Technical Report No. 78

Manitowoc - Two Rivers Urbanized Area

2015, Areawide Sewer Service Area Plan

Prepared By:

Bay-Lake Regional Planning Commission

Manitowoc-Two Rivers Urbanized Area
2015 Areawide Sewer Service Area Plan

May 2002

Prepared By:
Bay-Lake Regional Planning Commission
211 North Broadway, Suite 211
Green Bay, WI 54303

For:
The Wisconsin Department of Natural Resources
Approved: December 16, 2002
Amended July 8, 2003

Technical Report 78
Contract 52023

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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December 16, 2002

Marty Holden, Director
Bay Lake Regional Planning Commission
Suite 211 Old Fort Square
211 North Broadway
Green Bay, WI 54303

SUBJECT: Manitowoc/Two Rivers Sewer Service Area Plan

Dear Mr. Holden:

We have completed our review and approve of the Manitowoc -Two Rivers Urbanized Area 2015 Sewer Service Area Plan. The municipalities involved should ensure that water quality is protected during implementation of the plan.

The approval of this plan does not constitute approval of any of the following:

- o private sewage systems pursuant to Chapter ILHR 83, (WI Admin. Code),
- o sewer extension pursuant to Chapter NR 110, (WI Admin. Code),
- o authority to alter the bed or banks of any navigable waterway (Chapter 30, WI Stats.),
- o certification for any wetland alteration (Section 401, Federal Water Pollution Control Act, and NR 103, 299, WI Admin. Code).

Those approvals must be obtained separately from the respective agencies. In addition, storm water management plan development is required for any construction site activity disturbing five or more acres of land pursuant to Chapter NR 216 (WI Admin. Code). Any person aggrieved by this approval has the right to appeal the decision. Wisconsin Statutes and Administrative Code establish time periods within which requests to review Department decisions must be filed. For judicial review of a decision pursuant to s. 227.52 and 227.53, Wisconsin Statutes, a petition for review must be filed within 30 days after service of the decision. The respondent in an action for judicial review is the Department of Natural Resources. This notice is provided pursuant to s. 227.48(20), Wisconsin Statutes.

Sincerely,

Charles Ledin

Charles R. Ledin, Section Chief
Great Lakes & Watershed Planning Section
Bureau of Watershed Management

c. Gus Glaser, NER

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CHAPTER 1: INTRODUCTION

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 WDNR), to prepare Areawide Water Quality Management Plans.

State and Federal regulations also 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 208 Municipal Point Source Plan, more commonly known as a Sewer Service Area Plan.

In addition to the preparation of the Sewer Service Area Plan, a second key element of the Clean Water Act is Section 201, which requires the preparation of a facility plan. A 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 Sewer Service Area Plan form the municipal point source element of the *areawide water quality management plan*.

After the plan is approved by the WDNR, 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.

The Wisconsin DNR approved this plan on December 16, 2002. In May 2003, the plan was amended based on a request from the city of Two Rivers to change the Sewer Service Area Boundary to coincide with the existing 2002 city limits. The request was made prior to approval by the WDNR, but was not forwarded to the Technical Committee for review until 2003. Subsequently, a Public Hearing was held on July 8, 2003 to approve the amendments to the plan requested by the city of Two Rivers. No comments were received at the Public Hearing. The TAC voted to approve the amendments and forward the plan to the Bay-Lake Regional Planning Commission and WDNR for final approval.

BACKGROUND OF PLANNING NEEDS

The eastern portion of Manitowoc County along Lake Michigan is unique in many respects. Abundant natural resources are located along the shores of Lake Michigan and are vital to preserving the water quality of the area. The Manitowoc-Two Rivers urbanized area has been experiencing steady population and development growth over the past 40 years. The populations for these two cities and the adjacent townships recorded a total population of 55,737 persons according to the 1990 census. This is the largest urbanized area within the Bay-Lake Regional Planning Commission (BLRPC) area that does not yet have a sewer service area plan. It was felt by the Wisconsin Department of Natural Resources (WDNR) and BLRPC that continued growth and development could lead to significant negative impacts on the water quality and natural resources within the study's boundaries and adjacent lands. In addition, the Manitowoc River and other tributaries leading to Lake Michigan, along with wetlands and habitat areas, may be impacted significantly if efforts are not made to protect them from future development. In order to accommodate any future development in a logical manner and provide municipal services while preserving the existing natural resources, the WDNR has required that an *areawide sewer service plan* be developed.

Additional areas were included into the original planning area that are outside the two city's municipal limits because these areas could theoretically connect to the wastewater treatment facilities located in the city of Manitowoc or city of Two Rivers. This plan was established in response to the previously stated issues and concerns and will serve the following purposes:

1. Project future needs for sewer service and establish the geographic extent of the sewer service area for the year 2015.

2. Provide technical data for designing cost effective and environmentally sound sewage treatment configurations for the planning area.

3. Identify and protect sensitive environmental areas as environmental corridors or environmentally sensitive areas (ESAs) to improve the quality of both surface and ground waters by permitting no sewer developments in these areas.

4. Define the procedures for reviewing boundary and plan amendments and sewer extensions.

5. Serve as a guideline for government interaction and development of community plans.

6. Provide a basis for community officials to direct community growth without urban sprawl and protect environmental, social and economic concerns.

The delineation of a sewer service area not only identifies those areas eligible to receive sanitary sewer service, but also identifies and protects natural and environmentally sensitive areas from future development and indiscriminate urban growth. Such areas include, but are not limited to, areas of steep slope, floodways, shorelands, and wetlands. Wastewater treatment facilities could then be designed to provide adequate treatment capacity for the anticipated population growth in 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 20-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 area in the most cost-effective and environmentally sound manner.

The service area in this plan is delineated with the aid of the 20-year population projection, an acceptable residential population density, and a forecast of non-residential (i.e., commercial, 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. Land included in the service area is deemed eligible to receive sewer service; however, the governmental entities providing sewer service are not obligated to serve specific areas. This plan anticipates, however, that areas identified within the boundary will be served during the next twenty years, with the caveat that changes in the population or housing trends may call for modifications or amendments to the plan during the same period.

Sanitary sewers represent perhaps the greatest catalyst to development within an area. Orderly land use and organized community growth are directly dependent upon the orderly 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 fashion.

Upon approval of the *Manitowoc-Two Rivers Sewer Service Area Plan* by the Wisconsin Department of Natural Resources, permits for wastewater treatment facilities, facility plans, interceptors, and sewer extensions must be in conformance with the plan. The Bay-Lake Regional Planning Commission with assistance from the *Sewer Service Area Plan Technical Advisory Committee (TAC)* shall serve as the local 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 projects 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 provides an equitable and logical means for responding to changing physical, social and economic conditions. These boundary amendments are subject to WDNR review and approval. In addition, an update of this 208 Municipal Point Source Plan should be undertaken every five years to address changing conditions in community growth patterns and incorporate new information in the sewer service area amendment process.

DELINEATION OF THE PLANNING AREA

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

1. The area that potentially could be provided with public sewer service.

2. The recognition of extraterritorial powers for zoning, 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 that water quality problems are areawide concerns.

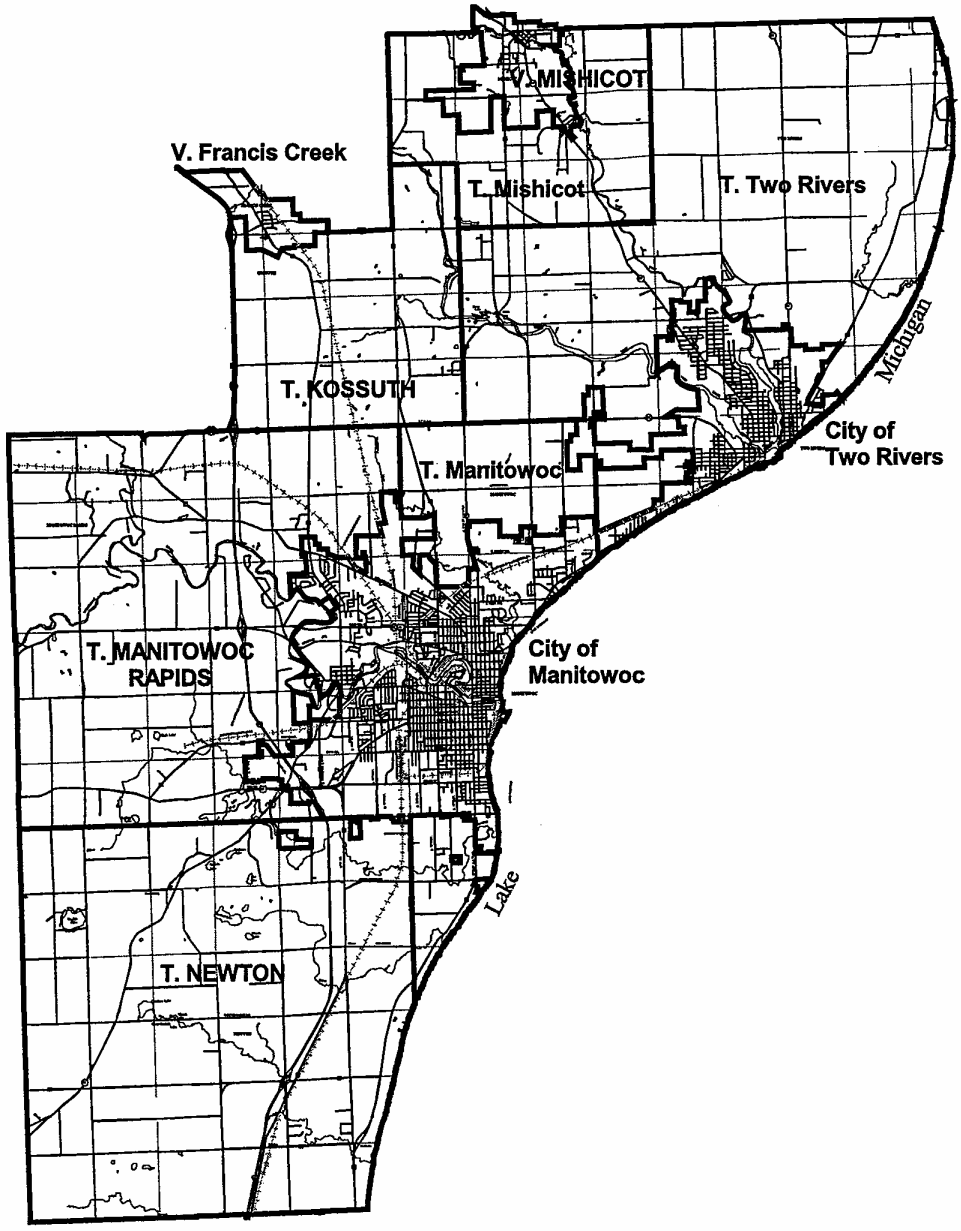
6. The locations of existing sanitary districts and failing on-site wastewater treatment systems.

Based on these criteria, the planning area for the *Manitowoc-Two Rivers Sewer Service Area Plan* includes sixteen municipalities, and approximately 94,700 acres, of land within eastern Manitowoc County and includes portions of the towns of Kossuth, Manitowoc, Manitowoc Rapids, Newton, and Two Rivers; the villages of Francis Creek and Mishicot; the cities of Manitowoc and Two Rivers; and the sanitary districts of Branch, English Lake, Rockwood, Shoto, Silver Creek, Holy Family Convent, and Silver Lake. The planning area, as well as the municipalities contained within it, are depicted on Map 1.

Map 1

Manitowoc & Two Rivers Planning Area

Manitowoc County, Wisconsin



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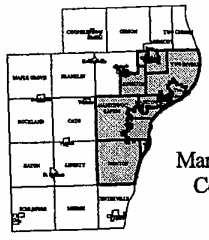
Minor Civil Division Boundaries

Source: Bay-Lake Regional Planning Commission, 2001.



Manitowoc County

PLAN CONTENTS

Chapter One:
This chapter contains the introduction and delineation of the planning area.

Chapter Two:
This chapters documents the plan's goals, objectives and policies regarding sewer service area planning.

Chapter Three:
This chapter presents a brief discussion of the planning area's wastewater treatment facilities.

Chapter Four:
This chapter presents the results of a 1997 land use inventory conducted by the Bay-Lake RPC, an inventory of natural features in the planning area, and the definition and mapping of environmentally sensitive areas that are unsuitable for the installation of waste water treatment systems.

Chapter Five:
This chapter presents population, housing and employment forecasts and a land use allocation required to meet the forecasted demands. This technical information provides a basis from which local decision makers can forecast their growth needs for a sewer service area boundary.

Chapter Six:
This chapter presents the delineated sewer service area for the cities of Manitowoc and Two Rivers.

Chapter Seven:
This chapter contains an outline of the plan's implementation and institutional structure. It sets forth the procedures for amending and updating the plan.

CHAPTER 2: GOALS, OBJECTIVES, AND POLICIES

INTRODUCTION

An early task in any planning process is to establish the goals and objectives that will provide the direction and a framework for the development of policies which lead to final plan implementation. The goals are a statement of direction, while the objectives consist of measurable results that determine if the goals are being attained. Policy statements are guidelines for action that achieve the goals and objectives.

The diversity of local community interest requires that common concepts are established for the sewer service area 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, and economic development. These goals and objectives are based off those region wide goals and objectives that BLRPC uses as a base to ensure consistency in its planning efforts on a local and regional scale.

ESTABLISHED GOALS, OBJECTIVES AND POLICIES

GOAL 1:

Guide the future growth within the defined sewer service area and beyond in an efficient and orderly manner to promote contiguous and ultimately compact development 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 the municipalities.

POLICIES:

1. The Manitowoc/Two Rivers Urbanized Area Sewer Service Plan should be reviewed and updated every five years to assess population, household and land use conditions and trends.

2. Sewer extensions that conform to the sewer service area plan, the municipalities sanitary extension master plans and integrate into the ultimate development of compact and contiguous development shall be given priority.

3. Sewer extensions should not be made beyond the 20-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.

5. Sewer extensions should be used as an important tool to implement community plans and growth policies.

OBJECTIVE 2:
Provide sufficient land area for reasonable future development of municipalities as prescribed by Wisconsin Administrative Code, NR 121.

POLICIES:
1. Community plans should be developed, adopted and updated every five 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:
Guide future 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:
By encouraging future rural developments to locate in those areas that are suitable for on-site sewage disposal systems. 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 area 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 Zoning 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 mock 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 environmental corridors 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 plan's designated environmental corridors, as defined by BLRPC.

2. Encourage developers to follow Wisconsin Best Management practices for stormwater management, as well as local ordinance, policy and applicable State of Wisconsin regulations such as NR 216.

3. Sewer extensions to natural areas not included in environmental corridors should conform to applicable rules and regulations, which include Wisconsin Administrative Codes NR 116 for shorelands and

floodplains, NR 115 and 117 for wetlands and NR 121 for environmental corridors, and should be reviewed on a case by case basis.

4. Sanitary sewer extensions into areas identified as containing prime agricultural and forest land 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 should not be permitted in areas identified as being in an environmental corridor unless the extension is to serve uses which are compatible with the corridor designation, such as public parks and outdoor recreation facilities or unless the extension must pass through the environmental corridor to serve areas that lie beyond the environmental corridor.

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 contiguous to existing sewered development should be given priority for sewer extension.

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/pollution problems at the outer fringe of the service area.

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 should be designed and constructed employing the local municipality's engineering standards, and should be consistent water quality and environmental criteria of the State of Wisconsin.

GOAL 5: To Minimize public sewerage service costs.

OBJECTIVE 1: Plan sewer service extensions.

POLICIES:

1. Avoid duplication of facilities.

2. Establish 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:

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

CHAPTER 3: EXISTING WASTEWATER TREATMENT SYSTEMS

INTRODUCTION

This chapter outlines the current wastewater treatment facilities (WWTF) and collection systems which existed throughout the planning area during the initial phase of the plan, as well as an overview of the conditions within each existing sanitary district and the status of their planning efforts for wastewater treatment

INVENTORY OF EXISTING WASTEWATER TREATMENT SYSTEMS

There are twelve sanitary districts within the planning area that either have their own treatment facilities or are in different stages of planning new collection systems or expanding existing ones to accommodate wastewater demands. The following descriptions give information related to each sanitary district's facilities and their planning status.

City of Manitowoc

The Manitowoc Wastewater Treatment Facility is located at 1015 S. Lakeview Drive, and was built in 1977. The plant utilizes a two-stage, high-rate trickling filter process and was first substantially expanded in 1977, which included the addition of plastic media trickling filters, secondary clarifiers, tertiary filters and chlorination system. In 1992 the plant was upgraded by adding a dechlorination system. This system currently has a design flow of 15.5 million gallons per day (MGD) and 37,000 pounds per day BOD_5. The WWTF currently serves 34,469 people and discharges into Lake Michigan (500 feet from shore) under WPDES Permit No. WI-0024601. In 1998 the WWTF received an average of 9.08 MGD and 20,600 pounds of BOD_5 per day; in 2,000 the plant received an average of 8.39 MGD and 20,044 pounds of BOD_5 per day. The WWTP permit No. WI-0024601 expired September 30, 2000.

The Manitowoc Wastewater Treatment Facility will continue to expand its services and continue to modernize in the future. A $16.5 million upgrade of the Manitowoc WWTF began in November, 1998 and was scheduled to be completed by March, 2001. This project did not increase the capacity of the treatment works, but instead entailed replacing or renovating outdated, worn out and inefficient structures and equipment in order to improve reliability and efficiency. The project included construction of a new raw wastewater pumping and preliminary treatment, a new primary clarifier to replace the oldest indoor primary clarifiers, a new pump station for the rock media filters, and additional final clarifier, replacement of the primary digester covers, new sludge dewatering (belt-press) facilities, refurbishing the tertiary filters, and various other improvements.

City of Two Rivers

The Two Rivers Wastewater Treatment Facility is located at 1415 Lake Street, and was built in 1978. The plant serves a population of 13,462 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 BOD_5 per day.

The WWTF discharges into Lake Michigan via the Two Rivers Harbor under WPDES Permit No. WI-0026590. In 1998 the WWTF received an average of 1.96 MGD and 2,560 pounds of BOD_5 per day; in 2000 the plant received an average of 1.82 MGD and 2,912 pounds of BOD_5 per day.

The WDNR has indicated that the plant is substantially in compliance with the effluent limits specified in the permit, which expires June 30, 2005.

Holy Family Convent

This private wastewater treatment facility is located at the Holy Family Convent 2409 South Alverno Road, just south of STH 151 and Alverno. 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 1990's that made the facility meet revised disinfection requirements. This system currently has a design flow of 0.100 million gallons per day (MGD) and 170 pounds per day BOD. The WWTF treats waste for the convent only and currently discharges into Silver Lake under WPDES Permit No. WI-0028142. In 1998 the WWTF received an average of 0.030 MGD and 55.0 pounds of BOD_5 per day; in 2,000 the plant received an average of .0496 MGD and 52.8 pounds of BOD_5 per day.

The WDNR has indicated that the plant is substantially in compliance with the effluent limits specified in the permit that expires on March 31, 2003.

