

7.1 EXECUTIVE SUMMARY

This Executive Summary provides a brief synopsis of the major findings and projections developed in the preparation of Champlin's Comprehensive Sanitary Sewer Plan. The City's Trunk Sanitary Sewer System is shown on Appendix 7-3.

- Champlin's existing sanitary sewer collection system consists of:
 - 86 miles of 6-inch through 21-inch diameter piping
 - 2,211 manholes
 - 8 lift stations
 - 7.48 miles of forcemain

- All sanitary sewer flows generated by the City of Champlin are conveyed to the Metropolitan Wastewater Treatment Plant in St. Paul via the CAB (Champlin Anoka-Brooklyn Park) Interceptor constructed in 1985 with the exception of the 86 units from the Charest-Woodlawn Addition area at 109th Avenue and Jefferson Highway which discharges to the Maple Grove sanitary sewer system.

- Champlin has six (6) inter-community connections providing for the collection of sanitary sewer flows from adjacent cities and one (1) inter-community connection collecting wastewater from Champlin.
 - A parcel adjacent to Indiana Avenue and west of West River Road flows to a Champlin lateral sanitary sewer (1 unit).
 - South of 109th Avenue and each side of Noble Avenue in Brooklyn Park connects to a Champlin lateral sanitary sewer, (10 units).
 - The Champlin Park High School connects to a Champlin Lateral Sanitary Sewer on the south side of 109th Avenue, (232 units)
 - The Northwood's Park building in Brooklyn Park flows to a Champlin lateral sanitary sewer, (1 unit summer months only).
 - The Charest-Woodlawn Addition in Champlin flows to the Maple Grove sanitary sewer system, (86 units and 2 City park buildings).
 - Nature's Crossing in Dayton flows to a Champlin trunk sanitary sewer, (60 units current and 125 units ultimate).
 - The Faulds Property in Dayton flows to a Champlin lateral sanitary sewer, (1 unit current and 3 units ultimate).

- As of 2008, Champlin had:
 - An estimated population of 24,400
 - Approximately 7,214 housing units connected to the municipal sanitary sewer system;
 - Nearly 7,308 Residential Equivalent Connections (REC's of SAC units) to the sewer system; and
 - An average daily sanitary flow of 1.77 million gallons.

- Three (3) areas of Champlin remain to be developed and served with sanitary sewer service:
 - The T.H. #169 corridor between 109th Avenue and Hayden Lake Rod Lake has about 40 acres of commercial, industrial, and office zoned property to be developed.
 - About 20 acres of single family residentially zoned property to the west of Cartway Road between Elm Creek and the Elm Creek Park Reserve.
 - Nearly 150 acres of single family, residentially zoned property along both sides of French Lake Road to the west of Revere Lane.

- Champlin is projected to be fully developed by Year 2030 with:
 - An estimated population of 27,100;
 - About 11,653 REC's; and
 - Projected average daily sanitary flows from Champlin of about 1.89 million gallons.

- Champlin has implemented policies and strategies to reduce and prevent infiltration and inflow.
 - Champlin will continue to pursue the elimination of storm sewer connections into the sanitary sewer system.
 - Champlin has established a sanitary sewer rehabilitation program that lines approximately 1 mile of vitrified clay sewer pipe each year.
 - Champlin has established an annual maintenance schedule for televising portions of the sewer system to detect leaks, obstructions and illicit discharge.

7.2 INTRODUCTION

The City of Champlin is located at the northern edge of Hennepin County and is generally located near the north central to Northwestern portion of the Twin Cities Seven County Metropolitan area as shown on the accompanying Location Map in Appendix 7-1. Champlin is triangular in shape, covering approximately 8.66 square miles of area, and is bounded by the Mississippi River to the northeaster, the City of Dayton to the west and by the cities of Brooklyn Park and Maple Grove to the south.

Purpose and Scope

The purpose of this report is to provide the City of Champlin with Comprehensive Sewer Policy Plan that will serve as an inventory of existing facilities as well as a guide for the completion of Champlin's lateral sanitary sewer system to serve the community as it becomes fully developed in addition to serving several adjacent residential developments in neighboring communities. The report has been based on the City's latest land use and population data and is consistent with that used in; the "City of Champlin Comprehensive Water Supply Plan."

