and requires that all wetlands and portions of wetlands five acres or more in size located in the shoreland zone be protected, and outlines minimum shoreland zoning standards for Wisconsin cities and villages. In addition to NR 115 and 117, NR 103 outlines water quality standards for wetlands and requires that all practicable alternatives be considered to avoid and minimize wetland disturbance and to ensure preservation, protection, restoration, and management of wetlands.

Any alternations that are to be made to any wetland, regardless of size, need to be reviewed and approved by the U.S. Army Corps of Engineers and the DNR before any action can be taken.

Topography and Steep Slope

Topography in the planning area is the result of bedrock configuration, glacial deposition, and erosion. The topography within the sewer service planning area varies from level to rolling, with several areas where the slope is twelve percent or greater. The areas of steep slope are primarily located along the major rivers within the area, especially the Manitowoc River. There are two areas in the planning area of greater topography and steep slopes reaching elevations of 790 feet (as compared to the Lake Michigan elevation of approximately 580 feet above sea level); between Silver Lake and Hartlaub Lake, southwest of the City of Manitowoc; and between STH 42 and English Lake, near the unincorporated community of Newtonburg.

Areas of steep slope are often highly erodible areas that are unsuitable for development as development on steep slopes can result in erosion and flooding during site preparation and construction. To make development suitable, greater excavations efforts are required in areas of steep slope, and the additional effort is reflected in the construction costs. In addition, septic systems on steep slopes may be unreliable due to the slope and shallow soils.

Bedrock Geology

The entire sewer service planning area is underlain by undifferentiated dolomites, ranging in depth from zero to 750 feet below the surface. On top of the dolomites is generally a thick layer of glacial deposits. Although most of the study area is covered in ground moraine, consisting of glacial till, unstratified clay, silt, sand, gravel and boulders, there is a significant area of glacial lake deposits within the East and West Twin Rivers watersheds. The lake deposits are primarily composed of organic materials, along with stratified clay, silt and sand. Additionally areas of end moraine occur in the Point Beach State Forest area, as well as south of the City of Manitowoc, along the lakeshore. End moraine typically is composed of till and stratified sand and gravel.

In the past, bedrock has not presented any significant problems to development; in areas where bedrock may cause problems, large stones and bedrock exist near the surface and have the potential for hindering excavation and considerably increasing the cost of construction. In addition, conventional on-site septic systems cannot function properly, resulting in wastewater passing through the cracked bedrock and contaminating the groundwater.

Soils

Soils, in part, determine how much rainfall or snow melt directly flows into the rivers, lakes, and wetlands, and how much infiltrates the ground. That which infiltrates the ground replenishes soil moisture and recharges the groundwater system.

Soil is composed of varying proportions of sand, gravel, silt, clay and organic material. The composition of a soil affects the specific properties of that soil especially in determining the capacity of supporting on-site wastewater treatment facilities. These properties must be evaluated prior to any development. Without such considerations, on-site wastewater treatment systems may fail and collection systems may require expensive and frequent maintenance. Factors that are considered when evaluating soils for on-site waste systems are:

- High or Fluctuating Watertable. When groundwater is near the soil surface, proper filtering cannot take place and often results in on-site systems either backing up into the home or contamination of groundwater. In addition, construction techniques used to de-water systems are costly. If sewer lines in wet soils have been placed improperly or if they break from the adverse soil conditions, groundwater infiltration occurs. As a result, the additional water would then enter the sewer lines and reduce the available capacity of the pipe and the overall effectiveness of the wastewater treatment plant.
- Bedrock. Large stones or bedrock near the soil surface may hinder excavation and considerably increase the cost of construction. In addition, conventional on-site septic systems cannot function properly, which may result in wastewater passing through the cracked bedrock and contaminating the groundwater.
- Soil Permeability. Permeability refers to the rate at which water flows through the soil. For an on-site disposal system to be successful, the soil must be capable of removing harmful substances and transmitting liquids. When passage is too rapid, groundwater can become polluted. If it is too slow, the soils can become saturated and effluent ponding may result.
- Flooding. On-site waste disposal systems that are located within a floodplain can result in problems. As water levels rise during periods of flooding, the system become saturated and results in untreated solid and liquid waste being discharged into the ground or surface waters.

Approximately 93 percent of the soils in the planning area have severe limitations for septic tank absorption fields and 7 percent have moderate limitations.

ENVIRONMENTALLY SENSITIVE AREAS

Introduction

Environmentally Sensitive Areas (ESAs) include parts of the landscape generally associated with surface water features, which should be protected from intensive development. They include all lakes, rivers, streams, wetlands, floodways, and other locally designated significant and unique natural resource features.

Wisconsin Administrative Code NR 121.05(1)(g)2c describes natural features and sensitive environmental areas that are to be excluded from sewer service areas and protected from sewered development in order to protect water quality. These areas are referred to as “environmentally sensitive areas” and are defined by the code as follows:

“Major areas unsuitable for the installation of waste treatment systems because of physical or environmental constraints are to be excluded from the service area. Areas to be considered for exclusion from the sewer service area because of the potential for adverse impacts on the quality of the waters of the state from both point and nonpoint sources of pollution include but are not limited to wetlands, shorelands, floodways and floodplains, steep slopes, highly erodible soils and other limiting soil types, groundwater recharge areas, and other such physical constraints.”

Other areas, including areas of scientific value or other important natural, historical, archaeological, and cultural features that warrant protection from sewered development may also be included in the definition of an ESA.

The designation of ESAs is intended to:

1. Protect general public health, safety, and welfare;
2. Protect surface and groundwater quality;
3. Reduce damage from flooding and stormwater runoff;
4. Maintain important wildlife habitats or outdoor recreation areas (with the support of local units of government); and
5. Reduce the costs of public utilities and environmental damages.

Some examples of potential cost benefits to the community and individuals include: less property damage from stormwater runoff and sedimentation; fewer insurance claims which result in lower insurance rates; lower maintenance costs for public utilities; and the potential for community recreation and aesthetic opportunities.

The ESA concept has been effectively adopted in many regions of Wisconsin and is being applied to the planning area to help preserve remaining undisturbed natural resources. Buffering of ESAs, particularly wetlands, can avoid negative impacts caused when development occurs directly adjacent or adjoining to the ESA.

ESA Definition

The *2040 Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan* sets forth the following definition of important natural and sensitive environmental features, hereinafter referred to as Environmentally Sensitive Areas or ESAs and shown on Map 3 to be used within this plan for the purpose of implementing NR 121:

- All surface waters included in the Wisconsin DNR 1:24,000 scale hydrography GIS database (such as streams, rivers, canals, lakes, ponds and reservoirs) and their adjacent 75-foot shoreland buffer, as measured from the ordinary high water mark, shall be designated as ESAs.
- All 100-year (or base) floodplains identified by FEMA shall be designated as ESAs.
- All DNR mapped wetlands shall be included in an ESA. Any ESA associated with such a wetland two acres in size or greater shall extend 50 feet beyond the edge of the wetland.
- Areas of steep slope 12 percent or greater shall be designated as ESAs.
- Publicly-owned scientific and natural areas, and identified historic and archaeological sites shall be included in the ESA.
- Other significant natural resource features, including but not limited to high-quality woodlands and wildlife habitat areas, significant geologic sites, steep slopes of greater than 12 percent, and wet, poorly-drained and organic soils shall be considered for inclusion as an ESA on a case-by-case basis by the Technical Advisory Committee.

The Manitowoc-Two Rivers-Mishicot SSA is comprised of approximately 6,048 acres of environmentally sensitive areas. Wetlands with buffer comprise approximately 3,977 acres,

floodplains comprise approximately 2,258 acres, waterways with setbacks comprise approximately 1,932 acres, and steep slopes comprise approximately 627 acres¹.

Sewer Extensions Excluded from ESAs

Sewer extensions for development will be excluded from designated ESAs. An exception to this exclusion does exist as the plan recognizes that it may be necessary, in some case, to construct sanitary sewers across and through identified ESAs, and that compatible land uses such as public parks and outdoor recreation facilities may need sewer at a future date. Additionally, mapping detail may not portray exact boundaries of physical features as they currently exist, in which case an onsite inspection would need to be conducted to properly identify the ESA.

The Technical Advisory Committee and applicable state agencies will review exceptions/modification of ESA mapping on a case-by-case basis. Pursuant to NR 1.95, when an exception of this particular nature exists, all reasonable alternatives to crossing the environmental corridor with sanitary sewer will be considered. Any changes to the ESA delineation would require a plan amendment and DNR approval.

Intensive uses to be excluded from ESAs include but are not limited to permanent structures such as residential, commercial, or industrial buildings; impervious surfaces such as parking lots and concrete or asphalt surfaced storage areas; and site disturbing activities such as clearing, grubbing, grading and filling.

Any consideration of development within or adjacent to an ESA must be in conformance with all applicable federal, state, and local rules and regulations including the provisions and requirements of the Federal Clean Water Act; Wisconsin Administrative Codes NR 103 (Water Quality Standards for Wetlands), 115 (Wisconsin's Shoreland Protection Program), 116 (Wisconsin's Floodplain Management Program), 117 (Wisconsin's City And Village Shoreland-Wetland Protection Program), 121 (Areawide Water Quality Management Plans), 216 (Storm Water Discharge Permits), and 299 (Water Quality Certification); and county and local zoning ordinances.

Uses which may be compatible with the protection and preservation of ESAs include non-intensive recreational facilities such as trails and picnic areas; and in some instances, utility facilities such as sewer and water lines, detention basins and stormwater drainageways; and limited clearing, grubbing, grading, and filling.

If there is any doubt as to the location of, or infringement on ESAs at the time of sewer extension or boundary amendment requests (as delineated on the review maps), the Bay-Lake Regional Planning Commission will consult with and request site specific information (including proposed building footprints) from the local municipality and/or the petitioner. This information, along with the ESA criteria from this plan, will be used to make a recommendation on the proposal.

ESAs have been delineated by Bay-Lake RPC using GIS. Map 3 shows the general location of ESAs throughout the Manitowoc-Two Rivers-Mishicot Sewer Service Area. Although ESAs

¹ The sum of the acreage of individual ESA features will not total the 6,048 acres of ESAs combined. This is because ESA features may be counted more than once when taken individually due to features overlapping such as wetlands that lie within floodplains or waterway setbacks, etc.

may overlay existing developed lands, it is their location throughout the undeveloped portion of the SSA that will determine future sewered development.

LAND USE

In 2008, Bay-Lake RPC finalized an inventory of the existing land uses within the planning area. Existing land use conditions were inventoried through a windshield survey of the rural areas, on 2005 1"= 400' orthophotography. The data was then transferred onto a digital base map of the area and digitized into Bay-Lake RPC's Geographic Information System (GIS) for mapping. In 2015, the land use data for the Manitowoc-Two Rivers-Mishicot SSA was updated in Bay-Lake RPC's GIS using on-screen, "heads-up" methodology of air photo interpretation with groundtruthing where needed.