Village of Mishicot

The Mishicot WWTF is located on Saxonburg Road. The new treatment plant began operating in 1983 utilizing a two-cell aerated lagoon system with a third-cell for quiescent settling and chlorination. This system currently has a design flow of 0.200 million gallons per day (MGD) with peak being 0.512 MGD, and 315 pounds per day BOD_5. The WWTF treats waste for the village and currently discharges into the East Twin River under WPDES Permit No. WI-0021369. In 1998 the Mishicot WWTF received an average of 0.252 MGD and 371 pounds of BOD_5 per day; in 2000 the plant received an average of .224 MGD and 347 pounds of BOD_5 per day.

The Mishicot WWTF generally complies with permit limits for BOD_5 and TSS. In 2000 average monthly BOD_5 for two out of the 12 months (May and June) exceeded the permit limit of 30 mg BOD_5/ l. Compliance with ammonia limits is only possible due to a variable limit, and compliance with a 1.0 mg/l limit for phosphorus is not feasible, requiring an Alternative Concentration limit for this substance. As a result, and because of the influent loading conditions, the DNR reissued WPDES Permit No. WI-0021369 to the Village with a requirement that planning for WWTF upgrading is completed by March 31, 2003, three months before that permit expires. Subsequent permit reissuance will address completion of construction as needed.

Village of Francis Creek

The Francis Creek Sewage Treatment Plant is located just southwest of CTH V and CTH Q. The treatment facility was constructed in 1982, with start-up in December of that year. There are no significant wet industries within the village so the wastewater contains only domestic wastes. This plant has a design flow of 0.07 million gallons per day (MGD) and 140 pounds per day BOD. In 1998 the WWTF received an average of 0.080 MGD and 125 pounds of BOD_5 per day; in 2000 the plant received an average of .062 MGD and 89 pounds of BOD_5 per day.

The plant discharges its wastes to groundwater of the Twin River Drainage Basin in Manitowoc County via a single seepage pond.

Groundwater monitoring has revealed that the Francis Creek WWTF is apparently adversely impacting groundwater quality down-gradient from the seepage pond. Groundwater standards which are exceeded include: 1) Both the Preventive Action Limit (PAL) and the Enforcement Standard for Chloride; 2) The PAL for Total Dissolved Solids; and 3) The PAL for Nitrate/Nitrite (though by a very small amount). There is a potential for impact on downgradient water users (the homes to the east along CTH Q), though it seems a remote possibility given the distance and the fact that the adjacent stream flows between those homes and the WWTP site. The concentration of Chloride and Total Dissolved Solids does not suggest a public health problem, but instead more of an aesthetic problem. Steps must be taken to reduce the concentration of these constituents in the groundwater, but it is not an emergency.

Consequently, the DNR required the Village of Francis Creek to initiate Facilities Planning to address correction of the exceedances of groundwater standards. Several alternatives have been evaluated, including the following: 1. Establishment of local limitations on home water softener usage, including a requirement for high efficiency softeners where installed. 2. Construction of a pumping station and force main to the city of Manitowoc for wastewater treatment. 3. Construction of a pumping station and force main to transport treated effluent to the West Twin River for surface water disposal.

Recently, revisions to the Groundwater Standards described in Chapter NR 140, Wisconsin Administrative Code, have been proposed to allow the DNR to grant exemptions for some additional substances. It is unknown if the Village of Francis Creek will qualify for such an exemption, if the proposed rule change is enacted. However, this possibility does exist. Consequently, the DNR recently reissued WPDES Permit No. WI-0021377 to the Village with a time extension for completing the Facilities Planning until March 31, 2001. Like the schedule for the Village of Mishicot, this date is three months prior to permit expiration, and subsequent permit re-issuance will include a compliance schedule for completing any needed construction.

Kossuth SD #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 1990's. This was a completely new collection and treatment system, replacing failed on-site systems for many of the

district residents. This system currently has a design flow of 0.0175 million gallons per day (MGD), and 42.5 pounds per day BOD. The WWTF discharges into the West Twin River via an unnamed tributary under WPDES Permit No. WI-0035874. In 1998 the WWTF received an average of 0.0077 MGD and 11.0 pounds of BOD_5 per day; in 2000, the WWTF received an average of .0092 MGD and 10.1 pounds of BOD_5 per day.

The WDNR has indicated that the plant is substantially in compliance with its effluent limits. Its permit expires September 30, 2004.

Town Sewer Systems

Currently, there are no centralized wastewater facilities within the townships of Manitowoc, Manitowoc Rapids, Newton, and Two Rivers. Wastewater treatment and disposal in these townships (not including the identified sanitary districts) are currently accomplished by on-site septic tanks or holding tanks.

Remaining Sanitary Districts

Within the Manitowoc-Two Rivers planning area, there is but one sanitary district in operation (Rockwood). The remaining sanitary districts (Branch, English Lake, Shoto, Silver Creek, and Silver Lake) 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 on-site septic tanks or holding tanks.

CHAPTER 4: LAND CHARACTERISTICS

INTRODUCTION

Examining the existing land use 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 future growth and development will occur. Additionally, many physical and biological characteristics that affect land development can be identified. Builders, elected officials and property owners need to consider these factors in development proposals to eliminate costly mistakes and a variety of construction or environmental problems. Some of the factors that need to be considered include existing land use(s), 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.

LAND USE IN THE PLANNING AREA

In 1997, BLRPC conducted 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, including the villages of Francis Creek and Mishicot on 1990 1"=800' aerial photography from BLRPC. The data was then transferred onto digital U.S.G.S. Quadrangle base maps and digitized into the Commission's Geographic Information System (GIS) and mapped.

The cities of Manitowoc and Two Rivers were inventoried with the assistance of the local planning and engineering staffs on 1990 1"=800' aerial photographs from Bay-Lake Regional Planning Commission. Through discussions with the local planning and engineering staffs, general land use classifications for the cities were developed and entered into BLRPC's GIS. Through the land use inventorying process, the Bay-Lake RPC developed detailed land use tabulations. These tabulations are summarized in Table 1.

Since this plan is formulated as a reaction to the wastewater treatment concerns in compliance with NR 121 of the cities of Manitowoc and Two Rivers and the areas that could be sewered by the wastewater treatment plants serving theses cities, land use information has been supplied for the entire planning area. Summaries of land use by minor civil division can be found in the appendix of this document.

Table 1: Existing Land Use in SSA Planning Area: 1997

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Source: Bay-Lake Regional Planning Commission, 1997

Notes:

[1] Land Use categories 100 through 700 collectively are referred to as developed and land use categories 800 and 900 collectively are referred to as undeveloped.

[2] Land use is generalized

[3] Rural Area means that portion of the planning area within towns of Kossuth, Manitowoc, Manitowoc Rapids, Newton, and Two Rivers; the villages of Francis Creek and Mishicot.

[4] May exclude lands in parks that are in agricultural use or other open space use. The City of Manitowoc Comprehensive Plan documents that the city has 672 acres of city-owned park and recreation areas and 215 acres of public and private school-related outdoor recreation facilities.

As was outlined within Chapter 1, the planning area for the Manitowoc-Two Rivers Sewer Service Area Plan encompasses portions of the towns of Mishicot and Kossuth; the entire towns of Manitowoc, Manitowoc Rapids, Newton, Two Rivers, villages of Francis Creek and Mishicot, and the Cities of Manitowoc and Two Rivers. The total land area contained within this planning area amounts to approximately 95,000 acres**.** The planning area's two most prevalent land uses are agriculture and natural areas (i.e. woodlands, floodplains, wetlands), comprising 81 percent of the land use; the balance of the land use, 19 percent, is comprised of developed uses. Within the cities of Manitowoc and Two Rivers, the primary land uses are residential and transportation (highways, streets) related, totaling approximately 29 percent and 15 percent of the land use with the cities, respectively.

Residential Land

Within the rural area, approximately 3,591 acres of land, or 4.5 percent of the planning area, is currently in residential land uses. The largest concentrations of residential land is in the villages of Francis Creek and Mishicot, with smaller concentrations in the communities of Shoto, Rockwood, Branch, Newton and around English Lake. There are, however, many scattered subdivisions and developments throughout the planning area. The cities of Manitowoc and Two Rivers total 4,247 acres of residential land, or approximately 29 percent of the land within the cities.

Commercial Land

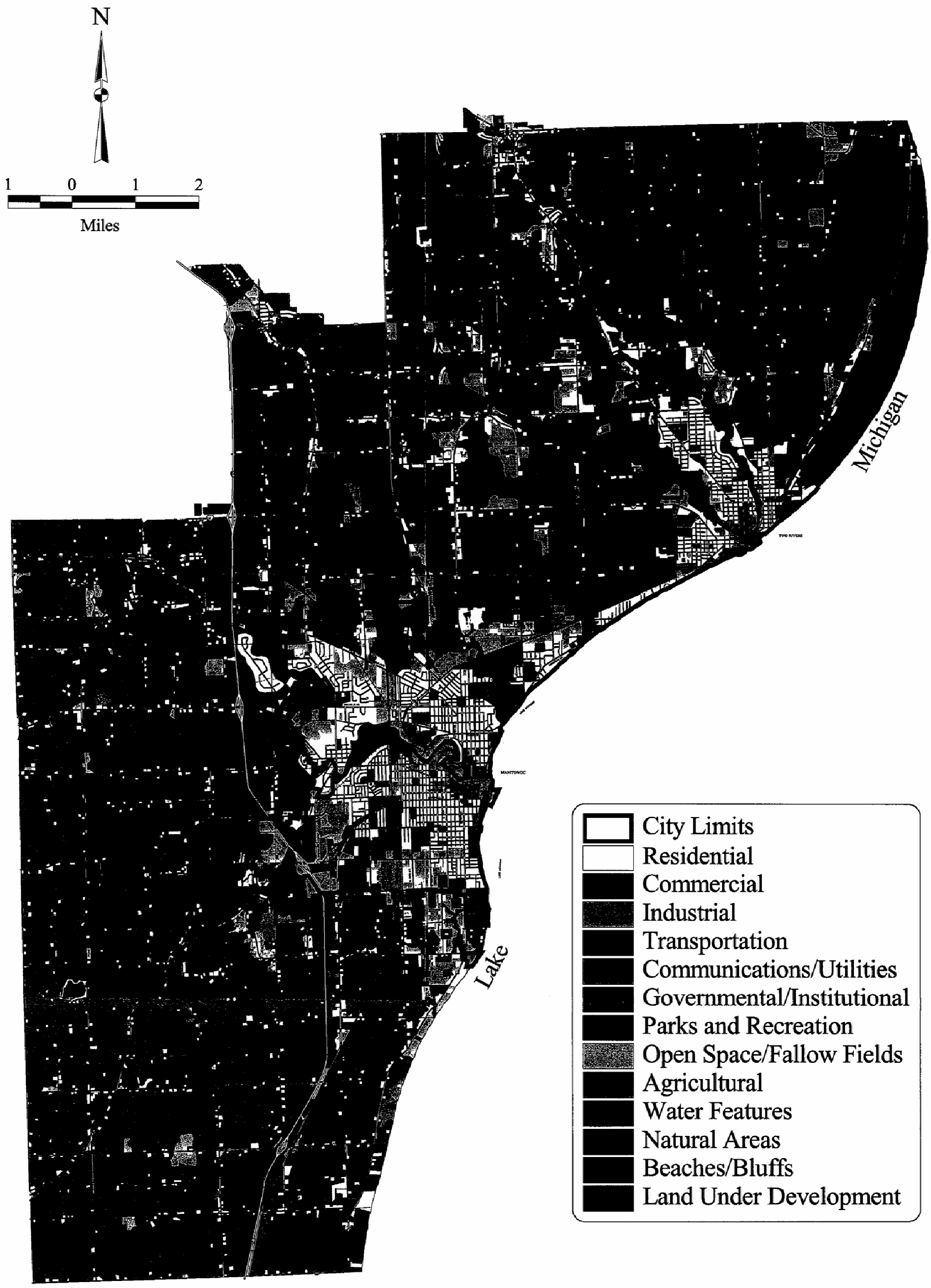
The cities of Manitowoc and Two Rivers contain approximately 526 acres (3.6 percent) of commercial land. The commercial uses are concentrated in the central business districts of the communities and along primary transportation corridors within the cities. Commercial uses, totaling 207 acres (0.3 percent), in the rural area located primarily in the villages of Mishicot and Francis Creek. There are additional commercial uses in the unincorporated communities and in areas near the cities.

Map 2

1997 Land Use

Manitowoc/Two Rivers SSA Planning Area

Manitowoc County, Wisconsin



Source: Bay-Lake Regional Planning Commission, 2001.

Industrial Land

Industrial land within the cities of Manitowoc and Two Rivers covers approximately 1,000 acres of land, or 7 percent of the cities. Industrial land is located in the city of Manitowoc Industrial Park along I-43, east of Rapids Road and along the Manitowoc River. Within the city of Two Rivers, industry is primarily located in the southern portion of the city and in the industrial park on the western edge of the city. The rural area has industrial lands totaling 345 acres or less than one percent of the rural total. The town of Manitowoc Rapids has a small industrial area along CTH R, while the rest of the industrial use in the rural area is largely composed of quarrying activities.

Transportation

Transportation uses within the Manitowoc-Two Rivers sewer service planning area are composed primarily of the road/highway network and comprise about six percent of the total land use or about 5,300 acres. Major transportation features include Interstate Highway 43, the Manitowoc County Airport, the Wisconsin Central Railroad, and harbor and marina facilities.

Transportation land within the cities of Manitowoc and Two Rivers covers approximately 2,200 acres of land, or 14.7 percent of the land use acreage within the cities. Transportation features within the rural area cover approximately 3,100 acres of land, or 3.9 percent of the land use acreage within the rural portion of the planning area.

Communications/Utilities

The cities of Manitowoc and Two Rivers have approximately 77 acres of land in communications or utilities use or less than one percent of their combined area. The majority of the land, (39 acres) is composed of the sewage treatment facilities within the cities. Within the rural area 56 acres, or less that one percent are in communications and utilities use. In total, communications and utilities account for less than one percent of the total planning area.

Institutional/Governmental

The rural area contains approximately 155 acres of land (0.2 percent) within the institutional or governmental use category. The cities of Two Rivers and Manitowoc have approximately 623 acres (4.2 percent) of institutional or governmental land, with the largest area being the Manitowoc County Fairgrounds in the city of Manitowoc. In total, institutional or governmental use land account for less than one percent of the total planning area.

Recreational

The cities of Manitowoc and Two Rivers have large tracts of recreational land, totaling 847 acres (5.7 percent) with the majority in parks and golf courses. Recreational land in the planning area totals 703 acres or less than one percent of the rural area. The major portions of the recreational land in the rural area are in golf courses in the village of Mishicot and near the unincorporated community of Branch. In total recreational land accounts for less than two percent of the total planning area.

Agriculture/Open Space

Within the rural area, agriculture is by far the largest category totaling almost 53,000 acres or 66 percent of the rural area. The cities of Manitowoc and Two Rivers contain approximately 3,100 acres of agriculture/open space lands, or 21 percent of the urban portion of the planning area. Overall, agriculture/open space areas account for over 59 percent of the land use with the planning area

Natural Areas

The natural areas category contains woodlands, water features, beaches/bluffs, as well as wetlands and floodplains. Within the cities, natural areas total about 2,200 acres or 14.8 percent of the urban area portion of the planning area. The natural areas within the rural portion of the planning area total almost 18,700 acres or 23 percent. The rural natural areas are primarily along river corridors and within the Point Beach State Forest. Overall, natural areas account for over 21 percent of the land use with the planning area.

NATURAL FEATURES

This section is intended to provide an inventory of the existing physical and environmental features within the planning area. Builders, elected officials and property owners need to consider how these resources are affected by development in order to eliminate costly mistakes and a variety of construction or environmental problems. Some of the factors which need to be considered include: wetlands, floodways and floodplains, bedrock geology, scientific and natural areas, woodlands, unique wildlife habitats, areas of steep slope, and historic and archeological sites. Many of these features are found in corridors that are located along rivers, streams, shorelines and natural drainageways and are essential to the maintenance of an ecological balance and diversity, as well as for the preservation of the natural beauty of the 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 to the 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, Glomski Lake, Carstens, Lake, Grosschuesch Lake, Waack Lake, Weyer's Lake and Kassbaum Lake.

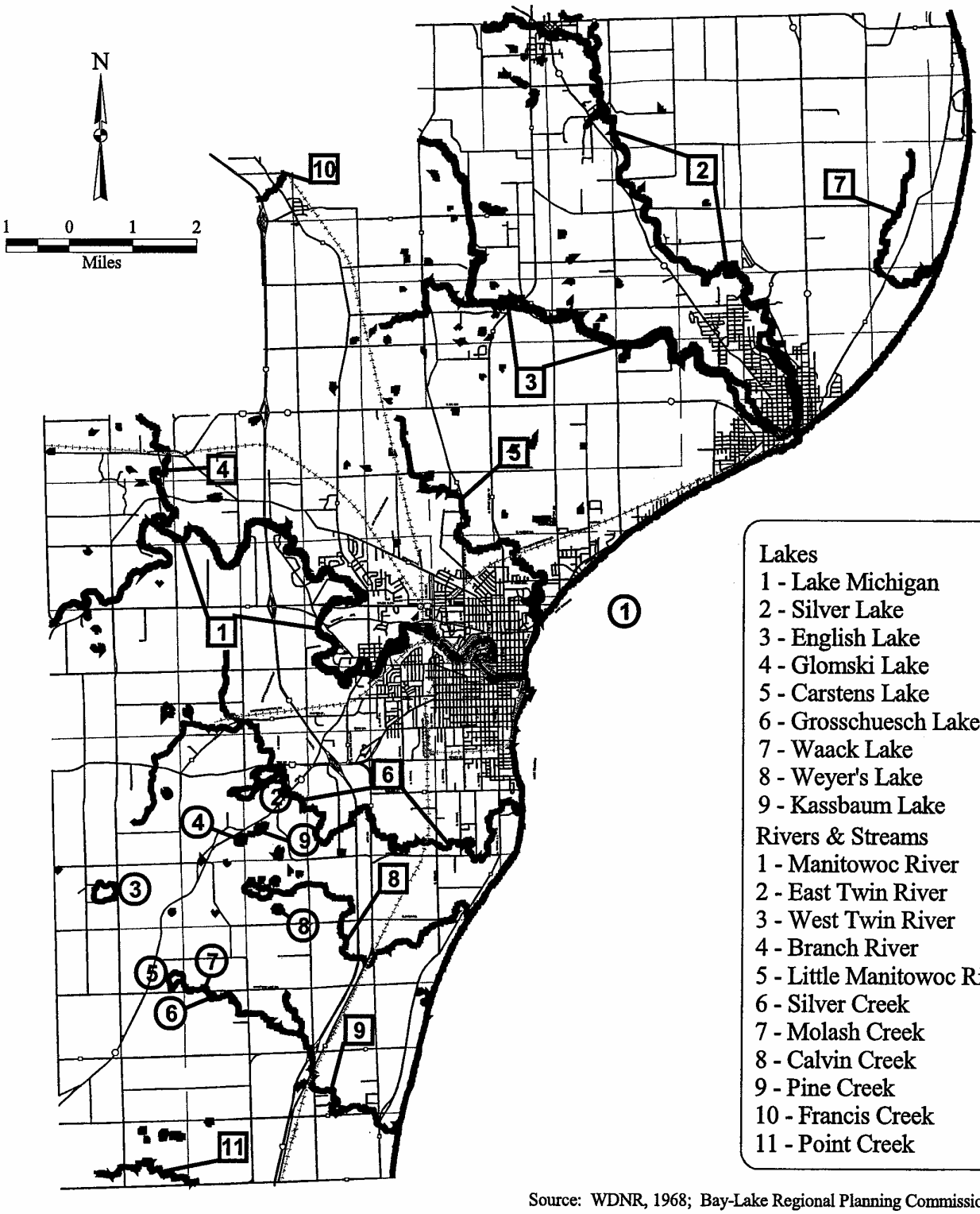
In addition to the numerous lakes in the planning area, there are a number of rivers. The principal river features are the Manitowoc River, which flows from west to east across the planning area and through the city of Manitowoc, and the East and West Twin Rivers that flow from the northwest to the southeast, through the city of Two Rivers. There are also a number of smaller rivers, which help to drain the planning area. These rivers include: Branch River, Little Manitowoc River, Silver Creek, Molash Creek, Calvin Creek and Pine Creek. Some of the larger surface water features are show in Maps 3 and 4.