Champlin's Sanitary Sewer System

Champlin was first settled in 1952 as a farming area near the mouth of Elm Creek as it joins the Mississippi River. The Village of Champlin was platted in 1856 and the principal urban growth of the community concentrated near the ferry crossing located just upstream of the Elm Creek – Rum River – Mississippi River juncture. The original Village developed into an area which provided a community identity without a strong commercial or industrial base.

Outside the original platted area of the Village, the land use was almost exclusively agricultural. Urban development did not begin in the township until the 1950's and this early residential development occurred in a checkerboard fashion as subdivisions leapfrogged into open areas. This type and amount of development pressure led to the consolidation of the Township and Village in 1971.

Champlin had experienced rather steady, but moderate, growth until about 1980, at that time its' population was counted at 8879. With the forthcoming availability of sanitary sewer capacity through the construction of the CAB (Champlin-Anoka-Brooklyn Park) interceptor in the mid-1980's, growth and development in Champlin greatly accelerated during the 1980's and the first half of the 1990's at a rate of over 800 persons per year. This resulted in a 1990 population of 16,848 a population of 20,307 in 1998 and a population of 24,400 in 2008. The rate of population increase in Champlin is expected to

moderate to approximately 100 persons per year during the next twelve (12) years to 2020 when Champlin is expected to reach a population of 25,800 and an ultimate population of 27,100 in year 2030.

Municipal sanitary sewer service was initially constructed in the Village of Champlin in 1964 and was conveyed to the Anoka Wastewater Treatment Plant via a lift station and forcemain for processing. The expansion of the sanitary sewer collections system within Champlin during the 1960's, the 1970's, and the early 1980's was largely confined to the original Champlin Village area and the adjacent township areas along the Mississippi River.

From 1964 until 1985, sewage was treated at the Anoka Sewage Treatment Plant. Due to the limited capacity and inefficiency of the plant, the Metropolitan Waste Control Commission made the long range decision to close down the Anoka Treatment Plant and handle the sewage from the Cities of Anoka, Andover, Ramsey, and Champlin through the Pigs Eye Plant in St. Paul. The first step in the process, the CAB (Champlin-Anoka-Brooklyn Park) interceptor, was constructed through Champlin in 1985 providing capacity within the confines of the respective comprehensive plans for growth in the CAB cities. In 1992, the Anoka Sewage Treatment Plant was removed from service and a trunk sewer pipe was installed from Anoka into Champlin (roughly paralleling T.H. #169), where it tied into the CAB Interceptor Line just south of Hayden Lake Road and east of T.H. #169.

With the Construction of the CAB Interceptor line through Champlin in 1985, sanitary sewer service became available to the entire area of the City within the MUSA (Metropolitan Urban Service Area) boundary. It made sanitary sewer service readily available to approximately 2,500 existing homes in the City of Champlin which, together with new growth and development, dramatically increased the flows from the community. And as can be seen on the City's sanitary sewer map, sanitary sewer lines have been extended to serve all the developed areas of the community. The MUSA boundary has since been extended further west so it encompasses the entire City of Champlin and an adjacent, existing single-family residential development in the City of Dayton. The Dayton development, referred to as the Nature's Crossing, is surrounded by the Elm Creek Park Reserve to the north, west and south. The most logically and economically way to provide sanitary sewer service is through Champlin as discussed and agreed upon by both cities.

7.3 SEWER ELEMENT OF COMPREHENSIVE PLAN

General

Under the Metropolitan Land Planning Act, local governments are to prepare comprehensive plans and submit these to the Metropolitan Council to determine their consistency with metropolitan system plans. Local comprehensive plans are to include land use and public facilities plans with sufficient information to establish the effects on or departures from metropolitan system plans. The public facilities plan includes a sewer element which:

1. Describes, designates and schedules the area to be served by the public sewer system; and:
2. Outlines the existing and planned capacities of the public sewer system.