Planning Area Land Use

The planning area consists of a 124,205-acre area that includes the cities of Manitowoc and Two Rivers, the villages of Mishicot and Francis Creek, and portions of the towns of Two Rivers, Mishicot, Kossuth, Manitowoc, Manitowoc Rapids, and Newton.

Table 3.1 lists the land use acreage for the planning area, as well as the percentage of developed and undeveloped land within the planning area. Map 4 displays the land use in the planning area and the SSA.

Table 3.1: Planning Area Land Use Data

Land Use Type	Total Acres	Percentage of Total Land	Percentage of Developed Land
DEVELOPED			
Residential	11,043.7	8.9%	37.9%
Single Family	9,408.8	7.6%	32.3%
Two Family	235.8	0.2%	0.8%
Multi-Family	225.5	0.2%	0.8%
Group Quarters	33.0	0.0%	0.1%
Mobile Homes	164.4	0.1%	0.6%
Open Space	969.9	0.8%	3.3%
Land Under Development	6.3	0.0%	0.0%
Commercial	1,259.9	1.0%	4.3%
Industrial	1,902.6	1.5%	6.5%
Transportation	7,530.9	6.1%	25.8%
Communications/Utilities	352.7	0.3%	1.2%
Institutional/Governmental	1,064.4	0.9%	3.6%
Recreational	4,034.4	3.2%	13.8%
Agricultural Structures	1,982.1	1.6%	6.8%
Total Developed Acres	29,170.7	23.5%	100.0%

Land Use Type	Total Acres	Percentage of Total Land	Percentage of Undeveloped Land
UNDEVELOPED			
Agricultural Lands	64,537.5	52.0%	67.9%
Woodlands	22,010.1	17.7%	23.2%
Vacant Lands	175.8	0.1%	0.2%
Natural Areas	6,688.9	5.4%	7.0%
Water Features	1,621.7	1.3%	1.7%
Total Undeveloped Acres	95,034.0	76.5%	100.0%

Total Land Area (Acres)	124,204.7
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Source: Bay-Lake Regional Planning Commission, 2015.

SSA Land Use

The Manitowoc-Two Rivers-Mishicot SSA comprises 26,468 acres of the total planning area of 124,205 acres. Table 3.2 lists the land use acreage for the SSA, as well as the percentage of developed and undeveloped land within the SSA. The sewer service area is comprised of approximately half developed and half undeveloped lands. Map 4 displays the land use in the planning area and the SSA.

The most prevalent land uses within the SSA are agricultural lands and residential lands, each comprising 23 percent of the total land use. Approximately 5 percent of the total land used is comprised of environmentally sensitive areas (Map 3).

With urban land uses (i.e. developed lands) comprising approximately 55 percent of the SSA, primarily within the City of Manitowoc, it is imperative to pursue solutions to urban runoff. Urban runoff can have a significant negative impact to water quality. Impervious surfaces and storm sewer drains provide immediate delivery of pollutants to the waterways without any filtering. Additionally, construction sites can lead to significant delivery of sediments to waterways.

Table 3.2: SSA Land Use Data

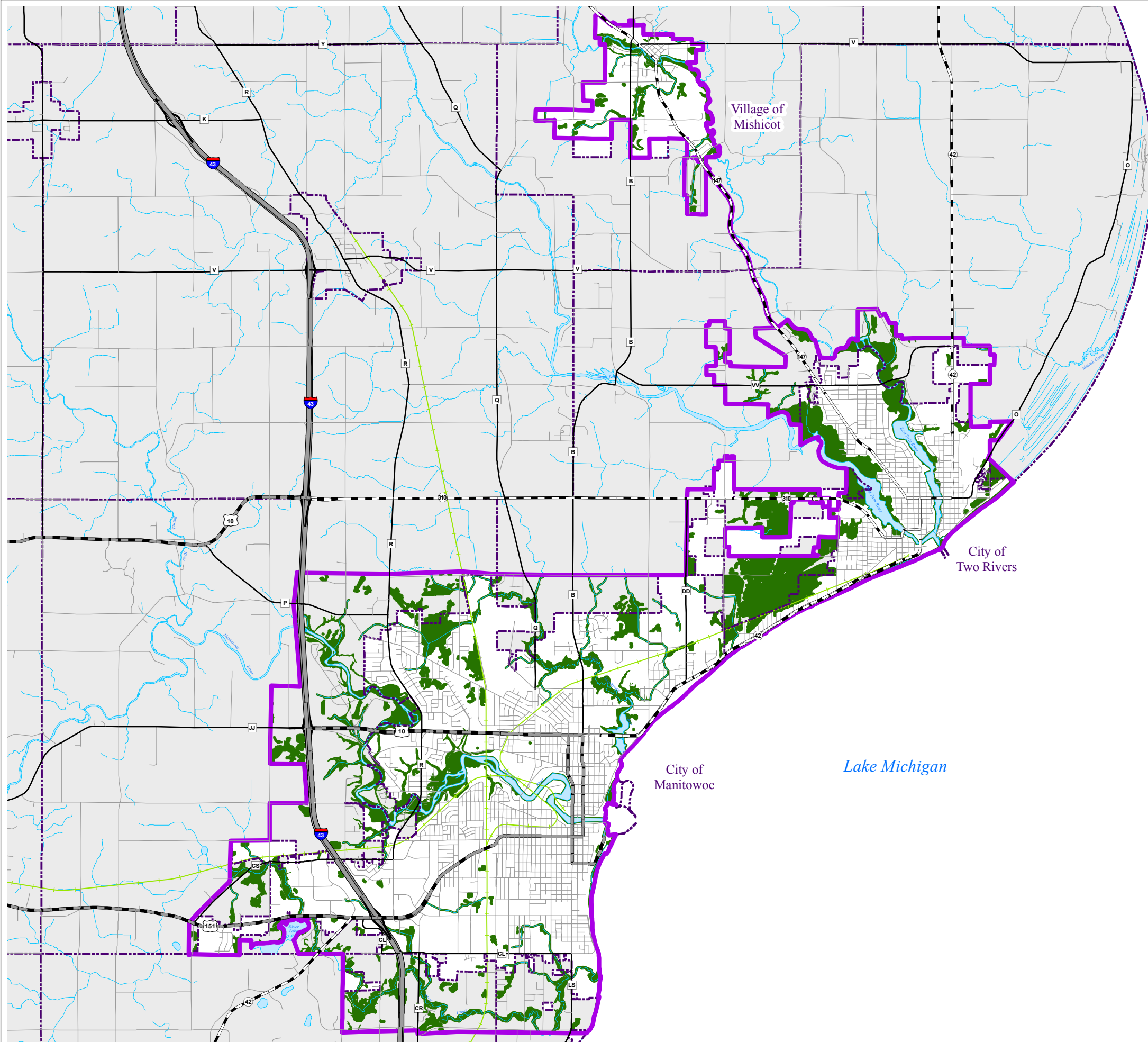
Land Use Type	Total Acres	Percentage of Total Land	Percentage of Developed Land
DEVELOPED			
Residential	6,105.7	23.1%	42.2%
Single Family	4,837.6	18.3%	33.5%
Two Family	228.6	0.9%	1.6%
Multi-Family	210.7	0.8%	1.5%
Group Quarters	33.0	0.1%	0.2%
Mobile Homes	74.8	0.3%	0.5%
Open Space	719.1	2.7%	5.0%
Land Under Development	1.8	0.0%	0.0%
Commercial	941.9	3.6%	6.5%
Industrial	1,356.3	5.1%	9.4%
Transportation	3,546.0	13.4%	24.5%
Communications/Utilities	237.8	0.9%	1.6%
Institutional/Governmental	903.6	3.4%	6.3%
Recreational	1,205.9	4.6%	8.3%
Agricultural Structures	159.6	0.6%	1.1%
Total Developed Acres	14,456.8	54.6%	100.0%



Land Use Type	Total Acres	Percentage of Total Land	Percentage of Undeveloped Land
UNDEVELOPED			
Agricultural Lands	6,116.3	23.1%	50.9%
Woodlands	3,490.6	13.2%	29.1%
Vacant Lands	128.1	0.5%	1.1%
Natural Areas	1,654.2	6.2%	13.8%
Water Features	622.5	2.4%	5.2%
Total Undeveloped Acres	12,011.6	45.4%	100.0%

Total SSA Land Area (Acres)	26,468.4
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Source: Bay-Lake Regional Planning Commission, 2015.

