

2030 Comprehensive Plan



August 2009

**Metropolitan Council Consistency Review
Completed August 12, 2009**

This Plan is dedicated to the memory of Jerry Stelzel, Supervisor and Town Board Chair, who emphasized agricultural preservation and the need for long range planning, providing over three decades of service to Empire and making a visible and lasting contribution to the welfare of the entire community.

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**2030 Comprehensive Plan
August 2009**

Empire Township 2030 Comprehensive Plan

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Empire Township 2030 Comprehensive Plan

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I Introduction

A. Purpose

Empire Township has developed this Comprehensive Plan to help guide development in the Township and to protect commercial agriculture and the natural environment. Under Minnesota Statutes 462.351-375 and 473.851-871, Empire Township has the authority and responsibility to prepare a comprehensive plan. The Comprehensive Plan has been prepared under the guidance of the Empire Planning Commission and Town Board with technical services and support provided by Resource Strategies Corporation. The Township also wishes to acknowledge Dakota County for providing Geographic Information Systems (GIS) data files for use in completing all graphic illustrations and land use calculations. This document also fulfills planning requirements under the Metropolitan Land Planning Act and replaces the Comprehensive Plan that was adopted in 1999.

B. Planning Process

This Comprehensive Plan is the result of a process that began shortly after the completion of the 1999 Plan. From August, 2001 to May, 2003 Empire Township conducted a “smart growth” pilot study, requested by and funded in part by the Metropolitan Council. “Perpetuating the Hard Edge, an Urban-Rural Interface Smart Growth Study” was adopted by the Empire Board of Supervisors on May 27, 2003. From 2004 to 2006 Empire was engaged in an environmental assessment worksheet (EAW) scoping process and preparation of an environmental impact statement (EIS) for mineral extraction on 3600 acres of land in the northwest corner of the Township.

Joint quarterly meetings have been held with the Planning Commission, Park Board and Town Board from 2006 – 2008 to identify community issues, priorities, and vision. The planning process revealed a general consensus that the Township should preserve the majority of the Township for agricultural uses, while allowing expanded opportunities for new residential development to be served by Township utilities. Other principal planning issues that surfaced included the following:

- Maintain Community Independence
- Promote the Rural Heritage and Agricultural Economy of the Community
- Retain the Small Town Atmosphere of Empire
- Provide Safe, Quiet, and Quality Neighborhoods
- Maintain the Financial Stability of the Community
- Provide Quality Public Services and Staffing Capabilities
- Expand Commercial and Industrial Development
- Protect the Vermillion River, Wetlands, and Natural Environment
- Expand Parks, Trails, and Recreation Opportunities

Empire Vision Statement

Empire Township is a unique, independent, rural community located on the edge of the expanding Twin Cities Metropolitan Area. Township officials acknowledge its proud agricultural heritage in carefully planning a transition from predominantly rural to emerging suburban characteristics. Empire residents cherish the Township's rich natural environment including rivers, wetlands, woodlands, good farmland, and rolling topography. Elected officials, appointed officials, and staff exemplify strong leadership and the pride of the community by embracing the past and facing the challenges of the future. Empire values its safe neighborhoods, efficient services, parks and trails, fiscal management, and overall quality of life, and pledges to maintain these community strengths as it continues to grow.

Data collection, research and analysis in the update of this Plan has reflected issues of concern and the Vision of Empire, as well as regional planning issues involving the University of Minnesota, Dakota County, and the Metropolitan Council. Research included, but was not limited to, the following elements:

- Trends in demographic data
- Regional growth and regional planning policies
- Regional transportation planning and policies
- Inventory of current uses of land
- Inventory of natural and geologic features, such as waters, wetlands and soil types
- Federal, state and regional regulations related to the environment
- Inventory and analysis of community facilities and services
- Alternatives for future growth

The Planning Commission held a formal public hearing on June 17, 2008 to receive public comment on the 2030 Comprehensive Plan. On June 24, 2008 the Town Board authorized the plan to be distributed to adjacent communities and review agencies for review and comment. A revised draft plan was approved by the Town Board, subject to Metropolitan Council review, on May 27, 2009. The Metropolitan Council completed its consistency review with regional plans on August 12, 2009.

II Background Conditions

A. Location

Empire Township is located near the geographic center of Dakota County, and within the Twin Cities Metropolitan Area (see **Figure 1**).

B. Population and Households

Table 1 and **Table 2** illustrate the population and household trends in Empire, adjacent rural communities and Dakota County as a whole. Dakota County has experienced significant increases in both population and the number of households. This growth is due to rapid suburban development in portions of the County (to the north and west) that are within the Metropolitan Urban Services Area or MUSA. These areas are contiguous to the existing developed Metropolitan Area, where an expanding network of sewers and regional highways has facilitated development.

Growth in Empire Township has been modest yet steady from 1970 to 2000. The annual growth rate was approximately one-quarter of the County growth rate. Between 2000 to 2006, however, Empire experienced a 37% increase in population from which equals a 6.2% annual growth rate or four times the annual rate from the previous 30 years. The County's annual population growth rate over the past six years has decreased to 1.67%.

The household growth from 1970 to 2000 was also modest, yet steady. The annual household growth rate in Empire from 1970 to 2000 was 3.0%, which was approximately one-third of the County growth rate for the same period. From 2000 to 2006, the annual rate of household increase jumped to 7.8%, which is two and a half times the rate of the previous 30 years. The annual County household growth rate dropped to 2.12% between 2000 and 2006.

Table 1
1970-2006 Population Trends

	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>'70-'00</u> <u>Annual %</u>	<u>2006</u>
Empire	1136	1224	1340	1638	1.47	2247
Castle Rock	1235	1340	1480	1495	0.70	1382
City of Coates	212	207	186	163	-0.77	181
Eureka	860	1268	1405	1490	2.44	1485
Vermillion	779	1070	1201	1243	1.99	1315
Dakota County	139,808	194,279	275,186	355,904	5.19	391,613

Source: US Census; Metropolitan Council

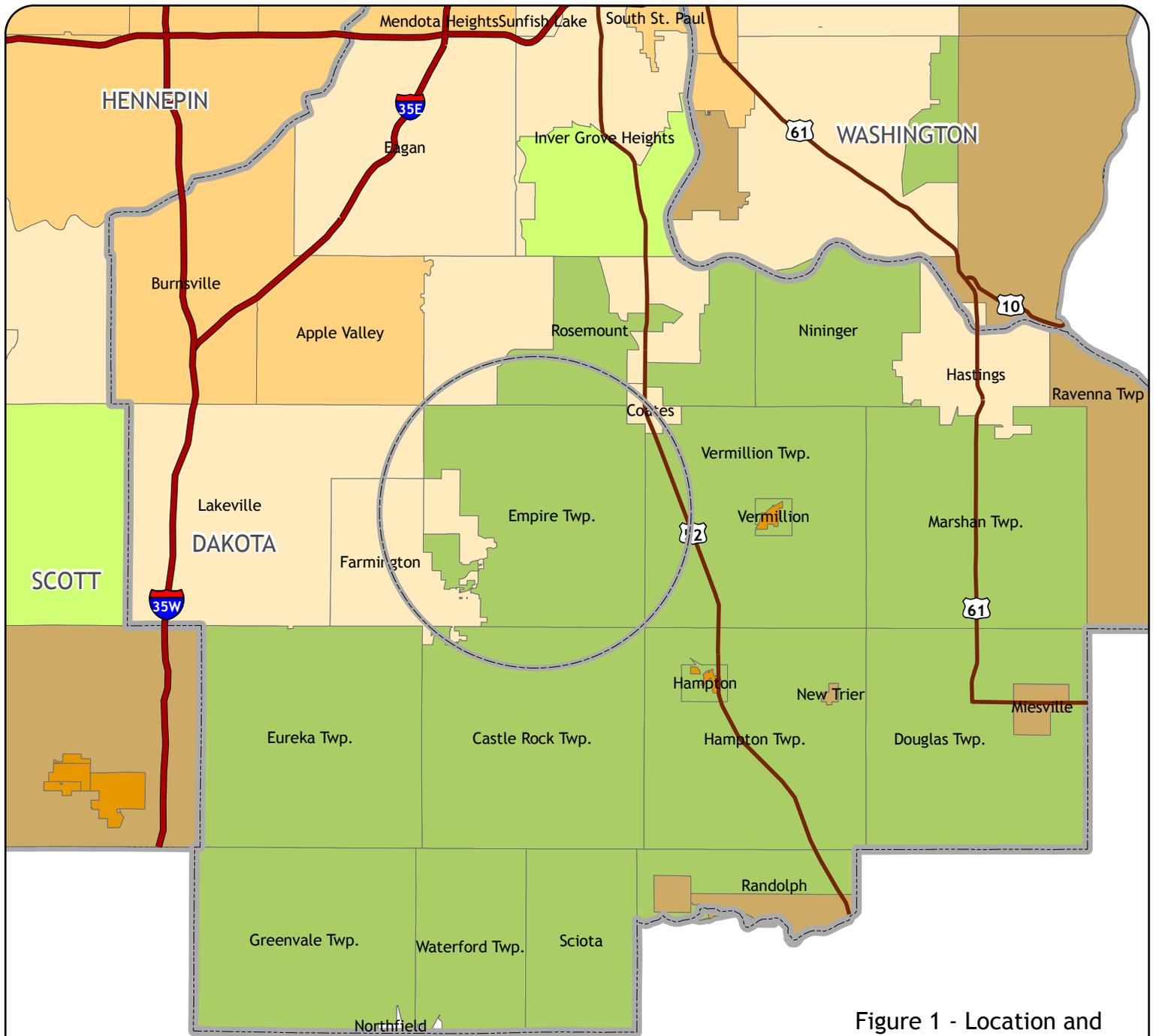


Figure 1 - Location and Planning Area Designation

Empire Township
Dakota County, MN

Metropolitan Council
Geographic Planning Areas

- Agricultural Preservation Area
- Developed Area
- Developing Area
- Diversified Rural
- Rural Center
- Rural Residential



Resource
Strategies
Corporation

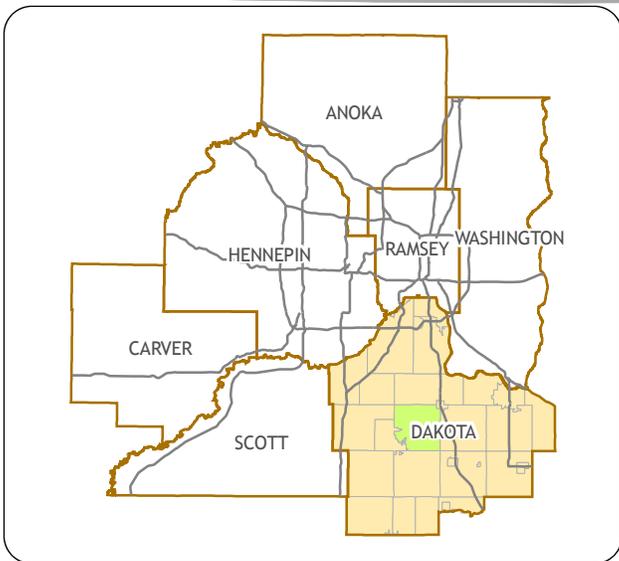


Table 2
1970-2006 Household Trends

	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>'70-'00</u> <u>Annual %</u>	<u>2006</u>
Empire	271	360	426	515	3.00	755
Castle Rock	290	395	460	514	2.58	481
City of Coates	61	65	66	64	0.16	65
Eureka	216	373	447	496	4.32	509
Vermillion	171	281	354	395	4.34	423
Dakota County	37,560	64,087	98,293	131,151	8.31	147,824

Source: US Census; Metropolitan Council

Table 3 illustrates the age breakdown of the 2000 population in Empire. The Township is a relatively young-aged community. School age children (5-17) represent 25.5% of the population, while preschoolers add another 8.1 %. Retirees (over 64) represent only 5.9% of the total population. The median age in 2000 was 31.6 years of age.

Table 3
2000 Age Distribution

<u>Age Group</u>	<u>Number</u>	<u>Percent</u>
Under 5	132	8.1
5-9	161	9.8
10-14	165	10.1
15-17	91	5.6
18-21	81	4.9
22-24	38	2.3
25-34	247	15.1
35-44	322	19.7
45-54	189	11.5
55-64	114	7.0
65-74	64	3.9
75-84	27	1.6
85 & over	7	0.4
Total	1638	100.0%

Source: US Census; Metropolitan Council

Table 4 identifies the racial background of the community. Only 5% of the of the 2000 represented any minority groups, which is not uncommon in rural Minnesota communities. The largest minority groups are Asian or Pacific Islander and Hispanic.

Table 4
2000 Race/Ethnicity

White/non-Hispanic	1567	95.7%
White/Hispanic	15	0.9%
American Indian	5	0.3%
African American	3	0.2%
Asian/Pacific Islander	31	1.9%
Multi-racial/Other	17	1.0%
Total	1638	100%

Source: US Census; Metropolitan Council

Table 5 illustrates residential unit types and ownership status. Ninety-three percent of the 2000 households in Empire were owner occupied and nearly 98% of the units were single family detached dwellings. There were only 13 attached residences (2.5%) in Empire in 2000.

Table 5
2000 Households by Type and Ownership

<u>Household Type</u>	<u>Owned Units</u>	<u>Rented Units</u>
Single Family Detached	479	23
Duplexes	0	4
3-4 Unit Building	0	9
Multiple Family	0	0
Mobile Home	0	0
Total Households	479	36

Source: U.S. Census; Metropolitan Council

Families, including male and female heads of household, occupied 84% of the housing units in 2000, as illustrated on **Table 6**. Nearly three-quarters of the 2000 non-family households were single person occupants.

Table 6
2000 Households by Householder Type

<u>Householder Type</u>	<u># Households</u>
Married Couples	377
Male Householder	17
Female Householder	37
Non-family (single)	60
Non-family (2 or more)	24
Total Households	515

Source: U.S. Census; Metropolitan Council

The 2000 median value of homes in Empire was \$159,600 compared to a \$152,400 median in all of Dakota County.

C. Employment

Employment has risen steadily in Empire since 1970; although, the 1990s appear to be a flat period of growth, which may be a reflection of several annexations. Local jobs are concentrated in the higher paying construction trades, trucking, mining industries, a turf management research facility, and golf course . There is no retail employment in Empire.

Table 7
1970-2006 Employment Trends

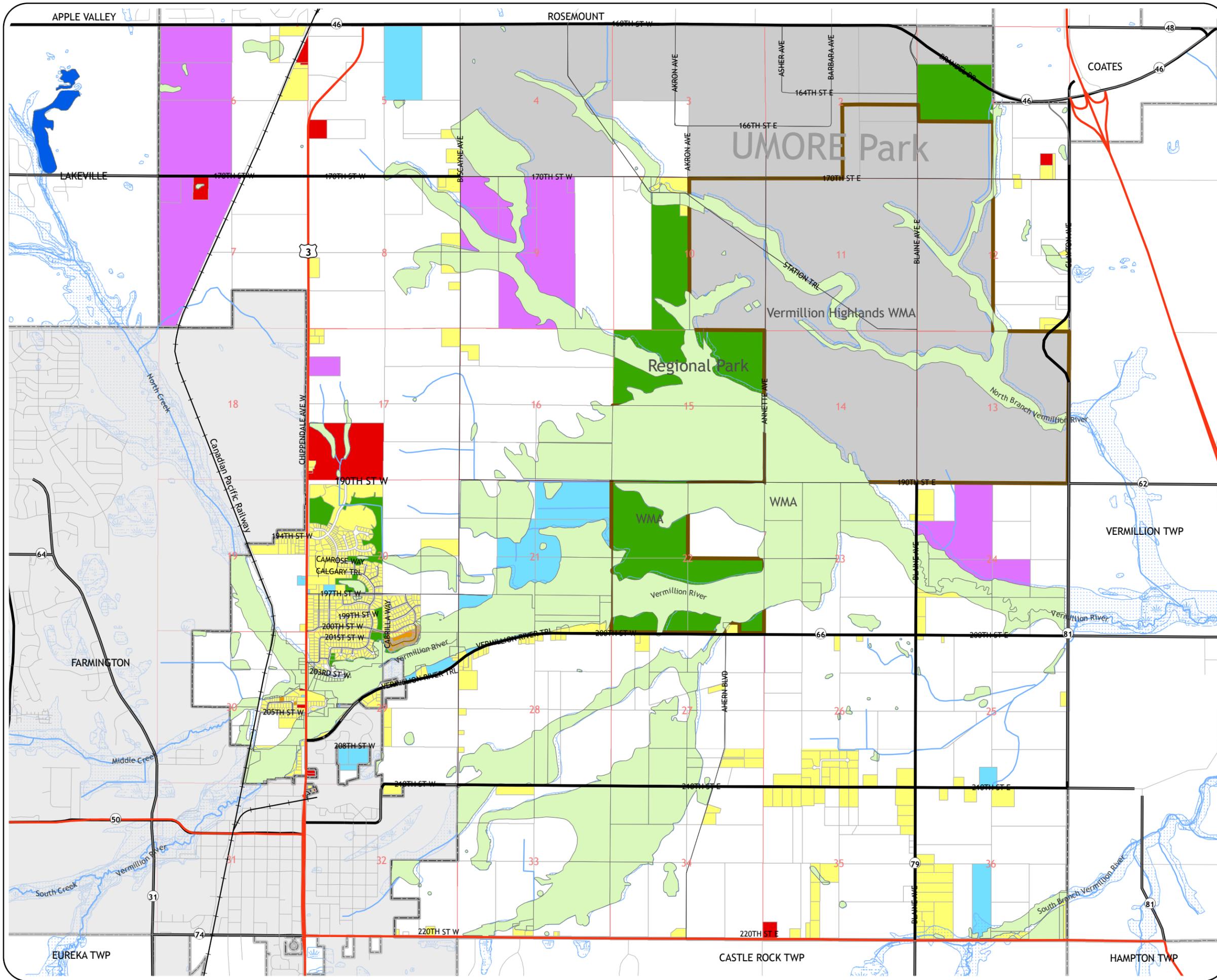
	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>2006</u>
Empire	40	107	167	174	241
Castle Rock	40	50	100	200	387*
City of Coates	10	50	90	254*	84
Eureka	*	50	50	80	182*
Vermillion	*	50	50	60	376*
Dakota County	31,100	62,134	106,029	148,261	175,702

Source: Metropolitan Council; DEED; (* unsubstantiated/questionable)

D. Existing Land Use

The primary land use in Empire Township is agricultural land (45%). A significant portion of the Township is under public ownership (29%), including land owned by the Minnesota Department of Natural Resources (DNR), the Metropolitan Council, Dakota County, and the University of Minnesota Outreach Research and Education Park (UMore Park). UMore Park consists of approximately 4528 acres within the Township and is dominated by open space or agricultural uses. Approximately 2830 acres of UMore Park is currently operated jointly by the University and the DNR as the Vermillion Highlands Wildlife Management Area (WMA). The DNR also recently acquired the 475-acre Miles farm for a dual WMA and Aquatic Management Area (AMA) along the Vermillion River. A new 455-acre regional park and 360-acre WMA were acquired in 2008, adjacent to the existing WMAs.

Metropolitan Council Environmental Services (MCES) owns approximately 460 acres near the Vermillion River for the operation of the Empire Wastewater Treatment Facility (WTF). Dakota County owns 120 acres on the east side of UMore Park, which includes the Dakota Woods (off-leash) Dog Park and an organic waste compost facility. Dakota County also owns 80 acres on the west side of UMore Park where the Highway Department and Communications Center are located. Both County properties abut CSAH 46. The Cambodian Buddhist Society of Minnesota also owns a 40-acre parcel with a temple/prayer facility. Existing land uses are illustrated on **Figure 2**.



Empire Township Dakota County, MN

Figure 2 Existing Land Use

- Land Use Category**
- Agriculture/Vacant
 - Single Family Residential
 - Multiple Family Residential
 - Industrial (includes mining)
 - Commercial (includes golf)
 - Public/Institutional
 - Public Park, Recreation and Open Space
 - University of MN (UMORE)
-
- Lakes
 - NWI Wetlands
 - Floodplain Area
 - Streams
 - Wildlife Management Area (WMA)



Mining operations currently occupy over 1100 gross acres of permitted land in various stages of extraction and reclamation. Residential uses account for nearly 1200 gross acres of land or approximately 5.5% of the existing land use. Commercial uses account for less than 1% of the existing land use. The breakdown of existing land use acreages is illustrated in **Table 8**.

Table 8
Existing Land Use Acreages

<u>Category</u>	<u>Gross Acres</u>	<u>Wet/Flood</u>	<u>Net Acres</u>	<u>Net %</u>
Agriculture/Vacant	10,841.42	1763.39	9078.03	44.9
Single Family Residential	1,196.67	220.28	976.39	4.8
Multiple Family Residential	15.16	0.81	14.35	0.1
Commercial	158.78	13.67	145.11	0.7
Industrial	1,118.94	182.57	936.37	4.6
UMore Park/WMA	4,528.48	542.85	3,985.63	19.7
Public/Institutional	638.54	305.44	333.10	1.6
Park/WMA/AMA	1512.11	959.55	561.56	2.8
Utility	10.09	-	10.09	0.1
Railroad	48.83	4.78	44.05	0.2
Right-of-way	134.23	6.45	127.78	0.6
Wetland/Floodplain	-	-	3,999.79	19.8
TOTAL	20,212.25	3,999.79	20,212.25	99.9%

Source: Dakota County GIS; Resource Strategies Corporation

E. Community Facilities

Communities facilities include the Town Hall and a leased public works building. A new public works facility is being constructed and will be completed in the fall of 2009. Empire has full and part time administrative staff at the Town Hall and two fulltime public works staff. Police protection is provided by the Dakota County Sheriff’s Department and fire protection is provided through a contract with the City of Farmington.

Empire owns and operates a municipal sewer and water system in a compact area currently located from 190th Street to 205th Street and from the Canadian Pacific Railway to Biscayne Avenue. There are nearly 600 utility customers at the present time. The community operates three wells with water treatment and an elevated storage facility. Empire’s sanitary sewer system has access to three MCES interceptors traversing the community, and currently only has one existing lift station. Empire is also the host community for the Empire WTF, which is located east of Biscayne Avenue, north of the Vermillion River. There are approximately 195 privately owned and operated Individual Sewage Treatment Systems (ISTSs) in the Township.

Town Hall Park, which is approximately two acres in size, is located just east of and adjacent to the Empire Town Hall. This park is equipped with a picnic shelter, playground, volleyball pit, tennis courts, and a basketball court. Sachs Park includes playground equipment, a ball field, and a soccer field. A new soccer field complex has been constructed in the Empire River Preserve development north of the Vermillion River with parking at Biscayne Avenue.

Empire is also developing several new parks. A four-field, lighted softball complex is being completed in the Providence neighborhood, along with a 20-acre passive recreation corridor which connects with a passive recreation area in the Summer Glen neighborhood.

Empire also has an extensive trail system, including bituminous trails along the west side of TH 3 from 194th Street to 205th Street, with a bridge over the Vermillion River. The trail extends along 205th to the Canadian Pacific Railway then south into the City of Farmington. Trails have been constructed along the Vermillion River from TH 3 to Biscayne Avenue. Additional trails link all neighborhoods to all park facilities, the Vermillion River, and the Town Hall.

Most of Empire Township and the large majority of its population resides within the Farmington Independent School District #192, which includes all of the City of Farmington, large portions of Eureka and Castle Rock Townships, and smaller portions of Lakeville and Vermillion Township. District #192 includes five elementary schools, two middle schools and Farmington Senior High School. The northern portion of Empire Township lies within the Rosemount-Apple Valley-Eagan Independent School District #196.

F. Natural Resources

Empire Township has a variety of natural features, including excellent farmland, rolling hills, floodplain and wetlands. The Vermillion River valley floor is low and flat. The elevation difference from the river to the surrounding farmland is slight, resulting in higher water tables and extensive wetland areas. As the valley slopes begin to rise, there are numerous short steep slopes with accompanying outcrops of St. Peter Sandstone. Where outcrops are absent, there is usually relatively shallow soil cover over the bedrock.

Surface Geology and Soils

The landscape in Empire is formed by the granular deposits and melt waters of the last retreating glaciers approximately 20,000 years ago. The surface geology in the Township is dominated either by Superior Lobe or Des Moines Lobe Glacial Outwash. The Des Moines Lobe consists of loam, sand, and gravel that is generally poorly-drained, while the Superior Lobe is primarily gravel and sand that is well-drained. A third type, the “Old Gray” Calcareous Till, consists primarily of sandy to clay loams that are generally well-drained.

Much of the land in Empire Township is part of the Waukegan-Wadena-Hawick Soil Association, which makes up a large portion of the northern tier of Townships in the County. A “soil association” is a general classification that represents areas with similar patterns of soils, topographic relief, and drainage. Most of this association is used for cultivation of crops and the majority of soils in Empire are highly productive for agricultural uses. Corn, soybeans, and small grains are commonly grown on these soils.

The main management concern for the productive use of this soil association is the water capacity of the soil as droughtiness occurs during dry periods, which can limit production during seasons with little precipitation. However, the soil is well-suited for irrigation and other techniques to improve soil moisture, including limiting tillage, returning crop residue to the soil, and inclusion of forage crops in rotation cycles.

A large swath of land through the Township, including land alongside the Vermillion River, is part of the Marshan-Cylinder Association. Most of this soil association is used for cultivated crops, such as corn and soybeans. Wetness and a seasonally high water table may restrict root growth, causing the soil to warm slowly in the spring and limit fieldwork. Most of this area is poorly suited to buildings and individual sewage treatment systems (ISTS) because of the high water table. Unless specially designed, ISTS systems can impact groundwater quality in these areas.

Bedrock Geology

An analysis of the location and structure of geologic features is important not only in locating a water supply, but in preserving it, as well. The bedrock area in Empire is predominantly part of the Prairie du Chien group, which consists of limestone formations deposited by an inland sea about 500 million years ago. A second type, the St. Peter Sandstone, is located in northern parts of the Township. The distance from the ground surface to the bedrock is shallow in many areas. In some places, the bedrock is exposed.

An aquifer is an underground source of water, located between bedrock layers. The Minnesota Geologic Survey has established aquifer sensitivity ratings that are related to ability of the soil to absorb contaminants, transform them into inert substances, dilute them so as to make them inactive, and release them into the aquifer. This ability is related to the travel time for surface water to reach the aquifer. Sandy soils in areas where bedrock is close to the surface tend to decrease the travel time and increase risk of pollution. This sensitivity rating ranges from “Very Low” (more than a century for surface contaminants to reach the aquifer) to “Very High” (hours to months). Most of the Township has a rating of “High” (weeks to years).

Surface Water and Wetland Resources

A “watershed” refers to a particular area of land over which precipitation, melting snow, and other sources of water drain. Watersheds are named for the rivers and streams that eventually carry these waters. These large areas generally cross the boundaries of local jurisdictions. Empire Township lies entirely within the Vermillion River Watershed. Water resources include the Vermillion River, its tributaries, associated floodplains, and wetland areas.

Wetland areas provide many practical, aesthetic and ecological benefits. These include acting as storage areas for water during flooding, the filtering of sediments, nutrients and toxic substances before they enter lakes, rivers, and streams, providing habitat for fish and other wildlife, and the replenishing of groundwater sources.

Protected water resources include one large wetland basin in the center of the Township and four watercourses of the Vermillion River. The main stem of the Vermillion River itself is designated as an Agricultural River. The North Branch, South Branch and North Creek of the Vermillion are designated Tributary Rivers. The Vermillion River and portions of its tributaries have been designated Trout Streams by the DNR. These are illustrated on **Figure 3**.

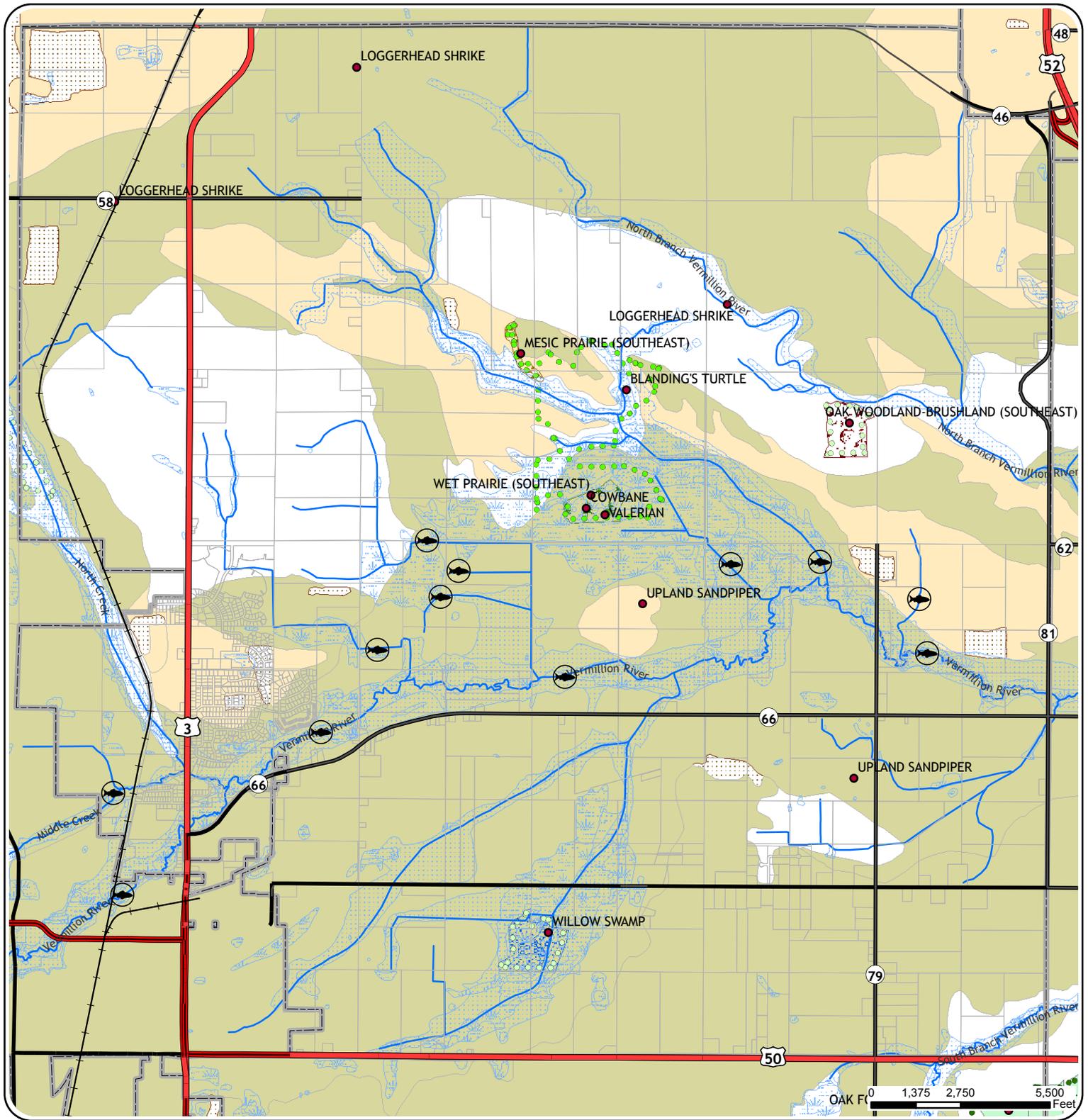
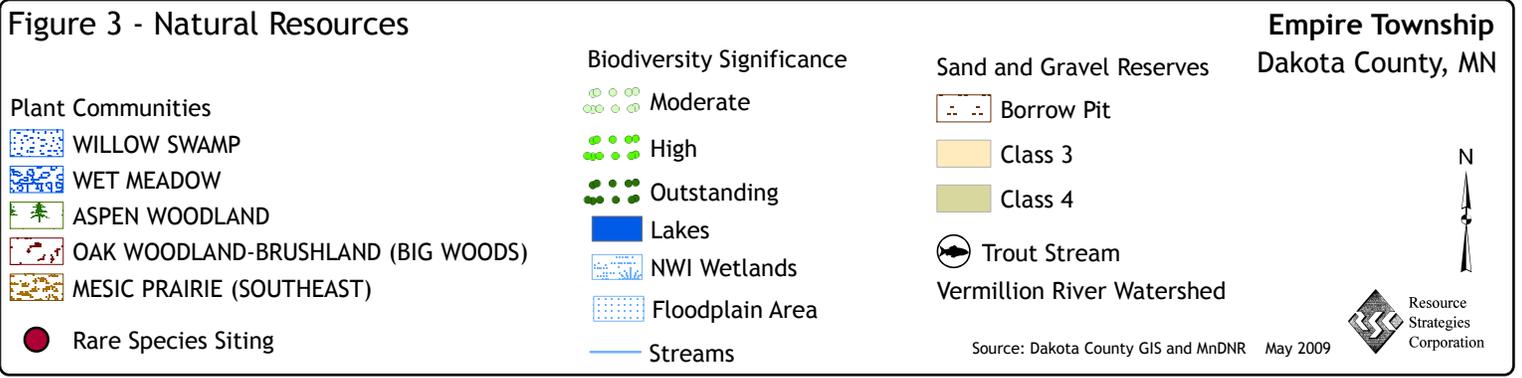


Figure 3 - Natural Resources



Plant and Animal Communities

The Minnesota Land Cover Classification System (MLCCS) identifies several wet basin plant communities in the river bottoms areas and associated wetlands. There is one remnant of the Big Woods near the North Branch Vermillion River and a Mesic Prairie remnant. The natural biodiversity significance includes moderate, high and outstanding rankings in Empire. Natural plant and animal communities, as well as the sites of rare species, are identified on **Figure 3**.

Aggregate Resources

Sand and gravel deposits are common throughout much of Empire Township. The highest grade of commercial deposits extend from the northwest corner to the east central border of the Township. There are presently six separate mining operations located in this area. Aggregate resources are illustrated on **Figure 3**.

G. Transportation

Empire is served by a network of State, County and local roadways. State trunk highway (TH) 3 is classified as an A Minor Connector Arterial through Empire, connecting St. Paul with Northfield and destinations south. County state aid highway (CSAH) 46 is a cross-county A Minor Expander Arterial west of TH 3 and an A Minor Connector Arterial east of TH 3 on the north boundary of the Township. TH 50 is an A Minor Connector Arterial on the south border of the Township.

CSAH 66 is classified as an A Minor Connector Arterial through the center of Empire, providing east-west access and a connection to TH 52 located just east of the Township. TH 52 is a Principal Arterial connecting St. Paul to Rochester and destinations southward. CSAH 81 is a north-south Minor Collector located on the east boundary of Empire.

Former County Road 58 (170th Street) is identified as a major collector, west of TH 3. A portion of CR 58 was turned back to the City of Lakeville in 2005. The remaining portion in Empire was turned back in 2008. The highway functional classification system and traffic count data are illustrated on **Figure 4**.

Empire is located in Market Area IV, outside of the metropolitan transit taxing district. The nearest regular route transit services are provided by Minnesota Valley Transit Authority, a six-city consortium serving Rosemount, Apple Valley, Burnsville, Eagan, Prior Lake, and Savage. There are park-and-ride lots in the City of Rosemount and a transit station nearby in Apple Valley. Dial-a-ride transit services, provided by Dakota Area Resources and Transportation for Seniors (DART), is available to seniors and economically and physically disadvantaged persons.

There is a private airstrip in Empire, but the nearest metropolitan airport facility is Airlake, a minor reliever airport in Lakeville. Minneapolis-St. Paul International Airport is approximately 12 miles and the St. Paul Downtown Airport is approximately 15 miles north of Empire. The Canadian Pacific Railway traverses Empire north to south on the westerly edge of the community.

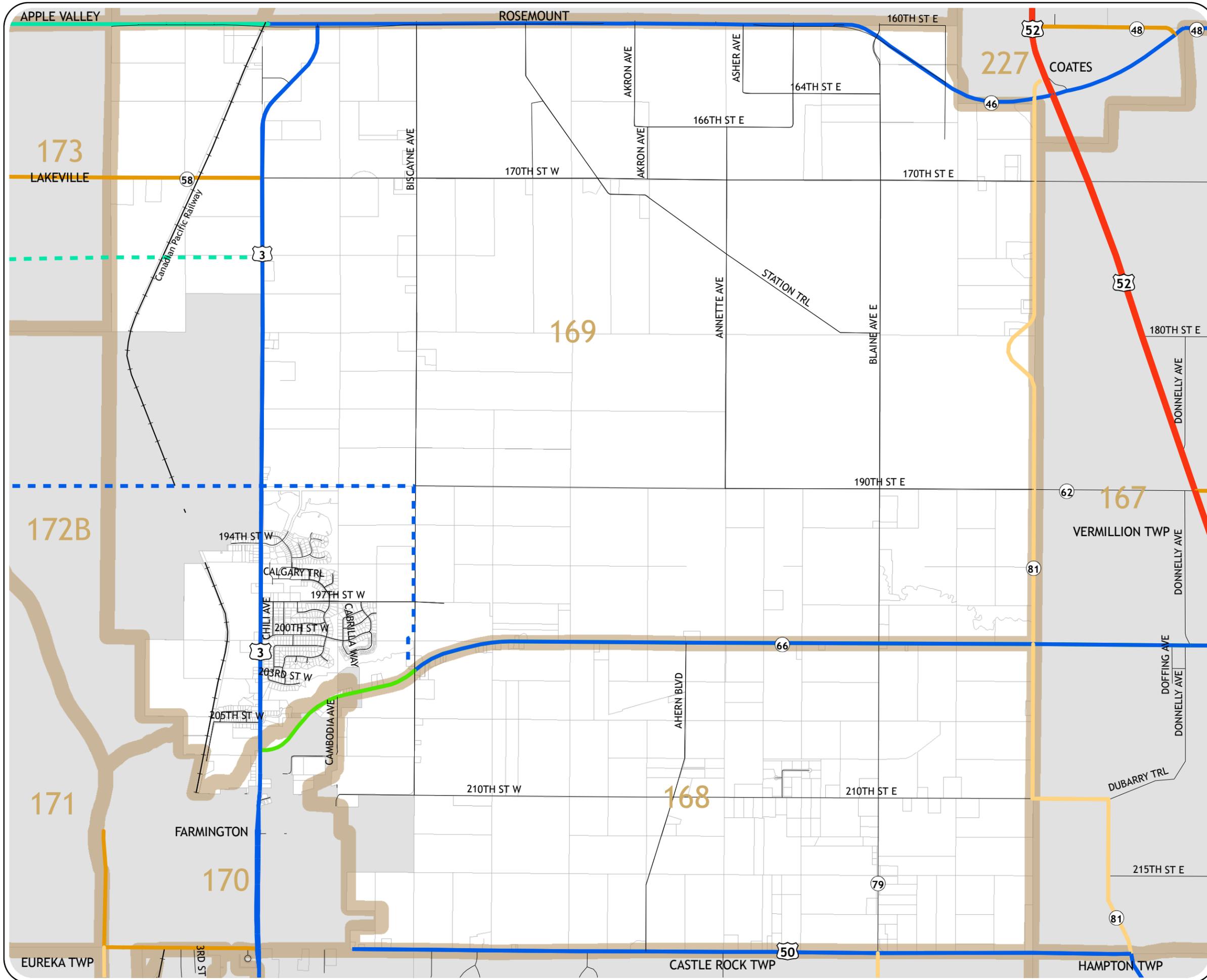
Empire Township Dakota County, MN

Figure 4 - Transportation

Functional Classification

- Principal Arterial
- A Minor Expander
- A Minor Connector
- B Minor
- Major Collector
- Minor Collector
- Future A Minor Arterial - Expander
- Future A Minor Arterial - Connector
- 169 Traffic Analysis Zone
- Railroad

See Appendix A-1 Transportation Plan for traffic counts and additional details



III 2030 Land Use Plan

The 2030 Land Use Plan serves as a policy guide for the future of the community. It addresses regional and local planning considerations, anticipated growth, future uses of land, public services, natural resource protection, and transportation. The following are Township goals and policies that form the basis of the 2030 Land Use Plan.

A. Community Goals

The community goals and policies have been modified from the 2000 Comprehensive Plan to reflect the visioning process and planning studies undertaken by Empire over the past several years. The following goals were used to develop the content of each section of the Plan and will be used with policies to guide future growth and changes to implementation tools, such as Empire's ordinances. Empire's policy statement are included in subsequent components of the Future Land Use Plan.

General Land Use Goals

- Preserve agriculture as a long term land use in the Township.
- Minimize the conversion or disruption of agricultural land uses by encouraging non-farm uses to develop in a contiguous fashion.
- Minimize the development of non-farm residential uses in the agriculture district.
- Preserve the rural character and jurisdictional identity of the Township.
- Provide life cycle housing opportunities in an expanded MUSA.
- Allow access to and removal of the major aggregate reserves in the Mineral Extraction Overlay area.
- Minimize conflicts between land uses.

Housing Goals

- Ensure an affordable supply of well-maintained housing for existing and future residents of the Township.
- Provide equal opportunity for a variety of housing choices for individuals and households of different ages, sizes, and incomes.
- Maintain the quality and character of existing neighborhoods.
- Protect residential uses from potential impacts of incompatible uses.

Commercial/Industrial Goals

- Provide opportunities for retail commercial uses to serve the resident population and surrounding agricultural area.
- Protect the economic viability of farming operations.
- Support agri-business expansion in the community.
- Expand non-farm industrial opportunities in designated areas of the Township.
- Encourage alternative energy industrial production facilities in appropriate locations.
- Promote and permit sand and gravel mining in the Mineral Extraction Overlay area.
- Establish an industrial park in Empire.