The following information and data regarding the Champlin Sanitary Sewer System is provided to fulfill the content requirements for the sewer element of the Champlin Comprehensive Plan for sewer areas within the Metropolitan Urban Service Area (MUSA).

Met Council Projections of Socioeconomic and Sanitary Flow Data

The estimated population, number of households, number of employees and sanitary sewer flows, as projected by the Metropolitan Council, to be served by the CAB Interceptor of the Metropolitan Council Environmental Service sewer system within Champlin is as follows:

YEAR	ESTIMATED SEWERED POPULATION	ESTIMATED NUMBER OF HOMES	ESTIMATED NUMBER OF EMPLOYEES	ESTIMATED AVERAGE SEWAGE FLOW RANGE (MGD)
1990	16,849	5,423	1,110	1.332 – 1.378
2000	22,193	7,425	2,623	1.984 – 2.074
2010	24,700	8,500	3,700	1.78
2020	25,800	9,200	5,100	1.83
2030	27,100	10,000	6,200	1.89

The estimated sewer population, the number of Residential Equivalent Connections (REC) by land use, the total number of REC's, and the total average daily sanitary flows for the community, as projected by the City of Champlin through the year 2030, (ultimate population achieved), are as follows:

YEAR	ESTIMATED SEWERED POPULATION	ESTIMATED RESIDENTIAL REC'S	ESTIMATED COM./IND./ OFFICE REC'S	ESTIMATED TOTAL REC'S	SEWAGE FLOW (MGD)
1990	16,831	5,611	309	5,920	1.15
1995	19,196	6,628	467	7,095	1.63
2000	21,500	7,422	870	9,423	1.59
2005	23,800	8,237	1,044	9,281	1.78
2010	24,700	8,546	1,100	9,646	1.78 ⁽¹⁾
2020	25,800	9,326	1,274	10,600	1.83 ⁽¹⁾
2030	27,100	10,000	1,280	11,280	1.89 ⁽¹⁾

⁽¹⁾ Based on City's projections.

Existing and Proposed Sanitary Sewer Services Area

The City of Champlin Trunk Sanitary Sewer System is shown on Appendix 7-2. The existing trunk sanitary sewer lines, including the CAB Interceptor, are identified and the proposed development areas are identified by the land use and anticipated development time frame. The existing inter-community sanitary sewer connection locations are also shown on Appendix 7-3 and include:

Inter-community connections flowing to Champlin:

1. One single family residential unit in Brooklyn Park adjacent to Indiana Avenue (10802 Indiana Avenue) connects to a Champlin lateral sanitary sewer flowing to lift station No 9, discharges to the Champlin portion of the CAB interceptor.
2. Ten single-family residential units in Brooklyn Park along the south side of 109th Avenue on both sides of Noble Avenue (the southeastern corner of the City) connect to a lateral sanitary sewer discharging to the Champlin portion of the CAB Interceptor.
3. One existing connection to a recreational park building in Brooklyn Park located on the south side of 109th Avenue to the east of Winnetka Avenue

(County Road #103), flows to the Champlin portion of CAB Interceptor via an 8-inch lateral line along Quebec Avenue.

4. One institutional connection at Champlin Park High School connects to a lateral sanitary sewer discharging to the Champlin portion of the CAB interceptor.
5. One hundred twenty-five (125) single-family residential homes, 60 existing and 65 future located in the Nature's Crossing of Dayton, located west of Goose Lake Road at the west end of Goose Lake Parkway. The sanitary sewer connects into the Champlin sanitary sewer system.
6. One single family residential unit in Dayton at the southwest corner of Champlin connects to a Champlin lateral sanitary sewer in Goose Lake Road which ultimately discharges to the Champlin portion of the CAB interceptor.

Inter - community connections flowing out of Champlin

1. Eighty-Six (86) single-family residential homes and two City park buildings located in or adjacent to the Charest-Woodlawn Addition of Champlin, generally located on the north side of 109th Avenue to the west of Jefferson Highway North, flow into the Maple Grove sanitary sewer system via Champlin Lift Station No. 4 and forcemain.