Environmentally Sensitive Areas (ESAs) Manitowoc-Two Rivers-Mishicot SSA



-  Sewer Service Area
-  Environmentally Sensitive Areas

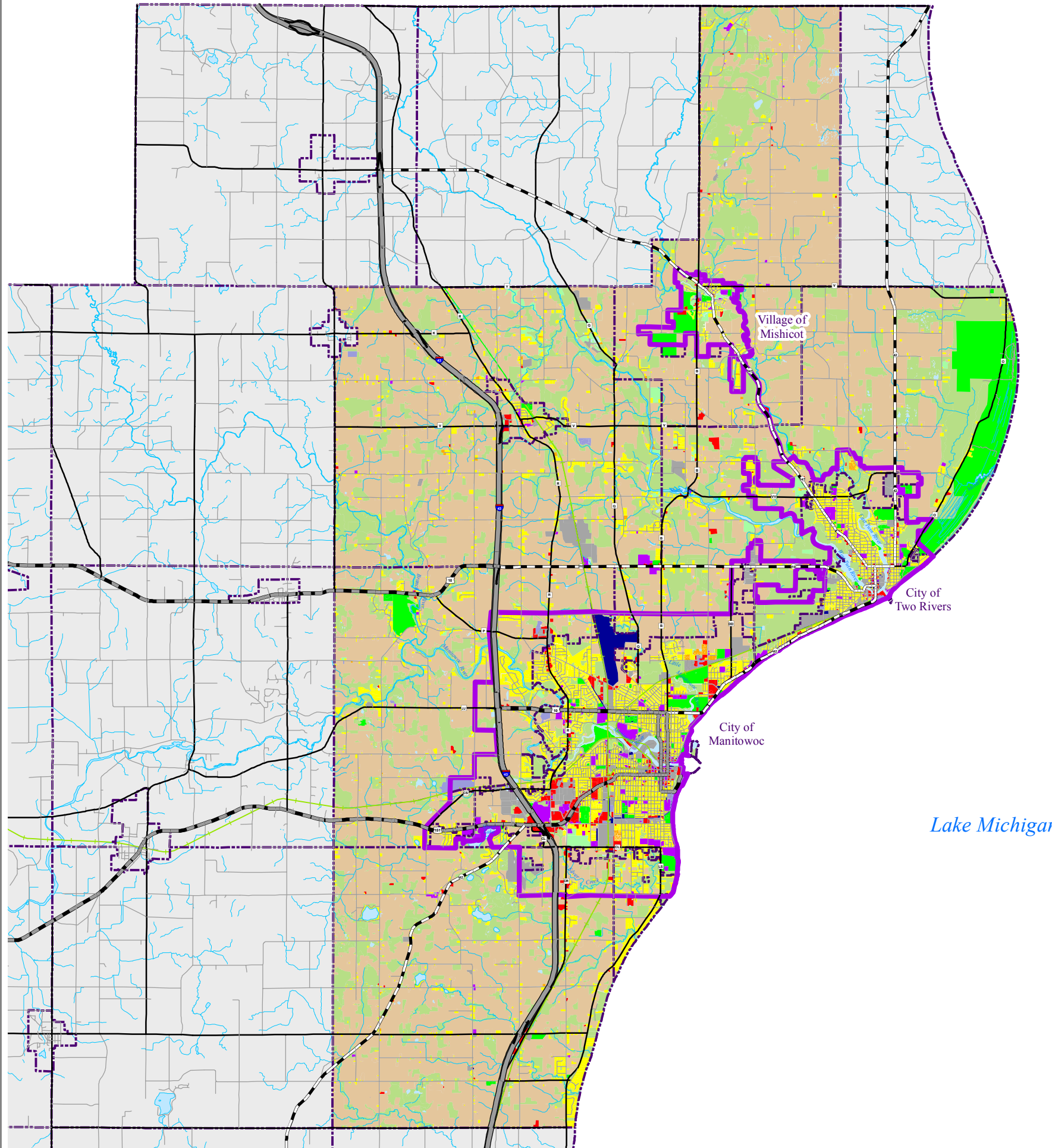
Base Map Features

-  Community Boundary
-  Interstate Highway
-  U.S. Highway
-  State Highway
-  County Highway
-  Local Road
-  Surface Water



G:\Manitowoc\Manitowoc County\SSA\2015
Source: WDNR, 2009; Manitowoc County, 2009;
Bay-Lake Regional Planning Commission, 2016.
This map is neither a legally recorded map nor a survey and is not intended to be used
as one. This drawing is a compilation of records, information and data used for reference
purposes only. Bay-Lake RPC is not responsible for any inaccuracies herein contained.

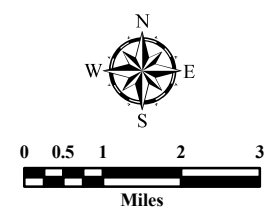
Land Use Manitowoc-Two Rivers-Mishicot Planning Area



-  Sewer Service Area
-  Residential
-  Mobile Homes
-  Commercial
-  Industrial
-  Transportation
-  Communications/Utilities
-  Governmental/Institutional
-  Parks and Recreation
-  Open Space/Fallow Fields
-  Agricultural
-  Water Features
-  Woodlands/Natural Areas

Base Map Features

-  Community Boundary
-  Interstate Highway
-  U.S. Highway
-  State Highway
-  County Highway
-  Local Road
-  Surface Water



CHAPTER 4: WASTEWATER AND STORMWATER MANAGEMENT

This chapter outlines the current wastewater treatment plant (WWTP) and collection systems, and stormwater management policies that exist throughout the planning area, as well as an overview of the sanitary districts in the planning area.

WASTEWATER TREATMENT AND COLLECTION FACILITIES

The DNR regulates municipal and industrial operations discharging wastewater to surface or groundwater through the Wisconsin Pollutant Discharge Elimination System (WPDES) permit program. There are six wastewater treatment and collection facilities in the SSA planning area that are permitted under the WPDES program; the Manitowoc Wastewater Treatment Facility (WWTF); Two Rivers WWTF; the Holy Family Convent WWTF; the Francis Creek Sewage Treatment Plant; and Town of Kossuth Sanitary District #2.

City of Manitowoc

The Manitowoc Wastewater Treatment Facility is located at 1015 S. Lakeview Drive, and was originally built in 1939 at a cost of \$980,000. This was a primary treatment plant consisting of primary clarifiers, a primary digester, a secondary digester and sand drying beds for the stabilized biosolids. There have been three major upgrades since then, with none of the original plant remaining on the site today.

The first upgrade began in 1954 and was completed at a cost of \$1,430,000. The major changes were the addition of rock trickling filters, secondary sludge pumping and 3 square final clarifiers. This increased the capacity of the treatment plant and added secondary treatment to improve biochemical oxygen demand (BOD₅) removal and reduce pollution.

The second major upgrade was finished in 1976 at a cost of \$19,500,000. This project increased the overall capacity of the plant, further improved the secondary treatment process with the addition of high rate stack trickling filters, added 3 new circular final clarifiers, and added a tertiary filtering process to further remove suspended solids. In addition, chemical tanks and feed pumps were also added to remove phosphorus from the effluent.

The third upgrade began in 1998 and was completed in 2001 at a cost of \$20,300,000. Three structures were removed and replaced with a new building that incorporated the processes from these buildings. Major improvements were made by constructing a new circular primary clarifier, adding stack filter motorized drives, a new rock filter pumping station, automating the tertiary filter operations, and replacing the primary digester covers and mixing system. Computerization of the treatment plant was also a major component of the plant upgrade.

The WWTF operates under WPDES permit number WI-0024601-08-0, which discharges to its outfall located 500 feet off shore in Lake Michigan. In 2014, the WWTF received an average of 6.512 million gallons per day (MGD) with 20,378 pounds of BOD₅; 11,005 pounds of suspended solids, and 207 pounds of phosphorus per day.

City of Two Rivers

The current Two Rivers Wastewater Treatment Facility is located at 1415 Lake Street and was built in 1978. The plant serves a population of 13,462 in the City of Two Rivers and the Village of Mishicot utilizing an activated sludge process which was substantially expanded in 1978 to

include primary and final clarifiers, a control building which housed a laboratory, vacuum filters and a standby generator. In 1994, the plant was modified by adding a new splitter box and fine bubble diffusers to achieve ammonia removal. In 1998, the DNR approved a facilities plan for WWTF modifications to replace the present chlorination/dechlorination system with an ultraviolet radiation system for disinfection. The chlorine contact tanks were converted to additional aeration basins and some necessary piping changes were made which increased the design capacity. The current design capacity is 3.07 MGD and 4,097 pounds of BOD₅ per day.

The WWTF discharges into Lake Michigan via the Two Rivers Harbor under WPDES Permit number WI-0026590-08-0. In 1998, the WWTF received an average of 1.96 MGD and 2,560 pounds of BOD₅ per day; in 2000, the plant received an average of 1.82 MGD and 2,912 pounds of BOD₅ per day. In 2012, the plant received an average flow of 2.117 MGD and 3,303 pounds of BOD₅ per day; in 2013, the plant received an average flow of 2.084 MGD and 3,013 pounds of BOD₅ per day; and in 2014, the plant received an average flow of 1.939 MGD and 2,575 pounds of BOD₅ per day.

Holy Family Convent

The Holy Family Convent WWTF is a private facility located at the Holy Family Convent at 2409 South Alverno Road in Manitowoc, just south of STH 151. The major treatment units were originally constructed in 1950. The plant utilizes a trickling filter process and was modified in 1969 with chlorination equipment. In 1972, the facilities were further upgraded with the addition of phosphorus removal equipment and buildings over the Imhoff tank and trickling filter. The facility was again upgraded in the early 1990s that made the facility meet revised disinfection requirements. This system currently has a design flow of 0.042 MGD and 78 pounds per day of BOD. The WWTF treats waste for the convent only and currently discharges into Silver Lake under WPDES Permit number WI-0028142. In 1998, the WWTF received an average of 0.030 MGD and 55.0 pounds of BOD₅ per day; in 2000, the plant received an average of 0.050 MGD and 52.8 pounds of BOD₅ per day; and in 2014, the plant received an average of 0.025 MGD and 38.3 pounds of BOD₅ per day.

Francis Creek

The Francis Creek WWTF is located just southwest of CTH V and CTH Q. The treatment facility was upgraded in 2004. There are no significant wet industries within the village so the wastewater contains domestic waste. The WWTF has a design flow of 0.095 MGD, 140 pounds per day of BOD₅ and 144 pounds per day total suspended solids. The WWTF operates under WPDES Permit number WI-0021377.

The Village of Francis Creek own and operates a sanitary sewer collection system with a WWTF that includes a stabilization pond treatment system and an absorption bed disposal system. Wastewater is collected from throughout the Village by a conventional gravity sewer system, with two lift stations. At the main lift station, wastewater is pumped to the pond site via a 5,240 foot six-inch force main. The stabilization pond system includes two ponds operated in series. The primary pond provides a high water level of six feet and a maximum surface area of approximately eight acres. The secondary pond has a maximum water level of five feet and a surface area of approximately two acres. The pond system will provide 160 days of storage at design flow. The absorption pond system was designed to minimize the loading rates and

provide the greatest level of treatment. A series of groundwater monitoring wells have been installed at the site. These wells are monitored on a quarterly basis and samples are tested to comply with DNR standards.

Kossuth Sanitary District #2

The Town of Kossuth Sanitary District #2 is located around the unincorporated community of Rockwood, just south of the Village of Francis Creek along CTH R. The wastewater treatment plant uses a recirculating sand filter process. Wastewater is collected throughout the district by a conventional gravity sewer system. There is a lift station serving several residents on the far northern edge of the district. The plant began operation in the mid-1990s. This system currently has a design flow of 0.0175 MGD, and 42.5 pounds per day of BOD₅. The WWTF discharges into the West Twin River via an unnamed tributary under WPDES Permit number WI-0035874. In 1998, the WWTF received an average of 0.0077 MGD and 11.0 pounds of BOD₅ per day; in 2000, the WWTF received an average of .0092 MGD and 10.1 pounds of BOD₅ per day; and in 2015, the WWTF received an average of 0.0090 MGD and 9.08 pounds of BOD₅ per day.

Remaining Sanitary Districts

The remaining sanitary districts of Branch, English Lake, Shoto, and Silver Creek exist on paper only. None of these sanitary districts have a centralized wastewater treatment facility. Those residences within these sanitary districts treat and dispose of their wastewater by private on-site wastewater treatment.

Town Sewer Systems

Currently, there are no centralized wastewater facilities serving the towns of Manitowoc, Mishicot, Manitowoc Rapids, Newton, and Two Rivers. Wastewater treatment and disposal in these towns (not including the identified sanitary districts) are currently accomplished by private on-site wastewater treatment.

STORMWATER MANAGEMENT

NR 216 of the *Wisconsin Administrative Code* regulates stormwater and related discharge permits to minimize the discharge of pollutants carried by stormwater runoff from certain industrial facilities, construction sites, and municipal separate storm sewer systems. NR216 establishes criteria defining those stormwater discharges needing WPDES stormwater permits. The cities of Manitowoc and Two Rivers are obligated to meet the requirements of this rule and have a Municipal Separate Storm Sewer System (MS4) permit under WPDES General Permit number WI-S050075-2.