Public Facilities and Services Goals

- Protect the health, safety, and welfare of all the Township’s residents.
- Maintain a level of public services appropriate to the rural nature of Empire, the needs and desires of the community, and the priorities of the community.
- Provide sound, responsible fiscal management based upon a stable, balanced tax base
- Represent the Township on issues involving county, regional, and state jurisdictions that have the potential for impacting the long-term goals of the Township.
- Assure that residents have the opportunity to offer input and have access to Township government activities.

Natural Resources Goals

- Protect and preserve natural systems for the collection and dispersion of stormwater and runoff.
- Ensure that development takes place in harmony with natural systems.
- Prevent instances of harmful erosion, flooding, and water, air or noise pollution.
- Protect the quality and quantity of the Township’s groundwater supply.
- Protect surface waters and wetland areas to promote recreation opportunities, aesthetic qualities, natural habitat areas, and groundwater recharge.
- Protect the habitat and biodiversity of the area.
- Encourage the removal of high grade aggregate resources prior to land development.

Transportation Goals

- Ensure a safe and efficient transportation system within the Township.
- Create a system of pedestrian trails to connect neighborhoods, public parks, and open spaces.
- Enhance transit opportunities as the community grows.

Park and Recreation Goals

- Ensure that the residents of Empire have access to a variety of recreational opportunities.
- Expand the parks, trails, and open space systems as the community grows.

B. Regional Development Framework

The Metropolitan Council’s *Development Framework* is a growth strategy for the region that identifies future areas for development and investments in regional infrastructure, such as highways, sewers, parks, and airports. The *Development Framework* divides the region into geographic planning areas. Empire is designated a “Developing Area” and “Agricultural Area” (see **Figure 1**). Developing Areas include communities that are partially or completely located within the Metropolitan Urban Service Area (MUSA). Only a small portion of Empire is currently located in the MUSA. Agricultural Areas are primarily undeveloped areas with productive farmland.

Upon completion of the *Development Framework*, the Metropolitan Council prepared “System Statements” for all communities. The System Statements identify local planning issues of relevance to the four Metropolitan Systems: sewer, transportation, airports and regional parks. Among the information included in the System Statements are 2010-2030 forecasts for population, households, and employment.

In 2005, the Metropolitan Council released initial population, household, and employment forecasts for all communities in the metropolitan area. The forecasts for Empire are based on land availability, the potential for infrastructure investments, and recent development trends. **Table 9** illustrates the March, 2006 revised 2010-2030 forecasts for population, households and employment for Empire Township.

Table 9
Metropolitan Council 2010 – 2030
Population, Household, and Employment Forecasts

	<u>2000</u>	<u>2006</u>	<u>2010</u>	<u>2020</u>	<u>2030</u>
Population	1638	2247	2780	4650	6500
Households	515	755	950	1600	2300
Persons/Household	3.18	2.98	2.93	2.91	2.83
Employment	174	241	250	300	340

Source: US Census; DEED; Metropolitan Council

C. Future Land Use Considerations

2000 - 2008 Planning Issues

The 2030 Land Use Plan is based upon a number of factors that have changed since the 2020 plan was adopted in 2000. In 2002 Empire conducted a “smart growth” study at the request of the Metropolitan Council to evaluate methods of creating a “hard edge” between the urbanizing cities of Dakota County and the agricultural townships. Empire was the pivotal community between the urbanizing and rural portions of the County. The smart growth study introduced more issues than it resolved and began a period of community assessment and re-evaluation, including the following activities.

During the smart growth study several major mining companies and landowners approached the Township about mineral extraction. Empire Township created a Mineral Extraction Overlay area as a land use designation in 1997, which was included in the 2000 plan. After three years of intensive environmental review the Town Board adopted the Adequacy Decision for the Final Environmental Impact Statement (EIS) on a 3600-acre mineral extraction area. A water quality monitoring and mitigation plan was adopted in 2007. Three mineral extraction permits have been issued since that time and several expansions and new permits are pending.

During the same timeframe, Dakota County and the Minnesota Department of Natural Resources coordinated actions with Empire for the establishment of a new regional park and concepts for a large Wildlife Management Area (WMA). The WMA concepts expanded when the university of Minnesota and Minnesota Legislature negotiated a swap of university land for financing of a new campus football stadium. Over the past several years the concepts for the regional park and WMA unfolded into a 3800-acre complex of public-owned land designated for hiking, cross country skiing, camping, horseback riding, hunting, agricultural research, and aquatic management.

During the same timeframe, Metropolitan Council Environmental Services (MCES) coordinated regional wastewater treatment capacity expansion with area communities. The Empire Wastewater Treatment Facility (WTF) was approaching capacity and the plant effluent discharged into the Vermillion River, which was on the verge of being designated a trout stream. MCES negotiated an operational change with state agencies to redirect the outfall to the Mississippi River. Empire Township issued conditional use permits to MCES for the expansion of the WTF from 12 million gallons per day (mgd) capacity to 24 mgd. The Township also permitted the construction of force mains and gravity lines through Empire for a new outfall line to the Mississippi River in Rosemount. MCES was also permitted to construct a new interceptor from Rosemount to the Empire WTF.

During this same timeframe, the University of Minnesota began planning for the long range use of the 7000-acre Rosemount Research Center and Empire Agricultural Experiment Station. After years of initial visioning and local planning workshops the University revealed the “University of Minnesota Outreach, Research, and Education” (UMore) plan for the property. More recently the University has expanded the UMore concept to long term development options for the creation of a University designed and driven community located within Empire and Rosemount. The University has also determined that substantial reserves of aggregate underlie the property. The University is undertaking environmental studies to evaluate potential impacts of mining, contamination from past property uses, and potential urban development of the property.

A well defined area of land for potential development is located south of the Mineral Extraction Overlay area, west of UMore Park, west of the new regional park and WMAs, west of the MCES’ Empire WTF, north of the Vermillion River, and east of the City of Farmington. This area includes the current MUSA in Empire and is the focus of contiguous expansion of urban growth in the 2030 Comprehensive Plan. Approximately 480 acres in this area will remain in agriculture; however, approximately 718 net acres will be added to the MUSA. Eight property owners requesting MUSA consideration control the majority of land. **Table 10** identifies the existing and proposed gross and net MUSA acres for the 2030 plan. The MUSA staging area is also illustrated on **Figure 6**.

Table 10
2010 – 2030 Residential Sewer Staging Areas

<u>Staging Period</u>	<u>Gross Acres</u>	<u>Wetland/ Floodplain Acres</u>	<u>Commercial/ Industrial Acres</u>	<u>Park Acres</u>	<u>Net Acres</u>
Current MUSA	534.1	37.0	5.2	89.4	402.5
2010 Addition	189.4	52.0	-	8.0	129.4
2015 Addition	300.7	39.2	81.5	44.0	136.0
2020 Addition	337.3	105.2	-	24.0	208.1
2025 Addition	264.6	19.9	-	-	244.7
TOTALS	1626.1	253.3	86.7	165.4	1120.7

Source: Empire Township

Table 11 identifies the existing vacant MUSA acreage and proposed 5-year MUSA addition net acreages and estimated total households within each MUSA stage, based on an average net density of three dwelling units per acre. **Table 11** illustrates the total or “optimum” number of households, at three units per acre, which may be developed in the MUSA at build out. Full development will not occur in the 2030 timeframe and the optimum number of households in the entire MUSA is not a reflection of the forecast of households by 2030.

Table 11
2010 – 2030 MUSA Additions / Optimum Household Development

	Existing/ Platted Units	Vacant/ Net Acres	New Units @ 3/acre	Total Units
Current MUSA	1168	34	102	1270
2010 Addition	-	129	387	387
2015 Addition	-	136	408	408
2020 Addition	-	208	624	624
2025 Addition	-	245	735	735
TOTAL	1168	752	2256	3424

Source: Empire Township

Table 12 identifies the proposed 2010-2030 population, household, and employment forecasts by Empire Township. The forecasts are based on the available land within the 2030 MUSA that may be developed in the next 20+ years. The forecasts reflect an increase of approximately 30 households per year over the Metropolitan Council’s 2006 forecasts and a 40% increase in employment based on amount of mineral extraction and accessory uses and construction-related jobs anticipated. (Note: the household forecasts were prepared over a two-year time frame in the update of the Empire Comprehensive Plan. The forecasts may be five to ten years premature in light of the current decline in housing development and overall economic conditions.)

Table 12
Empire Township 2010 – 2030
Population, Household, and Employment Forecasts

	<u>2000</u>	<u>2006</u>	<u>2010</u>	<u>2020</u>	<u>2030</u>
Population	1638	2247	2500	5600	8490
Households	515	755	850	1925	3000
Persons/Household	3.18	2.98	2.93	2.91	2.83
Employment	174	241	300	390	480

Source: US Census; Metropolitan Council; Empire Township

D. Future Land Use Designations

Agriculture

Empire is still committed to the long term preservation of agricultural land uses in the community. Empire restricts residential densities in the Agriculture area to one home per 40 acres. The Township has developed “right-to-farm” provisions in its ordinances that will protect normal farming practices from being considered nuisances. The Township also encourages voluntary enrollment in the Metropolitan Agricultural Preserve program outside of growth areas.

The Agriculture category in the 2030 Land Use Plan includes over 10,000 acres of land, which is only slightly less than the existing agricultural land use category. Within the Agriculture category nearly 6000 acres of land is also designated Mineral Extraction Overlay, including nearly 1700 acres within UMore Park. Land within the Mineral Extraction Overlay area will remain guided agriculture throughout the planning horizon, but will be the focus of long term analysis and environmental review for potential urban uses when aggregate resources become depleted in the Township.

Agricultural Policies

It is the policy of Empire Township to:

- Limit non-farm residential development densities in agricultural areas to one home per quarter-quarter section (1:40).
- Support and encourage incentives that will maintain and enhance farming operations and agricultural land use.
- Support voluntary enrollment of land in the Metropolitan Agricultural Preserves Program outside of proposed urban growth areas.
- Prohibit development that requires public services and utilities in the agricultural area.
- Prohibit commercial and industrial uses in agricultural areas, with the exception of business that directly serves or supports agriculture.
- Promote MPCA’s “best management practices” for farmland, in order to ensure that soil and water quality standards are maintained.
- Maintain right-to-farm provisions and uniform feedlot standards.

Mixed Residential

Because of the compact urban development area, lack of transit, and market for housing in Empire, the Township is guiding all residential development within the MUSA as a Mixed Residential land use category. Single family detached dwellings and single family attached dwellings are permitted at an average density of three units per acre. The MXR Mixed Residential Zoning District currently requires a minimum 70% detached home and maximum 30% attached home ratio in all conventional development proposals. This ratio and average density may be modified by Planned Unit Development (PUD) review procedures.

In conventional developments, a 15,000 square feet minimum lot size is required for single family detached homes, which yields a maximum density of 2.42 units per acre. Attached dwellings are permitted at a maximum density of six units per acre in conventional MXR developments. The conventional dimensional standards and densities in the MXR District may be modified by PUD. For example, a recent PUD allowed detached dwellings on smaller lot areas, attached dwellings at a net density of nine units per acre, and a detached dwelling to attached dwelling ratio of 47% to 53%.

Empire proposes to change the ratio of detached to attached dwellings in conventional developments from 70:30 to 60:40. This will allow higher densities within conventional development proposals and expand housing opportunities within the community. The Metropolitan Council has identified the need to provide 100 affordable households between 2011 and 2020. This goal could increase by 20% or to 120 affordable units because of the proposed 2020 household forecast increase by Empire. Housing affordability will best be met with increased opportunities for attached dwellings in the Mixed Residential area. The Township will also work with the Dakota County Community Development Agency (DCCDA) to evaluate other housing programs and opportunities for life cycle housing choices in the Township, including senior citizen housing.

Residential Policies

It is the policy of Empire Township to:

- Protect and maintain densities in existing residential areas
- Establish densities of three units per acre in new developments with access to public utilities.
- Require Development Agreements for all subdivision developments to ensure that the goals and regulations of the Township are met.
- Require staging of new residential development consistent with utility staging plans.
- Minimize conflicts between residential and non-residential uses through appropriate official controls.

Affordable Housing Policies

It is the policy of Empire Township to:

- Encourage the revitalization of existing housing as a source of affordable housing.
- Integrate new attached housing as affordable and lifecycle housing opportunities.
- Maintain regulations that protect the health and safety of residents and quality of neighborhoods, but which do not greatly decrease affordability.
- Participate in State and DCCDA programs that enhance affordable housing opportunities.
- Promote residential housing designs that maintain the rural atmosphere of the Township.

Table 13 illustrates the proposed 2030 land use acreages. The Mixed Residential category includes approximately 1157 net acres of existing and planned land for urban residential growth. As noted in **Table 11**, approximately 750 net acres of land are available for future residential development. The estimated increase in sewerer households from 2006 (600) to 2030 (2850) is approximately 2250 households, which will yield at least three units per acre within the proposed 2030 MUSA. Non-sewerer household growth in the Agriculture area is expected to be negligible. The 2030 future land uses are illustrated on **Figure 5**.

Neighborhood Commercial

Neighborhood Commercial areas are intended to provide gasoline sales, convenience shopping, restaurant, office and neighborhood service uses on a limited, neighborhood scale. Neighborhood Commercial areas require connection to municipal utilities. A single 5-acre Neighborhood Commercial area is identified within the approved Providence PUD at 190th Street and TH 3, which is centrally located within the proposed MUSA expansion area. This area is anticipated to serve the convenience commercial needs of the urbanizing area of the Township during the planning period.

Highway Commercial

Highway Commercial areas are intended to provide convenience commercial opportunities for the highway user, area residents, and area employees. Highway Commercial areas are currently limited to principal arterial highway intersection or interchange quadrants. Highway Commercial uses may include convenience gasoline sales, convenience grocery sales, fast foods, light automotive repair, day care, and similar sales and services. Highway Commercial uses must be capable of providing private sewer and water services, consistent with minimum Township and County standards.

Table 13
Future Land Use Acreages

<u>Category</u>	<u>Gross Acres</u>	<u>Wet/Flood</u>	<u>Net Acres</u>	<u>Net %</u>
Agriculture	10,592.57*	1,669.84	8,922.73	44.1
Mixed Residential	1,464.78	307.98	1,156.80	5.7
Neighborhood Commercial	5.15	-	5.15	0.0
Highway Commercial	6.15	-	6.15	0.0
Light Industrial	269.97	0.17	269.80	1.3
Alternative Energy Industrial	45.23	-	45.23	0.2
UMore Park	1,695.23	114.79	1,580.44	7.8
Public/Institutional	619.93	305.28	314.65	1.6
Park/Open Space	722.24	256.27	465.97	2.3
WMA	4,031.54	1233.45	2,798.09	13.9
Utility	0.11	-	0.11	0.0
Railroad	48.83	4.78	44.05	0.2
Right-of-way	137.80	6.45	131.35	0.7
OAA	572.72	100.78	471.94	2.3
Wetland/Floodplain	-	-	3,999.79	19.8
TOTAL	20,212.25	3,999.79	20,212.25	99.9%

* Includes 5920 acres of Mineral Extraction Overlay & >1000 acres current permitted operations

Source: Dakota County GIS; Resource Strategies Corporation

Light Industrial

Light Industrial areas are intended to provide opportunities for non-manufacturing industrial uses, including but not limited to assembly and light production uses, small distribution facilities, office-warehouses, contractor trades, service industries and accessory sales, implement sales and repair, automobile repair, and similar uses.

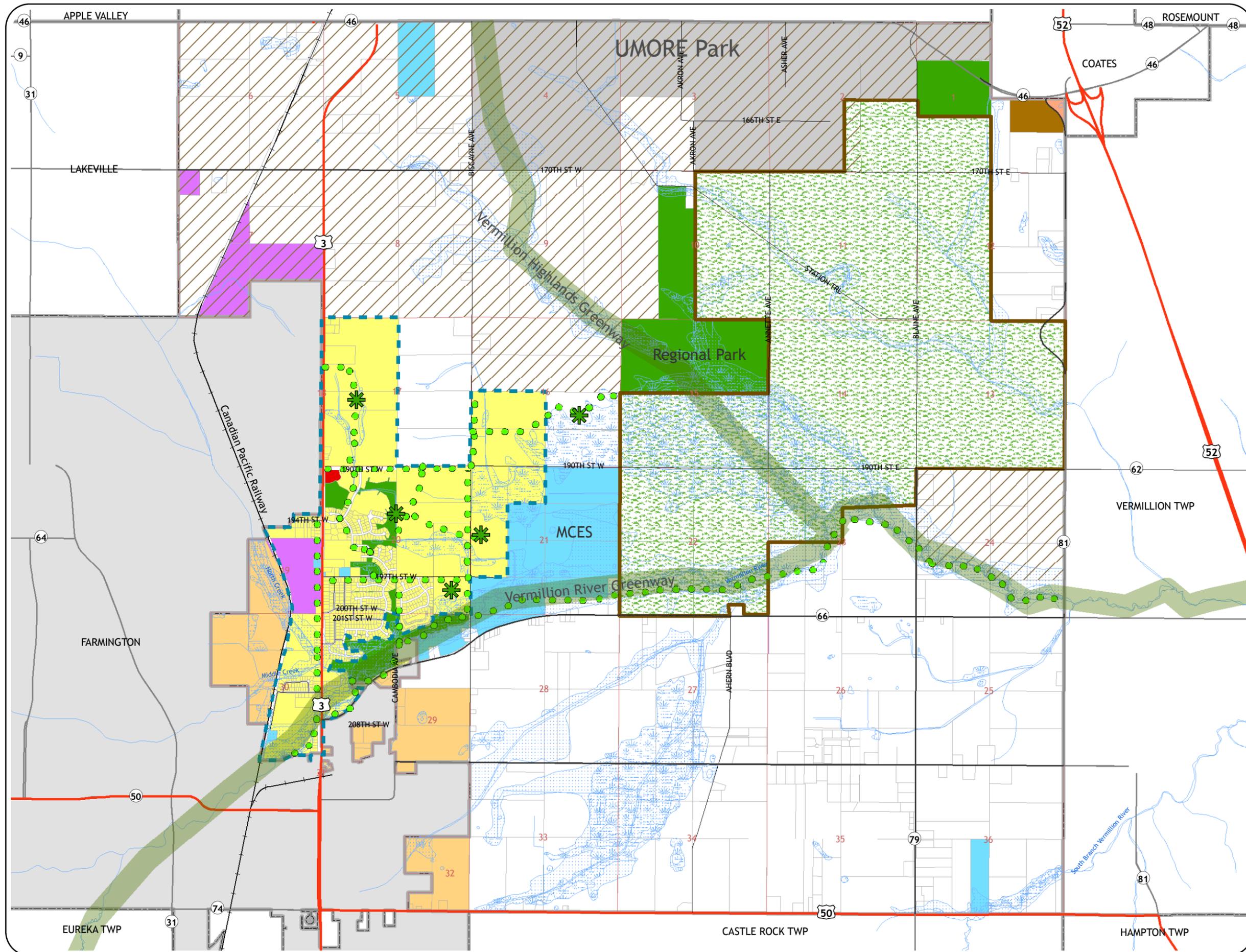
A Light Industrial area is planned between TH3 and the Canadian Pacific Railway at 197th Street as a future industrial park location within the MUSA. This area has been previously mined and remains in use as a topsoil and soil amendment production facility. Because of existing neighboring residential uses and highway access limitations, this area will require careful site planning for appropriate lot layouts, internal street circulation, site screening, and highway access management.

Empire Township Dakota County, MN

Figure 5 2030 Future Land Use

Land Use Category

-  Agriculture
-  Mixed Residential (3 units/acre)
-  Neighborhood Commercial
-  Highway Commercial
-  Light Industrial
-  Alternative Energy
-  Public/Institutional
-  Public Park, Recreation and Open Space
-  University of MN (UMORE)
-  Mining Overlay Area
-  Wildlife Management Area (WMA)
-  Orderly Annexation Area (OAA)
-  2030 MUSA
-  Future Park Concepts
-  Local Trail Corridors
-  Regional Trail Search Corridor
-  Lakes
-  NWI Wetlands
-  Floodplain Area
-  Streams



Two additional Light Industrial areas have been identified within the Mineral Extraction Overlay area near the Canadian Pacific Railway. A former mineral extraction area with a 15-acre existing landscape product business on 170th has been designated Light Industrial. A 190-acre area between TH3 and the railroad is also designated Light Industrial. This area has no commercial aggregate value and is more suitable for Light Industrial uses within the Mineral Extraction Overlay area. Uses within the Light Industrial areas located within the Mineral Extraction Overlay area must demonstrate the ability to furnish private sewer and water services, consistent with minimum Township and County standards.

Alternative Energy Industrial

The Alternative Energy Industrial area is a specialized land use category intended to provide opportunities for alternative energy production. The Alternative Energy Industrial area in Empire Township is intended to allow for the conversion of agricultural, biomass, and other waste product feedstock into alternative energy resources. The Alternative Energy Industrial area promotes alternative energy production through gasification technology, rather than direct incineration, in order to minimize air quality impacts. The Empire Township Zoning Ordinance will regulate specific uses and may permit other similar alternative energy production facilities.

The only Alternative Energy Industrial area established at the present time is located in the southwest quadrant of the TH 52 and CSAH 46 interchange. Alternative Energy Industrial areas require immediate proximity to and convenient access to principal arterial highways for the importation of production feedstock and the distribution of energy products. The Alternative Energy Industrial area is located outside of the MUSA and will require the provision of private sewer and water services, consistent with minimum Township and County standards.

Commercial/Industrial Policies

It is the policy of Empire Township to:

- Identify appropriate locations for neighborhood retail centers, based upon market demand and transportation accessibility.
- Identify and preserve light industrial development areas within the MUSA and in the Mineral Extraction Overlay area.
- Establish lot size, site coverage, setback, parking, and landscaping standards for commercial and industrial uses in order to provide safe and convenient access, adequate parking, and appropriate buffering between adjoining land uses.
- Minimize the incompatibility of commercial and industrial land uses with residential land uses.
- Encourage “green” technology for all new commercial and industrial uses.
- Ensure that commercial and industrial projects are designed in a manner that is functional, safe, and aesthetically pleasing.
- Establish a Neighborhood Commercial zoning district and performance standards in the Empire Township Zoning Ordinance.
- Establish a Highway Commercial zoning district and performance standards in the Empire Township Zoning Ordinance.
- Establish a Light Industrial zoning district and performance standards in the Empire Township Zoning Ordinance.
- Establish an Alternative Energy Industrial zoning district and performance standards in the Empire Township Zoning Ordinance.

Mineral Extraction Overlay

In 1997, Empire created the Mineral Extraction Overlay area in the Comprehensive Plan. The purpose of the Mineral Extraction Overlay area is to identify concentrated locations of high quality aggregate and where mineral extraction may occur. Over 6000 acres of land are included in the overlay area, including portions of UMore Park. Environmental reviews for mineral extraction have been completed on nearly 4000 acres of land. The University of Minnesota is currently conducting an EIS for mineral extraction on approximately 740 acres of UMore property in Empire Township. Over 1000 acres of land are currently permitted for mining in the Mineral Extraction Overlay area. The mining operations will include aggregate processing, ready mix concrete plants, asphalt plants, and other aggregate accessory uses, including roadway construction businesses and related uses.

Public/Institutional

The Public/Institutional designation is limited to Township and County governmental facilities, The MCES' Empire WTF, and the existing Buddhist Temple. Future Public/institutional uses, such as Township facilities, schools and churches may be allowed within existing zoning districts (Agriculture or Residential guided land) or, based on the potential intensity of the use, may be required to seek Comprehensive Plan amendments for designation as Public/institutional uses.

Park/Recreation

The 2030 Land Use Plan identifies the 120-acre Dakota County site, partially used as Dakota Woods Park, as a future park area. The Plan also identifies the 455-acre proposed Vermillion Highlands area Regional Park in the center of the Township. There are approximately 150 acres of existing Empire Township parks and recreation areas. The 2030 Land Use Plan identifies several proposed future park locations which could occupy an additional 150 acres of combined active and passive recreation areas for neighborhood and community parks.

Farmington Orderly Annexation Area

Empire Township and the City of Farmington executed joint resolutions on March 19, 2008 for permanent joint boundaries through an Orderly Annexation Agreement (OAA). The OAA area generally lies west of Biscayne Avenue and south of CSAH 66 and includes land lying westerly of the Canadian Pacific Railway in Sections 19 and 30. The OAA area is identified on the 2030 Future Land Use map and is subject to planning and zoning authority by the City of Farmington. The land area included in the OAA is nearly 575 acres.

UMore Park

The University of Minnesota Outreach, Research and Education Park (UMore Park) consisted of nearly 4530 acres in Empire Township. Approximately 2830 acres of land has become part of the Vermillion Highlands Wildlife Management Area (WMA) jointly operated by the University and the DNR for agricultural research and WMA usage. The remaining 1700 acres of UMore Park is being planned for potential mineral extraction and eventual urbanization. The University has completed a two-year long study of potential urban uses in Empire and the City of Rosemount (additional 2900 acres). The UMore Park property in Empire is also included in the Mineral Extraction Overlay area.

Wildlife Management Areas

The DNR has acquired the 475-acre Miles farm for a WMA and Aquatic Management Area (AMA) along the Vermillion River. This WMA/AMA abuts the 2830-acre Vermillion Highlands WMA. The DNR and Dakota County have jointly acquired the Butler farm for the proposed 455-acre unnamed Regional Park and 360 acres of additional WMA. The 2030 Land Use Plan identifies an additional 360 acres between the planned WMAs and the Vermillion River as potential WMA expansion. The total WMA designation in the 2030 Land Use Plan is approximately 4030 acres.

Historic Preservation

There are no properties in Empire Township that are on of the Register of National Historic Places. The Minnesota Historical Society has identified five archeological sites within the Township. One of these selected sites is of the Mounds Group, meaning that it is possibly an historic burial site. Empire Township is committed to preserving the rural quality of life in the Township, including its cultural resources. The Township will work with the State Historic Preservation Office and the Dakota County Historical Society to further identify and protect historic and cultural resources.

E. Public Facilities and Services

Sanitary Sewer System

Empire has owned and operated a municipal sewer system since the 1970s. There are nearly 600 utility customers at the present time. The existing and proposed sanitary sewer collection system is illustrated in **Appendix A-3**. There are three MCES interceptors located in Empire, which terminate at the Empire WTF, located immediately east of the existing and planned MUSA. The Empire WTF is currently being expanded from 12 mgd treatment capacity to 24 mgd. The outfall of the Empire WTF has also been re-routed from the Vermillion River in Empire to the Mississippi River in Rosemount.

The 2030 Land Use Plan identifies approximately 400 net acres within the existing MUSA and a planned expansion of the MUSA in 2030 to approximately 1120 net acres. The acreages and anticipated development within the MUSA are illustrated on **Table 10** and **Table 11**. The proposed trunk system for the expanded MUSA is illustrated **Appendix A-3**. The proposed sewer staging plan is illustrated on **Figure 6**. Estimated sewer flows from 2010 to 2030 are identified in **Table 14**.

Inflow/Infiltration

The Township televised and inspected the sanitary sewer lines in the late 1990s. The system was found to be in good condition, and potential sources of infiltration were not detected. Empire's oldest sewer mains are only 30 years old. The Township's sewage flows are now metered and there is no indication that infiltration or inflow (I/I) is a problem. Future infiltration is minimized by effective design specifications, construction techniques, and inspections to ensure proper installation of new facilities. The Township has adopted ordinance provisions to eliminate inflow sources from foundation drains, sump pumps, roof drains or other sources. Empire annually monitors sewer flows to determine whether any potential new I/I sources affect the local collection system and whether mitigation is appropriate. The Township will establish an ongoing I/I monitoring, inspection, and maintenance program.

Table 14
Sewer Flow Forecasts

Year	Residential Equivalents	Cumulative Units	Cumulative Flows (mgd)
2007	592	592	0.137
2010	108	700	0.161
2015	500	1200	0.274
2020	530	1730	0.390
2025	540	2270	0.506
2030	550	2820	0.620

mgd = million gallons per day; 0.137 mgd = average metered flow from July 2006 to June 2007;
Residential equivalents include attached and detached units and anticipated commercial flows;
Equivalent flows range from 231 gallons per household per day in 2007 to 220 in 2030

Municipal Water

The Township has operated a municipal water system for the past 30 years. Empire currently operates three municipal wells with treatment and a 300,000 gallon water tower. The existing and planned water distribution system is described in **Appendix A-2**. A booster pump is planned to be constructed within the existing water service area in the short term. A new 500,000 gallon water tower is required within the planning period to accommodate growth forecasts and serve higher elevations to the north of the existing service area. The Township is also planning to construct a system-wide water treatment plant during the planning period.

Administrative Services

The growth anticipated in this Plan will result in additional administrative demands on the Township. The current Clerk/Treasurer and utility billing positions will need to be supplemented as the community grows. Decisions will also need to be made regarding the provision of additional office space and meeting space, as well as ADA requirements at the Town Hall.

The Township currently utilizes professional consultants for legal, engineering, planning, auditing, and building inspection services. It is anticipated that these service provisions may remain cost effective and appropriate for the planning period; however, the Township should continually evaluate internal staffing options as the community grows.

Public Works

A new public works facility is being constructed and will be completed in the fall of 2009. The new facility is being constructed in anticipation of equipment storage and office needs for the next 30 years. There is expansion potential for additional building needs, as well as parking, at the public works site. Empire has two fulltime public works staff and seasonal employees for lawn care and park maintenance. The anticipated growth during the planning period will require the addition of new full time and part time public works staff and equipment for new street and utility maintenance.

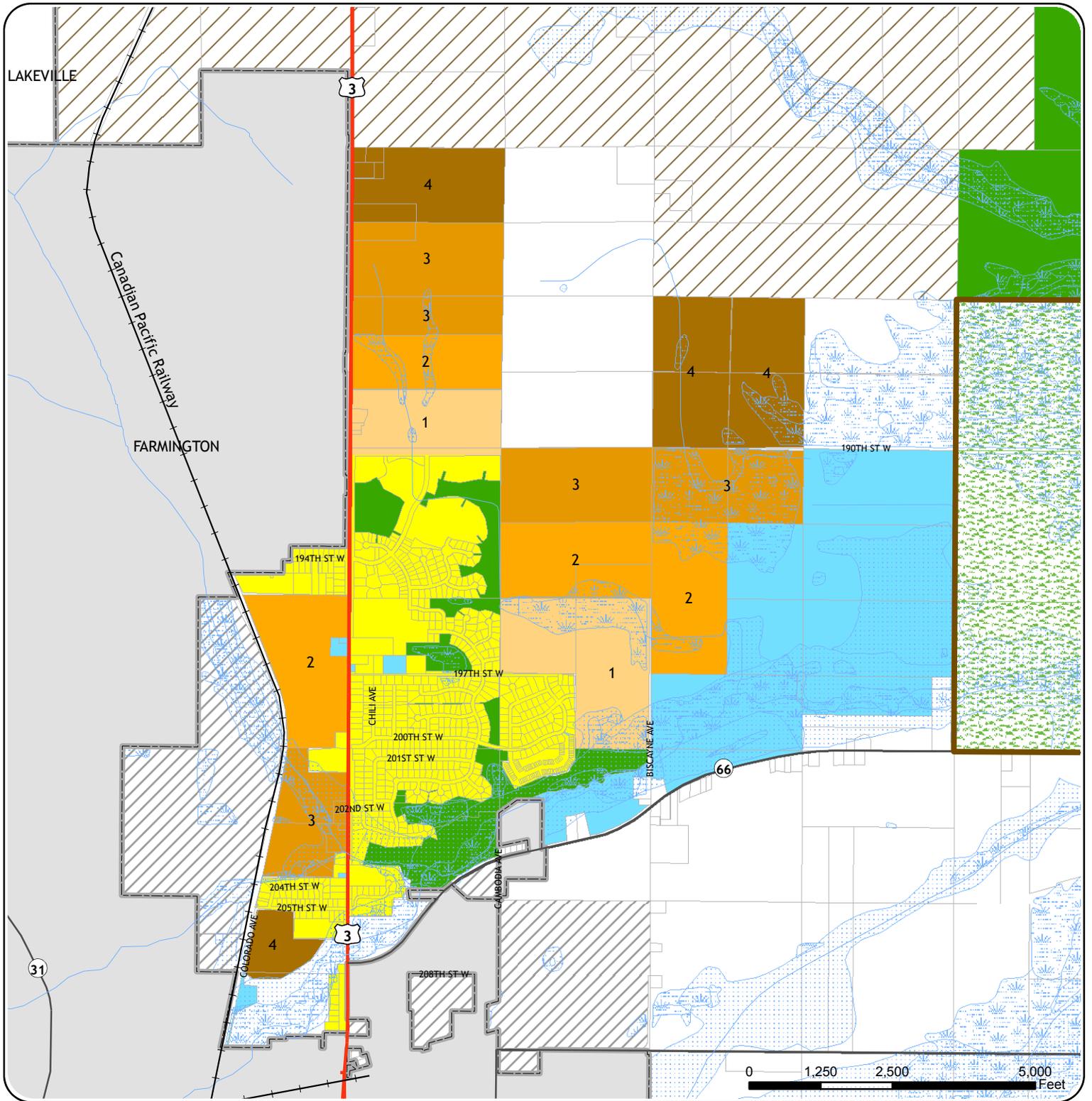


Figure 6 - Sewer Staging

Empire Township
Dakota County, MN

MUSA Addition

Existing

1 2010

2 2015

3 2020

4 2025

Park

Public/Institutional

Wildlife Management Area (WMA)

Orderly Annexation Area (OAA)

2030 WMA

Mining Overlay

Lakes

NWI Wetlands

Floodplain Area

Streams



Public Safety

As the community grows, there will be increasing needs for police and fire protection. It is anticipated that Empire will contract for additional police protection services in the future with the Dakota County Sheriff's Department. The Township's fire contract with the City of Farmington is subject to ongoing review and adjustment. The Township has discussed the potential for constructing a fire hall in the community. This could serve as a satellite facility in a contract service or joint service provision with adjacent communities. These service options require ongoing analysis in the future.

Solar Access Protection

The Township recognizes the importance of protecting access for solar collectors from potential interference by adjacent structures and vegetation. Provisions within the Township's zoning ordinance establish the regulatory basis for this protection. These controls include, but are not limited to, structure separation requirements and building height limitations.

Public Facilities and Services Policies

- Provide cost effective delivery of services through annual analysis and updates of services, operating budgets and capital improvement needs.
- Ensure the proper functioning of individual sewage treatment systems through inspection programs.
- Identify and plan for cost-effective improvements to public facilities before growth occurs.
- Identify ongoing administrative requirements as the community grows.
- Evaluate public safety needs and service options as the community grows.

F. Transportation

The Transportation element is a guide for the Township so that the transportation system meets the needs of residents and businesses as the community grows and changes. The primary transportation system in Empire is the road network, but other considerations include bicycle/pedestrian facilities and other elements of the metropolitan transportation system including aviation and transit. The Transportation element was developed in conjunction with the 2030 Land Use Plan, as well as regional development activities within Dakota County. **Appendix A-1** includes the detailed Transportation Plan for Empire Township.

Figure 4 identifies roadways in the Township, including their jurisdictions and functional classifications. Each of these roadways is under the governmental jurisdiction of either State of Minnesota, Dakota County, or Empire Township. Limited access roadways that carry larger volumes of traffic at higher speeds and capacities are under the jurisdiction of the State of Minnesota and Dakota County (e.g., TH3 and CSAH 46). Roads that serve mostly local traffic are under the jurisdiction of the Township.

A portion of CSAH 46 on the north border of Empire, west of TH3, is the only existing 4-lane roadway in Empire. Dakota County has identified the need to upgrade CSAH 46 to a 4-lane highway from TH 3 to TH 52, east of Empire, by 2030. MnDOT has identified the need to upgrade TH3 through Empire to a 4-lane highway, but there is no timetable for the potential improvement.

Dakota County has recently conducted east-west corridor studies to identify potential road connections between Empire Township and the Cities of Farmington and Lakeville. The results of these studies include the 195th Street corridor in Farmington and 190th Street in Empire. A new Minor Arterial County Highway will connect CSAH 31 in Farmington with CSAH 66 and ultimately result in a new interchange at TH 52 east of Empire. Another proposed east-west corridor will connect CSAH 9 in Lakeville to Biscayne Avenue in Empire along a 175th Street or 180th Street alignment.

CR 58 (170th Street) was turned back to Empire in 2008, between the City of Lakeville border and Biscayne Avenue. The Township and County have agreed to review and coordinate improvements needed on 170th Street to serve the new regional park should no other direct park access be feasible.

Because of the recent establishment and proposed expansion of large WMAs in Empire, establishment of a new regional park, and development potential at UMore Park, Dakota County has initiated a new north-south corridor study with Empire, Rosemount, the University of Minnesota, and the DNR. The study will evaluate minor arterial corridors through and around the WMAs and regional park, as well as existing east-west corridors through UMore and Vermillion Highlands open space collaborative. Existing north-south alignments to be evaluated include Biscayne Avenue, Akron Avenue (CR 73), Blaine Avenue (CR 79) and Clayton Avenue (CR 81).

Existing traffic volumes and forecasts are constantly changing due to residential development, commercial development, mining operations, and planned developments, including speculation on potential UMore Park development. Dakota County and the University are modeling forecast data on UMore, Rosemount, and Empire development scenarios, including mineral extraction. The forecast data included in **Appendix A-1** does not reflect all potential current growth assumptions or potential road network changes.

Township growth forecasts will result in total trip generation in excess of Metropolitan Council forecasts or current County modeling. The County will be remodeling forecasts for the system after the current updates to local comprehensive plans have been completed. All of Empire’s new growth in households and employment will occur in Traffic Analysis Zone 169, which covers the north 2/3 of the Township.

Table 15
2030 Forecasts by TAZ

<u>TAZ</u>	<u>Population</u>	<u>Households</u>	<u>Employment</u>	<u>Retail Only</u>
168	375	140	40	20
169	8115	2860	440	60
Totals	8490	3000	480	80

Source: Empire Township

Managing Access to Roadways

The Township has worked with MnDOT to identify future access locations on TH3. Empire will coordinate access on County roads with Dakota County, consistent with the County's spacing guidelines. The Township will also utilize the County's spacing guidelines to the maximum extent practicable on major Township roads. Local collector street spacing in Empire is planned at one-quarter to one-half mile intervals.

Transit

The Metropolitan Council is primarily involved in the planning of the region's transit system, which currently includes regular bus service, dial-a-ride services, high occupancy vehicle (HOV) lanes, HOV ramp meter bypasses, bus-only shoulder lanes, and park-and-ride lots. Met Council also operates the largest transit service provider, Metro Transit. The Council determines policies for transit based on the need for different types of service as well as the potential demand for service.

Empire is located in Market Area IV, outside of the metropolitan transit taxing district. Dial-a-ride transit services, provided by Dakota Area Resources and Transportation for Seniors (DART), is available to seniors and economically and physically disadvantaged persons. Minnesota Valley Transit Authority operates the nearest bus service in the City of Rosemount.

Pedestrian Access

Trail corridors will be required along all arterial and collector roadways and along all major streets in all developments. The Township has a priority to create a system of interconnected trails that link parks, County and regional trails, Town Hall and the Vermillion River. Possible future trail and regional greenway corridor alignments are illustrated on **Figure 5**. The Township will coordinate future plans of Dakota County and MnDOT to ensure that concerns about local pedestrian and bicycle connections and safety on major roadways are addressed.

Aviation

No metropolitan airports pose any potential impacts on the Township, nor are there any airspace restrictions affecting development in the Township. The Township will notify the Federal Aviation Administration in the event that any new structures are proposed in excess of 200 feet above ground level.

Transportation Policies

It is the policy of Empire Township to:

- Support access guidelines that limit access to major roads in the Township by encouraging shared access, frontage roads and appropriate intersection spacing guidelines.
- Promote available transit programs and opportunities for residents and businesses, such as park and pool facilities, rideshare programs and dial-a-ride services.
- Coordinate transportation planning and system improvements with local, county, regional and state jurisdictions.
- Promote and require development standards that provide safety for both vehicles and pedestrians.
- Develop priorities to improve the existing transportation system.

- Participate in regional transportation corridor studies that impact existing and future roadways in the Township.

G. Parks and Recreation

Empire has identified several potential new park locations and local and regional trails on **Figure 5**. These include potential park land additions to existing parks, new neighborhood parks, new community parks and a potential park and trail corridor linking Empire with the proposed new Vermillion Highlands area Regional Park. Empire is aware of and supports the Vermillion Highlands Greenway regional trail corridor connections to the new Regional Park from Lebanon Hills Regional Park and from the Vermillion River. The Vermillion River Greenway regional trail corridor for trails and river access is also proposed along the entire length of the Vermillion River in Empire. The Township supports this initiative and has constructed trails and park amenities along portions of the river between TH 3 and Biscayne Avenue. The 2030 Land Use Plan also identifies potential expansion of the Vermillion Highlands area WMA/AMA to enhance public access and river protection.

Empire will pursue parameters for collaborative partnerships with Dakota County, UMore and the DNR to maximize recreation opportunities near the Vermillion River. Empire will also develop a Parks and Trails Master Plan, based upon the growth assumptions in this Plan, to identify detailed parks and recreation needs before development occurs and to establish pedestrian connectivity throughout the Township.

