



Hudson Area Urban Sewer Service Plan for 2020

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Final Copy

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CHAPTER 1- INTRODUCTION

1.1 Introduction

In the sixteen years since the preparation of a 1981 Hudson Area Sewer Service Plan, the significance and impact of planning for orderly development has changed dramatically. A recently completed 1993 Comprehensive Plan for the City of Hudson reflected the changing conditions impacting Hudson since earlier planning efforts going back to the 1960s. Also in 1993, the City of Hudson completed a Comprehensive Sanitary Sewer Plan to guide sewage treatment and sewerage trunk facilities improvements. However, in Wisconsin, comprehensive plans and facility plans are augmented by other planning mechanisms that relate to specific regulatory functions.

Sewer service area plans are a formal element of state areawide water quality management plans (basin plans) which are part of state administrative rules. Being grounded in state law, agency actions on local development proposals must be consistent with sewer service area plans. In addition, urban areas are now more aware of sewer service areas because of their common use in development planning. Now communities with a population over 10,000 must consider sewer service area plans in development decisions where state approvals and permits are needed. Sewer service area plans, and their subsequent updates, are prepared by local or regional planning agencies, under contract with the Wisconsin Department of Natural Resources. The City of Hudson, and its surrounding communities, began the planning for a sewer service plan update in 1994. To the extent possible the preparation of this plan is based on already existing documents which will be referenced within.

Any proposal to extend sanitary sewer or to hookup to existing sanitary sewer in the Hudson area must start with contacting either the City of Hudson or the Village of North Hudson. Contact persons for this purpose are found in Appendix F.

1.2 Purpose

Sewer service area plans serve as a basis for Wisconsin Department of Natural Resources (WisDNR) approval of state and federal grants for the planning and construction of wastewater treatment and sewerage facilities. They also serve as a basis for WisDNR approval of locally proposed sanitary sewer extensions and Department of Commerce (COM) approval of private sewer laterals. In addition, because the service area plans identify environmentally sensitive areas, they serve as a guide for environmental permit decisions by federal and state agencies.

The urban sewer service area plan is intended to be an important planning and development guide for local communities. The plan serves the following purposes:

1. It projects future needs for sewer service and establishes the geographic extent of the sewer service area for a twenty-year planning period to the year 2020.

2. It provides technical data for designing cost-effective and environmentally sound sewage treatment configurations for the Planning Area.
3. It defines the procedures for reviewing boundary and plan amendments.
4. It identifies sensitive environmental areas as environmental corridors which will be protected from sewer development.
5. It serves as a guideline for government interaction and will be useful in the development of community plans.
6. It provides a basis for community officials to direct community growth and protect environmental, social and economic concerns.
7. The plan will become a component of the St. Croix River Basin Plan, an Areawide Water Quality Management Plan.

The approved urban sewer service area plan is required to be updated every five years to reflect changes in statutes and policies, and to review data, such as population projections and housing densities.

1.3 Background

The passage of the Federal Water Pollution Control Act Amendment (P.L. 92-500) in 1972 marked the beginning of a new approach to the planning, design and construction of municipal wastewater collection and treatment facilities. This law established Areawide Water Quality Management Planning under Section 208, and also the Facility Planning Grant Program under Section 201.

One of the principal purposes of areawide plans is to identify cost-effective solutions to wastewater collection and treatment problems on a regional basis. To accomplish this objective, areawide plans are required to include "the identification of treatment works necessary to meet the anticipated municipal and industrial waste treatment needs of the area over a twenty year period", and a program to "regulate the location, modification and construction of any facilities within such area which may result in any discharge in such area" (Public Law 92-500, Section 208(b)(2)(A)). The planning tool used to address these requirements in the City of Hudson area is the urban sewer service area plan.

The Section 201 Facility Planning Grant Program was developed to provide uniform guidelines for the planning, design and construction of municipal wastewater facilities and to provide financial assistance to communities with inadequate wastewater collection and treatment systems. Facility plans prepared under Section 201 must be consistent with the broader framework of the areawide plans prepared under Section 208.

In recent years, the State of Wisconsin has embodied many of the Federal areawide and facility planning requirements in the Wisconsin Administrative Code. These administrative rules set forth clear procedures and standards regarding the preparation of these plans and

their implementation. Specific sections of the code directly pertaining to these activities are NR121, concerning areawide waste treatment management planning; and NR110, concerning facility planning and sanitary sewer extensions. Chapter NR121, Areawide Water Quality Management Plans, requires urban sewer service area plans to be components of Areawide Water Quality Management Plans. The Hudson Urban Sewer Service Area lies entirely within the St. Croix River Basin Water Quality Management Area. Hence, when it is completed, the Hudson Area Urban Sewer Service Plan will be amended to the St. Croix River Areawide Water Quality Management Plan.

NR121, supplemented by WisDNR planning guidance (Appendix A), largely sets forth the requirements for sewer service area planning. Specifically, NR121 requires that the following major elements be included in the areawide plans: (1) population forecasts for 20 years in five year increments (NR121.05(2)(c)3); (2) existing and projected land use patterns including the delineation of sewer service areas (NR121.05(2)(c)4); and (3) an identification of sewage collection system needs through the delineation of sewer service areas for existing and proposed treatment systems for the 20 year planning period (NR121.05(2)(g)). Sewer service area plans prepared under NR121 must meet the following specific standards and criteria:

- The sewer service area is determined in such a fashion as to promote cost-effective and environmentally sound waste collection and treatment;
- The sewer service areas are delineated based on a 20 year population forecast, and municipally approved population density standards;
- Areas unsuitable for the installation of waste treatment systems because of physical or environmental constraints are to be excluded from the sewer service area. Areas to be considered for exclusion from the sewer service area because of the potential for adverse impacts on water quality from both point and non-point sources of pollution include, but are not limited to, wetlands, shorelands, floodways and floodplains, steep slopes, highly erodible and other limiting soil types, groundwater recharge areas, and other such physical constraints.
- The sewer service area plan shall include criteria for the construction of future treatment systems within the areawide planning area (NR110.08(5)).

Upon approval by the state, the St. Croix River Basin Plan, and more specifically the sewer service area element, establishes the framework within which facility plans are developed and sewer extensions are reviewed under NR110. NR110 establishes an extensive series of regulations covering all phases of design and construction of sewerage systems. Perhaps the most significant requirement of NR110 in terms of sewer service area planning is found in NR110.08(4) and NR110.08(5)(e) requiring facilities plans for all projects subject to review for conformance with the areawide plans. These requirements serve to elevate sewer service areas from a purely advisory planning guideline to a functional mechanism for directing growth and development. It is important to recognize that regulatory aspects of the sewer service area rest with the State of Wisconsin. The West Central Wisconsin Regional Planning Commission's and the St. Croix County Planning and Development Department's role remains advisory to the communities and the Department of Natural Resources.

1.4 Planning Committee

Section NR121 requires a local policy committee be established, or an existing one be used, to assist the DNR in the preparation of the plan and act as an advisor in matters concerning implementation. The West Central Wisconsin Regional Planning Commission formed a local intergovernmental planning committee is necessary to oversee the preparation of the plan update. The nine voting member Hudson Area Urban Sewer Service Planning Committee represents and reports back to its member units of local government and respective interest groups. The Committee consists of three appointees from the City of Hudson, two from the Village of North Hudson, one each from the Towns of Hudson, St. Joseph and Troy, and one from the St. Croix County Planning Department. The non-voting Committee Chair is from the Regional Planning Commission and the representative from the County only votes to break a tie. In addition, the Committee has advisory and non-voting participation from the Hudson Area Development Corporation, St. Croix County Economic Development Corporation, Western Wisconsin Board of Realtors, and the Minnesota-Wisconsin Boundary Area Commission.

1.5 Planning Area

The Hudson Urban Area is located in the southwestern quadrant of St. Croix County which lies in West Central Wisconsin. This rapidly urbanizing area is about 18 miles east of the Cities of Minneapolis and St. Paul, and about 66 miles west of Eau Claire, Wisconsin. Minneapolis and St. Paul are the central cities of the Minneapolis-St. Paul Metropolitan Statistical Area which encompasses St. Croix County. The City of Eau Claire is the central city of the Chippewa-Eau Claire Metropolitan Statistical Area which includes all of Chippewa and Eau Claire Counties.

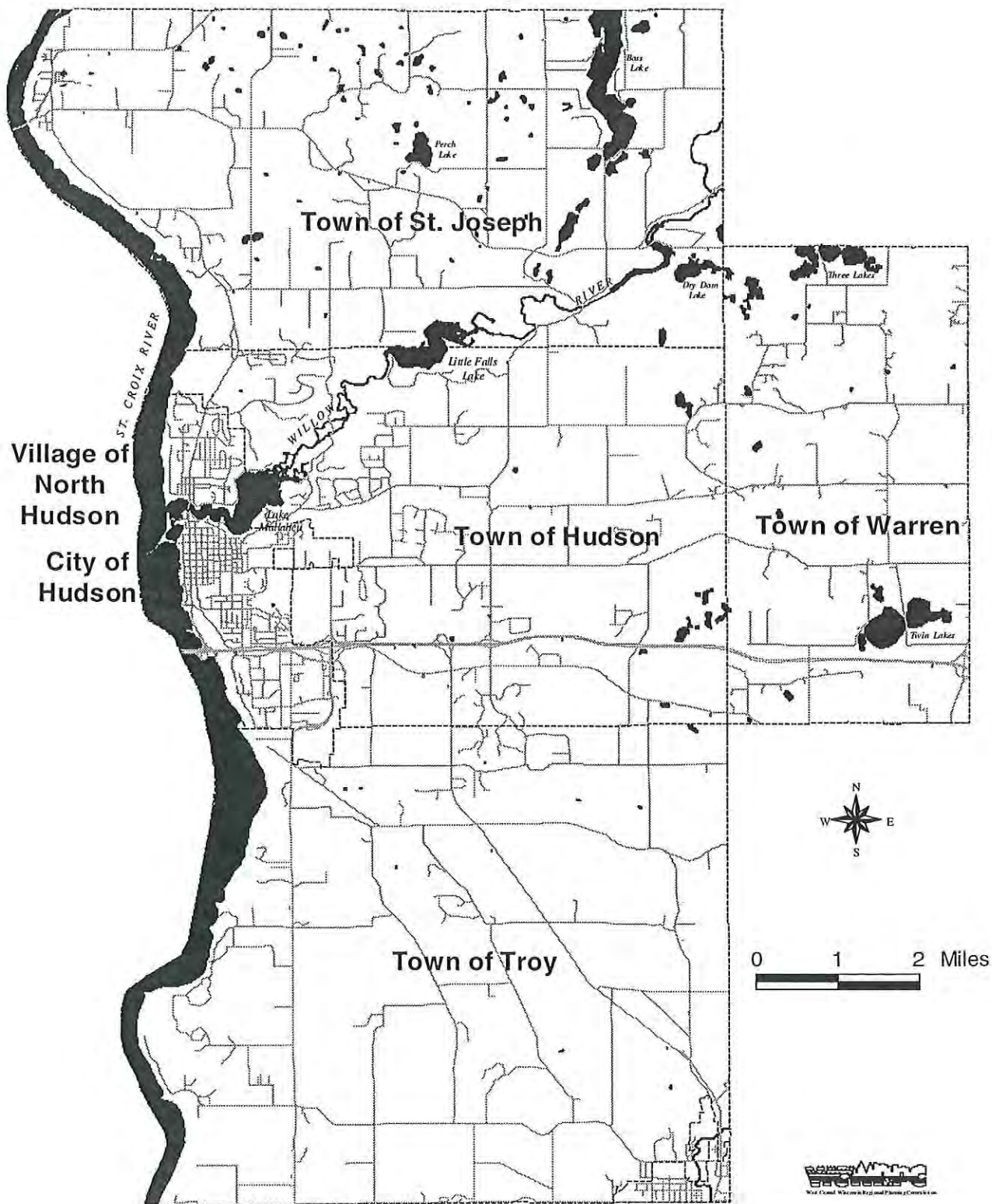
The City of Hudson, which has a land area of approximately 3.6 square miles, and to its north, the Village of North Hudson, about 1.5 square miles in size, lie at the western edge of the Town of Hudson. The Town of Hudson covers approximately 28.8 square miles and lies between the Town of St. Joseph to the north (34.94 square miles) and the Town of Troy to the south (41.71 square miles). The First Ward of the City of River Falls extends north from Pierce County into the Town of Troy. The Town of Warren (approximately 35.6 square miles) is directly east of the Town of Hudson and the southern one-third of the Town of St. Joseph, and contains the Village of Roberts.

The establishment of a planning area assists in focusing sewer service area study efforts to a well defined geographic area and facilitates a comprehensive examination of data needed in the planning effort. The criteria used in delineating the Planning Area included:

1. The recognition of areawide land use trends and patterns;
2. The recognition that water quality and growth problems are areawide concerns; and,
3. The delineation of planning areas in previous planning efforts.

Based on these criteria the Hudson Area Urban Sewer Service Planning Committee selected as the study or planning area for the sewer service area plan update the area encompassing all of the Towns of Hudson, St. Joseph and Troy, and the incorporated areas of the City of Hudson and the Village of North Hudson. In addition, the western half of the Town of Warren will be a supplemental study area regarding the potential for sanitary sewer service. Not all of the data collected for the Planning Area contains information for the western half of the Town of Warren. Hence, the plan focuses on the Towns of Hudson, St. Joseph and Troy, and the City of Hudson and the Village of North Hudson. The Planning Area encompasses approximately 83,000 acres. Map 1 outlines the Planning Area boundary and the municipality boundaries. For the purpose of the Plan, the Planning Area will also be referred to as the Hudson Urban Area or Hudson Area.

Planning Area



CHAPTER 2- GROWTH AND DEVELOPMENT TRENDS

2.1 General Characteristics of the Planning Area

The Hudson Urban Area lies within the beautiful Lower St. Croix River valley. The topography and drainage of this area are reflections of Hudson's glacial history. Hudson is centered on a large terminal (end) moraine that affects the physical geography of so much of West Central Wisconsin. The St. Croix River was a major drainage feature as the glaciers of the Pleistocene Epoch receded. The subsurface geology is that of upper Cambrian Sandstones and Ordovician Dolomites. The soils in the area are generally silty-loamy glacial tills.

The City of Hudson experienced rapid growth from 1970 to 1994, growing more than twice as fast in the 1980's than in the 1970's; with a similar rate of growth apparently continuing into the 1990's. The towns surrounding the City of Hudson, and the Village of North Hudson, experienced even faster population growth throughout the 1970's and 1980's. The Town of Hudson experienced the greatest growth, increasing its population by almost three-hundred percent between 1970 and 1990. In general, during the last twenty years, the population of the towns in the Hudson Area have been growing about three times as fast as the incorporated areas of the City of Hudson and the Village of North Hudson, and the County as a whole.

Employment has risen steadily in the Hudson Area. Not only is a substantial amount of employment being created in the Planning Area, but also a high percentage of the residents of this area are commuting to the Minneapolis/St. Paul area. The growth of the area's population and employment can be attributed to several factors: proximity to the Minneapolis/St. Paul Metropolitan area; an aggressive economic development program; a high quality of life; and proximity to transportation infrastructure and natural resources. To provide the urban area with a cost-effective, environmentally sound sewage treatment configuration, the sewer service plan should guide and/or control urban growth.

2.2 Population

2.2.1 Existing Population

The population of the Hudson Area has experienced dramatic fluctuations in the past. Generally, between 1920 and 1940 there were declines in population, as the nation as a whole experienced a migration from rural areas to the urban areas. However, since 1940 the population has shown steady to rapid growth. The rate of population growth for the Hudson Area has exceeded that of St. Croix County as a whole since 1940. A large share of this growth can be attributed to the migration of people from the Minneapolis/St. Paul Metropolitan Area into the Hudson Area. The future rate of increase will likely depend on the movement of people from the Twin Cities into the Hudson Area, infrastructure improvements, the availability of mortgage money, interest rates, and building costs.

Examination of selected characteristics of the Hudson Area population provides insight into the present and future needs of the community. Table 1 shows the median ages of the

people in the communities of the Planning Area. The median age is that age at which there are the same number of people in the population with ages above it and below it, and gives a cursory idea of the overall age structure of a community. Mirroring the statewide trends, in all cases the median age has increased since 1970, with the most noticeable change occurring in the Town of Troy. This is a complete reversal from the statewide trend prior to 1970 when the median age was falling since the 1950's.

TABLE 1 MEDIAN AGE COMPARISONS 1970 - 1990			
	<u>1970</u>	<u>1980</u>	<u>1990</u>
City of Hudson	26.6	28.8	32.1
Town of Hudson	22.6	26.6	30.8
Town of St. Joseph	24.5	27.2	31.6
Town of Troy	22.1	26.4	31.3
Village of North Hudson	25.4	28.0	30.5
St. Croix County	25.6	28.0	31.6
Wisconsin	27.2	29.4	32.9

Source: U. S. Census Bureau, 1970 - 1990

More information about the population of the Hudson Area is revealed in Table 2. This table shows the Dependency Ratio, which relates to the size of the potential working population (ages 15 through 64) and the assumed non-working or dependent

population. The dependency ratio is defined as the combined number of people aged under 15 and over 64 for every 100 members of the rest of the population. If the "working" population were small in comparison to the rest of the population, the dependency ratio would be high. Obviously, it is not an exact ratio of dependents to supporters since many people presumed to work may not and some who are considered dependent may work. Indeed, there are many individuals who are 65 and older who are independent. However, the dependency ratio does give a rough and comparative approximation of dependents to supporters. It can be seen that the dependency ratios for the area communities have been falling over the past twenty years. This means that the size of the "working" population (ages 15 through 64) has been growing compared to the rest of the population.

TABLE 2 DEPENDENCY RATIOS* 1970 - 1990					
<u>Year</u>	<u>City of Hudson</u>	<u>Town of Hudson</u>	<u>Town of St. Joseph</u>	<u>Town of Troy</u>	<u>Village of North Hudson</u>
1970	76.10	71.86	80.45	67.99	70.56
1980	51.20	51.44	51.39	47.16	56.20
1990	53.02	44.90	44.95	38.92	47.25

Source: U. S. Census Bureau, 1970 - 1990

* Dependency Ratio is defined as the total number of people aged under 15 and 65 and over for every 100 members of the rest of the population.

One factor related to the dependency ratio is the fertility rate. The fertility rate is defined as the number of children under five years of age for every 1000 women in the 15-49 age group. This rate on a national level continues to decline due to a number of factors including concern over a growing population and its demand on natural resources, the general state of the economy, married couples in which both partners work outside of the home, those same

married couples having fewer or even no children, a smaller percentage of marriages, and increased divorce rates. Table 3 displays the fertility rates for the communities in the Hudson Area for 1970 and 1990. Interestingly, in 1970 the City of Hudson had a lower fertility rate than the other communities in the Planning Area, while by 1990 the fertility rates of those communities, other than the Town of St. Joseph, dropped below that of the City. Indeed, the fertility rates have appeared to generally even out for the entire Hudson Area to about 30 children under age five for every 1000 women aged 15 to 49.

TABLE 3 FERTILITY RATES*		
	<u>1970</u>	<u>1990</u>
Hudson City	37.7	30.2
Hudson Town	42.0	29.1
St. Joseph Town	52.7	32.3
Troy Town	45.8	25.1
N. Hudson Village	49.3	29.4

* The fertility rate is defined as the number of children under five years of age for every 1000 women in the 15-49 age group.

Source: U. S. Census Bureau, 1970, 1990

As fertility rates have declined in the Hudson Area, the death rates have remained fairly stable. It is probable this trend will continue, although fertility rates may stabilize at some point. Assuming a stable death rate and a stable fertility rate (at or near the replacement level), the Hudson Area is

still projected to grow considerably over the next twenty years because of the major dynamic of its most recent growth, migration.

In order to understand the extent to which migration is affecting the area, one must consider what the population would be had no migration occurred and relate that to the actual population. The resulting figure approximates the in-migration of the area and is the derived from the following formula:

$$\begin{aligned} \text{Beginning of decennial population} + \text{Births} - \text{Deaths} &= \text{Expected end of decennial population} \\ \text{Actual end of decennial population} - \text{Expected end of decennial population} &= \text{Net In-Migration} \end{aligned}$$

For the Planning Area, net in-migration was 71.7 percent of the increase in the population from 1960 to 1970. Net in-migration was 73 percent of the increase in the Planning Area population between 1970 and 1980. For the 1980 to 1990 decennial period the net in-migration accounted for 64.0 percent of the population increase. Hence, net in-migration is a very significant component of the area's population increase and will likely remain so. The major factor of this area's migration is, of course, the proximity and easy access to the Twin Cities Metropolitan Area, with its employment opportunities and urban amenities, and the aesthetic appeal of the St. Croix River, the surrounding countryside and the small town or rural character of the communities. Another factor which may influence growth and development in the Planning Area is stricter development controls in Minnesota communities. Apparently the positive influences on many individual decisions to migrate overwhelm the perceived, potential or real negative influences of high commuting, land, development and taxation costs. This is evidenced in the continued growth of the Planning Area due, in large part, to in-migration.

The dynamics of the Hudson Area population over the last seventy years can be seen in Table 4. The declining population of the 1920's and 1930's gave way to population increases

after 1940. The most dramatic changes occurred in the thirty years between 1960 and 1990. Table 5 shows the population changes for the incorporated and unincorporated areas, as well as, the Planning Area and St. Croix County. While there was the fastest rate of growth in the 1970's corresponding to the nationwide trend of faster non-metropolitan than metropolitan growth, the Hudson Area has continued to grow at a rapid rate into the 1990's. This is demonstrated in Table 6 which shows population change between the 1990 Census and the Wisconsin Department of Administration's 1994 population estimate. By interpolating a yearly growth rate for the Planning Area it is apparent that, in the 1990's, growth continues at

TABLE 4 POPULATION CHANGE
HUDSON AREA COMMUNITIES, 1920 - 1990

<i>Year</i>	<i>City of Hudson</i>		<i>Town of Hudson</i>		<i>Town of St. Joseph</i>		<i>Town of Troy</i>		<i>Village of North Hudson</i>	
	<i>Pop.</i>	<i>Change</i>	<i>Pop.</i>	<i>Change</i>	<i>Pop.</i>	<i>Change</i>	<i>Pop.</i>	<i>Change</i>	<i>Pop.</i>	<i>Change</i>
1920	3,014	---	500	---	854	---	635	---	586	---
1930	2,725	-9.9%	490	-2.0%	752	-11.9%	677	6.6%	625	6.7%
1940	2,987	9.6%	426	-13.1%	718	-4.5%	589	-12.9%	595	-4.8%
1950	3,435	15.0%	467	9.6%	846	17.8%	655	11.2%	787	32.3%
1960	4,325	25.9%	649	39.0%	1,068	26.2%	845	29.0%	1,019	29.5%
1970	5,049	16.7%	925	42.5%	1,357	27.1%	1,517	79.5%	1,547	51.8%
1980	5,434	7.6%	2,012	117.5%	2,180	60.6%	2,326	53.3%	2,218	43.4%
1990	6,378	17.4%	3,692	83.5%	2,657	21.9%	2,850	22.5%	3,101	39.8%

Source: U.S. Census Bureau, 1920 - 1990

TABLE 5 POPULATION CHANGE
PLANNING AREA AND ST. CROIX COUNTY, 1950-1990

<i>Year</i>	<i>Incorporated Area</i>		<i>Unincorporated Area</i>		<i>Planning Area</i>		<i>St. Croix County</i>	
	<i>Pop.</i>	<i>Change</i>	<i>Pop.</i>	<i>Change</i>	<i>Pop.</i>	<i>Change</i>	<i>Pop.</i>	<i>Change</i>
1950	4,222	---	1,968	---	6,190	---	25,905	---
1960	5,344	26.6 %	2,562	30.2 %	7,906	27.7 %	29,164	12.6 %
1970	6,596	23.4 %	3,799	48.3 %	10,395	31.5 %	34,354	17.8 %
1980	7,652	16.0 %	6,518	71.6 %	14,170	36.3 %	43,262	25.9 %
1990	9,479	23.9 %	9,199	41.1 %	18,678	31.8 %	50,251	16.2 %

Source: U.S. Census Bureau, 1950 - 1990

more than 2 percent per year. The Town of Hudson appears to be growing slightly faster in the 1990's than it was in the 1980's; hence it has continued its very rapid growth, adding about 150 residents annually.