City Strategies for Reducing and Preventing Excessive Infiltration and Inflow

The City of Champlin has implemented several strategies for preventing and reducing excessive infiltration and inflow into its local sewer system. These strategies include:

1. The annual cleaning/inspections of portions of the sanitary sewer system. All clay piping is cleaned on a 3-year cycle. All plastic piping is cleaned on a 5-year cycle.
2. The annual televising of 20% (a 5-year cycle) of the City's vitrified clay pipe (VCP) and 10% (a 10-year cycle) of its polyvinyl chloride (PVC) sanitary sewer lines with a follow-up program to make the necessary corrections, repairs or pipe replacement to reduce infiltration, remove obstructions, and improve flows.
3. The City has established an annual pipe rehabilitation program in its Capital Improvement Program to line all vitrified clay pipe. The annual

budget provides for approximately one mile of pipe rehabilitation each year.

4. A city ordinance and inspection program to eliminate cross-connections of sump pump discharge into the sanitary sewers system which was implemented in 1994. Champlin's Ordinance Regulating the Operation of the Sanitary Sewer System, is shown on Appendix 7-3.

Management of Individual Sewage Treatment Systems.

The City of Champlin has reduced the number of individual sewage treatment systems (ISTS) within the City to 48-sites resulting from the expansion of the City's public sanitary sewer system.

Several existing ISTS sites recently had public sanitary sewer made available. By City Ordinance, parcels with public sanitary sewer availability have two years to connect to the public system. Appendix 7-4 identifies the list of properties that currently utilize ISTS.

Construction of ISTS within the City is not allowed if public sanitary sewer is available to serve the property. ISTS systems that are installed are administered by Hennepin County. The City Ordinance Authorizing Hennepin County to Administer Individual Sewage Treatment Systems Regulators is shown on Appendix 7-5. The Hennepin County Ordinance for Individual Sewage Treatment System Standards is located in Appendix 7-6.

7.4 LOCAL COMPREHENSIVE SEWER POLICY PLAN

The Local Comprehensive Sewer Policy Plan (LCSPP) discusses the collection and disposal of wastewater generated by the community. The LCSPP is broader in scope than the sewer element of the City's comprehensive plan and provides detailed sewer system engineering information.

Treatment and disposal of wastewater generated by the City of Champlin is accomplished by the MCES at the Metropolitan Waste Water Treatment Plant in St. Paul. The Comprehensive Sewer Policy Plan for the City of Champlin deals primarily with conveyance facilities required to collect the wastewater and transport it to the Champlin-Anoka-Brooklyn Park (CAB) Interceptor, an MCES facility which extends through Champlin.

The local elements of conveyance are the sewer services, laterals, trunks, manholes, lift stations, force mains, and all related appurtenances associated with the collection and transportation of the wastewater flows. The sewer laterals and service lines are laid out or designed during platting of the land as it is developed. Trunk sewers are largely dependent on the service area size,

type and density of development, and total anticipated sanitary flows to be generated. The trunk system includes all lines twelve inches (12") in diameter and larger, MCES facilities, and other facilities, such as lift stations are also part of the City's trunk sewer system. Champlin's trunk sewer system has been constructed and provides for the ultimate service area. Periodic review and updating of the trunk sewer system is required to ensure that the existing facilities meet the needs of the areas served.

Description of Sanitary Sewer System

The first municipal sanitary sewer facilities were constructed in 1964 within the original Village area (near the T.H. #169 bridge crossing of the Mississippi River). The initial trunk and lateral sanitary sewer pipe system extending into the surrounding neighborhood areas conveyed the effluent to Lift Station #1, located just south of the Mississippi River and west of T.H. #169, where it was pumped through an 8" forcemain to the Anoka Wastewater Treatment Plant, located on the north bank of the Mississippi River and just east of T.H. #169 at the confluence of the Rum River with the Mississippi River. The Metropolitan Waste Control Commission acquired Lift Station #1 and associated forcemain from the City of Champlin in 1971.

During the 1960's and 1970's, the expansion of Champlin's sanitary sewer collection system was largely confined to the original Champlin Village area and the adjacent township areas along the Mississippi River. To serve many of these early service areas, it was necessary to install lift stations and forcemains to elevate the effluent into the gravity system flowing to Lift Station #1. Lift Stations #2, 3, 5 & 6 and their associated forcemain outlets were constructed to serve specific drainage districts during that period of time.