Parks, Recreation and Open Spaces

It is the policy of Empire Township to:

- Design and maintain parks to ensure public and property safety.
- Accept land gifts and forfeitures in areas with potential recreational development opportunities that benefit the community.
- Require adequate land dedications or equivalent cash contributions through the subdivision process for the development of parks and trails.
- Monitor land use regulations for compatibility with existing parks, recreation areas and natural features.
- Locate additional trail corridors in the Township consistent with the 2030 Land Use Plan.
- Coordinate regional greenway trail and recreation opportunities with Dakota County, the DNR, and adjacent communities.
- Develop a Parks and Trails Master Plan.
- Evaluate park and recreation needs on an on-going basis.

H. Water and Natural Resources

Empire is located in the Vermillion River Watershed. The watershed was organized as a WMO in 1984, but was dissolved in 2000 and reorganized through a joint powers agreement (Dakota and Scott counties) as the Vermillion River Watershed Joint Powers Organization (VRWJPO). The VRWJPO adopted its watershed plan in 2005.

The primary purpose of the watershed organization is to protect and preserve natural drainage systems, surface water quality, and groundwater quality. The organization is also responsible for insuring that jurisdictions properly and consistently implement local water management plans, unless permitting jurisdiction has been relinquished to the watershed authority. Where issues concerning more than one jurisdiction cannot be resolved through efforts at the local level, the VRWJPO will act to settle such issues at the request of the jurisdictions.

Twelve rural Dakota County communities, including Empire are located within the Vermillion River Watershed. The VRWJPO adopted its Watershed Plan (VRW Plan) in October, 2005. The VRWJPO amended the VRWJPO Plan in October, 2006 with the adoption of the VRWJPO Standards. The Standards include a policy statement, basic regulation, and specific criteria to be met for each regulation in the following categories:

- ◆ Floodplain Alteration Standards
- ◆ Wetland Alteration Standards
- ◆ Buffer Standards
- ◆ Stormwater Management Standards
- ◆ Drainage Alteration Standards
- ◆ Agricultural Standards

In March, 2007 the VRWJPO adopted Rules, which govern situations where the VRWJPO may act to implement the VRWJPO Standards when a local unit of government has failed to prepare or implement a local water management plan, permitting actions are inconsistent or at variance with a local water management plan, or when a local unit of government has relinquished permitting authority to the VRWJPO. In February, 2008 the VRWJPO amended the VRWJPO Plan, again, by adopting revised Standards, revised Goals, Policies, Objectives, and Actions, and revisions to the Implementation Program.

Empire along with 11 other rural communities in the Vermillion River Watershed adopted a joint resolution in the Fall of 2007 to participate in the joint preparation of a rural collaborative local water management plan, to satisfy statutory requirements for local water management planning and to implement the VRWJPO Plan and Standards. The Rural Collaborative Local Water Management Plan was approved by the VRWJPO on October 23, 2008. The Township adopted the Rural Collaborative Local Water Management Plan on October 28, 2008. The 12-community collaborative also prepared a model ordinance for local implementation of the Local Water Management Plan. Empire adopted the Rural Collaborative Water Resources Management Ordinance on April 14, 2009.

Water Resources Goals

It is the goal of Empire Township to:

- Protect water resources from unnecessary impacts of future growth and development activities.
- Maintain and enhance natural systems and water resources for future generations to enjoy.
- Protect surface waters and wetland areas to promote water quality, recreation opportunities, aesthetic qualities, natural habitat areas, and ground water recharge.
- Protect the habitat and biodiversity of the area.

Water Resources Policies

It is the policy of Empire Township to:

- Adopt and enforce wetland alteration and mitigation requirements consistent with the Wetlands Conservation Act and Water Resources Management Ordinance.
- The natural drainage system will be protected and used to the extent possible for storage and flow of runoff. Wetlands should be used as natural recharge areas. Pre-settling of runoff will be required prior to discharge to wetlands.
- Temporary storage areas and pre-sedimentation ponds will be required to accommodate peak flows of water runoff. Newly constructed stormwater sedimentation ponds will be required to meet pond design standards of the Nationwide Urban Runoff Program (NURP).
- Monitor actions of the VRWJPO to insure that local interests are addressed in a coordinated and equitable manner.
- Work with the Dakota Soil and Water Conservation District to enhance education and programs related to the prevention of agricultural runoff and water quality.
- Use MPCA's urban "Best Management Practices" (currently titled "Protecting Water Quality in Urban Areas") for all new or redeveloped land developments.
- Require and review erosion and sedimentation control plans and NPDES Construction Permit documentation for all land disturbances consistent with the Water Resources Management Ordinance.
- Require development proposals to include measures for preventing erosion, minimizing site alteration, minimizing and improving the quality of runoff, and addressing view impacts during and after construction.
- Prohibit development on slopes greater than 18%.
- Encourage development to conform to the natural limitation of the topography and soil so as to create the least potential for soil erosion.
- Mineral extraction operations shall be required to submit permit documentation and land reclamation plans consistent with standards outlined in local ordinances.
- If erosion and sedimentation is resulting from an agricultural operation, the Soil and Water Conservation District should be consulted regarding possible corrective or preventive measures.
- Work with the VRWJPO to implement the Local Water Management Plan and Water Resources Management Ordinance.
- Establish and enforce standards and regulations restricting the clear cutting of woodland areas.

Shoreland and Floodplain Management

Dakota County is responsible for shoreland and floodplain management in unincorporated areas. Empire coordinates development review and permitting in the shoreland and floodplain areas with Dakota County. Regulations for shoreland and floodplain management are included in Dakota County Ordinance No. 50.

Individual Sewage Treatment Systems (ISTS)

The majority of Empire Township is not served by public sewer and an estimated 195 residential and commercial ISTSs exist in the community. Minnesota Pollution Control Agency Rules Chapter 7080 (now amended to incorporate Chapters 7081-7083), require that certain standards be met for all ISTS installers, pumpers, haulers, designers and inspectors, as well as

administration and enforcement of the Rules by local units of government. Dakota County Ordinance #113 governs ISTS regulations in areas of its jurisdiction. The ordinance provides standards, guidelines and regulations for the compliance and enforcement of the proper siting, design, construction, installation, operation, maintenance, repair, reconstruction, inspection and permanent abandonment of ISTSs.

Many of the provisions in Dakota County Ordinance #113 are more restrictive than MPCA Rules Chapter 7080, including requirements to submit “as-built” records by local installers, prohibiting repair or modification of cesspools, seepage pits and dry wells into septic tanks, requiring a State-licensed inspector, and requiring a seller of property to have a sewage system compliance inspection. Dakota County is currently working with area building officials to review amendments needed to Ordinance #113 and to develop a local model ordinance that will incorporate new provisions of MPCA Rules Chapters 7080-7083.

Empire and other rural communities have adopted Ordinance #113 and are responsible for the review, permitting, and inspections of new and existing ISTSs. All ISTS designers, installers, inspectors, and pumpers must be licensed by the MPCA. Dakota County maintains authority for permitting and inspections within shoreland and floodplain areas.

Empire and other rural communities and Dakota County have established a cooperative 3-year pumping program for ISTS monitoring and maintenance. The County provides notification to approximately one-third of the ISTS owners in each community every year. The notification includes the requirement for the pumping of septic tanks and visual inspection of the system. The County maintains the pumping records of the inspection program.

ISTS owners are required to contract with licensed pumpers for the maintenance and inspection program. Pumpers are required to submit pumping and inspection records to the County. If the inspection reveals necessary or potential repairs to a system the County refers the action to the local unit for appropriate enforcement. If ISTS owners do not respond to the maintenance and inspection requirement after a third notice, the County refers the matter to the local unit for enforcement. Inspection violations, complaints, and potential repairs are referred to the Building Official for enforcement. If the Building Official cannot remedy violations and repairs through normal enforcement procedures, the matter is turned over to the Township Attorney for prosecution.

Individual Sewage Treatment System Policies.

It is the policy of Empire Township to:

- Maintain the joint management program for individual sewage treatment systems that includes:
 - ◆ Design, construction, and inspection of new systems;
 - ◆ Record keeping of existing systems;
 - ◆ Pumping and visual inspection of systems every three years;
 - ◆ Repair or replacement of systems found to be an imminent public health threat or failure.
- Require ISTS inspectors to maintain adequate training and certification regarding updated installation techniques and regulations relating to individual sewage treatment systems.

- Require existing individual sewage treatment systems that need to be expanded or replaced to meet the standards of MPCA Rules Chapters 7080-7083, as amended, and Dakota County Ordinance #113 standards and regulations. Only alternative systems identified in MPCA Chapter 7080 will be allowed in the communities.
- Update local ordinances to incorporate amended MPCA Rules Chapters 7080-7083 standards.

Aggregate Resource Protection

Substantial aggregate resources are identified in Empire. The commercial grade aggregate resources are located in the Mineral Extraction Overlay area and identified on the 2030 Land Use Plan. Several mineral extraction permits are currently active within the Mineral Extraction Overlay area. The underlying land use designation in the overlay area is Agriculture. The corresponding AG Agriculture Preservation Zoning District limits development to one home per quarter-quarter section. The low density of potential development in the Agriculture area will also protect aggregate resources for potential extraction for years to come.

IV Implementation

The implementation of the Comprehensive Plan does not end with its adoption. The Township's official controls, such as the Zoning Ordinance and subdivision regulations, will ensure day to day monitoring and enforcement of the Plan. The regulatory provisions of these ordinances, as revised, will provide a means of managing development in the Township in a manner consistent with the 2030 Comprehensive Plan.

A. Official Controls

As part of the planning process, the Township will evaluate its land use controls and consider amendments to existing ordinances which eliminate inconsistencies with the 2030 Comprehensive Plan, enhance performance standards, protect public and private investments, conform to mandatory State and Federal regulations, and make them understandable documents. The principal official controls used to implement the Comprehensive Plan include the following:

- ✓ Zoning Ordinance
- ✓ Subdivision Ordinance
- ✓ Water Resources Management Ordinance
- ✓ Mineral Extraction Ordinance
- ✓ Individual Sewage Treatment Systems Provisions

The Comprehensive Plan identifies a number of specific changes to the ordinances or additional plans that need to be considered by the Township. Some of these changes include, but are not limited to, the following:

- ✓ Modify Mixed Residential development standards to allow a 60% mix of detached and 40% mix of attached residences in efforts to achieve a MUSA-wide minimum density of three units per acre
- ✓ Modernize the Commercial Zoning District provisions
- ✓ Establish new Industrial Zoning District provisions
- ✓ Review and modify other provisions of the Zoning Ordinance as needed
- ✓ Review and modify other provisions of the Subdivision Ordinance as needed
- ✓ Modify the Mineral Extraction Ordinance as appropriate to reflect new host community fees
- ✓ Update the Individual Sewage Treatment Systems provisions as needed
- ✓ Establish an ongoing I/I monitoring, inspection, and maintenance program.
- ✓ Prepare and adopt a Parks and Trails Master Plan

B. Capital Improvement Plan (CIP)

The Township will annually review capital expenditures that may arise over a five-year period, as a result of implementing this Comprehensive Plan. This may include public and private investments in infrastructure, infrastructure repair and replacement, building maintenance and repair, park expenditures, and other planned capital expenditures. Like the Comprehensive Plan, the capital improvements planning process is ongoing and subject to modification, as appropriate. **Table 15** illustrates the draft, unapproved CIP for the next five years.

**Table 16
Capital Improvements Plan**

<u>Year</u>	<u>Expenditure</u>	<u>Total Cost</u>	<u>Annual Cost</u>	<u>Funding</u>	<u>Total Levy</u>
2009	Public Works Facility	\$1,000,000	\$70,000	Bond	\$70,000
2009	Roundabout	\$300,000	\$22,000	Bond/Fees	-
2009	Public Works Equipment	-	\$28,000	Levy	\$28,000
2009	Seal-coating/ patching/filling	-	\$21,500	Levy	\$21,500
2009	Gravel/dust control	-	\$26,000	Levy	\$26,000
2009	Booster Station	\$138,000	\$20,000	WAC	-
2009	Water plant	\$4,000,000	\$74,800	Bond/WAC	-
2009	Water Tower	\$1,000,000	\$24,930	Bond/WAC	-
2009	Parks and trails	-	\$14,500	Levy	\$14,500
2009	Mining Mitigation	-	\$40,000	Fees	-
2009	TOTAL				\$160,000
2010	Public Works Facility	\$1,000,000	\$70,000	Bond	\$70,000
2010	Roundabout	\$300,000	\$22,000	Bond/Fees	-
2010	Public Works Equipment	-	\$28,000	Levy	\$28,000
2010	Seal-coating/ patching/filling	-	\$21,500	Levy	\$21,500
2010	Gravel/dust control	-	\$26,000	Levy	\$26,000
2010	Booster Station	\$138,000	\$20,000	WAC	-
2010	Water plant	\$4,000,000	\$74,800	Bond/WAC	-
2010	Water Tower	\$1,000,000	\$24,930	Bond/WAC	-
2010	Parks and trails	-	\$14,500	Levy	\$14,500
2010	Mining Mitigation	-	\$40,000	Fees	-
2010	TOTAL				\$160,000
2011	Public Works Facility	\$1,000,000	\$70,000	Bond	\$70,000
2011	Town Hall Improvements	\$150,000	\$11,000	Bond	\$11,000
2011	Roundabout	\$300,000	\$22,000	Bond/Fees	-
2011	Public Works Equipment	-	\$28,000	Levy	\$28,000
2011	Seal-coating/ patching/filling	-	\$21,500	Levy	\$21,500
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2011	Water Tower	\$1,000,000	\$24,930	Bond/WAC	-
2011	Parks and trails	-	\$14,500	Levy	\$14,500
2011	Mining Mitigation	-	\$40,000	Fees	-
2011	TOTAL				\$171,000

2012	Public Works Facility	\$1,000,000	\$70,000	Bond	\$70,000
2012	Town Hall Improvements	\$150,000	\$11,000	Bond	\$11,000
2012	Roundabout	\$300,000	\$22,000	Bond/Fees	-
2012	Public Works Equipment	-	\$28,000	Levy	\$28,000
2012	Seal-coating/ patching/filling	-	\$21,500	Levy	\$21,500
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2012	Booster Station	\$138,000	\$20,000	WAC	-
2012	Water plant	\$4,000,000	\$74,800	Bond/WAC	-
2012	Water Tower	\$1,000,000	\$24,930	Bond/WAC	-
2012	Parks and trails	-	\$14,500	Levy	\$14,500
2012	Mining Mitigation	-	\$40,000	Fees	-
2012	TOTAL				\$171,000
2013	Public Works Facility	\$1,000,000	\$70,000	Bond	\$70,000
2013	Town Hall Improvements	\$150,000	\$11,000	Bond	\$11,000
2013	Roundabout	\$300,000	\$22,000	Bond/Fees	-
2013	Public Works Equipment	-	\$28,000	Levy	\$28,000
2013	Seal-coating/ patching/filling	-	\$21,500	Levy	\$21,500
2013	Gravel/dust control	-	\$26,000	Levy	\$26,000
2013	Booster Station	\$138,000	\$20,000	WAC	-
2013	Water plant	\$4,000,000	\$74,800	Bond/WAC	-
2013	Water Tower	\$1,000,000	\$24,930	Bond/WAC	-
2013	Parks and trails	-	\$14,500	Levy	\$14,500
2013	Mining Mitigation	-	\$40,000	Fees	-
2013	TOTAL				\$171,000

C. Plan Amendment Procedure

The Comprehensive Plan is intended to be general and flexible; however, formal amendments to the Plan will be required when land use elements or growth policies are revised. Periodically, the Township should undertake a formal review of the plan to determine if amendments are needed to address changing factors or events in the community. While a plan amendment can be initiated at any time, the Township should carefully consider the implications of the proposed changes before its adoption.

When considering amendments to this plan, the Township will use the following procedure:

1. Landowners, land developers, or the Township may initiate amendments.
2. The Planning Commission may direct staff or the planning consultant to prepare a thorough analysis of the proposed amendment.
3. Staff or the planning consultant will present to the Planning Commission a report analyzing the proposed changes, including findings and recommendations regarding the proposed plan amendment.
4. The Planning Commission will decide whether or not to proceed with public initiated amendments, unless directed to proceed by the Town Board. When a decision to proceed is made, or whenever a privately initiated amendment is received, a formal public hearing will be held on the proposed amendment.

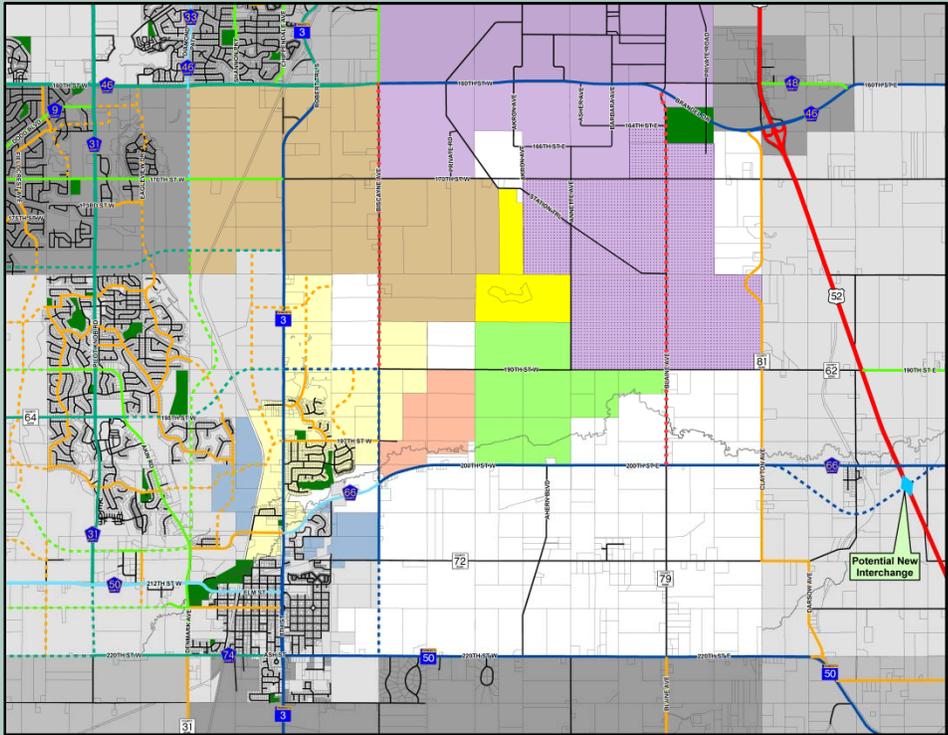
5. Following the public hearing the Planning Commission will make a recommendation with its findings to the Town Board.
6. The Town Board will receive the recommendation from the Planning Commission and make a final decision on whether to adopt the amendment.
7. All amendments must be submitted to area review jurisdictions and the Metropolitan Council for review prior to implementation.

APPENDIX A-1
Transportation Plan

Empire Township

2030 Transportation Plan

Appendix A-1 Empire Township Comprehensive Plan



Recommended Future Roadway Functional Classification



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I. INTRODUCTION

The purpose of this Transportation Plan is to provide guidance for Empire Township, as well as existing and future landowners in preparing for future growth and development. As such, whether an existing roadway is proposed for upgrading or a land use change is proposed on a property, this Plan provides the framework for decisions regarding the nature of roadway infrastructure improvements necessary to achieve safety, adequate access, mobility, and performance of the existing and future roadway system. This Plan includes established local policies, standards, and guidelines to implement the future roadway network vision that is coordinated with respect to county, regional, and state plans in such a way that the transportation system enhances quality economic and residential development within Empire Township.

II. TRANSPORTATION SYSTEM PRINCIPLES AND STANDARDS

The transportation system principles and standards included in this Plan create the foundation for developing the transportation system, evaluating its effectiveness, determining future system needs, and implementing strategies to fulfill the goals and objectives identified.

A. FUNCTIONAL CLASSIFICATION

It is recognized that individual roads and streets do not operate independently in any major way. Most travel involves movement through a network of roadways. It becomes necessary to determine how this travel can be channelized within the network in a logical and efficient manner. Functional classification defines the nature of this channelization process by defining the part that any particular road or street should play in serving the flow of trips through a roadway network. Functional classification is the process by which streets and highways are grouped into classes according to the character of service they are intended to provide. Functional classification involves determining what functions each roadway should perform prior to determining its design features, such as street widths, speed, and intersection control.

The functional classification system typically consists of four major classes of roadways: Principal Arterials, Minor Arterials, Major Collectors, and Minor Collectors. The existing roadways are described below and illustrated in Figure 2.1 – Existing Roadway Functional Classification.

PRINCIPAL ARTERIALS

Roadways of this classification typically connect large urban areas to other large urban areas or they connect metro centers to regional business concentrations via a continuous roadway without stub connections. They are designed to accommodate the longest trips. Their emphasis is focused on mobility rather than access, and as such private access should not be allowed. They connect only with other Principal Arterials, interstate freeways, and select Minor Arterials and Collector Streets. Principal Arterials are responsible for accommodating thru-trips, as well as trips beginning or ending outside of the Empire Township area.

There are no principal arterials within Empire Township. The nearest principal arterial is Trunk Highway (TH) 52, located east of Empire Township. It connects Rochester to the Twin Cities metro area. North of Empire Township is Dakota County State Aid Highway (CSAH) 42, which connects TH 52 to Interstate (I) 35.

MINOR ARTERIALS

Roadways of this classification typically link urban areas and rural Principal Arterials to larger towns and other major traffic generators capable of attracting trips over similarly long distances. Minor Arterials service medium length trips, and their emphasis is on mobility as opposed to access in urban areas. They connect with Principal Arterials, other Minor Arterials, and Collector Streets. Connections to Local Streets should be avoided if possible, and private access should not be allowed. Minor Arterials are responsible for accommodating thru-trips, as well as trips beginning or ending outside the Empire Township area. Minor Arterial roadways are typically spaced approximately 1 – 2 miles apart in developing communities similar to Empire Township. Within Empire Township, TH 3, CSAH 46, CSAH 66, and TH 50 are Minor Arterials.

In the Twin Cities Metropolitan Area, there is a further breakdown of Minor Arterial roadways to establish federal funding priorities, “A-Minor” and “B-Minor.” The A Minor Arterial classifications include Relievers, Expanders, Connectors, and Augmenters. As defined by the Twin Cities Metropolitan Council, Relievers provide ‘open up’ capacity for traffic on Metropolitan Highway Principal Arterials. Augmenters supplement the Principal Arterials within the Beltway. Expanders provide connection between developing areas outside the beltway, and connect Principal Arterials. Connectors provide links between rural town centers in the urban reserve and rural area. Figure 2.1 distinguishes between the types of Minor Arterial corridors.

TH 3 is an A-Minor Arterial Connector. It connects the City of Faribault in the south, through central Dakota County, to I-494 in Inver Grove Heights. West of Biscayne Avenue, CSAH 46 is designated as an A-Minor Arterial Expander. East of Biscayne Avenue the route is an A-Minor Arterial Connector. The route provides east-west connectivity through Dakota County between I-35 and the City of Hastings. CSAH 66 is designated as a B-Minor Arterial between TH 3 and Biscayne Avenue, and to the east the route is an A-Minor Arterial Connector. The route provides east-west connectivity between TH 3 and TH 52 to the City of Vermillion. TH 50 is an east-west corridor providing connectivity between TH 3 and TH 52, TH 61 and the Cities of Hampton, Miesville, and Red Wing. It is designated as an A-Minor Arterial Connector.

MAJOR COLLECTORS

Roadways of this classification typically link neighborhoods together within a community, or they link neighborhoods to business concentrations. In highly urban areas, they also provide connectivity between major traffic generators. A trip length of less than 5 miles is most common for Major Collector roadways. A balance between mobility and access is desired. Major Collector street connections are predominately to Minor Arterials, but they can be connected to any of the other four roadway functional classes. Local access to Major Collectors should be provided via public streets and individual property access should be avoided. Major Collector streets are predominantly responsible for providing circulation within a community such as Empire Township, and are typically spaced approximately ½ to 1 mile apart in urbanizing areas. An example of a Major Collector roadway is 170th Street between CSAH 31/Pilot Knob Road and TH 3.

MINOR COLLECTOR STREETS

Roadways of this classification typically include urban streets and rural township roadways, which facilitate the collection of local traffic and convey it to Major Collectors and Minor Arterials. Minor Collector streets serve short trips at relatively low speeds. Their emphasis is focused on access rather than mobility. Minor Collectors are responsible for providing connections between neighborhoods and the Major Collector/Minor Arterial roadways. These roadways should be designed to discourage short-cut trips through the neighborhood by creating jogs in the roadway (i.e. not direct, through routes). 197th Street and Dakota County Road (CR) 81 from TH 50 to CSAH 46 are examples of Minor Collector roadways.

LOCAL STREETS

Roadways of this classification typically include urban streets and rural township roadways, which facilitate the collection of local traffic and convey it to collectors and Minor Arterials. Their emphasis is to provide direct property access.

B. ROADWAY CAPACITY

Capacities of roadway systems vary based on the roadway's functional classification. From the Metropolitan Council Local Planning Handbook, roadway capacity per lane for divided arterials is 700 to 1,000 vehicles per hour and 600 to 900 vehicles per hour for undivided arterials. These values tend to be around 10% of the daily physical roadway capacity.

PRINCIPAL AND MINOR ARTERIALS

Based on the capacities noted above, a two lane arterial roadway has a daily capacity of 12,000 to 18,000 vehicles per day, a four-lane divided arterial street has a daily capacity of 28,000 to 40,000 vehicles per day, and a four-lane freeway has a daily capacity of approximately 70,000 vehicles per day. The variability in capacities are directly related to many roadway characteristics including access spacing, traffic control, adjacent land uses, as well as traffic flow characteristics, such as percentage of trucks and number of turning vehicles. Therefore, it is important that the peak hour conditions are reviewed to determine the actual volume-to-capacity on roadway segments with average daily traffic volumes approaching these capacity values.

MAJOR COLLECTORS AND MINOR COLLECTOR STREETS

Major Collector and Minor Collector streets have physical capacities similar to those of a two-lane arterial street; however the acceptable level of traffic on a residential street is typically significantly less than the street's physical capacity. The acceptable level of traffic volumes on Major Collectors and Minor Collector streets vary based on housing densities and setbacks, locations of parks and schools, and overall resident perceptions. Typically, traffic levels on Major Collector streets in residential/educational areas are acceptable when they are at or below 50% of the roadway's physical capacity, resulting in an acceptable capacity of 6,000 to 9,000 vehicles per day. Acceptable traffic levels on Minor Collector streets are considerably less. Typically, a daily traffic volume of 1,000 to 1,500 vehicles per day is acceptable on Minor Collector streets in residential areas.

Table 2.1 – Roadway Types and Capacities, identifies various roadway types and the estimated daily capacities that the given roadway can accommodate.

TABLE 2.1 – ROADWAY TYPES AND CAPACITY

Roadway Type	Daily Capacities
Gravel Roadway	Up to 500
Minor Collector Street	Up to 1,000
Urban 2-Lane	7,500 – 12,000
Urban 3-Lane or 2-Lane Divided	12,000 – 18,000
Urban 4-Lane Undivided	Up to 20,000
Urban 4-Lane Divided	28,000 to 40,000
4-Lane Freeway	Up to 70,000

GRAVEL ROADWAYS

The capacity of a gravel road is physically greater than 500 vehicles per day, but based on studies conducted by Minnesota counties, it has been determined that an ADT over 500 justifies paving the roadway. This is justified due to the maintenance costs of keeping a gravel road in working condition when ADT is over 500, and balancing this against the pavement costs, pavement life, and maintenance costs of a paved roadway with the same volumes.

The capacity of a transportation facility reflects its ability to accommodate a moving stream of people or vehicles. It is a measure of a supply side of transportation facilities. Level of Service (LOS) is a measure of the quality of flow. The concept of LOS uses qualitative measures that characterize operational conditions with a traffic stream and their perception by motorists. Six LOS are defined for roadways. They are LOS A, B, C, D, E, and F. LOS A represents the best operating conditions and LOS F represents the worst. The LOS of a multilane roadway can be dictated by its volume-to-capacity (v/c) ratio. The LOS of a two-lane roadway is defined in terms of both percent time-spent-following and average travel speed. LOS F is determined when v/c ratio is over 1.00. The criteria for LOS and general v/c ratio for multilane highways and speed for two-lane highways are provided in Table 2.2 below.

TABLE 2.2 – HIGHWAY LEVEL OF SERVICE

Level of Service	Multilane v/c Ratio	Two-Lane Average Travel Speed (mph)
A	<0.28	>55
B	>0.28 – 0.45	>50-55
C	>0.45 – 0.65	>45-50
D	>0.65 – 0.86	>40-45
E	>0.86 – 1.00	≤40
F	> 1.00	v/c >1.00

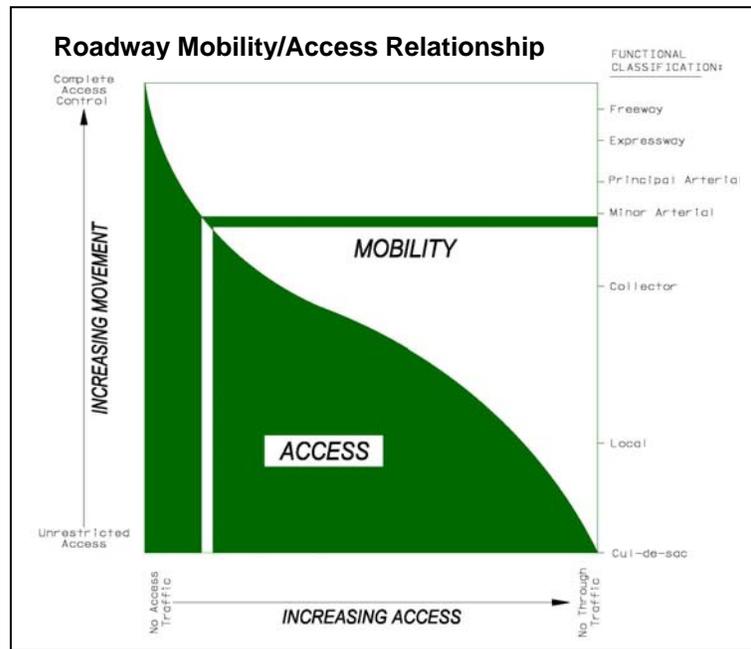
Generally, Empire Township should consider capacity improvements on roadways with a LOS D or worse and volume-to-capacity ratios over 0.75 during the peak hours.

C. ACCESS MANAGEMENT GUIDELINES

Access management guidelines are developed to maintain traffic flow on the network so each roadway can provide its functional duties, while providing adequate access for private properties to the transportation network. This harmonization of access and mobility is the keystone to effective access management.

Mobility, as defined for this Transportation Plan, is the ability to move people, goods, and services via a transportation system component from one place to another. The degree of mobility depends on a number of factors, including the ability of the roadway system to perform its functional duty, the capacity of the roadway, and the operational level of service on the roadway system.

Access, as applied to the roadway system in Empire Township, is the relationship between local land use and the transportation system. There is an inverse relationship between the amount of access provided and the ability to move through-traffic on a roadway. As higher levels of access are provided, the ability to move traffic is reduced. The graphic below illustrates the relationship between access and mobility.



Each access location (i.e. driveway and/or intersection) creates a potential point of conflict between vehicles moving through an area and vehicles entering and exiting the roadway. These conflicts can result from the slowing effects of merging and weaving that takes place as vehicles accelerate from a stop turning onto the roadway, or deceleration to make a turn to leave the roadway. At signalized intersections, the potential for conflicts between vehicles is increased, because through-vehicles are required to stop at the signals. If the amount of traffic moving through an area on the roadway is high and/or the speed of traffic on the roadway is high, the number and nature of vehicle conflicts are also increased.

Accordingly, the safe speed of a road, the ability to move traffic on that road, and safe access to cross streets and properties adjacent to the roadway all diminish as the number of access points increase along a specific segment of roadway. Because of these effects, there must be a balance between the level of access provided and the desired function of the roadway.

In Empire Township, access standards and spacing guidelines are recommended as a strategy to effectively manage existing ingress/egress onto Township streets and to provide access controls for new development and redevelopment. The proposed access standards (driveway dimensions) are based on Minnesota Department of Transportation (Mn/DOT) State-Aid design standards. It should be noted that Empire Township has access authority for those roadways under their jurisdiction. Likewise, Dakota County and Mn/DOT have access authority for roadways under their jurisdiction. To further the relationship of access and mobility throughout the Empire Township area, the Township supports managing access consistent with the roadway mobility and access relationship figure above and supports the access spacing guidelines of other roadway jurisdictions. Tables 2.4 and 2.5 below present the proposed access standards and access spacing for the Empire Township roadway network. Please refer to Dakota County's minimum access spacing guidelines identified in their current Transportation Plan.

TABLE 2.3 – ROADWAY ACCESS STANDARDS

Driveway Dimensions	Residential	Commercial or Industrial
Driveway Access Width	11' – 22' (16' desired)	16' – 32' (32' desired)
Minimum Distance Between Driveways	20'	20'
Minimum Corner Clearance from a Collector Street	60'	80' ⁽¹⁾

⁽¹⁾ At the discretion of the Township Engineer, 80' minimum

TABLE 2.4 – ACCESS SPACING GUIDELINES FOR COLLECTOR ROADWAYS IN EMPIRE TOWNSHIP

Type of Access by Land Use Type ⁽¹⁾	Major Collector	Minor Collector
Low & Medium Density Residential		
Private Access	Not Permitted ⁽²⁾	As Needed ⁽³⁾
Minimum Corner Clearance from a Collector Street	660'	300'
Commercial, Industrial or High Density Residential		
Private Access	Not Permitted ⁽²⁾	As Needed ⁽³⁾
Minimum Corner Clearance from a Collector Street	660'	660'

⁽¹⁾ These guidelines apply to Township streets only. Dakota County and Mn/DOT have access authority for roadways under their jurisdiction. Please refer to Dakota County's minimum access spacing guidelines identified in their current Transportation Plan.

⁽²⁾ Access to Major Collectors is limited to public street access. Steps should be taken to redirect private accesses on Major Collectors to other local streets. New private access to Major Collectors is not permitted unless deemed necessary.

⁽³⁾ Private access to Minor Collectors is to be evaluated by other factors. Whenever possible, residential access should be directed to non-continuous streets rather than Minor Collector roadways. Commercial/Industrial properties are encouraged to provide common accesses with adjacent properties when access is located on the Minor Collector system. Cross-traffic between adjacent compatible properties is to be accommodated when feasible. A minimum spacing between accesses of 660' in commercial, industrial, or high density residential areas is encouraged for the development of turn lanes and driver decision reaction areas.

D. GEOMETRIC DESIGN STANDARDS

Geometric design standards are directly related to a roadway's functional classification and the amount of traffic that the roadway is designed to carry. For Empire Township, geometric design standards were developed based on Mn/DOT State-Aid standards. The proposed geometric design standards for Major and Minor Collector roadways are illustrated in Figures 2.2 and 2.3 respectively. These design standards were developed to achieve adequate capacity within the roadway network, as well as a level of acceptance by adjacent land uses, given the constraints associated with the existing development pattern. Each component identified in the typical sections is essential to a particular roadway's ability to perform its function in the roadway network.

ROADWAY WIDTH

Roadway and travel lane widths are directly associated with a roadway's ability to carry vehicular traffic. On Major Collector roadways and Minor Collector streets, a 12' lane is recommended for each direction of travel. The 24' total travel width is recommended to accommodate anticipated two-way traffic volumes. In addition to the travel width, a minimum 6' shoulder lane width accommodates pedestrian and bicycle traffic, parked or stalled vehicles, and maintenance activity. Roadway widths not meeting the Geometric Design Standards results in decreased performance of the particular roadway and additional travel demand on the adjacent roadway network components. For example, a sub-standard Major Collector roadway may result in additional travel demand on an adjacent Minor Collector or local street, resulting in an overburden for adjacent landowners. Similarly, additional local circulation on an adjacent Minor Arterial results in reduced mobility for regional trips.

DESIGN SPEED

The design speed of a roadway is directly related to the roadway's function in the roadway system. The focus of Minor Arterial roadways is mobility; therefore these roadways should be designed to accommodate higher travel speeds. Likewise, Minor Collector roadways are more focused on accessibility and should be designed to accommodate lower travel speeds. The function of Major Collectors is balanced between mobility and accessibility; therefore these roadways should be designed accordingly. Table 2.5 below presents the recommended design speed for the Empire Township roadway network.

TABLE 2.5 – ROADWAY DESIGN SPEED GUIDELINES

Functional Classification	Design Speed ⁽¹⁾
Minor Collector Street	30 mph
Major Collector Roadway	35 – 40 mph
Minor Arterial Roadway	45 – 55 mph

⁽¹⁾ At the discretion of the Township Engineer for Township roadways, with approval by the Town Board

RIGHT-OF-WAY WIDTH

Right-of-way width is directly related to the roadway’s width and its ability to carry vehicular and pedestrian traffic in a safe and efficient manner. The roadway right-of-way widths identified in Figures 2.2 and 2.3 are the minimum required for Major and Minor Collector streets, respectively. For Minor Collector streets in residential areas, a minimum right-of-way width of 66’ is necessary for the added roadway width, as well as to provide added setback distance between the roadway and homes along the roadway. Right-of-way widths greater than 66’ may be required on Major Collector roadways within commercial areas to accommodate the potential for higher traffic volumes and the need for additional through or turning lanes. All right-of-way requirements may be increased at the discretion of the Township Engineer, with approval by the Town Board. Please refer to Dakota County’s right-of-way requirements for county roads in their current Transportation Plan. The Township should obtain identified local, county, and state right-of-way through any proposed redevelopment process to accommodate long-term roadway and sidewalk/trail needs.

BIKEWAYS, SIDEWALKS AND TRAILS

In addition to these standards for Township collector roadways, the state and county arterial and collector roadways should include components of the Township’s transportation system, and a bituminous trail is recommended on both sides of the roadway. Similar to the type of travel on the adjacent roadway, the trail will accommodate higher volumes and longer pedestrian and bicycle trips. A 10’ width is preferable because it would better accommodate two-way travel safely. Through the existing developed portions of the Township, 6’ wide on-street bikeways are recommended, and when possible a 5’ walk on at least one side. Design and accommodations for non-motorized traffic facilities in Empire Township follow the Mn/DOT Bikeway Facility Design Manual; Americans with Disabilities Act (ADA);

AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities; FHWA Designing Sidewalks and Trails, Part II, Best Practices Design Guide; and FHWA Design Guidance, Accommodating Bicycle and Pedestrian Travel: A Recommended Approach. The Township will continue to work with Dakota County and Mn/DOT to plan, evaluate, and design non-motorized facilities and integrate the facilities into reconstruction efforts. At the discretion of the Township, the requirements for trails, sidewalks, bikeways, and shoulders may vary.

E. ROADWAY JURISDICTION

Roadway jurisdiction directly relates to functional classification of roadways. Generally, roadways with higher mobility functions (such as arterials) should fall under the jurisdiction of a regional level of government. In recognizing these roadways serve greater areas resulting in longer trips and higher volumes, jurisdiction of Principal Arterial and Minor Arterial roadways should fall under the jurisdiction of the state and county, respectively. Similarly, roadways with more emphasis on local circulation and access (such as collectors) should fall under the jurisdiction of the local government unit. These roadways serve more localized areas and result in shorter trip lengths and lower volumes. Major Collector and Minor Collector roadways should fall under the jurisdiction of Empire Township. As roadway segments are considered for turn-back to the Township, efforts will be taken to evaluate the roadway features for conformance to current standards, structural integrity, and safety. This effort will help the Township develop short and long-range programs to assume the responsibilities of jurisdictional authority.

In Empire Township, three jurisdictions have responsibility for the overall road network. Mn/DOT is responsible for TH 3 and TH 50. Dakota County is responsible for CSAH 46, CSAH 66, CR 72, 79, and 81. Empire Township is responsible for all remaining roadways.

F. TRANSIT

It is recognized that various methods of travel impact the economic vitality of a community, county, or broader region. The term transit applies to all forms of sharing rides, regardless of whether the service is provided by a public or private operator, organization, or individual vehicle owner, or whether the ridesharing arrangements are formal or informal. Most transit rides, however, are provided by formal transit systems, at least during the morning and afternoon peak travel periods.

Based on the needs of a community, transit systems may be established to accommodate trips that are internal within the community (internal to internal), trips that begin in the community and end somewhere outside of the community (internal to external), and/or trips that begin outside of the community and end within the community (external to internal). An example of an internal to internal trip may be a trip that begins at a home in Empire Township and ends at a place of employment such as the Metropolitan Council Wastewater Treatment facility. An internal to external trip may be a trip that begins at a home in Empire Township and ends at the

Dakota County Courthouse in Hastings. A trip that begins at a home in Apple Valley and ends at Southern Hills Golf Club is an example of an external to internal trip.

Generally, communities with dial-a-ride as an initial service explore the feasibility of providing a fixed route schedule to connect residents with businesses, schools, places to shop, and employment centers. Empire Township is in such a situation with Dakota County providing limited dial-a-ride service throughout the community.

III. EXISTING TRANSPORTATION SYSTEM EVALUATION

The existing transportation system within Empire Township currently provides sufficient transportation service to the Township.

A. EXISTING TRAFFIC VOLUMES AND CAPACITY ISSUES

The existing traffic volumes in the area were collected by Mn/DOT and Dakota County and are represented in Figure 3.1 – Existing Average Daily Traffic Volumes. Volume to capacity analysis of the average daily traffic volumes indicates that TH 3 on the western edge of Empire Township, CSAH 46 west of CSAH 33, and CSAH 46 from Biscayne Avenue to Blaine Avenue are periodically congested, but no roadway segments within Empire Township are currently operating at a near congested or congested level.