Surface Water Features

Map 3

Manitowoc/Two Rivers SSA Planning Area

Manitowoc County, Wisconsin



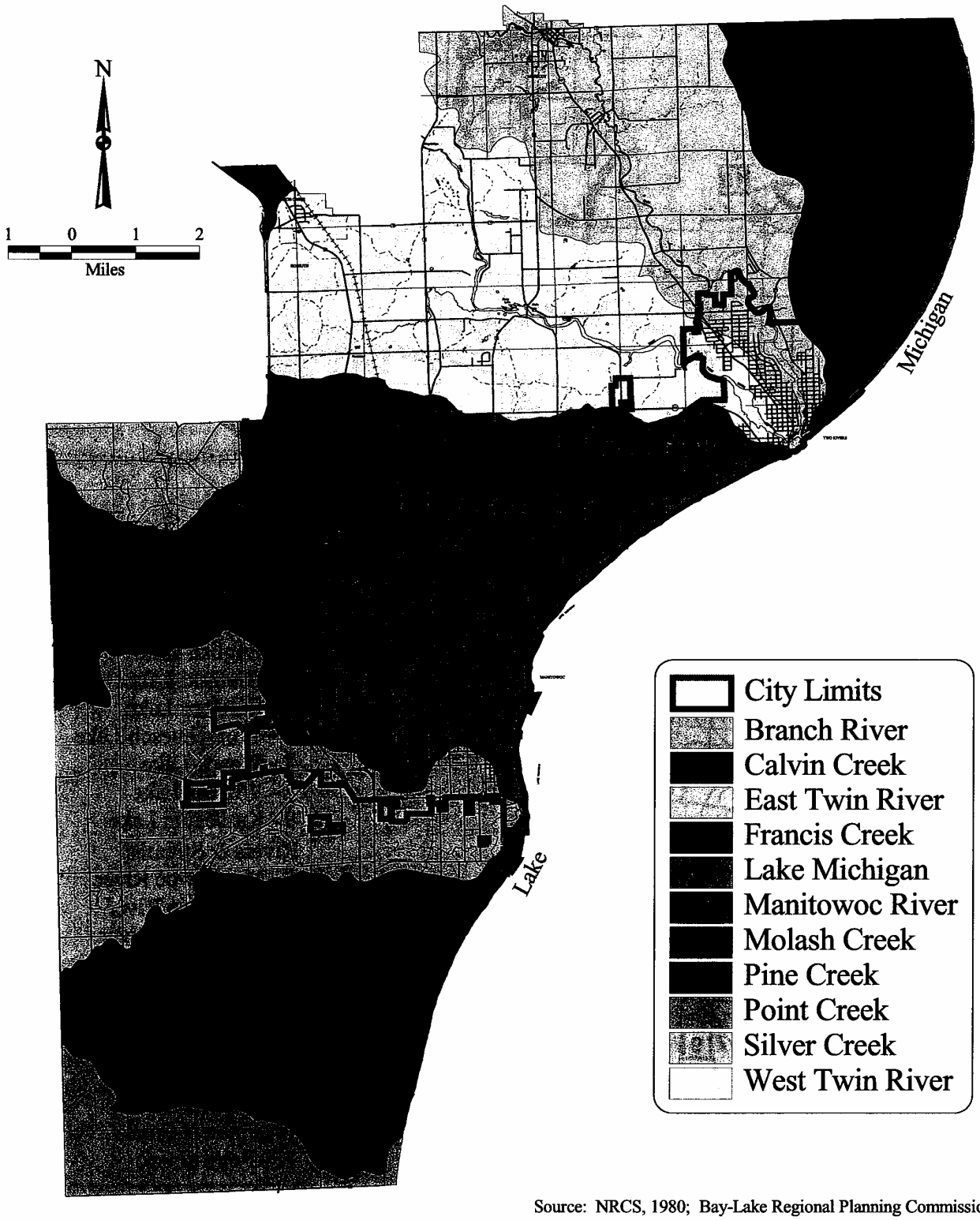
Source: WDNR, 1968; Bay-Lake Regional Planning Commission, 2001.

Watersheds

Map 4

Manitowoc/Two Rivers SSA Planning Area

Manitowoc County, Wisconsin



Source: NRCS, 1980; Bay-Lake Regional Planning Commission, 2001.

There are 11 watersheds in the planning area, and all drain to 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.

Shorelands and Floodplains

Shorelands and floodplains are often viewed as valuable recreational and environmental resources in both urbanized and rural areas. These areas provide for storm water retention and habitat for various types of wildlife unique to the area. Development that is permitted to take place in these areas may have an adverse effect on water quality, wildlife habitat and stormwater drainage. In addition, it may also result in increased development and maintenance costs when providing for protection from the occurrence of flooding and high water, 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 areas is generally permitted but specific design techniques must be considered. Development in 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 59.97 of the Wisconsin Statutes and Wisconsin Administrative Codes NR 115,116, and 117 and is established in the Manitowoc County Zoning Ordinance. Floodplains in the planning area are depicted in Map 5.

Wetlands

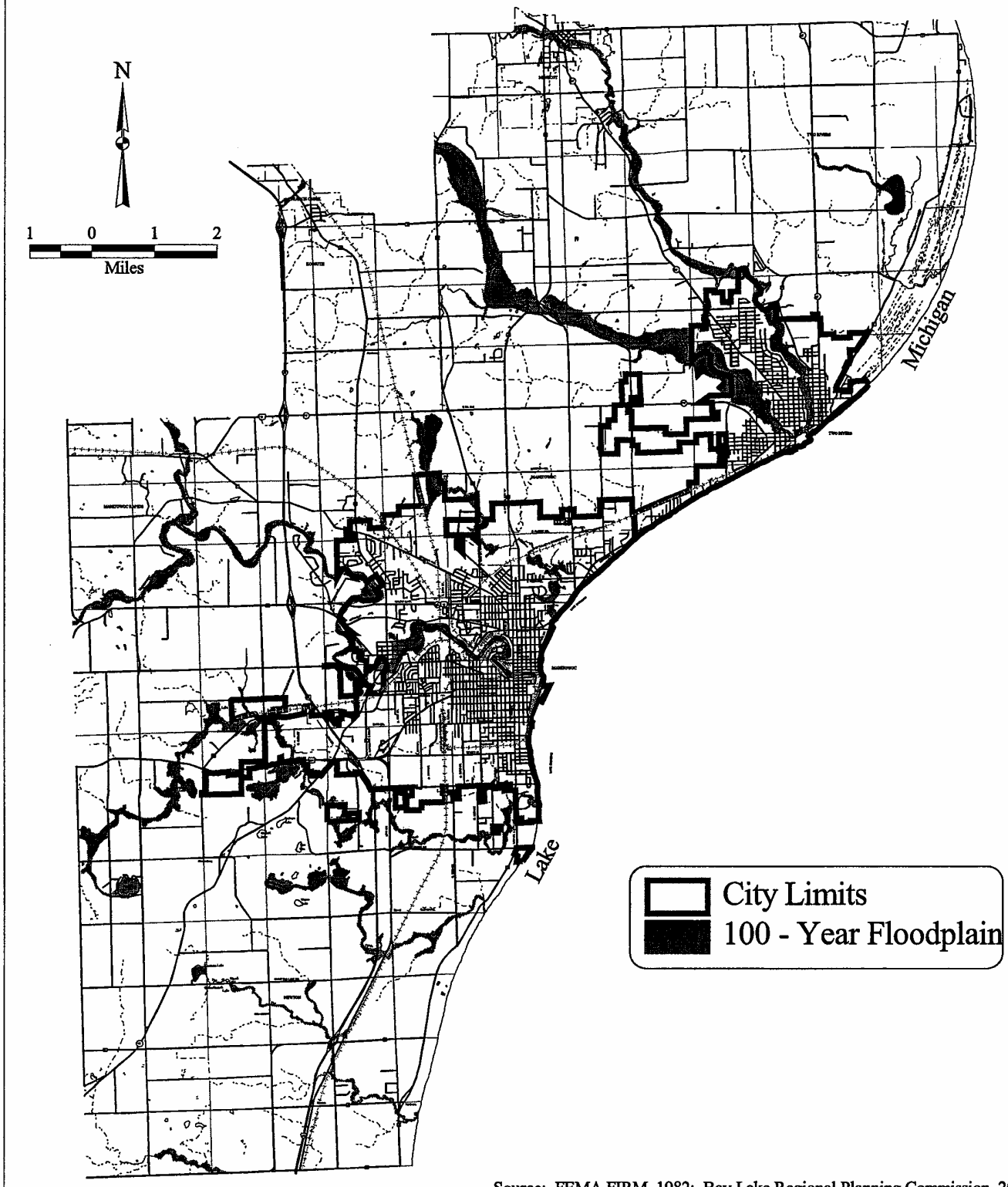
Wetlands are areas where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophilic vegetation and which has soils indicative of wet conditions. Wetlands are important for groundwater recharge and provide habitat for a variety of plants and animals. They also provide natural open space, help maintain both surface and groundwater quality, and provide water storage areas for periods of flooding and high water. Whenever possible, wetlands should be left unaltered. Filling or draining of wetlands is also quite costly, destroys the productive capacity of the ecosystem and can adversely affect surface water quality and drainage. Wetlands in the planning area as identified by the WDNR under Wis. Stats. 23.32 are depicted in Map 6.

Floodplains

Map 5

Manitowoc/Two Rivers SSA Planning Area

Manitowoc County, Wisconsin



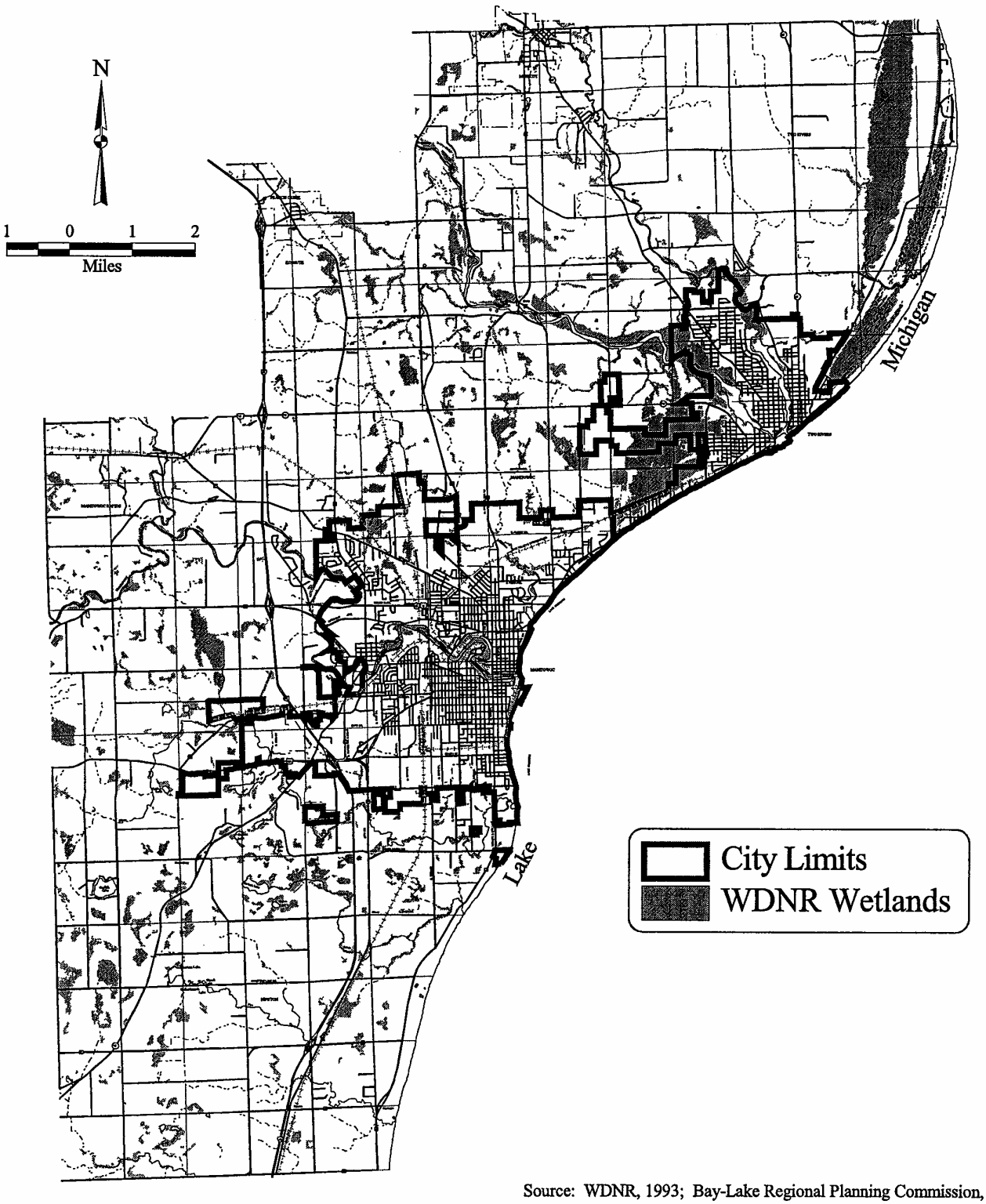
Source: FEMA FIRM, 1982; Bay-Lake Regional Planning Commission, 2001.

Wetlands

Map 6

Manitowoc/Two Rivers SSA Planning Area

Manitowoc County, Wisconsin



Source: WDNR, 1993; Bay-Lake Regional Planning Commission, 2001.

In 1972, Congress passed the Federal Water Pollution Control Act Amendments, also known as the Clean Water Act, "to restore and maintain the chemical, physical, and biological integrity" of the nation's waters. The Act defined "navigable waters" as "waters of the United States." Section 404 of the Clean Water Act established a permit program regarding discharges of dredged and filled material. In 1977, the U.S. Army Corps of Engineers issued final regulations on the Section 404 program and explicitly included "isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not part of a tributary system to interstate waters or to navigable waters of the United States, the degradation or destruction of which could affect interstate commerce. The basic premise of the program is that no discharge or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. Activities that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. When a permit is applied for in conjunction with any of these activities, the applicant must show that he has: 1) taken steps to avoid wetland impacts where practicable, 2) minimized potential impacts to wetlands, and 3) provided compensation for any remaining unavoidable impacts through activities to restore or create wetlands. The permit process is often accompanied by a field review of the site.

Wisconsin Administrative Codes NR 115 and NR 117 fall under the jurisdiction of the Wisconsin Department of Natural Resources and mandate that shoreland wetlands be protected in both the rural and urban areas of the state. In the unincorporated areas, NR 115 provides the legislation to protect wetlands of five acres or more that are within the jurisdiction of county shoreland zoning ordinances. This wetland provision would be applicable in the towns of Kossuth, Manitowoc, Manitowoc Rapids, Newton, and Two Rivers. To protect wetlands in the incorporated areas, NR 117 was enacted in 1983 and requires that all shoreland wetlands of five acres or more be protected. This wetland provision would be applicable in the villages of Francis Creek and Mishicot and the cities of Manitowoc and Two Rivers. As a result of NR 115 and 117, many of the wetlands that remain today will be protected from future development.

The Manitowoc-Two Rivers Sewer Service Area has two very large wetland complexes. North of the city of Two Rivers is a large wetland within Point Beach State Forest consisting of wooded ridge-swale topography. Two portions of this area, the Wilderness Ridge and Point Beach Ridges, have been identified by the Wisconsin Coastal Management Program and the Wisconsin Department of Natural Resources as state natural areas which contain intact native plant and animal communities believed to be representative of the pre-settlement landscape. In addition to the Point Beach area, there is a large wetland between the cities of Manitowoc and Two Rivers, which has also been identified as a state natural area. It is one of the largest river marshes along Lake Michigan, and provides a vital stop over for many species of birds during migration periods. Besides the two largest wetland complexes, there are many scattered throughout the planning area and especially concentrated along river and stream corridors and headwaters. Wetlands within the planning area total 9,203 acres, or 9.7 percent of the entire planning area.

Topography and Steep Slope

The topography within the sewer service study 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 also two areas where there are concentrations of hills and steep slopes, reaching elevations of 790 feet as compared to the Lake Michigan elevation of approximately 580 feet above sea level. One of these areas is between Silver Lake and Hartlaub Lake, southwest of the city of Manitowoc. Another area of steep slopes is between STH 42 and English Lake, near Newtonburg (see Map 7).

Bedrock and Glacial Geology

The entire sewer service study area is underlain by undifferentiated dolomites, ranging in depth from 0 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 (see Map 8).