To further address the negative impacts of polluted runoff on the streams, rivers, and lakes, and fulfill the public education and outreach component requirements of NR216, the cities of Manitowoc and Two Rivers participate on the Northeast Wisconsin Stormwater Consortium (NEWSC). NEWSC works collaboratively with a number of communities in Northeast Wisconsin to meet stormwater management goals and provide information and education to residents.

Stormwater Management Ordinances

City of Manitowoc

The City of Manitowoc addresses erosion control and stormwater management through Chapter 28 of the *City of Manitowoc Municipal Code*. The stormwater management ordinance for the City of Manitowoc is intended to control the quality and the quantity of stormwater that is leaving newly developed and redeveloped sites.

City of Two Rivers

The City of Two Rivers addresses erosion control and stormwater management through Chapter 7 of the *City of Two Rivers Municipal Code*. The stormwater management ordinance for the City of Two Rivers is intended to protect the health, safety and welfare of the City, its citizens and business, and others in the surrounding area.

CHAPTER 5: DEMOGRAPHIC TRENDS AND PROJECTIONS

Many factors affect the future growth of a community, and it can be difficult to predict with any level of accuracy. The best method to predict growth is to provide a population increase estimate (projection) and apply that growth to various areas. This will allow for economic evaluation of alternative locations for future growth. Physical factors directly affect where the future development should occur. These factors can make development in some areas physically difficult, uneconomical, or undesirable. Examples of limiting physical factors include: wetlands, floodplains, shorelands, and steep slopes (or highly erodible soils) near surface waters. Existing growth influences development through the location and extension of necessary public facilities and utilities. If future growth is allowed to go uncontrolled and developable areas are abundant, development is likely to occur in a scattered manner.

Careful analysis of all of growth factors will provide a basis for projecting and guiding growth within the planning area. This chapter examines these factors and how they may affect future growth in the Manitowoc-Two Rivers-Mishicot SSA planning area.

In order to obtain a clear understanding of the planning area, important factors pertaining to the population of the area must be carefully analyzed. For the majority of the planning decisions, population analysis and projections play an important role for long-range planning.

POPULATION PROJECTIONS

Projecting the future total populations within the planning area is of great importance in determining the finalized sewer service area boundary. The population size (past, present and projected) and household characteristics provides one indication of how much land will be needed for future land uses. The population distribution also provides an indication of where the various land uses and community facilities should be located in the future. The projections used come from the most recent Wisconsin Department of Administration (WDOA) Demographic Services report, *Wisconsin's Future Population: Projections for the State, Its Counties and Municipalities, 2010-2040* (December 2013).

WDOA applies the cohort-component methodology, a method widely used by applied demographers in states that have comparatively steady population change. This methodology takes a base period experience of fertility, mortality and migration (for this release, the 2000 – 2010 intercensal period) and modifies the age- and sex-specific rates for each of these components, based on indicators provided by federal sources, going forward into the future. Historical Wisconsin data – extending back 30 years or more – also influence the shaping of future rates, particularly in the realm of migration.

Similarly, the municipal projections rely on historic patterns; specifically, the growth rates of individual communities since 1990, with greater weight given to recent change than distant change.

While other U.S. states have used projections models that incorporate employment forecasts – specifically, the need or demand for workers in relationship to supply – it has been found that the cohort-component model, with its focus on basic demographic events, is the most effective for Wisconsin.

Although five of the municipalities within the Manitowoc-Two Rivers-Mishicot SSA planning area have experienced population increases (villages of Francis Creek and Mishicot, and the towns of Kossuth, Manitowoc, and Newton), the population of the area as a whole has decreased since 2000 (Table 5.1).

WDOA projected the Manitowoc-Two Rivers-Mishicot SSA planning area to have a population of 55,390 persons by 2040. This would be a decrease of 2,840 persons from the 2010 Census population of 58,230 persons.

Table 5.1: Population and Projections

Geographic Area	Year			Projections			Number Change 2010-2040
	1990	2000	2010	2020	2030	2040	
Cities							
City of Manitowoc	32,521	34,053	33,736	33,760	34,180	32,870	-866
City of Two Rivers	13,030	12,639	11,712	11,300	10,910	9,990	-1,722
Villages							
Village of Francis Creek	562	681	669	680	700	685	16
Village of Mishicot	1,296	1,422	1,442	1,455	1,495	1,460	18
Towns							
Town of Kossuth	1,951	2,033	2,090	2,120	2,185	2,135	45
Town of Manitowoc	936	1,073	1,083	1,120	1,180	1,175	92
Town of Manitowoc Rapids	2,560	2,520	2,150	2,135	2,150	2,055	-95
Town of Mishicot	1,344	1,409	1,289	1,260	1,235	1,150	-139
Town of Newton	2,261	2,241	2,264	2,320	2,385	2,335	71
Town of Two Rivers	2,147	1,912	1,795	1,730	1,675	1,535	-260
Total	11,199	11,188	10,671	10,685	10,810	10,385	-286

Source: U. S. Census for years cited; WDOA Population Projections, 2013; and Bay-Lake Regional Planning Commission, 2015.

HOUSING PROJECTIONS

Another determining factor in allocating acreage for the sewer service area is that of household size, or more commonly referred to as “persons per household.” The projected number of persons per household is expected to decline throughout the 25-year planning period throughout the planning area and within respective municipalities. Table 5.2 depicts the most recent WDOA current and projected persons per household figures for the Manitowoc-Two Rivers-Mishicot SSA planning area municipalities.

Table 5.2: Persons Per Household

Geographic Area	Actual Year 2010	Projected Years		
		2020	2030	2040
Cities				
City of Manitowoc	2.24	2.16	2.11	2.06
City of Two Rivers	2.27	2.19	2.13	2.09
Villages				
Village of Francis Creek	2.42	2.33	2.27	2.22
Village of Mishicot	2.31	2.24	2.18	2.13
Towns				
Town of Kossuth	2.53	2.44	2.38	2.33
Town of Manitowoc	2.47	2.39	2.33	2.28
Town of Manitowoc Rapids	2.55	2.46	2.40	2.35
Town of Mishicot	2.65	2.56	2.49	2.44
Town of Newton	2.56	2.47	2.41	2.35
Town of Two Rivers	2.36	2.28	2.22	2.18

Source: WDOA Population and Household Projections, 2014; and Bay-Lake Regional Planning Commission, 2015.

Persons per household figures relate directly to future land uses. Positive population projections divided by household size yields the number of additional dwelling units needed to house the increased population, as shown in Table 5.3. A total of 106 dwelling units are projected to be needed by 2040. However, only the villages of Francis Creek and Mishicot, and the towns of Kossuth, Manitowoc, and Newton are projected to experience an increase in population, resulting in a need for additional dwelling units.

Table 5.3: Housing Projections

Geographic Area	Actual Population 2010	Projected Population 2040	Population Change 2010-2040	Projected Dwelling units Needed 2040¹
Cities				
City of Manitowoc	33,736	32,870	-866	0
City of Two Rivers	11,712	9,990	-1,722	0
Villages				
Village of Francis Creek	669	685	16	7
Village of Mishicot	1,442	1,460	18	8
Towns				
Town of Kossuth	2,090	2,135	45	19
Town of Manitowoc	1,083	1,175	92	40
Town of Manitowoc Rapids	2,150	2,055	-95	0
Town of Mishicot	1,289	1,150	-139	0
Town of Newton	2,264	2,335	71	30
Town of Two Rivers	1,795	1,535	-260	0
Total	10,671	10,385	-286	90

Source: 2010 U.S. Census; WDOA, 2013; and Bay-Lake Regional Planning Commission, 2015.

CHAPTER 6: SEWER SERVICE AREA ANALYSIS

As was documented in the preceding chapters of this document, a variety of physical and socio-economic factors contribute to the future growth of a community. An analysis of some of these factors may provide some insight into the anticipated growth patterns of an area enabling the guidance of such growth in a logical and cost-effective manner. This chapter presents the factors that were utilized in determining the sewer service area boundary for the Manitowoc-Two Rivers-Mishicot Sewer Service Area.

LAND USE PROJECTIONS AND ALLOCATIONS

The delineation of the sewer service area boundary was based on the *Bay-Lake Regional Planning Commission Standard Model*, which consisted of the following steps to derive the acreage allocations.

- 1) Develop land use density ratios based on current municipal populations and land use data.
- 2) Apply the land use density ratios to 25-year projections of population to determine acres needed for future development.
- 3) Compared acres needed for future development with acreage available to accommodate projected future growth.
- 4) Delineate the sewer service area boundary based on the results.

Land Use Projections Methodology

The acres needed for future development for the design year of 2040 was based on a *population density model* that used land use density ratios (Table 6.1) derived from 2008 land use mapping and the 2010 population for each community in the Manitowoc-Two Rivers-Mishicot SSA planning area to determine the persons per developed acre and the persons per residential acre. Referring to Table 6.2, a total of 272 acres are projected to be needed to accommodate future growth to 2040.

Table 6.1: Land Use Density Ratios, Manitowoc-Two Rivers-Mishicot SSA Planning Area

Geographic Area	2010 Population	2008 Developed Land (Acres)	2008 Residential Land (Acres)	Percent Residential Land	Persons Per Developed Acre	Persons Per Residential Acre
Cities						
Manitowoc	33,736	8,592.3	3,354.1	39.0%	3.93	10.06
Two Rivers	11,712	2,592.9	1,141.9	44.0%	4.52	10.26
Villages						
Francis Creek	669	324.0	134.0	41.4%	2.06	4.99
Mishicot	1,442	777.4	226.3	29.1%	1.85	6.37
Towns						
Kossuth	2,090	3,652.7	1,282.2	35.1%	0.57	1.63
Manitowoc	1,083	942.0	676.6	71.8%	1.15	1.60
Manitowoc Rapids	2,150	3,013.9	1,400.0	46.4%	0.71	1.54
Mishicot	1,289	1,674.6	620.5	37.1%	0.77	2.08
Newton	2,264	3,051.8	1,202.4	39.4%	0.74	1.88
Two Rivers	1,795	4,549.3	1,005.8	22.1%	0.39	1.78
Total	58,230	29,170.7	11,043.7	37.9%	2.00	5.27

Source: 2010 US Census; WDOA Projections, 2013; and 2008 Land Use, Bay-Lake Regional Planning Commission, 2016.