Capacity improvements are recommended on any roadway with a future level of service of D, E, or F, as defined in the roadway capacity discussion within the Roadway Capacity section. Roadways identified above as near congested (having a volume to capacity ratio between 0.75 and 1) or congested (having a volume to capacity ratio greater than 1) are recommended to be monitored and programmed for capacity improvements when necessary. Roadways that are periodically congested (having a volume to capacity ratio between 0.5 and 0.75) are generally identified as providing an acceptable level of service.

B. SAFETY AND MOBILITY

A planning-level analysis of the existing transportation system in Empire Township was completed and included evaluating crash records for the types of accidents most commonly occurring and to determine where accident trends may exist. In the five year time period from January 1, 2002 through December 31, 2006, there were 267 crashes on the roadways within or directly adjacent to Empire Township. Locations with the highest accident frequency are at the intersections of TH 3 at CSAH 46 and CSAH 46 at Chippendale Avenue. Both of these intersections have crash rates 1.3 times higher than the state average for similar intersections. Of the 267 crashes, 50 included injuries, 48 had possible injuries, and 169 involved property damage only. Rear end crashes represented 19% of the crashes, and 16% were right angle crashes. Additionally, Section III-D discusses findings of the TH 3 safety audit.

C. JURISDICTIONAL ISSUES

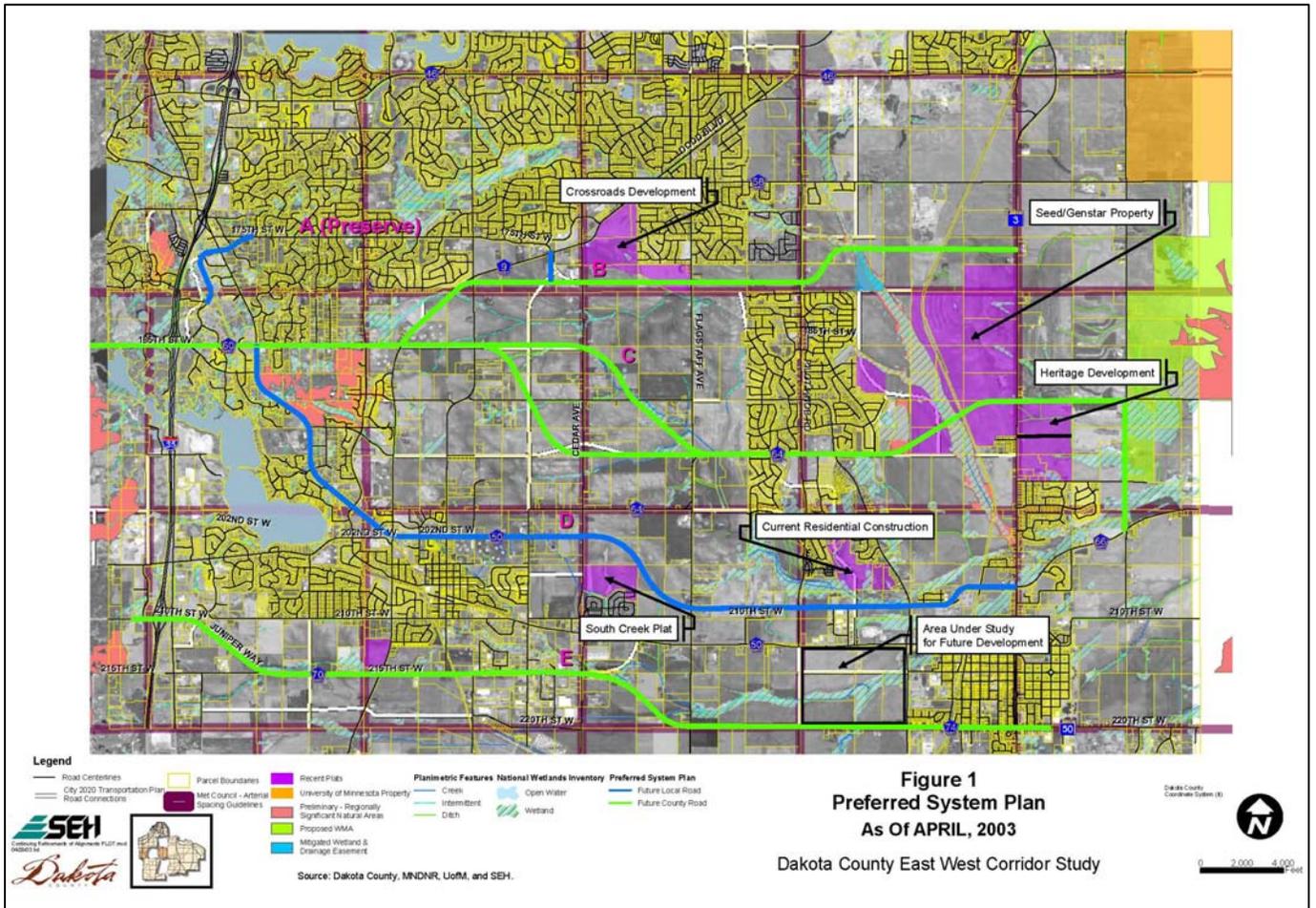
According to the 2025 Dakota Transportation Plan, Blaine Avenue north of 190th Street is identified as a potential jurisdictional transfer from the Township to the County in the future, extending CR 79 to CSAH 46. Due to UMore Park's plans to convert part of their property around Blaine Avenue to a potential nature reserve, the transfer could be reconsidered.

D. RELEVANT AREA TRANSPORTATION STUDIES

Several studies have been completed in recent years to provide direction relative to the development of the Empire Township's roadway system.

DAKOTA COUNTY EAST-WEST CORRIDOR PRESERVATION STUDY – 2003¹

The purpose of the study was to identify a preferred corridor preservation plan that had the consensus of study partners to preserve corridors for future transportation system improvements as development continues to occur. The result was identification of five east-west preservation corridors to be preserved to provide continuous east-west travel across the County. The study also recommended preservation treatments and key assessment findings. Alignments B, C, and D most directly affect Empire Township and are described in this Plan. The Preferred System Plan is illustrated below.



¹ SEH, Dakota County East-West Corridor Preservation Study, June 2003.

Alignment B –East of Cedar Avenue, a 120’ wide corridor under County jurisdiction was identified for preservation of to address land use constraints.

Alignment C – This corridor is identified as a potential four-lane arterial facility with a 150’ wide right-of-way preserved under County jurisdiction. Alignment D – Preserve Alignment D for development as a potential two-lane collector or a three-lane urban street facility with a 100’ width under local jurisdiction. The City of Farmington has indicated that a low design speed, three-lane urban section may be desirable through the industrial park area and adjacent to the school. In addition, the City has identified constrained sections where less than 100’ of right-of-way may be acceptable for a two-lane urban street design. These issues will be addressed by the City of Farmington as Alignment D is developed in more detail. Based on the current orderly annexation agreement with Farmington, Empire Township will have jurisdiction of that part of the corridor located between the railroad tracks and TH 3.

DAKOTA COUNTY EAST-WEST CORRIDOR PRESERVATION STUDY PHASE 2 – 2006²

The purpose of the Phase 2 study was to focus on 3 east-west preservation corridor alignment segments to further refine the alignments. These refinements include a revised location for Alignment B between Highview Avenue to TH 3, a refinement to Alignment C between Cedar Avenue and Flagstaff Avenue, and an extended alignment location for Alignment C east of Biscayne Avenue. The refinements to Preferred System Plan are illustrated below and those impacting the Empire Township area are described below.



Alignment B – A preservation corridor width of 120’ east of Cedar Avenue for development as a potential four-lane arterial facility.

Alignment C East of Biscayne Avenue – Preservation corridor of 150’ on Biscayne Avenue alignment. Preservation corridor of 110’ on the County Highway 66 alignment.

² SEH, Dakota County East-West Corridor Preservation Study, November 2006.

The study identified that more detailed study is needed to determine the preferred County Highway 66 preservation corridor alignment in the area of Highway 52 including the Highway 52 interchange location and configuration. Dakota County will continue to monitor this area in collaboration with Vermillion Township to determine the appropriate timing for a more detailed alignment/environmental study effort.

SAND & GRAVEL MINING ENVIRONMENTAL IMPACT STATEMENT (EIS)

The traffic impact study associated with the sand and gravel mining EIS considered the traffic impacts associated with the removal and processing of approximately 200 million tons of sand and gravel resources within the mining area illustrated in Figure 2.1. The study provided a detailed analysis of potential traffic impacts that may result and identified options for mitigating the impacts. Goal 8 of the Mitigation Plan from the Final EIS identifies the specific mitigation strategies relating to traffic.

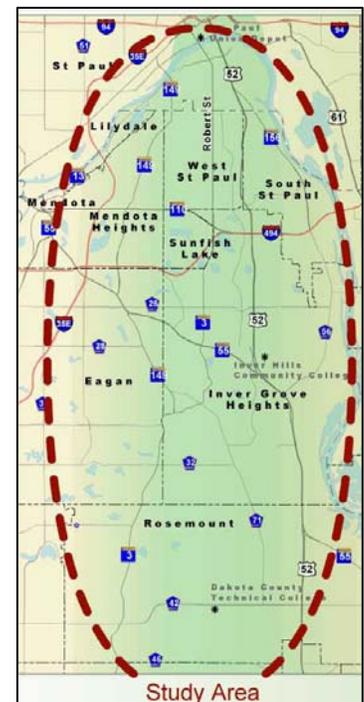
ROAD SAFETY AUDIT³

A road safety audit (RSA) was conducted for TH 3 from CSAH 46 (160th Street West) to CSAH 50 (Elm Street) in the City of Farmington and Empire Township. A RSA is a tool where the safety performance, design, and operation of roadways and intersections are examined by an independent multi-disciplinary team. The report provides short range, mid-range (2-10 years), and long-range (20+ years) recommendations for the TH 3 corridor and the intersections of CSAH 46/160th Street, 170th Street, 194th Street, 197th Street, 200th Street, 205 Street, CSAH 66, 209th Street, and CSAH 50/Elm Street.

ROBERTS STREET CORRIDOR⁴

A feasibility study was initiated to develop a long term vision for transit service in the corridor that responds to transportation issues and challenges, provides information to assist decision makers to address land use and transportation issues to support a transit investment, and guides short term transit improvements. The study area extends into northern Empire Township and included the development and evaluation of alternatives to ultimately identify a recommended approach to work towards the long term vision. Transit modes studied included express bus, limited stop bus rapid transit, streetcar or trolley, light rail transit, and commuter rail. The recommended approach was to

- Build a foundation of transit ridership with expanded bus options



³ SRF, Road Safety Audit – TH 3 from CSAH 46 to CSAH 50, December 2006.

⁴ URS, CR Planning, Connetics Transportation Group, Robert Street Corridor Transit Feasibility Study, November 2008.

- Institute transit orientated development policies to transform corridor land use
- Develop dedicated sources of funding for transit operations and capital investments
- Amend federal transit funding criteria to recognize a wider range of public transit benefits
- Develop a regional rail integration plan to define interfaces to other rail transit corridors and access to the downtown cores
- Develop public/private partnerships to promote corridor needs and opportunities



Short and medium term actions consistent with the long term vision were developed. The long term vision includes a transitway from downtown St. Paul to Rosemount linking major destinations in southern Ramsey and northern Dakota Counties. The vision focuses on providing Improved mobility and accessibility to activity centers in downtown St. Paul, Dakota County Northern Service Center, Inver Hills Community College, Thomson Reuters, and Dakota County Technical College

- A sustainable transportation option for development of UMore Park
- Transit options for the planned growth areas of Inver Grove Heights and Eagan
- Opportunities to focus and enhance new transit orientated development at designated station sites

UMORE PARK⁵

The University of Minnesota owns 12 square mile area of land in Rosemount and Empire Township known as U More Park. These 12 sections remain mostly undeveloped. The University of Minnesota Outreach, Research and Education (UMore) Park is the largest contiguous property in the United States that is owned by a land grant university. The vision to build a University-founded community at UMore Park is a 25 to 30 year endeavor. Values contributed to this mission include the integrated elements of education, health, energy, environment, transportation and interdisciplinary strengths. The community will provide the pathway to

- A unique and lasting University legacy of discovery and research-based education that helps to sustain people and communities in the region over the generations
- A vital regional economy that is characterized by enriched communities, thriving businesses, and educational, social and natural amenities
- An attractive locale to live in, work in and visit that incorporates University research and education to achieve quality of life, innovation, a sense of place, close connection with the natural environment and sustainability
- A growing University endowment that supports the academic mission in perpetuity

Planning is underway for a unique, vibrant, intellectually and culturally rich, sustainable community of 20,000 to 30,000 people. The northern portion of UMore Park is located in the City of Rosemount; the southern portion is within Empire Township. Suburban development characterizes the area to the north and west of UMore Park, while low-density agricultural use and conservation land predominated the south and east.

As the planning moves forward and various portions of UMore Park are developed or mined, in either case more traffic will be generated for Empire Township and other jurisdictional roadways. Mining will generate temporary traffic, but in the form of large vehicles, trucks. Residential and business development will generate more permanent traffic loads on the road system.

Vermillion Highlands is a 2,822 acre area located in the southern-most area of UMore Park. It is currently under joint management by the University and the Minnesota Department of Natural Resources in conjunction with Dakota County. By action of the legislature and the Governor in May 2006, the University will deed this segment of the property to the State of Minnesota in 2032, to be maintained as a natural area for public access. The University has rights in perpetuity for research, education and public engagement on the property.

⁵ <http://www.umorepark.umn.edu/> . Retrieved on February 26, 2008.

VERMILLION HIGHLANDS REGIONAL PARK⁶

In May 2008, protection of the Butler Trust property became a reality. The 816 acres, acquired and managed by Dakota County, the Minnesota Department of Natural Resources (DNR), and the University of Minnesota, will become part of a 4,000-acre natural area complex in central Dakota County.

The Butler Trust property provides the critical connection between the 475-acre Vermillion River Aquatic and Wildlife Management Area (WMA) and the 2,840-acre Vermillion Highlands Research, Recreation and Wildlife Management Area. Of the total 816 acres, the southern 360 acres will be acquired by DNR for an expansion of the adjacent WMA. The northern 456 acres will become a new Dakota County regional park.

⁶ <http://www.co.dakota.mn.us/CountyGovernment/Projects/FarmlandNaturalArea/News+and+Program+Updates.htm>. Retrieved on April 22, 2009.

E. MULTIMODAL TRANSPORTATION OPPORTUNITIES

It is recognized that various methods of travel impact the economic vitality of a township, city, county, or broader region.

RAIL

The Canadian Pacific Railroad (CP) runs north-south through the western portion of the Township. The trains system intersects with CSAH 46 and 170th Street in the Township.

TRANSIT SERVICE

There are currently no fixed transit routes or passenger facilities within Empire Township. The Township is designated by the Metropolitan Council as a Transit Market Area IV. Service options for Market Area IV include dial-a-ride, volunteer driver programs, and ride sharing. As a result, minimal transit service is provided by Dakota Areas Resources and Transportation for Seniors (DARTS) by means of a dial-a-ride service for seniors and physically and economically disadvantaged persons is provided. Dial-a-ride service is a reservation-only, shared ride transit service.

AVIATION

West of Empire Township is Airlake Airport in Lakeville, which is the nearest airport. Airlake primarily serves private business travel and personal recreational travel needs and features a single 4,098' runway. Broad assortments of international, domestic, and regional airlines fly from the Minneapolis-St. Paul International Airport.

SIDEWALKS AND TRAILS

Empire Township has some local trails that serve the residential neighborhoods east of TH 3 from 203rd Street to just north of 197th Street. The trail system begins slightly north of 203rd Street and runs in a northeasterly direction to connect with 197th Street. The trail commences northwest from 197th Street through the residential subdivisions.

IV. FUTURE TRANSPORTATION SYSTEM

The transportation system in the Empire Township area is in a rural to urban transition in response to the growth experienced in recent years and the anticipated growth for this area. As growth continues to occur, it will be important for the Township to develop a roadway system that is efficient and consistent with the transportation system principles and standards outlined in Section II.

A. FUTURE ROADWAY CORRIDORS

The Land Use Plan illustrates the projected future land uses within the 2030 urban growth boundary. A supporting future road network has been developed in consideration of the 2030 urban growth boundary and is illustrated in Figure 4.1 – Recommended Future Roadway Functional Classification. This network has been developed in consideration of the proposed land uses, the Dakota County 2025 Transportation Plan, and the various studies and related corridor purposes outlined in Section III–D. The transportation system for some of the area outside of the 2030 urban growth boundary is currently being evaluated in the Rosemount / Empire / UMore Transportation System Study. Based on the outcome of this study, the Township may consider amending this Plan to incorporate findings.

A suitable arterial-collector system to accommodate future development and traffic patterns is necessary in the growing community of Empire Township. The existing county and state highways have historically provided much of the local circulation and connectivity; however these roadways will not be capable of meeting both the future local and regional travel demands. A Township collector system is needed to provide acceptable local circulation and access to developing areas, as well as to enable the Principal Arterial and Minor Arterial roadways to serve longer, regional travel. It is not anticipated that all of the proposed collector streets will be constructed by 2030; rather, collector streets should be constructed as development occurs. As the urban growth boundary is amended over time, additional studies will be necessary to determine specific roadway alignments and intersection spacing.

The roadway corridors identified are conceptual, based on network needs, and should be used as a guide for development of the Township’s roadway system. In most cases, the actual roadway alignments are flexible to meet the needs of future development, at the discretion of the Township Engineer. New or re-designated roadways within the 2030 growth boundary necessary to support the land uses identified in Land Use Plan and future traffic growth include Minor Collector corridors. Routes paralleling TH 3 on the east and west side of TH 3 and Biscayne Avenue would serve local trips and allow the Minor Arterial routes to accommodate regional trips. East-west Minor Collector corridors along 197th Street and the north urban growth boundary will provide similar benefits.

The transportation system for some of the area outside of the 2030 urban growth boundary is currently being evaluated in the Rosemount/ Empire/UMore Transportation System Study. Based on the outcome of this study, the Township may consider amending this Plan to incorporate the study findings. Additionally, there are some existing and future corridors outside of the 2030 urban growth boundary and the Rosemount/ Empire/UMore Transportation System Study area that should be considered as Major Collector corridors if the Township pursues amending its 2030 growth boundary or annexation agreement with the City of Farmington at some time in the future to allow for urban development. These routes include CR 72 and Ahern Boulevard. The purpose of considering these corridors as future Major Collectors would be to provide options for local traffic to move through the area without relying on the Minor Arterial roadway system for local trips.

B. FORECASTED TRAFFIC VOLUMES

Average annual daily traffic volumes were forecasted for Minor Arterial and Principal Arterial roadways based on the future land use vision within the urban growth boundary identified in the Land Use Plan. Exhibit B – Transportation Analysis Zone Breakdown illustrates the Township’s planned households, population, and employment in 2030. These future traffic volumes are illustrated in Figure 4.2 – 2030 Forecasted Average Daily Traffic Volumes. Existing traffic volumes were obtained from Mn/DOT, and traffic growth rates were factored into the forecasts. Details regarding traffic forecasting methodology are provided in Section VI.

C. ROADWAY SAFETY & CAPACITY NEEDS

The forecasted average annual daily travel demands approach or exceed daily capacities on several corridors. Generally, the recommended Geometric Design Standards and associated right-of-way width requirements located within Section II–D (Geometric Design Standards) will provide sufficient capacity to accommodate future traffic volumes on the Township’s roadways. Table 2.1 – Roadway Types and Capacities identifies various roadway types and the daily capacities that the given roadway can accommodate.

Exhibit A provides historical and projected 2030 traffic volumes, capacities, and volume-to-capacity ratios. Capacity improvements are recommended on any roadway with a future level of service of D, E, or F, as defined in Section II–B. Roadways identified as near congested (having a volume to capacity ratio between 0.75 and 1) or congested (having a volume to capacity ratio greater than 1) are recommended to be monitored and programmed for capacity improvements when necessary. Roadways that are periodically congested (having a volume to capacity ratio between 0.5 and 0.75) are generally identified as providing an acceptable level of service. Corridors and associated strategies recommended for capacity improvements are summarized for each roadway identified below with a volume to capacity ratio over 0.5:

STATE ROADWAYS

The entire length of TH 3 as it extends north from the City of Farmington is forecasted to be congested based on its current design. The Sand & Gravel Mining EIS Traffic Impact Study summarized in Section III-C recognized that TH 3 would need to be expanded to a 4-lane facility as the area grows. These improvements are anticipated to be sufficient to handle the anticipated growth within Empire Township. The intersection of TH 3/CR 64 is currently being constructed by Mn/DOT and Dakota County. This is being constructed as a one-lane roundabout but has provisions to expand it to a two-lane roundabout as traffic increases and TH 3 is expanded. This design is compatible with the forecasted traffic volumes.

The intersection of TH 3 with 170th Street is expected to experience further delay and safety issues as traffic volumes increase. A change in intersection control is anticipated to be needed in the future. This is consistent with the Sand & Gravel Mining EIS Traffic Impact Study conclusions.

The intersection of TH 3 at CSAH 46 has a high crash rate when compared to similar intersections throughout the state. The intersection is currently signalized and a change in control is not anticipated at this time.

As traffic increases on TH 3, there is likely to be an increase in safety issues. The road safety audit (RSA) that was conducted for TH 3 from CSAH 46 (160th Street West) to CSAH 50 (Elm Street) in the City of Farmington and Empire Township provides safety improvements that are to be considered as traffic increases. The report provides short range, mid-range (2-10 years), and long-range (20+ years) recommendations for the TH 3 corridor.

The Township will work with Mn/DOT and Dakota County to implement the TH 3 EIS and TH 3 RSA study conclusions, review and monitor traffic volumes and intersection operations, obtain additional right-of-way, as well as stage improvement strategies that will become necessary as development occurs.

TH 50 east of the City of Farmington is forecasted to be periodically congested based on its current design. This periodic congestion is anticipated to be evident all the way to the City of Hampton. Although traffic can likely be handled by the current design for quite some time, eventual improvements to the corridor may include adding left turn lanes or right-turn bypass lanes at intersections where there are a significant turning volumes. The Township will work with Mn/DOT and Dakota County to monitor the roadway for improvements.

COUNTY ROADWAYS

Traffic volumes on CSAH 33 north of CSAH 46 are expected to nearly triple to approximately 9,000 vehicles per day and the roadway is forecasted to be periodically congested. This roadway is just north of the Township boundary, but is expected to handle some of the traffic from the Empire Township area as it heads to the north. No expansion is anticipated to be needed, since there are multiple other routes for traffic to get to the north, including TH 3, TH 52, and Pilot Knob Road.

CSAH 46 from Pilot Knob Road (CSAH 31) to TH 52 is forecasted to be near congested or congested based on its current design. The Sand & Gravel Mining EIS Traffic Impact Study summarized in Section III-C recognized that CSAH 46 would need to be expanded to a 6-lane facility west of CSAH 33 as the area grows. East of TH 3, a 4-lane roadway or a roadway with turn lanes will likely be necessary in the future to handle the increased traffic from TH 3 to TH 52. As CSAH 46 is a recent new roadway to the area, traffic volumes have not fully balanced between CSAH 46 and CSAH 42. Improvements to CSAH 46 east of TH 3 will likely not be necessary until the capacity of CSAH 46 is expanded to the west and until more drivers use it as a route to access TH 52 and others areas to the east.

CR 64 west of TH 3 is forecasted to be near congested by 2030 based on a 2-lane rural design. There are plans by Dakota County to expand CR 64 to a four-lane facility as needed by traffic volumes. This is consistent with the roundabout design of CR 64 with TH 3.

CR 66 from TH 3 to Biscayne Avenue is forecasted to be periodically congested based on its current design. No improvements are likely to be needed.

The Township will work with Dakota County to implement the EIS study conclusions, review and monitor traffic volumes and intersection operations, obtain additional right-of-way, as well as stage improvement strategies that will become necessary as development occurs.

LOCAL ROADWAYS

Due to the prevalence of County and State roadways throughout the Empire Township area, no local roadways are anticipated to need more than two-lanes to handle future traffic to 2030.

INTERSECTIONS

Existing and proposed intersection locations may have inadequate sight distances. Sight lines at these locations may be obstructed due to horizontal and/or vertical curvature of the roadways, as well as other roadside obstructions. As future intersections are established or new land use developments route additional traffic to existing intersections, an engineering study will be required to determine the appropriate measures needed to achieve adequate intersection sight distances. These may include reconstruction of a portion of the existing through roadway, relocating the intersection, or other means to remove the sight obstruction. To accommodate necessary turn lanes, additional right-of-way may be required at the intersection.

An intersection control evaluation will be needed for advanced intersection control at intersections along TH 3 and potentially CSAH 46. The intersection control evaluation will identify the traffic control option (e.g. all way stop, roundabout, possible signalization) and capacity improvements (e.g. turn lanes) necessary to accommodate the traffic volumes in a safe and efficient manner. Intersections should be designed to properly handle the anticipated traffic through the use of turn lanes and/or alternate traffic control (e.g. all way stop, roundabout, possible signalization) at all intersections and limiting Minor Collector access along the roadway as consistent with the standards in Section II. Direct driveway access should not be allowed. Access management, as outlined in Section II-C, will be an important tool in maintaining mobility on these roadways. Right-of-way should be acquired as properties in the area develop or redevelop. The Township will work with Dakota County and Mn/DOT to implement Intersection Control Evaluations, review and monitor traffic volumes and intersection operations, obtain additional right-of-way, as well as stage improvement strategies that will become necessary as development occurs.

D. MULTIMODAL

It is important for the community to plan for the ability to accommodate multimodal activities (i.e. transit, pedestrian, and bicycle) on all non-local roadways to provide other opportunities to move about the Township and beyond.

TRANSIT SERVICE

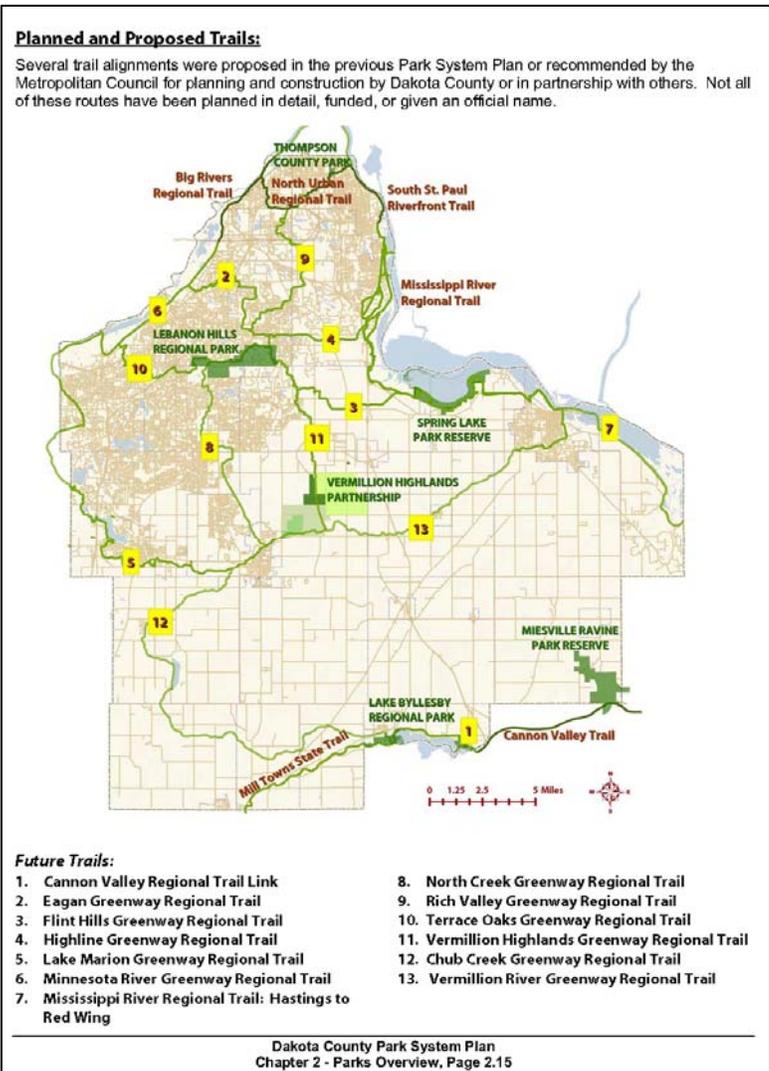
The Dakota County Transit Plan (Draft November 2007) describes the future vision for transit in the County. Different types of transit modes exist in Dakota County due to the County's size and diversity. The type of transit provided is based upon the geographic area and the need of transit riders. Although it is not a function of County government to provide transit services, it does participate in providing transit infrastructure. Current transit service options available include local regular route service, express regular route service, community based circulators, and special services.

As a Transit Service Area IV community, regular route transit service is not planned in the Township. To promote carpooling, the Township should consider a park-and-ride location close to TH 3 either in Empire Township or with the City of Farmington to help foster new car/van pools. The Township should continue to work with Dakota County to implement the Roberts Street Corridor transit initiatives.

SIDEWALKS, TRAILS & GREENWAY CORRIDORS

In addition to these recommendations, it is important for the community to plan for the ability to accommodate multimodal activities (i.e. pedestrian, and bicycle) on all non-Local roadways to provide other opportunities to move about the Township and beyond. The typical sections for Minor and Major Collectors listed in Section II-D – Geometric Design Standards and Figures 2.2 and 2.3 include construction requirements for these off-street opportunities.

The Township should consider reviewing pedestrian facilities to determine their adequacy as traffic conditions change. Sidewalks and trails, providing pedestrians a route to future controlled intersections, should be incorporated into road projects and land developments to safely accommodate pedestrian and traffic growth in the Township. Additionally, the Vermillion Highlands and Vermillion River Greenway Regional Trails are located within Empire Township. The Township should engage in any potential future planning efforts.



AVIATION PLANS/FACILITIES

Empire Township is required to include standards for airspace protection in its Comprehensive Plan and local controls. Federal Regulation Title 14, Part 77 establishes standards and notification requirements for objects affecting navigable airspace. This notification serves as the basis for evaluating the effect of the construction or alteration on operating procedures, determining the potential hazardous effect of the proposed construction on air navigation, identifying mitigation measures to enhance safe air navigation, and charting of new objects. Notification allows the Federal Aviation Administration (FAA) to identify potential aeronautical hazards in advance, thus preventing or minimizing the adverse impacts to the safe and efficient use of navigable airspace.

Title 14, Part 77.13 requires any person/organization who intends to sponsor any of the following construction or alterations to notify the Administrator of the FAA when:

- Any construction or alteration exceeding 200 feet above ground level;
- Any construction or alteration:
 - Within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with at least one runway more than 3,200 feet
 - Within 10,000 feet of a public use or military airport which exceeds 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet
 - Within 5,000 feet of a public use heliport which exceeds a 25:1 surface;
- Any highway, railroad or other traverse way whose prescribed adjusted height would exceed that above noted standards;
- When requested by FAA; and,
- Any construction or alteration located on a public use airport or heliport regardless of height or location.

Persons/organizations intending to sponsor construction/alterations which require notification to the FAA under Title 14, Part 77.13 shall notify the FAA using FAA form 7460-1 as may be amended. The Township's Zoning Ordinance limits structures to a maximum height of 200'.

V. GOALS & IMPLEMENTATION

The following goals, policies, and strategies outline Empire Township's plan for ensuring adequate infrastructure is available to support the growth anticipated within the urban growth boundary, as well as potential funding sources for completing necessary improvements.

A. GOALS & POLICIES

The transportation goals and policies identified have been developed to meet the needs of the land uses associated with the build-out of the urban growth boundary.

TRANSPORTATION GOAL #1

Provide a safe, efficient, and adequate transportation system that serves and balances both access and mobility needs.

POLICIES

1. Collector Streets – Use the functional classification system to define and plan existing and new roadways. As development plans are presented to the Township, future collector streets should be designed to provide continuity and prudent access to other collector streets and arterials and adhere to the recommended access management guidelines and locations identified in Figure 4-1 – Recommended Future Roadway Functional Classification. Review concept plans for plat and development proposals to evaluate the distribution of Minor Collector roadways so as to not overburden local streets.
2. Local Streets – Local streets should be laid out to permit efficient plat layout while being compatible with the area's topography, adjacent roadways, municipal utility plans and environmental constraints. Encourage a more grid-like street pattern and discourage the use of cul-de-sacs, except where it is impractical to provide through streets, environmental or other important features are best preserved with a cul-de-sac, or other unique circumstances exist.
3. Access Spacing – Require access spacing that is consistent with the transportation plan, as well as Dakota County and Mn/DOT standards.

4. Municipal Services – As the street system continues to expand, street maintenance such as snowplowing, grading rural roadways, dust coating, routine maintenance, etc. will become increasingly important issues. Additional street construction will either increase contracted labor expenses or necessitate an expansion of the Township’s services provided by the public works department. Prior to approving proposed subdivisions, consideration should be given to the Township’s ability to provide municipal services, facilities and equipment for snowplowing, street grading, minor street repair, dust-coating, etc. on either a contracted or staff basis.
5. Development Driven Improvements – Require developers to construct needed improvements as development progresses.
6. Non-Development Driven Improvements – Non-development driven improvements should be prioritized and programmed in the Capital Improvement Program.

TRANSPORTATION GOAL #2

Maintain a transportation system that is coordinated and cost-effective.

POLICIES

1. Transportation Improvement & Expansion – Improve and expand the existing transportation system as necessary to meet current and future transportation needs.
2. Maintain Existing Infrastructure – Preserve and maintain the existing transportation infrastructure to protect the significant investment, to increase its efficiency, and delay the need for improvement or expansion by use of a Capital Improvement Plan.
3. Capital Improvement Planning – Schedule transportation projects in a capital improvement program. The program may contain elements for new construction and reconstruction of the roadway system, with scheduled maintenance included in annual budgets. Street maintenance may include routine patching, crack filling, and storm sewer cleaning. Implement a schedule for roadway maintenance and reconstruction, street widening/realignment, etc.
4. County Capital Improvement Plan – The Township should continue to work with the County elected and appointed officials to include County Road reconstruction projects on the County’s Capital Improvement Plan to address needed reconstruction and potential trails along the roadways when improved.

5. Right-of-Way Preservation – Require right-of-way dedication along state, county, and local roads to meet future capacity needs. Proactively work to preserve future transportation corridors both by acquiring needed right-of-way in advance when possible and through the use of official mapping.
6. Roadway Project Coordination – Continue to coordinate future road construction and reconstruction projects with all utility service providers and Dakota County to ensure efficient repair/replacement and avoid duplicate costs.
7. Funding Mechanism – Develop a funding mechanism for Major Collector and Minor Arterial roadways to establish expectations and ensure consistent application.
8. Developer Agreements – Utilize developer agreements as a tool to ensure improvements are constructed as agreed upon in the platting or development process.
9. Regional Transportation Planning – Cooperate on a regional level in planning and development of a transportation system, including coordination among multiple jurisdictions, public and private transit providers and agencies at all government levels, while serving the functional needs of all.
10. Regional Traffic Management – Work on a local, state, and regional level to reduce traffic congestion and safety concerns on transportation corridors.

TRANSPORTATION GOAL #3

Coordinate transportation with land use planning and promote alternative transportation such as bicycling, walking, transit and rail.

POLICIES

1. Comprehensive Transportation Planning – Approach transportation in a comprehensive manner by giving attention to all modes and related facilities through linking transit and land use and by combining or concentrating various land use activities to reduce the need for transportation facilities.
2. Transportation & Economic Development – Create or encourage a transportation system that contributes to the economic vitality of the community by connecting people to work, shopping, and other activity generators/attractions and supports growth of commercial and industrial uses.

TRANSPORTATION GOAL #4

Plan and invest in multi-modal transportation choices based on the full range of costs and benefits to slow the growth of congestion and serve the Township and region's economic needs.

POLICIES

1. Transportation System – Create/provide a safe, cost effective, and efficient transportation system that is adequate for vehicular, pedestrian, bicycle, and truck transportation for the movement of people and goods and services in the community.
2. Transit/Alternative Modes of Transportation – To diminish/prevent congestion, the Township should encourage alternate and/or integrated transportation methods that are less dependent on motor vehicles. The Township could promote and encourage walking and biking as alternate transportation methods.

B. STRATEGIES

Various strategies can be utilized to ensure proper transportation improvements are made to provide and protect the infrastructure investment. Astute land use planning and subdivision plat review are key to ensuring the long-term roadway network vision is developed and future traffic issues are avoided. To accomplish this, each development proposal (e.g. redevelopment of a single parcel, plat review, change of use, expansion of a business or operation, etc.) should be evaluated for consistency with the following

1. Work with property owners/developers to remove/relocate existing driveway and field approaches off non-local roads.
2. Provide road and trail connectivity between adjacent parcels.
3. Review/require access spacing that is consistent with the Transportation Plan.
4. Connect residential and non-residential areas.
5. Require turn and bypass lanes on non-local roads impacted by new development, including those that are not immediately adjacent.
6. Require off-site improvements, including those in other jurisdictions, where the existing transportation network will be directly impacted by new development, including where the development is not immediately adjacent. This could include but is not limited to paving roads, repairing surfaces, fixing sub-standard drainage, improving sight distances, etc.

7. Require the dedication of rights-of-way for all required future transportation improvements identified in the transportation plan including trails, roads, bridges, transit facilities, drainage, utilities, and any other related improvement requiring use of a corridor/location.
8. Require the equitable participation in the construction of collector and arterial roads.
9. Review probable neighborhood traffic patterns, areas where excessive speed is possible, and the potential for pedestrian conflicts.
10. Require all local roads to be constructed to property lines, or the corresponding amounts of money be escrowed, where stub streets are proposed to adjacent properties, but are not immediately warranted.
11. Require fees, construction participation, and/or cost participation proportionately to future required infrastructure such as overpasses, interchanges, and other Local/County responsibilities as afforded by law and justifiable.
12. Require traffic impact studies, including the analysis of intersections to determine the need for and contribution to intersection improvements.
13. Gravel Roadway Improvements – When traffic from a proposed urban development may exceed 500 ADT, work with the developer to identify a strategy to upgrade and improve the gravel corridor.
14. TH 3 Safety – To protect the safety of residents, businesses and visitors to and through the Township, the Township should continue to work with Mn/DOT, Dakota County, and the City of Farmington to address access management along TH 3.

C. IMPROVEMENTS

In addition to the review of specific development driven improvements, the mining EIS identifies specific improvements that will be necessary based on the pace of development and removal of the aggregate. Sections IV-C and III-D also identify potential improvements in the Empire Township area.

D. POTENTIAL TRANSPORTATION FUNDING SOURCES

There are a number of various funding mechanisms available to support transportation projects these include the following

FEDERAL FUNDING. Empire Township may apply for federal funds for highways through the Surface Transportation Program of the Federal Highway Trust Fund, through Mn/DOT's Area Transportation Partnership (ATP). Solicitation occurs approximately every two years, with federal funding covering 80% of a project's cost. Types of projects funded include highway

reconstruction, safety, trails which are part of highway projects, transit, and park-and-ride projects.

MSAS SYSTEM. Although not eligible for townships, the State of Minnesota, through the gas tax and license fees, collects funds to be used to construct and maintain the State's transportation system. Most of the funds collected are distributed for use on the State's Trunk Highway (TH) system, the County State Aid Highway (CSAH) system and the Municipal State Aid Street (MSAS) system. Of the funds available they are distributed 62% TH, 29% CSAH and 9% MSAS. Cities with a population above 5,000 are eligible to receive a portion of the MSAS funding. If Empire Township incorporated and had a population over 5,000 it would be eligible to receive state aid funding.

MN/DOT COOPERATIVE FUNDS. The State of Minnesota has funds available to assist with cooperative projects that increase safety and mobility. Solicitations are due in October each year for construction the following year.

MINNESOTA RAILROAD-HIGHWAY GRADE CROSSING SAFETY IMPROVEMENT PROGRAM. This program is available to increase the safety at at-grade railroad crossings. Funds may be used for the installation of warning devices, signal installation and upgrades, signs and pavement markings, crossing closures, roadway relocations, lighting, crossing alignments and grade improvements and grade separations.

MN DEPARTMENT OF NATURAL RESOURCES GRANTS. Various federal and state grants are available for the development or reconstruction of trails. Typically grants require a 50% match and illustration that the trail is not only of local importance but also of regional significance. Grant programs through the DNR for trail projects include the Federal Recreational Trail Grant Program, Regional Trail Grant Program, Outdoor Recreation Grant Program, and Local Trail Connections Program.

COLLECTOR AND LOCAL STREETS. Developers may be required to fund a portion or the entire cost of Minor and Major Collector Roadways, as well as local streets as a part of their development fees. The cost distribution will be analyzed at the time of development.

MN/DOT ENHANCEMENT FUNDS. Under the Surface Transportation Act funds are set aside for states to fund alternative transportation projects. Each District in the State of Minnesota is allocated funds toward this program that covers 12 areas. Areas such as bicycle trails, pedestrian education, archaeological projects, and transportation museums are just some of the funding categories. These funds are awarded on an 80-20% match. The majority of funds are utilized to build or refurbish bicycle/pedestrian trail systems.

MINING FUND. The state recently passed legislation that will provide host communities 42.5% of the county aggregate production tax (\$0.15 per ton in 2008). The dollars generated from this fee are to be used exclusively towards maintenance, construction, and reconstruction of roads and bridges within the Township to accommodate the truck traffic.

VI. TRAFFIC FORECASTS

The following describes the general approach to traffic forecasting efforts and resulting outputs for this Transportation Plan. Developers will use the traffic volume forecast data to include in the individual development traffic study.