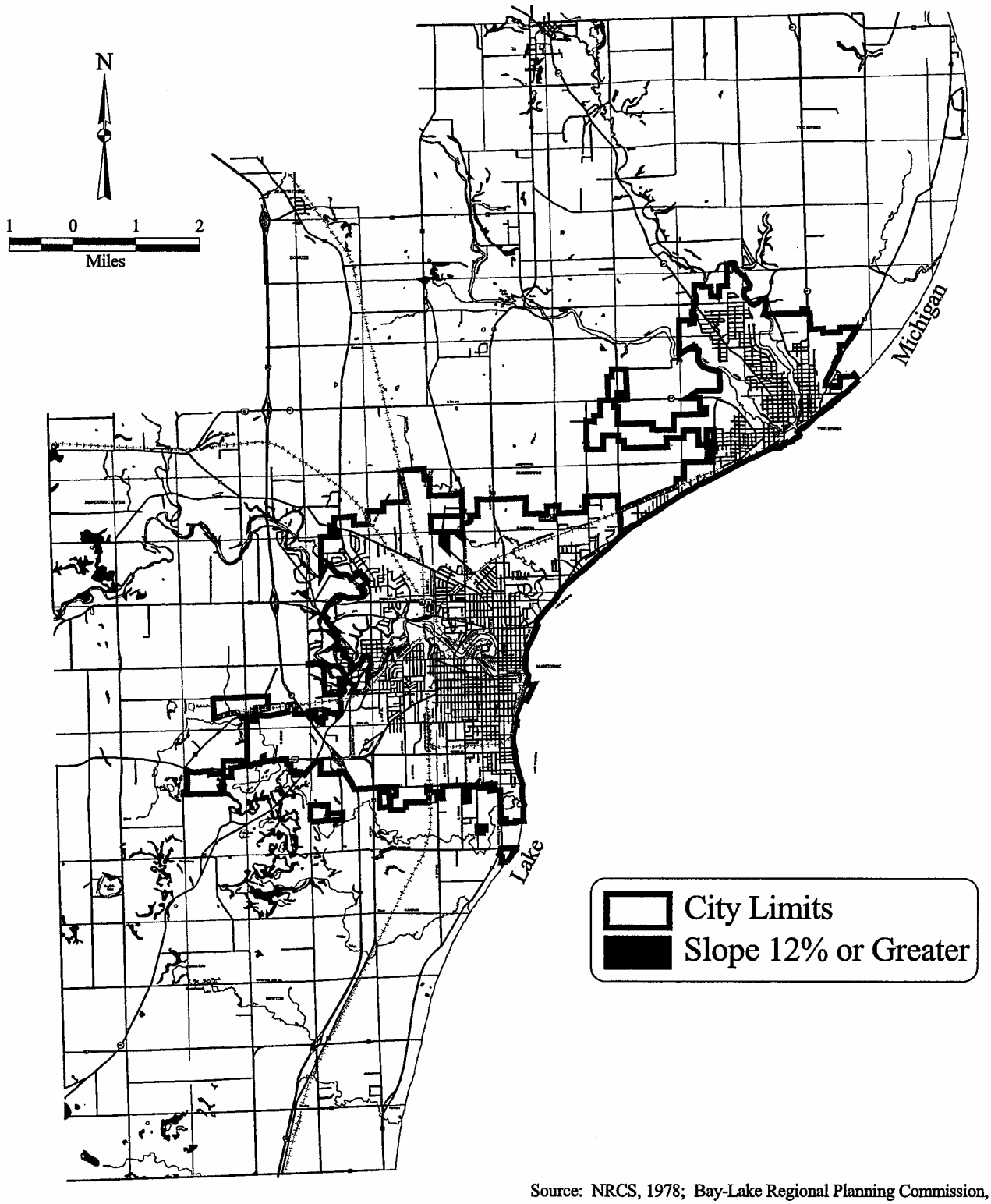
In the past, bedrock has not presented any significant problems to development; in areas where bedrock may cause problems, large stones and bedrock exist near the surface and have the potential for hindering excavation and considerably increasing the cost of construction. In addition, conventional on-site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

Steep Slope

Map 7

Manitowoc/Two Rivers SSA Planning Area

Manitowoc County, Wisconsin



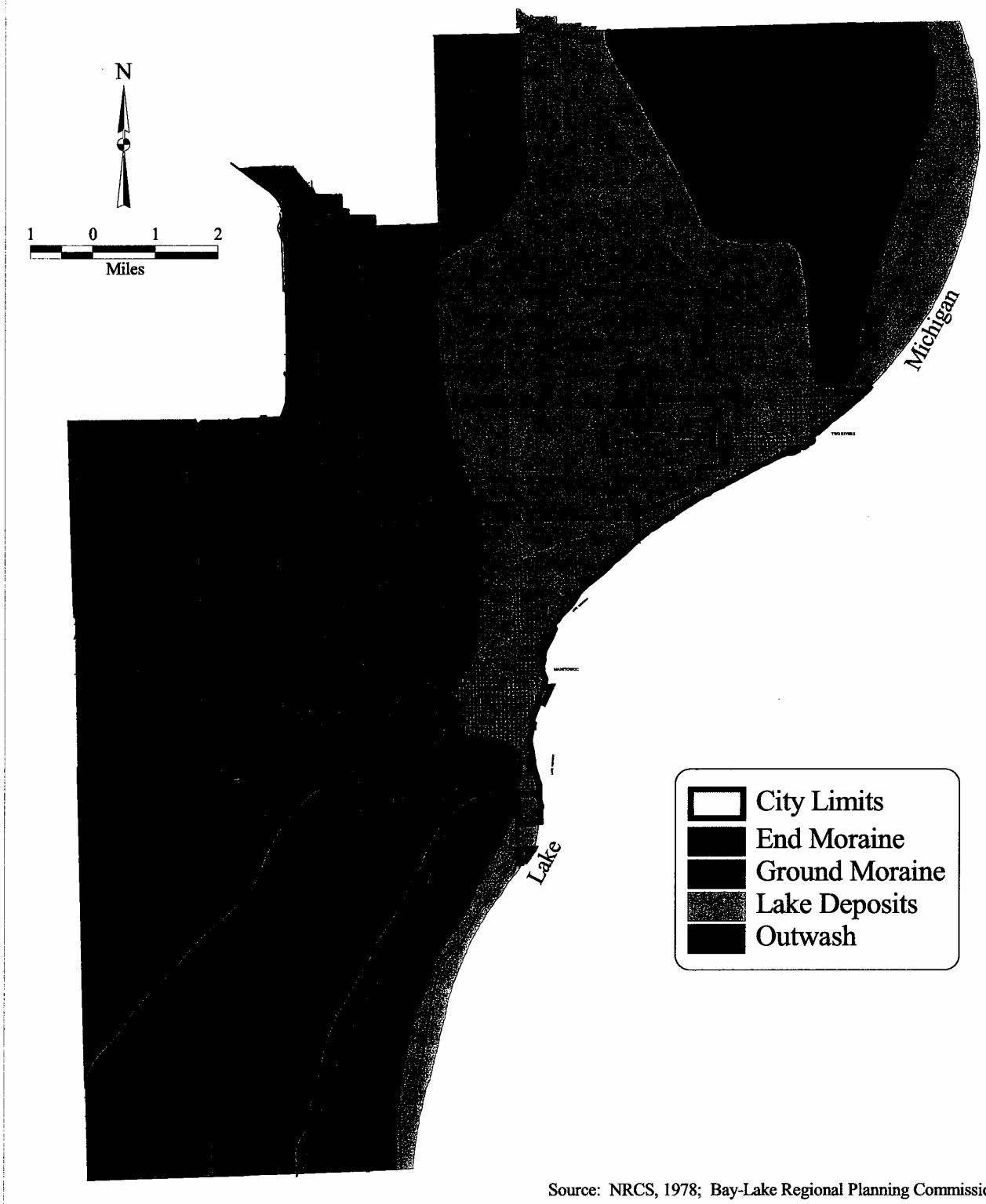
Source: NRCS, 1978; Bay-Lake Regional Planning Commission, 2001.

Map 8

Glacial Geology

Manitowoc/Two Rivers SSA Planning Area

Manitowoc County, Wisconsin



Source: NRCS, 1978; Bay-Lake Regional Planning Commission, 2001.

General Soils and Soil Limitations

The general soil associations within the Manitowoc - Two Rivers Sewer Service Study Area are shown in Map 9 are described as follows:

Areas Dominated by Soils that Formed in Glacial Till: The major soils associations within this category are the Kewaunee-Manawa-Poygan and the Hortonville-Symco. The Kewaunee-Manawa-Poygan association is nearly level to sloping, well-drained clayey soil. These soils have good potential for agricultural uses, however, they need to be managed to control water erosion, improve drainage, and maintaining soil fertility. Additionally, the major soils in this association also have severe limitations for use as septic tank absorption fields.

The Hortonville-Symco soil association contains soils that tend to be nearly level to moderately steep, as well as range from well-drained to somewhat poorly drained. These soils have good potential for the agricultural uses within the study area. Management concerns include controlling water erosion, improving drainage, and maintaining fertility. Although the gently sloping Hortonville soils have moderate limitations for use as septic tank absorption fields, the Symco and moderately steep Hortonville soils have severe limitations for septic tank absorption fields.

Areas Dominated by Soils that formed in Lacustrine Deposits: The major soil associations within this category include the Zurich-Mundelein-Briggsville and Pella-Mundelein-Shiocton. The Zurich-Mundelein-Briggsville association is a nearly level to sloping, well drained to somewhat poorly drained soils that have a loamy or clayey subsoil. This association is well suited to growing crops common to the study area. Primary management concerns include controlling water erosion, improving drainage and maintaining fertility. The well drained Zurich soils have slight limitations for septic tank absorption fields, however, the moderately well drained Zurich, Mundelein and Briggsville soils have severe limitations for this use.

The Pella-Mundelein-Shiocton association is a nearly level and gently sloping, somewhat poorly drained and poorly drained soils that are dominantly loamy throughout. If the soils in this association are drained, they have a good potential for cultivated crops common in the study area. If the soils are not drained, they can serve as pasture or wildlife habitat. The main management concerns within this association are improving drainage and maintaining fertility. All of the soils within this association have severe limitations for use as septic tank absorption fields.

Areas Dominated by Soils that Formed in Glacial Drift: Within this category are the Kewaunee-Boyer-Nichols and Hocheim-Lutzke associations. The Kewaunee-Boyer-Nichols association is gently sloping to steep, well drained and moderately well drained soils that are sandy, loamy or clayey. The primary management concerns within this association are controlling water erosion and maintaining soil fertility. These soils have a fair to good rating for the potential to produce crops common to the area, although

some moderately steep soils are used for woodland, pasture or wildlife habitat. The Kewaunee soils have severe limitations for septic fields, while the gently sloping Boyer and Nichols soils have slight limitations. The sloping Boyer and Nichols soils have moderate limitations for septic tank absorption fields.

The Hocheim-Lutzke association is a gently to steeply sloping, well drained loamy soil. These soils have fair to poor potential for cultivated crops, but have good potential for use as woodland. The primary management concerns include controlling erosion and maintaining soil fertility. Those soils which are moderately steep soils have a severe limitation for septic tank absorption fields, while the gently sloping soils have slight limitations, and the sloping soils have moderate limitations.

Areas Dominated by Soils that are Underlain by Outwash Deposits: The Wasepi-Plainfield-Boyer and Granby-Oakville-Tedrow associations comprise this category or soils. The Wasepi-Plainfield-Boyer association is nearly level to moderately steep, excessively drained to somewhat poorly drained with sandy and loamy soils. The major soils within this grouping have fair to poor potential for cultivated crops common to the area, although most of the soils within this category are used for crops such as corn, small grains and alfalfa. The primary management concerns are controlling wind and water erosion, improving drainage and maintaining soil fertility. The Wasepi soils have severe limitations for septic tank absorption fields, however, the gently sloping Plainfield and Boyer soils have slight limitations, while the sloping Plainfield and Boyer soils have moderate limitations.

The Granby-Oakville-Tedrow association is a nearly level to sloping, well drained to poorly drained soils that are dominantly sandy throughout. The major soils in this association have poor potential for cropland and most are used as woodland and wildlife habitat. The primary management concerns include controlling soil blowing, improving drainage and maintaining fertility. The Granby and Tedrow soils have severe limitations for use as septic tank absorption fields, while the gently sloping Oakville soils have slight limitations for this use.

Areas Dominated by Organic Soils: The Houghton-Palms-Willette association comprises this category, and is nearly level, very poorly drained organic association. Most of the soils are in natural vegetation, providing wildlife habitat, although some small areas are used for pasture. The major soils have poor potential for crops, woodland and pasture, and is best suited to its natural sedge-based state. The main management concerns in using this association for crops include improving drainage, controlling soil blowing and subsidence. The major soils have severe limitations for use as septic tank absorption fields.

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 Water table. 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.

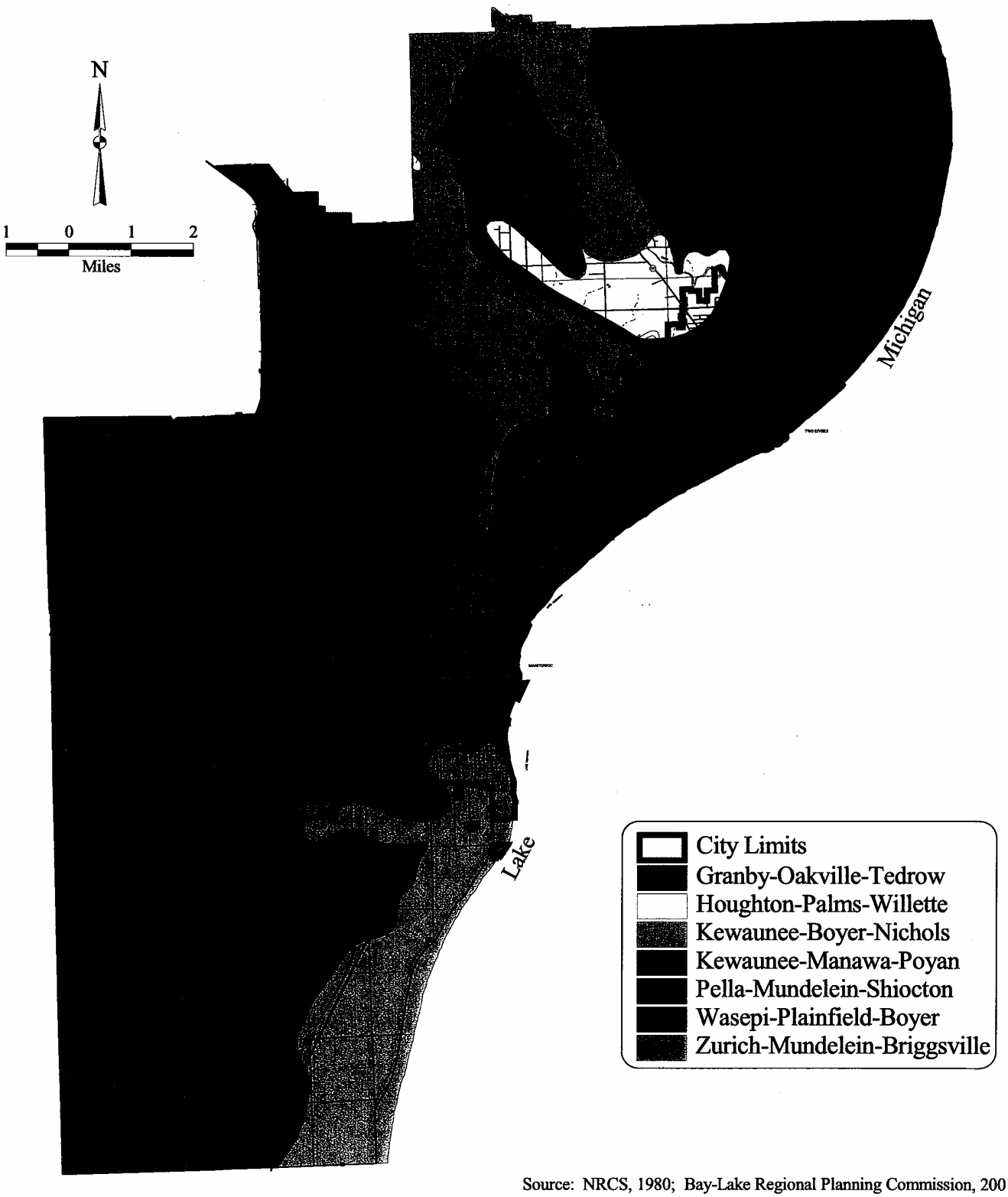
Approximately 93 percent of the soils in the planning area have severe limitations for septic tank absorption fields and 7 percent have moderate limitations (Map 10).

General Soil Associations

Map 9

Manitowoc/Two Rivers SSA Planning Area

Manitowoc County, Wisconsin



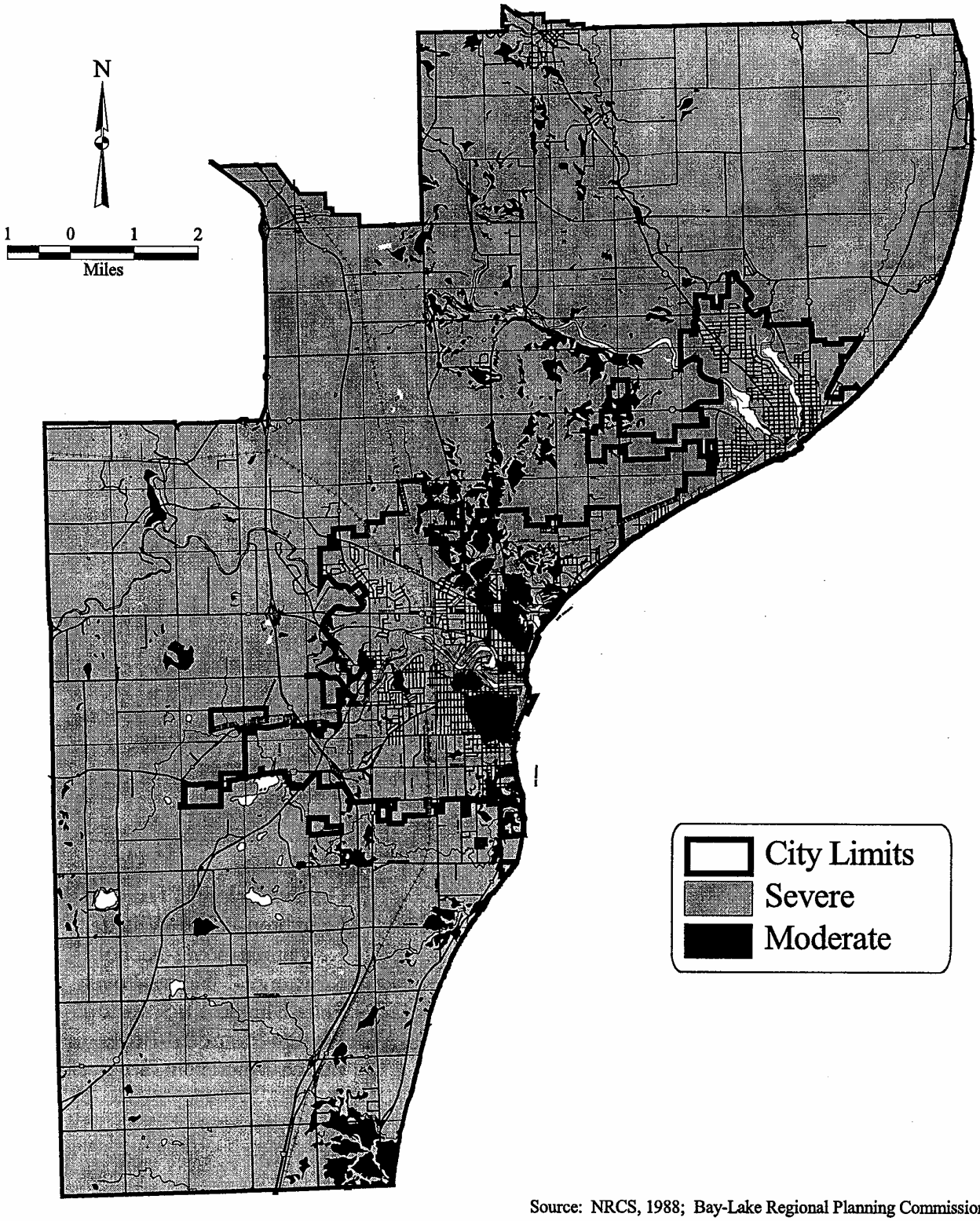
Source: NRCS, 1980; Bay-Lake Regional Planning Commission, 2001.

Soil Limitations for Septic Systems

Map 10

Manitowoc/Two Rivers SSA Planning Area

Manitowoc County, Wisconsin



Source: NRCS, 1988; Bay-Lake Regional Planning Commission, 2001.

Natural Areas

State Natural Areas are designated by the WDNR Bureau of Endangered Resources as tracts of land in a natural or near natural state, which are managed to serve several purposes including scientific research, teaching of resource management, and preservation of rare native plants and ecological communities. There are currently no designated State Natural Areas within the study area, although a number of sites possess characteristics which make them suitable for designation. These potential natural areas are described below.