2.2.2 Population Trends

The background provided by the demographic history of the Planning Area reveals the trends which will likely project into the future. The population projections in Table 6 were developed by the West Central Wisconsin Regional Planning Commission in 1995. They were

based on St. Croix County U.S. Census populations from 1970 to 1990, and a 1995 estimate produced by the Regional Planning Commission. The methodology used in generating the population projections is described in Chapter 3.

	<u>1990 Census</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>
City of Hudson	6,378	7,331	8,012	8,692	9,373	10,053	10,734
Town of Hudson	3,692	4,471	5,094	5,883	6,667	7,449	8,229
Town of St. Joseph	2,657	3,038	3,372	3,707	4,041	4,376	4,710
Town of Troy	2,850	3,197	3,521	3,846	4,170	4,495	4,819
Village of North Hudson	3,101	3,425	3,792	4,160	4,527	4,894	5,262
Unincorporated Area	9,199	10,706	11,987	13,436	14,878	16,320	17,758
Incorporated Area	9,479	10,756	11,804	12,852	13,900	14,947	15,996
Hudson Urban Area	18,678	21,462	23,791	26,288	28,778	31,267	33,754

Source: West Central Wisconsin Regional Planning Commission (WCWRPC), 1995

2.3 Employment

2.3.1 Existing Employment

The employment trends compiled for the Planning Area are from the U.S. Census Bureau, and the Wisconsin Department of Industry, Labor and Human Relations (DILHR). The Department of Industry, Labor and Human Relations no longer exists. The employment statistics function of DILHR is now provided by the Wisconsin Department of Workforce Development. The Wisconsin Department of Commerce (COM) handles some of the other functions formerly performed by DILHR, including the review of certain sewer hookups.

U.S. Census employment and occupation figures are "place of residence" which indicate the employment or occupation of people who live in a certain area or municipality and not where they work. Hence, someone living in Town of Hudson, for example, is listed in the Census under the Town of Hudson as working in manufacturing, but there is no indication they actually work in Bayport, Minnesota. In contrast, the DILHR information lists jobs by "place of work" and reflects the employment of firms within a county or county subarea. The manufacturing job in the City of Hudson, for example, held by the Town of Warren resident will be listed under the Incorporated Areas employment figures from DILHR.

Table 7 presents the distribution of employment of workers living within the Planning Area in 1980 and 1990. Except for employment in agriculture, there is not much difference between the number of Town (unincorporated) and City or Village (incorporated) residents employed in each of the employment categories. In 1990, about 38 percent of the County's total population lived in the Planning Area. At the same time about 35 percent of St. Croix County residents employed in manufacturing, and about 55 percent of St. Croix County residents employed in wholesale/retail trade and services lived in the Planning Area. This would indicate there are a disproportionate number of wholesale/retail trade and service workers living in the Planning Area.

TABLE 7		DISTRIBUTION OF EMPLOYMENT BY INDUSTRY GROUP (Place of Residence)				
	<i>Incorporated Areas</i>		<i>Unincorporated Areas</i>		<i>Planning Area</i>	
	<u>1980</u>	<u>1990</u>	<u>1980</u>	<u>1990</u>	<u>1980</u>	<u>1990</u>
Agriculture	18	61	217	223	235	284
Construction	161	243	182	283	343	526
Manufacturing	1,118	1,250	797	1,306	1,915	2,556
Transportation & Public Utilities	256	351	200	391	456	742
Wholesale & Retail Trade	770	1,435	555	1,348	1,325	2,783
Finance, Insurance, Real Estate	201	497	219	409	420	906
Services	936	2,185	7,33	2,182	1,669	4,367
Government	469	607	390	628	859	1,235
TOTAL	3,929	6,629	3,293	6,770	7,222	13,399

Source: U.S. Census Bureau, 1980 - 1990

While the above table does not indicate where employed residents work, Table 8 shows the number and percentage of workers living in the Planning Area who commuted to the Minneapolis/St. Paul Metro Area counties in Minnesota during 1990. In every Planning Area community, more than half of the workers commuted to Minnesota in 1990. It is likely that

TABLE 8		PLANNING AREA WORKERS COMMUTING TO MINNEAPOLIS/ST. PAUL AREA 1990	
<i><u>Place of Residence</u></i>	<i><u>Total Commuting</u></i>	<i><u>Total Workers</u></i>	<i><u>Percent Commuting</u></i>
Town of Hudson	1,186	1,971	60.2 %
Town of St. Joseph	989	1,440	68.7 %
Town of Troy	814	1,758	46.3 %
City of Hudson	1,675	3,298	50.8 %
Village of N. Hudson	904	1,680	53.8 %
Unincorporated	2,989	5,169	57.8 %
Incorporated	2,579	4,978	51.8 %
Planning Area	5,568	10,147	54.9 %

Source: U.S. Census Bureau, Journey-To-Work Data

most of those workers not commuting to Minnesota work in St. Croix County and a small percentage of workers commute to surrounding Wisconsin counties. There are also more workers living in the Planning Area commuting into Minnesota than there are Wisconsin workers commuting from outside of St. Croix County into the County.

The employment figures shown in Table 9 for St. Croix County indicate that manufacturing within the county has historically employed the largest number of workers. In 1983 manufacturing employed 22% of those people working in St. Croix County. By 1995, 27% of those people working in St. Croix County were in manufacturing jobs. Historically, the largest growth in jobs in absolute numbers has been in manufacturing which has created 3000 jobs in 12 years. The sector of the economy showing the largest growth rate in employment has been construction for which employment grew by 141 percent between 1983 and 1995. This is not surprising considering the growth of population and housing units in the county.

TABLE 9		ST. CROIX COUNTY EMPLOYMENT BY MAJOR CATEGORY (Place of Employment)			
	<u>1983</u>	<u>1993</u>	<u>1983-93 %</u> <u>Change</u>	<u>1995</u>	<u>1993-95 %</u> <u>Change</u>
Agriculture	2,075	1,830	-11.8%	1,830	0.0%
Construction	340	640	88.2%	820	28.1%
Manufacturing	3,100	5,300	70.9%	6,120	15.5%
Transportation & Public Utilities	440	930	111.4%	880	-5.3%
Wholesale & Retail Trade	2,980	4,990	67.4%	5,180	3.8%
Finance, Insurance, & Real Estate	380	530	39.5%	600	13.2%
Services	2,400	3,900	62.5%	4,520	15.9%
Government	2,100	2,900	38.1%	2,930	1.0%
Total Employees	13,815	21,020	52.2%	22,880	8.8%

Source: Wisconsin Department of Industry, Labor, and Human Relations, 1983, 1993, 1995
1980 & 1990 Census (agriculture figures only)

Table 10 presents the distribution of jobs for 1982 and 1992 within the Planning Area by incorporated and unincorporated areas, and the entire Planning Area. Unlike the county as a whole, in the Planning Area retail and services employment dominates, with manufacturing employment trailing those categories. This reflects the influence of the Hudson area as a commercial center for much of the surrounding area. In 1992, retail and services accounted for about 53% for the employment within the Planning Area while manufacturing accounted for 19%.

TABLE 10		DISTRIBUTION OF EMPLOYMENT BY INDUSTRY GROUP (Place of Employment)					
INDUSTRIAL CLASS	<u>SIC Code</u>	<u>Incorporated</u>		<u>Unincorporated</u>		<u>Planning Area</u>	
		<u>1982</u>	<u>1992</u>	<u>1982</u>	<u>1992</u>	<u>1982</u>	<u>1992</u>
Agriculture & Forestry	0-999	3	30	12	13	15	43
Mining	1000-1499	0	0	0	0	0	0
Construction	1500-1999	126	175	23	62	149	237
Manufacturing	2000-3999	779	1,175	189	240	968	1,415
Transportation & Public Utilities	4000-4999	469	776	5	28	474	804
Wholesale Trade	5000-5199	39	68	11	7	50	75
Retail Trade	5200-5999	640	1,438	251	548	891	1,986
Finances, Insurance & Real Estate	6000-6999	134	168	1	4	135	172
Services	7000-8999	842	1,805	239	75	1,081	1,880
Public Admin.	9000-9999	693	708	31	22	724	730
Education	8200-8299	280	488	1	0	281	488
Total		3,725	6,343	762	999	4,487	7,342

Source: Wisconsin Department of Industry, Labor, and Human Relations, 1982, 1992

2.3.2 Other Economic Indicators

Two other indicators of the economic condition of St. Croix County are unemployment rates and personal income. The unemployment rate for St. Croix County has remained low in the 1990's, falling from 3.6% in 1990 to 3.0% in 1996. Table 11 shows the income per capita for the communities in the Hudson Urban Area. In the 1970s the incomes rose in the towns faster than they did in the incorporated communities. However, from 1982 to 1992 incomes rose the fastest in the City of Hudson and the Town of Troy.

TABLE 11 INCOME PER CAPITA HUDSON URBAN AREA						
	<u>1970</u>	<u>1978</u>	<u>% Change 1970-78</u>	<u>1982</u>	<u>1992</u>	<u>% Change 1982-92</u>
Hudson City	\$3,843	\$7,634	98.6	\$12,183	\$26,152	114.7
Hudson Town	\$2,974	\$6,977	134.6	\$8,312	\$14,581	75.4
St. Joseph Town	\$2,538	\$6,227	145.4	\$7,704	\$15,691	103.7
Troy Town	\$2,288	\$6,018	163.0	\$6,569	\$14,600	122.3
N. Hudson Village	\$2,544	\$5,326	109.4	\$6,812	\$11,691	71.6

Source: Wisconsin Department of Revenue, 1970 - 1992

Table 12 shows a comparison of per capita incomes for western Wisconsin communities from 1970 to 1992. Most of these communities have experienced similar growth in personal income. However, it is evident that incomes in Hudson are higher than both the county and state average, and are higher than in other communities in the area.

TABLE 12 INCOME PER CAPITA (dollars) COMMUNITY COMPARISON				
	<u>1970</u>	<u>1978</u>	<u>1982</u>	<u>1992</u>
River Falls	2,438	5,157	6,266	12,673
Baldwin	3,244	5,893	7,780	12,636
New Richmond	3,233	6,512	8,199	15,830
Rice Lake	2,631	4,877	6,300	13,350
Menomonie	2,049	3,974	4,209	8,718
Hudson	3,843	7,634	12,183	26,152
St. Croix County	2,802	5,729	7,248	14,883
WISCONSIN	3,043	5,936	7,407	13,287

Source: Wisconsin Department of Revenue, 1970 - 1992

2.3.3 Employment Trends

The Planning Area has a large number of workers commuting to employment centers in Minnesota. This is likely to continue as the area grows from continued immigration. Per capita incomes have risen in the area due to a shift in the occupations of residents from more blue collar occupations to more white

collar ones. The area will continue to be influenced by the rising incomes of its residents. Employment within the county indicates there are good basic industry employment opportunities in St. Croix County. Manufacturing employment in the county may not grow as fast as it has in the recent past. However, manufacturing should remain an important part of the Planning Area economy.

2.4 Land Use

The following land use analysis is derived from existing community land use plans. All of the communities in the Planning Area are active in planning for their future. Information from their plans give a general overview of land use change in the Planning Area.

2.4.1 Incorporated Communities Land Use Analysis

The City of Hudson consisted of approximately 2,470 acres in 1991, this is an increase of 847 acres from the 1973 figure of 1623 acres. This is a 52 percent increase in less than twenty years. The increase is due to increases in residential development and vacant land. Residential lands in 1991 totaled about 651 acres or 26.4% of the total land. In 1973, there were 371 residential acres, which constituted 22.8% of the total. Hudson has slightly increased the residential percentage of its total land area over eighteen years. However, the increase of 651 residential acres represents a percentage increase of over 75%. This increase occurred mostly during the 1980's when there was also an 40% increase in vacant land. There was also a 179% increase in multiple family residential acreage. Therefore, the city experienced greater housing densities during this time. The large increase in vacant land is largely due to the addition of land to the city for expansion of its industrial park. The 1991 commercial acreage is 272 acres or about 11% of the total acreage. 1973 figures for commercial use were 3.7% of the total or 60 acres. By 1991 there was an addition of 106 acres to the 5 industrial acres present in 1973. In 1973 industrial acreage accounted for .3% of the land total; whereas, the 111 acres in 1991 makeup 4% of the land in Hudson. Finally, Hudson has increased its institutional land use from 90 acres (5.5% of total land area) in 1973 to an about 164 acres (6.6% of total land area) in 1991.

TABLE 13 LAND USE, CITY OF HUDSON				
	1964	1973	1980	1991
	<u>Acreage</u>	<u>Acreage</u>	<u>Acreage</u>	<u>Acreage</u>
Single Residential	290	371	405	570
Multi-Residential	10	--	29	*81
TOTAL RESIDENTIAL	300	371	434	651
Commercial	23	60	75	272
Industrial	8	5	37	111
Parks	209	222	242	116
Institutional	83	90	97	164
Vacant	219	546	501	703
Transportation	354	339	409	452
TOTAL LAND AREA	1,196	1,623	1,818	2,470

Source: City of Hudson, Wisconsin Comprehensive Plan, 1993 *estimated
Hudson Area Sewer Service Plan, 1981

It appears Hudson has expanded its vacant lands for residential and industrial development. By maintaining vacant lands, they have broadened their ability to attract commercial and industrial uses, and direct residential growth to existing vacant areas within the corporate limits. Providing there is planned, orderly development, this should increase the

development density of the city and make it more efficient to provide city services to new homes, businesses, and industry. Table 13 shows Hudson land uses from 1964 to 1991.

The land use information for the Village of North Hudson is not current, but does show that the Village, between 1964 and 1985, experienced steady residential land use growth, a fluctuation in commercial acreage, and expansion of industrial acres. In the twelve years between 1973 and 1985 there were approximately 157 residential acres added to the Village, about a 73% increase. Table 14 shows Village of North Hudson land use information from 1964 to 1985.

TABLE 14 LAND USE, VILLAGE OF NORTH HUDSON				
	1964	1973	1980	1985
	<u>Acreage</u>	<u>Acreage</u>	<u>Acreage</u>	<u>Acreage</u>
Single Residential	105	216	267	329.01
Multi-Residential	12	----	14	44.28
TOTAL RESIDENTIAL	117	216	281	373.29
Commercial	4.0	6	22	9.47
Industrial	0.5	5	10	27.91
Parks	0.5	3	28	25.66
Institutional	20.0	8	13	20.29
Vacant	408.0	332	405	401.50
Transportation	148.0	144	86	94.78
TOTAL LAND AREA	698.0	714	845	952.90

Source: Village of North Hudson Comprehensive Plan, 1987,
Hudson Area Sewer Service Plan, 1981

2.4.2 Unincorporated Communities Land Use Analysis

The unincorporated communities of the Towns of Hudson, St. Joseph and Troy consists of approximately 54,465 acres (1994). Unincorporated residential lands in 1994 totaled about 12,837 acres or 23.6% of the total unincorporated land. In 1973, there were 3,134 unincorporated residential acres, which constituted 4.9% of the Planning Area unincorporated total. Hence, the unincorporated area has increased the residential percentage of its total land area over twenty years. However, the increase of 9,703 residential acres during this time occurred when the unincorporated area was losing some residential land to the Cities of Hudson and River Falls, and the Village of North Hudson.

The 1993 commercial acreage estimate is 1,013 acres for the unincorporated communities, while in 1973 figures for commercial use were 34 acres. This is an increase of over 2,800% in commercial land in the unincorporated area, about 144 percent per year.

During this period commercial lands were growing in the Towns of Hudson and Troy, but diminishing in the Town of St. Joseph. The 1994 unincorporated industrial acreage estimate is 258 acres, while in 1973 there were 25 acres in industrial use. Over about twenty years this was a 932% increase in industrial land in the unincorporated area, a little over 47 percent per year. Tables 15, 16 and 17 show the land use estimates for the Towns of Hudson, St. Joseph and Troy.

TABLE 15 LAND USE, TOWN OF ST. JOSEPH

	1973*		1980	1987	1994
	<u>Acreage</u>		<u>Acreage</u>	<u>Acreage</u>	<u>Acreage</u>
Residential	800	Residential	2,704	3,500	4,369
Commercial	17	Commercial	221	206	193
Industrial	2	Manufacturing	9	4	8
Agricultural	15,185	Agriculture	12,922	11,552	10,486
Wetlands	41	Swamp & Waste	136	176	195
Forest	4,078	Forest	2,360	2,327	2,754
Gov't/Institutional	10	TOTAL	18,352	17,765	18,005
Trans./Comm./Utils.	690				
Parks	128				
TOTAL LAND AREA	20,934				

Source: *West Central Wisconsin Regional Planning Commission (WCWRPC), 1974
Wisconsin Department of Revenue 1980, 1987, and 1994.

TABLE 16 LAND USE, TOWN OF HUDSON

	1973*		1980	1987	1994
	<u>Acreage</u>		<u>Acreage</u>	<u>Acreage</u>	<u>Acreage</u>
Residential	660	Residential	2,943	3,609	5,031
Commercial	17	Commercial	371	565	705
Industrial	21	Manufacturing	129	134	184
Agricultural	13,163	Agriculture	11,017	9,562	7,337
Wetlands	133	Swamp & Waste	110	109	198
Parks	10	Forest	869	758	616
Forest	3,205	TOTAL	15,439	14,737	14,071
Gov't/Institutional	5				
Trans./Comm./Utils.	837				
Parks	10				
TOTAL LAND AREA	19,325				

Source: *West Central Wisconsin Regional Planning Commission (WCWRPC), 1974
Wisconsin Department of Revenue 1980, 1987, and 1994.

TABLE 17 LAND USE, TOWN OF TROY 1974 - 1994

	1974		1979		1990		1994	
<u>Land Use</u>	<u>Acres</u>	<u>Percent</u>	<u>Acres</u>	<u>Percent</u>	<u>Acres</u>	<u>Percent</u>	<u>Acres</u>	<u>Percent</u>
Agriculture	21,263	87.8	20,565	86.0	16,840	75.016	16,589	74.1
Residential	1,674	6.9	2,157	9.0	3,210	14.3	3,437	15.4
Forest	1,289	5.3	1,085	4.5	2,209	9.8	2,158	9.6
Commercial	0	0	88	0.4	105	0.5	115	0.5
Manufacturing	2	+	4	+	63	0.3	66	0.3
Swamp & Waste	9	+	5	+	24	0.1	24	0.1
Total	24,237	100.0	23,904	100.0	22,451	100.0	22,389	100.0

+ = less than 0.1%

Source: Wisconsin Department of Revenue:

The major clusters of residential development in the unincorporated area are in and around the various subdivisions. The higher density development in these areas may result in ground and surface water problems due to nitrate and phosphorous contamination from septic systems. History shows, high concentrations of septic systems will inevitably bring about their own demise, unless strict precautions are implemented. Some precautions may include: careful review of sizing and siting requirements for drainfields and wells in relation to each other, and the number of occupants; alternate site for drainfields or wells; restricted site location of septic systems in relation to valuable surface waters, wetlands, steep slopes, areas of high groundwater, etc.; and monitoring systems to assure compliance with maintenance requirements.

It is apparent the communities in the Planning Area have experienced rapid growth over the past twenty years. This is summarized in Table 18 which shows residential, commercial and industrial land use change over about a twenty year period for the incorporated, unincorporated and planning areas. Growth in all three land use categories is high in both the incorporated and unincorporated areas. However, the incorporated area saw extreme growth in industrial land uses while the unincorporated area saw extreme growth in commercial land uses. For the Planning Area as a whole this meant approximately equivalent growth of commercial and industrial land uses.

TABLE 18 LAND USE, PLANNING AREA - <i>ACRES</i>									
	<i>Incorporated *</i>			<i>Unincorporated</i>			<i>Planning Area</i>		
	<i>1973</i>	<i>1994</i>	<i>% chg.</i>	<i>1973</i>	<i>1994</i>	<i>% chg.</i>	<i>1973</i>	<i>1994</i>	<i>% chg.</i>
Residential	587	3,443	587%	3,134	12,837	310%	3,721	16,280	338%
Commercial	66	375	468%	34	1,013	2879%	100	1,388	1288%
Industrial	10	216	2060%	25	258	932%	35	474	1254%

* Includes Village of North Hudson 1994 land use estimates

Source: West Central Wisconsin Regional Planning Commission, 1997

2.4.3 Residential Trends

During the past twenty years residential growth was faster in the incorporated communities of the Planning Area than in the unincorporated communities. However, in absolute acreage there were over three times more residential lands added to the unincorporated area of the Planning Area than in the incorporated communities. Larger lot sizes of 1 to 5 acres are common in the unincorporated area. It is likely the real estate market will continue to put pressure on the rural and urbanizing lands of the unincorporated areas to convert to residential uses. The majority of future residential growth in the unincorporated areas of the Planning Area is not likely to place significant demands on the wastewater treatment facilities for the City of Hudson. Infill of vacant, developable lands, and existing development near the boundaries of the City of Hudson and Village of North Hudson will most likely cause the most demand from the unincorporated area for sewer service. Most of the continued development in the unincorporated communities will probably come in the form of unsewered subdivisions well removed from the possibility of sewer extension.

2.4.4 Non-Residential Trends

The phenomenal growth in commercial and industrial land uses from 1973 to 1994 reflect the significant increases in manufacturing, retail and service employment within the county during the same period. There has been explosive growth of commercial land uses in the unincorporated area, and although the largest growth in industrial land use has occurred in the incorporated communities, 27 more industrial acres have been added to the unincorporated area than in the incorporated communities. Industrial and large-scale commercial development occurring without sewer service has raised water quality concerns with local officials. Because of this concern, it is likely that in the future most of this development will be sewerred. Certainly the market for sewerred commercial and industrial land is evident with the City of Hudson Industrial Park expansion and the potential for commercial agglomeration in and around the sewerred commercial area near Interstate Highway 94 in the City of Hudson.

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CHAPTER 3 - SEWER SERVICE AREA DELINEATION

3.1 Planning Process

The delineation of the sewer service area boundary will incorporate environmentally sensitive areas, existing sewer systems, land use patterns and urban development areas, and projected growth data. This comprehensive look at the Hudson Planning Area will form the basis for the determination of the sewer service boundary. By excluding environmental corridors from development, our natural resources will be protected for future generations to enjoy. An inventory of the existing sanitary sewer systems will determine the effect future development will have on the sewage capacities and possible regional treatment alternatives. Identification of urban development areas will aid in determining what infill and/or expansion alternatives should be used in delineating the sewer service area. In addition, projected growth data will estimate the acreages needed for future development within the sewer service area.