A. FORECAST METHODOLOGY

The general approach to forecasting the traffic volumes consisted of the following

- Utilize historical traffic trends, the Dakota County 2025 projections, and adjacent City transportation plan forecasts to forecast future traffic volumes.
- Collect year 2000 and current year traffic count data and basic roadway attribute information in the study area for the purpose of validating the capacity and developing historical growth trends.

B. DETAILS

Additional details concerning the methodology follow

Historical and Current Year Traffic Count Data – Traffic count data in the study area was collected from the Minnesota Department of Transportation (Mn/DOT) and recent traffic studies in the area. This included A.M. and P.M. peak hour, as well as average daily traffic volumes.

Dakota County 2025 Forecasts – Forecasts for 2025 were collected from the Dakota County 2025 Transportation Plan to provide a basis for 2030 forecasts.

Adjacent City 2030 Forecasts – Forecasts for 2030 were collected from the Cities of Lakeville, Farmington, and Rosemount to verify the 2030 forecasts for the roadways which are adjacent to those communities and Empire Township.

Traffic Analysis Zones (TAZs) – The current TAZ information was collected from the Metropolitan Council for the Township. These zones include the socioeconomic data to verify the trips that are anticipated by the community and how this matches the forecasts.

Socioeconomic Data – Land Use data for year 2030 was developed by the Township. The projected population, households, and employment data was aggregated into the TAZs as identified in Exhibit B.

Review of Forecasts – The traffic forecasts were reviewed for reasonableness with the other forecasts throughout the area.

C. POST PROCESSING

- Traffic forecast volumes were rounded to the closest 10 if less than 1,000 or to the nearest 100 if more than 1,000.
- All products depicting the forecast numbers (maps, tables, layouts, etc.) contain a very visible caution that the forecast numbers depicted have a likely confidence range of plus or minus 15 percent.

EXHIBIT A – Empire Township Traffic Counts and Forecasts
Empire Township 2030 Transportation Plan

Roadway			Existing Characteristics								2030 Projections					
Route	Route Description	Future Func. Class	Design Type	Roadway Capacity	2000 Volume	2004 Volume	2005 Volume	2006 Volume	2007 Volume	Existing V/C Ratio	Average Yearly Growth***	Future Design Type	Roadway Capacity	2030 Volume*	Future V/C Ratio	
TH 3	South of CSAH 66	A-MiA-C	R3	18000	10800	12500		12200		0.68	-1.2%	R3	18000	21300	1.18	
	CSAH 66 to 197th Street	A-MiA-C	R3	18000	9100	9800		10400		0.58	3.0%	R3	18000	20600	1.14	
	197th Street to CR 58	A-MiA-C	R3	18000	8500	9100		10400		0.58	6.9%	R3	18000	26100	1.45	
	CR 58 to CSAH 46	A-MiA-C	R3	18000	8500	9100		10400		0.58	6.9%	R3	18000	23100	1.28	
TH 50	North of CSAH 46	A-MiA-E	R3	18000	9000	10200		9600		0.53	-3.0%	R3	18000	19900	1.11	
	West of Berring Avenue	A-MiA-C	R2	15000	5000	5800		5800		0.39	0.0%	R2	15000	10200	0.68	
	Berring Avenue to CR 79	A-MiA-C	R2	15000	4350	4300		4500		0.30	2.3%	R2	15000	8100	0.54	
CSAH 33	CR 79 to CR 81	A-MiA-C	R2	15000	4200	4250		4250		0.28	0.0%	R2	15000	7800	0.52	
	North of CSAH 46	B-MiA	U3	16000			3300		3150	0.21	-2.3%	U3	16000	9200	0.58	
CSAH 46**	West of CSAH 33	A-MiA-E	D4	35000			23000		20500	0.66	-5.6%	D4	35000	35500	1.01	
	CSAH 33 to Shannon Parkway	A-MiA-E	D4	35000			16400		19700	0.47	9.6%	D4	35000	34400	0.98	
	Shannon Parkway to Chippendale Avenue	A-MiA-E	D4	35000			12200		12500	0.35	1.2%	D4	35000	27700	0.79	
	Chippendale Avenue to TH 3	A-MiA-E	D4	35000			12200		12500	0.35	1.2%	D4	35000	27700	0.79	
	TH 3 to Biscayne Avenue	A-MiA-E	R3	18000			4500		10900	0.25	55.6%	R3	18000	18700	1.04	
	Biscayne Avenue to Blaine Avenue	A-MiA-C	R2	15000			8300		9000	0.55	4.1%	R2	15000	14200	0.95	
	Blaine Avenue to CR 81	A-MiA-C	R2	15000			8100		8900	0.54	4.8%	R2	15000	14200	0.95	
	CR 81 to TH 52	A-MiA-C	R3	18000			8100		8900	0.45	4.8%	R3	18000	14200	0.79	
	CR 64	West of TH 3	A-MiA-C										R2	15000	12000	0.80
	CSAH 66	TH 3 to Biscayne Avenue	B-MiA	R2	15000	2950		3000		3300	0.20	4.9%	R2	15000	7500	0.50
CSAH 66	Biscayne Avenue to CR 79	A-MiA-C	R2	15000	2650		2500		2400	0.17	-2.0%	R2	15000	7100	0.47	
	CR 79 to CR 81	A-MiA-C	R2	15000	2300		2350		2700	0.16	7.2%	R2	15000	6300	0.42	
	CR 81 to TH 52	A-MiA-C	R2	15000	1850		2300		2050	0.15	-5.6%	R2	15000	5500	0.37	

Source: Historic data from MndOT

D4 = Urban 4-Lane Divided
 U4 = Urban 4-Lane Undivided
 U3 = Urban 3-Lane or 2-Lane Divided
 U2 = Urban 2-Lane

L4 = Rural 4-Lane Divided
 R4 = Rural 4-Lane Undivided
 R3 = Rural 3-Lane or 2-Lane Divided
 R2 = Rural 2-Lane

Urban - Curb and Gutter
 Rural - No Curb and Gutter

PA: Principal Arterial
 A-MiA-R: A - Minor Arterial Reliever
 A-MiA-C: A - Minor Arterial Connector
 A-MiA-E: A - Minor Arterial Expander
 B-MiA: B - Minor Arterial

* The Forecast Numbers Have a Likely Confidence Range of Plus or Minus 15%.

Periodically Congested, V/C = 0.50 to 0.74, LOS C
 Near Congested, V/C = 0.75 to 1.00, LOS D & E
 Congested, V/C > 1.00, LOS F

** This extension of CSAH 46 on the border with Empire Township was not constructed until 2004.

*** The Average Yearly Growth is measured within the counts from 2004 to 2007.

**EXHIBIT B - Transportation Analysis Zone Breakdown
Empire Township 2030 Transportation Plan**

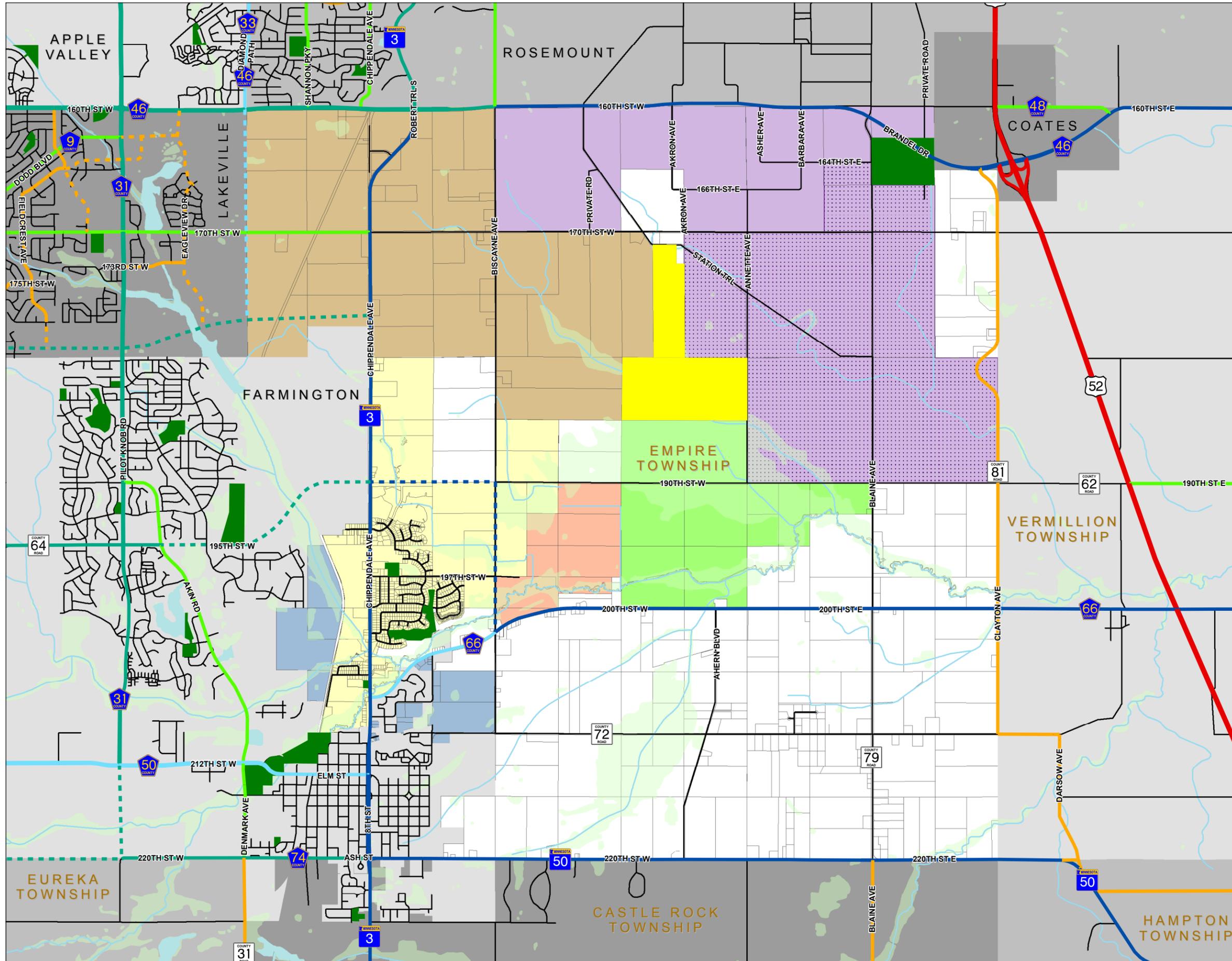
<u>TAZ</u>	<u>Population</u>	<u>Households</u>	<u>Employment</u>	<u>Retail Only</u>
168A	375	140	40	20
169A&B	8115	2869	440	60
Totals	8490	3000	480	80

**Outside of Township
Boundary – to be
determined by Farmington**

TAZ	Entity
168 - B	Farmington (Within City Limits)
168 - C	Farmington (Orderly Annexation Area)
169 - C	Farmington (Within City Limits)
169 - D	Farmington (Orderly Annexation Area)
Total	



TRANSPORTATION PLAN



Legend

Existing Functional Classification

- Principal Arterial
- A Minor Arterial-Connector
- - - Future A Minor Arterial-Connector
- A Minor Arterial-Expander
- - - Future A Minor Arterial-Expander
- B Minor Arterial
- - - Future B Minor Arterial
- Major Collector
- - - Future Major Collector
- Minor Collector
- - - Future Minor Collector
- 2030 MUSA Boundary
- Farmington Orderly Annexation Area
- Mining EIS Area
- Metro Council Wastewater Facility
- Umore Property
- Potential Umore Nature Reserve
- Regional Park
- Wildlife Management Area
- Parks
- Wetlands
- Lakes
- Watercourses & Drainageways

Source:
Dakota County, MnDNR

Met Council Existing & Future Functional Classification (4-2-08)

0 4,000 Feet

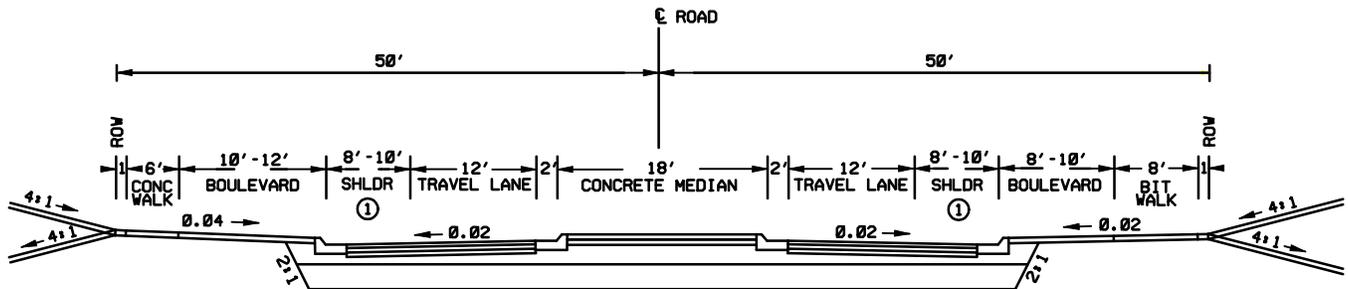
Existing Roadway Functional Classification

Figure 2.1

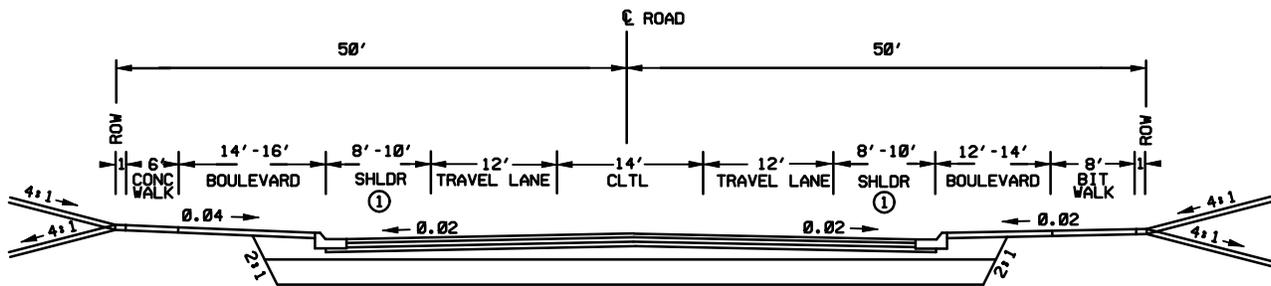
2009



TYPICAL SECTION OF MAJOR COLLECTOR WITH MEDIAN



TYPICAL SECTION OF MAJOR COLLECTOR



① 10' WHEN PARKING PERMITTED

1. Design standards for Minor Arterials shall be under the jurisdiction of Mn/Dot and Dakota County.
2. Additional ROW will be needed at intersections to accommodate turn lanes, at the discretion of the Township Engineer.

FIGURE 2.2

GEOMETRIC DESIGN STANDARDS FOR MAJOR COLLECTORS



BOLTON & MENK, INC.
Consulting Engineers & Surveyors



TRANSPORTATION PLAN

Legend

Average Daily Traffic Volumes

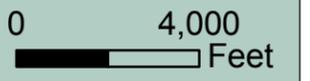
- XXXX 2000
- XXXX 2005
- XXXX 2006

Existing Functional Classification

- Principal Arterial
- A Minor Arterial-Connector
- A Minor Arterial-Expander
- B Minor Arterial
- Major Collector
- Minor Collector
- Local Roads
- Wetlands
- Lakes
- Watercourses & Drainageways

Source: Dakota County, MnDNR

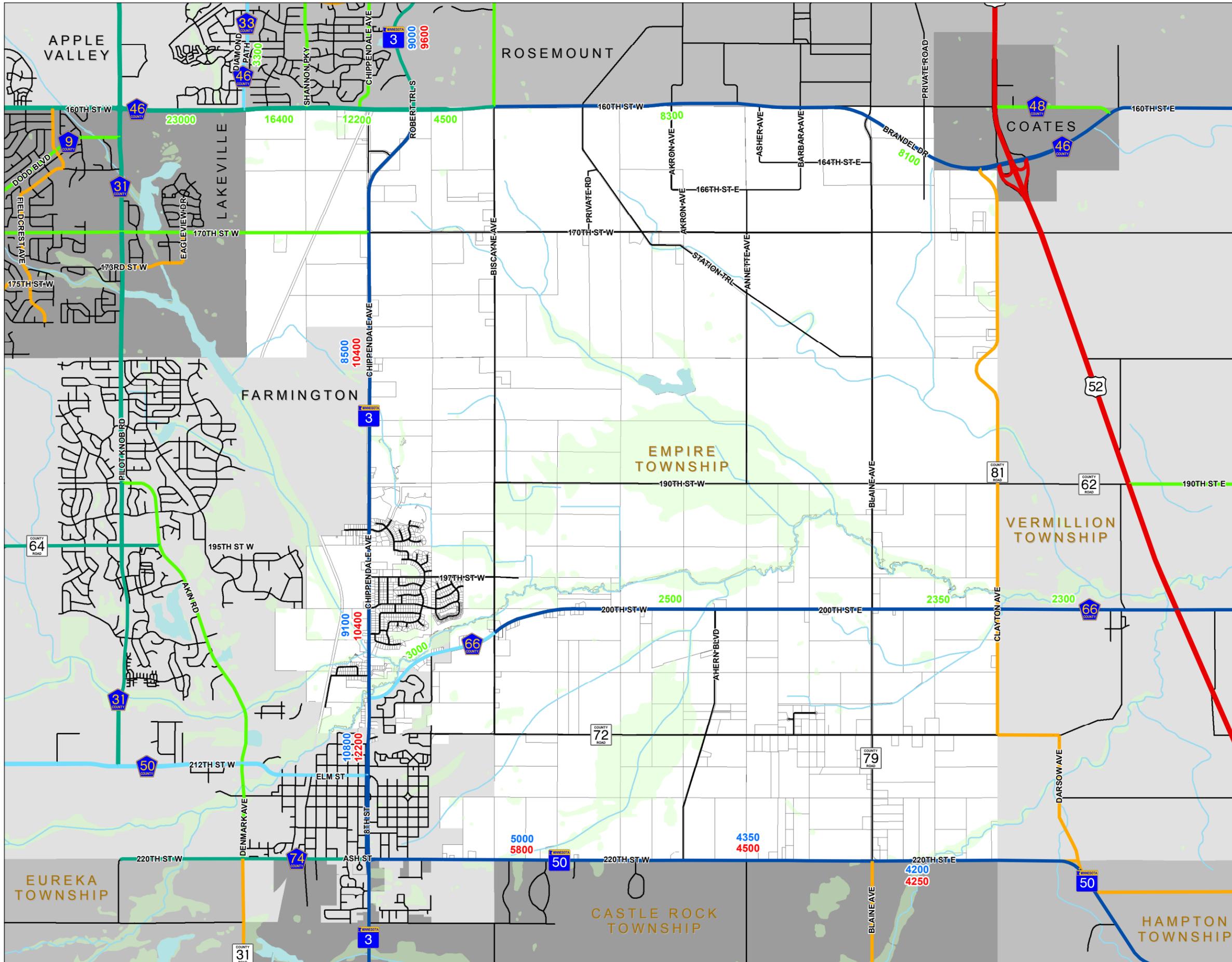
Functional Classification - Metropolitan Council and The Lawrence Group (TLG) Date: 10-5-2007

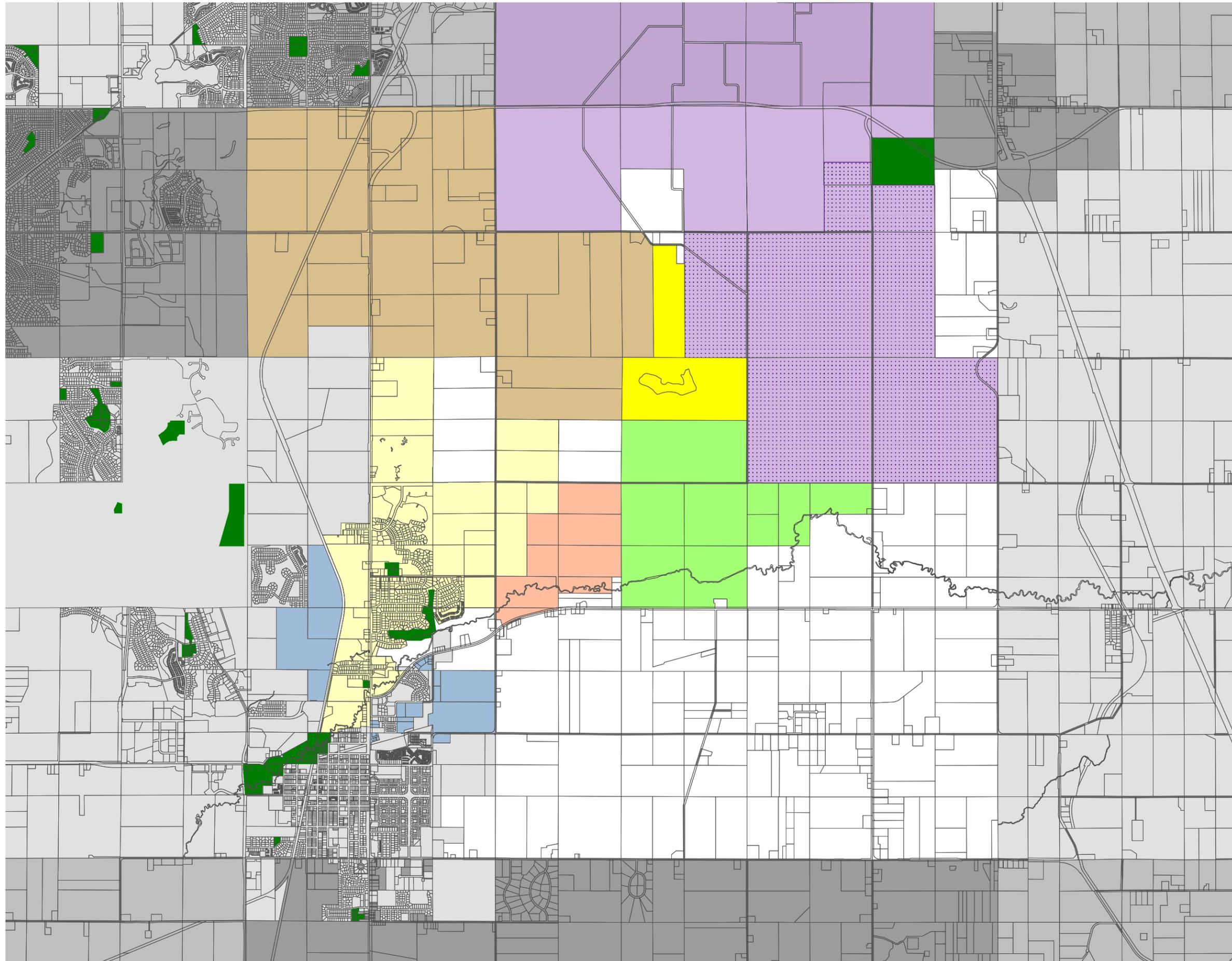


Existing Average Daily Traffic Volumes

Figure 3.1

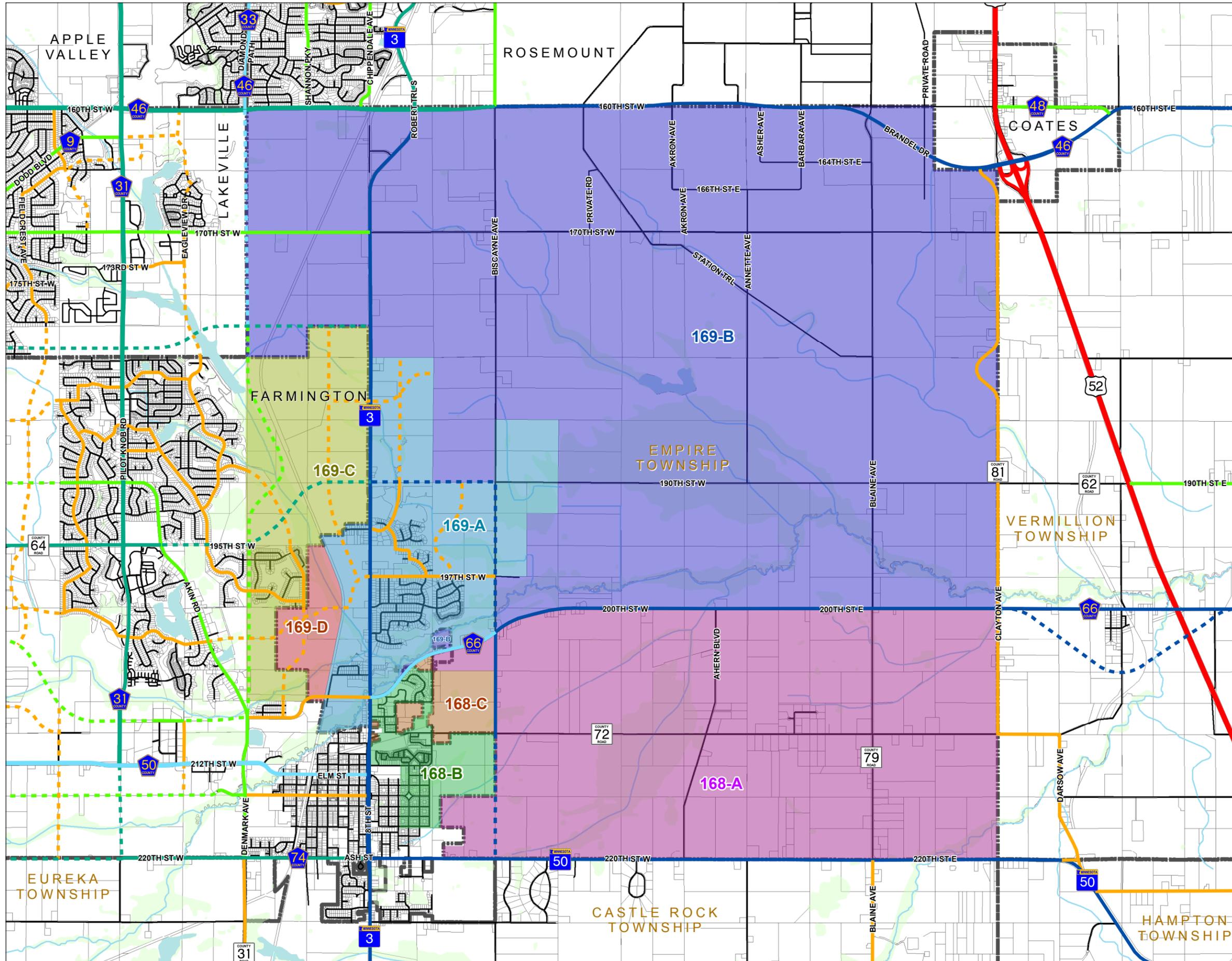
2009







TRANSPORTATION PLAN



Legend

Transportation Analysis Zones

- 168-A
- 168-B
- 168-C
- 169-A
- 169-B
- 169-C
- 169-D

Future Functional Classification

- Principal Arterial
- A Minor Arterial-Connector
- Future A Minor Arterial-Connector
- A Minor Arterial-Expander
- Future A Minor Arterial-Expander
- B Minor Arterial
- Future B Minor Arterial
- Major Collector
- Future Major Collector
- Minor Collector
- Future Minor Collector
- Local Roads
- Lakes
- Watercourses & Drainageways
- Wetlands
- City/Township Limits

Source: Dakota County, MnDNR, Met Council

Met Council Existing Functional Classification (4-2-08)



Transportation Analysis Zones

Figure 6.1

2009



APPENDIX A-2
Municipal Water Plan

Empire Township

Water Distribution System Plan

Appendix A2

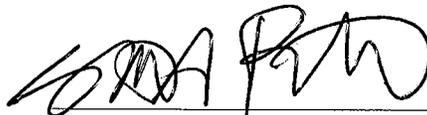
Empire Township Comprehensive Plan



WATER SYSTEM PLAN
FOR
EMPIRE TOWNSHIP, MINNESOTA

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By:



Seth A. Peterson, P.E.

License No. 26468

Date:

13 MAY 2009

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EXHIBIT B – CALCULATION OF USER RATES

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SECTION 1

INTRODUCTION

A. PURPOSE

The purpose of this report is to provide Empire Township with relevant information regarding the state of the Township's potable water infrastructure. This report will aid the township in planning system improvements to meet future water demand.

B. REPORT ORGANIZATION

To adequately address the major areas that are evaluated, the report is organized in eight sections as shown below:

Section 1: Introduction.

Section 2: Description of existing major water system components.

Section 3: Land usage and population projections.

Section 4: Historical and future projections of water usage.

Section 5: Drinking water quality.

Section 6: Evaluation of the existing water system.

Section 7: Proposed water system improvements.

Section 8: Recommendations for improving the Township's water system and associated costs and financing options.

SECTION 2

EXISTING FACILITIES

A. GENERAL

This Section provides a summary of the existing water supply, treatment, storage and distribution facilities for Empire Township. Empire Township's existing water system consists of three municipal wells, one elevated storage tank, and a water distribution system. Water treatment consists of chemical addition of chlorine, fluoride, and polyphosphate. The distribution system is comprised of watermains ranging from 6 to 12 inches in diameter. The existing water system is shown in Figure 2.1.

B. WATER SUPPLY

The Township's water is currently provided by three wells, Well Nos. 1, 2, and 3. Well No. 3 began operation in November 2007. A summary of the specific well construction information is provided in Table 2.1. The current total well capacity is 3.12 MGD and the firm capacity is 1.32 MGD.

TABLE 2.1			
WELL CONSTRUCTION SUMMARY			
	Well No. 1	Well No. 2	Well No. 3
Unique Well No.			
Constructed	1973	1981	2007
Well Pump Capacity (gpm)	600	500	1500
Casing Diameter (inches)	12	12	18
Casing Depth (feet)	340	355	325
Overall Well Depth (feet)	410	457	425

The total well capacity is determined as the total capacity of all wells operating for 20 hours per day. It is considered good practice to allow the well pumps a few hours of down time to "rest", which ultimately extends the life of the pumps and allows for aquifer recharge. The firm capacity is the total capacity with the single largest pump out of service and is determined for a pumping period of 20 hours per day. Regulatory agencies recommend the firm capacity be equal to or greater than the average day demand it serves.

C. WATER TREATMENT

Treatment of source water consists of chemical addition prior to entry into the distribution system. Chlorine is added for disinfection, fluoride is added for dental cavity protection, and polyphosphate is added to help sequester or mask the iron in the water and also assist the Township in meeting the lead and copper water rules.

D. WATER STORAGE

The existing storage facility in Empire Township consists of one 300,000-gallon elevated water tower. Details of the water storage tower are presented in Table 2.2.

Capacity (gallons)	300,000
Year Constructed	1999
High Water Level	1050.00
Support Type	Pedestal

E. WATER DISTRIBUTION SYSTEM

The distribution system is comprised of water mains ranging in size from 6 to 12 inches in diameter. There is currently only one pressure system in the Township.

SECTION 3

LAND USE AND POPULATION

A. LAND USE

The water system planning area is based on providing service in the current Township proper, as well as projected growth areas north, east, and west of the existing service. The north area is projected as a residential area. To the west a commercial/industrial sector will be developed. A middle school is planned to be constructed east of the existing service area. The total land area in this region that is available for residential development is approximately 1,240 acres. The residential density is expected to average 3.0 units per acre and 3.0 persons per unit. Approximately 96 acres on the West side of the Township is planned for commercial/industrial development and 81 acres on the East side of the Township has been reserved for a middle school.

B. POPULATION PROJECTION

The Metropolitan Council's "Revised Empire Township Development Framework Forecasts Through 2030" is presented in Table 3.1. The Metropolitan Council projects Empire Township's population to approach 6,500 in 2030.

TABLE 3.1					
REVISED					
EMPIRE TOWNSHIP					
Development Framework Forecasts Through 2030					
	1990	2000	Revised Development Framework		
			2010	2020	2030
Population	1,340	1,638	2,500	5,600	8,490
Households	426	515	850	1,925	3,000
Employment	167	174	300	390	480

Due to the difficulty in projecting population to a corresponding future date, population projections with regard to parcel development have been tabulated in Table 3.2. The land

parcels in Table 3.2 represent the residential development land located to the north of the Township proper.

TABLE 3.2				
PROJECTED POPULATION				
Parcel Acreage Developed	Total Developed Acreage	Population Density (people/acre)	Parcel Population	Service Population
Existing (2006)	-	-	-	1760
80	80	9	720	2480
80	160	9	720	3200
80	240	9	720	3920
80	320	9	720	4640
80	400	9	720	5360
80	480	9	720	6080
80	560	9	720	6800
80	640	9	720	7520
80	720	9	720	8240
80	800	9	720	8960
80	880	9	720	9680
80	960	9	720	10400
80	1040	9	720	11120
80	1120	9	720	11840
80	1200	9	720	12560
40	1240	9	360	12920

SECTION 4

WATER USAGE

A. EXISTING WATER USAGE

Historical water data is an important tool for determining trends and helps assist the Township in determining if there are problems within the system. Yearly and monthly pumping summaries from 2002 to 2007 are presented below in Table 4.1. The yearly pumping totals reveal an increasing trend in water demand, which follows the increase in population. The amount of water processed in 2007 is approximately two times the amount pumped in 2002.

TABLE 4.1						
MONTHLY WATER PUMPING RECORDS (MILLION GALLONS)						
Month	2002	2003	2004	2005	2006	2007
January	2.87	2.17	2.41	3.50	5.29	3.38
February	2.10	1.89	2.49	2.18	4.19	3.00
March	2.07	2.17	2.71	2.64	4.71	3.10
April	2.35	2.40	3.57	3.33	5.09	4.37
May	3.39	3.40	3.76	4.36	7.19	9.20
June	3.29	7.14	6.63	7.50	12.08	10.80
July	7.96	7.49	8.60	10.31	16.06	16.29
August	4.10	10.26	6.79	8.62	10.14	9.93
September	4.30	7.81	6.89	5.83	4.99	8.10
October	2.33	4.73	4.19	4.32	4.54	4.14
November	2.01	2.15	2.64	3.37	3.34	3.04
December	2.28	2.55	2.76	3.75	3.20	3.23
Total	39.04	54.15	53.43	59.71	80.81	78.58

Tools that are an aid in determining future flows include the average day per capita and maximum day to average day peaking ratio. Since 2002, the average day demand per capita has averaged 104 gallons/day. The average day demand for the Township has steadily increased the last three years with a maximum average day demand of 126 gallons per capita per day (gpcpd) experienced in 2006. The maximum day to average day ratio has averaged 3.76 since 2002 and the highest ratio of 4.71 was experienced in 2005. These parameters are summarized below in Table 4.2.

TABLE 4.2					
HISTORICAL WATER PUMPED					
Year	Avg. Day (MGD)	Estimated Population	Average Day per Capita (gpcpd)	Maximum Day (MGD)	Peaking Factor (Max. Day/Avg. Day)
2002	0.107	1,171	91	0.401	3.75
2003	0.148	1,419	104	0.666	4.50
2004	0.146	1,650	88	0.529	3.62
2005	0.164	1,638	100	0.772	4.71
2006	0.221	1,758	126	0.671	3.04
2007	0.215	1,878	114	0.635	2.95
Average			104		3.76

Unaccounted for water is a tool that helps determine if the amount of water being pumped from a community’s source is being used efficiently. Unaccounted for water is the difference between the total water pumped and the total water sold. Typically, there is a certain amount of water that is pumped into the system but is not accounted for. Unaccounted for water may include items such as: leaks in the distribution system, under-registering meters, flushing hydrants, fire fighting purposes, ice rink flooding, water for parks, street cleanings and unmetered water usage by contractors. The Township should try to estimate the amount of unmetered water usage as best as possible to determine if there are any problems within the distribution system such as leaking pipes and under registering meters. Typically, if unaccounted for water is 10 percent or greater of the total water pumped from the source, the Township should take measures to identify the source and reduce the amount of unaccounted for water. The Township’s unaccounted for water since 2002 is shown in Table 4.3.

TABLE 4.3					
UNACCOUNTED FOR WATER					
Year	Water Pumped (Million Gals.)	Water Sold (Million Gals.)		Unaccounted For Water (Million Gallons)	Percent Unaccounted For Water (%)
		Residential	C/I/I		
2002	39.036	38.426	0.028	0.582	1.5
2003	54.147	50.532	0.055	3.560	6.6
2004	53.427	46.778	1.807	4.842	9.1
2005	59.713	52.143	1.794	5.776	9.7
2006	80.810	71.489	5.583	3.738	4.6
2007	78.580	72.961	3.813	1.806	2.3

Unaccounted for water has been below 10 percent since 2002 and this is very good. Determining unaccounted for water is an important tool and it is recommended that the Township continue to monitor this parameter as this will allow Township staff to determine if there are any problems within the system and help identify the problems and causes for the unaccounted for water. Reducing the amount of unaccounted for water will conserve the amount of water pumped as well as preserve the life expectancy of the well pumps.

B. WATER DEMAND PROJECTIONS

Water demand projections have been estimated with respect to parcel land development. For simplicity reasons, commercial/industrial and institutional developments have been correlated as residential development.

From Table 4.2, the total average demand per capita has been selected as 104 gallons/day. Multiplying this value with the population density per acre of 9 expected for the residential development equates to a water demand of 936 gallons/acre/day. A typical water demand rate used for estimating water demand from commercial/industrial developments is 1500 gallons/acre/day. The institutional demand rate is calculated by assuming a rate of 15 gallons/student/day. Assuming a school enrollment of 400, the total institutional water demand will be 6,000 gallons/day.

For the commercial/industrial development sector, the equivalent residential area is calculated by dividing the 1500 gallons/acre/day by 936 gallons/acre/day and then multiplying this result by the total commercial/industrial development area. This equates

to an equivalent residential area of 154 acres. The same method is applied to determine the equivalent residential area for the middle school. This value equates to approximately 6.5 acres of equivalent residential area. A total residential development area of 1,400 acres has been used to project future water demand.

The future projected water demand for Empire Township is presented in Table 4.4. The average day demand has been calculated by multiplying the service area population by the average per capita usage of 105 gallons/day, selected in part from Table 4.2. The maximum day demand has been calculated by multiplying the average day demand by a peaking factor of 4.00. The ultimate projected average and maximum water demand for Empire Township is 1.508 and 6.031 MGD, respectively.

TABLE 4.4			
PROJECTED WATER DEMAND			
Additional Service Area (acres)	Service Area Population	Average Daily Demand (MGD)	Maximum Daily Demand (MGD)
Existing (2006)	1,760	0.185	0.739
80	2,480	0.260	1.042
160	3,200	0.336	1.344
240	3,920	0.412	1.646
320	4,640	0.487	1.949
400	5,360	0.563	2.251
480	6,080	0.638	2.554
560	6,800	0.714	2.856
640	7,520	0.790	3.158
720	8,240	0.865	3.461
800	8,960	0.941	3.763
880	9,680	1.016	4.066
960	10,400	1.092	4.368
1,040	11,120	1.168	4.670
1,120	11,840	1.243	4.973
1,200	12,560	1.319	5.275
1,240	12,920	1.357	5.426
1,320	13,640	1.432	5.729
1,400	14,360	1.508	6.031
Service area population values in bold represent equivalent residential populations converted from commercial/industrial/institutional development sectors			

SECTION 5

DRINKING WATER QUALITY

A. GENERAL

Drinking water quality is regulated by numerous Federal and State regulations. In addition, the treated drinking water quality must meet local expectations for taste, odor, hardness, and general quality. The ability to test for water contaminants has evolved to parts per billion and less; however, the understanding of the health effects of some of these contaminants is still evolving. The U.S. Environmental Protection Agency (USEPA) provides for the City the guidelines for producing safe drinking water. This section will provide an overview of drinking water regulations and a summary of existing water system quality data. Water quality design goals will be established based on regulatory requirements and public expectations.

B. DRINKING WATER REGULATIONS

1. Safe Drinking Water Act (SDWA) Regulations

i. Overview

Through the passage of the Safe Drinking Water Act (SDWA) in 1974, the U.S. Congress authorized the USEPA to establish drinking water regulations that apply to all public water systems in the United States. State governments, through their health departments and environmental agencies, are responsible for implementation and enforcement of the provisions of the Act.

Under the SDWA, the USEPA initially proposed National Interim Primary Drinking Water Regulations (NIPDWR). Upon further research and special studies, and with the passage of the 1986 Amendments to the SDWA, the interim regulations were adopted as National Primary Drinking Water Regulations (NPDWRs) and 83 contaminants were required to be regulated.

Further changes were made to the SDWA with the 1996 Amendments. These amendments retained most of the NPDWRs previously enacted, but did change the process for selecting contaminants to be regulated and did mandate new rules regarding arsenic, uranium, radon, and groundwater disinfection. The 1996 Amendments place increasing emphasis on ensuring that all new and existing water systems have the technical, managerial, and financial capacity to comply with NPDWRs. Systems which do not commit the resources required to comply with the new rules may not be eligible for Drinking Water State Revolving Fund (DWSRF) loans and may be vulnerable to enforcement actions.