Table 6.2: Acreage Needed to 2040 - Population Density Model, Manitowoc-Two Rivers-Mishicot Planning Area

Geographic Area	2010 Population	2040 Projection*	Population Change	Persons Per Developed Acre	Persons Per Residential Acre	Acres Need for Development**	
Cities							
Manitowoc	33,736	32,870	(866)	3.93	10.06	NA	NA
Two Rivers	11,712	9,990	(1,722)	4.52	10.26	NA	NA
Villages							
Francis Creek	669	685	16	2.06	4.99	7.7	3.2
Mishicot	1,442	1,460	18	1.85	6.37	9.7	2.8
Towns							
Kossuth	2,090	2,135	45	0.57	1.63	78.6	27.6
Manitowoc	1,083	1,175	92	1.15	1.60	80.0	57.5
Manitowoc Rapids	2,150	2,055	(95)	0.71	1.54	NA	NA
Mishicot	1,289	1,150	(139)	0.77	2.08	NA	NA
Newton	2,264	2,335	71	0.74	1.88	95.7	37.7
Two Rivers	1,795	1,535	(260)	0.39	1.78	NA	NA
Total	58,230	55,390	(2,840)	1.67	4.22	272	129

Notes:

*WDOA MCD Projections based on 2010 Census

** Formula: Population Change/Persons Per Acre

NA - No Allocation (negative #)

Source: Bay-Lake Regional Planning Commission Land Use Survey, 2008; U.S. Census Bureau, 2012; and WDOA, 2013.

Available Acreage for Future Growth

Although 272 acres are projected to be needed for future growth of the Manitowoc-Two Rivers-Mishicot SSA planning area, no additional acreage is needed within the delineated SSA boundary because there is sufficient available acreage (between vacant and undeveloped lands) with 88,705 acres available to accommodate projected future growth to 2040 (Table 6.3).

Table 6.3: Available Acreage, Manitowoc-Two Rivers-Mishicot Sewer Service Area

	Residential	Industrial and Commerical	Parks and Recreation	Institutional and Governmental	Agricultural and Natural Areas ¹	Total
Acreage Available	19	115	1	4	88,565	88,705

1. Available Acreage = vacant lands + undeveloped lands (which includes agricultural lands, woodlands, and unregulated natural areas).

Source: Bay-Lake Regional Planning Commission, 2016.

SSA BOUNDARY DETERMINATION

As discussed above, no additional land would be required within the Manitowoc-Two Rivers-Mishicot SSA to meet future projected growth. Based on this determination, coupled with consensus of the SSA TAC, it was determined that there would be no increase to the sewer service area boundary. However, due to changes in the accuracy of parcel mapping over the years, and shifting development demands, the TAC decided to change the boundaries of the SSA with no increase in overall SSA acreage.

Manitowoc-Two Rivers-Mishicot SSA Boundary

Map 5 depicts the delineated sewer service area. The Manitowoc-Two Rivers-Mishicot Sewer Service Area boundary encompasses approximately 26,468 acres. Environmentally sensitive areas (ESAs), as depicted on Map 3 are displayed within the delineated SSA boundary. ESAs comprise approximately 6,048 acres (22.8 percent) of the SSA. The SSA boundary configuration aids in the protection of ESAs, provides adequate acreage of developable lands for the SSA, and allows for flexibility in terms of the future locations for development.

Location of an area within the sewer service area boundary does not mean that it is to be immediately served by public sewers, nor does it guarantee that it will ever be served by public sewer. Decisions concerning whether to provide sewer service, timing of services, and the conditions of service are controlled by county and municipal governments, the affected wastewater treatment facility, the DNR, and/or the Manitowoc-Two Rivers-Mishicot SSA TAC. However, as a general rule, the extension of sewers should be carried out so that areas that are presently undeveloped and are contiguous to the wastewater collection system and/or that can be served by existing wastewater collection facilities are developed prior to areas requiring the development of new collection facilities.



The sewer service area boundary lines are drawn as near to scale as possible. Generally the sewer service area lines are drawn to follow municipal boundaries, quarter section lines (or fractions thereof), parcel lines, the center line of roads or streams, or a fixed distance from the aforementioned features. The boundary lines are tied to the Wisconsin Transverse Mercator 1983/1991 (WTM 83/91), and has real world coordinates in a geographic information system (GIS).

SSA Boundary Description

Appendix A provides a detailed written boundary description for the 2040 Manitowoc-Two Rivers-Mishicot SSA boundary.

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Official SSA Boundary Manitowoc-Two Rivers-Mishicot SSA

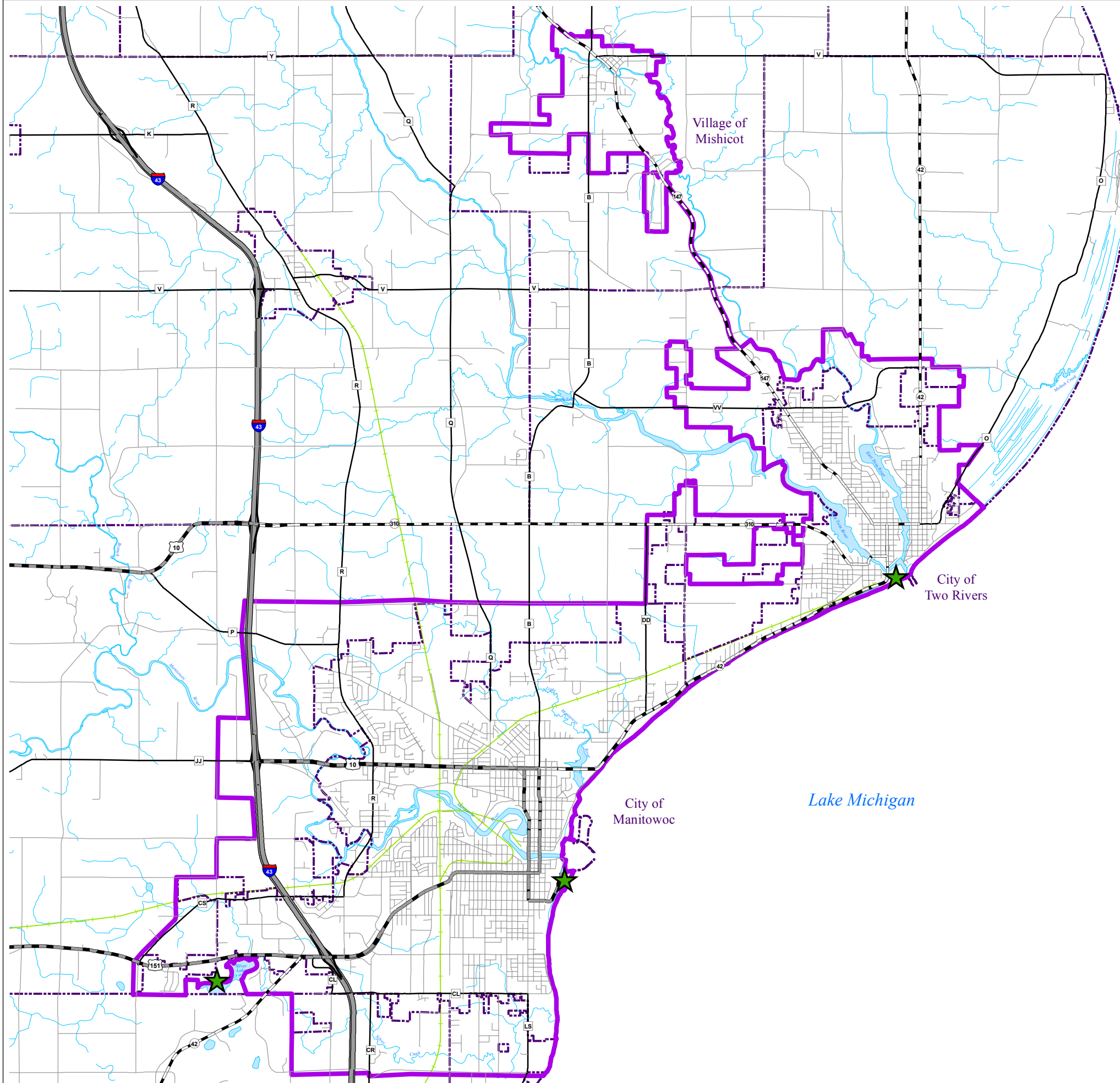
-  Sewer Service Area Boundary
-  Wastewater Treatment Facility

Base Map Features

-  Community Boundary
-  Interstate Highway
-  U.S. Highway
-  State Highway
-  County Highway
-  Local Road
-  Surface Water



G:\Manitowoc\Manitowoc_County\SSA\2015
Source: WDNR, 2009; Manitowoc County, 2009;
Bay-Lake Regional Planning Commission, 2016.
This map is neither a legally recorded map nor a survey and is not intended to be used
as one. This drawing is a compilation of records, information and data used for reference
purposes only. Bay-Lake RPC is not responsible for any inaccuracies herein contained.



CHAPTER 7: PLAN IMPLEMENTATION AND INSTITUTIONAL STRUCTURE

The success of any planning program can best be measured by the extent to which the program is implemented and by how well the plan provides a framework for further investigation into the problems or issues being addressed.

The following sections describe the institutional mechanism for implementing this plan. These include:

- Technical Advisory Committee;
- Procedures for Sewer Extension Review;
- Wastewater Treatment Facility Review;
- Sewer Service Area Boundary Amendments;
- Plan Amendments; and
- Plan Update.

TECHNICAL ADVISORY COMMITTEE

The Technical Advisory Committee (TAC) is the board of members that assist the Bay-Lake RPC in creating and updating the SSA plan, and reviewing amendment requests. The responsibility of the TAC is to provide information, guidance, and recommendations for the proposals and future development within the Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan boundaries. The TAC shall assist the Bay-Lake RPC in overseeing development so that it proceeds in accordance with the goals, objectives, and policies of this plan and that all necessary actions be implemented by the Bay-Lake RPC to advance development as it is in agreement with this plan.

The TAC consists of four voting representatives with one voting member representing each of the municipalities and the county: the City of Manitowoc, the City of Two Rivers, the Village of Mishicot, and Manitowoc County. In the event of a tie vote, the deciding vote goes to Manitowoc County.

The DNR and the Bay-Lake RPC staff representatives attend the TAC meetings as ex-officio, non-voting members.

PROCEDURE FOR SEWER EXTENSION REVIEWS

With the final approval of this plan, DNR will require that applications for sewer extensions in the Manitowoc-Two Rivers-Mishicot SSA be reviewed by the Bay-Lake RPC to determine if the extensions are in conformance with the sewer service plan. This local review process is illustrated in Figure 7.1 and is outlined below:

1. The municipalities comprising the Manitowoc-Two Rivers-Mishicot SSA or their consulting engineers should submit a letter and a plan map of the proposed sewer extension to the Bay-Lake RPC (via mail or e-mail).

To avoid delays, this **submittal should be made early in the planning process, prior to completing detailed plans and specifications for the project.** Submitting the plans early

will ensure that local review is made prior to submittal of the plans to DNR and that costly detailed sewer design and specification documents are not prepared for areas that do not conform to the plan and are subsequently rejected by DNR.

2. The Bay-Lake RPC will review all submissions for sewer extension projects and will provide a recommendation as to whether or not the proposed project is in conformance with the plan.
3. The Bay-Lake RPC will review all submissions and will provide the applicant with a review letter within 15 business days of receipt of the plan map.