3.2 Delineation of Environmentally Sensitive Areas or Limiting Environmental Conditions

The purpose of using environmental features to determine a sewer service area is to help preserve and protect valuable areas from urban development. To do this, environmental corridors are delineated and urban growth is prohibited from occurring in these areas. The following environmentally sensitive areas will be considered for inclusion as part of the environmental corridors: wetlands; floodplains; prime farmland; and endangered resources. The following limiting environmental conditions will be considered for inclusion as part of the environmental corridors: steep slopes; soils limitations; shorelands; natural areas; and historical resources. The Sewer Service Plan prohibits development in environmental corridors and acknowledges the preservation of environmentally sensitive areas. The features found in the Planning Area are described in the following sections.

3.2.1 Wetlands

A wetland is any area which water is at, near, or above the surface long enough to support hydrophytic vegetation or water-loving plants and which has soils indicative of wet conditions. Wetlands may be seasonal or permanent and are commonly referred to as swamps, marshes, or bogs. These areas serve as groundwater recharge zones and also as a habitat for a variety of plants and animals. Wetlands act like a sieve, filtering out silts before they can enter streams and lakes. Particular attention must be given wetlands within shorelands to assure protection from development. Wisconsin Wetland Inventory maps and 1"=400' scale aerial photographs were used to delineate all regulated wetlands within the Planning Area.

3.2.2 Floodplains

Floodplain zoning is required to be implemented by counties, cities and villages by Wisconsin Statute 87.30(1). The purpose of Wisconsin Administrative Code NR116,

Floodplain Management Program, is the protection of property and public investments from the effects of flooding. Federal Emergency Management Agency 100 year floodplain maps were used to delineate flood hazard areas within the Planning Area. Flood hazard areas are prevalent throughout the Planning Area. Variations in the width of the flood hazard zones are due to topography and water volumes. In the Sewer Service Planning Area there is considerable development within the 100 year floodplain. Enforcement of local floodplain zoning ordinances should be reviewed.

3.2.3 *Prime Farmlands*

Consideration of new development within prime farmland areas must be developed in accordance with the St. Croix County Land Farmland Preservation Plan, St. Croix County Comprehensive Zoning Ordinance, and Erosion Control Plan of St. Croix County. These documents have implemented procedures to direct non-farm development away from prime farmland. Soils that fall into classes I, II, and III of the Soil Conservation Services capability unit classification system are usually considered prime agricultural lands. The St. Croix County Comprehensive Zoning Ordinance and Farmland Preservation Plan makes provisions to protect prime agricultural lands from development through the Exclusive Agricultural District and the facilitation of the Wisconsin Farmland Preservation Program.

Any development requesting sewer hookups or extensions should consult the appropriate farmland preservation instruments to determine if the proposal is in accordance with current regulations. Appendix B shows the Natural Resources Conservation Service and St. Croix County determination of potentially productive agricultural lands through designation of *Land Evaluation Site Assessment (LESA)* Agricultural Groups 1 through 5 soils.

3.2.4 *Endangered Resources*

The WisDNR, Bureau of Endangered Resources conducts data searches for natural areas, and endangered plants and animals. The Bureau urges special notice be taken to protect any and all endangered resources from development. The exact locations of the endangered resources can only be used for analysis and review purposes; therefore, they will not be used here for environmental corridors, but all site plan review for development should include the consideration of endangered resources. Several fish and invertebrates of significance have been identified in the Planning Area.

3.2.5 *Steep Slopes*

Steep slopes are considered, in this plan and by the WisDNR, to be any area of 12% or greater slope and consisting of any soil type. Any development on these slopes could result in high construction costs and severe erosion with resultant negative impacts to surface waters. Therefore, development on steep slopes is to be prohibited. Any amendments to allow development must consider direct runoff into streams or rivers and must follow locally approved construction erosion control ordinances and the institution of best management practices to control on-site runoff.

Both the City of Hudson and St. Croix County recognize that slopes 20 percent and greater represent a severe limitation to development. Development is currently restricted on these steep slopes.

The steep slopes within the Planning Area represent slopes classified as having a severe or very severe erosion hazard potential (category D through F) by the Soil Conservation Service. In addition, the 7.5 minute quadrangles of the Planning Area were used to cross-reference steep sloped areas.

3.2.6 Shoreland Zoning

Lands within 1000 feet of the ordinary high water mark of a lake or pond and 300 feet past the ordinary high water mark or landward edge of the floodplain, whichever is greater, of a river or stream are designated shorelands. Shorelands are usually considered prime residential building areas because of their scenic beauty. However, shorelands provide valuable habitat for both aquatic and terrestrial animals and vegetation. Shorelands also act as buffers and thus serve to protect water quality. Wisconsin requires counties to protect and prevent the loss and erosion of these valuable resources by adopting and enforcing a shoreland ordinance. The authority to enact and enforce this provision comes from Chapter 59.97 of the Wisconsin Statutes. Wisconsin Administrative Code NR115 dictates the shoreland management program. County ordinances can be more, but not less, stringent than NR115.

The St. Croix Riverway District encompasses approximately a 200 foot area from the mean high water mark along the St. Croix River. The St. Croix County Zoning Department enforces special restrictions in the District.

3.2.7 Natural Areas

The WisDNR, Bureau of Endangered Resources conducts data searches for natural areas, and endangered plants and animals. Natural areas have significant habitat and recreational value. Several natural areas have been identified in the Planning Area.

3.2.8 Historical Resources

Historic sites are of great importance to our society, as they are reminders of the past and also of the progress which has taken place since. Therefore, this plan addresses these significant areas and how development may affect them.

A record search by the State Historical Society of Wisconsin revealed a significant presence of architectural, historical, and archeological properties in the Planning Area. They are also certain there are many undiscovered prehistoric and early historic sites present. A listing of these sites and their location are not provided so as to protect them from disturbance. However, any development requiring extensions to the sanitary sewer must be reviewed, pursuant to Wisconsin Statute 44.40 (1989), against the historical resource list to determine whether historic properties within the project area will be affected. The Historical Society must be contacted for a determination of possible impacts on these resources from the development.

The Historical Society strongly recommends that all development alternatives be surveyed by a qualified archeologist to identify any sites. Also, if the removal or alteration of any building or structure over 50 years old is proposed, the Historical Society should be contacted so they may assist in evaluating any historical significance. Cooperation of all developers, public and private, will assure preservation of these valuable resources of our community.

3.3 Other Local Options

3.3.1 Closed Depressions

Closed depressions are common features in St. Croix County. They have formed through two quite different geological processes: karst development and glaciation. Karst development occurs in regions with highly soluble bedrock and results in distinctive land forms such as sinkholes. St. Croix County is covered by several rather thick, soluble carbonate units, and has particularly well developed karst, especially in the eastern half of the county. Glacial action can also result in topography marked by closed depressions known as kettles or kettleholes. Kettles develop when large blocks of glacier ice are buried within glacial deposits and subsequently melt. Many of the depressions in the western and northwestern portions of the county are kettles that developed in the St. Croix moraine after it was deposited during the Wisconsinan glaciation.

Baker, Hughes, Huffman and Nelson, Closed Depression Map of St. Croix County, Wisconsin, 1991

Closed depressions are extremely sensitive land features because of their close association with the groundwater. The release of pollutants into or near closed depressions are almost certain to reach groundwater immediately.

3.3.2 Wellhead Protection Areas

Municipal water suppliers are required by state administrative code to establish wellhead protection measures for new wells. It is also appropriate to establish protection measures for existing public water supply wells to protect the public health, safety and welfare, and to reduce public costs should a pollution event occur. Because it is difficult to adequately react to a pollution event which occurs in proximity to a well, strict prohibitions of certain high risk land uses should be established for that area (within the 30-day time of travel of contributing groundwater to a well). Certain high risk land uses should be limited, and best management practices and monitoring established in the area between the 30-day and 5-year time of travel of contributing groundwater to a public water supply well. There have time of travel zones of contribution identified in the Planning Area through hydrogeological investigation for the municipal wells for the City of Hudson and the Village of North Hudson (see Appendix C).

3.3.3 Environmental Corridors

Environmental corridors are significant areas of environmental resources characterized by often continuous systems of open space, physical features, environmentally sensitive lands and natural or cultural resources which can be adversely impacted by development. These areas are often evident to people in the area and they identify with them as significant natural

areas in their surroundings. Environmental corridors, as implemented in this plan, also include isolated, non-continuous natural and cultural features which meet specified resource criteria.

The adverse impacts caused by development in these areas can create undue costs to society in the attempt to alleviate those problems. Managing development in these areas either eliminates or reduces the adverse impacts from development. The impacts of developing in some of these areas cannot be overcome by management, and in those areas it is prudent to prohibit development. In managing the development in those areas which can accommodate it, the costs associated with the adverse impacts of development can be shifted from society as a whole to those who choose to develop in them. This is accomplished by ensuring development occurs using engineering, site design, construction and management practices which address potential adverse impacts.

3.4 Delineation of Environmental Corridors

WisDNR recommends lands delineated as environmental corridors not be developed for intensive urban use. NR121.05 (g) (2) (c), Wisconsin Administrative Code, describes the areas which should be excluded from sanitary sewer development as: wetlands; shorelands; floodplains; steep slopes; and other limiting physical features. The WisDNR guidelines for defining environmental corridors is in Appendix A.

The identification of environmental corridors is intended to: reduce runoff and erosion damage around lakes and rivers; preserve the quality of surface and ground water; guide development to protect environmentally sensitive areas; prevent excessive non-point source pollution; provide long term protection of wildlife habitats and recreation areas; and reduce public utility costs. Prohibiting development of environmental corridors is an effort to become more critical of the degrading effects development can have on our environment. Directing sewer development into areas with minimal environmental impact is the goal of this plan. After several meetings with discussions of environmental corridors, the Hudson Area Urban Sewer Service Planning Committee recommended that all regulated wetlands; shorelands within 75 feet of the ordinary high water mark or the landward edge of the floodplain, whichever is greater; 100 year floodplain; areas of 12% or greater slope; and closed depressions be designated environmental corridors. Wetlands, shorelands and 100 year floodplains currently have state and/or federal restrictions, whereas, the steep sloped areas and closed depressions do not. Implementation of this plan will restrict the extension or hookup of sewer service to new structures located within environmental corridors.

Areas of 12% or greater slope were considered as part of the environmental corridor delineation because the Soil Conservation Service classifies these slopes as having a severe or very severe erosion hazard potential. In an effort to preserve water quality, and reduce the runoff and erosion damage of these areas, the Hudson Area Urban Sewer Service Planning Committee recommended these areas be included in the environmental corridors.

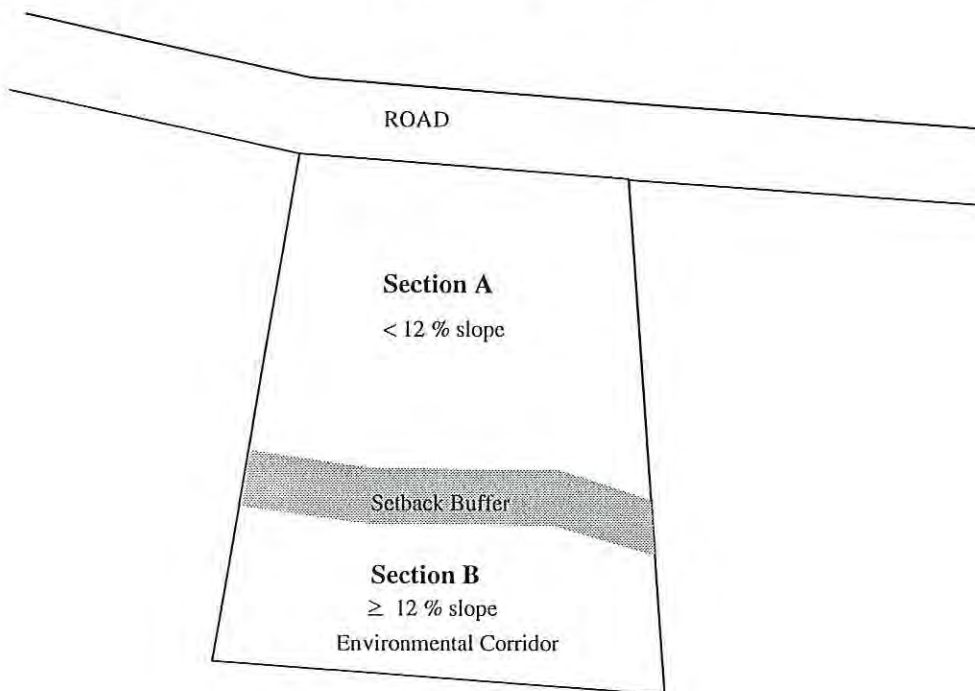
There are two criteria which may permit sewer extension or hookups to lands upon which there are environmental corridors: non-encroachment of the environmental corridor

portion of a site; and, enforcement of the Uniform Dwelling Code and local erosion controls allowing sewer extensions into 12% to 20% steep sloped areas.

3.4.1 Non-Encroachment of the Environmental Corridor Portion of a Site

The plan does allow sewer extensions or hookups to buildings on lots which are partially within an environmental corridor if the actual construction is not on that portion of the lot affected by any one of the five criteria (wetlands, shorelands, floodplains, 12% or greater slope, closed depressions). In addition, there must be sufficient setbacks and erosion control measures taken, as determined by local zoning or land development controls. An example of this may be a residential subdivision lot, of which, only a portion is greater than 12% slope, as depicted in Figure 1. Section B has a slope greater than 12%, which defines it as an environmental corridor. Section A is the portion of the lot with less than 12% slope and thus, with locally acceptable setbacks and erosion control measures, would be permitted extension of sewer service by the local municipality without a plan amendment. **Any alteration of wetlands, slopes 12% or greater, or closed depressions to remove these areas from an environmental corridor, and hence make them available for sewered development, is prohibited.** Any change to the environmental corridor delineation requires WisDNR approval and a plan amendment.

FIGURE 1 Environmental Corridor Setbacks



3.4.2 Enforcement of the Uniform Dwelling Code and Local Erosion Controls Allowing Sewer Extensions Into 12% to 20% Steep Sloped Areas

The need to extend sewer lines indicates impending development of land. Naturally, the exposure of soils during the excavation and building process soon follows. The potential for these exposed soils to either reach a surface water or storm sewers leading to surface waters increases without adequate construction site erosion controls. Soil loss rates increase exponentially as slope increases, therefore greater damage may result from development on lands with 12 to 20 percent slope without properly installed and maintained construction site controls. Sedimentation of surface waters can be a serious problem in developing areas and can result in reduced habitat for fish spawning and aquatic insects.

The Department of Commerce currently requires the City of Hudson and Village of North Hudson to conduct inspections in order to determine compliance with the Wisconsin Uniform Dwelling Code (IHLR 20-25). The Uniform Dwelling Code (UDC) applies to all one and two household homes, manufactured buildings for dwellings, and newly constructed community-based residential facilities providing care, treatment and services for three to eight unrelated adults constructed after June 1, 1980. The UDC contains many provisions, one being containment of soils on the developing site with erosion control measures. Both the city and village staff inspect new development for compliance with this code and have enforcement authority to correct problems.

As determined by the Department of Commerce, if enforcement of the construction site erosion control provisions of the UDC is inadequate in either municipality, all sewer extensions into areas containing slopes between 12 and 20 percent will not be approved in the respective municipality. Once adequate enforcement is achieved, as determined by the Department of Commerce, sewer extensions can then be approved in areas of 12 to 20 percent slope. The procedure for the actions outlined above begin with the Department of Commerce informing the Department of Natural Resources that inadequate enforcement exists. The Department of Natural Resources will send a letter to the affected municipality and the sewer service area plan compliance reviewer to inform them that extensions into areas of 12 to 20 percent slope will not be approved until further notice. The municipality will then work with the Department of Natural Resources to improve their enforcement. When the Department of Commerce is satisfied with the level of UDC compliance regarding erosion control, they will notify the Department of Natural Resources. A letter will be sent to the affected municipality and the sewer service areas plan compliance reviewer to approve extensions into 12 to 20 percent slope, if all other conditions in the plan are satisfied.

Beyond the scope of the UDC erosion control requirements, the Village of North Hudson has an erosion control ordinance (18.055) which requires an erosion control plan for land disturbance activity and contains enforcement authority. The City of Hudson also has an ordinance requiring erosion and sediment control for land disturbance activity (6-97 Section 16.24). Before land disturbance activities within the city occur, an erosion control plan must first be approved. Escrow requirements and enforcement actions are outlined in the ordinance.

Proper implementation and enforcement of these ordinances will reduce movement of soils off-site during construction activities. Review of these municipal erosion control ordinances will be conducted by the Department of Natural Resources. If these ordinances are not adequately implemented or enforced, the Department of Natural Resources will send a letter to the affected municipality and the sewer service area plan compliance reviewer to inform them that sewer extensions into areas of 12 to 20 percent slope will not be approved until further notice. The Department of Natural Resources will work with the affected municipality to improve the enforcement of their ordinance. Once adequate enforcement is achieved, the Department of Natural Resources will notify the municipality and the sewer service area plan compliance reviewer that sewer extensions can be approved in areas of 12 to 20 percent slope, if all other conditions in the plan are satisfied.

Each municipality is responsible for proper implementation and enforcement of the UDC and their respective erosion control ordinances. Failure to do so will impact sewer extensions only within the municipality where improvements in enforcement must be achieved.

3.4.3 Other Environmental Corridor Considerations

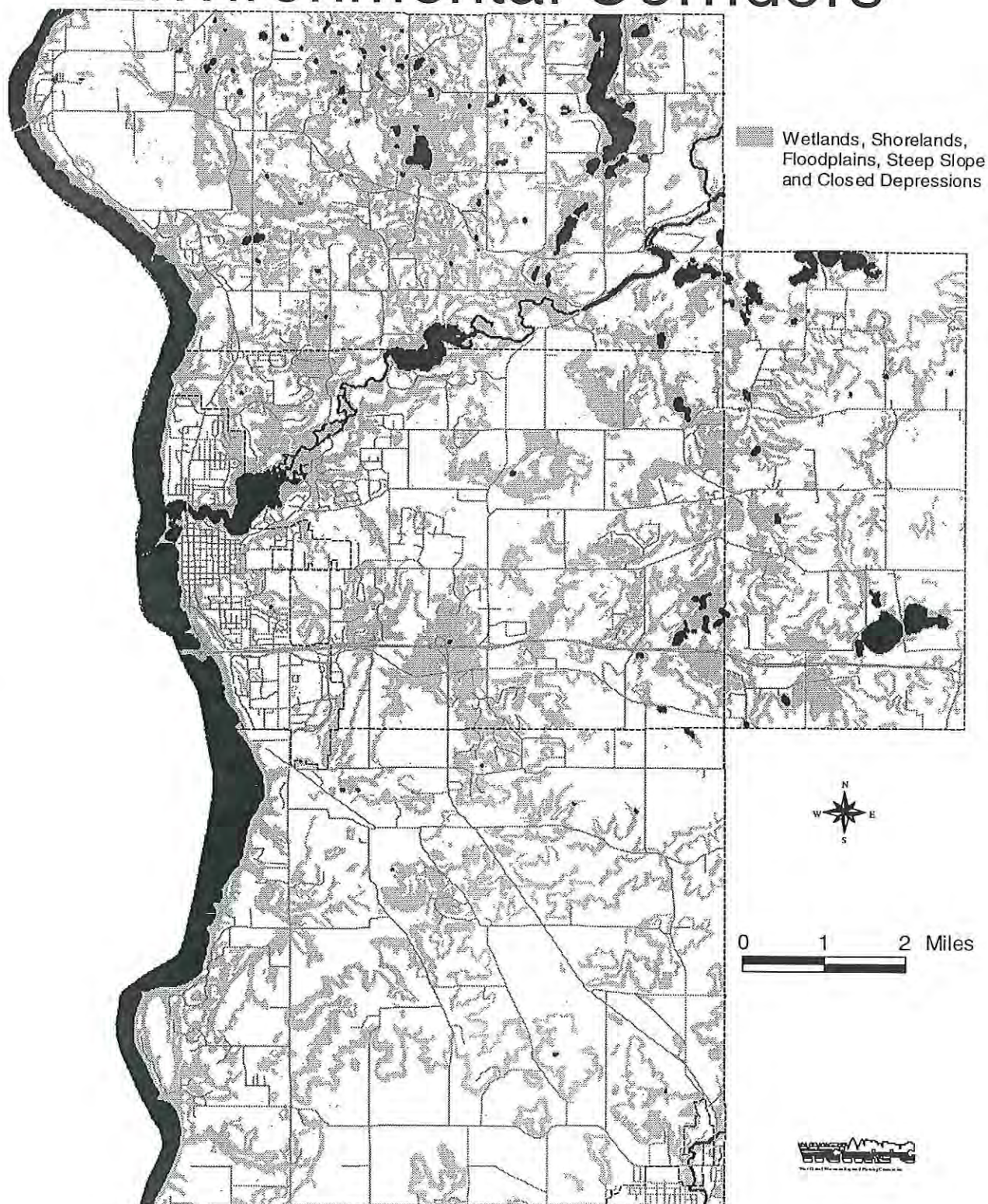
While this sewer service plan emphasizes preservation of environmental corridors, it also recognizes the possibility of a conflict between environmental preservation and legitimate local and regional development. An example may be, the need to cross an environmental corridor to service an outdoor recreation facility with sanitary sewer lines. When such a conflict occurs, the problem should be resolved with utmost care taken to minimize damage to the environment. Any changes to the environmental corridor delineation of this plan requires WisDNR approval and a plan amendment.

This Sewer Service Plan defines the environmental corridors as being:

- All regulated wetlands.
- Shorelands within 75 feet of the ordinary high water mark or the landward edge of the floodplain, whichever is greater.
- All areas within the Federal Emergency Management Agency 100 year flood hazard zones.
- All areas of 12% or greater slope.
- Closed depressions.

The environmental corridors are depicted on Map 2. It should be noted that, maps delineating the environmental corridors will be used for review of proposed sewer extensions and hookups. However, due to the accuracy limitations of these maps, actual site specific data will also be used to determine plan conformance.