The major components of the SDWA of interest to Empire Township are:

- National Primary Drinking Water Regulations (NPDWRs)
- Radionuclides Rule
- Radon Rule
- Microbial and Disinfection By-Products Rule (M-DBP)
- Total Coliform Rule
- Ground Water Rule
- Inorganic Contaminants Regulated by Primary Drinking Water Regulations (including arsenic)
- Drinking Water Contaminant Candidate List (DWCCCL)

2. National Primary Drinking Water Regulations (NPDWRs)

National Primary Drinking Water Regulations are the enforceable standards with which water suppliers must comply. Currently, there are standards for 92 contaminants including turbidity, 8 microorganism indicators, 4 radionuclides, 19 inorganic contaminants, and 60 organic contaminants. The USEPA is required to review and revise, as appropriate, each NPDWR every six years. The most recent review was completed in July 2003. Based upon this review, the USEPA is planning to consider revisions to the Total Coliform Rule (TCR) with new requirements for ensuring the integrity of the distribution systems. A list of the USEPA Drinking Water Standards for Regulated Contaminants is located in Appendix A.

Based on the well water quality data for Empire Township, the NPDWRs of most concern is the Radionuclides Rule.

3. Radionuclides Rule

The final Radionuclides Rule was promulgated by the USEPA on December 7, 2000. The rule updates the maximum contaminant level (MCL) for radium 226/228, alpha emitters, gross beta and photon emitters and sets a new standard for uranium. The compliance date, which applies to all community water systems, was December 8, 2003. Maximum limits have been established to avoid adverse health impacts of naturally occurring radionuclides (a measure of radioactivity) and other potential radiation exposure for vulnerable systems near nuclear facilities. Elevated levels of alpha emitters often result in elevated levels of radium 226/228.

Based on the chemical analysis done over the past several years, the Empire Township water supply currently does exceed maximum contaminant levels (MCL) for Gross Alpha and Radium 226+228. Well Nos. 1, 2, and 3 have Gross Alpha levels between 6.0 and 16.5 pCi/L (MCL 15.4 pCi/L) and Radium 226+228 levels between 3.4 and 8.9 pCi/L (MCL 5.4 pCi/L). At present, the Township does not have any additional wells to blend with to reduce the Gross Alpha and Radium 226+228 levels. All three wells draw water from the Jordan formation. Water analysis has indicated that the high levels of radium in this aquifer are responsible for the high levels of Gross Alpha.

4. Radon Rule

On November 12, 1999, the USEPA published a proposed regulation for radon in drinking water. The issuance of the final rule has been delayed and was expected to be finished in year 2005. The radon rule is a complex one, since it addresses radon occurrence in both air and water. The proposed MCL for radon is 300 pCi/L. An alternative MCL (AMCL) of 4,000 pCi/L in water is available to those states that adopt an Indoor Air Program. The State of Minnesota adopted an Indoor Air Program; therefore the alternate MCL is applicable. The Indoor Air program requires that the concentration of radon gas in the air shall be less than a threshold level depending on the exposure duration. This program is administered by the Minnesota Department of Health. This rule does not impact the Township's water system.

5. **Microbial and Disinfection By-Products Rules (M-DBP)**

Disinfection of drinking water was one of the major public health advances in the 20th century and has been identified as the primary reason for the increasing life span of humans. Common epidemics such as typhoid and cholera have been reduced, if not eliminated, through disinfection of water supplies. However, chemical disinfectants such as chlorine, chlorine dioxide, ozone, et cetera can react with naturally occurring materials in the water to form unintended organic and inorganic by-products which may pose health risks. A major challenge is to balance the risks from microbial pathogens and disinfection by-products.

The USEPA has some exiting and developing future rules to address these concerns. Some of the rules apply only to surface water (lakes and rivers), some apply only to ground water (wells) and others apply to both surface and ground waters. Since Empire Township only uses water from ground sources, this report will only discuss those that apply to ground water. They are as follows:

i. Existing Regulations:

- Interim Trihalomethanes Rule
- Total Coliform Rule
- Stage 1 Disinfectants and Disinfection By-Products Rule

ii. Future Regulations:

- Ground Water Rule
- Stage 2 Disinfectants and Disinfection By-Products Rule

iii. Existing Regulations

Total Coliform Rule – The Total Coliform Rule, revised in 1989, applies to all public water systems and establishes a maximum contaminant level (MCL) for total coliforms. As mentioned above, the USEPA is considering revisions to this rule based upon a 2003 review.

Interim Trihalomethane Rule – In 1979, USEPA set and interim MCL for total trihalomethanes of 0.10 mg/L as an annual average. This applies to any community water system serving at least 10,000 people that adds a disinfectant to the drinking water during any part of the treatment process.

As the population of Empire Township is below this threshold, this regulation does not apply to the Township.

Stage 1 Disinfectants and Disinfection By-Products Rule – The final Stage 1 Disinfectants and Disinfection By-Products Rule applies to community water systems and non-transient non-community systems and transient non-community water systems, including those serving fewer than 10,000 people that add a disinfectant to the drinking water during any part of the treatment process.

The final Rule includes the following key provisions:

- Maximum residual disinfectant level goals (MRDLGs) for chlorine (4 mg/L), chloramines (4 mg/L), and chlorine dioxide (0.8 mg/L).
- Maximum contaminant level goals (MCLGs) for three trihalomethanes (bromodichloromethane (zero), dibromochloromethane (0.06 mg/L), and bromoform (zero)), two haloacetic acids (dichloroacetic acid (zero) and trichloroacetic acid (0.3 mg/L), bromated (zero), and chlorite (0.8 mg/L).
- Maximum residual disinfection levels for three disinfectants (chlorine (4.0 mg/L), chloramines (4.0 mg/L), and chlorine dioxide (0.8 mg/L)).
- Maximum contaminant levels for total trihalomethanes (0.080 mg/L) – a sum of the three listed above plus chloroform;, haloacetic acids (HAA5) (0.060 mg/L) – a sum of the two listed above plus monochloroacetic acid and mono- and dibromoacetic acids); and two inorganic disinfection by-products (chlorite (1.0 mg/L) and bromate (0.010 mg/L)).
- A treatment method for removal of DBP precursor material, such as total organic carbon (TOC).

iv. Future Regulations

The Ground Water Rule – The EPA published the Ground Water rule on November 8, 2006, which specifies the appropriate use of disinfection and, just as importantly, addresses other components of ground water systems to ensure public health protection.

Stage 2 Disinfectants and Disinfection By-Product Rule – The SDWA, as amended in 1996, required the USEPA to finalize a Stage 2 Disinfectants and Disinfection By-Products Rule by May 2002. However, this rule was named Long Term 2 and Stage 2 because the interim rules are in place. This rule has not been finalized yet. Although, the 1996 Amendments do not require the USEPA to finalize a Long Term 2 Enhanced Surface Water Treatment Rule along with the Stage 2 Disinfectants and Disinfection By-Products Rule, the USEPA has chosen to finalize these rules together to ensure a proper balance between microbial and disinfection by-products risks.

6. Total Coliform Rule

USEPA promulgated a total coliform rule applying to both surface water supplies and ground water supplies on June 29, 1989, which became effective on December 31, 1990. A presence/absence approach is now used to determine compliance with the coliform MCL. The Maximum contaminant Level Goal (MCLG) is zero. In general, coliforms must be absent in at least 95 percent of samples. Compliance is determined on a monthly basis. However, at the last six year review (2002) conducted by the USEPA on drinking water standards, the agency decided to propose revisions to the Total Coliform Rule with new requirements for ensuring integrity of distribution systems.

The recommended guidelines for total coliform control are:

- maintenance of detectable disinfectant residual throughout the distribution system, and
- proper repair/replacement/maintenance of the distribution system.

i. Inorganic Contaminants

Twenty inorganic contaminants are regulated by the National Primary Drinking Water Standards. They include arsenic, copper, fluoride, lead, mercury, nitrate, and nitrites. Empire Township currently is not impacted by this rule, as the levels of these contaminants in the raw water are below the MCLs.

ii. Drinking Water Contaminant Candidate List (DWCCCL)

The USEPA has drinking water regulations for more than 90 contaminants and the complete list is presented in Appendix B. The SDWA includes a process that the agency follows to identify new contaminants which may require regulation in the future. USEPA periodically releases a Contaminant Candidate List (CCL). The first list was published in March 1998 and had 60 unregulated contaminants. The second list published in February 2005 carries forward 51 of the original contaminants. In July 2003, USEPA announced its decision not to regulate nine contaminants in the original CCL: acanthamoeba, aldrin, dieldrin, hexachlorobutadiene, manganese, metribuzin, maphthalene, sodium, and sulfate. The current contaminant candidate list (CCL) is presented in Appendix A.

C. SECONDARY DRINKING WATER STANDARDS (SDWS)

In addition to the NPDWRs, which cover the contaminants that affect public health, the EPA recommends Secondary Drinking Water Standards (SDWS) with limits on those contaminants that affect the aesthetic qualities of drinking water. The secondary regulations are intended to serve as guidelines and are not federally enforceable.

Although the water utilities are not required to treat to SDWSs, they should be aware that keeping the quality of drinking water within these guidelines makes it more acceptable to consumers, thereby decreasing complaints to the utilities. Table 5.1 lists the secondary standards.

Table 5.1 EPA National Secondary Drinking Water Contaminant Standards		
Contaminant	Effects	SMCL – mg/L
Aluminum	Colored Water	0.05 to 0.2
Chloride	Salty Taste	250
Color	Visible Tint	15 color units
Copper	Metallic Taste, blue-green stain	1
Corrosivity	Metallic Taste, corrosion, fixture stains	Non-corrosive
Fluoride	Tooth discoloration	2
Foaming Agent	Frothy, cloudy, bitter taste, odor	0.5
Iron	Red or rusty color and staining	0.3
Manganese	Black or brown color and staining, bitter or metallic taste	0.05
Odor	“rotten egg” or musty or chemical smell	3 TON
PH	Low pH – bitter metallic, corrosion	6.5 to 8.5
	High pH – slippery feel, soda taste, deposits	
Silver	Skin discoloration, graying of the whites of the eye	0.1
Sulfate	Salty taste	250
TDS	Hardness, deposits, colored water, staining, salty taste	500

D. SUMMARY OF WATER QUALITY ISSUES

Empire Township has water quality issues with radionuclides, iron and manganese in their source wells. The radionuclide constituents are gross alpha and combined radium, and have been detected in levels that exceed regulatory MCLs under the NPDWRs. Exceeding the MCL for these radionuclides carries an increased risk of cancer. The Township also has issues with iron and manganese in their source wells. Iron and manganese are categorized under the SDWS. Iron concentrations exceeding the MCL results in red water problems, such as laundry staining and manganese concentrations exceeding the MCL contributes to black staining. The radionuclide water quality issues for Empire Township are summarized in Table 5.2.

TABLE 5.2			
RADIONUCLIDE ANALYSES RESULTS			
Sample Location	Sample Location	Gross Alpha Concentration (pCi/L)	Combined Radium Concentration (pCi/L)
Well No. 1	12-Jan-06	13.20	4.00
	02-May-06	16.50	8.30
	17-Jul-06	15.20	8.90
	24-Oct-06	14.60	7.90
	Average	14.88	7.28
Well No. 2	12-Jan-06	6.70	3.40
	02-May-06	12.30	6.60
	17-Jul-06	6.00	6.60
	24-Oct-06	9.80	3.70
	Average	8.70	5.08
Well No. 3	12-Feb-07	7.17	6.51
Regulatory MCL for Gross Alpha and Combined Radium is 15.4 and 5.4 pCi/L. Numbers in RED indicate exceeding the MCL for the parameter noted.			

SECTION 6

WATER SYSTEM EVALUATION

A. GENERAL

This section provides an evaluation summary of the existing water supply, treatment, storage, and distribution system for Empire Township. The existing system consists of three supply wells, one elevated storage tank, and a distribution system with a network of watermains ranging from 6 to 12 inches in diameter. The existing water infrastructure components have been evaluated in terms of current and future demands.

B. WATER SUPPLY WELLS

1. General

Empire Township currently obtains water from three wells, Well Nos. 1, 2, and 3. All three wells draw water from the Jordan aquifer. Supply well details are located in Table 2.1.

2. Well Capacity

The Recommended Standards for Water Works (Ten State Standards) recommends that the average day demand be met by the firm capacity. Firm capacity is the pumping capacity with the largest well out of service. In addition, the daily well output is calculated based on operating for 20 hours per day to allow 4 hours per day of aquifer recharge. The largest single well unit is Well No. 3. The existing firm capacity is 1.32 MGD utilizing wells 1 and 2. The total capacity of the existing wells is 3.12 MGD.

Table 6.1 presents the number of wells that will be needed to meet future demand projections. The projected demands, both average and peak day usage, are also located in Table 4.4. It is assumed that new wells would have a capacity of 1,000 gpm. Table 6.1 shows that new wells will need to be added by the time 640, 960, and 1,400 acres have been developed.

TABLE 6.1
PROJECTED WATER SUPPLY REQUIREMENTS

Developed Land (acres)	Projected Population	Average Day Demand (MGD)	Maximum Day Demand (MGD)	No. of New Wells Required *	Firm Capacity (MGD) **	Total Capacity (MGD)
Existing	1,760	0.185	0.739	0	1.32	3.12
160	3,200	0.336	1.344	0	1.32	3.12
320	4,640	0.487	1.949	0	1.32	3.12
480	6,080	0.638	2.554	0	1.32	3.12
640	7,520	0.790	3.158	1	2.52	4.32
800	8,960	0.941	3.763	1	2.52	4.32
960	10,400	1.092	4.368	2	3.72	5.52
1120	11,840	1.243	4.973	2	3.72	5.52
1240	12,920	1.357	5.426	2	3.72	5.52
1400	14,360	1.508	6.031	3	4.92	6.72

*Assumes new well capacity of 1.200 MGD (1000 gpm operating for 20 hours per day)
**Existing Firm Capacity is 1.32 MGD

3. Wellhead Protection

Wellhead protection should be given consideration when evaluating new well locations. Wellhead protection is a method of preventing contamination of public water supplies by managing potential contaminant sources in the area that contribute to a public water supply well. Land uses relative to commercial, industrial, and underground storage of chemicals and petroleum are considered higher risks to ground water protection than permanent open spaces, parks, farmland and low-density residential lots. All public water suppliers are required to implement wellhead protection measures. The Minnesota Department of Health (MDH) was granted authority to implement wellhead protection and rules governing wellhead protection were adopted in November 1997. Grouping of wells eases wellhead protection and potential treatment beyond the existing facilities.

C. WATER TREATMENT

Empire Township currently adds fluoride, chlorine, and polyphosphate at the well house prior to entry into the distribution system. The current water treatment system does not remedy water quality issues present in source wells such as the elevated levels of

radionuclides (gross alpha and combined radium) or iron and manganese. As discussed earlier, Empire Township has water quality issues regarding radionuclide concentrations exceeding the regulatory MCLs. Consumption of water containing elevated levels of gross alpha and combined radium carries an increased cancer risk. Empire Township also has elevated levels of iron and manganese in all of these wells and well 1 is currently to be used as an emergency well only based on discussions with the MDH and due to elevated combined radium concentrations. Wells 2 and 3 also have exhibited elevated combined radium concentrations and will require treatment to meet the MCL. Treatment for radionuclides can be accomplished through conventional gravity filtration methods. A side benefit of using gravity filtration is the removal of iron and manganese through the process. Although elevated levels of iron and manganese in potable water do not carry an associated health hazard, they create aesthetic problems. Further discussion of the water treatment facility occurs in Section 7.

D. WATER STORAGE

Empire Township's existing storage facility consists of one, 300,000-gallon elevated water tower. Details of the storage tank are presented in Table 2.2.

The principal purpose of storage is to provide the ability to equalize pumping rates during periods of variable rate demand. Adequate storage permits a reduction in the size of the pumps required to supply a community because peak demands are diminished by the reserve provided in storage. Storage is typically provided in elevated tanks for communities the size of Empire Township to provide storage and a pressure source even when the wells are not pumping.

The primary reasons for providing storage are as follows:

- To equalize pressure in the distribution system.
- For emergency requirements (pump failure, power failure).
- Fire protection.

Storage adequacy can be assessed using the Average Day Criteria or the Maximum Day, Fire Protection and Emergency Storage Criteria.

Average Day Criteria

Generally, the minimum recommended standard, without fire protection, is equal to the average day demand (Ten State Standards, 1997). By this standard, Empire Township will have inadequate storage by the time the first 160 acres is developed. The average daily demand when the current land area is fully developed is 1.512 million gallons per day, resulting in a 1.2 million gallons deficit. Assuming that new storage tanks have a volume of 400,000 gallons, a new storage tank would need to be implemented by the time 160, 640, 1,120, 1,400 acres are developed. By the average day criteria method, a total of four new storage tanks would be needed.

Maximum Day, Fire Protection and Emergency Storage Criteria

Another approach is to consider the individual storage components for equalization, fire demand, and emergency reserve versus the available water supply production facilities. The water production and storage must be considered together, since an increase in production may decrease the amount of water storage required. Water storage requirements using this approach are summarized in Table 6.2. In accordance with the average day criteria, the current storage is inadequate by the time the first 160 acres is developed to meet the maximum day, fire protection and emergency storage criteria. Assuming that new storage tanks have a volume of 400,000 gallons, a new storage tank would need to be implemented by the time 160, 640, and 1,120 acres are developed. By the Maximum Day, Fire Protection and Emergency Storage Criteria method, a total of three new storage tanks would be needed. The new water treatment facility will likely have an underground reservoir as part of the design and this will lessen the amount of elevated storage required.

Future storage requirements will be of the elevated storage and reservoir type as discussed previously. An elevated tank will be required for the high service area (currently the golf course area) to provide constant pressure to this area and a reservoir would be provided at the water treatment facility.

TABLE 6.2									
REQUIRED STORAGE BASED ON MAXIMUM DAY, FIRE PROTECTION AND EMERGENCY STORAGE CRITERIA									
Acres	160	320	480	640	800	960	1120	1240	1400
Fire Demand (gpm) ¹	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	3,500
Max. Day Demand (gpm)	<u>940</u>	<u>1,360</u>	<u>1,780</u>	<u>2,200</u>	<u>2,620</u>	<u>3,040</u>	<u>3,460</u>	<u>3,770</u>	<u>4,190</u>
Peak Usage (gpm)	2,940	3,360	3,780	4,200	4,620	5,040	5,460	5,770	7,690
Firm Pumping Supply (gpm) ²	<u>1,100</u>	<u>1,100</u>	<u>1,100</u>	<u>2,100</u>	<u>2,100</u>	<u>3,100</u>	<u>3,100</u>	<u>3,100</u>	<u>4,100</u>
Withdrawal from Storage (gpm)	1,840	2,260	2,680	2,100	2,520	1,940	2,360	2,670	3,590
Fire Flow Duration (hrs)	<u>3</u>	<u>3</u>							
Fire Demand Storage (gallons)	331,200	406,800	482,400	378,000	453,600	349,200	424,800	480,600	646,200
Emergency Storage (gallons) ³	<u>270,720</u>	<u>391,680</u>	<u>512,640</u>	<u>633,600</u>	<u>754,560</u>	<u>875,520</u>	<u>996,480</u>	<u>1,085,760</u>	<u>1,206,720</u>
Total Storage Needed (gallons)	601,920	798,480	995,040	1,011,600	1,208,160	1,224,720	1,421,280	1,566,360	1,852,920
Current Available Storage (gallons)	<u>300,000</u>	<u>300,000</u>							
Net Storage Deficit (gallons)	301,920	498,480	695,040	711,600	908,160	924,720	1,121,280	1,266,360	1,552,920
Net Storage Deficit Rounded (gallons)	300,000	500,000	700,000	725,000	925,000	925,000	1,125,000	1,300,000	1,550,000
<p>¹Fire flow requirements vary within the Township depending on type and construction facilities. Fire flow requirements for normal residential development vary between 1,500 to 2,000 gpm. For multi-family and commercial areas such as the downtown business district, residential apartment areas, schools, and industrial areas; flows of 3,500 gpm for 3 hours are generally considered acceptable.</p> <p>²Based on current firm capacity combined with the projected well implementation plan</p> <p>³Emergency storage equals 20% of maximum day demand</p>									

E. WATER DISTRIBUTION SYSTEM

1. General

The analysis of a water distribution system often requires the use of a method of modeling the system. A model is prepared that simulates the known conditions as closely as possible. This model provides a basis for simulation of future operating conditions of the system. From these simulations, determinations can be made as to the improvements that the system will need. The model is a “tool” used to make decisions and should not be considered to be final as conditions may and often do change and thereby creating inconsistencies in the model. However, having a model is a very effective design “tool”.

The water distribution system for Empire Township was modeled using the CYBERNET Hydraulic Network Model. The computer network model is used to analyze steady state flows for pipe distribution systems. The information required by the model includes data such as diameter, length, and Hazen-Williams C Factor (pipe roughness factor) for each pipe in the system. Other data required include ground elevation of pipe junctions, elevated storage water level and water demand on the system.

2. Model Results

From the modeling, it was determined that systems of 10- and 12-inch trunk watermains are required. The areas within the trunk watermain grid would be filled in with smaller diameter watermains (8”, 10”, and 12”) as the areas are developed. The proposed trunk watermains would be connected to the existing Township system.

3. Pressure Zones

Currently, the Township operates one pressure zone. With the anticipated growth, a second pressure zone will be required in order to properly serve the Township. In order to avoid confusion, the new pressure zones will be labeled: low system and high system. The elevations that each system will serve are presented in Table 6.3.

TABLE 6.3	
PRESSURE ZONES	
Zone	Elevation (ft)
Low System	955
High System	1140

The current water system will serve customers to elevation 955 and in order to get water to the “high” system, or to those users between elevations 955 and 1040, a booster station is required. Preliminary siting and design of the booster station has been completed and the station will be located in the Providence development and will have a capacity of 1,100 gpm. The low and high systems will be interconnected to provide looping of the system and the two systems are divided using pressure reducing valve stations at the interconnection points.

SECTION 7

PROPOSED WATER SYSTEM IMPROVEMENTS

A. GENERAL

The major water system components have been evaluated in the previous sections. A detailed description of the proposed improvements is presented in this section. Figure 7.1 shows the proposed system improvements.

B. WATER SUPPLY

With the addition of Well No. 3, Empire Township has the capacity to meet water demand into the near future. As shown in Table 6.1, assuming a new well would have a capacity of 1,000 gpm, three additional wells would be required to meet demand for the entire planned development area.

C. WATER TREATMENT

The objective of a water system is to provide quality water that is fit for domestic and commercial use. A review of the existing facilities, water quality data, and drinking water standards indicate that for Empire Township to provide a quality water product to its customers, additional treatment must be provided for:

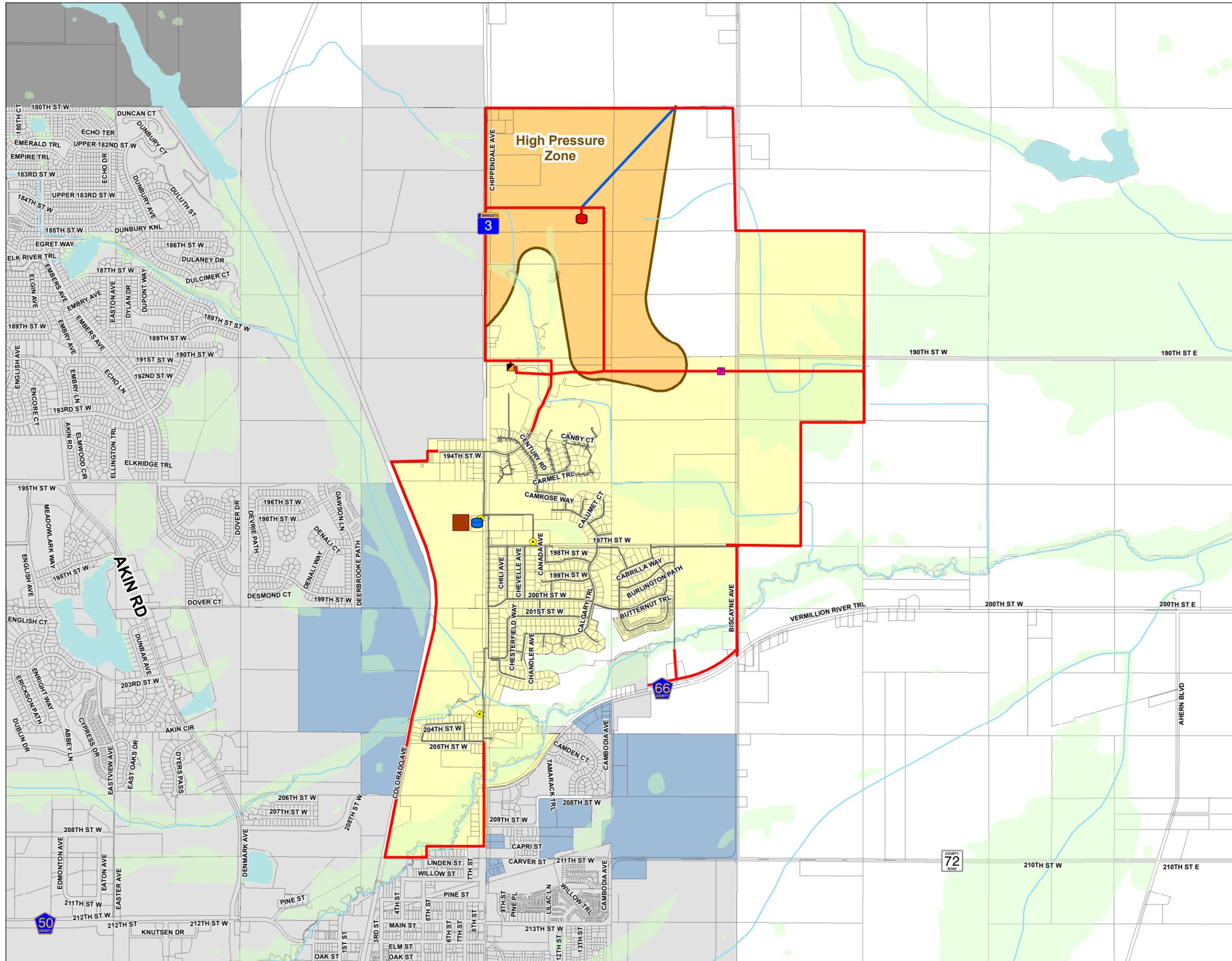
- Radionuclide removal to provide a safe product water
- Iron and manganese removal to prevent nuisance conditions

Due to the anticipated growth of Empire Township a water treatment facility with a capacity of 3,000 gpm is proposed to meet current and future demand. The treatment facility will include aeration, detention, and filtration. The following paragraph provides a brief summary of the functions of the processes required in the treatment plant.

The aerator removes unwanted and troublesome dissolved gases and begins to oxidize the iron and manganese in the raw water. Following aeration, chlorine or potassium permanganate is added to react with the iron and manganese and allow it to settle in the detention tank. Potassium permanganate may be added after detention to further oxidize the manganese prior to entering the filter. As the water enters the filters, the radionuclides and oxidized iron and manganese are captured by the filter media and



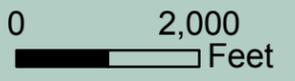
WATER SYSTEM PLAN



Legend

- Proposed Water Treatment Facility
- Proposed Pressure Reducing Valve
- Proposed Water Tower
- Proposed Booster Station
- Proposed Watermain**
- 12"
- 8"
- Existing Watermain
- Existing Water Tower
- Existing Well Locations
- High Pressure Zone
- 2030 MUSA Boundary
- Farmington Orderly Annexation Area
- Wetlands
- Lakes
- Watercourses & Drainageways

Source: Dakota County, MnDNR



Proposed Water System

Figure 7.1

2009



removed from the water. Filter media will consist of a dual media, either silica sand and anthracite or greensand and anthracite. Final selection of the filter media will occur after pilot testing is completed on the source water. The filtered water then enters the clearwell/reservoir where it is stored prior to conveyance into the distribution system via high service pumps. The clearwell/reservoir provides a temporary location to store finished water for backwash purposes and reduces on/off cycling of the high service pumps. After a certain amount of run time, the filters require backwashing to remove the oxidized iron and manganese and the backwash water is stored in the backwashing tank where the oxidized material is allowed to settle and the clear water is returned to the head of the treatment facility. The oxidized material is pumped from the backwash tank to the sanitary sewer system.

Due to the potential for additional growth in the Township, the water treatment facility would be designed to allow for easy expansion of the facility to meet the water demand needs for the Township.

It is currently planned to place the water treatment facility on property adjacent to the tower and well house. This location is central to both Well 2 and well 3 is piped to this location. This minimizes the amount of raw water piping required and reduces infrastructure costs.

D. WATER STORAGE

A new storage tank will be required once the first 160 acres is developed. As discussed in Section 6 an additional 1.2 million gallons of storage is required for complete development of the planned area. As discussed previously, the required water storage will be comprised of elevated storage and in-ground reservoir storage as a component of the water treatment facility.

F. DISTRIBUTION SYSTEM

As previously discussed, 10-, and 12-inch trunk watermains will be required in the planned development area. Watermains and service connections will be planned to accommodate new construction in the development areas.

A new booster station will be required to provide service to customers located in the High system. As previously discussed, the booster station is currently partially designed. The booster station project should be started again when development of the Providence development continues in order to serve customers located in the High system.

SECTION 8

RECOMMENDATIONS, ESTIMATED USER RATES AND FINANCING OPTIONS

A. GENERAL

This section presents associated user rates for recommended water system improvements, and financing options available to ensure implementation of the recommended improvements.

B. RECOMMENDED CAPITAL IMPROVEMENTS

It is recommended that Empire Township construct a water treatment plant in the near future to address water quality issues that pose a health hazard and address any concerns with the Minnesota Department of Health. Table 8.1 presents the estimated costs for the various proposed improvements and the costs in the table do include engineering costs. Any land and/or financing costs have not been included. The table lists when, depending on acres developed, improvements should be made. As discussed above and as shown in the table, the water treatment facility should be constructed in the near future. The booster pump station and elevated storage tank should be constructed when development occurs in the high pressure zone and additional wells will be required as development occurs. Additional trunk watermain will be required as the development occurs outside of the Township's current water system.

Item	Acres Developed *	Cost
Construct 3,000 gpm Treatment Facility	NA	\$7,500,000
Booster Pump Station	80	\$675,000
Construct 300,000 Gallon Elevated Storage	160	\$880,000
Drill New Well No. 4	640	\$400,000
Drill New Well No. 5	960	\$400,000
Drill New Well No. 6	1,400	\$400,000
Total Cost		\$10,255,000
* Estimated date on when infrastructure should be completed. Schedule may vary depending on the amount and location of growth.		

C. FINANCING OPTIONS

Several funding options are available and any option should be thoroughly reviewed by the Township's financial consultant. These are described in the following paragraphs.

1. General Obligation Bonds

The Township could issue general obligation bonds for the various improvements. The rates for the bonds are dependent on current financial situation of the Township and the rates available on the open market.

2. Drinking Water Revolving Loan Fund

The State Drinking Water Loan Fund administered through the Public Facilities Authority (PFA) provides financial assistance, primarily in the form of loans, to eligible public drinking water suppliers for construction of water storage, treatment and distribution systems that meet Safe Drinking Water Act Standards.

The Authority provides below-market loans with interest rates determined by a Quarterly Set Rate minus discounts based on demographic characteristics of the borrower. The loan period is for 20 years.

To become eligible for funding, projects must be included on the Minnesota Department of Health's (MDH) Project Priority List and on the Authority's Intended Use Plan (IUP). An applicant must demonstrate it has the financial capability to repay the loan and must issue a general obligation bond to the Authority as security for the loan.

This project has not yet been scored by the Department of Health, but appears it would meet the requirements for eligibility and qualify for the low interest loan program.

D. FINANCIAL IMPACT

A summary of the impact of the projects listed in Table 8.1 on water usage rates and average monthly water bills over the next 20 years is presented in the detailed calculations in Appendix B. The table lists the proposed rate increases required to fund the proposed capital improvements.

Assumptions made for the financial projections are as follows:

- All costs are based on today's dollar. User rates have not been adjusted for inflation.
- Operation & Maintenance costs are assumed to increase by 10.0% annually plus \$100,000 additional for new water treatment facilities.
- Debt service for capital improvements is based on securing loans at 5% interest rate and a 20-year term.
- For financial projections, annual housing starts were estimated at the number of households projected as part of the water treatment facility.
- Water use for an average residential customer is estimated to be 105 gallons per capita. This value is used for calculation of average residential monthly water bills.

Proposed financial impacts can be summarized as follows:

- The current rate structure appears to be adequate to pay for future improvements.
- A positive fund reserve is established throughout the anticipated acreage developed time period.
- Fund reserve could be used to pay for capital projects.
- Detailed calculations for the proposed rates are shown in Appendix B.

EXHIBIT A

DRINKING WATER STANDARDS INFORMATION

Drinking Water Contaminant Candidate List

1,1,2,2-Tetrachloroethane
1,2,4-Trimethylbenzene
1,1-Dichloroethane
1,1-Dichloropropene
1,2-Diphenylhydrazine
1,3-Dichloropropane
1,3-Dichloropropene
2,4,6-Trichlorophenol
2,2-Dichloropropane
2,4-Dichlorophenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-methyl-Phenol (o-cresol)
Acetochlor
Alachlor ESA & other acetanilide pesticide degradation products
Aluminum
Boron
Bromobenzene
DCPA mono-acid degradate
DCPA di-acid degradate
DDE
Diazinon
Disulfoton
Diuron
EPTC (s-ethyl-dipropylthiocarbamate)
Fonofos
p-Isopropyltoluene (p-cymene)
Linuron
Methyl bromide
Methyl-t-butyl ether (MTBE)
Metolachlor
Molinate
Nitrobenzene
Organotins
Perchlorate
Prometon
RDX
Terbacil
Terbufos
Triazines & degradation products of triazines
Vanadium

EPA National Primary Drinking Water Standards

	Contaminant	MCL or TT ¹ (mg/L) ²	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Acrylamide	TT ⁸	Nervous system or blood problems;	Added to water during sewage/wastewater increased risk of cancer treatment	zero
OC	Alachlor	0.002	Eye, liver, kidney or spleen problems; anemia; increased risk of cancer	Runoff from herbicide used on row crops	zero
R	Alpha particles	15 picocuries per Liter (pCi/L)	Increased risk of cancer	Erosion of natural deposits of certain minerals that are radioactive and may emit a form of radiation known as alpha radiation	zero
IOC	Antimony	0.006	Increase in blood cholesterol; decrease in blood sugar	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	0.006
IOC	Arsenic	0.010 as of 1/23/06	Skin damage or problems with circulatory systems, and may have increased risk of getting cancer	Erosion of natural deposits; runoff from orchards, runoff from glass & electronics production wastes	0
IOC	Asbestos (fibers >10 micrometers)	7 million fibers per Liter (MFL)	Increased risk of developing benign intestinal polyps	Decay of asbestos cement in water mains; erosion of natural deposits	7 MFL
OC	Atrazine	0.003	Cardiovascular system or reproductive problems	Runoff from herbicide used on row crops	0.003
IOC	Barium	2	Increase in blood pressure	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	2
OC	Benzene	0.005	Anemia; decrease in blood platelets; increased risk of cancer	Discharge from factories; leaching from gas storage tanks and landfills	zero
OC	Benzo(a)pyrene (PAHs)	0.0002	Reproductive difficulties; increased risk of cancer	Leaching from linings of water storage tanks and distribution lines	zero
IOC	Beryllium	0.004	Intestinal lesions	Discharge from metal refineries and coal-burning factories; discharge from electrical, aerospace, and defense industries	0.004
R	Beta particles and photon emitters	4 millirems per year	Increased risk of cancer	Decay of natural and man-made deposits of certain minerals that are radioactive and may emit forms of radiation known as photons and beta radiation	zero
DBP	Bromate	0.010	Increased risk of cancer	Byproduct of drinking water disinfection	zero
IOC	Cadmium	0.005	Kidney damage	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metal refineries; runoff from waste batteries and paints	0.005
OC	Carbofuran	0.04	Problems with blood, nervous system, or reproductive system	Leaching of soil fumigant used on rice and alfalfa	0.04
OC	Carbon tetrachloride	0.005	Liver problems; increased risk of cancer	Discharge from chemical plants and other industrial activities	zero
D	Chloramines (as Cl ₂)	MRDL=4.0 ¹	Eye/nose irritation; stomach discomfort, anemia	Water additive used to control microbes	MRDLG=4 ¹

LEGEND

 D	Disinfectant	 IOC	Inorganic Chemical	 OC	Organic Chemical
 DBP	Disinfection Byproduct	 M	Microorganism	 R	Radionuclides

	Contaminant	MCL or TT1 (mg/L) ²	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Chlordane	0.002	Liver or nervous system problems; increased risk of cancer	Residue of banned termiticide	zero
D	Chlorine (as Cl ₂)	MRDL=4.0 ¹	Eye/nose irritation; stomach discomfort	Water additive used to control microbes	MRDLG=4 ¹
D	Chlorine dioxide (as ClO ₂)	MRDL=0.8 ¹	Anemia; infants & young children: nervous system effects	Water additive used to control microbes	MRDLG=0.8 ¹
DBP	Chlorite	1.0	Anemia; infants & young children: nervous system effects	Byproduct of drinking water disinfection	0.8
OC	Chlorobenzene	0.1	Liver or kidney problems	Discharge from chemical and agricultural chemical factories	0.1
IOC	Chromium (total)	0.1	Allergic dermatitis	Discharge from steel and pulp mills; erosion of natural deposits	0.1
IOC	Copper	TT7; Action Level = 1.3	Short term exposure: Gastrointestinal distress. Long term exposure: Liver or kidney damage. People with Wilson's Disease should consult their personal doctor if the amount of copper in their water exceeds the action level	Corrosion of household plumbing systems; erosion of natural deposits	1.3
M	<i>Cryptosporidium</i>	TT3	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
IOC	Cyanide (as free cyanide)	0.2	Nerve damage or thyroid problems	Discharge from steel/metal factories; discharge from plastic and fertilizer factories	0.2
OC	2,4-D	0.07	Kidney, liver, or adrenal gland problems	Runoff from herbicide used on row crops	0.07
OC	Dalapon	0.2	Minor kidney changes	Runoff from herbicide used on rights of way	0.2
OC	1,2-Dibromo-3-chloropropane (DBCP)	0.0002	Reproductive difficulties; increased risk of cancer	Runoff/leaching from soil fumigant used on soybeans, cotton, pineapples, and orchards	zero
OC	o-Dichlorobenzene	0.6	Liver, kidney, or circulatory system problems	Discharge from industrial chemical factories	0.6
OC	p-Dichlorobenzene	0.075	Anemia; liver, kidney or spleen damage; changes in blood	Discharge from industrial chemical factories	0.075
OC	1,2-Dichloroethane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	zero
OC	1,1-Dichloroethylene	0.007	Liver problems	Discharge from industrial chemical factories	0.007
OC	cis-1,2-Dichloroethylene	0.07	Liver problems	Discharge from industrial chemical factories	0.07
OC	trans-1,2-Dichloroethylene	0.1	Liver problems	Discharge from industrial chemical factories	0.1
OC	Dichloromethane	0.005	Liver problems; increased risk of cancer	Discharge from drug and chemical factories	zero
OC	1,2-Dichloropropane	0.005	Increased risk of cancer	Discharge from industrial chemical factories	zero
OC	Di(2-ethylhexyl) adipate	0.4	Weight loss, live problems, or possible reproductive difficulties	Discharge from chemical factories	0.4
OC	Di(2-ethylhexyl) phthalate	0.006	Reproductive difficulties; liver problems; increased risk of cancer	Discharge from rubber and chemical factories	zero
OC	Dinoseb	0.007	Reproductive difficulties	Runoff from herbicide used on soybeans and vegetables	0.007
OC	Dioxin (2,3,7,8-TCDD)	0.00000003	Reproductive difficulties; increased risk of cancer	Emissions from waste incineration and other combustion; discharge from chemical factories	zero
OC	Diquat	0.02	Cataracts	Runoff from herbicide use	0.02
OC	Endothall	0.1	Stomach and intestinal problems	Runoff from herbicide use	0.1

LEGEND

D	Disinfectant	IOC	Inorganic Chemical	OC	Organic Chemical
DBP	Disinfection Byproduct	M	Microorganism	R	Radionuclides

	Contaminant	MCL or TT1 (mg/L) ²	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Endrin	0.002	Liver problems	Residue of banned insecticide	0.002
OC	Epichlorohydrin	TT8	Increased cancer risk, and over a long period of time, stomach problems	Discharge from industrial chemical factories; an impurity of some water treatment chemicals	zero
OC	Ethylbenzene	0.7	Liver or kidneys problems	Discharge from petroleum refineries	0.7
OC	Ethylene dibromide	0.00005	Problems with liver, stomach, reproductive system, or kidneys; increased risk of cancer	Discharge from petroleum refineries	zero
IOC	Fluoride	4.0	Bone disease (pain and tenderness of the bones); Children may get mottled teeth	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories	4.0
M	<i>Giardia lamblia</i>	TT3	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
OC	Glyphosate	0.7	Kidney problems; reproductive difficulties	Runoff from herbicide use	0.7
DBP	Haloacetic acids (HAA5)	0.060	Increased risk of cancer	Byproduct of drinking water disinfection	n/a ⁶
OC	Heptachlor	0.0004	Liver damage; increased risk of cancer	Residue of banned termiticide	zero
OC	Heptachlor epoxide	0.0002	Liver damage; increased risk of cancer	Breakdown of heptachlor	zero
M	Heterotrophic plate count (HPC)	TT3	HPC has no health effects; it is an analytic method used to measure the variety of bacteria that are common in water. The lower the concentration of bacteria in drinking water, the better maintained the water system is.	HPC measures a range of bacteria that are naturally present in the environment	n/a
OC	Hexachlorobenzene	0.001	Liver or kidney problems; reproductive difficulties; increased risk of cancer	Discharge from metal refineries and agricultural chemical factories	zero
OC	Hexachlorocyclopentadiene	0.05	Kidney or stomach problems	Discharge from chemical factories	0.05
IOC	Lead	TT7; Action Level = 0.015	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities; Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits	zero
M	<i>Legionella</i>	TT3	Legionnaire's Disease, a type of pneumonia	Found naturally in water; multiplies in heating systems	zero
OC	Lindane	0.0002	Liver or kidney problems	Runoff/leaching from insecticide used on cattle, lumber, gardens	0.0002
IOC	Mercury (inorganic)	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands	0.002
OC	Methoxychlor	0.04	Reproductive difficulties	Runoff/leaching from insecticide used on fruits, vegetables, alfalfa, livestock	0.04
IOC	Nitrate (measured as Nitrogen)	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	10
IOC	Nitrite (measured as Nitrogen)	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	1

LEGEND

D Disinfectant	IOC Inorganic Chemical	OC Organic Chemical
DBP Disinfection Byproduct	M Microorganism	R Radionuclides

	Contaminant	MCL or TT ¹ (mg/L) ²	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Oxamyl (Vydate)	0.2	Slight nervous system effects	Runoff/leaching from insecticide used on apples, potatoes, and tomatoes	0.2
OC	Pentachlorophenol	0.001	Liver or kidney problems; increased cancer risk	Discharge from wood preserving factories	zero
OC	Picloram	0.5	Liver problems	Herbicide runoff	0.5
OC	Polychlorinated biphenyls (PCBs)	0.0005	Skin changes; thymus gland problems; immune deficiencies; reproductive or nervous system difficulties; increased risk of cancer	Runoff from landfills; discharge of waste chemicals	zero
R	Radium 226 and Radium 228 (combined)	5 pCi/L	Increased risk of cancer	Erosion of natural deposits	zero
IOC	Selenium	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines	0.05
OC	Simazine	0.004	Problems with blood	Herbicide runoff	0.004
OC	Styrene	0.1	Liver, kidney, or circulatory system problems	Discharge from rubber and plastic factories; leaching from landfills	0.1
OC	Tetrachloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from factories and dry cleaners	zero
IOC	Thallium	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories	0.0005
OC	Toluene	1	Nervous system, kidney, or liver problems	Discharge from petroleum factories	1
M	Total Coliforms (including fecal coliform and <i>E. coli</i>)	5.0% ⁴	Not a health threat in itself; it is used to indicate whether other potentially harmful bacteria may be present ⁵	Coliforms are naturally present in the environment as well as feces; fecal coliforms and <i>E. coli</i> only come from human and animal fecal waste.	zero
DBP	Total Trihalomethanes (TTHMs)	0.10 0.080 after 12/31/03	Liver, kidney or central nervous system problems; increased risk of cancer	Byproduct of drinking water disinfection	n/a ⁶
OC	Toxaphene	0.003	Kidney, liver, or thyroid problems; increased risk of cancer	Runoff/leaching from insecticide used on cotton and cattle	zero
OC	2,4,5-TP (Silvex)	0.05	Liver problems	Residue of banned herbicide	0.05
OC	1,2,4-Trichlorobenzene	0.07	Changes in adrenal glands	Discharge from textile finishing factories	0.07
OC	1,1,1-Trichloroethane	0.2	Liver, nervous system, or circulatory problems	Discharge from metal degreasing sites and other factories	0.20
OC	1,1,2-Trichloroethane	0.005	Liver, kidney, or immune system problems	Discharge from industrial chemical factories	0.003
OC	Trichloroethylene	0.005	Liver problems; increased risk of cancer	Discharge from metal degreasing sites and other factories	zero
M	Turbidity	TT ³	Turbidity is a measure of the cloudiness of water. It is used to indicate water quality and filtration effectiveness (e.g., whether disease-causing organisms are present). Higher turbidity levels are often associated with higher levels of disease-causing micro-organisms such as viruses, parasites and some bacteria. These organisms can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.	Soil runoff	n/a
R	Uranium	30 ug/L as of 12/08/03	Increased risk of cancer, kidney toxicity	Erosion of natural deposits	zero

LEGEND

D	Disinfectant	IOC	Inorganic Chemical	OC	Organic Chemical
DBP	Disinfection Byproduct	M	Microorganism	R	Radionuclides

	Contaminant	MCL or TT ¹ (mg/L) ²	Potential health effects from exposure above the MCL	Common sources of contaminant in drinking water	Public Health Goal
OC	Vinyl chloride	0.002	Increased risk of cancer	Leaching from PVC pipes; discharge from plastic factories	zero
M	Viruses (enteric)	TT ³	Gastrointestinal illness (e.g., diarrhea, vomiting, cramps)	Human and animal fecal waste	zero
OC	Xylenes (total)	10	Nervous system damage	Discharge from petroleum factories; discharge from chemical factories	10

NOTES

1 Definitions

- Maximum Contaminant Level Goal (MCLG)—The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
- Maximum Contaminant Level (MCL)—The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
- Maximum Residual Disinfectant Level Goal (MRDLG)—The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- Maximum Residual Disinfectant Level (MRDL)—The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- Treatment Technique (TT)—A required process intended to reduce the level of a contaminant in drinking water.