In 1980, the Wisconsin Department of Natural Resources conducted an inventory of natural areas within the coastal zone of Wisconsin along Lakes Michigan and Superior. An unpublished update of this inventory was conducted by the Commission in 1992 for those areas within the Bay-Lake Region. The inventory identified the location, land uses, and ownership of each natural area as well as a description of the site with comments on plant and animal species that were present at the time the inventory was conducted. The natural areas were categorized based on their level of disturbance and value as habitat as well as the degree to which they had recovered from past disturbances. The inventory identified eight natural areas within the planning area (see Table 2 and Map 11). The following is a description of the categories:

- NA-1 Natural Areas - tracts of land and/or water so little modified by man's activity, or sufficiently recovered, that they contain nearly intact native plant and animal communities believed to be representative of the pre-settlement landscape. They are of statewide or greater natural area significance. Some tracts containing critical species habitats are also within this designation.

- NA-2 Natural Areas - tracts of land and/or water slightly modified by man's activities or insufficiently recovered from past disturbances such that they are of county or multi-county natural area significance because of one or more of the following reasons: the degree of quality is less than the grazing, water level manipulation, or pollution, etc.; the type may be the most abundant or a very common type in the region, only the very best of which might qualify for state scientific area recognition, or the area may be too small.

  NA-2 areas are valuable assets to the local communities as education sites, for passive, non-destructive recreation and as "ecological zones" which maintain a relatively high degree of naturalness. Some of these sites, depending on their fragility, may be suitable for county or local park development, but caution should be exercised to avoid degradation of their primary features. Protective zoning could be an alternative method of protection.

  If maintained for a sufficient period of time in an undisturbed condition, NA-2 areas should increase in their degree of naturalness. Scars of disturbance will gradually disappear, although some types will never fully recover. Some areas in this category may be viewed in the future as being worthy of state significance.

- NA-3 Natural History Areas - tracts of land/or water modified by man's activities, but which retain a moderate degree of natural cover and often would be suitable for education use, such that exclusion from a natural area inventory would be an oversight. Two or more of the identifying natural area criteria may be substandard in natural history areas, but in time and with protection, most natural history areas will increase in "naturalness". Natural history areas may reflect patterns of former vegetation or show the influence of settlement on

vegetation. Some natural history areas are quite scenic. An important value of some of the larger NA-3 sites is their role in watershed protection and as environmental corridors.

- NA-1(RSH) Rare Species Habitats - sites where the primary natural value is the presence of one or more rare, threatened, or endangered species of plants or animals.

Table 2: Designated Scientific / Natural Areas

NAME	LOCATION	SIZE	CODE	OWNERSHIP	DESCRIPTION
Wilderness Ridge	T20N, R24E Section 16	8 Acres	State Scientific Area (SA)	WDNR	This area consists of two perpendicular transects, each sixty-six feet wide, located on and across ridges and swales of the abandoned beach lines of glacial Lake Nipissing. The east-west transect is sedge dominated with ridge and swale topography. Northern conifer-hardwood forest on the north-south ridge is composed of red and white pine, hemlock and yellow birch.
Point Beach Ridges	T20, 24E, Section 31,32	175 Acres	State Scientific Area (SA)	WDNR	Wooded ridge-swale topography, dunes and beach within Point Beach State Forest. A total of about five miles of similar forested ridges is preserved in the forest. A substantial expanse of swamp timber and brush marsh within the State Forest, sections 5, 8, 17, and 20, lies land ward from the ridge-swale complex. Numerous critical plant species are present.
Weyers Lake	T18N, R23E, Section 10	30 Acres	Natural History Area (NA-2)	Manitowoc Fish & Game Association	Small seepage lake surrounded by brush-timber swamp of elm, alder, black ash, dogwood, tamarack, white cedar and white birch. Access to south edge. It is a seepage lake with hard water; maximum depth thirty-two feet. There is no development on the shore.
Glomski Lake	T18N, R23E Section 4	40 Acres	Natural History Area (NA-2)	Private	A deep, hard water lake in the terminal moraine, with no immediate development except one pier. Hardwood swamp and brush surround the lake. Maximum depth forty-three feet.
Camp Vits	T19N, R23E Section 26	100 Acres	Natural History Area (NA-2)	Private	An extensive second growth forest of mixed hardwoods and some white pine with a white birch-white cedar-hemlock forest on the steep north and east facing slope above the Manitowoc River. Large size and proximity to Manitowoc are strong points.

Table 2: Designated Scientific / Natural Areas, continued

NAME	LOCATION	SIZE	CODE	OWNERSHIP	DESCRIPTION
Woodland Dunes	T19N, R24E Parts of Sections 2,3,10,11	700 Acres	Natural Area (NA-2)	Natural Areas Preservation, Inc.	A forested tract containing ridges of former glacial lakes levels, lying 10-20 feet above Lake Michigan's present level. The ridges are wooded with scattered hemlock and pine with aspen. Small elm, cedar, and brush are present in lowlands. An important stopping place for a variety of migratory birds. Several maintained trails and boardwalks provide access to a variety of habitat variations and facilitate local educational use and nature implementation.
Twin River Marsh	T20N, R24E Sections 34 and 35	80 Acres	Natural Area (NA-2)	Private	One of the largest marshes along Lake Michigan. Area is dominated by sedges and cattails with some shrub-carr. Some infringements by the city and local farmers are taking place. Marsh is an excellent stop over for many species of birds. Timber on north edge has been completely cut producing birch and shrub-carr. Some areas are being grazed.
Wet Mesic Woods	T20N, R24E Sections 9,16	100 Acres	Natural History Area (NA-3)	Private	This woods has suffered cutting long ago and recent infringement by housing. It does retain characteristics of a hemlock-yellow birch forest. The floor of the woods has cradle knolls and contains many small ephemeral ponds.

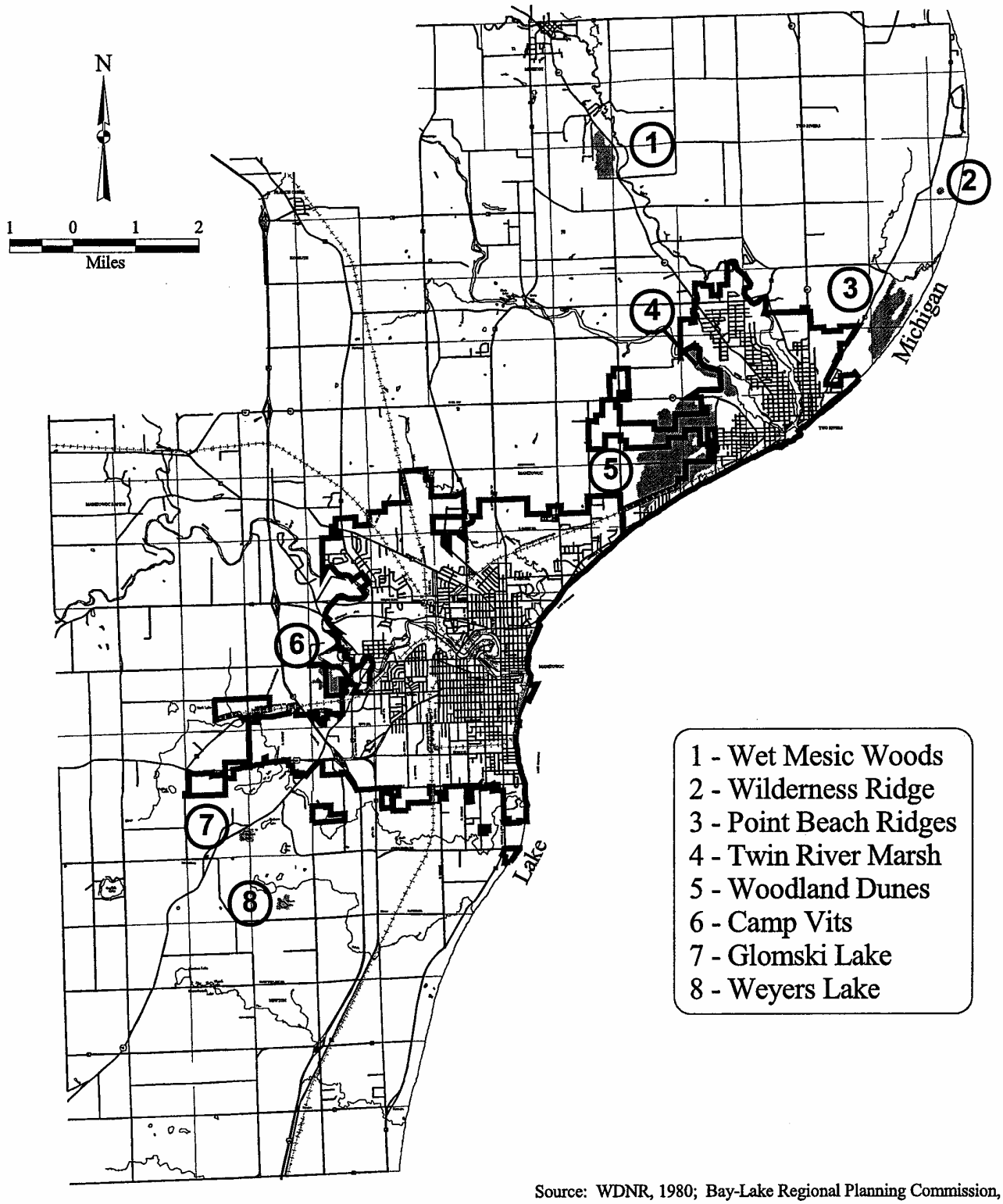
Source: Office of Coastal Management, Wisconsin Department of Administration Scientific Areas Section, Wisconsin Department of Natural Resources, Natural Area Inventory, Wisconsin's Great Lakes Coast Revised 1980; and BLRPC, 1995.

Natural Areas

Map 11

Manitowoc/Two Rivers SSA Planning Area

Manitowoc County, Wisconsin



Source: WDNR, 1980; Bay-Lake Regional Planning Commission, 2001.

DELINEATION OF ENVIRONMENTAL SENSITIVE AREAS

Introduction

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" (ESAs) 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 sewer service are. 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, floodway and flood plains, steep slope, highly erodable soils and other limiting soil limitations, 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 environmental environmentally sensitive area.

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, and lower maintenance costs for public utilities.

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 on the quality of wetlands created when development occurs right up to the wetland.

ESA Definition

The *Manitowoc-Two Rivers Urbanized Area 2015 Areawide Sewer Service Area Plan* sets forth the following definition important natural and sensitive environmental features, hereinafter referred to as Environmentally Sensitive Areas to be used within this plan for the purpose of implementing NR 121:

- All lakes, ponds, flowages, rivers and streams identified on the 7.5 minute U.S.G.S quadrangle maps and their adjacent 75' shoreland buffer, as measured from the ordinary high water mark, shall be designated as ESAs.
- All lakes, ponds, flowages, rivers and streams identified on the U.S.G.S. quadrangle maps shall be considered navigable until such time as an official Wisconsin Department of Natural Resources determination indicates otherwise.
- Any Environmentally Sensitive Area associated with a non-navigable lake or pond shall extend 25 feet from the ordinary high water mark.
- Any Environmentally Sensitive Area associated with a non-navigable flowage, river or stream shall extend 25 feet from the both sides of the center of the channel of such feature.
- All floodplains (FEMA 100-year) shall be designated as ESAs.
- All Department of Natural Resources (DNR) mapped wetlands shall be included in an ESA. Any Environmentally Sensitive Area associated with such a wetland two acres in size 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 areas with identified archaeological sites shall be included in the ESA.
- Other significant natural resource features, including but not limited to, river and stream headwaters, woodlands, high-value wildlife habitat areas, geologic and natural area sites, steep slopes, and wet, poorly drained and organic soils, shall be considered for inclusion as an ESA on a case-by-case basis by the TAC.

Sewer Extension Prohibited

Sewer extensions for development within designated ESAs will be prohibited. 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 environmental corridors, and that, compatible land uses such as public parks and outdoor recreation facilities may need sewer at a future date. Also, 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 environmental corridor. The Technical Advisory Committee and WDNR will review these exceptions/modification of environmental corridor 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 WDNR approval.

Intensive uses to be considered for exclusion from within 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, 115, 116, 117, 121, 216, and 299, 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; in some instances, utility facilities such as sewer and water lines, detention basins, and stormwater drainage-ways; and limited clearing, grubbing, grading, and filling.

If there is any doubt 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 petitioner. This information, along with the ESA criteria from this plan, will be used to make a recommendation on the proposal.

Application of the above ESA's definition will not apply to those areas currently developed or platted at the time of plan publication, but will apply to those areas not yet developed or platted at the time of publication.

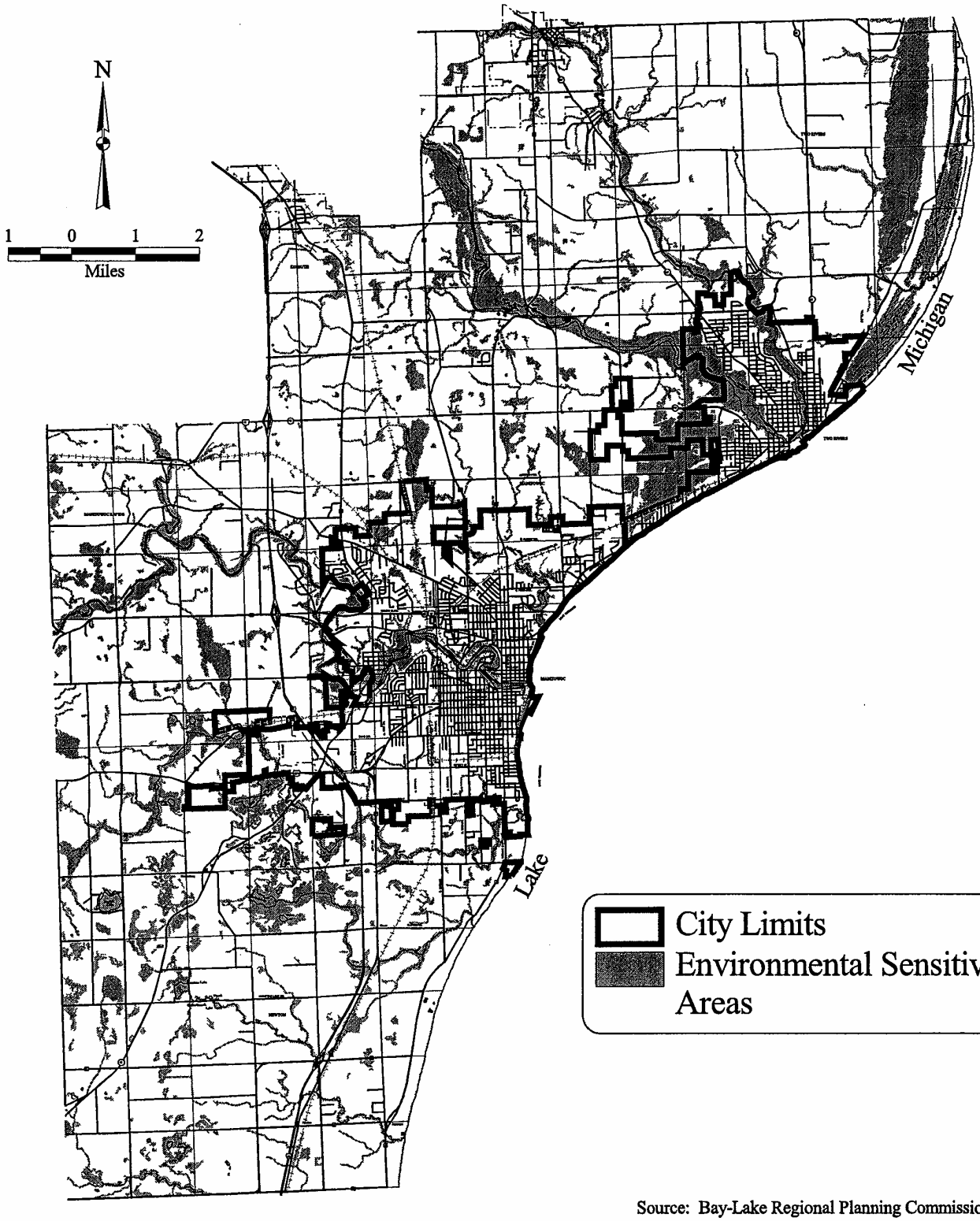
ESAs have been delineated by the BLRPC using GIS software. Map 12 shows the general location of ESAs throughout the planning area. Although ESAs may overlay existing developed lands, it is their location throughout the undeveloped portion of the Sewer Service Area that will determine future sewered development.

Environmental Sensitive Areas

Map 12

Manitowoc/Two Rivers SSA Planning Area

Manitowoc County, Wisconsin



Source: Bay-Lake Regional Planning Commission, 2001.

CHAPTER 5: SOCIOECONOMIC AND LAND USE PROJECTIONS

INTRODUCTION

Many factors affect the future growth of a community. These factors can generally be included in the following three broad-based categories:

1. Political, social, and economic conditions that affect population change;
2. Natural, environmental and engineering limitations that affect development;
3. Existing growth patterns.

Of these, the first category is most often the hardest to predict with accuracy. The best method to evaluate theses factors 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, steep slopes or highly erodable 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 these 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 Planning Area.

POPULATION, HOUSING, EMPLOYMENT PROJECTIONS

In order to obtain a clear understanding of the Manitowoc-Two Rivers 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. The population size (past, present and projected), and household characteristics provides one indication of how much land will be needed for future residential 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 are the 1990-2015 Department of Administration (DOA) population projections by five year increments for minor civil division (MCD). DOA utilizes the cohort component method of population projection. These are the official state projections, consistent with U.S. Bureau of Census State of Wisconsin projections. The DOA county projections are required to be used as control totals in accordance with Wis. Admin. Code. NR121 for the development of sewer service area plans. However, the WDOA approved projections for the city of Manitowoc are those contained in the city's adopted comprehensive plan entitled City of Manitowoc

Comprehensive Plan 1999 to 2019. These population projections are found in Table 3 All of the congressional towns, the village of Francis Creek, and the city of Two Rivers are expected to have a steady decline in population to the year 2015. The city of Manitowoc is expected to grow in population by the year 2015 by 4,300 persons.

Table 3: Manitowoc-Two Rivers Planning Area Population and Projections, 1970-2015

Geographic Area	Census 1970	Census 1980	Census 1990	Estimate 1999	Projections 2000	Projections 2005	Projections 2010	Projections 2015	Difference 1999-2015
Town of Kossuth	1,877	2,097	1,951	1,995	1,891	1,854	1,825	1,780	-215
Town of Manitowoc	1,258	1,177	936	1,000	917	893	874	847	-153
Town of Manitowoc Rapids	3,552	3,186	2,560	2,653	2,388	2,294	2,219	2,118	-535
Town of Mishicot	1,743	1,334	1,344	1,376	1,267	1,217	1,178	1,124	-252
Town of Newton	2,256	2,332	2,261	2,350	2,305	2,302	2,300	2,288	-62
Town of Two Rivers	2,627	2,663	2,147	2,151	2,031	1,956	1,896	1,814	-337
Village of Francis Creek	492	589	562	610	589	597	603	608	-2
Village of Mishicot	938	1,503	1,296	1,418	1,343	1,360	1,374	1,384	-34
City of Manitowoc [1]	33,430	32,547	32,521	34,469	34,867	36,121	37,421	38,769	4,300
City of Two Rivers	13,732	13,354	13,030	13,445	13,275	13,239	13,210	13,117	-328

Source: Department of Administration Demographic Services Center, 1999.