Environmental Corridors



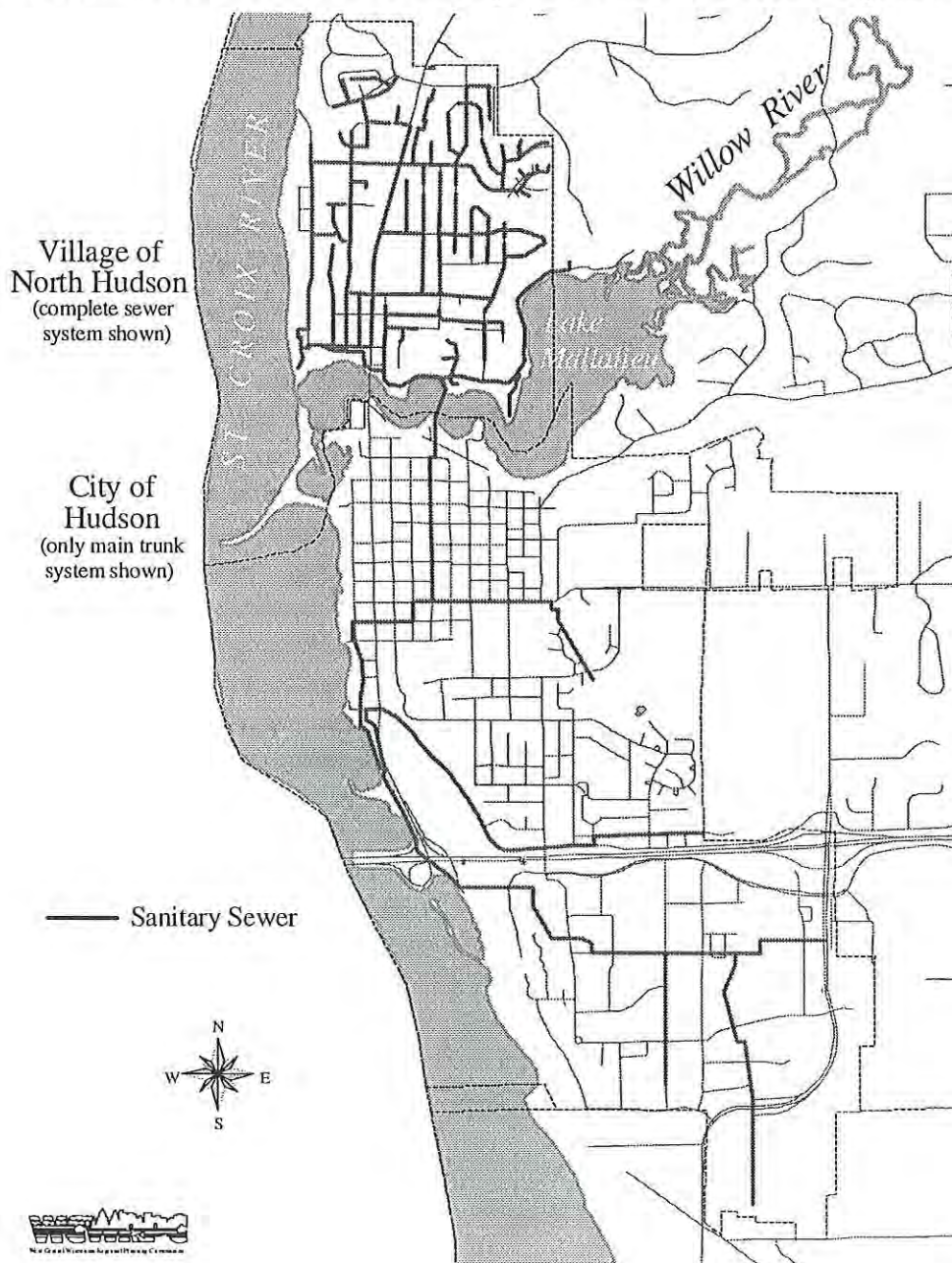
3.5 Identification and Quantification of Existing Conditions

3.5.1 Inventory of Sanitary Sewerage System

There are six major sanitary sewer districts in the City of Hudson, each defining the limits of service for a separate trunk system. The Village of North Hudson constitutes another major sanitary district which is served by the City of Hudson wastewater treatment facility. The sanitary sewer trunk system is depicted on Map 3.

MAP 3

Hudson Area Sanitary Sewer Trunk System



3.5.2 Description of Wastewater Treatment Plant (capacities and projections)

Before 1960, wastewater from the City of Hudson and the Village of North Hudson was discharged into the St. Croix River without treatment. In 1960, the current secondary wastewater treatment facility was built by the City of Hudson, its owner and operator. The plant, which uses the high-rate trickling filter process as its biological treatment procedure, was designed for an average daily flow of 560,000 gallons per day, but has been subsequently upgraded (1981) to the average daily hydraulic capacity of 1.11 millions of gallons per day (MGD). This facility is located on the western edge of the city, along the St. Croix River.

Design Wastewater Flows and Characteristics

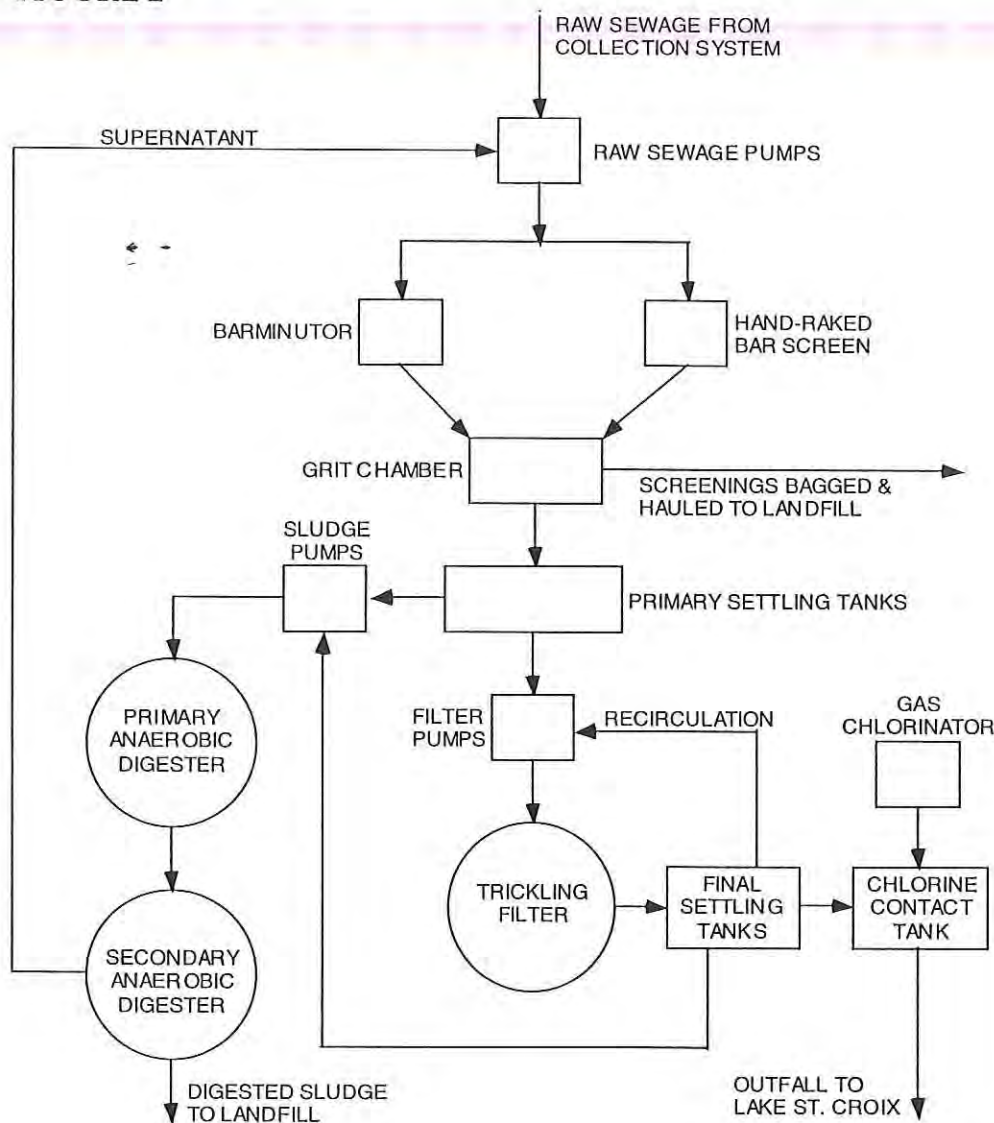
<u>Parameter</u>	<u>Design Characteristic</u>
Average Daily Flow	1.11 MGD
Flow Peak	2.42 MGD
BOD ₅	2400 lbs/day
Suspended Solids	2040 lbs/day
Population Served	14,000 persons

The current average sewer flow is 800,000 gallons a day. The City of Hudson has projected that the current design flows and loadings will be reached in the year 2002.

The unit processes of the facility are comminution and grit removal, primary sedimentation, biological oxidation through the trickling filter process, final sedimentation, chlorination disinfection, and separate anaerobic digestion of sludge.

Wastewater enters the plant at a wet well. From there it is pumped to a dual channel containing a hand-raked bar screen and barminutor. The bar screen separates large solids and trash from the flow which may damage or clog the following equipment. The barminutor is designed to cut rags and other solids into smaller pieces to ready them for treatment. From the bar screen or the barminutor the wastewater enters a gravity grit chamber where sand and other grit is removed and mechanically collected. Collected grit is bagged for land disposal. The settleable organic material is separated from the liquid in the primary clarifier. The settled organic material, known as primary sludge, is collected and pumped to the anaerobic digester for further treatment. Effluent of the primary clarifier is pumped to the high-rate trickling filter, which consists of a circular tank filled with a clay tile filter media. A rotating distributor, powered by the reactive force of water outletting through the orifices in the distributor arms, spreads the waste evenly over the six-foot deep media. A biological mass, attached to the media, oxidizes much of the organic material in the liquid as it flows through the filter. The filter effluent enters a final clarifier where dead biomass and filter sloughings are settled, collected, and pumped to the anaerobic digester. The liquid then flows through a flow meter and chlorine contact tank for disinfection. The treated effluent is discharged to the Lake St. Croix portion of the St. Croix River through the outfall pipe.

FIGURE 2



FLOW SCHEMATIC

EXISTING WASTEWATER TREATMENT FACILITY

Part of the final clarifier effluent can be recirculated through the trickling filter by opening a valve which allows the effluent to drop into the filter pump wet well.

Primary and secondary sludge is removed from the clarifiers to the digester by means of the sludge pumps located in the bottom floor of the digester control building. In the anaerobic digesters, the organic portion of the sludge is stabilized through biological activity in the absence of dissolved oxygen. The digesters are kept at an optimum temperature, usually 90° - 95° F., so anaerobic microorganisms can function most efficiently. Products of this process are chiefly methane gas, carbon dioxide, water and a stabilized sludge of lesser volume than the raw sludge fed to the digesters.

Methane gas, produced in the digestion process, can be used as a fuel to maintain the temperature necessary for the process. Fuel oil is used to supplement digester gas. The primary digester has a fixed concrete cover, while the secondary digester has a steel floating cover. Digested sludge is removed periodically and disposed of in a sanitary landfill.

3.5.3 Regional Treatment Alternatives

The City of Hudson is in the process of implementing their Comprehensive Sanitary Sewer Plan, 1993 and their Wastewater Treatment Facilities Plan, 1996. This includes plans for a major wastewater treatment facility expansion and several planned improvements to their sanitary sewer trunk system. The planned wastewater treatment facility expansion would create a facility capacity of 2.2 million gallons per day, enough capacity to accommodate currently planned demand for the City of Hudson and Village of North Hudson until the year 2026.

There are preliminary discussions occurring regarding the possibility of the City of Hudson's wastewater treatment facility accommodating additional inter-community flows from communities to the east along Interstate Highway 94. This would mean that the City of Hudson wastewater treatment facility planning which has occurred to this point would need serious revision. Because of the preliminary nature of these discussions it is premature to consider them in this plan. The amount of added wastewater treatment facility and permitted discharge capacity that might be required by any proposed expanded inter-community flows is not currently planned for. Any wastewater treatment facility expansion necessary to facilitate additional inter-community flows would need to be addressed by the City of Hudson in updated wastewater treatment facility planning, and any service areas that might be added would have to be addressed by either an update of, or amendment to, this plan.

Several western Wisconsin communities have implemented a cooperative effort to provide the treatment and processing of bio-solids into a marketable product. Bio-solids are the solid residue from the wastewater treatment process. This residue can be processed to become a soil amendment for a variety of non-food production horticultural situations. The City of Hudson is a member of this organization and sends its sewerage sludge to the facility.

3.5.4 Identification of Urban Development Areas

Since the treatment facility has the capability of handling sewage from future development to the year 2026, and a facilities plan is being implemented to address the conditions of the year 2026, the next step is to look at where development can and should occur within the urban area. A stated policy of this plan is to encourage development of vacant developable lands within the corporate limits -- or infill. One purpose of this portion of the plan is to address the infill policy by identifying the areas within Hudson and North Hudson available for development. Also, this plan encourages compact and orderly development to occur adjacent to existing development to contain the costs of public service provision and prevent scattered or sprawling development. In addition, unsewered-developed and sewerer-undeveloped areas are identified, because these areas will eventually have an impact on sewer capacities.

Sewered-undeveloped areas are of importance because at sometime they will be developed and additional loadings from them will add to the wastewater treatment flow. The significant sewer-undeveloped areas identified were the vacant lots in the industrial park of the City of Hudson, the area around the St. Croix County Government Center, and the vacant area between Wisconsin Street and Grandview Drive. These areas are already experiencing development and once they are developed they will put additional demand on the existing wastewater treatment facility. The future demand from these and other potential development areas is being planned for accordingly as evidenced in the City of Hudson's wastewater treatment facility and sanitary sewer plans.

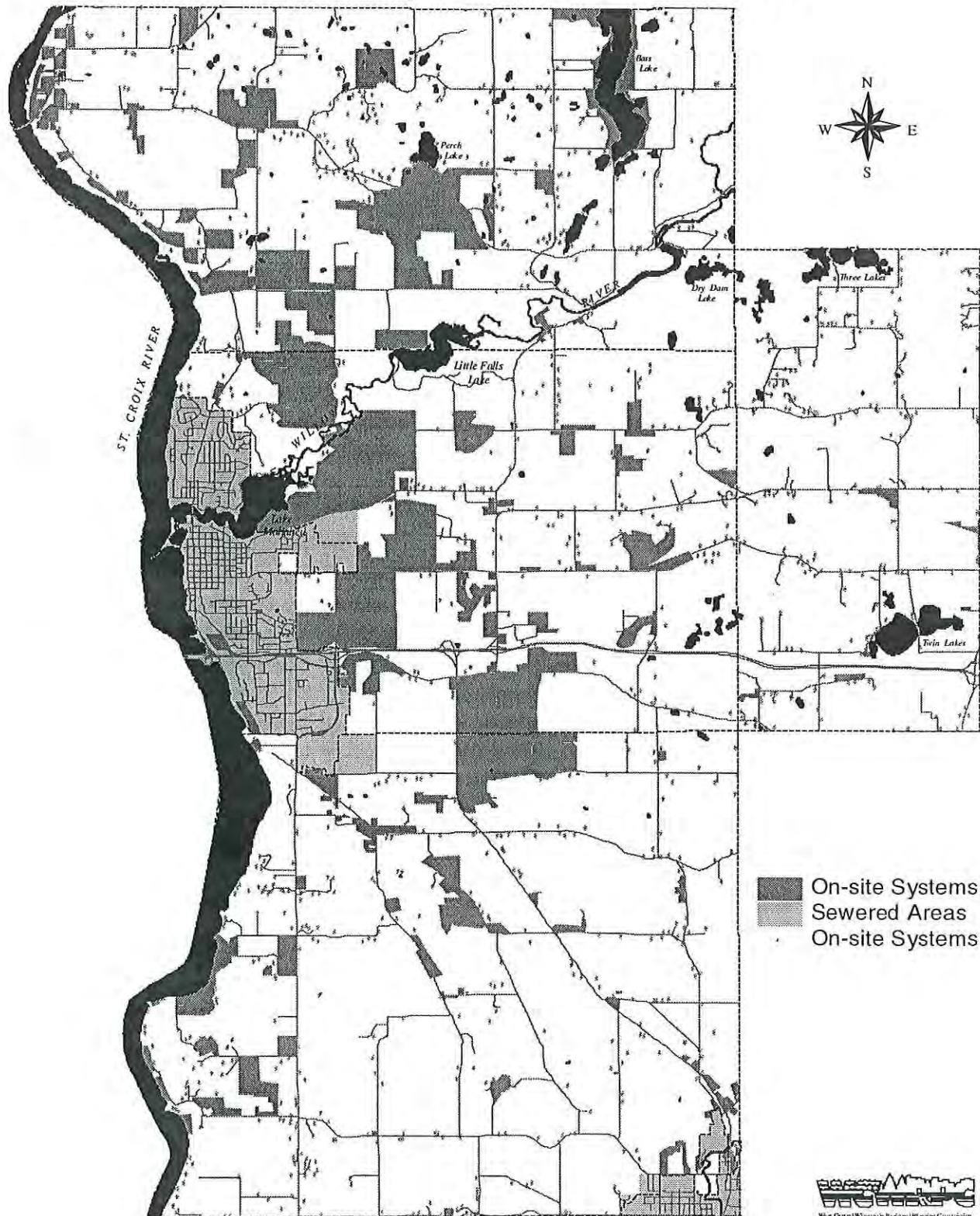
The unsewered-developed areas in the unincorporated area were identified by the land use inventories. The unsewered-developed lands in the Planning Area include both subdivision, scattered large lot development, and farmsteads. There are also limited areas within the corporate limits of both the City of Hudson and the Village of North Hudson which have older unsewered development. Both communities express policies in comprehensive or facilities plans to eventually serve some of these areas.

The most significant unsewered-developed areas are the various subdivisions in the Towns of Hudson, St. Joseph and Troy. Some of the older of these subdivisions which are near the City of Hudson and Village of North Hudson may have to be served in the near future because of failing septic systems, or surface or groundwater degradation. In these areas it is appropriate to consider extension of sewer service if significant numbers of septic systems are failing. However, one impediment to serving some of these areas is the density at which past development has occurred. Typical one acre lots with 150 to 200 feet of road frontage can cost \$10,000.00 or more to serve with sanitary sewer, and in areas with lots larger than one acre, the costs of sewer service becomes uneconomical as there is not sufficient density for efficient sewer provision. This is not only because of the hookup costs to homeowners, but also the volume of flow collected for the length of pipe installed is not efficient, which actually adds costs for the treatment facility. This condition will act as a barrier to sewer extension in some areas around the City and Village.

The majority of vacant lands within the Planning Area are existing operating farms or old currently fallow farms. Much of this land which is not being farmed contains marginal farmland in terms of agricultural productivity potential. However, both productive and marginal farmland are experiencing development pressure in the Planning Area.

Map 4 shows the areas of developed and undeveloped areas, sewer- or unsewered. It can be seen there is a mix of subdivision and scattered individual developments in the Planning Area.

Development Areas



3.6 Forecast of Urban Growth

3.6.1 Population Projections

In June 1992, the West Central Wisconsin Regional Planning Commission (TABLE 19) produced community level population projections for its seven counties based on the 1990 Census and previous Censuses and published them in *Population Projections for the West Central Wisconsin Region 1990-2020*. One year later the Wisconsin Department of Administration's (DOA) Demographic Services Center produced small area population projections, in accordance with State Statute 16.96, based on their 1992 population estimate and 1970 through 1990 Censuses (Table 20). These projections were published in *Official Municipal Population Projections 1990-2015*.

There were differences in methodologies and assumptions between these two efforts that were reflected in the numbers attributed to the possible future population growth for the communities in the Planning Area. While the DOA numbers appeared to be conservative, the Regional Planning Commission numbers reflected their concern for the continued strong effect of the Minneapolis/St. Paul Metropolitan Area on St. Croix County population growth. Consequently, it was determined for this planning effort it was prudent to develop new population projections based upon more recent information about growth influences on the Planning Area and any resulting newly conceived assumptions.

Regional Planning Commission Projections Produced in 1992

TABLE 19 ST. CROIX COUNTY POPULATION PROJECTIONS 1995 - 2020							
<u>Place</u>	<u>1990 Census</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>
City of Hudson	6,378	6,964	7,549	8,256	8,963	9,614	10,264
Town of Hudson	3,692	4,031	4,370	4,781	5,191	5,568	5,945
Town of St. Joseph	2,657	2,906	3,154	3,444	3,734	4,005	4,276
Town of Troy	2,850	3,112	3,373	3,690	4,006	4,297	4,588
Village of North Hudson	3,101	3,386	3,670	4,015	4,359	4,675	4,991
Unincorporated Area	9,199	10,049	10,897	11,915	12,931	13,870	14,809
Incorporated Area	9,479	10,350	11,219	12,271	13,322	14,289	15,255
Hudson Urban Area	18,678	20,399	22,116	24,186	26,253	28,159	30,064

Source: West Central Wisconsin Regional Planning Commission, 1992

Department of Administration Projections Produced in 1993

TABLE 20 ST. CROIX COUNTY POPULATION PROJECTIONS 1995 - 2015						
<u>Place</u>	<u>1990 Census</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>
City of Hudson	6,378	7,052	7,452	7,742	7,972	8,182
Town of Hudson	3,692	4,323	4,679	4,964	5,188	5,415
Town of St. Joseph	2,657	2,919	3,109	3,253	3,367	3,476
Town of Troy	2,850	3,060	3,215	3,323	3,408	3,483
Village of North Hudson	3,101	3,375	3,578	3,728	3,847	3,958
Unincorporated Area	9,199	10,302	11,003	11,540	11,963	12,374
Incorporated Area	9,479	10,427	11,030	11,470	11,819	12,140
Hudson Urban Area	18,678	20,729	22,033	23,010	23,782	24,514

Source: Wisconsin Department of Administration, 1992

3.6.2 Population Projection Methodology

The West Central Wisconsin Regional Planning Commission used a population projection methodology similar to that employed by the Department of Administration in 1993. Instead of employing the DOA 1992 population estimate, the Regional Planning Commission calculated a 1995 population estimate using population growth indicators and historical household size. The 1995 estimate was then used with 1970, 1980 and 1990 historical populations to generate projected populations. The resulting numbers were dampened against excessive population growth rates using a comparison of the growth rates of adjoining communities. This damping is similar to that used by DOA in 1993. The following discussion follows the assumptions and procedure used to develop new population projection for the Hudson Sewer Service Plan.

3.6.3 Assumptions Behind Population Projections

Generally, population growth trends do not remain constant from decade to decade. The factors that influence population change are dynamic and are often subject to the effect of larger trends from outside an area's control. The forecasting of population change requires that certain assumptions be made regarding the conditions prevailing during the forecast period. Therefore, it is important to identify the assumptions inherent in the projection. The following factors and assumptions were incorporated into the population projections developed for the Hudson Sewer Service Plan.

In-migration will continue to be the driving impetus for population growth in Planning Area. Many factors are involved in the personal and business decisions which result in migration into the Planning Area. The major factor of this migration is, of course, the proximity and easy access to the Minneapolis/St. Paul Metropolitan Area, with its employment opportunities and urban amenities. In the Planning Area there is the draw of the aesthetic appeal of the natural environment and pastoral countryside, and the small town character of the communities. Indeed, the future rate of population increase will depend on the interrelated factors driving in-migration. These interrelated factors include the local, regional and national economy, people's perceptions and lifestyle preferences, the physical and cultural setting of the county, infrastructure improvements, regulation and taxation.

The economy has an important role in population growth of the Planning Area. The regional economy impacting the Planning Area is driven by the Twin Cities Metro area. In some parts of the Planning Area there are more than 70 percent of the population commuting to the Twin Cities Metro area for their employment opportunities. Locally, manufacturing employment has increased dramatically, and the growing population in the Planning Area has spurred more commercial services and retail trade employment. The creation and expansion of industrial development has continued into the 1990's, and commercial development continues to be generated, much of it probably from agglomeration effects. As a likely result of local and regional economic activity, construction employment increased by over 20 percent from 1990 to 1994. The availability of mortgage money, interest rates, and building costs are also economic factors that appear to remain favorable in the Planning Area.

The large increase in manufacturing employment in St. Croix County is contrary to national trends, where retail and service sector employment gains are outpacing virtual losses in manufacturing employment. In a local economy where one-fourth of the employment is in manufacturing, there may be concern about the effect a national recession could have. However, manufacturing employment gains were made in St. Croix County during two decades that saw major recessions decimate manufacturing employment elsewhere. The majority of the manufacturing employment increase in St. Croix County has occurred in the Planning Area.