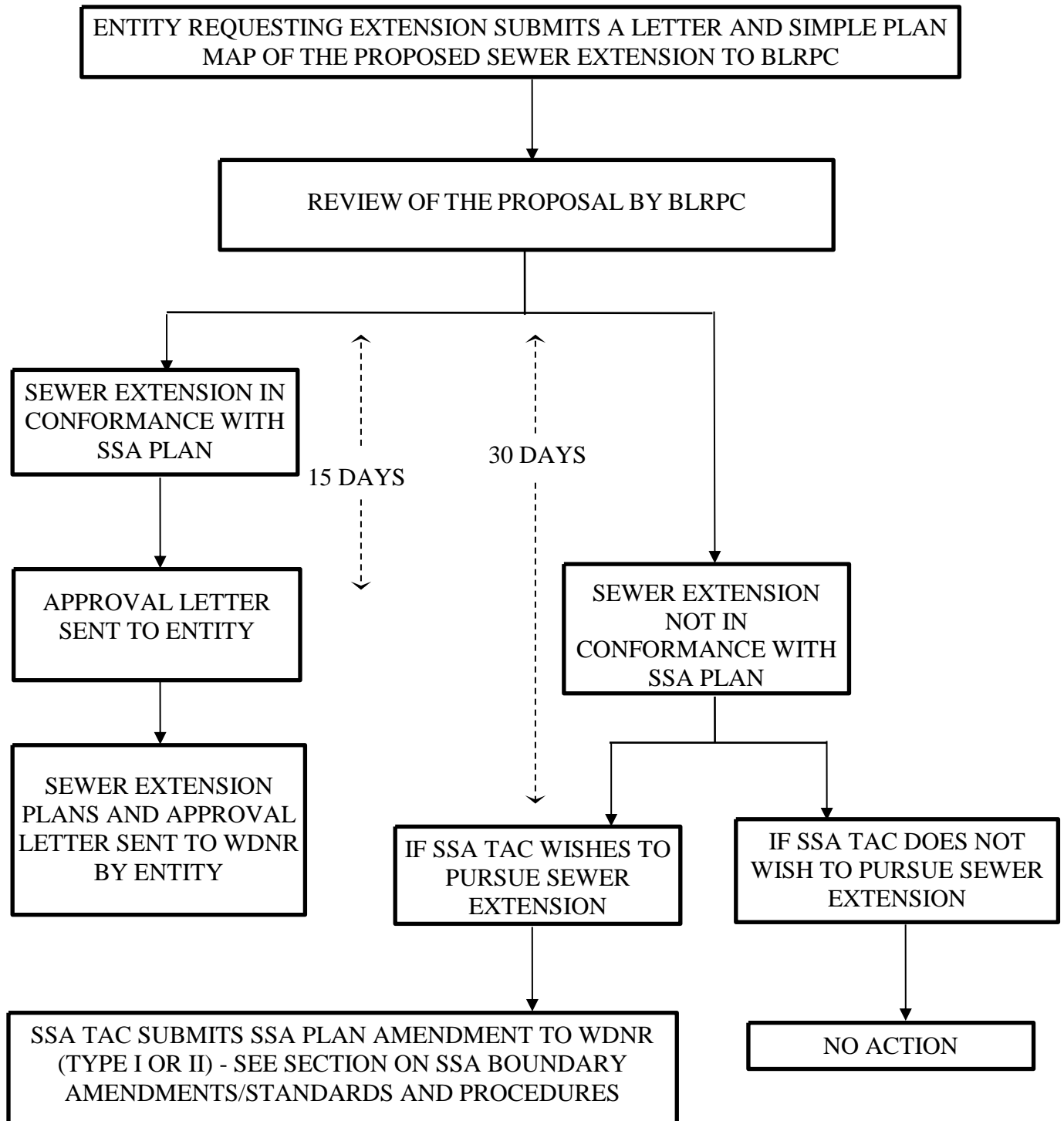
If the proposed sewer extension is in conformance with the plan, the letter should be attached to the sewer extension plans that are submitted to DNR by the applicant. Additionally, the Bay-Lake RPC will notify the affected municipality within the Manitowoc-Two Rivers-Mishicot SSA of the issuance of a conformance letter.

4. If the proposed extension is not in conformance with the plan or if there are questions about consistency, the applicant and the Manitowoc-Two Rivers-Mishicot SSA TAC will be notified by e-mail within 30 days.
 - a. The TAC should then decide if it wishes to further pursue the sewer extension. If not, no further action is necessary.
 - b. If the sewer extension is pursued, the plan must be amended in order for the proposed extension to be in conformance with the plan. The process for adopting plan amendments is discussed in the section titled, "Sewer Service Area Boundary Amendments: Standards and Procedures."

Note: After the plan is amended, the proposed sewer extension request should be resubmitted as discussed in number 1 above.

5. Additionally, in accordance with NR 113.07(1)(e), proposals for large holding tanks (greater than 3,000 gpd) may require an amendment to the plan by the WWTP to ensure the tank is within the sewer service area.

Figure 7.1: Flow Diagram of Procedure for Sewer Extension Review



Source: Manitowoc-Two Rivers-Mishicot SSA TAC and Bay-Lake Regional Planning Commission, 2015.

WASTEWATER TREATMENT FACILITIES REVIEW

Sewer service area plans serve as the long-term plan for the urbanized area's wastewater treatment plants and collection infrastructure and are used as guidance during the facilities planning process established under NR110.

The *Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan* does not anticipate that there will be any need for additional sewage treatment facilities to serve non-industrial development in the planning area. Any sewage collection facilities built within the established 25-year sewer service area should be connected to existing wastewater treatment plants.

Proposals for new wastewater treatment facilities are subject to DNR regulations, including NR 110.08(5), which states: "It is the policy of the department to restrict the construction of new sewage treatment facilities in order to preserve and protect the quality of the waters of the state." This policy is defined by the other specific requirements found in NR 110.08(5). These requirements generally serve to discourage or disallow new wastewater treatment plants, especially small private plants, but whether any particular proposal for a new or upgraded facility is approved depends on the particular circumstances involved.

It should also be noted that NR 110 regulations apply to regulated facilities discharging to surface water or upon the ground surface, as opposed to Privately Owned Wastewater Treatment Systems (POWTS) discharging into the soil subsurface, which are regulated by the Wisconsin Department of Safety and Professional Services. POWTS greater than 12,000 gallons per day require DNR concurrence as well. Larger, regional wastewater facilities are usually preferable for the following reasons:

- Economies of scale exist in the construction, operation, and maintenance of regional treatment plants.
- Owners of small treatment plants generally have less financial capability to hire a competent operator and carry out necessary maintenance and repairs.
- The administrative costs are greater with the regulation of large numbers of small plants.
- In urban areas, there is usually a significant investment of public dollars in existing treatment plants designed to serve all anticipated development in the urban area; the provision of additional treatment facilities in these areas is not cost-effective.

Note: It is also recognized by the DNR that connection to an existing treatment facility is not always cost-effective or environmentally sound and there may be instances where a small sewage treatment facility is the most feasible solution.

Additional treatment facilities to serve residential, commercial, or public facilities should not be approved by the Manitowoc-Two Rivers-Mishicot SSA TAC as being in conformance with this plan unless it is documented that it is cost-effective, environmentally-sound, and in the best interest of the municipality.

One common reason for the construction of a small wastewater treatment facility is to provide interim sewage treatment service to an area of development until sewers may be extended to serve that area. At such time public sewers are extended to serve the development, the treatment

plant may be phased out. This approach may be used to solve wastewater treatment problems in areas that are not currently considered to be cost-effective for regional sewer extensions.

If new wastewater treatment is needed in a particular circumstance, it should only be approved if it satisfies the requirements for specific situations specified in Section 110.08(5) of the *Wisconsin Administrative Code*. These situations and subsequent requirements include:

1. Treatment Facility to Serve Existing Residential Development: It is necessary to solve a documented and severe existing water quality (groundwater or surface water) or public health problem related to failing on-site systems; or, it is needed to replace an existing treatment facility which is not in compliance with its Wisconsin Pollutant Discharge Elimination System (WPDES) permit.
 - It is the cost-effective solution to the existing problem.
 - It is publicly owned, operated, and maintained.
2. Interim Treatment Facility: It is necessary to solve a documented and severe existing water quality (groundwater or surface water) or public health problem related to failing on-site systems; or it is needed to replace an existing treatment facility which is not in compliance with its WPDES permit.
 - It is the most cost-effective solution to the existing problem.
 - It is publicly owned, operated, and maintained.
 - The sewage collection system is designed so that it may be easily connected to the regional system in the future.
 - The service area of the proposed system lies entirely within the planned service area of the regional system as delineated in this plan.
 - An agreement is signed by all involved municipalities that provides for a specified date of abandonment and connection; this inter-municipal agreement shall be reviewed and approved by the DNR prior to facilities plan approval; the WPDES permits shall contain schedules for facilities abandonment and connection.
3. Treatment Facility Serving Isolated Non-Residential Development: The development may not be more rationally and efficiently located in an urban area and thus be accommodated by an existing municipal plant.
 - Joint treatment with adjacent wastewater treatment system is not feasible.
 - The proposed facility is designed to handle only the waste generated by the development.
 - The WPDES permit limits service to the isolated non-residential development.
 - In the case of a commercial facility, only commercial facilities that serve and facilitate travel on public highways.
4. Treatment Facility to Serve New Residential Development: Proposals for a new treatment facility intended to serve new residential development may be denied.

Note: Variances may be granted only after the general public interest, environmental impacts,

and socioeconomic impacts have been considered as well as the impact on orderly development and the provision of general government services and the following criteria have been met:

- The proposal is consistent with the responsibility to protect, maintain, and improve water quality management.
- It is publicly owned, operated, and maintained.
- It is the cost-effective solution to the problem.
- All other federal, state, and local approvals and permits have been obtained.

SSA BOUNDARY AMENDMENTS: STANDARDS AND PROCEDURES

Since unanticipated development may occur beyond that acreage which was determined necessary for the 25-year sewer service area boundary, a mechanism for reviewing and revising the service area boundary is essential. Amendments will provide the municipalities of the Manitowoc-Two Rivers-Mishicot Urbanized Area and private developers with the needed flexibility to incorporate community growth, additional technical data, new community needs, and ongoing public input into the sewer service planning process.

The Bay-Lake RPC will review amendment requests and forward them to the TAC, maintain the records of boundary amendments, review requests for sewer extensions, and update the service area boundary map.

Two types of amendments to the service area boundaries may be expected: *Type I Amendments* and *Type II Amendments*.

Type I Amendments are required when the service area boundary changes but the total acreage is not increased. The amendment would be reviewed by Bay-Lake RPC and the TAC and, if approved according to the amendment procedures, a request for a sewer service area amendment is forwarded to the DNR.

Type II Amendments would result in an increase in the service area acreage. This type of amendment would be used to add to the total acres that have been projected for land development up to the existing corporate limits or for municipalities that are experiencing population growth in excess of that projected in the plan. The amendment would be reviewed by Bay-Lake RPC and the TAC and, if approved according to the amendment procedures, a request for a sewer service area amendment is forwarded to the DNR.