1. Source is The City of Manitowoc Comprehensive Plan population projections as approved by WDOA.

Household Size and 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 20 year planning period throughout the planning area and within respective municipalities. The historical and projected persons per household figures for the Manitowoc-Two Rivers Planning Area are contained in Table 4.

Table 4: Persons Per Household, 1990-2015

Geographic Area	Household Size Actual 1990	Projected 1995	2000	2005	2010	2015
Town of Kossuth	3.00	2.97	2.92	2.86	2.81	2.76
Town of Manitowoc	3.00	2.97	2.92	2.86	2.81	2.76
Town of Manitowoc Rapids	3.01	2.98	2.93	2.87	2.82	2.77
Town of Mishicot	2.89	2.86	2.81	2.75	2.70	2.65
Town of Newton	3.02	2.99	2.94	2.88	2.83	2.78
Town of Two Rivers	2.89	2.86	2.81	2.75	2.70	2.65
Village of Francis Creek	2.57	2.54	2.49	2.43	2.38	2.33
Village of Mishicot	2.66	2.63	2.58	2.52	2.47	2.42
City of Manitowoc	2.39	2.36	2.32	2.26	2.22	2.17
City of Two Rivers	2.51	2.48	2.43	2.37	2.32	2.27
Manitowoc County	2.62	2.59	2.54	2.48	2.43	2.38

Source: U. S. Bureau of the Census, 1990 Census of Population, General Population Characteristics, and the WDOA, Household Projections by Household Type (for counties): 1990-2015, 1993

Note: The projected incremental difference for the county was applied to the 1990 Census population per household figures for the cities, villages and towns to arrive at the projected population per household figures.

These persons per household figures relate to future land uses directly. For example, if *Community A* currently had a total population of 1,000 persons, a persons per household figure of 3, and an average residential lot size of 1 acre, then approximately 333 acres of land would be needed to house the total population. If the total population and lot size stayed the same, but the persons per household figure dropped to 2.5, then approximately 400 acres (an increase of 67 acres) would be necessary to house the same population. Positive population projections divided by household size yields the number of additional dwelling units, as shown in, Table 5, to house

the increased population. The city of Manitowoc is the only unit of government in the planning area projected to have an increase in population and an increase in housing units 3,157 units.

Table 5: Housing Projections, 2015

Geographic Area	Estimate 1999	Projected Population 2015	Population Change 1999-2015	Projected Dwelling units Needed 2015
Town of Kossuth	1,995	1,780	-215	0
Town of Manitowoc	1,000	847	-153	0
Town of Manitowoc Rapids	2,653	2,118	-535	0
Town of Mishicot	1,376	1,124	-252	0
Town of Newton	2,350	2,288	-62	0
Town of Two Rivers	2,151	1,814	-337	0
Village of Francis Creek	610	608	-2	0
Village of Mishicot	1,418	1,384	-34	0
City of Manitowoc [1]	34,469	38,769	4,300	3,157
City of Two Rivers	13,445	13,117	-328	0

Source: U.S. Bureau of the Census, 1990, WDOA, 1998, BLRPC, 1999, 1. City of Manitowoc Comprehensive Plan

Employment Projections

The Commission used employment projections to identify acreage needed for future industrial and commercial development. These future totals are to be used as a minimum for development consideration during this plan. Based on BLRPC standards, nine acres (gross) and 11 acres (gross) per 100 employees were used for industrial and commercial growth respectively. Employment projections were determined utilizing a "market share" technique. Though this is not an exact science in determining future employment, it helps identify for this planning activity a "ball park figure" in which to begin the analysis. City employment projections were developed by utilizing projected county employment projections. The first step was to determine each of the city's "share" or percentage of the total employment for the county by industrial division for 1990. These percentages were then applied to the county employment figures for 2000 to estimate the city employment by economic division. Projections for the year 2015 were obtained by applying to the 2000 figures the projected annual percentage change in employment by divisions as determined by the Wisconsin Department of Workforce Development in the report *Northeast Wisconsin Projections: 1992-2005.* The employment totals are depicted in Table 6. Projections were not prepared for the balance of the communities since they were projected to have declines in population. Employment overall is expected to increase by approximately 5,800 from 2000 to 2015, with Manitowoc's employment increasing from 20,657 to 24,994 and Two River's from 6,882 to 8,328.

Table 6: Employment Projections-City of Manitowoc 2000-2015

Division	Employment					Change
	1990	2000	2005	2010	2015	2015-2000
Agricultural	97	244	307	371	434	190
Mining	22	*	*	*	*	*
Construction	390	740	788	836	884	144
Manufacturing	6,474	7,217	7,541	7,866	8,191	974
Trans. & Public Utilities	590	786	865	943	1,022	236
Wholesale	411	472	509	547	585	113
Retail	3,330	3,475	3,735	3,996	4,257	782
Fin, Ins, & R.E.	451	524	576	628	681	157
Services	4,766	5,548	6,075	6,602	7,129	1581
Government	1,276	1,526	1,557	1,587	1,618	92
NEC		126	149	172	193	67
All Industries	**17,807**	**20,657**	**22,102**	**23,548**	**24,994**	**4,337**

Notes: * data suppressed, NEC not elsewhere cited

Source: 1990 Employment Information for Bay-Lake, Department of Workforce Development;

Employment and Wages Covered by Wisconsin's UI Law, April 1991, Department of Workforce Development

Employment and Wages Covered by Wisconsin's UI Law, January 2001, Department of Workforce Development

Wisconsin Department of Workforce Development, Division of Jobs, Employment and Training Services, *Northeast Wisconsin Projections: 1992-2005*

Table 7: Employment Projections-City of Two Rivers 2000-2015

Division	Employment					Change
	1990	2000	2005	2010	2015	2015-2000
Agricultural	20	50	63	76	90	40
Mining	*	*	*	*	*	*
Construction	88	167	178	189	199	32
Manufacturing	2,864	3,193	3,336	3,480	3,623	430
Trans. & Public Utilities	567	756	831	907	982	226
Wholesale	152	174	188	202	216	42
Retail	973	1,015	1,091	1,168	1,244	229
Fin, Ins, & R.E.	121	140	155	169	183	43
Services	1,038	1,208	1,323	1,438	1,553	345
Government	110	132	134	137	139	7
NEC	0	47	149	80	99	52
All Industries	**5,933**	**6,882**	**7,364**	**7,846**	**8,328**	**1,446**

Notes: * data suppressed, NEC not elsewhere cited

Source: 1990 Employment Information for Bay-Lake, Department of Workforce Development;

Employment and Wages Covered by Wisconsin's UI Law, April 1991, Department of Workforce Development

Employment and Wages Covered by Wisconsin's UI Law, January 2001, Department of Workforce Development

Wisconsin Department of Workforce Development, Division of Jobs, Employment and Training Services, *Northeast Wisconsin Projections: 1992-2005*

CHAPTER 6: SEWER SERVICE AREA BOUNDARY

INTRODUCTION

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. Manipulation of some of these factors may help guide such growth in a logical and cost-effective manner. This chapter presents the factors that were utilized in determining the Sewer Service Area boundaries for the cities of Manitowoc and Two Rivers urbanized area.

The delineation of the final sewer service area boundary consisted of four steps: 1) projection of population, and employment housing for the design year 2015, 2) application of land allocation standards to the projections to developed an initial land use allocation, 3) modification of the land use allocation based on local polices and locally adopted plans through an iterative review process, and 4) delineation of a sewer service area boundary based the results of step 3.

2015 INITIAL LAND USE PROJECTIONS AND ALLOCATION

The initial number of acres set aside for development for the design year of 2015 was based on accepted planning standards of growth and is shown in Table 8. The focus of the land allocation was on the adjacent cities of Manitowoc and Two Rivers, since the balance of the communities in the planning area were projected to have declining populations. These standards were applied to the population projections in Table 3, the housing projections in Table 5 and the employment projections in Tables 6 and 7 to project land needed for additional residential, parks, governmental, industry, and commercial development. These allocations and standards were then reviewed locally by the city of Manitowoc and Two Rivers and adjusted by the Commission to account for local trends.

The cities of Manitowoc and Two Rivers will require at a minimum 2,200 acres, and 144 acres respectively to accommodate future residential and employment growth during this 2000 to 2015 planning period. These projections served as a basis for discussion with the cities of Manitowoc and Two Rivers to delineate the sewer service area boundary as detailed in the next section.

Residential

According to the *City of Manitowoc Comprehensive Plan*, the city will require approximately 1,188 acres of gross residential land to accommodate residential growth. This is based on 1984 units of single family dwellings at an average density of 2 units per acre and 1,173 units of multi-family dwellings at an average density of 6 units per acre.

Parks

According to the standard, approximately, 60 acres of additional park lands are required in the city of Manitowoc. However, the City of Manitowoc's adopted future park sites map identified six new neighborhood parks, one community park, and expansion of an existing park in the undeveloped portion of the proposed sewer service area totaling approximately 260 acres in major park acquisitions. Therefore an additional 200 acres was allocated to the 60 aces bringing the total acreage required to 260 acres.

Governmental

Approximately, 52 acres of lands are required for governmental use in the city of Manitowoc.

Industry and Commercial

Based on the employment projections noted above, approximately 149 acres of land for industrial development and 295 acres of land are required for commercial use in the city of Manitowoc and 69 acres of land for industrial development and 74 acres of land are required for commercial use in the city of Two Rivers. However, based on lands that are presently committed for industrial development in the undeveloped portion of the City of Manitowoc Sewer Service area, the acreage for Manitowoc was increased to 405 acres.

Table 8: Initial Sewer Service Area Land Allocation for New Development

Geographic Area	Acres Residential [1]	Acres Parks [2]	Acres Governmental [3]	Acres Industry [4]	Acres Commercial [5]	Acres Total
Town of Kossuth	na	na	na	na	na	na
Town of Manitowoc	na	na	na	na	na	na
Town of Manitowoc Rapids	na	na	na	na	na	na
Town of Mishicot	na	na	na	na	na	na
Town of Newton	na	na	na	na	na	na
Town of Two Rivers	na	na	na	na	na	na
Village of Francis Creek	na	na	na	na	na	na
Village of Mishicot	na	na	na	na	na	na
City of Manitowoc	1,188	260	52	405	295	2,200
City of Two Rivers	na	na	na	69	74	144

Source: BLRPC

Notes; "na-" indicates no additional acreage required

Following land use standards used to calculate land allocations were based on SEWRPC Land Use Development, Objectives, Principles, and Standards and the City of Manitowoc Comprehensive Plan.

[1] Acres of single residential based on 2 dwelling units gross acres 2, and acres of multi-family based on 6 dwelling units per gross acre.

[2] Acres of parks based on 14 gross acres per 1,000 persons, plus additional acreage as documented in the City of Manitowoc Comprehensive and Planning and future park sites map as approved by the Manitowoc City Council October 15, 2001.

[3] Acres of government based on 12 gross acres per 1,000 persons

[4] Acres of industrial based on 9 gross acres per 100 employees, plus lands committed for industrial development.

[5] Acres of commercial based on 11 gross acres per 100 employees

SSA BOUNDARY DETERMINATION

As noted above, the initial acreage allocation as shown in Tables 7 and 8 determined that at a minimum approximately 2,400 acres of additional land would be required to meet future growth requirements for the Manitowoc/Two Rivers Sewer Service Area Boundary. This initial allocation did not include a market factor to accommodate market forces for freedom in the market place and to accommodate the future growth plans of the cities of Manitowoc and Two Rivers, as identified by city staff and as described in adopted comprehensive plans. To address this, the Commission staff presented the initial allocation for review and comment at a series of meetings that were held with the development staff of both cities.

At these meetings, at determination was made of the location all proposed locally significant residential developments, industrial parks, commercial areas, institutional and governmental facilities, and parks and conservancy areas. These areas were then included within the proposed sewer service area boundary for each city. Also at these meetings, a determination was made of the consistency of the proposed sewer area boundary with land use plans contained in locally adopted comprehensive plans. In the case of the city of Manitowoc, those areas shown in the comprehensive plan as being served with sewer were included within the proposed sewer service area boundary. As a result of these consultation with the city of Two Rivers and the city of Manitowoc, the sewer service area boundary was delineated.

Map 13 depicts the delineated sewer service area for the city of Manitowoc, and Map 14 depicts the delineated sewer service area for the city of Two Rivers. Tabular data is presented in Table 9. The sewer service area boundary shown on each map represent the outer extent of projected sewer service area. Environmentally Sensitive Areas as depicted on Map 12 and as defined in Chapter 4 are not available for sewered development. This boundary configuration aids in the protection of environmentally sensitive areas, and at the same time provides adequate acreage of developable lands for each community, allows for flexibility in terms of the future locations for development, and promotes consistency with locally adopted comprehensive plans. Table 9 details the land allocation within the sewer service areas.

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 be served by public sewer. Decisions concerning timing of services, the conditions of service, or whether to actually provide sewer service or not are controlled by the city of Two Rivers and the city of Manitowoc and their respective wastewater treatment plants. However, as a general rule, the extension of sewers should be carried out so that areas that presently undeveloped that are contiguous to the waste water collection system and or that can be served by existing waster collection facilities are developed first 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, property ownership lines, the center line of roads or streams, or a fixed distance from the aforementioned features. The boundary lines are tied to the Manitowoc County Coordinate System on the county base map, and has real world coordinates in a geographic information system (GIS).

City of Manitowoc SSA boundary

To foster consistency amongst plans under 1999 Wisconsin Act 9, the SSA for the city of Manitowoc approximates the boundary of the city's peripheral planning areas described in the City of Manitowoc Comprehensive Plan. According to the *City of Manitowoc Comprehensive Plan*

"its expected that development process will begin in these[peripheral planning] areas within the 20 year planning period[1999-2019], and that the City should anticipate infrastructure improvements that will support future development of these areas on public utilities."

Table 9: Acreage Allocation Manitowoc-Two Rivers SSA

Existing	Manitowoc SSA Boundary			Two Rivers SSA Boundary			
Development Status	Inside City	Outside City [3]	Total	Inside City	Outside City	Total	Grand Total
Developed [1]	8,841	1,531	10,372	2,375	390	2,765	13,137
ESAs	1,323	1,478	2,801	1,280	771	2,051	4,852
Undeveloped -Comitted[2]	1,114	71	1,185	370	26	396	1,581
Residential	526	0	526	138	0	138	664
Industrial	334	71	405	232	0	232	637
Commercial	160	0	160	0	26	26	186
Parks/Conservancy	94	0	94	0	0	0	94
Governmental	0	0	0	0	0	0	0
Undeveloped-Uncommited	0	4,090	4,090	31	1,086	1,117	5,207
Total Undeveloped	1,114	4,161	5,275	401	1,112	1,513	6,788
Total	11,278	7,170	18,448	4,056	2,273	6,329	24,777

Source: BLRPC, 2003

Notes

[1] Developed means land currently used for residential, commercial, industrial, transportation (mapped right of way), utilities, governmental, or outdoor recreational use, lands mapped on an official map as parkways, and lands mapped on approved subdivisions .

[2] Not developed means lands that are not developed, such as farmland and other open space, excluding ESAs.

[3] For Manitowoc this area approximates the city's peripheral planning areas as identified in the city's adopted comprehensive plan.

[4] Includes buffer areas.

The city of Manitowoc sewer services area boundary encompasses approximately 18,400 acres, consisting of approximately 11,200 acres within the current city limits and 7,200 acres that are outside of the city limits. Of the total acres, approximately 10,400 are developed, 5,120 acres are undeveloped, and 2,800 acres are environmentally sensitive areas (see Map 13 and Table 9.). The 5,200 acres of undeveloped land would accommodate the minimum amount of land required for development by 2015 of 2,200 acres plus a market factor.

City of Two Rivers SSA boundary

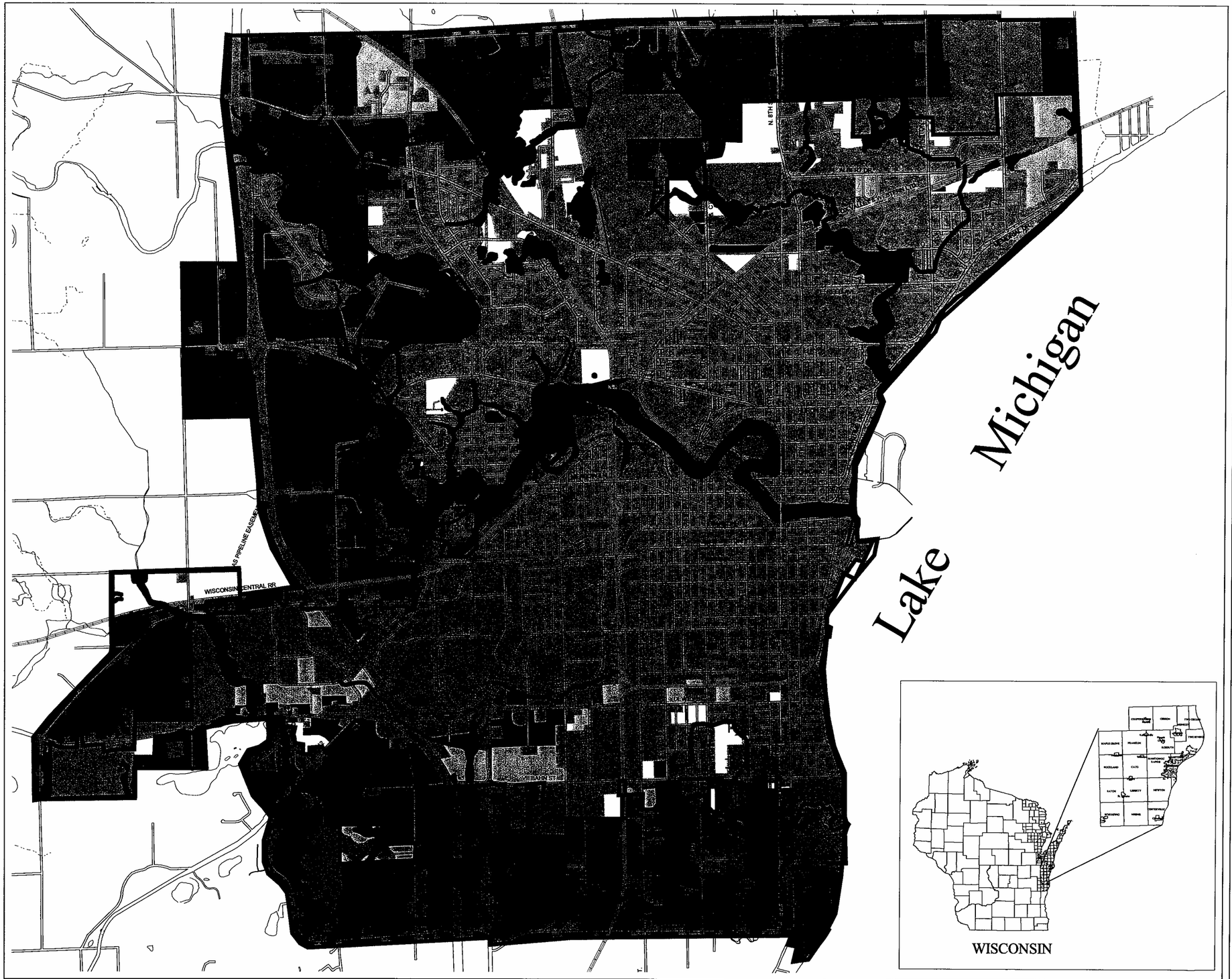
The city of Two Rivers sewer service area boundary encompasses approximately 6,300 acres, consisting of approximately 4,050 acres within the current city limits and 2,200 acres that are outside of the city limits. Of the total acres, approximately 2,800 are developed, 2,000 acres are environmentally sensitive areas, and 1,500 acres are undeveloped. (see Map 14 and Table 9). The 1,500 acres of undeveloped land would accommodate the minimum amount of land required for development by 2015 of 144 acres plus a market factor..