The lifestyle preferences of people and the perceptions of people and business contribute to decision-making which influences the movement of people and businesses. The Planning Area is on the metropolitan fringe with its low population density, low crime, rural residences and small communities, relative to the metropolitan core. In addition, nearness to the metropolitan core gives Planning Area residents access to its cultural, recreational and entertainment activities and events.

The physical setting of the Planning Area provides an aesthetic, natural beauty which most likely continues to attract people. The St. Croix and Willow Rivers with their valleys and associated natural features create the base for this aesthetic attraction. The natural environment combined with the cultural setting of the Planning Area rural, small town and farm character leaves little question about the beauty of the Planning Area, and its continued appeal as a place to locate a home or business.

Infrastructure improvements in St. Croix County are likely to be a large influence on continued in-migration. Transportation improvements recently completed or to be completed in the near future include the Stillwater Bridge over the St. Croix River at Houlton, the I-94 Hudson Bridge upgrade to six lanes, improvements to Highway 35 from I-94 to River Falls, and an upgrade to four lanes of Highways 35 and 64 from Houlton to New Richmond. The improvement of bridges and highways to meet demand will create more demand as development responds to the opportunities improved access provides.

The expansion of public utilities capacity can provide opportunities for continued residential, commercial and industrial development. For example, The City of Hudson is planning additional capacity for their wastewater treatment plant that will allow for and may attract development. Public utility expansion is probably ancillary to the other factors driving in-migration, and likely adds to the cumulative effect of all the factors in force.

Relative differences in taxation between the Twin Cities area and St. Croix County may also have a significant effect on in-migration. Although property taxes may be slightly higher in Wisconsin than in Minnesota, personal income taxes, sales taxes and taxes related to doing business (corporate income, commercial and manufacturing property and unemployment taxes, and worker's compensation insurance) are definitely lower in Wisconsin. These tax structures are not anticipated to change significantly during the forecast period.

Another factor which has and will influence the Planning Area growth and development is stricter development controls in Minnesota communities when compared to the development standards in St. Croix County. The growing and cumulative impacts of urban

and suburban development have long been felt in the Minneapolis/St. Paul Metro area, resulting in a long tradition of land development regulations. These regulations, while addressing real impacts affecting communities, are often perceived as onerous and unnecessary and can influence location decisions.

Apparently the many positive influences on many individual, group or organizational decisions to migrate to the Planning Area overwhelm the perceived, potential or real negative influences of high commuting, land, development and taxation costs. This is evidenced in the continued growth of the Planning Area since 1990, and is presumed to continue into the forecast period of these population projections.

3.7 1995 Population Estimates

3.7.1 Methodology for Deriving the 1995 Population Estimates for Planning Area Communities

The compilation of recorded building permits (an indicator or precursor of population growth) during 1990 through 1994 and adjusted for housing occupancy provided an index of population growth in the Planning Area communities (Table 21).

TABLE 21 BUILDING PERMITS 1990 - 1994 (Housing Units)								
<u>Place</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1990-1994</u>	<u>Percent Occupancy</u>	<u>Adjusted Total</u>
City of Hudson	24	110	90	61	114	399	95.5	381
Town of Hudson	38	32	60	54	58	242	96.9	234
Town of St. Joseph	24	29	28	28	32	141	90.9	128
Town of Troy	15	16	30	33	33	127	92.5	117
Village of N. Hudson	20	16	28	31	22	117	96.4	113
Unincorporated Area	77	77	118	115	123	510	----	479
Incorporated Area	44	126	118	92	136	516	----	494
Hudson Urban Area	121	203	236	207	259	1,026	----	973

Source: U.S. Census Bureau, 1990-1995

TABLE 22 PERSONS PER HOUSEHOLD	
	<u>1990</u>
Hudson City	2.50
Hudson Town	3.33
St. Joseph Town	2.98
Troy Town	2.97
N. Hudson Village	2.87

Source: U. S. Census Bureau, 1990

The 1990-1994 Adjusted Building Units multiplied by the 1990 Person per Household U.S. Census (Table 22) information yields an estimate of 1995 population, which below is compared to the Wisconsin Department of Administration 1995 population projection (Table 23).

TABLE 23 1995 POPULATION ESTIMATE

	1990-1994 Added Housing Units A	1990 Persons per Household B	1990-1995 Population Growth Estimate C	1990 Census Population D	Derived 1995 Population Estimate	Wis. Dept. of Admin. 1995 Projection
	(A x B)		(C + D)			
Hudson City	381	2.5	953	6,378	7,331	7,052
Hudson Town	234	3.33	779	3,692	4,471	4,323
St. Joseph Town	128	2.98	381	2,657	3,038	2,919
Troy Town	117	2.97	347	2,850	3,197	3,060
N. Hudson Village	113	2.87	324	3,101	3,425	3,375

Source: West Central Wisconsin Regional Planning Commission, 1995; Wis.DOA, 1993

3.7.2 1990-1995 Rate of Growth

For additional comparison, the derived 1995 population estimate was used to extrapolate a 1990-2000 ten year growth rate and is presented below with the growth rates demonstrated in the 1980 and 1990 decennial periods (Table 24). It is clear that significant population growth is continuing into the 1990's. Indeed, the information provided by the derived 1995 estimates indicates that growth is occurring in the Planning Area at a faster rate than was predicted by the Wisconsin Department of Administration population projections. The 1990-2000 rate of growth developed from the WCWRPC 1995 estimate is 29.8%, as opposed to the DOA projected growth rate of 14.9%. It was then deemed appropriate, based on more current local information, that population projections be developed on past Censuses and the WCWRPC 1995 estimates.

TABLE 24 1990-1995 RATE OF GROWTH APPLIED TO 1990-2000

	1990 Census Population	Derived 1995 Population Estimate	1990-1995 Rate of Growth	Extrapolated 1990-2000 Ten Year Growth Rate	Observed 1980-1990 Ten Year Growth Rate	Observed 1970-1980 Ten year Growth Rate
Planning Area	18,678	21,462	14.9%	29.8%	31.8%	36.3%
Hudson City	6,378	7,331	14.9%	29.8%	17.4%	7.6 %
Hudson Town	3,692	4,471	21.1%	42.2%	83.5%	117.5%
St. Joseph Town	2,657	3,038	14.3%	28.7%	21.9%	60.6%
Troy Town	2,850	3,197	12.2%	24.4%	22.5%	53.3%
N. Hudson Village	3,101	3,425	10.4%	20.9%	39.8%	43.4%

Source: West Central Wisconsin Regional Planning Commission, 1995

3.7.3 Methodology for Deriving the 2000-2020 Population Projections

Average change in the population:

$$G = (((P95-P70)/25) + ((P95-P80)/15) + ((P95-P90)/5)) / 3$$

where **P** is population

G is average annual numerical population change, and

70, 80, 90 (U.S. Census) and 95 (WCWRPC estimate) are the reference years of the population data.

Preliminary population projection:

$$P2000 = P95 + 5G; P2005 = P95 + 10G; P2010 = P95 + 15G, P2015 = P95 + 20G, \text{ and } P2020 = P95 + 25G.$$

Modifications for high rates of change:

An implied average annual rate of change at the time of forecast time origin (P95) was calculated for **G** for each community in and bordering the Planning Area. The bordering communities include the Towns of Somerset, Richmond, Warren and Kinnickinnic, the Villages of Somerset and Roberts, and the City of New Richmond in St. Croix County, the Town of Clifton and City of River Falls in Pierce County, and Washington County, Minnesota. From these rates of change the mean and standard deviations (S.D.) were determined for the bordering communities.

Any Planning Area community with a rate of change which fell above of the range given by

$mean \pm 1.5$ (S.D.) of the bordering communities

was reset so as to equal

$mean + 1.5$ (S.D.) of the bordering communities

The purpose of this adjustment was to dampen high rates of change by taking into consideration for each Planning Area community the rate of change in neighboring communities. The adjustment assumes that high rates of growth for any given community cannot continue for very long into the future and should therefore be dampened to reflect the changes of other nearby communities. After this adjustment the modified rates of change were converted into the annual numerical changes by applying the modified rate to the base year population (P95) of each community. This adjustment was only necessary for the Town of Hudson.

No provisions were made to account for annexations because the population change experienced by both jurisdictions, annexing territory and having territory annexed from it, reflect change which would incorporate any annexation. In any event, annexation trends indicate there have been no unusually large annexations, and existing annexation patterns should continue into the future.

The derived population projections were not adjusted to an overall County projection largely because the most dynamic aspect of the County's population change is occurring in the Planning Area. Hence, any adjustment to a county-wide projection might inappropriately

alter the results. Table 25 presents the completed population projections for the Hudson Sewer Service Plan.

Regional Planning Commission Projections Produced in 1995

TABLE 25 ST. CROIX COUNTY POPULATION PROJECTIONS 2000 - 2020							
<u>Place</u>	<u>1990 Census</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>
City of Hudson	6,378	7,331	8,012	8,692	9,373	10,053	10,734
Town of Hudson	3,692	4,471	5,094	5,883	6,667	7,449	8,229
Town of St. Joseph	2,657	3,038	3,372	3,707	4,041	4,376	4,710
Town of Troy	2,850	3,197	3,521	3,846	4,170	4,495	4,819
Village of N. Hudson	3,101	3,425	3,792	4,160	4,527	4,894	5,262
Unincorporated Area	9,199	10,706	11,987	13,436	14,878	16,320	17,758
Incorporated Area	9,479	10,756	11,804	12,852	13,900	14,947	15,996
Hudson Urban Area	18,678	21,462	23,791	26,288	28,778	31,267	33,754

Source: West Central Wisconsin Regional Planning Commission (WCWRPC), 1995

3.8 Residential Development

3.8.1 Dwelling Unit Projection

To establish a projection of residential land consumption the previously generated population projections are used with a projection of persons per household to determine how many dwelling units are likely to be developed by the year 2020. Table 26 show the historical housing unit information, while Table 27 shows the historical and projected persons per household.

TABLE 26 TOTAL HOUSING UNITS			
<u>Place</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>
City of Hudson	1,613	2,052	2,634
Town of Hudson	256	591	1,144
Town of St. Joseph	437	703	974
Town of Troy	463	764	1,051
Village of N. Hudson	472	749	1,122
St. Croix County	10,376	14,710	18,519

Source: U. S. Census Bureau, 1970 - 1990

TABLE 27 PERSONS PER HOUSEHOLD				
<u>Place</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2020</u>
Hudson City	3.27	2.72	2.50	2.26
Hudson Town	3.89	3.52	3.33	2.96
St. Joseph Town	3.71	3.26	2.98	2.56
Troy Town	3.60	3.15	2.97	2.54
N. Hudson Village	3.48	3.06	2.87	2.50

Source: U. S. Census Bureau, 1970 - 1990, WCWRPC persons per household projections.

The number of required housing units in 2020 (Table 28) is derived by dividing the 2020 population projections by the 2020 persons per household projection. The Planning Area is likely to see an increase of 5,668 housing units from 1995 to the year 2020.

TABLE 28		HOUSING UNITS REQUIRED*		
<i>Place</i>	<i>1990</i>	<i>1995</i>	<i>2020</i>	
City of Hudson	2,552	2,939	4,747	
Town of Hudson	1,109	1,277	2,804	
Town of St. Joseph	891	1,087	1,827	
Town of Troy	959	1,173	1,915	
Village of North Hudson	1,081	1,252	2,103	
Planning Area	6,592	7,728	13,396	

* Based on 1990 Census population, WCWRPC population and persons per household projections.

TABLE 29		RESIDENTIAL DENSITIES	
<u>Place</u>	<u>Acres</u>		
City of Hudson	.33		
Town of Hudson	3.00		
Town of St. Joseph	3.40		
Town of Troy	2.90		
Village of North Hudson	.33		

Source: Wisconsin Department of Revenue, WCWRPC, St. Croix County Zoning Office, 1995

3.8.2 Residential Development Densities

Table 29 shows the average residential densities which are likely to occur over the projection period.

3.8.3 Acres Needed to Accommodate Future Residential Development

The number of acres needed to accommodate the residential development occurring from 1995 to the year 2020 is derived by multiplying the

average residential density by the housing unit change from 1995 to 2020 (Table 30).

TABLE 30		ACRES NEEDED FOR FUTURE RESIDENTIAL DEVELOPMENT	
<u>Place</u>	<u>Average Residential Densities</u>	<u>Additional Housing Units 1995-2020</u>	<u>Land to Accommodate Residential Growth</u>
City of Hudson	0.33 acres	1,808	597 acres
Town of Hudson	3.00 acres	1,527	4,581 acres
Town of St. Joseph	3.40 acres	740	2,516 acres
Town of Troy	2.90 acres	742	2,152 acres
Village of North Hudson	0.33 acres	851	281 acres
Planning Area	1.79 acres	5,668	10,127 acres

3.8.4 Allocation of Future Residential Development

Low density residential development in the unincorporated areas creates a pattern of land consumption much greater than that within the incorporated communities. All of the development in the unincorporated areas is also unsewered. The trend of developing unsewered subdivisions in the rural area of the Planning Areas will continue. However, there will also be a continued market for sewerred residential development in incorporated communities to accommodate higher density and lower cost housing. The above residential land projections indicate there will be 2,659 housing units added to the incorporated communities (46.9% of the additional housing units added to the Planning Area) and 3,009 housing units added in the unincorporated area (53.1% of the additional housing units added to the Planning Area).

3.9 Non-Residential Development

3.9.1 Employment

The employment projections for the West Central region of Wisconsin from the Department of Industry, Labor and Human Relations are the only projections for employment available. They are only available by county, therefore, it is necessary to manipulate these and historical employment figures to serve the purpose here of determining a non-residential land consumption projection. Table 31 shows 1994 employment and 2020 projected employment for St. Croix County.

TABLE 31 ST. CROIX COUNTY EMPLOYMENT PROJECTIONS				
<u>Employment Categories</u>	<u>SIC Code</u>	<u>1994</u>	<u>2020 Projection</u>	<u>Change 1994-2020</u>
Agricultural, Forestry and Mining	0-1499	1,830	1,500	-330
Construction	1500-1999	660	990	330
Manufacturing	2000-3999	5,500	7,838	2,338
Transportation, Utilities & Communications	4000-4999	950	1,354	404
Wholesale/Retail Trade	5000-5999	5,000	7,000	2,000
Finance, Insurance and Real Estate	6000-6999	540	810	270
Services	7000-8999	3,900	5,948	2,048
Government	9000+	3,000	3,600	600
TOTAL		21,380	29,040	7,660

Source: DILHR, WCWRPC, 1996.

Available historical employment limits analysis to the distinction between the unincorporated and incorporated areas of the Planning Area. The above employment projections were attributed to the incorporated and unincorporated areas of the Planning Area based on historical percentages of total county employment within the Planning Area.

3.9.2 Commercial and Industrial Development Densities

A non-residential development standard estimate was derived for commercial, industrial and governmental land uses by using historical employment figures to calculate employees per acre for each area by category. It is assumed that these numbers will not change significantly in the projection period. These derived non-residential development densities were used with the employment projections to establish a projection for incorporated and unincorporated area non-residential development land consumption requirements to the year 2020.

3.9.3 Acreage Needed for Non-Residential Development

The projection of non-residential land consumption found in Table 32 gives a rough estimate of the amount of land that is likely to be required in the incorporated and unincorporated areas for commercial, industrial and governmental uses. The incorporated area is likely to see about 82% of the commercial development, 85% of the industrial development, and 62% of the increase in governmental uses in the Planning Area.

TABLE 32 NON-RESIDENTIAL LAND CONSUMPTION 1994-2020			
	<u>Incorporated Area</u>	<u>Unincorporated Area</u>	<u>Planning Area</u>
Commercial	2,348	526	2,874
Industrial	456	83	539
Government	75	46	121
TOTAL	2,879	655	3,534

3.9.4 Allocation of Future Non-Residential Development

Most large-scale commercial and industrial development is going to occur within incorporated communities on sanitary sewer. All of the communities in the Planning Area agree that these kinds of land uses belong on public utilities. However, there may be disagreement as to what is the large-scale threshold of commercial development.

3.10 Delineation of Sewer Service Area Boundary 2020

There were five areas considered for inclusion into a new Hudson urban sewer service area. Each were selected by the Hudson Area Urban Sewer Service Planning Committee as potential development areas deserving consideration for future sewer service. Area A includes the area bounded on the west by the 1981 sewer service boundary, on the south by Tower Road, on the east by the proposed alignment of the new State Trunk Highway 35, and to the north by Interstate 94. Area B is bounded on the west by the 1981 sewer service boundary, east on Sherman Road and north on the Chicago and Northwestern railroad tracks. Area C is bounded on the west by the 1981 sewer service boundary, south by Interstate 94, north by the Willow River State Park, and east by a line that runs north from the eastern boundary of Area A, and excludes Area B. Area D is bounded by Area A to the west, existing State Trunk Highway 35 to the east, Tower Road to the south and Interstate 94 on the north.

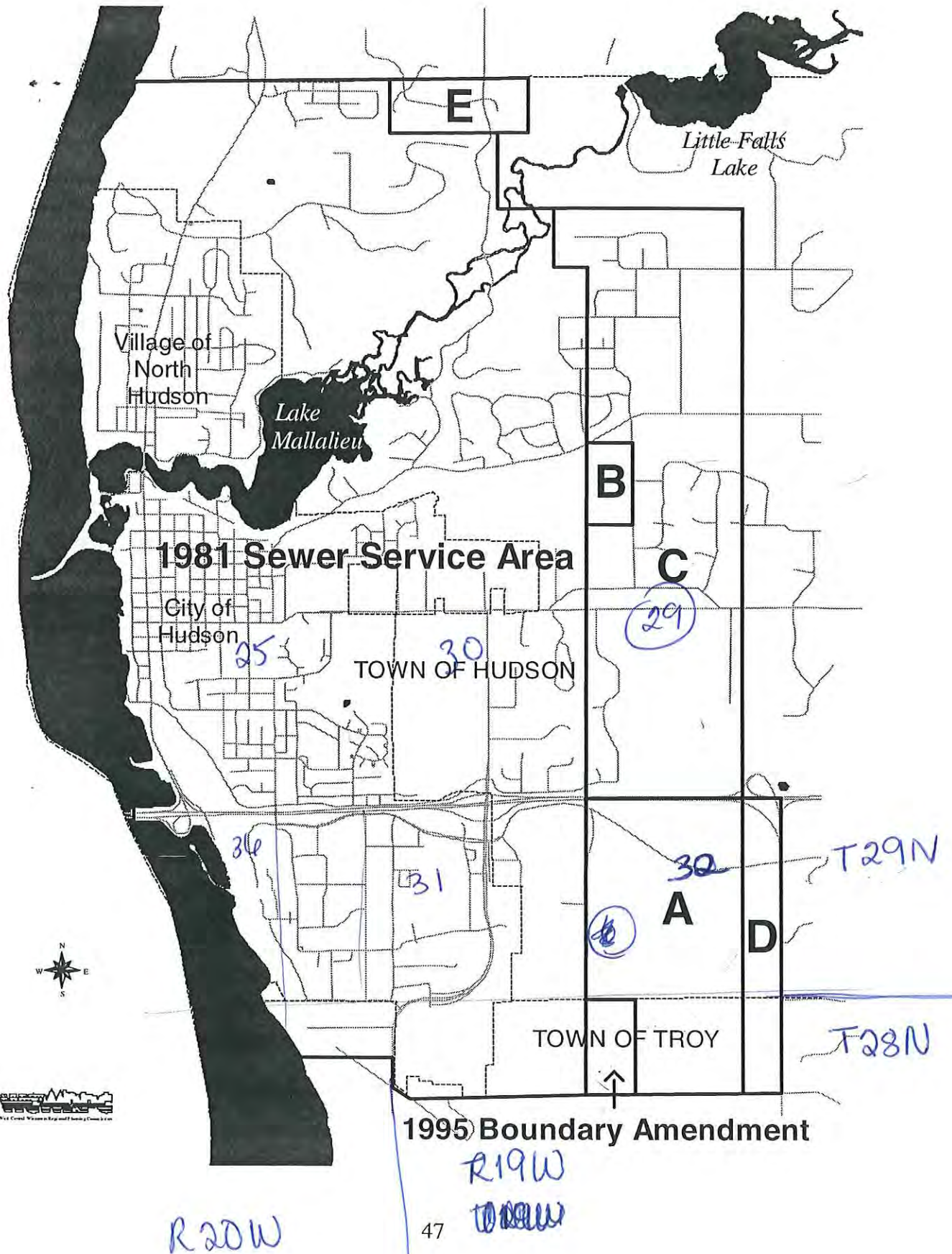
Area E includes the area bounded by the 1981 sewer service boundary on the west and south, Willow River State Park to the east and the St. Joseph/Hudson town line to the north.

The Hudson Area Urban Sewer Service Planning Committee chose all five areas to be included in the updated Hudson Urban Sewer Service Area. Area A was included because it contains city owned land planned for industrial development and other areas where there has been an expressed interest in sewer service. Area B was included because there has been an expressed interest in serving it and it is consistent with the City of Hudson's comprehensive and wastewater treatment facility plan. Area C was included because there is a chance that subdivisions within it may need to be served by the year 2020, possibly due to on-site system failures. Area D was included because of the likelihood that due to the new alignment of Highway 35 this area will see commercial development demand. Area E was included to satisfy the planning of North Hudson which has discussed this addition with the Town of Hudson. These two communities agree this area should be included for potential sewer service because it is removed from the other non-sewer service area portions of the Town of Hudson by the intervening Willow River State Park and there is existing development which may require sewer service by the year 2020. Map 5 shows the boundary alternatives.