In both types of amendments, procedures were developed to provide a fair and reasonable means of reviewing service area boundary changes. These procedures include public notice, public comment period, public hearings, and public records of the proceedings of the hearing. The public notice shall be published in the official paper of the municipality affected by the change, or other notification means allowable under Wisconsin statutes. All costs associated with the preparation and publishing of the public notice shall be borne by the petitioner.

Standards were established to provide a framework for analyzing the merits of proposed SSA boundary amendments and to identify basic parameters necessary for amendment evaluation. These amendment standards and their established procedures are outlined below.

Amendment Standards

To provide an equitable and uniform basis for revising the sewer service boundaries, all proposed amendments that would shift or add acreage to the service area shall meet standards one through six, and number seven when applicable.

1. There shall be minimal adverse impacts on ESAs and water quality as a result of development stimulated by the amendment.
2. Existing or planned sewage treatment facilities must have sufficient capacity to treat the projected wastewater flows generated by the added territory.
3. The SSA boundary amendment area must be in conformance with the local comprehensive plans adopted under s. 66.1001, *Wis. Stats.* and zoning regulations and the established goals and objectives of this plan.
4. The configuration of sewer service area boundaries may be modified provided that the amendment area has a common boundary with the current sewer service area and will not create a void within the sewer service area (i.e. no satellites or voids).
5. Modifications of the boundary can be shown to be cost-effective, orderly, and a logical extension of urban development.
6. The delivery of other services by the existing and proposed community facilities (i.e. parks, schools, fire protection, etc.) will be available and will be provided for the amended area.
7. When the projected number of acres of the *Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan* have been developed, the service area may be increased by amending the boundary when it can be demonstrated that:
 - a) the current population growth rate exceeds the plan's projected population growth rate for the municipality; and
 - b) the population density standard is modified by the TAC to reflect quantifiable changes in the municipality population distribution.

Annexations or detachments of territory (as defined in s. 66, *Wis. Stats.*) within the boundaries of the sewer service area do not constitute amendments to the SSA boundary and are therefore not subject to amendment procedures.

Amendment Procedures

Type I Amendment: A municipality amends the service area boundaries without increasing the land area the municipality has within its sewer service boundary. For every acre added to the municipality's service area, an area of developable land of equal size is removed. For this type of amendment, the following procedure is used (a flow diagram of this procedure is shown in Figure 7.2):

1. A petition to include or exclude a particular area from the Manitowoc-Two Rivers-Mishicot SSA is filed by the municipality. The petition shall include the following:
 - a) a map showing the location of the properties;

- b) general development plans for the area including land use proposals and a preliminary timetable for implementing the development plan;
 - c) an indication of the specific service needs of the site (i.e., sewer and water line size, water pressure, roadways, etc.); and
 - d) a check for \$1,500 from the developer of the property to the Bay-Lake Regional Planning Commission to assist with costs associated with the development of the staff report prepared for the DNR.
2. The municipality refers the petition to the Bay-Lake RPC for initial review. The Bay-Lake RPC conducts an initial review, develops a recommendation, compiles information for the TAC, and forwards the request to the TAC. The TAC reviews the request and develops a recommendation to the DNR.
 3. Within 60 days of the Bay-Lake RPC receiving a completed amendment application, the TAC holds a public meeting and public hearing on the petition following publication of a Class 1 Notice according to s. 985, Wis. Stats. The public notice shall be published in the official paper of the municipality affected by the request. All costs associated with the preparation and publishing of the public notice shall be borne by the petitioner.

Representatives submitting the petition, Bay-Lake RPC staff, DNR staff, and interested citizens may testify. A record of the public hearing proceedings and testimony shall be maintained by the Bay-Lake RPC on behalf of the TAC.

4. The TAC shall review the recommendations and take final action on the amendment request. All or any part of the petitioned land may be added to the service area along with additional safeguards or conditions deemed necessary by the TAC to carry out the intent of the sewer service area amendment standards.

In formulating a recommendation, Bay-Lake RPC and the TAC should consider citizen input received at the meeting; comments from other local committees and the DNR; conformance with community plans; development trends in the area; possible impacts on the physical environment; and conformance with the adopted sewer service plan goals and objectives and the amendment standards. Land recommended for removal from the service area should have a low development potential in terms of recent development trends within the municipality, inadequate urban services, unique environmental features, or poor site conditions due to soils or groundwater. Additionally, signed statements from affected landowners acknowledging withdrawal from the sewer service area will be required.

Amendments approved by the TAC shall be transmitted by Bay-Lake within 30 days of the public hearing.

5. The Bay-Lake RPC shall develop a Staff Report for the amendment and submit it to the DNR within 30 days after the TAC has transmitted their recommendation to the Bay-Lake RPC.
6. The DNR will review the amendment and approve or deny it in writing to the municipality and the Bay-Lake RPC. If the DNR rejects the amendment, their decision may be appealed in accordance with the procedures in s. 227.52 and 227.53, Wis. Stats., which allows for a party

to file a petition for judicial review. Approval conflicts between the DNR and the TAC must be resolved before sewer lines are extended into any new area.

Note: The DNR should normally approve the amendment within approximately 45 days unless an environmental assessment (EA) is deemed necessary in accordance with NR 150. If an EA is required, the DNR will prepare it and issue a public notification to allow for receipt of public comments to be considered prior to final approval. When an EA is required, the DNR review period may extend to approximately three months or more. An EA is normally required if the amendment proposal delineates an area of over 1,000 acres that may be served with sewer, or if it may result in the sewered area increasing by more than five (5) percent per year. The DNR may require an EA under any project circumstances if they determine the proposal has the potential to cause significant environmental effects and may involve unresolved conflicts in the use of available resources.

Type II Amendment: A municipality amends the sewer service boundary to increase the total acreage of the service area.

It was previously stated that Type II Amendments would be used when the Manitowoc-Two Rivers-Mishicot Urbanized Area Sewer Service boundary is modified to accommodate land for new development over the next 20 years, or for municipalities that are experiencing growth in excess of that projected in the sewer service plan. In addition, the plan will be reviewed every two and a half years and updated every five years to incorporate modifications to the service boundary based upon unanticipated growth occurrences. When a Type II Amendment is made, the following procedure is used (a flow diagram of this procedure is shown in Figure 7.2):

1. If the municipality receives a development petition that requires the expansion of the sewer service area, a boundary amendment petition is submitted to the municipality. If the municipality seeks to expand the sewer service boundary beyond the allotted acreage, a petition shall be sent to the Bay-Lake RPC and TAC for review. The petitioner's request should include:
 - a) Comparisons of population projections of the sewer service plan with actual population increases in the municipality.
 - b) Comparisons of land acreage projections in the plan with the actual amount of vacant land.
 - c) Provide data on the current development density of the municipality.
 - d) Supply information on the capacity of existing sewer lines and treatment facilities to serve the area proposed for additions to the sewer service boundary.The petitioner's request shall include a check for \$1,500 to the Bay-Lake Regional Planning Commission to assist with costs associated with the development of the staff report prepared for the DNR.
2. The Bay-Lake RPC conducts an initial review, develops a recommendation, compiles information for the TAC, and forwards the request to the TAC. The TAC reviews the request and develops a recommendation to the DNR.

3. Within 60 days of the Bay-Lake RPC receiving a completed amendment application, the TAC holds a public meeting and public hearing on the petition following publication of a Class 1 Notice according to s. 985, Wis. Stats. The public notice shall be published in the official paper of the municipality affected by the request. All costs associated with the preparation and publishing of the public notice shall be borne by the petitioner.

Representatives submitting the petition, Bay-Lake RPC staff, DNR staff, and interested citizens may testify. A record of the public hearing proceedings and testimony shall be maintained by the Bay-Lake RPC on behalf of the TAC.

4. The TAC shall review the recommendations and take final action on the amendment request. All or any part of the petitioned land may be added to the service area along with additional safeguards or conditions deemed necessary by the TAC to carry out the intent of the sewer service area amendment standards.

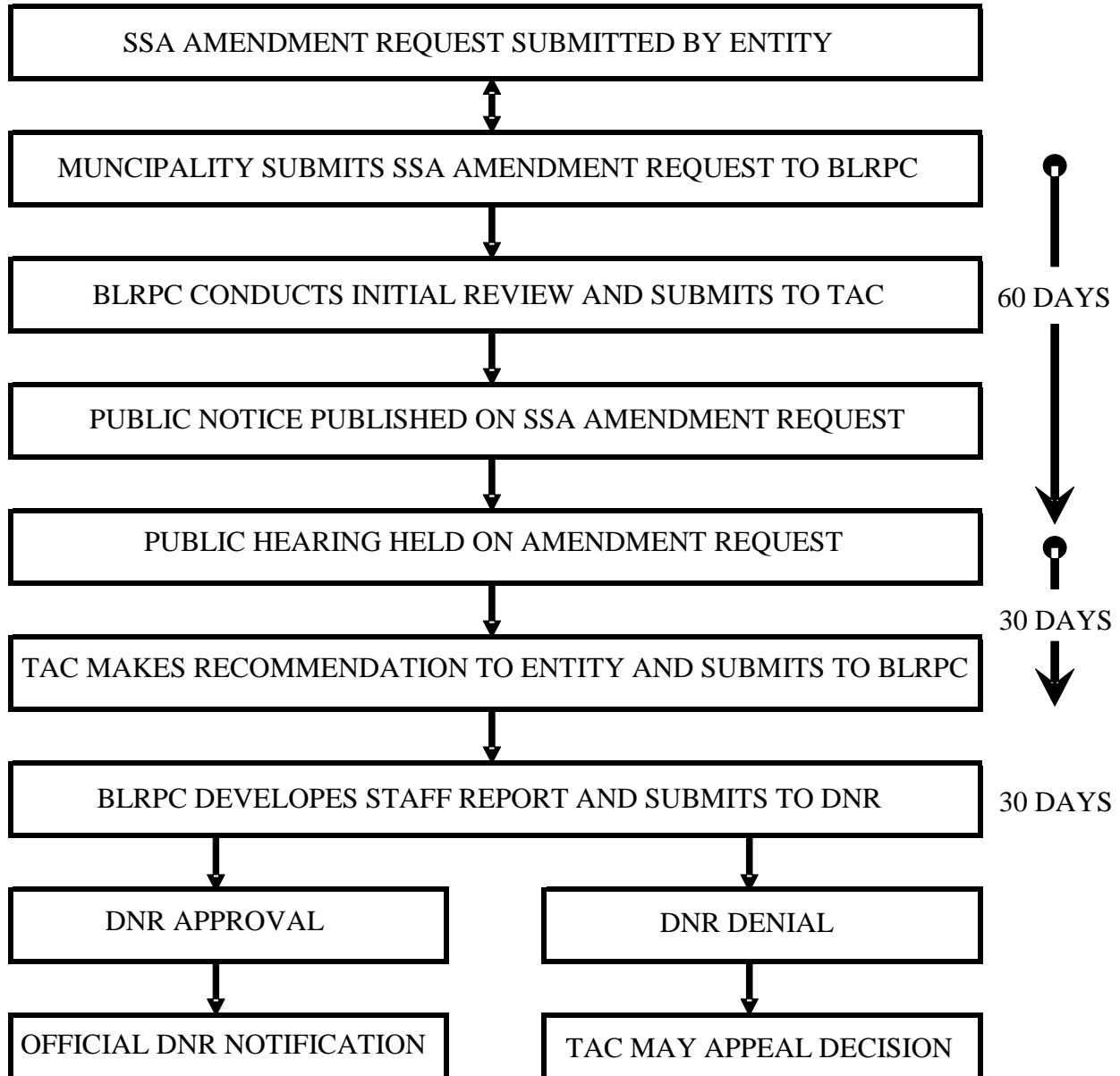
In formulating a recommendation, Bay-Lake RPC and the TAC should consider citizen input received at the meeting; comments from other local committees and the DNR; conformance with community plans; development trends in the area; possible impacts on the physical environment; and conformance with the adopted sewer service plan goals and objectives and the amendment standards. Land recommended for removal from the service area should have a low development potential in terms of recent development trends within the municipality, inadequate urban services, unique environmental features, or poor site conditions due to soils or groundwater. Additionally, signed statements from affected landowners acknowledging withdrawal from the sewer service area will be required.