Map 13

Selected Sewer Service Area Boundary

City of Manitowoc

Manitowoc County, Wisconsin



SSA Boundary
City Boundary

Developed
Environmental Sensitive Areas
Conservancy/Park

Undeveloped- Committed
Residential
Business/Commercial
Industrial

Undeveloped - Uncommitted

WISCONSIN

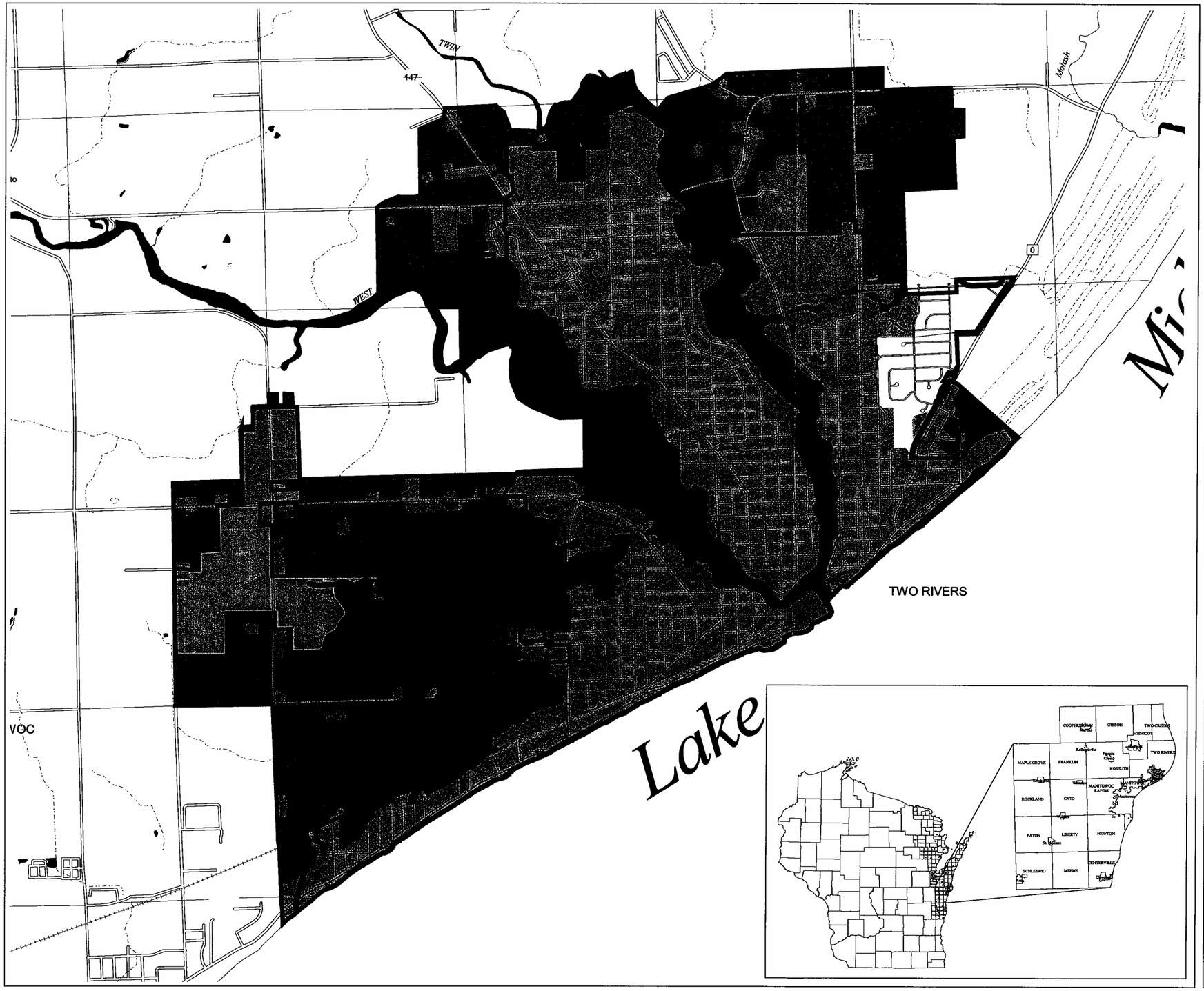
N

2000 0 2000 4000 Feet

Revised: 5/15/2002
Source: Bay-Lake Regional Planning Commission, 2001.

Map 14

Selected Sewer Service Area Boundary
City of Two Rivers
Manitowoc County, Wisconsin



SSA Boundary
City Boundary

Developed
Environmental Sensitive Areas

Undeveloped- Committed
Residential
Business/Commercial
Industrial
School Site

Undeveloped - Uncommitted

N

2000 0 2000 4000 Feet

Revised: 7/08/2003
Source: Bay-Lake Regional Planning Commission, 2001.

CHAPTER 7: PLAN IMPLEMENTATION AND INSTITUTIONAL STRUCTURE

INTRODUCTION

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 Facilities Review;
- Subdivision Review for Plan Conformance;
- Sewer Service Area Boundary Amendments;
- Plan Amendments; and
- Plan Update.

TECHNICAL ADVISORY COMMITTEE

The Technical Advisory Committee (TAC) shall consist of one appointed representative from the city of Manitowoc, one appointed representative from the city of Two Rivers, and one appointed representative from the Manitowoc County Planning and Parks Commission. The responsibility of the TAC is to provide information, guidance and recommendation for the proposals and future development within the *Manitowoc-Two Rivers Sewer Service Area Plan* boundaries. The TAC shall oversee and ensure that development proceeds in accordance to the goals, objectives and policies of this plan and that all necessary actions be implemented to advance development so that it is in agreement with this plan. Each member will have one vote during times of final weighting for amendment requests.

Along with the TAC, Wisconsin Department of Natural Resources and Bay-Lake Regional Planning Commission staff representatives (without voting powers) will sit in on the Technical Advisory Committee meetings. The TAC will convene, when requested, to oversee the implementation duties of the Manitowoc/Two Rivers SSA Plan.

PROCEDURE FOR SEWER EXTENSION REVIEWS

With the final approval of this plan, WDNR will require that applications for sewer extensions in the Manitowoc-Two Rivers area be reviewed by Bay-Lake Regional Planning Commission to determine if the extensions are in conformance with the sewer service area plan. This local review process is illustrated in Figure 1 and is outlined below:

1. The municipality or their consulting engineers should submit a letter and a simple plan map of the proposed sewer extension to the Bay-Lake Regional Planning Commission. To avoid delays, this submittal shall 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 WDNR and that costly detailed sewer design and specification documents are not prepared for areas that do not conform with the plan and are subsequently rejected by WDNR.

2. The Bay-Lake Regional Planning Commission 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.

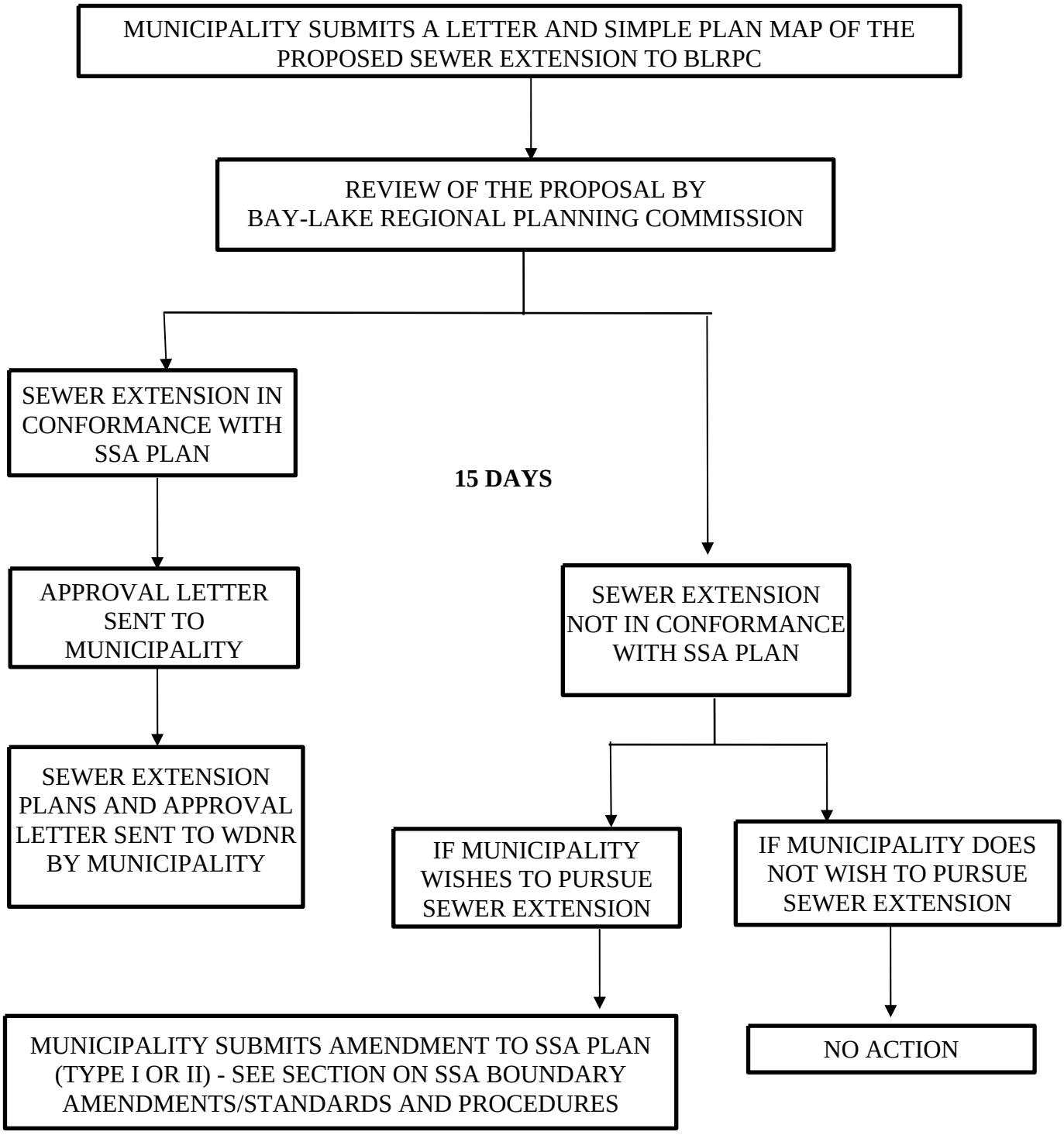
3. The Bay-Lake Regional Planning Commission will review all submissions and will provide the applicant with a review letter within **15** days of receipt of the plan map. If the proposed sewer extension is in conformance with the plan, the letter should be attached to the sewer extension plans which are submitted to WDNR by the applicant. Additionally, the Bay-Lake Regional Planning Commission will notify the municipality 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 its corresponding municipality will be notified by letter within **15** days.

    a) The community 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. The process for adopting plan amendments is discussed in the section entitled, "Sewer Service Area Boundary Amendments: Standards and Procedures."

        i) After the plan is amended, the community should submit the proposed sewer extension plan as discussed in number 1 above.

Figure 1: Flow Diagram of Procedeure for Sewer Extension Review



Source: Bay-Lake Regional Planning Commission, 1997.

WASTEWATER TREATMENT FACILITIES REVIEW

The *Manitowoc-Two Rivers 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 20-year sewer service area should be connected to existing wastewater treatment plants.

The WDNR has had a long-standing policy against the proliferation of new wastewater treatment facilities. The reasoning behind this policy is embodied in a topical study entitled "*Analysis of Wisconsin's Nonproliferation Policy and Implementation Recommendations*" adopted by the Natural Resources Board in August 1977. The policy was adopted because it was found that:

- 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 usually is 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 WDNR 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 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 which 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 121.05(1)(g) and 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 municipally 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 municipally 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 which provides for a specified date of abandonment and connection; this inter-municipal agreement shall be reviewed and approved by the WDNR 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 development specified in number 3.
- 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 municipally 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 20-year Sewer Service Area Boundary, a mechanism for reviewing and revising the service area boundary is essential. Amendments will provide municipalities 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 Regional Planning Commission will review amendment requests and forward them to the TAC, maintain the records of boundary amendments, review 208 requests for sewer extensions, and update the service area boundary map.

Two types of amendments to the service area boundaries may be expected. *Type One Amendments* are required when a municipality's service area boundary changes but the total acreage is not increased. The amendment would be reviewed by BLRPC and the Technical Advisory Committee and, if approved according to the Amendment Procedures, a request for a sewer service area amendment is forwarded to the WDNR. *Type Two Amendments* would result in an increase in a municipality's 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 BLRPC and the Technical Advisory Committee and, if approved according to the Amendment Procedures, a request for a sewer service area amendment is forwarded to the WDNR.

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 community affected by the amendment. 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 which would shift or add acreage to the service area shall meet standards one through six and number seven when applicable. Annexations or detachments of territory (as defined in Chapter 66 of the Wisconsin Statutes) within the boundaries of the sewer service area do not constitute amendments to the SSA Boundary and are therefore subject to amendment procedures.

1. There shall be minimal adverse impacts on environmental corridors and water quality as a result of development stimulated by the amendment.

2. Existing or planned sewage 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 adopted local comprehensive plan 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, will not create a void within the sewer service area.

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 Sewer Service Area Plan* have been developed, the service area may be increased by amending the boundary when it can be demonstrated:

    a) The current population growth rate exceeds the plan's projected population growth rate for the municipality.

    b) The population density standard is modified by the Technical Advisory Committee to reflect quantifiable changes in the municipality's population distribution.

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 equal size is removed. For this type of amendment, the following procedure is used (a flow diagram of this procedure is shown in Figure 2):

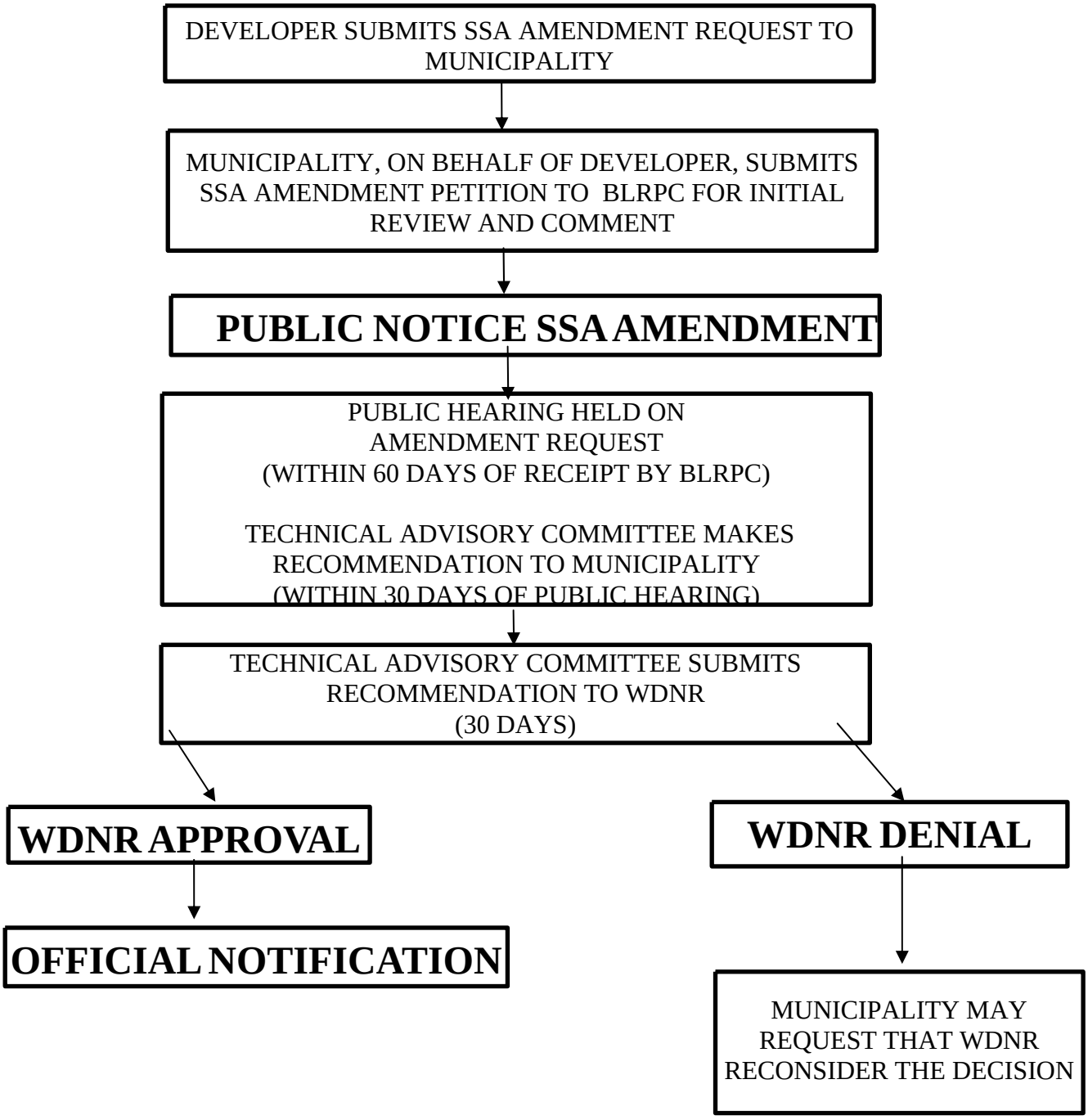
1. A petition to include / exclude a particular area from the Manitowoc-Two Rivers Sewer Service Area is filed with the municipality. The petition should include a map showing the location of the properties; general development plans for the area including land use proposals and a preliminary timetable for implementing the development plan; and an indication of the specific service needs of the site (i.e., sewer and water line size, water pressure, roadways, etc.).

2. The municipality refers the petition to the BLRPC for initial review. The BLRPC then forwards the request (with a recommendation) to the Technical Advisory Committee (TAC) for review and recommendation to the WDNR.

3. Within **60** days of receiving a completed amendment application by the BLRPC, the Technical Advisory Committee holds a public meeting and public hearing on the petition following publication of a Class I Notice according to Chapter 985 of the Wisconsin Statutes. The public notice shall be published in the official paper of the community affected by the amendment. All costs associated with the preparation and publishing of the public notice shall be borne by the petitioner. Representatives submitting the petition, BLRPC staff, WDNR staff, and interested citizens may testify. A record of the public hearing proceedings and testimony shall be maintained by the Technical Advisory Committee. The Technical Advisory Committee shall then take action on the proposed amendment within **30** days of the public hearing.