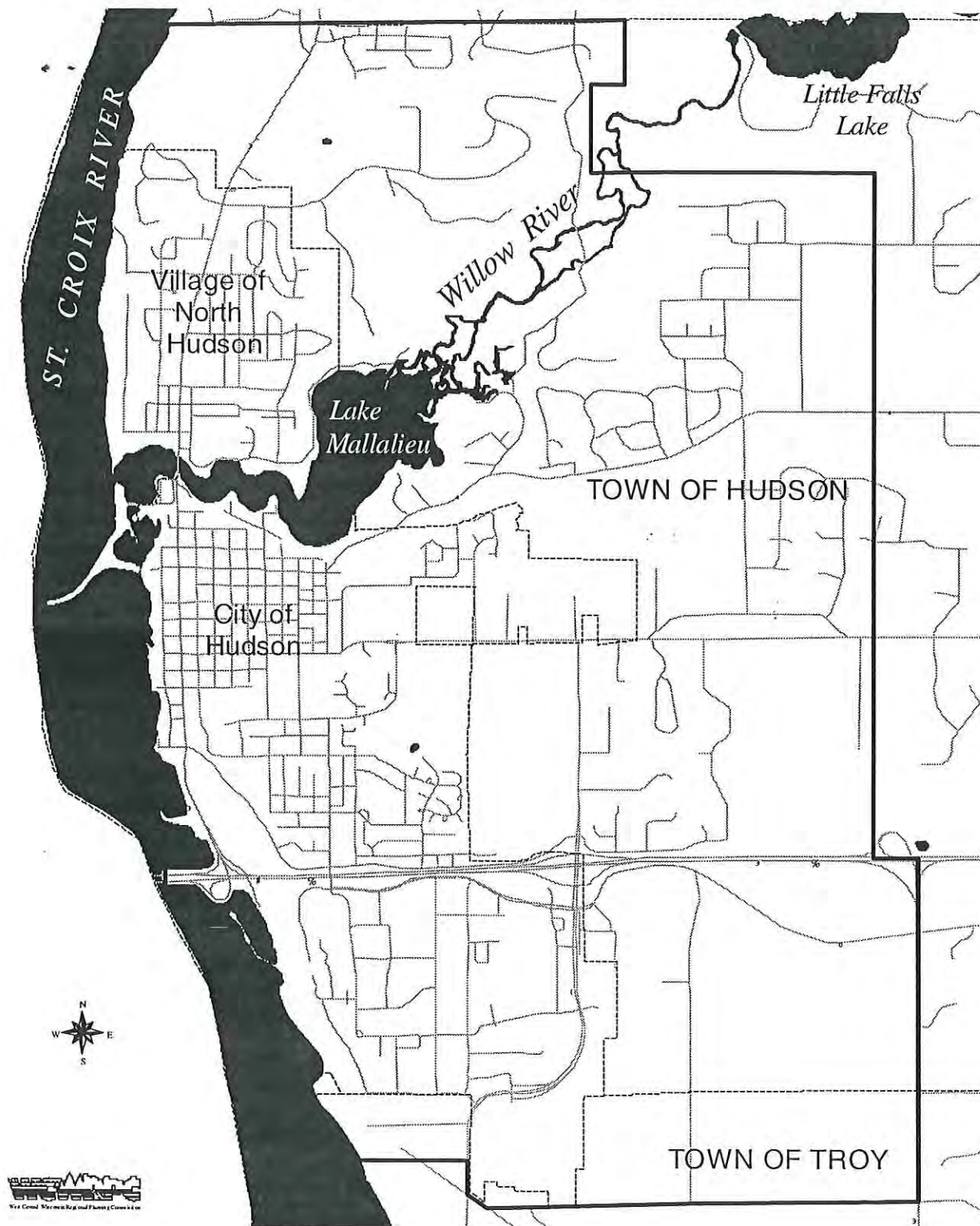
Inclusion of lands within the sewer service area does not imply they will be developed and sewerred by 2015, only that there is a potential for development utilizing sewer service. Environmental corridors and the high cost of sewer extension will be major limiting factors for sewerred development. There is probably no way to determine exactly where these development acres will occur. It is hoped that new development will occur in a compact and orderly way as outlined in the policies of this plan. Such development often provides for more cost-effective public services. However, land economics, within the development framework government has in place, has considerable influence over the actual occurrence of development. Map 6 shows the Hudson Urban Sewer Service Area for 2020.

The selected sewer service area contains approximately 9,525 acres of land, of which 80 acres are a 1995 boundary amendment. The 1981 sewer service area contained about 6,839 acres. Hence, the Planning Committee has added 2,686 acres to the sewer service area with the 1995 amendment and this plan update.

Boundary Alternatives



Sewer Service Area 2020



CHAPTER 4 - GOALS AND POLICIES

Goal is a long-term end toward which programs or activities are ultimately directed, but might never be attained. It represents a general statement which outlines the most preferable situation which could possibly be achieved if all the objectives and policies were developed to their fullest degree.

Objective is a specific, measurable, intermediate end that is achievable and marks progress toward a goal.

Policies are the way in which programs and activities are conducted to achieve an identified objective and goal. They are courses of action selected to guide and determine present and future decisions.

The policies stated in this plan represent an effort to improve the quality of life in and around the City of Hudson through the protection of surface water quality, while recognizing the diversity in character and resources of the area's communities. Those policies that direct action using the words "will" or "shall" are mandatory and regulatory aspects of the Hudson Area Urban Sewer Service Plan. In contrast, those policies that direct action using the word "should" are advisory and serve as guides, reflecting a common vision of the communities within the Planning Area. These communities are strongly encouraged to pursue these policies toward their preceding stated objectives and goals. Communities can effect these policies by implementing the regulatory tools they are authorized to use, such as, planning, zoning, subdivision controls, impact fees, and site plan review.

Goal 1 To create an orderly and planned pattern of community growth and development that will provide a high quality living environment.

Objective 1.1 By guiding future growth within the defined urban service area in an efficient and orderly manner to promote contiguous and compact development.

Policy 1.1.1 Community plans should be updated every five years to reflect changing economic and physical conditions.

Policy 1.1.2 Urban development should be encouraged to "infill" vacant developable lands within city boundaries, then be staged outward according to local plans.

Policy 1.1.3 Sewer extensions that reflect the contiguous and compact pattern of development should receive priority over extensions which will contribute to "leapfrog" development or urban sprawl.

Policy 1.1.4 The supply of land dedicated to urban development should approximate current and future needs as determined from population, employment and land use projections, and be based on a locally determined density standard.

Policy 1.1.5 Future commercial and industrial development should expand upon existing areas and be readily accessible to major transportation systems.

Policy 1.1.6 Future residential development should occur adjacent to existing development to contain costs of public service provisions, and reflect compact and orderly development.

Policy 1.1.7 The City of Hudson and the Village of North Hudson require the land they serve with public services to be within their corporate jurisdictions. On a case by case basis, through negotiations between affected communities and land owners, the City or Village will determine whether extensions of sanitary sewer service beyond the City or Village corporate limits will require annexation.

Policy 1.1.8 Sewer extensions will not be made beyond the 20 year urban sewer service area, unless the plan is amended.

Objective 1.2 By guiding future rural development in an efficient, orderly and compatible manner to maintain a rural character.

Policy 1.2.1 Rural development should take place adjacent to existing development to prevent further scattered development.

Policy 1.2.2 Future residential development should be directed to existing platted subdivisions.

Policy 1.2.3 Commercial development should be clustered around existing development to prevent scattered or strip development.

Policy 1.2.4 Industrial development should occur in established sewer industrial parks.

Policy 1.2.5 Development into areas identified as prime agricultural land will be discouraged according to county farmland preservation plans.

Goal 2 To protect water quality, natural resources and sensitive natural areas from the encroachment of development.

Objective 2.1 By delineating environmental corridors and discouraging development in areas environmentally unsuitable for development.

- Policy 2.1.1 Environmental corridors identified in local plans should include regulated wetlands, highly erodible soils, floodplains, steep slopes, areas of high bedrock and groundwater, wildlife habitats, unique scientific areas, and archaeological sites.*
- Policy 2.1.2 Local land use plans and ordinances should be used to guide development away from environmental corridors.*
- Policy 2.1.3 Sewer extensions shall not be permitted into areas identified as environmental corridors unless the extension is to serve compatible uses such as public parks and outdoor recreation facilities.*
- Policy 2.1.4 Sewer extensions into physical or cultural resource areas not included in environmental corridors shall conform to applicable rules and regulations, and shall be reviewed on a case-by-case basis.*
- Policy 2.1.5 Rural development should be discouraged where soils are unsuitable for conventional on-site disposal systems.*
- Policy 2.1.6 Developers of unsewered subdivisions should demonstrate that the immediate groundwater supply is safe and will be protected through site plans for the proper placement of wells and septic systems.*
- Policy 2.1.7 Erosion and sediment control practices should be used when clearing or developing land and constructing sanitary sewer systems, where the potential for erosion is high.*

Goal 3 To provide and maintain a full range of community facilities and services which are efficient, economical, and environmentally sound.

- Objective 3.1 To provide sanitary sewer systems which will effectively and economically serve urban development.*
- Policy 3.1.1 Sanitary sewer extensions should occur consistent with the timing or provision of other public facilities and services.*
- Policy 3.1.2 Sewer extensions should occur contiguous to existing systems, according to local staging plans, where facilities can accommodate them.*
- Policy 3.1.3 Sanitary sewer systems should be provided for existing development in unincorporated areas whenever they are the most cost-effective alternative for addressing failing on-site disposal systems.*
- Policy 3.1.4 Sanitary sewer system construction and sizing should be staged to encourage lower capital investment and flexibility.*

Policy 3.1.5 Existing capacity in sanitary sewer systems should be used before making substantial expansions or extensions.

Policy 3.1.6 The number of waste treatment plants should be minimized to avoid duplication of facilities, institute economies of scale and lessen environmental degradation.

CHAPTER 5 - SUMMARY

5.1 Sewer Service Area

The selected sewer service area contains approximately 9,525 acres of land. The 1981 sewer service area contained about 6,839 acres. Hence, the Planning Committee has added 2,686 acres to the sewer service area with the 1995 amendment and this plan update.

5.2 Developed Land

The approximate amount of land which has currently been developed within the sewer service area is about 2,900 acres.

5.3 Environmental Corridors

Environmental corridors are significant areas of environmental resources characterized by often continuous systems of open space, physical features, environmentally sensitive lands and natural or cultural resources which can be adversely impacted by development. This Sewer Service Plan defines the environmental corridors as being: all regulated wetlands; shorelands within 75 feet of the ordinary high water mark or the landward edge of the floodplain, whichever is greater; all areas within the Federal Emergency Management Agency 100 year flood hazard zones; and, all areas of 12% or greater slope.

The St. Croix County Comprehensive Zoning Ordinance has provisions for the protection of wetlands, shorelands, floodplains and steep slopes which are effective in the unincorporated area. This plan provides for protection during sewer development of about 455 acres these resources for within the sewer service area.

5.4 Lands Available for Development

The approximate amount of land available for development within the Hudson Sewer Service Area is 5230 acres. This was derived by subtracting the area of existing developed lands, the environmental corridors, and an estimate of remaining undevelopable land (roads, poor soils, shallow bedrock, etc.) within the sewer service area from the total land area of the sewer service area.

5.4.1 Residential Land Needs

The residential unit projections indicate there will be 2,659 housing units added to the incorporated communities (46.9% of the additional housing units added to the Planning Area) and 3,009 housing units added in the unincorporated area (53.1% of the additional housing units added to the Planning Area). Residential development in the unincorporated area, because of the lower density of residential development, will consume more land per housing unit than in the incorporated area. The City of Hudson and the Village of North Hudson are expected to require approximately 878 acres for residential development between 1995 and 2020, while the Towns of Hudson, St. Joseph and Troy will require about 9249 acres. However, residential land consumption within the Hudson Sewer Service Area is expected to

come almost entirely from the anticipated residential development within incorporated areas. It is assumed here that about 5 percent of the new housing in the unincorporated area could become sewerred due to property owner decisions to annex and receive sewer service. Therefore, there will be approximately 1340 acres of new sewerred residential land required between 1995 and 2020.

5.4.2 *Commercial/Industrial Land Needs*

The projected requirement for non-residential land included for the incorporated area within the Planning Area is 2879 acres. Non-residential development includes commercial, industrial and institutional uses. It is expected that all of the non-residential development in the incorporated area will require sewer service, while all non-residential development in the unincorporated area will not be sewerred.

5.4.3 *Lands in Excess of Needs*

There are approximately 5230 acres available for development in the sewer service area, while development within the sewer service area will require about 4219 acres, leaving about 1011 acres in excess of the projected land consumption requirements. The excess land allows for the uncertainty of market decisions about where development will actually occur within the sewer service area.

5.5 Description of Local Policies Regarding the Relationship Between Annexation and Provision of Sewer Extensions

The City of Hudson and the Village of North Hudson require the land they serve with public services to be within their corporate jurisdictions. On a case by case basis, through negotiations between affected communities and land owners, the City or Village will determine whether extensions of sanitary sewer service beyond the City or Village corporate limits will require annexation.

5.6 Public and Community Participation

The Hudson Area Urban Sewer Service Plan will be available for public review and will receive a public hearing. While the Plan is available for review there will be a two-page bulletin available at St. Croix County Planning and Development, City of Hudson and Village of North Hudson offices which summarizes the purpose of the plan, its contents and how it affects development in the Hudson area.

5.7 Adoption of Final Plan

The Hudson Area Urban Sewer Service Planning Committee adopted the final Hudson Area Urban Sewer Service Plan on December 12, 1997. After a public hearing on the plan, it will be submitted to the Wisconsin Department of Natural Resources for their approval. Once the DNR approves the plan it will then be a valid water quality plan and its implementation will commence.

CHAPTER 6 - PROCEDURES FOR SEWER EXTENSION REVIEW

Any proposal to extend sanitary sewer in the Hudson area must start with contacting either the City of Hudson or the Village of North Hudson. Contact persons for this purpose are found in Appendix F. The City of Hudson and the Village of North Hudson require the land they serve with public services to be within their corporate jurisdictions. On a case by case basis, through negotiations between affected communities and land owners, the City or Village will determine whether extensions of sanitary sewer service beyond the City or Village corporate limits will require annexation.

The sewer service plan is the tool used in the review of proposals for sewer extensions and hookups. The St. Croix County Planning Department, as a Designated Planning Agency (DPA) will advise the WisDNR and WisCOM regarding whether a sewer extension/hookup is in conformance with the plan. For a proposal to be in conformance with the plan, the sewer extension/hookup review confirms the proposal is within the sewer service area, consistent with plan goals, objectives and policies, and also not in an environmental corridor.

The environmental corridor criteria in the review process means developers and municipal officials must be aware of the criteria and its consequences when proposing new development. An awareness of the sewer service plan by the developers and local governments will ensure proper and timely development occurs.

The St. Croix County Planning Department, WisDNR, and all the municipalities represented on the Hudson Sewer Service Area Planning Committee recognize the importance of residential, commercial, and industrial development in the Hudson area. Likewise, the City of Hudson recognizes the importance of preserving water quality and the environment. Consequently, the implementation of this plan will be accomplished through site specific review, in many instances, to insure sensible decisions are made to protect our natural resources, but also, to not unduly prevent development from occurring.

Upon the final approval of this plan, implementation of the plan will consist of reviewing proposals for sewer extensions and hookups. The St. Croix County Planning Department, as a DPA, will be responsible for advising the WisDNR on the consistency of the proposed projects with the Sewer Service Area Plan. The local review procedures for sewer extensions are outlined below. NR110 must be reviewed by the applicant for detailed WisDNR plan approval requirements.

1. Applicants for sewer extensions will submit a letter and a plan map showing the proposed sewer extension and the project service area (with acreages) to the St. Croix County Planning Department. This should be done early in the planning process, prior to detailed plans, to avoid delays of the project. Early submittal of the plans will ensure the local review process is completed prior to final submittal of the plans to WisDNR.
 - 1a. If there is any doubt as to the proposed extension infringing on an environmental corridor (as delineated on the review maps), the St. Croix County Planning Department will consult with and request site specific information from the local

municipality and/or the developer. This information, along with the environmental corridor criteria from this plan, will be used to make a recommendation on the proposal.

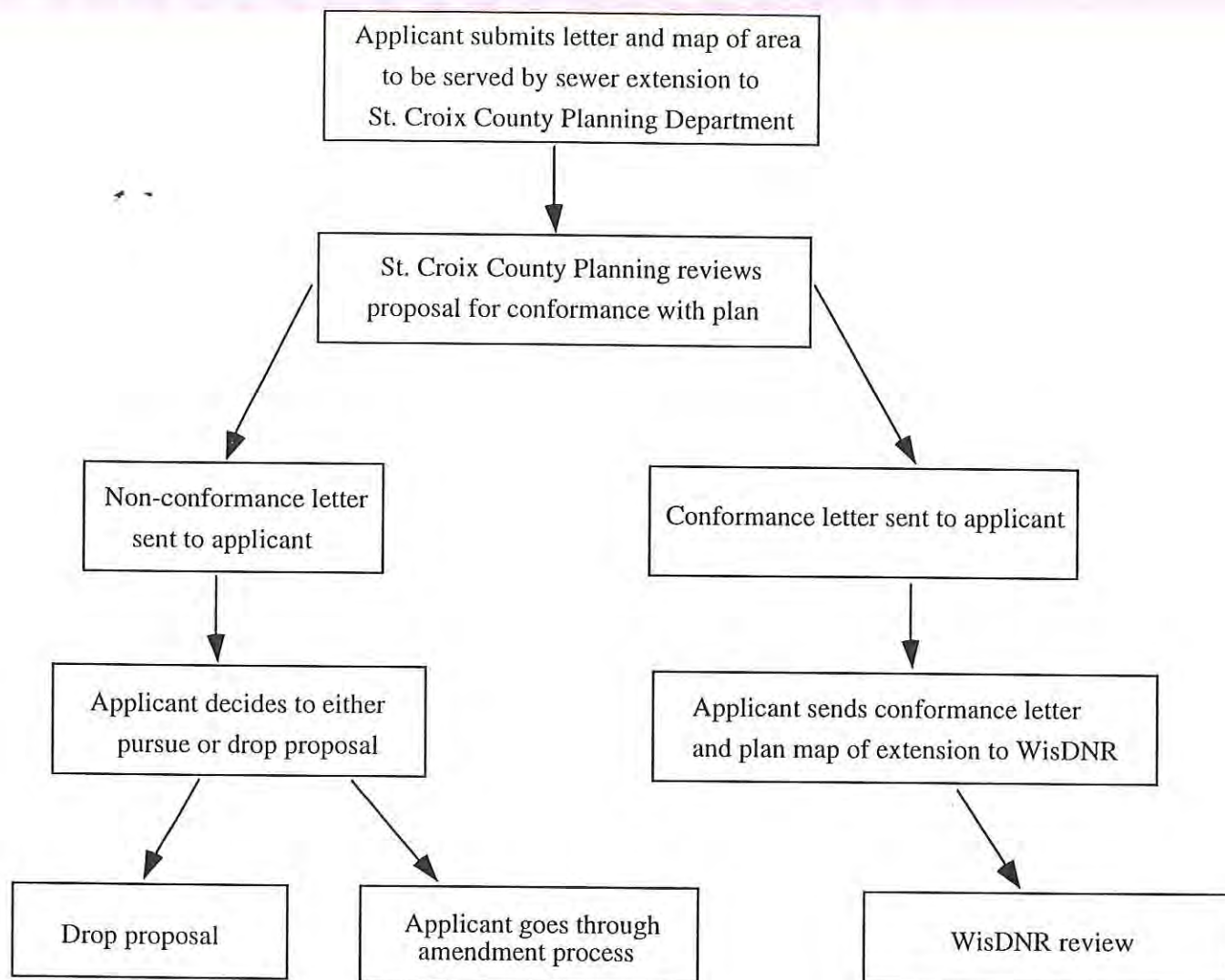
2. The St. Croix County Planning Department staff will review all submissions for conformance with the plan, specifically ensuring the proposed extension does not infringe on an environmental corridor, and is within the sewer service area.
 - 2a. If the requested sewer extension is in conformance with the plan, a sewer service area conformance letter will be sent to the applicant within 15 days of receipt of the plan map. The sewer service area conformance letter and other materials required by NR110 must then be submitted by the applicant to WisDNR for final review and approval of the sewer extension.
 - 2b. If the proposed extension is not in conformance with the plan, or if there are questions about consistency, a letter of non-conformance will be sent to the applicant within 15 days. The applicant should then decide if it wants to further pursue the sewer extension. If not, no further action is necessary.
3. If the applicant decides to pursue the sewer extension, the plan must be amended for the proposed extension to be in conformance. The amendment procedures can be found in the Plan Amendment Process section. An applicant can also alter the proposal to pursue conformance and re-apply.
4. If the plan is amended, the applicant must notify the St. Croix County Planning Department that it wishes to have the proposed extension re-evaluated.

6.1 Enforcement of the Uniform Dwelling Code and Local Erosion Controls Allowing Sewer Extensions Into 12% to 20% Steep Sloped Areas

The need to extend sewer lines indicates impending development of land. Naturally, the exposure of soils during the excavation and building process soon follows. The potential for these exposed soils to either reach a surface water or storm sewers leading to surface waters increases without adequate construction site erosion controls. Soil loss rates increase exponentially as slope increases, therefore greater damage may result from development on lands with 12 to 20 percent slope without properly installed and maintained construction site controls. Sedimentation of surface waters can be a serious problem in developing areas and can result in reduced habitat for fish spawning and aquatic insects.

The Department of Commerce currently requires the City of Hudson and Village of North Hudson to conduct inspections in order to determine compliance with the Wisconsin Uniform Dwelling Code (IHLR 20-25). The Uniform Dwelling Code (UDC) applies to all one and two household homes, manufactured buildings for dwellings, and newly constructed community-based residential facilities providing care, treatment and services for three to eight unrelated adults constructed after June 1, 1980. The UDC contains many provisions, one being

FIGURE 3 Review Procedures for Sewer Extension Requests



containment of soils on the developing site with erosion control measures. Both the city and village staff inspect new development for compliance with this code and have enforcement authority to correct problems.

As determined by the Department of Commerce, if enforcement of the construction site erosion control provisions of the UDC is inadequate in either municipality, all sewer extensions into areas containing slopes between 12 and 20 percent will not be approved in the respective municipality. Once adequate enforcement is achieved, as determined by the Department of Commerce, sewer extensions can then be approved in areas of 12 to 20 percent slope. The procedure for the actions outlined above begin with the Department of Commerce informing the Department of Natural Resources that inadequate enforcement exists. The Department of Natural Resources will send a letter to the affected municipality and the sewer service area plan compliance reviewer to inform them that extensions into areas of 12 to 20 percent slope will not be approved until further notice. The municipality will then work with the Department of Natural Resources to improve their enforcement. When the Department of Commerce is satisfied with the level of UDC compliance regarding erosion control, they will

notify the Department of Natural Resources. A letter will be sent to the affected municipality and the sewer service areas plan compliance reviewer to approve extensions into 12 to 20 percent slope, if all other conditions in the plan are satisfied.

Beyond the scope of the UDC erosion control requirements, the Village of North Hudson has an erosion control ordinance (18.055) which requires an erosion control plan for land disturbance activity and contains enforcement authority. The City of Hudson also has an ordinance requiring erosion and sediment control for land disturbance activity (6-97 Section 16.24). Before land disturbance activities within the city occur, an erosion control plan must first be approved. Escrow requirements and enforcement actions are outlined in the ordinance.

Proper implementation and enforcement of these ordinances will reduce movement of soils off-site during construction activities. Review of these municipal erosion control ordinances will be conducted by the Department of Natural Resources. If these ordinances are not adequately implemented or enforced, the Department of Natural Resources will send a letter to the affected municipality and the sewer service area plan compliance reviewer to inform them that sewer extensions into areas of 12 to 20 percent slope will not be approved until further notice. The Department of Natural Resources will work with the affected municipality to improve the enforcement of their ordinance. Once adequate enforcement is achieved, the Department of Natural Resources will notify the municipality and the sewer service area plan compliance reviewer that sewer extensions can be approved in areas of 12 to 20 percent slope, if all other conditions in the plan are satisfied.

Each municipality is responsible for proper implementation and enforcement of the UDC and their respective erosion control ordinances. Failure to do so will impact sewer extensions only within the municipality where improvements in enforcement must be achieved.

CHAPTER 7 - PROCEDURES FOR SEWER HOOKUP REVIEW

Any proposal to hookup to existing sanitary sewer in the Hudson area must start with contacting either the City of Hudson or the Village of North Hudson. Contact people for this purpose are found in Appendix F.