2 Units are in milligrams per liter (mg/L) unless otherwise noted. Milligrams per liter are equivalent to parts per million (ppm).

3 EPA's surface water treatment rules require systems using surface water or ground water under the direct influence of surface water to (1) disinfect their water, and (2) filter their water or meet criteria for avoiding filtration so that the following contaminants are controlled at the following levels:

- *Cryptosporidium* (as of 1/1/02 for systems serving >10,000 and 1/14/05 for systems serving <10,000) 99% removal.
- *Giardia lamblia*: 99.9% removal/inactivation
- Viruses: 99.99% removal/inactivation
- *Legionella*: No limit, but EPA believes that if *Giardia* and viruses are removed/inactivated, *Legionella* will also be controlled.
- Turbidity: At no time can turbidity (cloudiness of water) go above 5 nephelometric turbidity units (NTU); systems that filter must ensure that the turbidity go no higher than 1 NTU (0.5 NTU for conventional or direct filtration) in at least 95% of the daily samples in any month. As of January 1, 2002, for systems servicing >10,000, and January 14, 2005, for systems servicing <10,000, turbidity may never exceed 1 NTU, and must not exceed 0.3 NTU in 95% of daily samples in any month.
- HPC: No more than 500 bacterial colonies per milliliter
- Long Term 1 Enhanced Surface Water Treatment (Effective Date: January 14, 2005): Surface water systems or (GWUDI) systems serving fewer than 10,000 people must comply with the applicable Long Term 1 Enhanced Surface Water Treatment Rule provisions (e.g. turbidity standards, individual filter monitoring, *Cryptosporidium* removal requirements, updated watershed control requirements for unfiltered systems).
- Filter Backwash Recycling: The Filter Backwash Recycling Rule requires systems that recycle to return specific recycle flows through all processes of the system's existing conventional or direct filtration system or at an alternate location approved by the state.

4 No more than 5.0% samples total coliform-positive in a month. (For water systems that collect fewer than 40 routine samples per month, no more than one sample can be total coliform-positive per month.) Every sample that has total coliform must be analyzed for either fecal coliforms or *E. coli* if two consecutive TC-positive samples, and one is also positive for *E. coli*/fecal coliforms, system has an acute MCL violation.

5 Fecal coliform and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Disease-causing microbes (pathogens) in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. These pathogens may pose a special health risk for infants, young children, and people with severely compromised immune systems.

6 Although there is no collective MCLG for this contaminant group, there are individual MCLGs for some of the individual contaminants:

- Haloacetic acids: dichloroacetic acid (zero); trichloroacetic acid (0.3 mg/L)
- Trihalomethanes: bromodichloromethane (zero); bromoform (zero); dibromochloromethane (0.06 mg/L)

7 Lead and copper are regulated by a Treatment Technique that requires systems to control the corrosiveness of their water. If more than 10% of tap water samples exceed the action level, water systems must take additional steps. For copper, the action level is 1.3 mg/L, and for lead is 0.015 mg/L.

8 Each water system must certify, in writing, to the state (using third-party or manufacturers certification) that when it uses acrylamide and/or epichlorohydrin to treat water, the combination (or product) of dose and monomer level does not exceed the levels specified, as follows: Acrylamide = 0.05% dosed at 1 mg/L (or equivalent); Epichlorohydrin = 0.01% dosed at 20 mg/L (or equivalent).

LEGEND

D	Disinfectant	IOC	Inorganic Chemical	OC	Organic Chemical
DBP	Disinfection Byproduct	M	Microorganism	R	Radionuclides

National Secondary Drinking Water Standards

National Secondary Drinking Water Standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

Contaminant	Secondary Standard
Aluminum	0.05 to 0.2 mg/L
Chloride	250 mg/L
Color	15 (color units)
Copper	1.0 mg/L
Corrosivity	noncorrosive
Fluoride	2.0 mg/L
Foaming Agents	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Odor	3 threshold odor number
pH	6.5-8.5
Silver	0.10 mg/L
Sulfate	250 mg/L
Total Dissolved Solids	500 mg/L
Zinc	5 mg/L

EXHIBIT B

CALCULATION OF USER RATES

Empire Township, Minnesota
Calculation of User Rates

Apr-09

Service Details

Land Developed (acres)	Existing	80	160	240	320	400	480	560	640	720	800	880	960	1040	1120	1200	1240
Population	1760	2480	3200	3920	4640	5360	6080	6800	7520	8240	8960	9680	10400	11120	11840	12560	12920
Connections	587	827	1067	1307	1547	1787	2027	2267	2507	2747	2987	3227	3467	3707	3947	4187	4307
New Households	-	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	120
Yearly Sales (Million Gallons) ⁽¹⁾	67	95	123	150	178	205	233	261	288	316	343	371	399	426	454	481	495

Capital Projects

Construct 3000 gpm Treatment Fac.				\$7,500,000								\$7,500,000					
Watermain Upsizing Costs		\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Booster Pump Station		\$675,000															
Construct 300,000 Gallon El. Storage			\$880,000												\$1,000,000		
Drill New Well No. 4									\$600,000								
Drill New Well No. 5												\$600,000					
Drill New Well No. 6																	\$600,000
Total Capital Projects	\$0	\$775,000	\$980,000	\$7,600,000	\$100,000	\$100,000	\$100,000	\$100,000	\$700,000	\$100,000	\$100,000	\$7,600,000	\$700,000	\$100,000	\$1,100,000	\$100,000	\$700,000

Expenses

O & M Costs ⁽²⁾	\$200,000	\$220,000	\$242,000	\$266,200	\$292,820	\$322,102	\$354,312	\$389,743	\$428,718	\$471,590	\$518,748	\$670,623	\$737,686	\$811,454	\$892,600	\$981,860	\$1,080,046
Existing Debt Service	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Capital Loan Debt (5% @ 20yrs.)	\$0	\$62,155	\$140,751	\$742,251	\$742,251	\$742,251	\$742,251	\$742,251	\$798,391	\$798,391	\$798,391	\$1,399,891	\$1,456,031	\$1,456,031	\$1,536,231	\$1,536,231	\$1,592,371
Total Expenses	\$200,000	\$282,155	\$382,751	\$1,008,451	\$1,035,071	\$1,064,353	\$1,096,563	\$1,131,994	\$1,227,109	\$1,269,981	\$1,317,139	\$2,070,514	\$2,193,717	\$2,267,485	\$2,428,831	\$2,518,091	\$2,672,417

Water System Rates

Water Availability Charge	\$36.00	\$36.72	\$37.45	\$38.20	\$38.97	\$39.75	\$40.54	\$41.35	\$42.18	\$43.02	\$43.88	\$44.76	\$45.66	\$46.57	\$47.50	\$48.45	\$49.42
Water Usage Charge	\$1.80	\$1.84	\$1.87	\$1.91	\$1.95	\$1.99	\$2.03	\$2.07	\$2.11	\$2.15	\$2.19	\$2.24	\$2.28	\$2.33	\$2.38	\$2.42	\$2.47
Water Connection Fee	\$2,550	\$2,601	\$2,653	\$2,706	\$2,760	\$2,815	\$2,872	\$2,929	\$2,988	\$3,047	\$3,108	\$3,171	\$3,234	\$3,299	\$3,365	\$3,432	\$3,501
Water Trunk Fee	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Revenue Generated ⁽³⁾

Water Availability Charge	\$84,528	\$121,470	\$159,855	\$199,728	\$241,131	\$284,111	\$328,713	\$374,986	\$422,978	\$472,740	\$524,324	\$577,781	\$633,167	\$690,538	\$749,950	\$811,462	\$851,413
Water Usage Charge	\$95,094	\$136,653	\$179,837	\$224,694	\$271,273	\$319,625	\$369,802	\$421,859	\$475,851	\$531,833	\$589,864	\$650,004	\$712,313	\$776,855	\$843,693	\$912,894	\$957,839
Water Connection Fee	-	\$624,240	\$636,725	\$649,459	\$662,448	\$675,697	\$689,211	\$702,996	\$717,056	\$731,397	\$746,025	\$760,945	\$776,164	\$791,687	\$807,521	\$823,671	\$420,072
Total Revenue	\$179,622	\$882,363	\$976,417	\$1,073,881	\$1,174,852	\$1,279,433	\$1,387,727	\$1,499,841	\$1,615,885	\$1,735,970	\$1,860,212	\$1,988,730	\$2,121,644	\$2,259,080	\$2,401,164	\$2,548,028	\$2,229,324

Annual surplus/(deficit) -\$20,378 \$600,208 \$593,666 \$65,430 \$139,781 \$215,080 \$291,164 \$367,847 \$388,776 \$465,989 \$543,073 -\$81,784 -\$72,072 -\$8,406 -\$27,667 \$29,937 -\$443,092

Fund Reserve -\$20,378 \$579,830 \$1,173,497 \$1,238,927 \$1,378,708 \$1,593,788 \$1,884,952 \$2,252,799 \$2,641,575 \$3,107,564 \$3,650,637 \$3,568,853 \$3,496,780 \$3,488,375 \$3,460,708 \$3,490,644 \$3,047,552

Average Quarterly Rate ⁽⁴⁾

Water Availability Charge	\$36.00	\$36.72	\$37.45	\$38.20	\$38.97	\$39.75	\$40.54	\$41.35	\$42.18	\$43.02	\$43.88	\$44.76	\$45.66	\$46.57	\$47.50	\$48.45	\$49.42
Water Usage Charge	\$40.50	\$41.31	\$42.14	\$42.98	\$43.84	\$44.72	\$45.61	\$46.52	\$47.45	\$48.40	\$49.37	\$50.36	\$51.36	\$52.39	\$53.44	\$54.51	\$55.60
Average Quarterly Rate =	\$76.50	\$78.03	\$79.59	\$81.18	\$82.81	\$84.46	\$86.15	\$87.87	\$89.63	\$91.42	\$93.25	\$95.12	\$97.02	\$98.96	\$100.94	\$102.96	\$105.02
Average Monthly Rate =	\$25.50	\$26.01	\$26.53	\$27.06	\$27.60	\$28.15	\$28.72	\$29.29	\$29.88	\$30.47	\$31.08	\$31.71	\$32.34	\$32.99	\$33.65	\$34.32	\$35.01

(1) Yearly sales based on 110 gpcpd based on past data.

(2) Includes annual adjustment of 10 % plus \$100,000 for WTP. Does not include depreciation.

(3) Assumes no existing fund reserve

(4) Average quarterly rate based on 22,500 additional gallons/household/quarter which is average usage.

% inc. in Water Availability Charge 2
 % increase in Water Usage Charge 2
 % increase in water conn. Fee 2

EXHIBIT C

DNR WATER SUPPLY PLAN

**DEPARTMENT OF NATURAL RESOURCES - DIVISION OF WATERS and
METROPOLITAN COUNCIL
WATER SUPPLY PLANS**

These guidelines are divided into four parts. The first three parts, Water Supply System Description and Evaluation, Emergency Response Procedures and Water Conservation Planning apply statewide. Part IV, relates to comprehensive plan requirements that apply only to communities in the Seven-County Twin Cities Metropolitan Area. If you have questions regarding water supply plans, please call (651) 259-5703 or (651) 259-5647 or e-mail your question to wateruse@dnr.state.mn.us. Metro Communities can also direct questions to the Metropolitan Council at watersupply@metc.state.mn.us or (651) 602-1066.

DNR Water Appropriation Permit Number(s)	1980-6194
Name of Water Supplier	Empire Township, Minnesota
Address	3385 W. 197 th St., Farmington, MN 55024
Contact Person	Jeff Hince
Title	Utility Supervisor
Phone Number	651-463-4494
E-Mail Address	info@township.empire.mn.us

PART I. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION

The first step in any water supply analysis is to assess the current status of demand and supplies. Information in Part I, can be used in the development of Emergency Response Procedures and Conservation Plans.

A. ANALYSIS OF WATER DEMAND.

Fill in Table 1 for the past 10 years water demand. If your customer categories are different than the ones listed in Table 1, please note the changes below.

--

TABLE 1 Historic Water Demand

Year	Total Population	Population Served	Total Connections	Residential Water Sold (MG)	C/I/I Water Sold (MG)	Wholesale Deliveries (MG)	Total Water Sold (MG)	Total Water Pumped (MG)	Percent Unmetered/Unaccounted	Average Demand (MGD)	Maximum Demand (MGD)	Residential gallons/capita/day	Total gallons/capita/day
1998	1578	1105	352	35.37	0	0	35.37	35.37	0	0.097	NA	88	88
1999	1608	1126	358	42.33	0	0	42.33	42.33	0	0.116	NA	103	103
2000	1638	1147	365	40.93	0	0	40.93	40.93	0	0.112	NA	98	98
2001	1650	1155	368	46.43	0	0	46.43	46.43	0	0.127	NA	110	110
2002	1690	1171	373	38.42	.028	0	38.45	39.04	1.51	0.107	0.401	90	91
2003	1858	1419	452	50.33	.055	0	50.39	54.15	6.94	0.148	0.666	97	104
2004	2105	1650	500	46.78	1.81	0	48.59	53.43	9.06	0.146	0.529	78	88
2005	2226	1638	546	52.14	1.79	0	56.76	59.71	4.94	0.164	0.772	87	100
2006	2247	1758	563	77.07	1.70	0	78.77	80.81	2.52	0.221	0.671	120	126
2007	2291	1917	581	72.96	3.81	0	77.47	78.48	1.29	0.215	0.635	104	112

MG – Million Gallons MGD – Million Gallons per Day C/I/I- Commercial, Industrial, Institutional

Residential. Water used for normal household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens.

Institutional. Hospitals, nursing homes, day care centers, and other facilities that use water for essential domestic requirements. This includes public facilities and public metered uses. You may want to maintain separate institutional water use records for emergency planning and allocation purposes.

Commercial. Water used by motels, hotels, restaurants, office buildings, commercial facilities, both civilian and military.

Industrial. Water used for thermoelectric power (electric utility generation) and other industrial uses such as steel, chemical and allied products, food processing, paper and allied products, mining, and petroleum refining.

Wholesale Deliveries. Bulk water sales to other public water suppliers.

Unaccounted. Unaccounted for water is the volume of water withdrawn from all sources minus the volume sold.

Residential Gallons per Capita per Day = total residential sales in gallons/population served/365 days **Total Gallons per Capita per Day** = total water withdrawals/population served/365 days

NOTE: Non-essential water uses defined by Minnesota Statutes 103G.291, include lawn sprinkling, vehicle washing, golf course and park irrigation and other non-essential uses. Some of the above categories also include non-essential uses of water.

Water Use Trends. Discuss factors that influence trends in water demand (i.e. growth, weather, industry, conservation). If appropriate, include a discussion of other factors that affect daily water use, such as use by non-resident commuter employees or large water consuming industry.
See Section 3 of Water Distribution System Plan

TABLE 2 Large Volume Users - List the top 10 largest users.

Customer	Gallons per year	% of total annual use
None that represent more than 5% of total usage		

B. TREATMENT AND STORAGE CAPACITY.

TABLE 3(A) Water Treatment

Water Treatment Plant Capacity	NA	Gallons per day
Describe the treatment process used (i.e., softening, chlorination, fluoridation, Fe/Mn removal, reverse osmosis, coagulation, sedimentation, filtration, others). Also, describe the annual amount and method of disposal of treatment residuals, if any.		
The only current treatment is the addition of flouride, chlorine, and polyphosphate at the well house prior to distribution.		

TABLE 3(B) Storage Capacity - List all storage structures and capacities.

Total Storage Capacity	Average Day Demand (average of last 5 years)	
300,000 Gallons	178,800	Gallons per day
Type of Structure	Number of Structures	Gallons
Elevated Storage	1	300,000
Ground Storage		
Other:		

C. WATER SOURCES. List all groundwater, surface water and interconnections that supply water to the system. Add or delete lines to the tables as needed.

TABLE 4(A) Total Water Source Capacity for System (excluding emergency connections)

Total Capacity of Sources	2,600	Gallons per
	minute	
Firm Capacity (largest pump out of service)	1,100	Gallons per
	minute	

TABLE 4(B) Groundwater Sources - Copies of water well records and well maintenance information should be included with the public water supplier's copy of the plan in Attachment A. If there are more wells than space provided or multiple well fields, please use the List of Wells template (see Resources) and include as Attachment .

Well # or name	Unique Well Number	Year Installed	Well & Casing Depth (ft)	Well Diameter (in)	Capacity (GPM)	Geologic Unit	Status
1		1973	410/340	12	600	Jordan Aquifer	
2		1981	457/355	12	500	Jordan Aquifer	
3		2007			1500	Jordan Aquifer	

Status: Active use, Emergency, Standby, Seasonal, Peak use, etc. GPM – Gallons per Minute
 Geologic Unit: Name of formation(s), which supplies water to the well

TABLE 4(C) Surface Water Sources

Intake ID	Resource name	Capacity (GPM/MGD)
None		

GPM – Gallons per Minute MGD – Million Gallons per Day

TABLE 4(D) Wholesale or Retail Interconnections - List interconnections with neighboring suppliers that are used to supply water on a **regular basis** either wholesale or retail.

Water Supply System	Capacity (GPM/MGD)	Wholesale or retail
None		

GPM – Gallons per Minute MGD – Million Gallons per Day

TABLE 4(E) Emergency Interconnections - List interconnections with neighboring suppliers or private sources that can be used to supply water on an emergency or occasional basis. Suppliers that serve less than 3,300 people can leave this section blank, but must provide this information in Section II C.

Water Supply System	Capacity (GPM/MGD)	Note any limitations on use
None		

GPM – Gallons per Minute MGD – Million Gallons per Day

D. DEMAND PROJECTIONS.

TABLE 5 Ten Year Demand Projections

Year	Population Served	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Projected Demand (MGY)

MGD – Million Gallons per Day MGY – Million Gallons per Year

Projection Method. Describe how projections were made, (assumptions for per capita, per household, per acre or other methods used).

See Table 4.4 in the Water Distribution System Plan. Projections based on developed acreage.

E. RESOURCE SUSTAINABILITY

Sustainable water use: use of water to provide for the needs of society, now and in the future, without unacceptable social, economic, or environmental consequences.

Monitoring. Records of water levels should be maintained for all production wells and source water reservoirs/basins. Water level readings should be taken monthly for a production well or observation well that is representative of the wells completed in each water source formation. **If water levels are not currently measured each year, a monitoring plan that includes a schedule for water level readings must be submitted as Attachment .**

TABLE 6 Monitoring Wells - List all wells being measured.

Unique well number	Type of well (production, observation)	Frequency of Measurement (daily, monthly etc.)	Method of Measurement (steel tape, SCADA etc.)
Wells 1, 2, 3	Production	Yearly	

Water Level Data. Summarize water level data including seasonal and long-term trends for each ground and/or surface water source. If water levels are not measured and recorded on a routine basis then provide the static water level (SWL) when the well was constructed and a current water level measurement for each production well. Also include all water level data taken during well and pump maintenance.

Attachment B: Provide monitoring data (graph or table) for as many years as possible.

Ground Water Level Monitoring – DNR Waters in conjunction with federal and local units of government maintain and measure approximately 750 observation wells around the state. Ground water level data are available online www.dnr.state.mn.us/waters. Information is also available by contacting the Ground Water Level Monitoring Manager, DNR Waters, 500 Lafayette Road, St. Paul, MN 55155-4032 or call (651) 259-5700.

Natural Resource Impacts. Indicate any natural resource features such as calcareous fens, wetlands, trout streams, rivers or surface water basins that are or could be influenced by water withdrawals from municipal production wells. Also indicate if resource protection thresholds have been established and if mitigation measures or management plans have been developed.

None

Sustainability. Evaluate the adequacy of the resource to sustain current and projected demands.

Describe any modeling conducted to determine impacts of projected demands on the resource.

Source Water Protection Plans. The emergency procedures in this plan are intended to comply with the contingency plan provisions required in the Minnesota Department of Health’s (MDH) Wellhead Protection (WHP) Plan and Surface Water Protection (SWP) Plan.	
Date WHP Plan Adopted:	November 1997
Date for Next WHP Update:	
SWP Plan:	<input type="checkbox"/> In Process <input type="checkbox"/> Completed <input type="checkbox"/> Not Applicable

F. CAPITAL IMPROVEMENT PLAN (CIP)

Adequacy of Water Supply System. Are water supply installations, treatment facilities and distribution systems adequate to sustain current and projected demands? Yes No If no, describe any potential capital improvements over the next ten years and state the reasons for the proposed changes (CIP Attachment).

Construction of a new 3,000 gpm water treatment facility is required to produce water that meets the Primary Drinking Water Standard for combined Radium levels.

Proposed Water Sources. Does your current CIP include the addition of new wells or intakes? Yes No If yes, list the number of new installations and projected water demands from each for the next ten years. Plans for new production wells must include the geologic source formation, well location, and proposed pumping capacity.

Water Source Alternatives. If new water sources are being proposed, describe alternative sources that were considered and any possibilities of joint efforts with neighboring communities for development of supplies.

See Section 7 of Water Distribution System Plan

Preventative Maintenance. Long-term preventative programs and measures will help reduce the risk of emergency situations. Identify sections of the system that are prone to failure due to age, materials or other problems. This information should be used to prioritize capital improvements, preventative maintenance, and to determine the types of materials (pipes, valves, couplings, etc.) to have in stock to reduce repair time.

PART II. EMERGENCY RESPONSE PROCEDURES

Water emergencies can occur as a result of vandalism, sabotage, accidental contamination, mechanical problems, power failures, drought, flooding, and other natural disasters. The purpose of emergency planning is to develop emergency response procedures and to identify actions needed to improve emergency preparedness. In the case of a municipality, these procedures should be in support of, and part of, an all-hazard emergency operations plan. If your community already has written procedures dealing with water emergencies we recommend that you use these guidelines to review and update existing procedures and water supply protection measures.

Federal Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act as amended by the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Public Law 107-188, Title IV – Drinking Water Security and Safety) requires community water suppliers serving over 3,300 people to prepare an Emergency Response Plan. **Community water suppliers that have completed the Federal Emergency Response Plan and submitted the required certification to the U.S. Environmental Protection Agency have satisfied Part II, Sections A, B, and C of these guidelines and need only provide the information below regarding the emergency response plan and source water protection plan and complete Sections D (Allocation and Demand Reduction Procedures), and E (Enforcement).**

Provide the following information regarding your completed Federal Emergency Response Plan:

Emergency Response Plan	Contact Person	Contact Number
Emergency Response Lead	Jeff Hince	651-470-5056
Alternate Emergency Response Lead	Township Hall, Empire Township	651-463-4494
Emergency Response Plan Certification Date		

Operational Contingency Plan. An operational contingency plan that describes measures to be taken for water supply mainline breaks and other common system failures as well as routine maintenance is recommended for all utilities. Check here if the utility has an operational contingency plan. At a minimum a contact list for contractors and supplies should be included in a water emergency telephone list.

Communities that have completed Federal Emergency Response Plans should skip to Section D.

EMERGENCY RESPONSE PROCEDURES

- A. Emergency Telephone List.** A telephone list of emergency contacts must be included as Attachment C to the plan (complete template or use your own list). The list should include key utility and community personnel, contacts in adjacent communities, and appropriate local, state and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list on a regular basis (once each year recommended). In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Responsibilities and services for each contact should be defined.
- B. Current Water Sources and Service Area.** Quick access to concise and detailed information on water sources, water treatment, and the distribution system may be needed in an emergency. System operation, water well and maintenance records should be maintained in a central secured location so that the records are accessible for emergency purposes and preventative maintenance. A detailed map of the system showing the treatment plants, water sources, storage facilities, supply lines, interconnections, and other information that would be useful in an emergency should also be readily available. Check here if these records and maps exist and staff can access the documents in the event of an emergency.
- C. Procedure for Augmenting Water Supplies.** List all available sources of water that can be used to augment or replace existing sources in an emergency. In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Copies of cooperative agreements should be maintained with your copy of the plan and include in Attachment . Be sure to include information on any physical or chemical problems that may limit interconnections to other sources of water. Approvals from the MN Department of Health are required for interconnections and reuse of water.

TABLE 7 (A) Public Water Supply Systems – List interconnections with other public water supply systems that can supply water in an emergency.

Water Supply System	Capacity (GPM/MGD)	Note any limitations on use
None		

GPM – Gallons per Minute MGD – Million Gallons per Day

TABLE 7 (B) - Private Water Sources – List other sources of water available in an emergency.

Name	Capacity (GPM/MGD)	Note any limitations on use
None		

GPM – Gallons per Minute MGD – Million Gallons per Day

D. Allocation and Demand Reduction Procedures. The plan must include procedures to address gradual decreases in water supply as well as emergencies and the sudden loss of water due to line breaks, power failures, sabotage, etc. During periods of limited water supplies public water suppliers are required to allocate water based on the priorities established in Minnesota Statutes 103G.261.

Water Use Priorities (Minnesota Statutes 103G.261)	
First Priority.	Domestic water supply, excluding industrial and commercial uses of municipal water supply, and use for power production that meets contingency requirements.
	<i>NOTE:</i> Domestic use is defined (MN Rules 6115.0630, Subp. 9), as use for general household purposes for human needs such as cooking, cleaning, drinking, washing, and waste disposal, and uses for on-farm livestock watering excluding commercial livestock operations which use more than 10,000 gallons per day or one million gallons per year.
Second Priority.	Water uses involving consumption of less than 10,000 gallons per day.
Third Priority.	Agricultural irrigation and processing of agricultural products.
Fourth Priority.	Power production in excess of the use provided for in the contingency plan under first priority.
Fifth Priority.	Uses, other than agricultural irrigation, processing of agricultural products, and power production.
Sixth Priority.	Non-essential uses. These uses are defined by Minnesota Statutes 103G.291 as lawn sprinkling, vehicle washing, golf course and park irrigation, and other non-essential uses.

List the statutory water use priorities along with any local priorities (hospitals, nursing homes, etc.) in Table 8. Water used for human needs at hospitals, nursing homes and similar types of facilities should be designated as a high priority to be maintained in an emergency. Local allocation priorities will need to address water used for human needs at other types of facilities such as hotels, office buildings, and manufacturing plants. The volume of water and other types of water uses at these facilities must be carefully considered. After reviewing the data, common sense should dictate local allocation priorities to protect domestic requirements over certain types of economic needs. In Table 8, list the priority ranking, average day demand and demand reduction potential for each customer category (modify customer categories if necessary).

Table 8 Water Use Priorities

Customer Category	Allocation Priority	Average Day Demand (GPD)	Demand Reduction Potential (GPD)
Residential	1		
Institutional	1		
Commercial	2		
Industrial	3		
Irrigation	4		
Wholesale	5		
Non-essential	6		
	TOTALS		

GPD – Gallons per Day

Demand Reduction Potential. The demand reduction potential for residential use will typically be the base demand during the winter months when water use for non-essential uses such as lawn watering do not occur. The difference between summer and winter demands typically defines the demand reduction that can be achieved by eliminating non-essential uses. In extreme emergency situations lower priority water uses must be restricted or eliminated to protect first priority domestic water requirements. Short-term demand reduction potential should be based on average day demands for customer categories within each priority class.

Triggers for Allocation and Demand Reduction Actions. Triggering levels must be defined for implementing emergency responses, including supply augmentation, demand reduction, and water allocation. Examples of triggers include: water demand >100% of storage, water level in well(s) below a certain elevation, treatment capacity reduced 10% etc. Each trigger should have a quantifiable indicator and actions can have multiple stages such as mild, moderate and severe responses. Check each trigger below that is used for implementing emergency responses and for each trigger indicate the actions to be taken at various levels or stages of severity in Table 9.

- | | |
|---|--|
| <input type="checkbox"/> Water Demand | <input type="checkbox"/> Water Main Break |
| <input type="checkbox"/> Treatment Capacity | <input type="checkbox"/> Loss of Production |
| <input type="checkbox"/> Storage Capacity | <input type="checkbox"/> Security Breach |
| <input type="checkbox"/> Groundwater Levels | <input type="checkbox"/> Contamination |
| <input type="checkbox"/> Surface Water Flows or Levels | <input type="checkbox"/> Other (list in Table 9) |
| <input type="checkbox"/> Pump, Booster Station or Well Out of Service | |
| <input type="checkbox"/> Governor’s Executive Order – Critical Water Deficiency (required by statute) | |

Table 9 Demand Reduction Procedures

Condition	Trigger(s)	Actions
Stage 1 (Mild)	One well runs for 18 hours/day	Request users to use water conserving measures
Stage 2 (Moderate)	Cannot maintain water tower capacity at 50% over 24 hour period	Request users to observe odd/even watering.
Stage 3 (Severe)	Cannot maintain water tower capacity at 33% over a 24 hour period.	Request odd/even watering during restricted hours only and limit wholesale water sales.
Critical Water Deficiency (M.S. 103G.291)	Executive Order by Governor & as provided in above triggers	Stage 1: Restrict lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses Stage 2: Suspend lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses

Note: The potential for water availability problems during the onset of a drought are almost impossible to predict. Significant increases in demand should be balanced with preventative measures to conserve supplies in the event of prolonged drought conditions.

Notification Procedures. List methods that will be used to inform customers regarding conservation requests, water use restrictions, and suspensions. Customers should be aware of emergency procedures and responses that they may need to implement.

Water customers would be informed of the conservation measures through public announcements and press releases.

E. Enforcement. Minnesota Statutes require public water supply authorities to adopt and enforce water conservation restrictions during periods of critical water shortages.

**Public Water Supply Appropriation During Deficiency.
Minnesota Statutes 103G.291, Subdivision 1.**

Declaration and conservation.
(a) If the governor determines and declares by executive order that there is a critical water deficiency, public water supply authorities appropriating water must adopt and enforce water conservation restrictions within their jurisdiction that are consistent with rules adopted by the commissioner.
(b) The restrictions must limit lawn sprinkling, vehicle washing, golf course and park irrigation, and other nonessential uses, and have appropriate penalties for failure to comply with the restrictions.

An ordinance that has been adopted or a draft ordinance that can be quickly adopted to comply with the critical water deficiency declaration must be included in the plan (include with other ordinances in Attachment 7 for Part III, Item 4). Enforcement responsibilities and penalties for non-compliance should be addressed in the critical water deficiency ordinance.

Sample regulations are available at www.dnr.state.mn.us/waters

Authority to Implement Water Emergency Responses. Emergency responses could be delayed if city council or utility board actions are required. Standing authority for utility or city managers to implement water restrictions can improve response times for dealing with emergencies. Who has authority to implement water use restrictions in an emergency?

- Utility Manager City Manager City Council or Utility Board
 Other (describe):

Emergency Preparedness. If city or utility managers do not have standing authority to implement water emergency responses, please indicate any intentions to delegate that authority. Also indicate any other measures that are being considered to reduce delays for implementing emergency responses.

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PART III. WATER CONSERVATION PLAN

Water conservation programs are intended to reduce demand for water, improve the efficiency in use and reduce losses and waste of water. Long-term conservation measures that improve overall water use efficiencies can help reduce the need for short-term conservation measures. Water conservation is an important part of water resource management and can also help utility managers satisfy the ever-increasing demands being placed on water resources.

Minnesota Statutes 103G.291, requires public water suppliers to implement demand reduction measures before seeking approvals to construct new wells or increases in authorized volumes of water. Minnesota Rules 6115.0770, require water users to employ the best available means and practices to promote the efficient use of water. Conservation programs can be cost effective when compared to the generally higher costs of developing new sources of supply or expanding water and/or wastewater treatment plant capacities.

A. Conservation Goals. The following section establishes goals for various measures of water demand. The programs necessary to achieve the goals will be described in the following section.

Unaccounted Water (calculate five year averages with data from Table 1)	
Average annual volume unaccounted water for the last 5 years	3,944,000 gallons
Average percent unaccounted water for the last 5 years	6.5 percent
AWWA recommends that unaccounted water not exceed 10%. Describe goals to reduce unaccounted water if the average of the last 5 years exceeds 10%.	

Residential Gallons Per Capita Demand (GPCD)	
Average residential GPCD use for the last 5 years (use data from Table 1)	104 GPCD
In 2002, average residential GPCD use in the Twin Cities Metropolitan Area was 75 GPCD. Describe goals to reduce residential demand if the average for the last 5 years exceeds 75 GPCD.	
Adoption of the Minnesota Plumbing Code, which requires installation of water efficient fixtures to be installed during construction or remodeling. Implimentation of an ordinance to prohibit lawn sprkinling between 10 A.M. and 6 P.M. Conduct water audits of homes, buisnesses and all township buildings. Many of the lots in the township have larger yards and citizens are applying significant volumes of water to their yards. Education programs may help in reducing this volume.	

Total Per Capita Demand: From Table 1, is the trend in overall per capita demand over the past 10 years <input checked="" type="checkbox"/> increasing or <input type="checkbox"/> decreasing? If total GPCD is increasing, describe the goals to lower overall per capita demand or explain the reasons for the increase.
Adoption of the Minnesota Plumbing Code, which requires installation of water efficient fixtures to be installed during construction or remodeling. Implimentation of an ordinance to prohibit lawn sprkinling between 10 A.M. and 6 P.M. Conduct water audits of homes, buisnesses and all township buildings. Continued monitoring of the average gallons per capita day water usage to

assess the affectiveness of the conservation efforts.

Peak Demands (calculate average ratio for last five years using data from Table 1)	
Average maximum day to average day ratio	3.76
If peak demands exceed a ratio of 2.6, describe the goals for lowering peak demands.	
Implimentation of an ordinance to prohibit lawn sprinkling between 10 A.M. and 6 P.M.	

B. Water Conservation Programs. Describe all short-term conservation measures that are available for use in an emergency and long-term measures to improve water use efficiencies for each of the six conservation program elements listed below. Short-term demand reduction measures must be included in the emergency response procedures and must be in support of, and part of, a community all-hazard emergency operation plan.

- 1. Metering.** The American Water Works Association (AWWA) recommends that every water utility meter all water taken into its system and all water distributed from its system at its customer’s point of service. An effective metering program relies upon periodic performance testing, repair, repair and maintenance of all meters. AWWA also recommends that utilities conduct regular water audits to ensure accountability. Complete Table 10 (A) regarding the number and maintenance of customer meters.

TABLE 10 (A) Customer Meters

	Number of Connections	Number of Metered Connections	Meter testing schedule (years)	Average age/meter replacement schedule (years)
Residential	563	563		/
Institutional				/
Commercial	5	5		/
Industrial				/
Public Facilities				/
Other				/
TOTALS				

Unmetered Systems. Provide an estimate of the cost to install meters and the projected water savings from metering water use. Also indicate any plans to install meters.

TABLE 10 (B) Water Source Meters

	Number of Meters	Meter testing schedule (years)	Average age/meter replacement schedule (years)
Water Source			/

(wells/intakes)			
Treatment Plant			/

2. **Unaccounted Water.** Water audits are intended to identify, quantify, and verify water and revenue losses. The volume of unaccounted-for water should be evaluated each billing cycle. The AWWA recommends a goal of ten percent or less for unaccounted-for water. Water audit procedures are available from the AWWA and MN Rural Water Association.

Frequency of water audits: each billing cycle yearly other:

Leak detection and survey: every year every years periodic as needed
 Year last leak detection survey completed:

Reducing Unaccounted Water. List potential sources and efforts being taken to reduce unaccounted water. If unaccounted water exceeds 10% of total withdrawals, include the timeframe for completing work to reduce unaccounted water to 10% or less.
 Continue to monitor unaccounted for water and the current meter replacement program.

3. **Conservation Water Rates.** Plans must include the current rate structure for all customers and provide information on any proposed rate changes. Discuss the basis for current price levels and rates, including cost of service data, and the impact current rates have on conservation.

Billing Frequency: Monthly Bimonthly Quarterly
 Other (describe):

Volume included in base rate or service charge: 0gallons or 0cubic feet

Conservation Rate Structures

- Increasing block rate: rate per unit increases as water use increases
- Seasonal rate: higher rates in summer to reduce peak demands
- Service charge or base fee that does not include a water volume

Conservation Neutral Rate Structure

- Uniform rate: rate per unit is the same regardless of volume

Non-conserving Rate Structures

- Service charge or base fee that includes a large volume of water
- Declining block rate: rate per unit decreases as water use increases
- Flat rate: one fee regardless of how much water is used (unmetered)

Other (describe):

Water Rates Evaluated: every year every years no schedule
 Date of last rate change:

Declining block (the more water used, the cheaper the rate) and flat (one fee for an unlimited volume of water) rates should be phased out and replaced with conservation rates. Incorporating a seasonal rate structure and the benefits of a monthly billing cycle should also be considered along with the development of an emergency rate structure that could be quickly implemented to encourage conservation in an emergency.