4. In formulating a recommendation, the BLRPC and TAC should consider: citizen input received at the meeting; comments from other local committees and the WDNR; conformance with community plans; development trends in the area; possible impacts on the physical environment; and conformance with the adopted Sewer Service Area 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 in 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.*

Figure 2: Flow Diagram of Procedures for SSA Boundary Amendment (Types I and II)



Source: Bay-Lake Regional Planning Commission, 1997.

5. The TAC shall review the recommendations and take final action on the amendment request within **30** days of the public hearing. All or any part of the petitioned land may be added to or removed from 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.
6. Amendments approved by the TAC shall be submitted to the WDNR within **30** days of approval. The WDNR will review the amendment and notify the community and the BLRPC within **45** days of receiving the amendment. If the WDNR rejects the amendment, the community may request the Department to reconsider their decision.
7. Approval conflicts between the WDNR and the Technical Advisory Committee must be resolved before sewer lines are extended into any new area.

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 Sewer Service Area boundary is modified to accommodate land for new development over the next 20 years, or for municipalities which are experiencing growth in excess of that projected in the sewer service plan. In addition, the plan will be reviewed every two and one-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 2):

1. If the municipality receives a development petition which 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 should be sent to the BLRPC by the municipality, which includes:

    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 land which is vacant.

    c) data on the current development densities of the municipality.

    d) information on the capacity of existing sewer lines and treatment facilities to service the area proposed for additions to the sewer service boundary.

2. The municipality refers the petition to the BLRPC for initial review. The BLRPC then forwards the request (with a recommendation) to the Technical Advisory Committee (TAC) for review and recommendation to the WDNR.

3. Within **60** days of receiving a completed amendment application by the BLRPC, the Technical Advisory Committee holds a public meeting and public hearing on the petition following publication of a Class I Notice according to Chapter 985 of the Wisconsin Statutes. The public notice shall be published in the official paper of the community affected by the amendment. All costs associated with the preparation and publishing of the public notice shall be borne by the petitioner. Representatives submitting the petition, BLRPC staff, WDNR staff, and interested citizens may testify. A record of the public hearing proceedings and testimony shall be maintained by the Technical Advisory Committee. The Technical Advisory Committee shall then take action on the proposed amendment within **30** days of the public hearing.

4. In formulating a recommendation, the BLRPC and TAC should consider: citizen input received at the meeting; comments from other local committees and the WDNR; conformance with community plans; development trends in the area; possible impacts on the physical environment; and conformance with the adopted Sewer Service Area Plan goals and objectives and the amendment standards.

5. The TAC shall review the recommendations and take final action on the amendment request within **30** days of the public hearing. All or any part of the petition 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.

6. Amendments approved by the TAC shall be submitted to the WDNR within **30** days of approval. The WDNR will review the amendment and notify the community and the BLRPC within **45** days of receiving the amendment. If the WDNR rejects the amendment, the community may request the Department reconsider the decision.

7. Approval conflicts between the WDNR and the Technical Advisory Committee must be resolved before sewer lines are extended into the new area.

OTHER DOCUMENT AMENDMENTS

All other portions of this SSA Plan (text, data, and maps) may be amended by the Technical Advisory Committee upon request. Proposed amendments shall be submitted to the BLRPC and forwarded to the members of the Technical Advisory Committee at least **seven** days prior to the meeting at which action on the amendment will be taken. Amendments approved by the Technical Advisory Committee will be transmitted to the WDNR for review and final approval.

PLAN UPDATE

A comprehensive review of the *Manitowoc-Two Rivers Sewer Service Area Plan* should be undertaken every two and one-half years and updated, if necessary; otherwise updated every

five years, with the first such review and update to be initiated by 2002. The updated should include as a minimum:

1. A review and update of the 1990 and 2000 population trends.

2. A review and update of population and demographic projections to the year 2020.

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 which were made during the preceding five years.

8. A description of amendments to the plan and service area boundaries which 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 20-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: LAND USE INVENTORY

Code	Land Use Classification	City of Manitowoc		City of Two Rivers		Town of Kossuth	
		Acres	Percent	Acres	Percent	Acres	Percent
100	Residential	3,015.0	27.5%	1,231.8	31.3%	305.7	4.1%
200	Commercial	419.6	3.8%	106.2	2.7%	21.0	0.3%
300	Industrial	848.5	7.8%	192.3	4.9%	49.1	0.7%
400	Transportation	1,703.3	15.6%	489.4	12.4%	372.3	5.0%
500	Communication/Utilities	58.0	0.5%	18.7	0.5%	-	-
600	Institutional/Governmental Facilities	530.1	4.8%	92.6	2.4%	23.3	0.3%
700	Outdoor Recreation	639.6	5.8%	207.0	5.3%	12.1	0.2%
800	Agriculture/Silviculture	2,540.8	23.2%	591.9	15.0%	4,841.9	65.6%
900	Natural Areas	1,192.4	10.9%	1,003.2	25.5%	1,749.9	23.7%
NEC	Other Development	1.0	0.0%	-	-	3.5	0.0%
	Total Acres	10,948.3	100.0%	3,933.1	100.0%	7,378.7	100.0%

Code	Land Use Classification	Town of Manitowoc		Town of Manitowoc Rapids		Town of Michicot	
		Acres	Percent	Acres	Percent	Acres	Percent
100	Residential	358.8	8.3%	843.1	4.8%	147.9	2.6%
200	Commercial	8.1	0.2%	15.3	0.1%	15.4	0.3%
300	Industrial	19.4	0.4%	68.0	0.4%	1.3	0.0%
400	Transportation	164.2	3.8%	824.6	4.7%	189.8	3.4%
500	Communication/Utilities	1.0	0.0%	3.9	0.0%	13.8	0.2%
600	Institutional/Governmental Facilities	-	-	9.4	0.1%	2.0	0.0%
700	Outdoor Recreation	10.0	0.2%	256.5	1.4%	23.2	0.4%
800	Agriculture/Silviculture	2,881.7	66.4%	12,430.6	70.1%	4,258.6	75.8%
900	Natural Areas	893.8	20.6%	3,276.6	18.5%	953.0	17.0%
NEC	Other Development	0.8	0.0%	-	-	11.6	0.2%
	Total Acres	4,337.8	100.0%	17,727.9	100.0%	5,616.6	100.0%

Code	Land Use Classification	Town of Newton		Town of Two Rivers		Village of Francis Creek	
		Acres	Percent	Acres	Percent	Acres	Percent
100	Residential	783.4	3.6%	856.3	4.2%	91.9	12.0%
200	Commercial	72.9	0.3%	28.1	0.1%	5.4	0.7%
300	Industrial	178.0	0.8%	9.8	0.0%	8.8	1.1%
400	Transportation	857.9	3.9%	530.1	2.6%	96.1	12.5%
500	Communication/Utilities	13.0	0.1%	21.2	0.1%	0.1	0.0%
600	Institutional/Governmental Facilities	33.6	0.2%	37.0	0.2%	4.5	0.6%
700	Outdoor Recreation	19.6	0.1%	27.5	0.1%	6.4	0.8%
800	Agriculture/Silviculture	16,247.5	73.7%	11,174.8	54.9%	456.8	59.6%
900	Natural Areas	3,832.5	17.4%	7,657.9	37.6%	96.7	12.6%
NEC	Other Development	7.5	0.0%	5.5	0.0%	-	-
	Total Acres	22,045.8	100.0%	20,348.3	100.0%	766.5	100.0%

Code	Land Use Classification	Village of Michicot	
		Acres	Percent
100	Residential	195.2	12.1%
200	Commercial	50.1	3.1%
300	Industrial	10.5	0.6%
400	Transportation	98.9	6.1%
500	Communication/Utilities	2.9	0.2%
600	Institutional/Governmental Facilities	45.3	2.8%
700	Outdoor Recreation	347.5	21.5%
800	Agriculture/Silviculture	637.8	39.4%
900	Natural Areas	230.7	14.2%
NEC	Other Development	-	-
	Total Acres	1,618.9	100.0%

APPENDIX B: SSA AMENDMENT APPLICATION MANUAL

APPENDIX B: MANITOWOC-TWO RIVERS URBANIZED AREA 2015 AREAWIDE SEWER SERVICE AREA PLAN APPLICATION MANUAL

1. INTRODUCTION

This manual is intended to provide a brief guidance to applicants for sewer service area amendments and sewer extension. The Bay-Lake Regional Planning Commission and the Sewer Service Area Plan Technical Advisory Committee may revised it from time to time as needed to aid the public comply with the *adopted Manitowoc-Two Rivers Urbanized Area 2015 Areawide Sewer Service Area Plan.*

A. What is a Sewer Service Areas Planning?

Sewer service area planning is a water pollution control planning process required by the Federal Clean Water Act and administer by the Wisconsin Department of Natural Resources (WDNR) under Chapter 121, Wisconsin Administrative Code (NR 121). Through this process communities develop 20 year-plans to guide sewered development and prevent water pollution associated with such development.

A sewer service area plan delineates lands that are most suitable for development and that can be serviced by a public wastewater collection and treatment system within 20 years. To protect water resources, the plan designates "environmentally sensitive areas" such as wetlands, shorelands, floodways and floodplains, areas of steep slope, where new sewered development is prohibited.

Only lands within a sewer service area are eligible to receive public sanitary sewer service. In addition, it is also necessary for the property owner to reach an agreement with the owner of the sewage treatment plant and with the entity who owns and operates the sanitary sewer collection system before such sewer service will be provided.

Federal and State regulations direct how the sewer service areas will be identified and who will do this. In Wisconsin, the Department of Natural Resources (DNR) is responsible for identifying all sewer service areas. The DNR contracted with the Bay-Lake Regional Planning Commission to prepare the sewer area service plan for the cities of Two Rivers and Manitowoc. The plan is entitled the *Manitowoc-Two Rivers Urbanized Area 2015 Areawide Sewer Service Area Plan.*

Federal and state guidelines also allow the boundaries of the sewer service areas to be revised and adjusted when necessary. At a minimum, it is recommended that they be reviewed at least every five to ten years to determine if circumstances warrant a change of the sewer service area delineation.

B. What are Environmentally Sensitive Areas and why are they important?

The Federal Clean Water Act and federal and state regulations also require that any part of a sewer service area which, if developed, could result in an adverse water quality impact, be specifically identified and not provided sewer service. An adverse water quality impact would be any harm to surface waters or ground waters often resulting from such actions as pollution, erosion, grading, or filling.

The Bay-Lake Regional Planning Commission defines such areas as Environmentally Sensitive Areas (ESAs). These areas include natural resource features such as lakes, rivers and streams,

wetlands, shorelands and floodlands, and steep slopes, including in some cases buffer areas adjacent to these areas.

The protection and preservation of these Environmentally Sensitive Areas can result in:

- ☐ cleaner and safer water for drinking and recreation;
- ☐ control of flooding and erosion;
- ☐ filtering of air and noise pollution; and
- ☐ Provision of wildlife habitat.

Improper development of these areas can result in failing foundations of pavements and structures and wet and flooded structures and property.

When developing land within a sewer service area, all Environmentally Sensitive Areas must be identified and preserved to protect the environment and to prevent serious and costly development problems.

More detailed information about these Environmentally Sensitive Areas can be found in Chapter 4 of the *Manitowoc-Two Rivers Urbanized Area 2015 Areawide Sewer Service Area Plan*

C. What are Amendments and why are they important?

The *Manitowoc-Two Rivers Urbanized Area 2015 Areawide Sewer Service Area Plan* does two very important things:

- ☐ It identifies and delineates a sewer service area (SSA) for which as or might receive, sanitary sewer service by the year 2015; and
- ☐ It identifies and delineates environmentally sensitive areas (ESA's) within the sewer service areas.

Any attempt to change those delineations is referred to as an amendment. There can be sewer service area changes, environmentally sensitive area changes, or both, but all are referred to as amendments. Sewer service area amendment requests must meet certain specific requirements and conditions which have been set forth by the Bay-Lake Regional Planning Commission and the Wisconsin Department of Natural Resources. Detailed information concerning these requirements and conditions are provided in Section II of this document.

D. Who can ask for Amendments?

Any official representative of the DNR, the county, a city, village, town or sanitary district can apply for an amendment. Such a representative is commonly referred to as the applicant.

E. Who is responsible for reviewing Amendments?

The Bay-Lake Regional Planning Commission, and Manitowoc-Two Rivers Sewer Service Area Plan Technical Advisory Committee (TAC) and the Wisconsin Department of Natural Resources are responsible for reviewing all amendments. The Wisconsin Department of Natural Resources also has the final responsibility of approving or denying amendments. In addition, the local unit of government must also concur with the amendment.

F. When can Amendments be requested?

An amendment can be requested at any time. However, it is strongly recommended that the applicant get local approval of the change first then meet with the staff of the Bay-Lake Regional Planning Commission to discuss the change. This is very important because an amendment is reviewed only if the local unit of government supports the request.

It is especially important that the applicant keep in mind that review by Bay-Lake Regional Planning Commission, Manitowoc-Two Rivers Sewer Service Area Plan Technical Advisory Committee (TAC) and the Wisconsin Department of Natural Resources can sometimes take as long as three months, or even longer for especially complicated amendments. Remember no sewered development or associated construction can occur until this review is complete and the amendment approved.

G. What kinds of Amendments are there?

The Sewer Service Area Plan identifies two types of amendment.

- ***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 equal size is removed.
- ***Type II Amendment:*** A municipality amends the sewer service boundary to increase the total acreage of the service area.

The Sewer Service Area Plan contains amendment standards to provide a fair and uniform basis for revising the sewer service boundary, while protecting the state's water quality.

H. What are Amendment Standards?

The amendment standards provide guidance to ensure that that the proposed amendment be justified by sound planning, environmental and engineering principals. All requests for amendments must be coordinated with the local wastewater treatment plant operator that is expected to treat the wastewater from the amended area. The local waste water treatment plant operator may have additional requirements that a petitioner must satisfy prior to receiving approvals from the waste water treatment plant operator. Such items could include a facilities plan, cost effectiveness study, intergovernmental agreements, compliance with ordinances, etc. Approval of an amendment is not a guarantee that the amended area will receive sewer services; it merely makes it eligible to receive sewer services.

1. There shall be minimal adverse impacts on environmental corridors and water quality as a result of development stimulated by the amendment.

2. Existing or planned sewage 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 adopted local comprehensive plan and zoning regulations and the established goals and objectives of the Sewer Service Area 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, will not create a void within the sewer service area.

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 Sewer Service Area Plan* have been developed, the service area may be increased by amending the boundary when it can be demonstrated:

    a) The current population growth rate exceeds the plan's projected population growth rate for the municipality.

    b) The population density standard is modified by the Technical Advisory Committee to reflect quantifiable changes in the municipality's population distribution.

I. How do I start?

The first step is to determine exactly what you want to do. When you know what property is involved and what it will be used for, check the Sewer Service Area maps to see what, if any, changes need to be requested. The Bay-Lake RPC office has a larger, more detailed color map of sewer service area and of the environmentally sensitive areas.

The second step is to check with the local unit of government and the wastewater treatment plant operator to determine if they will support your change. The Bay-Lake RPC will not review any change without local government support.

The third step is to contact the Bay-Lake RPC to arrange a meeting to discuss the change. The staff of the Bay-Lake RPC will let you know what information you need to provide and will answer any questions you may have about the amendment application manual.

The fourth step is to fill out the amendment application and gather any other information you need or want which supports your request. This can include maps, letters of support, technical studies, or special reports or plans.

Amendment review and the associated time frame for a decision do not begin until after all information requested in the amendment application manual is provided to the Bay-Lake RPC.

The last step is to provide the information to the Bay-Lake Regional Planning Commission. This must include, at a minimum:

- ☐ a map showing the requested change;
- ☐ a letter explaining the change and its reasons;
- ☐ a copy of the appropriate parts of the application manual with the information filled in; and
- ☐ a check to the Bay-Lake Regional Planning Commission to cover the cost of the review as determined by the Commission.

1. **II. AMENDMENTS**

2. **A. What do I need to do?**

The first step is to arrange a meeting with the staff of the Bay-Lake RPC. At that time, any questions you may have can be answered, you can look at any more detailed maps that the BLRPC may have, and the BLRPC staff will confirm if you need an amendment.

The second step is to provide to the Bay-Lake RPC:

- ☐ A letter explaining the amendment request, specifically address who is requesting the amendment, the type of amendment, and any other support for the amendment;
- ☐ A map or maps showing the location of the amendment request and other pertinent information such as sanitary district boundaries, existing and proposed sanitary sewers, land uses, zoning, natural resource features;
- ☐ A check to the Bay-Lake Regional Planning Commission in the amount of $900 to help defray the cost involved in reviewing the amendment request;

- ☐ A completed sewer service area amendment application; and
- ☐ Any other information which would support this amendment.

B. Sewer Service Area Amendment Application

Provide the following information:

- ☐ Location
- ☐ Acreage
- ☐ Metes and bounds description
- ☐ Location and extent of ESAs
- ☐ Existing Land Uses/Zoning
- ☐ Proposed Land Uses/Zoning
- ☐ Projected Population
- ☐ Projected Housing Units
- ☐ Projected Employment
- ☐ Local Land Use Plan and statement of consistency
- ☐ Area Development Plan
- ☐ Erosion Control Plan
- ☐ Stormwater Management Plan
- ☐ Other Permits or Approvals
- ☐ Letter from engineer or other qualified person regarding location and capacity of downstream sewers
- ☐ Letter from sewage treatment plant operator
- ☐ Sewage Loading Calculations
- ☐ Documentation Local Unit of Government Support
- ☐ Annexation History and/or Intergovernmental Cooperation Agreements (if applicable)
- ☐ Letter from State Historical Society
- ☐ Letters from the U.S. Fish and Wildlife Service and the Wisconsin Department of Natural Resources Bureau of Endangered Resources
- ☐ Ability to provide other services

C. Then what happens?

When all required materials and a completed application are submitted to the Bay-Lake Regional Planning Commission, a public hearing will be held by Technical Advisory Committee within 60 days from the date of receiving a completed application. The Technical Advisory Committee has 30 days from the public hearing date to approve the amendment and an other 30 days from the approval date to notify the WDNR of its recommendation. The WDNR has 45 days from the date of receiving the TAC's recommendation, including Bay-Lake Regional Planning Commission staff report and the public hearing comments, to take action on the amendment. During the review process the BLRPC may contact the Wisconsin Department of Natural Resources, and any other concerned units or agencies of government, for their review on this matter.

D. What if I disagree?

Should the applicant disagree with the findings and recommendation of the Bay-Lake Regional Planning Commission and the TAC, the applicant may indicate that to the Wisconsin Department of Natural Resources when the BLRPC submits all materials and information to the DNR.

The Wisconsin Department of Natural Resources will review and consider all information, and then issue a decision on this matter. Their decision on this matter is final.

III. SEWER EXTENSIONS

For sewer extensions that are within the approved sewer service area if found to be in conformance with the plan, a Type I or Type II amendment will not required. However, additional information similar to that required for a Type I or Type II amendment may be required. Please note that the wastewater treatment plant operator may require additional information, conditions, or stipulations. Applications for sewer extensions are strongly urged to contact the wastewater treatment plant operator prior to requesting approval of sewer extension from the Bay-Lake RPC.