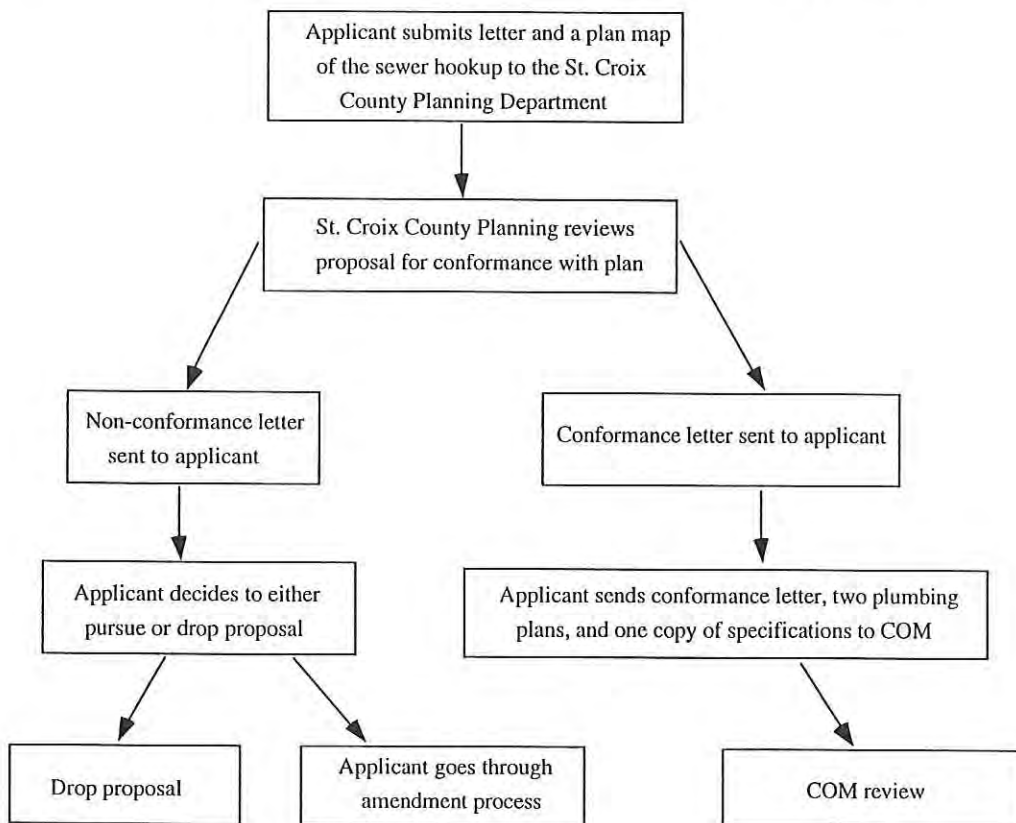
An arrangement between the WisDNR and the WisCOM requires review by the St. Croix County Planning Department of private sewer hookups to confirm conformance with the Hudson Area Urban Sewer Service Plan. COM 82.20 (4) requires all new residential (developments greater than two dwelling units), commercial, and industrial developments to submit a letter from the St. Croix County Planning Department indicating the proposed development is in conformance with the sewer service plan along with plumbing plans and other information required for WisCOM plan review. Specific requirements are outlined in COM82 and NR110.

Local review of private hookups will be done by the St. Croix County Planning Department.

1. Applicants for sewer hookups will submit a letter containing the project name, project location, and project owner and a plan map showing the proposed sewer hookup to the St. Croix County Planning Department. This should be done early in the planning process, prior to detailed plans, to avoid delays of the project. Early submittal of the plans will ensure the local review process is completed prior to final submittal of the plans to WisCOM.
 - 1a. If there is any doubt as to the proposed hookup infringing on an environmental corridor (as delineated on the review maps), the St. Croix County Planning Department will consult with and request site specific information from the local municipality and/or the developer. This information, along with the environmental corridor criteria from this plan, will be used to make a recommendation on the proposal.
2. The St. Croix County Planning Department staff will review all submissions for conformance with the plan, specifically ensuring the proposed hookup does not infringe on an environmental corridor and is within the sewer service area.
 - 2a. If the requested sewer hookup is in conformance with the plan, a sewer service area conformance letter will be sent to the applicant within 15 days of receipt of the plan map. The sewer service area conformance letter and other materials required by WisCOM must then be submitted by the applicant to WisCOM for approval.
 - 2b. If the proposed hookup is not in conformance with the plan, or if there are questions about consistency, a letter of non-conformance will be sent to the applicant within 15 days. The applicant should then decide if it wants to further pursue the sewer hookup. If not, no further action is necessary.

3. If the applicant decides to pursue the sewer hookup, the plan must be amended for the proposed hookup to be in conformance. The amendment procedures can be found in the Plan Amendment Process section. An applicant can also alter the proposal to pursue conformance and re-apply.
4. If the plan is amended, the applicant must notify the St. Croix County Planning Department that it wishes to have the proposed hookup re-evaluated.

FIGURE 4 Review Procedures for Sewer Hookup Requests



CHAPTER 8 - SEWER SERVICE AREA AMENDMENT PROCESS

With the possibility of a shift in development patterns, a mechanism for reviewing and revising the sewer service area boundary is essential. The amendment process will allow the communities and developers to alter the service area by using additional technical data, new community needs and trends, and possible facility changes. All amendment records and updated boundary maps will be maintained by the St. Croix County Planning Department.

Four types of amendments may be made to the Sewer Service Plan. Type I amendments are requests for boundary changes without the total acreage of the service area changing. Type II amendments are requests to alter the boundary and the acreage of the service area. Type III amendments are requests to add holding tank service areas to the plan. A Type IV amendment is a request for development of an environmental corridor.

Proposals for an amendment to the Sewer Service Plan should include:

1. The exact acreage.
2. Legal description of the lands to be added or deleted.
3. A detailed map of the area and surroundings.
4. Land use proposals.
5. A list of specific service needs to the area (i.e., water, sewer, roads).

8.1 Type I Amendment. The Sewer Service Area Boundary is Altered Without the Total Acreage Changing

With this amendment acreage can only be added to the service area if a corresponding number of acres is subtracted. This "swap" requirement will keep the locally approved population density figures unchanged. Requests of this type should be submitted to the St. Croix County Planning Department by the governmental entity that will be servicing the proposed area.

St. Croix County Planning Department staff will then review the proposed amendment based on these criteria:

1. Such sewerage service can be provided in a cost-effective manner.
2. There will be no significant adverse water quality and/or environmental impact associated with providing sewer service to the area.
3. The proposed amendment is in compliance with the policies and goals of this plan.
4. Existing or planned sewerage systems have sufficient capacity to treat projected flows.

5. The areas to be swapped are of the same acreage.

Upon St. Croix County Planning Department review, the amendment must be approved by the Hudson Area Urban Sewer Service Planning Committee, and then WisDNR will make final approval.

8.2 Type II Amendment. The Sewer Service Area Boundary is Modified and the Total Acreage is Altered

With this amendment acreage cannot be added to the sewer service area unless the following circumstances exists: (1) area is needed to accommodate unanticipated population growth; (2) a change in local population densities has been approved by the local municipality; and (3) failing on-site wastewater systems. Requests of this type should be submitted to the St. Croix County Planning Department by the governmental entity that will be servicing the proposed area.

In addition to the above requirements of an amendment proposal, a Type II amendment proposal should also include:

1. Actual population increases in the municipality
2. Actual amount of vacant lands within the portion of the municipality in the sewer service area.
3. Current development density of the municipality
4. Current levels and capacities of the treatment facility to serve the proposed area.

St. Croix County Planning Department staff will then review the proposed amendment based on these criteria:

1. There is a significant difference in the projected population and the actual population of the municipality.
2. Such sewerage service can be provided in a cost-effective manner.
3. There will be no significant adverse water quality and/or environmental impact associated with providing sewer service to the area.
4. The proposed amendment is in compliance with the policies and goals of this plan.
5. Existing or planned sewerage systems have sufficient capacity to treat projected flows.

Upon St. Croix County Planning Department review, the amendment must be approved by the Hudson Area Urban Sewer Service Planning Committee with final approval being made by the WisDNR.

8.3 Type III Amendment. The Addition of a Holding Tank Service Area to the Plan

A holding tank service area is required if there is a holding tank within the Planning Area and outside the sewer service area which generates 3,000 gallons or more of septage per day. Further explanation of holding tank service areas is contained in Chapter 9 of this plan. A request for this type of amendment must be made by the wastewater treatment facility that will service the tank. Requests for a Type III amendment should be submitted to the St. Croix County Planning Department and include:

1. A map of the proposed holding tank service area.
2. The exact acreage of the proposed area.
3. Proof there is a contract with the POTW to handle the septage from the tank.
4. The proposed amendment is in compliance with the policies and goals of this plan.

St. Croix County Planning Department staff will review the proposed amendment based on the information above. In addition, a request for a Type III amendment for new development utilizing a new holding tank that encroaches on an environmental corridor will be denied. The amendment will be allowed if it is determined that the actual construction of all buildings and the holding tank are not on those portions of the holding tank service area within an environmental corridor, and there are sufficient setbacks and erosion control measures taken, as defined by local zoning and land development regulations.

Upon St. Croix County Planning Department review and Hudson Area Urban Sewer Service Planning Committee approval, final approval will be made by the WisDNR.

8.4 Type IV Amendment. The Development of an Area Designated as an Environmental Corridor

All requests for Type IV amendments will be reviewed on a case-by-case site specific manner. A Type IV Amendment is one which is requested by the municipality wishing to extend sewer service to an area delineated as an environmental corridor. The plan recognizes the possible conflict between development and preservation of environmental corridors and this amendment is an attempt to allow both to co-exist. Requests of this type should be submitted to the St. Croix County Planning Department and the Wisconsin Department of Natural Resources, Western Central Regional Office by the governmental entity that will be servicing the proposed area. The St. Croix County Planning Department and the WisDNR staff will review the proposed amendment based on:

1. There will be no significant adverse water quality and/or environmental impact associated with providing sewer service to the area.
2. The proposed amendment is in compliance with the policies and goals of this plan.
3. Such sewerage service can be provided in a cost-effective manner.
4. All appropriate local, state, and federal environmental permits (such as erosion control, wetland preservation, floodplain, etc.) have been granted for the proposed development.

An approved Type IV amendment is one which allows development of an environmental corridor with minimal environmental impacts. To that end, the WisDNR may approve the amendment with specific conditions, such as erosion control and/or stormwater management requirements, which must be met to ensure protection of the potentially affected resources. The Type IV amendment necessitates a meeting between the developer, the municipality, the St. Croix County Planning Department, and WisDNR during the formulation of a proposal to eliminate or minimize disagreements and misunderstandings early in the process.

The Hudson Area Urban Sewer Service Plan is intended to be a guide for local municipalities in water quality management. The plan map is based on the preceding data and maps, especially the population projections, growth areas, and environmental corridors. Together this information has been analyzed and translated into the sewer service area for 2020. There is substantial acreage of developable land within the City of Hudson which should be used before developing extensions. Inclusion of lands within the sewer service area does not imply they will be developed and sewered by 2020.

The sewer service plan is designed to accommodate changes which may occur in the years between updates. Development trends, population density changes, community needs, and failed septic systems are all possible reasons the sewer service plan may need to be altered during the interim years. All changes in the plan require an amendment which must be approved by the Hudson Area Urban Sewer Service Planning Committee with final approval being made by the WisDNR. Changes to the plan could include altering the sewer service area boundary, adding holding tank service areas, or the inclusion of an environmental corridor into the sewer service area.

CHAPTER 9 - HOLDING TANK SERVICE AREAS

In some cases, municipalities are faced with high cost alternatives to improving their wastewater treatment and disposal situations. With the number of affordable alternatives diminishing, holding tanks may be the only alternative. As of October 1, 1987, a revised NR113 took effect to consistently handle this alternative. At the same time NR113 was being changed, NR205 was being revised to clarify Publicly Owned Treatment Works (POTW) obligations to accept septage. As of June 1, 1994, there were newly proposed drafts of further revisions to NR113 and NR205. The provisions of this section can only relate to programs and policy as they are currently enforced. Three terms should be defined here to aid in understanding the requirements of NR113:

1. "Publicly owned treatment works planning area" means the area delineated in a map form in which the planning for a specific POTW is being or has been prepared to cover. In other words, the area that a POTW is responsible to consider in planning a cost-effective regional wastewater treatment alternative.
2. "Publicly owned treatment works sewer service area" means the area presently served and anticipated to be served by a sewerage collection system as approved under ch. NR121 or as a facility planning effort done under ch. NR110, if no NR121 designation has been made.
3. "Publicly owned treatment works holding tank service area" means the area outside the POTW's sewer service area, but inside or equal to the POTW's planning area where a contract has been developed for holding tank wastewater to be treated at the POTW.

The general requirements applicable to the Hudson Sewer Service Area are:

4. If a holding tank or septic tank is located within the sewer service area boundary, the disposal of septage from that system must be at the Hudson POTW, as required by NR113 and NR205.
5. New holding tanks for new development, outside of the sewer service area and inside the planning area, which receive more than 3,000 gallons of wastewater per day require that the owner of the holding tank system and the POTW reach an agreement and seek a water quality management plan amendment by the St. Croix County Planning Department with approval by the WisDNR. The amendment is needed to put the area tributary to the holding tank within a holding tank service area of the POTW. The new holding tank cannot be approved until the amendment has been completed or until the WisDNR has received adequate assurance that it will be completed. This type of amendment does not require an acreage swap. The St. Croix County Planning Department will evaluate the amendment request and may recommend the holding tank owner consider other POTWs because of cost effectiveness or environmental concerns.
6. Holding tanks to replace existing failed onsite systems, which will receive more than 3,000 gallons of wastewater per day, should also be included in the designated POTW holding tank service area. However, if the owner of the holding tank can satisfactorily demonstrate

that he is unable to become part of such a service area, the holding tank may be approved provided the owner has a multi-year contract with a POTW, of sufficient capacity, to provide treatment for all wastewater tributary to the holding tank. Further, the owner must provide satisfactory assurance all such wastewater will only be disposed of at a POTW.

7. Small holding tank (generating under 3,000 gallons per day) and septic tank wastewater must be taken to a POTW if:

- a. The septic tank is located in the POTW's sewer service area.
- b. The holding tank is located in the POTW's sewer service or holding tank service areas.

NOTE: The POTW acceptance requirement, for holding tank wastewater within the sewer service and holding tank service area and septic tank wastewater within the sewer service area is in s. NR205.07(2)(i).

- c. The holding tank is located inside the POTW's planning area, but outside the POTW's sewer service and holding tank service area(s); if the POTW will accept the wastewater and; the cost to the disposer/hauler is less than or equal to the following costs*:

<u>Years</u>	<u>Maximum Fee/1000 Gallons</u>
1996-1998	\$16.00
1999-2001	\$18.00
2001-2003	\$20.00

* costs beyond 1995 are anticipated but not yet promulgated under NR113 and NR205 1994 revisions.

The above requirements (in 4., including 4. a., b., and c.) do not apply if the wastewater from small holding tanks and septic tank systems will be land spread in accordance with a WisDNR or WPDES permit.

8. POTW's are required to accept, treat, and dispose of septage under certain circumstances as directed by 144.08 State Statute and ch. NR205. The following is a summary:

- a. Winter disposal (November 15 - April 15)
 - i. Each year, prior to September 1, licensed disposers/haulers may apply to a POTW for permission to dispose of septage during the winter.
 - ii. Applications submitted to the POTW by licensed disposers are subject to review by the POTW and the POTW shall:
 - A. Review septage applications and provide a written denial or approval to the licensed disposer/hauler by October 1 of each year.

B. Develop a disposal plan for each licensed disposer/hauler approved for septage acceptance. A disposal plan, at a minimum, shall contain the following terms and conditions:

- (1) Specific quantities, location, times, and methods for the discharge of septage to the sewerage system.
- (2) Requirements to report the source and amount of septage placed in the sewerage system.
- (3) Requirements (if any) for the licensed disposer/hauler to pay to analyze other than residential septage.
- (4) Actual and equitable disposal fees based on the septage introduction into the sewerage system and calculated at a rate applied to other users of the sewerage system, and including the cost of additional facilities or personnel necessary to accept septage at the point of introduction into the sewerage system.
- (5) All terms and conditions imposed on the disposer of septage.
- (6) A formal approval that the licensed disposer/hauler has permission to discharge septage into a specific POTW under specific conditions.

C. Accept and treat septage from licensed disposers/haulers unless:

- (1) Treatment of the septage would cause the POTW to exceed its operating design capacity or to violate any applicable effluent limitations or standards, water quality standards, or other legally applicable requirements, including court orders or state or federal statutes, rules, regulations or orders; or
- (2) The septage is not compatible with the sewerage system; or
- (3) The disposer/hauler has not applied for and received approval to dispose of septage in the sewerage system or the disposer/hauler fails to comply with the disposal plan; or
- (4) The licensed disposer/hauler fails to comply with the septage disposal rules promulgated by the POTW or the conditions of the disposal plan.

b. Area the POTW is Required to Accept Septage from Year-Round

- i. Septage that is generated within its sewer service area.
- ii. Holding tank wastewater that is generated outside the POTW's sewer service area, but inside or equal to the POTW's planning area where a contract has been developed for acceptance, treatment, or disposal.

c. Priority System (NR205.07(2)(h))

- i. 'First Priority'. Wastes from existing or new holding and septic tanks within the POTW's sewer service area and holding tanks within the POTW's holding tank service area(s).
- ii. 'Second Priority'. Wastes from existing holding tanks for residential or commercial establishments outside the POTW sewer service area and holding tank service area(s), but inside the POTW's planning area where the holding tank was installed to replace an inadequate private sewerage system.
- iii. 'Third Priority'. Wastes from existing septic tanks and holding tanks that were installed not as replacement to an inadequate sewerage system for residential or commercial establishments outside the POTW's sewer service area and holding tank service areas, but inside the POTW's planning area.
- iv. 'Fourth Priority'. Wastes from new or existing septic and holding tanks for residential or commercial establishments outside the POTW's planning area.

The service area for a POTW may include both a urban sewer service area and a holding tank area. The POTW should have the capacity to accept wastewater from both areas. A holding tank service area must be delineated for any holding tank outside the sewer service area, but within the Planning Area, generating 3,000 gallons or more of septage a day. The difference between the sewer and holding tank service areas is the holding tank service area includes areas not intended to be sewerd during the design life of the POTW. Also, holding tanks may be located in either service area.

No holding tank service area has been delineated in this plan, because there were no identified contracts to dispose of large holding tank wastewater into the Hudson treatment plant from areas outside the sewer service area, yet within the Planning Area. In addition, to the knowledge of the treatment plant staff, there were no holding tanks in the Planning Area, and outside the sewer service area, required to contract with the POTW.

A service area amendment is required when a holding tank service area is added within the Hudson POTW Planning Area, and outside the Hudson Urban Sewer Service Area. An amendment request for a holding tank service area for new development cannot be approved if the area encroaches on an environmental corridor. The amendment will be allowed if it is determined that the actual construction of all buildings and the holding tank are not on those portions of the holding tank service area within an environmental corridor, and there are sufficient setbacks and erosion control measures taken, as defined by local zoning and land development. The procedures for amendments are outlined in Plan Amendment Process section of this plan.

APPENDICES

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

POLICIES AND PROCEDURES
SEWER SERVICE AREA PLANS AND AMENDMENTS
January 1994

Since 1979, sewer service area (SSA) plans have been developed for more than 150 Wisconsin communities in designated and non-designated areas of the state. The plans, which are prepared by local or regional planning agencies under contract with the Department, are designed to protect water quality. This planning process is described in NR 121, Wis. Adm. Code. Designated areas of the state include Southeastern Wisconsin, Dane County and the Fox River Valley.

These guidelines describe the areas which were to be excluded from sanitary sewer service areas as environmental corridors.

1. Initiating Sewer Service Area Revisions

SSA revisions can be initiated only by a designated planning agency (DPA), a designated management agency (DMA) or by an entity seeking DMA status (e.g., a previously unsewered sanitary district). The Department will review a denial by a DPA only if an appeal of the denial comes from a DMA. The Department does not accept revisions or appeals submitted by developers, individuals or other organizations.

2. Sewer Service Area Boundary

SSA boundaries should follow specific physical or cultural features, such as roads, rivers, property boundaries, drainage divide, the outer limits of environmental corridors and related floodland and wetland areas, or a line at a specific distance from a physical or cultural feature. When a planning agency submits a SSA plan or amendments to the DNR, they must submit maps with adequate detail to precisely identify these boundaries.

3. Land Use and Service Limitations:

The DNR can approve water quality plans or amendments in which the Designated Planning Agency in cooperation with local governments set land use limitations or other additional requirements above and beyond the minimum requirement of Ch. NR 121, Wis. Adm. Code. Examples of such limitations include: residential, commercial, industrial, institutional, housing type (single versus multiple units) and restricted provisions of other urban services such as water supply, school, and transportation. However in reviewing sewer extensions for conformance with water quality management plans, WDNR is not authorized to consider land use limitations or requirements which are not related to water resource management.

4. Updates To SSA Plans:

Ch. NR 121, Wis. Adm. Code, calls for an update of the WQMP including the SSA plan every five years. If three significant amendments to a SSA have been submitted for a DMA to the Department during five year period, any additional

amendment must include an overall analysis of population projection and density assumption of that SSA and its cumulative impact on the receiving STP.

5. Conditional Approval:

The DNR can add conditions as part of a SSA amendment approval if necessary to protect ground or surface water. If any person is aggrieved by the Department's decision, that person 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.

6. Conformance Review:

One duty of the Designated Planning Agency (under contract with the Department) is to review sewer extension requests to determine conformance with water quality management plans. If the Designated Planning Agency decides that a proposed extension is not in conformance with the plan, the DMA for that area may appeal that decision to the DNR. The legislature has authorized the Department to consider conformance with areawide plans as part of its review of facility plans and "plans and specifications" under s. 144.04, Wis. Stats. The Department, in adopting Chapter NR 110, Wis. Adm. Code, specifically requires that all facility plans and all "plans and specifications" for reviewable projects, including sewer extensions, shall be in conformance with areawide plans in order to be approved. As with any other requirement (e.g., sewer sizing, number of manholes, etc.) it is up to the applicant to provide evidence of compliance and up to the Department to review for compliance. The sole responsibility for reviewing a request for a sewer extension for conformance with areawide plans rests with the Department. In carrying out the responsibility to assure conformance of a sewer extension project with areawide water quality management plan requirements, the Department has two options: 1) review by the Department staff, or 2) contract with a designated or local planning agency.

7. Revision of Approved SSA Plan:

The Department can withdraw earlier sewer extension or SSA plan approvals if new information indicates that sewer development will have a significantly negative impact on water quality.

8. Holding Tank Service Area:

The following summarizes the relationship between sewer service area and holding tank service area:

1. The planning area and sewer service area boundaries are those identified under NR 121, Wis. Adm. Code. The holding tank service area must be defined and identified at the time of negotiation between the holding tank owner and the publicly owned wastewater treatment works (POTW).

2. If a holding tank or a septic tank is located within the 20 year sewer service area boundary, the disposal of the septage from that system must be at that POTW (required by NR 113 and NR 205, Wis. Adm. Code). This is true regardless of whether a county boundary is

involved. The areawide water quality management plan need only identify this requirement.

3. Holding tanks for new development outside of the 20 year sewer service area, which will receive more than 3,000 gallons per day of wastewater, require that the owner of the holding tank system and the POTW reach an agreement (and seek a water quality management plan amendment by the DPA with approval by the DNR). The amendment is needed to put the area tributary to the holding tank within the holding service area of the POTW. The new holding tank cannot be approved until the amendment has been completed or until the Department has received adequate assurance that it will be completed. This amendment does not require a swap of acreage. The DPA will evaluate the amendment request and may recommend that the holding tank owner consider other POTW's because of cost effectiveness or environmental concerns.

4. Holding tanks to replace failing onsite system(s), which receive more than 3,000 gallons of wastewater per day, should also be included in a designated POTW service area. However, if the owner of the holding tank can satisfactorily demonstrate that he is unable to become part of such a service area, the holding tank may be approved provided that owner has a multi-year contract with a POTW to provide treatment for all wastewater tributary to the holding tank. Furthermore, the owner must provide satisfactory assurance that all such wastewater will only be disposed of at a POTW.