Current Water Rates. Include a copy of the actual rate structure in Attachment or list current water rates including base/service fees and volume charges below.
Quarterly Base Charge- \$36/REU, Consumptive Fee- \$1.80/1,000 gals

Non-conserving Rate Structures. Provide justification for the rate structure and its impact on reducing demands or indicate intentions including the timeframe for adopting a conservation rate structure.

4. **Regulation.** Plans should include regulations for short-term reductions in demand and long-term improvements in water efficiencies. Sample regulations are available from DNR Waters. Copies of adopted regulations or proposed restrictions should be included in Attachment (see Township website for ordinances and updates) of the plan. Indicate any of the items below that are required by local regulations and also indicate if the requirement is applied each year or just in emergencies.

- Time of Day: no watering between 10 A.M. am/pm and 6 P.M. am/pm (reduces evaporation) year around seasonal emergency only
- Odd/Even: (helps reduce peak demand) year around seasonal emergency only
- Water waste prohibited (no runoff from irrigation systems)
Describe ordinance:
- Limitations on turf areas for landscaping (reduces high water use turf areas)
Describe ordinance:
- Soil preparation (such as 4"-6" of organic soil on new turf areas with sandy soil)
Describe ordinance:
- Tree ratios (plant one tree for every square feet to reduce turf evapotranspiration)
Describe ordinance:
- Prohibit irrigation of medians or areas less than 8 feet wide
Describe ordinance:
- Permit required to fill swimming pool every year emergency only
- Other (describe):

State and Federal Regulations (mandated)

Rainfall sensors on landscape irrigation systems. Minnesota Statute 103G.298 requires “All automatically operated landscape irrigation systems shall have furnished and installed technology that inhibits or interrupts operation of the landscape irrigation system during periods of sufficient moisture. The technology must be adjustable either by the end user or the professional practitioner of landscape irrigation services.”

Water Efficient Plumbing Fixtures. The 1992 Federal Energy Policy Act established manufacturing standards for water efficient plumbing fixtures, including toilets, urinals, faucets, and aerators.

Enforcement. Are ordinances enforced? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, indicate how ordinances are enforced along with any penalties for non-compliance.
City staff and local law enforcement.

5. Education and Information Programs. Customers should be provided information on how to improve water use efficiencies a minimum of two times per year. Information should be provided at appropriate times to address peak demands. Emergency notices and educational materials on how to reduce water use should be available for quick distribution during an emergency. If any of the methods listed in the table below are used to provide water conservation tips, indicate the number of times that information is provided each year and attach a list of education efforts used for the last three years.

Current Education Programs	Times/Year
Billing inserts or tips printed on the actual bill	
Consumer Confidence Reports	
Local news papers	
Community news letters	
Direct mailings (water audit/retrofit kits, showerheads, brochures)	
Information at utility and public buildings	
Public Service Announcements	
Cable TV Programs	
Demonstration projects (landscaping or plumbing)	
K-12 Education programs (Project Wet, Drinking Water Institute)	
School presentations	
Events (children’s water festivals, environmental fairs)	
Community education	
Water Week promotions	
Information provided to groups that tour the water treatment plant	
Website (include address: _____)	
Targeted efforts (large volume users, users with large increases)	
Notices of ordinances (include tips with notices)	
Emergency conservation notices (recommended)	
Other:	

List education efforts for the last three years in Attachment _____ of the plan. Be sure to indicate whether educational efforts are on-going and which efforts were initiated as an

emergency or drought management effort.

Proposed Education Programs. Describe any additional efforts planned to provide conservation information to customers a minimum of twice per year (required if there are no current efforts).

A packet of conservation tips and information can be obtained by contacting DNR Waters or the Minnesota Rural Water Association (MRWA). The American Water Works Association (AWWA) www.awwa.org or www.waterwiser.org also has excellent materials on water conservation that are available in a number of formats. You can contact the MRWA 800/367-6792, the AWWA bookstore 800/926-7337 or DNR Waters 651/259-5703 for information regarding educational materials and formats that are available.

6. **Retrofitting Programs.** Education and incentive programs aimed at replacing inefficient plumbing fixtures and appliances can help reduce per capita water use as well as energy costs. It is recommended that communities develop a long-term plan to retrofit public buildings with water efficient plumbing fixtures and that the benefits of retrofitting be included in public education programs. You may also want to contact local electric or gas suppliers to see if they are interested in developing a showerhead distribution program for customers in your service area.

A study by the AWWA Research Foundation (Residential End Uses of Water, 1999) found that the average indoor water use for a non-conserving home is 69.3 gallons per capita per day (gpcd). The average indoor water use in a conserving home is 45.2 gpcd and most of the decrease in water use is related to water efficient plumbing fixtures and appliances that can reduce water, sewer and energy costs. In Minnesota, certain electric and gas providers are required (Minnesota Statute 216B.241) to fund programs that will conserve energy resources and some utilities have distributed water efficient showerheads to customers to help reduce energy demands required to supply hot water.

Retrofitting Programs. Describe any education or incentive programs to encourage the retrofitting of inefficient plumbing fixtures (toilets, showerheads, faucets, and aerators) or appliances (washing machines).

Plan Approval. Water Supply Plans must be approved by the Department of Natural Resources (DNR) every ten years. Please submit plans for approval to the following address:

DNR Waters
Water Permit Programs Supervisor
500 Lafayette Road
St. Paul, MN 55155-4032

or Submit electronically to
wateruse@dnr.state.mn.us.

Adoption of Plan. All DNR plan approvals are contingent on the formal adoption of the plan by the city council or utility board. Please submit a certificate of adoption (example available) or other action adopting the plan.

Metropolitan Area communities are also required to submit these plans to the Metropolitan Council. Please see PART IV. ITEMS FOR METROPOLITAN AREA PUBLIC SUPPLIERS.

METROPOLITAN COUNCIL

PART IV. ITEMS FOR METROPOLITAN AREA PUBLIC SUPPLIERS

Minnesota Statute 473.859 requires water supply plans to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process. Much of the required information is contained in Parts I-III of these guidelines. However, the following additional information is necessary to make the water supply plans consistent with the Metropolitan Land Use Planning Act upon which local comprehensive plans are based. Communities should use the information collected in the development of their plans to evaluate whether or not their water supplies are being developed consistent with the Council's Water Resources Management Policy Plan.

Policies. Provide a statement(s) on the principles that will dictate operation of the water supply utility: for example, "It is the policy of the city to provide good quality water at an affordable rate, while assuring this use does not have a long-term negative resource impact."

EmpireTownship provides a variety of public services to residents, businesses, and property owners in the community, including public utilities. Municipal water, wastewater services, stormwater management, and street lighting are basic public utilities and among the services provided by the Township. The purpose is to conserve water resources, protect water quality, to establish equitable fees for the provision of public utilities to properties, and to protect the public health, safety, and welfare.

Impact on the Local Comprehensive Plan. Identify the impact that the adoption of this water supply plan has on the rest of the local comprehensive plan, including implications for future growth of the community, economic impact on the community and changes to the comprehensive plan that might result.

This plan is an integral part of the comprehensive plan

Demand Projections

Year	Total Community Population	Population Served	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Projected Demand (MGY)
2010					
2020					
2030					
Ultimate					

Population projections should be consistent with those in the Metropolitan Council's 2030 *Regional Development Framework* or the Communities 2008 Comprehensive Plan update. If population served differs from total population, explain in detail why the difference (i.e., service to other communities, not complete service within community etc.).

See Table 4.4 as demand projections are based on additional service area and corresponding population rather than by year.

PLAN SUBMITTAL AND REVIEW OF THE PLAN

The plan will be reviewed by the Council according to the sequence outlined in Minnesota Statutes 473.175. **Prior to submittal to the Council, the plan must be submitted to adjacent governmental units for a 60-day review period.** Following submittal, the Council determines if the plan is complete for review within 15 days. If incomplete, the Council will notify the community and request the necessary information. When complete the Council will complete its review within 60 days or a mutually agreed upon extension. The community officially adopts the plan after the Council provides its comments.

Plans can be submitted electronically to the Council; however, the review process will not begin until the Council receives a paper copy of the materials. Electronic submissions can be via a CD, 3 ½" floppy disk or to the email address below. Metropolitan communities should submit their plans to:

Reviews Coordinator
Metropolitan Council
390 Robert St,
St. Paul, MN 55101

electronically to:
watersupply@metc.state.mn.us

ATTACHMENT A

WELL RECORDS AND MAINTENANCE INFORMATION

TO BE INSERTED BY TOWNSHIP

ATTACHMENT B
STATIC WATER LEVEL

TO BE INSERTED BY TOWNSHIP

ATTACHMENT C

EMERGENCY CONTACT LIST

Township Hall – 651-463-4494

Public Works Phones – 651-470-5056 or 651-470-0898

Dakota County

 Sheriff – 651-437-4211

Minnesota Department of Health – Bassam Banat – 651-643-2105

City Engineer – Bolton & Menk – 952-890-0509

 Brian Hilgardner Cell – 612 -328-4729

 Seth Peterson Cell – 612-803-5223

Appendix A-3
Sanitary Sewer Plan

Empire Township

Sanitary Sewer System Plan

Appendix A-3

Empire Township Comprehensive Plan



Sanitary Sewer System Plan

Appendix A-3

Empire Township Comprehensive Plan

Empire Township, Minnesota

BMI Project No. T15.22165

April, 2009

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By: Travis L. Winter

Travis L. Winter, P.E.

License No. 46649

Date: 4/30/09



BOLTON & MENK, INC.
Consulting Engineers & Surveyors

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Sanitary Sewer System Plan

Empire Township, MN

TITLE SHEET

CERTIFICATION SHEET

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I. BACKGROUND

A. Flow Characteristics

A conceptual understanding of the flow characteristics of sanitary sewers is necessary to appropriately interpret the information in this plan. The vast majority of the times, sanitary sewers are virtually unused and the sewer is barely flowing. However, given the normal patterns of human habitation, there is a consistency in the total volume of water used per person that is focused during a limited number of hours in the day. Sanitary sewers must be designed to accommodate the maximum peak rate of flow which occurs during that focused period each day, in order not to cause backups into peoples' homes.

B. Previous Studies

Previous studies were examined and utilized in the preparation of this report. They include the 2001 Infrastructure Management Plan as well as record drawings showing pipe inverts and grades of the existing sanitary sewers.

C. Topography of the Area

Empire Township is located near the Vermillion River, which is a tributary water of the Mississippi River. The adjacent land is primarily flat with a few rolling hills and shallow streams. The area also has a number of wetlands with some of them being large in nature.

Empire Township's wastewater collection system is presented with two obstacles: flood plains where no development is permitted and wetland areas which must be avoided or mitigated (at increased cost).

The topography of Empire Township defines major 'branches', which can serve as corridors for sewer lines. All of these connect directly to the MCES Interceptors within the township which take flows to the Wastewater Treatment Plant (WWTP). Wetland locations created some challenges with the alignments of major branches.

D. Existing Facilities

Collection System - The existing wastewater collection system in Empire Township consists of sewers ranging in size from 4-inches to 12-inches. The capacity of the existing wastewater collection system is controlled by the capacity of the sewer lines

leading and connecting to the MCES sewer. Most of the current Empire Township Utility Service Area is controlled by the capacity of 8-inch sewer pipes throughout the township. There is one 12-inch sewer that flows along Calgary Lane and connects to the MCES Interceptor southeast of Caldwell Court. This 12-inch sewer has been sized for future development north of 197th Street West. A 10-inch sewer also flows along Butternut Trail and connects to the MCES Interceptor to the south of Cabrilla Way. This 10-inch sewer is sized for future development north of 197th Street West and east of Butternut Trail. No investigation or assessment of the materials or condition of the existing sewer lines was included in this study. Many of the lines are in newer development and made of PVC according to record drawings. See Exhibit 1 for existing sewer locations and sizes.

MCES Interceptors - All of the wastewater from Empire Township will be routed into two MCES Interceptor Sewers. The MCES Interceptors ranges in size from 42-inches to 60-inches. The interceptors have been designed to collect wastewater from many undeveloped areas in the southern Dakota County region, including the future utility service area for Empire Township. There are currently six connections to the MCES Interceptor that runs along the southern border of the Township. The table 1 below summarizes these locations:

Table 1

Existing MCES Interceptor Sewer Collection Locations			
Service District (*)	Location	Approximate Area Served	Trunk Sewer Size Leading to Connection Point
1	SW	35 Acres	8"
2	SW	145 Acres	8"
3	SW	105 Acres	8"
4	SW	20 Acres	8"
5	SE	300 Acres	12"
6	SE	125 Acres	10"

* See Exhibit 2 for service district locations.

A second 48-inch MCES Interceptor, the Rosemount Interceptor, flows along Biscayne Avenue and 190th Street. The interceptor has been designed to collect wastewater from Rosemount as well as future development in Empire Township.

There are currently four planned connection points to the Rosemount Interceptor. Table 2 below summarizes these locations:

Table 2

MCES Rosemount Interceptor Connection Points			
Service District (*)	Location	Approximate Proposed Area Served	Connection Size
7	E	290 Acres	15"
8	E	160 Acres	21"
9	NE	360 Acres	18"
10	NE	40 Acres	18"

* See Exhibit 2 for service district locations.

Treatment Facilities - The wastewater from both MCES Interceptors are collected at the nearby Empire MCES Treatment Facility. The System Statement for Empire Township states that there are many projects scheduled through 2030 to upgrade the treatment plant. These projects will provide additional capacity at the plant as well as improve its ability to meet required permit standards.

Lift Stations - There is only one lift station located in the southwest corner of the township's current utility service area (service district 2). The lift station collects wastewater from the Edmar Addition area and pumps the wastewater directly into the nearby MCES Interceptor.

Individual Sewage Treatment Systems – Section 8.7 of Empire Township's zoning ordinance adopts MPCP Rule Chapter 7080 and serves as the guidelines and rules for ISTS. The Township has also adopted Dakota County Ordinance No. 113. This ordinance provides the rules for systems within the Floodplain and Shoreland areas. ISTS's within this area are permitted and regulated by Dakota County. All other systems are managed by the Township according to MPCA Rule Chapter 7080. ISTS's are not allowed and none exist within the municipal urban service area of Empire Township.

II. INTRODUCTION

A. General

In 2001, Empire Township adopted an Infrastructure Management Plan. The purpose of the plan was to provide the Township with the necessary information regarding the wastewater system, water system, and storm drainage system in order to establish priorities, plan, fund, and implement required future improvements.

Empire Township grew at a moderate rate through the 1990's. In future population projections, the growth rate will rise dramatically. These population changes place new demands on infrastructure and public services, and also accelerate the demands. This puts a significant burden on the Township to plan, monitor and implement infrastructure improvements to accommodate the capacity for all public services. These services fall into three broad categories:

- 1) Services that require little or no infrastructure (police, human services, etc.)
- 2) Services whose infrastructure capacity can promptly be increased (some water distribution improvements, fire stations, parks, etc.)
- 3) Services whose infrastructure capacity requires extensive advanced planning and construction, or major renovation when the required capacity exceeds the available capacity of the system (streets, water supply/treatment, storm and sanitary sewer systems, wastewater treatment, etc.)

B. Purpose of Study

The purpose of this study is to examine the wastewater collection system for the township. The rate and nature of development in the area requires that all previous planning efforts be reviewed and updated more frequently than in the past.

The age and condition of individual elements in the collection system were not a part of this study. Conclusions and recommended priorities may need to be adjusted in the future if failures in the existing system occur. Televising, rating and regular maintenance of the sewers in the existing system will lessen the impact of these unexpected failures.

C. Growth Patterns

During the 1990's, the township experienced an overall growth rate of 22.3%, which lead to a population of 1,638 in 2000. The focus of this report is on the system improvements necessary to serve the community through the year 2030. Table 11 of the 2030 Comprehensive Plan shows the optimum growth potential within the existing MUSA and MUSA expansion areas through 2030.

If all property within the 2030 growth boundary were developed at the residential density of 9 persons per acre, the population would exceed the estimated 8,490 people for 2030. This is consistent with the expected pattern that not every parcel will be developed, nor every lot sold according to an exacting timeline. When estimating the 2030 population the following situations were taken into account:

1. Some property owners may choose not to develop
2. Lots may remain unsold
3. There are wetlands located within the boundary
4. Parks will develop
5. The housing market may fluctuate.

Surface improvements such as streets which can be conveniently expanded as growth occurs require significantly less planning than gravity utilities such as sanitary and storm sewers which must consider a broader timeline and anticipate full build-out even though some parts of the system will not be constructed by the year 2030.

III. STUDY PARAMETERS

A. Standards

This plan utilizes the “Ten States Standards” developed by The Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers.

B. Study Area

For wastewater collection purposes, Empire Township is categorized in the following ways:

- 1) Areas that are currently serviced by the existing wastewater collection system. (See Exhibit 1)
- 2) Areas immediately adjacent to the existing service area that can be serviced with simple extensions of existing lines.
- 3) Areas that can be served through the existing system but as development continues should be re-routed to a new interceptor sewer.
- 4) Areas that can only be served by establishing new routes for wastewater flow to a MCES Interceptor.

Three steps were followed to identify and serve these areas.

- 1) Identify the areas where development is prohibited or not practical. These include the hillsides, flood plains, wetlands, etc.
- 2) Identify areas that are fully developed with densities and uses already in place.
- 3) Identify flow areas due to existing topography.

C. Methods Employed

Two features will be the limiting factors in determining the extensions of trunk sewer lines.

- 1) *The Elevation of the Existing Sewers vs. the Topography* – Given the required slope for the sewer, there is an established gravity service area boundary which makes up the service districts for this report. These boundaries are shown with the future service area on Exhibit 2.

- 2) *The Size and Grade of the Existing Sewers* – These determine a maximum flow capacity that the existing system can carry.

The driving energy of flow in a sanitary sewer is gravity. Therefore, the pipes must be laid on a grade (or slope) to force the flow. Slopes are expressed in percentage (%) and represent the number of feet of fall in 100 feet of length. (i.e., a grade of 1.00% is one foot of fall in 100 feet.)

The slope together with pipe diameter and pipe material is used to calculate the actual volume of flow that a full pipe can carry. Typically, this volume is expressed in cubic feet per second (cfs) or gallons per minute (gpm). This rate of flow is the actual capacity of the sewer line.

Required Capacities - The purpose of a municipal wastewater collection system is to collect and transport the wastewater of a community to a point of treatment or ultimate disposal.

For undeveloped areas, a “unit per acre” lot count was predicted based on zoning, topography, etc. For this study it was assumed that the area within the study boundary will be essentially all single family residential use with three units per acre, three persons per unit, and 100 gallons of water used per person per day.

One area of the township is planned for industrially zoned operations, for this area a flow rate of 1,200 gallons per acre per day was used for estimating capacity. Industrial areas are more difficult to predict wastewater flows due to the character and size of specific occupants is unknown at this time. Further, the water use patterns of commercial and industrial property can easily change.

Recreational areas, cemeteries, flood plains and wetlands were not considered to contribute wastewater flow.

D. Design Criteria

There are two important design considerations used to establish the future wastewater collection network:

1. *Pipe Sizing* - The following design criteria are used in the design of interceptor or main collector sewers
 - a. The minimum pipe diameter is 8-inch
 - b. A minimum depth of ten feet is required to extend laterals to receive sewage from basements and to prevent freezing

- c. Sufficient slope will be required to, when flowing full, provide a mean velocity of not less than 2.0 feet per second to prevent solids build-up.
 - d. Provide manholes at a maximum of 400-foot intervals for maintenance access.
2. *Peaking Factor* - A peaking factor is the ratio of the peak hourly flow to the average daily flow. In general, sewer systems serving small contributing areas have higher peaking factors than sewer systems serving larger areas. Multiple peaking factors were used in this study; they fall in the range of 3.5-4.0.

IV. FINDINGS

A. Corridor Layouts and Sizing

The land area within the 2030 boundary is divided into 12 districts. The district boundaries are set up to split the land areas based the most cost effective routes for the proposed trunk sewer mains. There are six existing wastewater service districts, and six new service districts that have been identified and are necessary to provide the framework of the collection system to accommodate development within the 2030 service area. The trunk sewer mains for each district will need to be constructed prior to development within each district. The sizes of the trunk sewer mains were determined based on the ultimate growth of each district. This ensures the improvements implemented from this report are cost effective and are also able to provide the necessary capacity for future use as development proceeds beyond the 2030 land area.

B. 2030 Development Plan

Development within the 2030 Boundary as shown in Exhibit 2 will occur in stages over the 20-year period. The total area within the 2030 boundary consists of approximately 1,630 acres. Of that gross land area 1,120 acres are developable or contain existing development; the remaining area is designated for parks, or is unbuildable due to wetlands or flood plain restrictions. Predictions to when individual areas will develop are not a part of the sanitary sewer system plan; rather this plan shows what wastewater improvements will need to be implemented to support development in all areas within the 2030 growth boundary. This study assumes that development will be based on:

- 1) The scheduled availability of sanitary sewer service.
- 2) Development requests and inquiries received by the Township.
- 3) The market for housing or other land use.

Each service district will have an individual connection to the MCES interceptors. These 12 districts all discharge into the Empire MCES Treatment Facility. See Exhibit 2 for district locations.

1) District 1 (Existing Service Area)

This district contains four acres that are developed; the remaining area is below the floodplain elevation or is unbuildable with wetlands. The district 1 trunk line serves a small area along State Highway 3. The trunk line also serves a small portion of Farmington along the northern border with Empire Township.

2) District 2 (Existing Service Area)

This district includes a small area of developed land that is serviced with 8-inch mains and the only lift station in the Township. The area between the existing development and the Vermillion River contains additional land for development to occur.

3) District 3 (Existing Service Area)

The district 3 trunk line flows south along State Highway 3 to a connection point into the MCES Interceptor. The area contains two existing developments that are shown as sub-districts 3A and 3B in Exhibit 2.

3A. The central service area is an existing development, which is fully built. The area is served with 8-inch branch lines flowing throughout. The wastewater flows into the 8-inch trunk line, at two connection points, that flows south along State Highway 3.

3B. The northern service area, located on 194th Street, is an existing development with little room for future growth. A single 8-inch line flows south along State Highway 3 where it connects to the MCES Interceptor.

This trunk line is at capacity or slightly over capacity where both service areas combine. When this line is reconstructed, it will need to be up-sized to 10-inch to ensure proper capacity is maintained.

4) District 4 (Existing Service Area)

The district 4 trunk line flows west into a connection with the MCES Interceptor. The area is a fully developed with a single 8-inch line.

5) District 5 (Existing Service Area)

The district 5 trunk line flows from north to south along Calgary Trail and connects to the MCES Interceptor south of Calgary Trail. The trunk is a 12-inch line with 8-inch branches. The 12-inch line was designed for future development within the service area, and has the required capacity and depth to serve the entire district.

It is assumed the land in sub-district 9A will be one of the next areas that development will occur, for that reason it has been analyzed and determined that the 12-inch line in district 5 will be able to provide adequate service. When sub-districts 9B or 9C develop, the district 9 trunk main will need to be constructed to handle the additional flows. Ultimately all flow from sub-districts 9A, 9B, and 9C will be directed to the district 9 trunk main.

6) District 6 (Existing Service Area)

The district 6 trunk line flows from north to south along Butternut Trail and connects to the MCES Interceptor south of Cabrilla Way. The trunk is a 10-inch line with 8-inch branches. The area has existing development with high density and single family lots. The existing 10-inch has capacity to support future development in the district.

7) District 7 (Future Service Area)

The district 7 trunk line will flow south to north and connect to an existing 15-inch connection to the MCES Rosemount Interceptor. The trunk will be a 15-inch line with 8-inch branches. Part of the district is located west of Biscayne Avenue and can be serviced with 8-inch branches. The branches will need to be constructed under Biscayne Avenue and connect into the 15-inch trunk line.

8) District 8 (Future Service Area)

The district 8 trunk line will flow north to south and connect to an existing 21-inch connection to the MCES Rosemount Interceptor. The interceptor connection is 21-inch; however, the trunk service main will be 18-inch.

The land to the north of the district is a mining site, which can be serviced by this trunk line. This land is outside of the 2030 Boundary but was taken into consideration when sizing the 18-inch trunk sewer. The topography of the land may change after mining is complete, which may change the serviceable area of the trunk line.

9) District 9 (Future Service Area)

The district 9 trunk line will flow west to east where it will connect to an existing 18-inch connection to the MCES Rosemount Interceptor. This district is split into three sub-districts. The district was subdivided to show that 9A could be serviced through the trunk main of district 5 should it be developed before any of the surrounding area. The size of the trunk sewer for the district ranges from 10 to 18-inch.

- 9A. The first sub-district consists of the golf course property. As previously mentioned, this area can be served by the 12-inch line flowing south through District 5. When development occurs to the north or east of the first sub-district, the 12-inch line will not have the capacity to handle flows from district 9. When district 9B or 9C develops, the trunk main for the district will need to be constructed and put into service.
- 9B. The second sub-district is located along State Highway 3, north of the golf course, in the northwest corner of the 2030 Boundary. This sub-district will be serviced with a 10-inch trunk sewer flowing south to the golf course property where it connects to a 12-inch trunk sewer.
- 9C. The third sub-district is located west of Biscayne Avenue. An 18-inch trunk sewer will be required to meet the required capacity for all of District 9.

Various 8-inch branches will service other corridors within the district. The order of development plays a crucial role in the process of this District.

When calculating capacity for the trunk main in the district, it was also taken into account the ultimate development of the 160 acres of land between district 9 and district 8.

10) District 10 (Future Service Area)

There are only 40 acres of district 10 contained inside the 2030 service boundary; the remaining 160 acres of the district are part of the ultimate service area. The district 10 trunk line will flow west to east where it will connect to an existing 18-inch connection to the MCES Rosemount Interceptor. Although the connection is 18-inches, a 12-inch trunk line will meet the capacity requirements of the district. If development in the portion of district 10 that is within the 2030 boundary occurs, and it is not possible at that time to construct the necessary interceptor for the district, a temporary lift station will be required to pump flows into district 9B.

11) District 11 (Future Service Area)

This district is planned to be entirely industrial use. The district 11 trunk will flow north to south, where it will to connect to the MCES Interceptor. Currently there are no available connection points. A connection to the eastern most manhole in the boundary will be needed to allow for adequate depth to serve the entire area. A 10-inch trunk size is required to meet the capacity for the developable industrial property.

12) District 12 (Future Service Area)

The district 12 trunk will flow to the north into an existing MCES Interceptor via an 8-inch line. There are no available connection points in the district. A connection can be made at the same manhole required for district 11.

V. INFLOW AND INFILTRATION (I/I)

Earlier operation of sanitary sewers permitted “tapping” into the sanitary sewer line to allow flow of storm and ground water. In addition, the materials and methods for construction did not provide a water tight seal at pipe joints. These practices resulted in large volumes of clear water flowing to the wastewater system. Conditions which result in storm water and ground water entering the sanitary sewer system are referred to as inflow and infiltration (I & I). I&I is a serious problem for wastewater collection systems due to the fact that it dramatically increases the volume of water being treated which results in increased costs.

- 1) *Inflow* – Is the most critical component, it occurs in direct proportion to increased rainfall. Typical sources are: storm water from rain leaders, basement sump pumps and foundation drains, which are illegally connected to the sanitary sewer pipe.
- 2) *Infiltration* – This occurs when ground-water seeps into sewer pipes through cracks, leaky joints and deteriorated manholes.

Currently, Empire Township does not have an inflow and infiltration (I/I) program in place. The township recognizes the need to implement a program to eliminate I/I, and is working to have a plan implemented within the next few years. The township plans to utilize televising and flow monitoring to find problem areas in the system, and implement updates to eliminate I/I.

VI. RECOMMENDATIONS

It is essential that Empire Township periodically revisit this study to confirm or deny the underlying assumptions used, such as the population projection and population density, and make adjustments as are appropriate to ensure the wastewater collection system is able to support the needs of development.

The actual timing and locations of the developments within the township may change, and this will dramatically affect the sequencing of infrastructure improvements.

The characteristics of actual development, i.e. density of residential, wet industry, percentage of higher density residential, and park areas may change the sizing of the trunk mains.

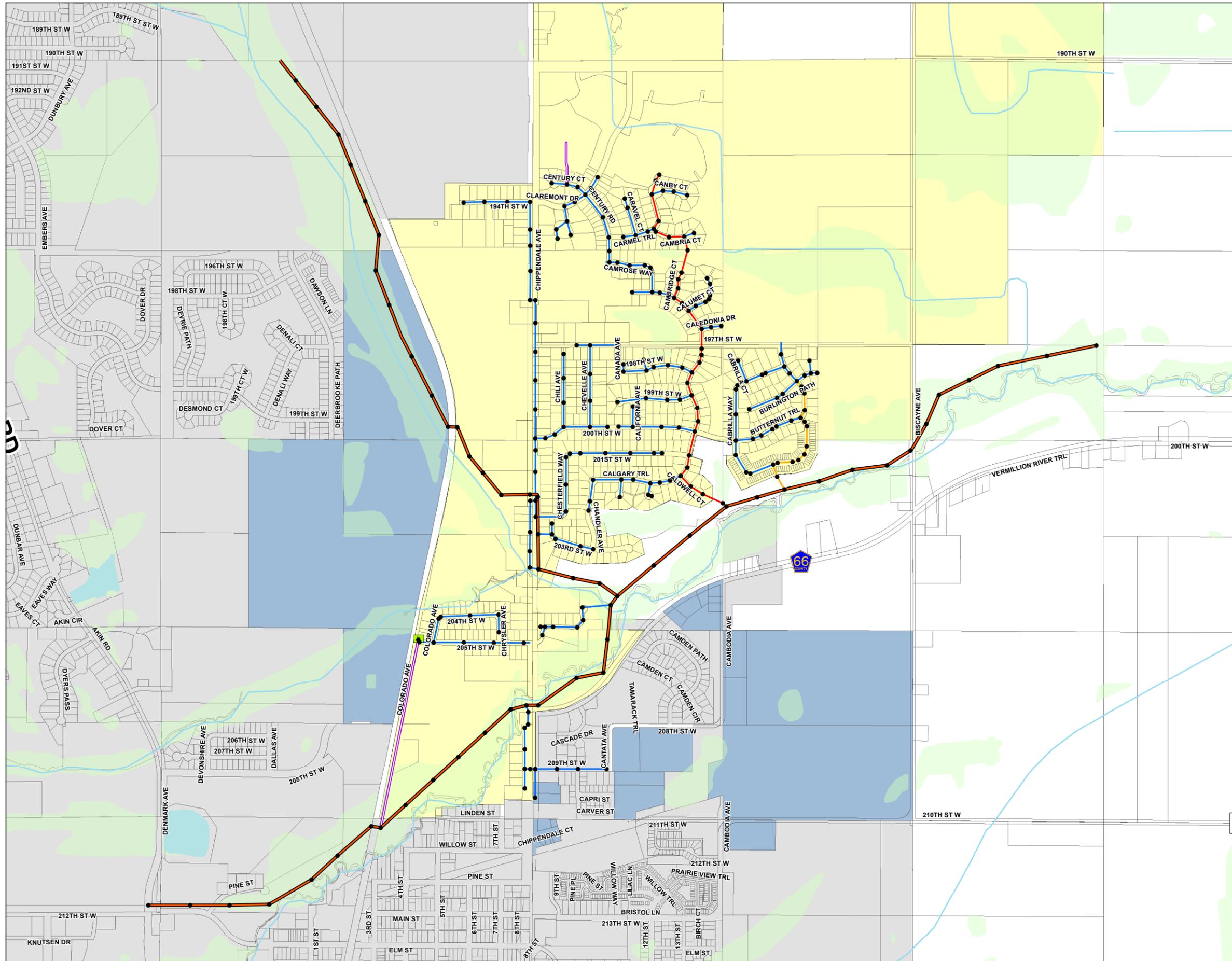
Also, once an I&I program has been implemented, flow monitoring should be utilized to compare well pump and waste water discharge rates to see if there is a clear correlation between the two. If a spike in the waste water flow shows up during fall and spring wet periods, then a sump pump inspection program should be considered.

The improvements to the wastewater collection system identified in this report will permit the Township to serve the surrounding properties within the 2030 boundary. The phasing of the improvements recommended in this report should coincide with the phasing of development in each service district. If development precedes the availability of sanitary sewer, the cost to extend service to and through existing developments will be considerably greater than those estimated here.

EXHIBIT 1



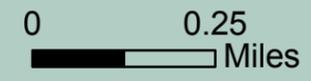
SANITARY SEWER PLAN



Legend

- Sanitary Manholes
- Lift Station
- Sanitary Pipe**
 - MCES Interceptor
 - 12"
 - 10"
 - 8"
 - 6"
- Sanitary Forcemain
- 2030 MUSA Boundary
- Farmington Orderly Annexation Area
- Wetlands
- Lakes
- Watercourses & Drainageways

Source: Dakota County, MnDNR



Existing Sanitary Sewer System

Exhibit 1

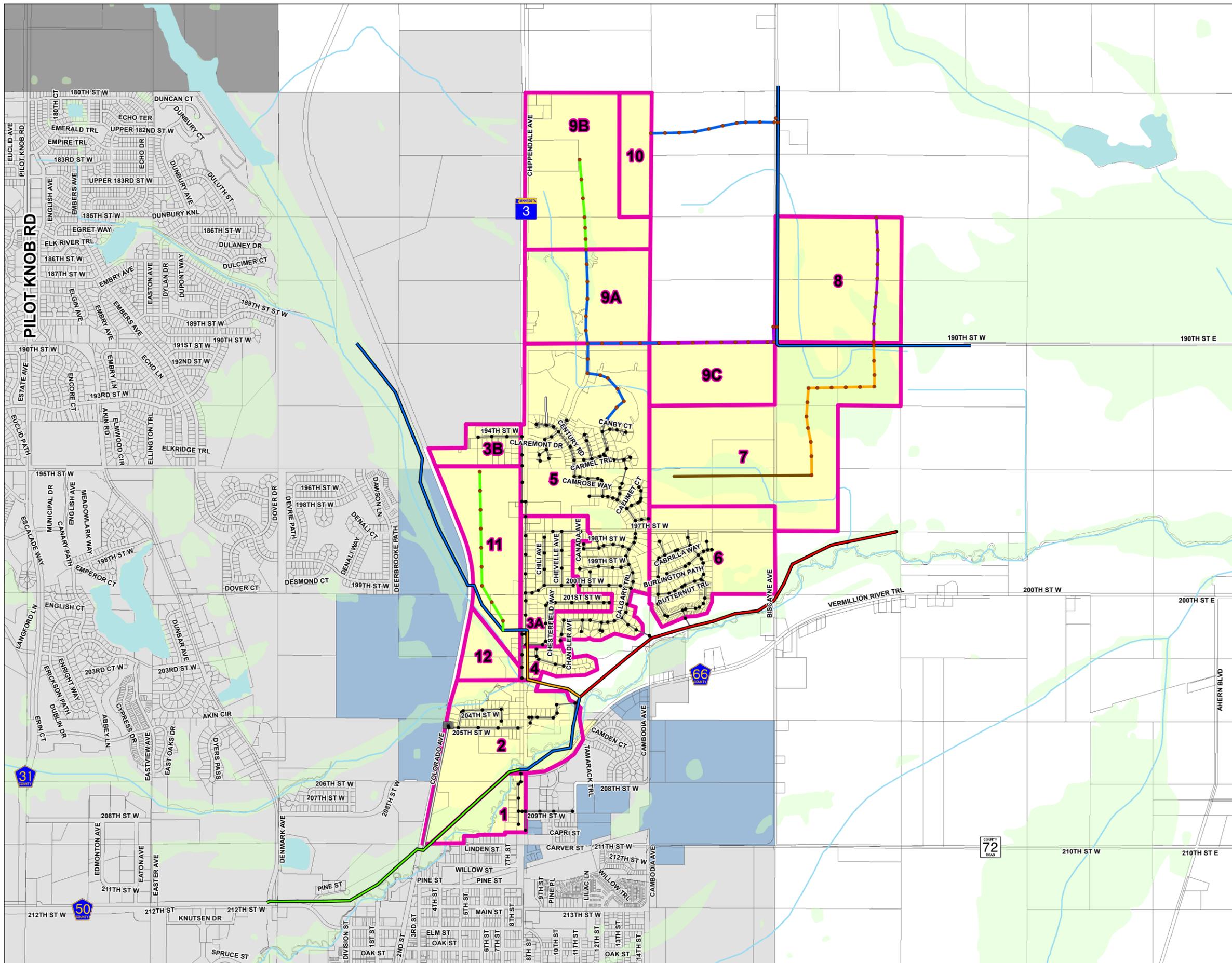
2008



EXHIBIT 2



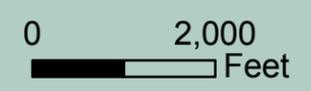
SANITARY SEWER PLAN



Legend

- Future Manholes
- Future Sanitary Pipe**
 - 21"
 - 18"
 - 15"
 - 12"
 - 10"
 - 8"
- Existing Sanitary Pipe
- Existing Sanitary Forcemain
- Existing MCES Interceptors**
 - 60"
 - 54"
 - 48"
 - 42"
- Existing Lift Station
- District Boundaries
- 2030 MUSA Boundary
- Farmington Orderly Annexation Area
- Wetlands
- Lakes
- Watercourses & Drainageways

Source: Dakota County, MnDNR



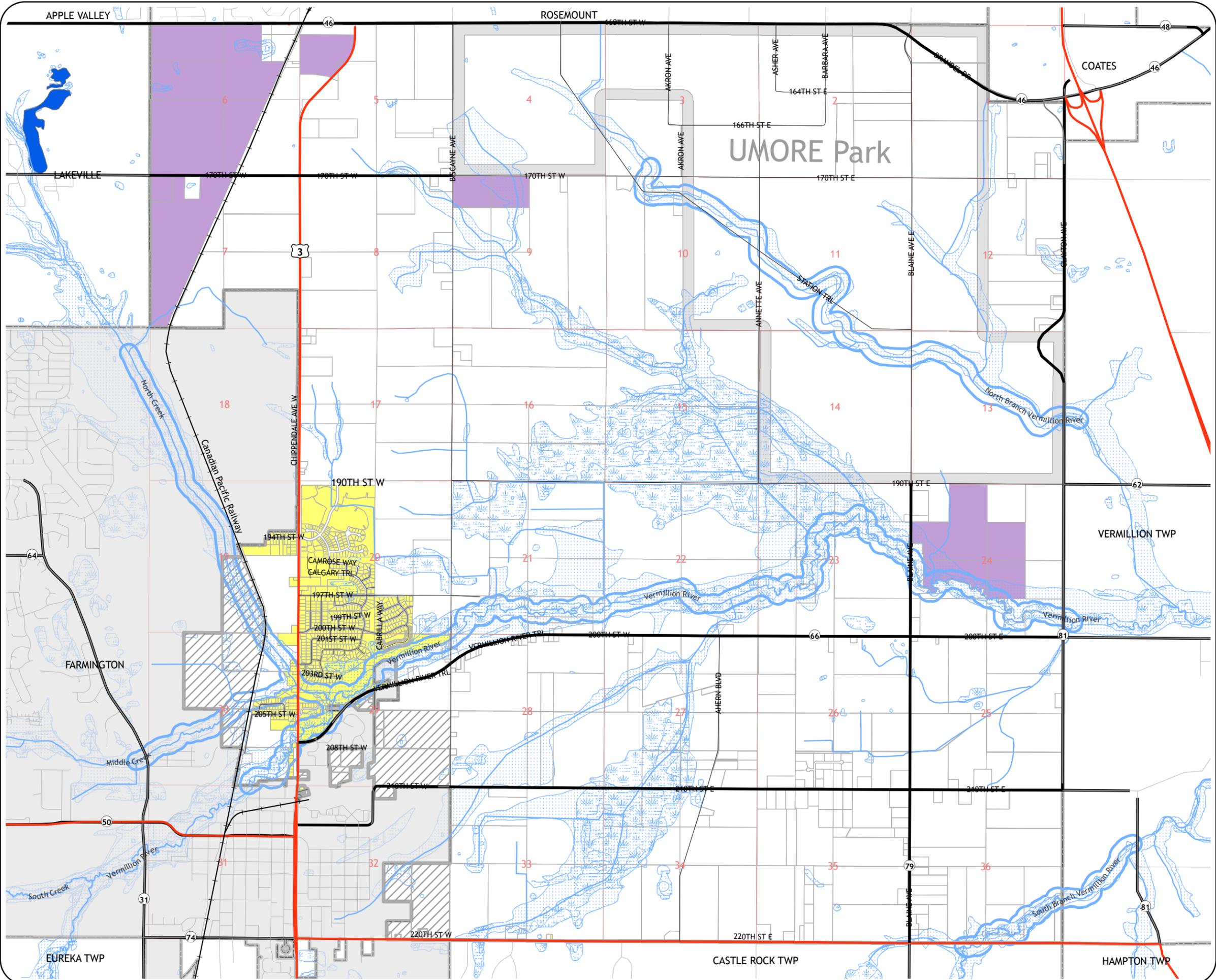
Future Sanitary Sewer System

Exhibit 2

2008



Appendix B
Zoning Map



Empire Township Dakota County, MN Zoning Map

Zoning Districts

-  AG - Agricultural Preservation
-  MXR - Mixed Residential
-  CB - Commercial/Business
-  ME - Mineral Extraction
-  Farmington Orderly Annexation

Overlay Districts

-  FO Floodplain Overlay
-  SO Shoreland Overlay