Amendments approved by the TAC shall be transmitted by Bay-Lake within 30 days of the public hearing.

5. The Bay-Lake RPC shall develop a staff report for the amendment and submit it to DNR within 30 days after the TAC has transmitted their recommendation to the Bay-Lake RPC.
6. The DNR will review the amendment and approve or deny it in writing to the municipality and the Bay-Lake RPC. If the DNR rejects the amendment, their decision may be appealed in accordance with the procedures in s. 227.52 and 227.53, Wis. Stats., which allows for a party to file a petition for judicial review. Approval conflicts between the DNR and the TAC must be resolved before sewer lines are extended into any new area.

Note: The DNR should normally approve the amendment within approximately 45 days unless an environmental assessment (EA) is deemed necessary in accordance with NR 150. If an EA is required, the DNR will prepare it and issue a public notification to allow for receipt of public comments to be considered prior to final approval. When an EA is required, the DNR review period may extend to approximately three months or more. An EA is normally required if the amendment proposal delineates an area of over 1,000 acres that may be served with sewer, or if it may result in the sewered area increasing by more than five (5) percent per year. The DNR may require an EA under any project circumstances if they determine the proposal has the potential to cause significant environmental effects and may involve unresolved conflicts in the use of available resources.

Figure 7.2: Flow Diagram of Procedures for SSA Amendment (Type I and II)



Source: Manitowoc-Two Rivers-Mishicot SSA TAC and Bay-Lake Regional Planning Commission, 2015.

OTHER AMENDMENTS TO THE PLAN

All other portions of this SSA plan (including text, data, and maps) may be amended by the TAC. Proposed amendments shall be submitted to Bay-Lake RPC and forwarded to the members of the TAC at least seven (7) days prior to the meeting at which action on the amendment will be taken. Amendments approved by the TAC will be transmitted to the DNR for review and final approval.

In accordance with NR 113.07(1)(e), proposals for large holding tanks (greater than 3,000 gpd) would require an amendment to the plan.

PLAN UPDATE

A comprehensive review of the *Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan* should be undertaken every 5 years and updated, if necessary; otherwise updated every 10 years, with the first such review and update to be initiated by 2020 and 2025, respectively. The updated should include as a minimum:

1. A review and update of 2015 to 2025 population trends.
2. A review and update of population and demographic projections to the year 2045.
3. A review of population densities, household size, and urban development trends.
4. An assessment of impact from major land use changes or developments.
5. A review of any significant changes to environmentally sensitive lands.
6. A review and revision, if necessary, of the policy statements.
7. A description of relevant events occurring during the preceding five years.
8. A description of amendments to the plan and service area boundaries that were made during the preceding five years.
9. A review and revision of service area boundary extended to accommodate the area's population for the next 25-year planning period.
10. A review of changes in the institutional structure for plan review and implementation.
11. An update on citizen participation efforts.

APPENDIX A: AFFIDAVIT OF PUBLICATION FOR PUBLIC HEARING

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**STATE OF WISCONSIN
BROWN COUNTY**

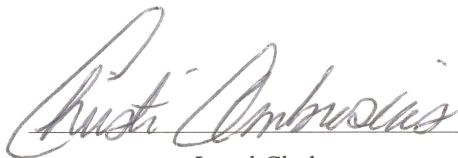
BAY LAKE REGIONAL PLANNING COM

425 S ADAMS ST STE 201
GREEN BAY WI 543014117

I, being duly sworn, doth depose and say I am an authorized representative of the Herald Times Reporter, a newspaper at Manitowoc Wisconsin and that an advertisement of which the annexed is a true copy, taken from said paper, which published therein on:

Account Number: GWM-60121403
Order Number: 0001376594
No. of Affidavits: 1
Total Ad Cost: \$24.75
Published Dates: 06/22/16

(Signed)



Legal Clerk

(Date)

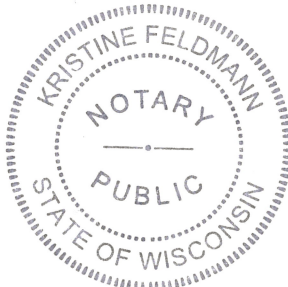
6-22-16

Signed and sworn before me



My commission expires

12-7-19



PLEASE TAKE NOTICE THAT the Manitowoc-Two Rivers-Mishicot Sewer Service Area Technical Advisory Committee will hold an Open House (informational meeting) and Public Hearing on the proposed 2040 Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan. The Open House will be held on July 13, 2016, from 4:00 to 5:30 pm. The Public Hearing will be held at 5:30 pm following the Open House. The meetings will be held at the Two Rivers City Hall at 1717 E Park St in Two Rivers, WI in the City Council Chambers Room. A complete draft of the 2040 Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan is available for review online at www.tinyurl.com/SSA-Plan and in hard copy at the following locations until July 13, 2016:

- Manitowoc City Hall, Engineering Office, 900 Quay St, Manitowoc, WI 54220
- Two Rivers City Hall, Engineering Office, 1717 E Park St, Two Rivers, WI 54241
- Mishicot Village Hall, 511 E Main St, Mishicot, WI 54228

Your comments are welcome and encouraged at the open house and the public hearing. Questions and/or comments can be addressed to Angela Kowatzek-Adrians at Bay-Lake Regional Planning Commission, (920) 448-2820 or angelaka@baylakerpc.org.
RUN: June 22, 2016 WNAXLP

BAY LAKE REGIONAL PLANNING COM

Re: Open House

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APPENDIX B: TAC APPROVAL DOCUMENTATION

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MINUTES

Technical Advisory Committee Manitowoc-Two Rivers-Mishicot Sewer Service Area

July 13, 2016, 5:42 PM – 5:49 PM

Two Rivers City Hall
Council Chambers
1717 E Park St
Two Rivers, WI

Members Present: Dan Koski (Manitowoc), James McDonald (Two Rivers), John Tulachka (Mishicot alternate), and Scott Ahl (Two Rivers alternate)

Members Excused: Tim Ryan (Manitowoc County), Larry Hlinak (Mishicot)

Others Present: David Gerdman (WDNR)

Staff Present: Jeff Agee-Aguayo for Angela Kowalzek-Adrians (BLRPC)

Agenda Item 1: Introductions were not needed.

Agenda Item 2: Agenda was reviewed.

Agenda Item 3: Notes were reviewed from the previous meeting.

Agenda Item 4: No public input was received.

Agenda Item 5: (Action Item) Moved by McDonald, seconded by Koski, to approve the *2040 Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan*. Unanimously approved.

Agenda Item 6: Meeting was adjourned at 5:49 PM.

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APPENDIX C: DNR APPROVAL DOCUMENTATION

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September 16, 2016

DNR File No. BL-0015

Angela Kowalzek-Adrians
Natural Resources Planner
Bay-Lake Regional Planning Commission
425 S Adams Street, Suite 201
Green Bay, Wisconsin 54301

Subject: 2040 Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan

Dear Ms. Kowalzek-Adams:

We have completed our review of the 2040 Manitowoc-Two Rivers-Mishicot Sewer Service Area Plan update. The Department hereby approves the plan update. The 2040 sewer service area contains 26,522.3 acres. While the boundaries of the sewer service area are changing, the plan update does not increase the acres in the sewer service area.

Bay-Lake RPC formed a Technical Advisory Committee for the plan update. The City of Manitowoc, City of Two Rivers, Village of Mishicot, and Manitowoc County were represented on the committee. WDNR's David Gerdman also served on the committee as an ex-officio member. Bay-Lake RPC held a public hearing on the plan update on July 13th, 2016.

The Wisconsin Department of Natural Resources (WDNR) first received the Manitowoc-Two-Rivers-Mishicot SSA Plan from the Bay-Lake Regional Planning Commission (Bay Lake RPC) on July 20th, 2016. Following our review, WDNR asked Bay Lake RPC to provide a map outlining the environmentally sensitive areas, and mark the locations of wastewater treatment plants on the SSA boundary map. Bay Lake RPC provided this additional information on September 8th, 2016.

The plan update will be forwarded to the US Environmental Protection Agency to meet the requirements of the Clean Water Act of 1987 (Public Law 92-500 as amended by Public Law 95-217), and outlined in the federal regulations 40 CFR, Part 35.

This review is an integrated analysis action under s. NR 150.20(2)(a)3, Wis. Adm. Code. By means of this review, the Department has complied with ch. NR 150, Wis. Adm. Code, and with s. 1.11, Stats.

The approval of this plan update does not constitute approval of any other local, state, or federal permit that may be required for sewer construction or associated land development activities.

Appeal Rights:

Wisconsin statutes and administrative rules establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to sections 227.52 and 227.53, Wis. Stats., a party has 30 days after the decision is mailed, or otherwise served by the Department, to file a petition with the appropriate circuit court and serve the petition on the Department. Such a petition for judicial review must name the Department of Natural Resources as the respondent.

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BAY-LAKE REGIONAL PLANNING COMMISSION

www.baylakerpc.org

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cwojtczak@baylakerpc.org

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Transportation Planner

jagee@baylakerpc.org

Angela M. Kowalzek-Adrians

Natural Resources Planner

AngelaKA@baylakerpc.org

Richard J. Malone

Office Accounts Coordinator

rmalone@baylakerpc.org

Brandon G. Robinson

Community Assistance Planner

brobinson@baylakerpc.org

Joshua W. Schedler

GIS Coordinator

jschedler@baylakerpc.org

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