For more information call Roger Shores at (608) 266-5237.

GUIDANCE FOR APPROVING SEWER SERVICE AREA PLANS AND PLAN AMENDMENTS

The following guidance has been developed by the Wisconsin Department of Natural Resources (DNR) for the evaluation of sewer service area (SSA) plans and plan amendments. These guidelines represent the minimum criteria that will be used by the Department in reviewing and approving of SSA plans and amendments. Field investigations will be conducted by Department staff in those cases where it is deemed necessary. The results of the field investigations will weigh heavily in the final decision on a request for approval.

The local community or designated management agency may utilize more stringent criteria than those established in this guidance. All plans and plan amendments will be reviewed on an individual basis and the merits of each will be considered along with the consistency of the submittal with these guidelines or other approved amendment procedures. Unique local conditions or circumstances will be considered in the approval of plans or plan amendments. This guidance will be revised as necessary to reflect changes in state laws, administrative rules and DNR policies.

Copies of all SSA plans and amendments, and supporting information must be submitted to both the DNR Central Office (Roger Shores, 101 S. Webster St., WR/2 GEF II, Madison, WI 53707-7921) and to the appropriate DNR Water Resources Management, District Staff contact. Both the DNR Central Office and District Staff contacts should be contacted at the very beginning of the process.

Environmentally Sensitive Areas - NR 121.05(g)(2)(c), Wis. Adm. Code, describes environmentally sensitive areas to be excluded from SSA. These excluded areas are commonly referred to as "environmental corridors". In this guidance the term "environmental corridor" will be used as a generic term for environmentally sensitive areas that should be considered for exclusion from SSA. Environmental corridors may include wetlands, shorelands, floodways and floodplains, steep slopes and highly erodible soils, groundwater recharge areas and other physical constraints.

WETLANDS:

Definition - An area where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic vegetation and has soils indicative of wet conditions (NR 103, Wis. Adm. Code).

Policy - All wetlands should be identified and protected from sewer development. Wetlands should be clearly identified as environmentally sensitive areas (i.e., environmental corridors) on sewer service area maps. Wetlands which have not been altered should be given high priority for preservation.

Sewer Service Area Plans and Plan Amendments Plans and plan amendments which would impact a wetland must be evaluated according to the following:

1. Wetland Impacts - Does the project have the potential to directly or indirectly affect wetlands?

2. Water/Wetland Dependency - Is the proposed activity wetland dependent? (Does the project need to be located in or adjacent to a wetland or surface water to fulfill its basic purpose?)
3. Practical Alternatives Analysis - Are practicable alternatives available which will not adversely impact wetlands or have other significant adverse environmental impacts? Explain in detail: background of project, alternatives, comparison of alternatives.
4. Wetland Functional Assessment - How will the project affect the wetland?: Describe the wetland that will be affected and explain how the project may affect the functional values of the wetland, water quality or other environmental values.

SHORELANDS:

Definition - Shorelands are lands within the following distances from the ordinary high-water mark of navigable waters: 1,000 feet from a lake, pond or flowage or 300 feet from a river or stream to the landward side of the floodplain, whichever distance is greatest.

Policy - Shorelands represent environmental features which should be given high priority for protection from development, particularly those shorelands which coincide with wetlands as identified in the State Wetlands Mapping Program.

Sewer Service Area Plans and Plan Amendments - The Department will not approve any plan or plan amendment that is not consistent with an approved county or state shoreland zoning ordinance. Additionally, evaluation of plan amendments will consider the following:

- a. Potential adverse water quality impacts. In assessing plan amendments the Department will consider adverse impacts upon any of the following:
 1. maintenance of dry season stream flow, or the discharge, recharge or flow of groundwater from a wetland
 2. filtering or storage of sediments, nutrients or heavy metals that would otherwise drain into navigable waters
 3. shoreline protection against erosion to reduce the flow of effluent, sediment and nutrients from the shoreland area.
- b. Potential adverse impacts on habitats. Amendments where the proposed activity would adversely disrupt wildlife habitat or fish spawning, breeding, nursery or feeding grounds should include protective measures.
- c. Storm and flood water storage capacity. Amendments which would result in a reduction of storm and flood water storage capacity should be avoided or minimized.

- d. Presence of, or proximity to, scientific study areas, sanctuaries and refuges, or scarce wetland areas. SSA plans and amendments should assess and take into consideration potential adverse impacts to these areas.

STEEP SLOPES AND HIGHLY ERODIBLE SOILS:

Definition - This category is defined as any slope equal to or greater than 12 percent and any soil type occurring on a slope equal to or greater than 12 percent.

Policy - In general, slopes equal to or greater than 12 percent regardless of soil type and which are proximal to a stream should be excluded from development. Slopes in combination with other environmental features should be considered for designation as environmental corridors.

Sewer Service Areas Plans and Plan Amendments - Sewer Service area plans should exclude slopes equal to or greater than 12 percent, which are proximal to a stream, from sanitary sewer service. Where a local construction erosion control ordinance exists, the plans should be consistent with the slope restrictions of the ordinance. Amendments to the service area plan should consider the following.

- a. Proximity of the slope to a stream. Amendments for sewered development on steep slopes which would result in direct runoff into a stream should be prohibited. Development on any slopes should include mitigating measures for protection of water quality.
- b. Amendments to allow sewered development on slopes should be the most cost-effective alternative and should be consistent with the existing development pattern and locally approved construction erosion control ordinances.

FLOODPLAINS:

Definition. The floodplain is the land which has been or may be hereafter covered by flood water during the regional flood. The floodplain includes the floodway and the flood fringe.

The floodway is the channel of a river or stream and those portions of the floodplain adjoining the channel required to carry and discharge the flood water or flood flows associated with the regional flood.

Policy. In order to prevent development in a high hazard area, floodplains should be considered for exclusion from sanitary service areas. Portions of the floodway shall not be included except where there is existing development which must be served.

Sewer Service Area Plans and Plan Amendments. The Department will not approve any plan or plan amendment that is not consistent with an approved county or state floodplain zoning ordinance or which would allow service to new development in the floodway. In addition, the plans or plan amendments should be evaluated considering the following:

- a. Flood water conveyance capacity. Amendments or plans which would result in a reduction of the flood water conveyance capacity should be denied unless remedial actions are identified and approved before approval of the amendment or plan. Remedial actions must conform with NR 116.
- b. Existing development within the floodway. When there is an existing lawful development within the floodway, a new plan or plan amendment may include the development within the boundaries of its proposed service area.
- c. Storm and flood water storage capacity. Amendments which would result in a reduction in storm and flood water storage capacity should be avoided or remedial actions should be identified.

OTHER LIMITING PHYSICAL FEATURES:

Definition - Physical features of an area which may have significant local or statewide importance. These areas may include woodlands or plant stands of rare or endangered species; rare or endangered animal habitats; historical or archaeologic sites; or groundwater recharge/discharge areas.

Policy - Areas which include one or more of the above features may be considered for environmental corridor designation when they represent an integral part of the direct stream drainage area.

Sewer Service Area Plans and Plan Amendments - In the preparation of service area plans, appropriate state or local offices (e.g., State Historical Society, DNR Bureau of Endangered Species) should be contacted to determine if any of these features are present in the planning area. Areas containing these features may be excluded from sanitary sewer service. Plan amendment requests to provide sanitary sewer service to an area with any of these features should be the least disruptive alternative and should include preventive measures to provide maximum protection of adjacent water resources.

II. GUIDANCE FOR SUBMISSION OF PROPOSALS FOR SEWER SERVICE AREA AMENDMENTS

Proposals for the amendment of sewer service areas should include the exact acreage, as well as a description of lands to be added or deleted. The description should allow these areas to be easily located on a map in relation to the boundaries of the original sewer service areas, and to roadways, environmental corridors, and other significant features. At a minimum, amendments should be described in terms of township, range, section, and quarter section, and shown on an appropriately detailed map with the scale indicated.

The locational description should be accompanied by a description of the resource base of the land being added to or deleted from the service area. This description should include the acreage of each resource feature (e.g. wetlands, woodlands, habitat) to be added or deleted. Any anticipated water quality impacts from the proposed amendments should be identified to the extent possible.

The acreage incorporated by an approved sewer service area is determined by the population of the area, the projected future population which will be serviced by the sewer system, and by locally approved density assumptions for the service area. Accordingly, incremental acreage cannot be added to the sewer service area unless the following circumstances exist: 1) area is needed to accommodate unanticipated population growth, and 2) a change in local densities has been approved by the local municipality.

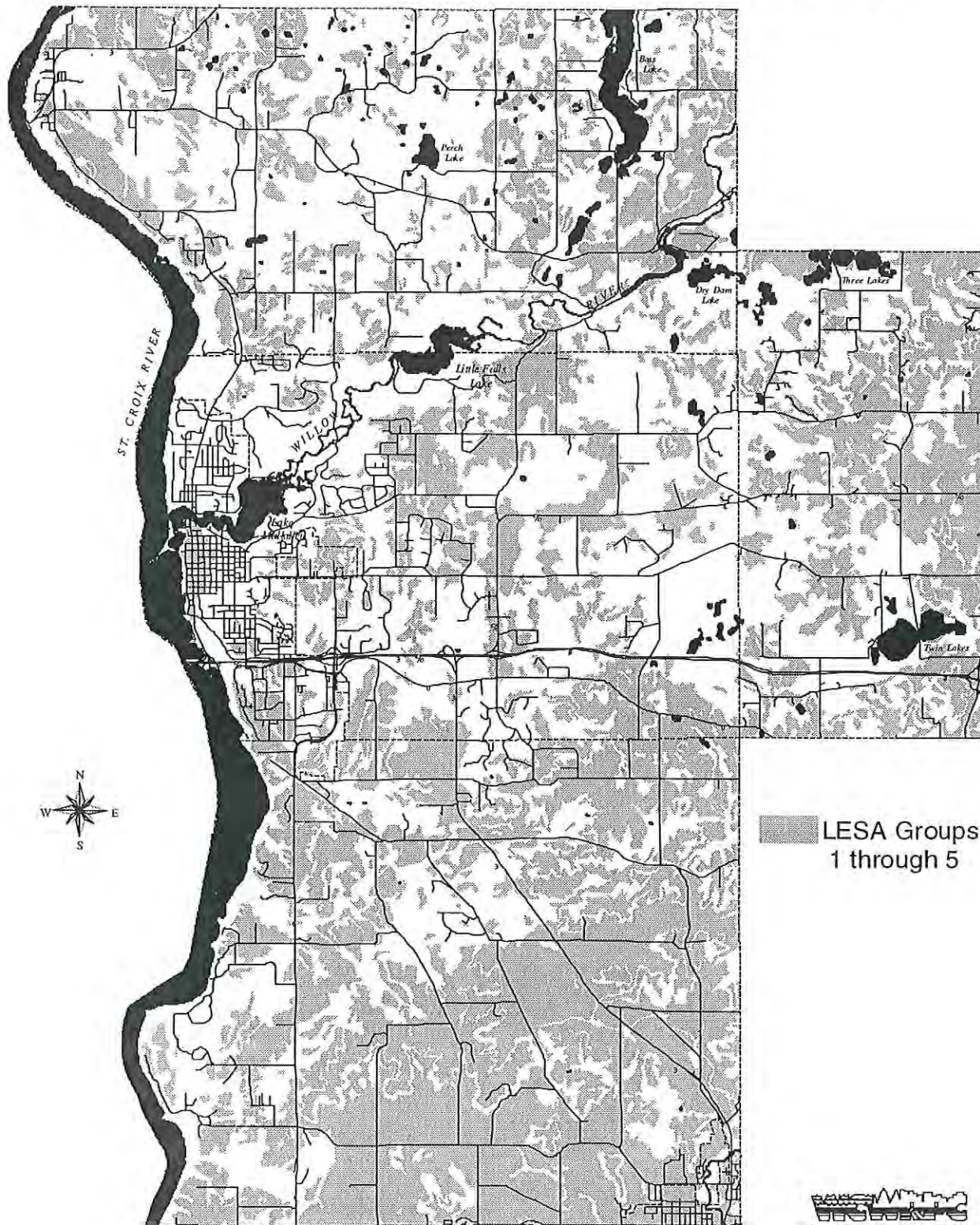
If population projections and locally approved densities remain unchanged, acreage can only be added to the service area if a corresponding number of acres is subtracted, keeping the population density stable. The exception to this swap requirement is a case where a density range has been established for the service area and the addition of land to the service area does not violate either the upper or lower limit of the range.

Documentation of public participation and approval of the density assumptions in local decisions to amend an approved sewer service area must be submitted with sewer service area amendment requests. A locally approved land use plan may be submitted as a basis for a change in the service area and density assumptions, however, public participation must be documented in any case. SSA amendment proposals must include an analysis of how each of the amendment criteria are met.

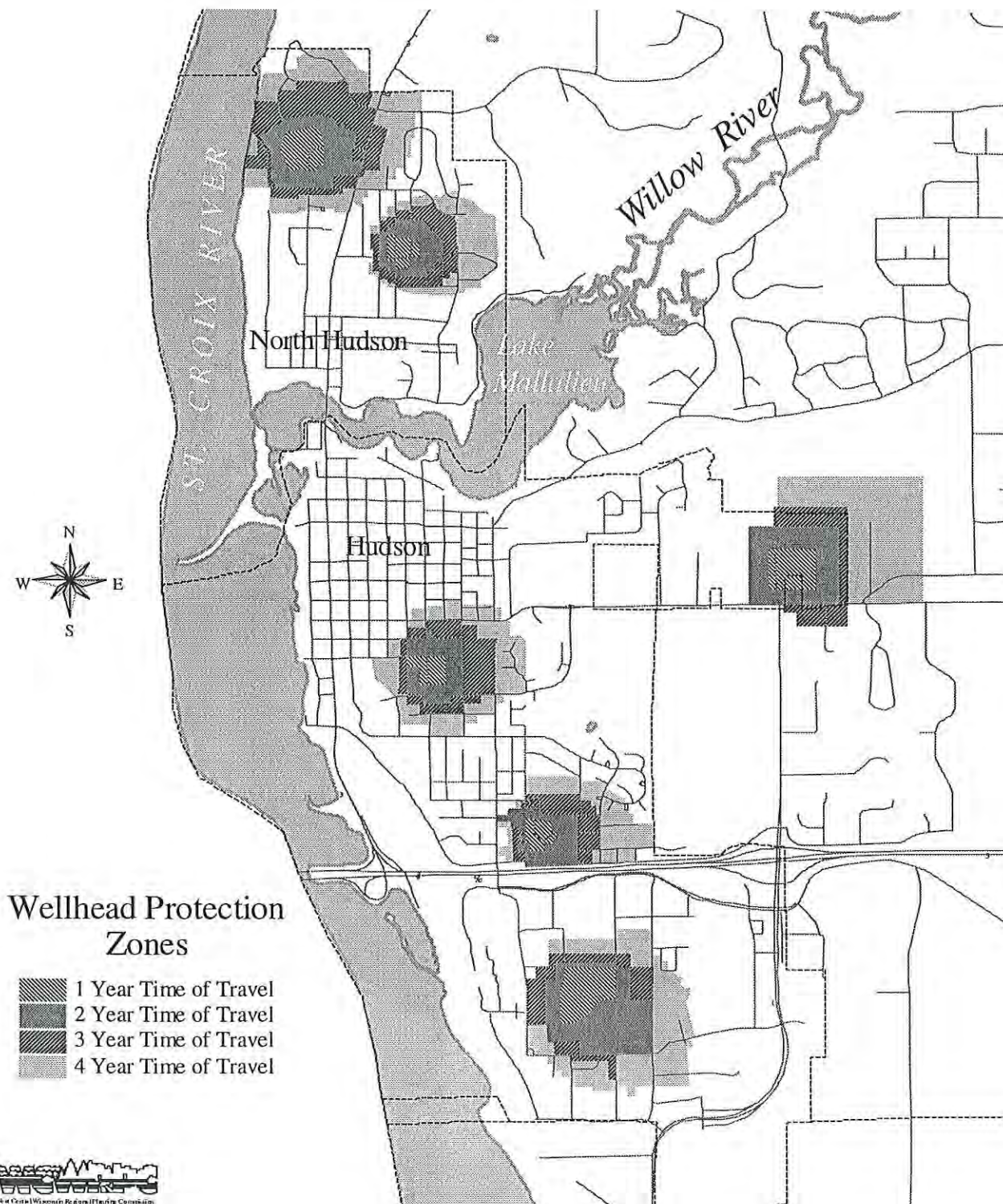
The planning commission or agency must maintain a current map of sewer service areas in its jurisdiction, showing approved amendments (additions or deletions) to the service areas.

For more information call Roger Shores at (608) 266-5237.

Productive Agricultural Soils



Hudson Area Wells



Hudson Area Urban Sewer Service Planning Committee

Richard Pearson City of Hudson 1109 Crest View Dr. Hudson, WI 54016 715-386-8255	Appointee
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Mr. Henry M. Paulson, Public Works Director City of Hudson c/o City Hall, 505 Third Street Hudson, WI 54016 715-386-4767	Appointee
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Mr. Jack D. Breault, Mayor City of Hudson c/o City Hall, 505 Third Street Hudson, WI 54016 715-386-4765	Appointee
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Mr. Dennis Darnold, City Planner City of Hudson c/o City Hall, 505 Third Street Hudson, WI 54016 715-386-4765	Hudson Staff
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Mr. David Fodroczi, Director St. Croix County Planning Department 1101 Carmichael Road Hudson, WI 54016 715-386-4674	Appointee
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Ms. Ellen Denzer, Planner St. Croix County Planning Department 1101 Carmichael Road Hudson, WI 54016 715-386-4673	Alternate
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Ms. Rita Horne, Chairperson Town of Hudson 429 Stageline Road Hudson, WI 54016 715-386-4678	Appointee
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Mr. Dean Albert, Chairman Town of Troy 296 Highway 35 North River Falls, WI 54022 715-425-2665	Appointee
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Lloyd Dahlke, Chair
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603 River Road
Hudson, WI 54016
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Appointee

Mr. Len Meissen, President
Village of North Hudson
400 7th Street North
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Appointee

Mr. Mark Ekblad
Village of North Hudson
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Hudson, WI 54016
715-386-5141

Appointee

Ms. Kim Kolashinski
Western Wisconsin Board of Realtors
c/o Edina Realty, Inc., 700 2nd Street
Hudson, WI 54016
715-386-8236

Appointee

Ms. Paula Stolp
Hudson Area Development Corporation
c/o Northern States Power, 1201 Livingston Road
Hudson, WI 54016
715-386-4780

Appointee

Mr. John Schommer
Hudson Area Development Corporation
c/o St. Croix Storage and Transfer
239 Monroe Street North
Hudson, WI 54016
715-386-5530

Alternate

Mr. Dan McGuiness, Administrative Director
Minnesota-Wisconsin Boundary Area Commission
619 Second Street
Hudson, WI 54016
715-386-9444

Appointee

Mr. Bill Rubin, Executive Director
St. Croix Economic Development Corporation
1101 Carmichael Road
Hudson, WI 54016
715-386-4383

Appointee

Legal Type Description of the Sewer Service Boundary
2015

TO BE APPENDED WHEN AVAILABLE

Resource and Technical Assistance Contact List**Contact****Area**

Ellen Denzer, Planner
 St. Croix County Planning
 1101 Carmichael Road
 Hudson, WI 54016
 715-386-4673

- Sewer Service Extension, Hookup and Amendment Review

Cindy Sherman, Zoning Administrator
 St. Croix County Zoning
 1101 Carmichael Road
 Hudson, WI 54016
 715-386-4680

- St. Croix County Comprehensive Zoning Ordinance

Dennis Darnold, Planner
 505 Third Street
 Hudson, WI 54016
 715-386-4765

- City of Hudson Development Regulations

Village of North Hudson
 400 7th Street North
 Hudson, WI 54016
 715-386-5141

- Village of North Hudson Development Regulations

Charles Christenson
 St. Croix County Conservationist
 Land & Water Conservation Office
 1960 8th Avenue
 Baldwin, WI 54002
 715-684-2894

- Groundwater
- Soils
- Wetlands
- Erosion Control

Don Siler, District Conservationist, USDA
 Natural Resources Conservation Service
 1960 8th Avenue
 Baldwin, WI 54002
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- Soils
- Wetlands

Mary Barney
 Recycling Coordinator
 1101 Carmichael Road
 Hudson, WI 54016
 715-386-4674

- Recycling

Henry Paulson
Public Works Director
505 Third Street
Hudson, WI 54016
715-386-4767

- City of Hudson Wastewater Treatment Facility
- City of Hudson Sanitary Sewer System

Mark Ekblad
Public Works
400 7th Street North
Hudson, WI 54016
715-386-5141

- Village of North Hudson Sanitary Sewer System
- Village of North Hudson Water System

Pete Skorseth, Environmental Engineer
Wisconsin DNR
990 Hillcrest St., Suite 104
Baldwin, WI 54002
715-684-2914

- Water Supply
- Wastewater

Dan Simonson
Water Quality Planning
Wisconsin DNR
P.O. Box 4001
Eau Claire, WI 54702
715-839-3725

- Surface Water
- Stormwater Management
- Sewer Service Area Plans

Dan Koich
Water Regulation and Zoning
Wisconsin DNR
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Eau Claire, WI 54702
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- Shoreland
- Setbacks
- Floodplain
- Wetlands

Steve Thon
Wastewater Engineer
Wisconsin DNR
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Eau Claire, WI 54702
715-839-3776

- Municipal Sewer and Water
- Groundwater

Roger Shores WR/2
Water Quality Planning
Wisconsin DNR
101 S. Webster, GEF II
P.O. Box 7921
Madison, WI 53707-7921
608-266-5237

- Sewer Service Area Plans

Duane Klein
Dept. of Agriculture, Trade & Consumer
Protection
801 W. Badger Road
Madison, WI 53708-8911
608-266-7896

- Fertilizers and Pesticides

Chip Harry L. Brown, III
State Historical Society of Wisconsin
816 State Street
Madison, WI 53706-1488
608-264-6404

- Historical Resources

Leroy Jansky
Dept. of Commerce-Safety & Bldg. Div.
13 E. Spruce Street
Chippewa Falls, WI 54729
715-726-2544

- Septic Systems

Kathy Prentice
Dept. of Commerce-Environmental &
Regulatory Service Div.
1300 State Highway 29 East
Chippewa Falls, WI 54729
715-726-2559

- Underground Storage Tanks (retail)

Darrell Christy
Dept. of Commerce-Environmental &
Regulatory Service Div.
S7840 Balsam Road
Eau Claire, WI 54701
715-878-4499

- Underground Storage Tanks (non-retail; commercial and residential)

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Gary Lepak	715-839-3779
Tim Hanson	715-839-3773
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Bill Evans	715-839-3710
Susan Borman	715-839-3836
Cindy Casey	715-839-1606
Jack Tritt	715-839-3768
Paul Wiegner	715-839-5171
Ginger Hooper	715-839-3759
Loren Brumberg	715-839-3770
Elizabeth Spencer	608-264-6054

Forests of St. Croix County
Conservation Warden
Air Management Engineers

Floodplain Engineer
Water Supply, Non-municipal Groundwater
Water Supply, Non-municipal Groundwater
Hydrogeologist-Soil & Water Contamination
Aquatic Botanist-Wetlands
Urban Forestry
Solid Waste-Disposal
Solid Waste-Recycling
Solid Waste-Hazardous
Solid Waste-Tires
Endangered Resources