In the late 1970's sanitary sewer service was also provided to 66 existing single family residences in the Charest-Woodlawn Subdivision, located at the northwest quadrant of Jefferson Highway and 109th Avenue in the south central portion of the community. Sewer service was provided by constructing lift station #4 and a forcemain which conveyed the effluent to Maple Grove's collection system. That system continues to operate the same today in serving the fully developed area of 86 homes and 2 City park buildings.

In the early 1980's, a number of existing single family residential developments in central Champlin, which had been built in Champlin Township during the late 1950's and the 1960's, were experiencing well and septic tank problems. These subdivisions, generally located between 111th and 119th Avenues from ¼ mile west of Winnetka Avenue (County Road #103) to West River Road (County Road #12), were adjacent to the proposed and pending Champlin-Anoka-Brooklyn Park (CAB) Interceptor line. Municipal sanitary sewer collection systems were designed and constructed through these neighborhoods which conveyed the effluent via lift stations and forcemains constructed at the edge of

the developments and near the future CAB alignment. These interim lift stations and forcemains, with the exception of Lift Station #8, which was relocated farther downstream to serve an enlarging sewer district, were eliminated by the CAB Interceptor in 1985.

The construction of the CAB Interceptor line through Champlin in 1985 placed the entire community within the Metropolitan Urban Service Area (MUSA) boundary. Sanitary Sewer flows from Champlin were no longer restricted by the pumping capacity of Lift Station #1 and its 8" forcemain to the Anoka Wastewater Treatment Plant. Sanitary sewer trunk and lateral lines have been extended in the past twenty (20) years to serve all the platted and developed areas of the City including those served by Lift Stations #7, #8, and #9.

The only significant land areas of the City remaining to be served by sanitary sewer are:

1. Approximately 20 acres of single-family residentially zoned property adjacent to West Hayden Lake Road, west of Cartway Road and south of Elm Creek. An MCES pumping station is being constructed in 2008 that will provide gravity sewer service to this area.
2. About 150 acres of single family, residentially zoned property along both sides of French Lake Road (Co. Road No. 121) from 1 mile west of T.H. No. 169 to the west corporate boundary and north of the Elm Creek. This area will be served by connecting to the recently constructed MCES Dayton-Champlin Interceptor.

In summary, the Champlin Trunk Sanitary Sewer System consists of 2.8 miles of 12 inch diameter and larger piping, 8 lift stations and 7.48 miles of forcemain (4", 6", & 8").

<u>Pump No.</u>	<u>Location</u>	<u>Year Constructed</u>	<u>Flow (GPM)</u>
#2	1217 Sherwood Street	1982 (Replacement)	140
#3	13224 Revere Lane	2004 (Replacement)	300
#4	9506 109 th Avenue	1977	100
#5	12290 Gettysburg Avenue	1978	680
#6	7500 River Shore Lane	1979-1980	50
#7	11625 Mississippi Avenue	1987	200
#8	11330 Georgia Avenue	1985 (Replacement)	890
#9	11000 Mississippi Avenue	1995	200

City of Champlin "Lift Station Inventory Records" for each lift station are provided in Appendix 7-7.

Metropolitan Facilities

Lift Station #1, located along the south bank of the Mississippi River one (1) block west of the T.H. #169 bridge, and its associated 8" forcemain were constructed by the City of Champlin in 1964 to convey effluent to the Anoka Wastewater Treatment Plant, a Metropolitan Waste Control Commission (MWCC) facility. In 1971, the MWCC purchased the lift station and forcemain from the City of Champlin and took over the operation and maintenance of those facilities.

With the shutdown of the Anoka Wastewater Treatment Plant (WWTP) in 1992, the forcemain from Lift Station #1 as well as the forcemain crossing the Mississippi River from the former Anoka WWTP were reconstructed to discharge the flows into the Champlin-Anoka-Brooklyn Park (CAB) Interceptor, near the intersection of T.H. #169 and Hayden Lake Road, for conveyance to the Metropolitan Wastewater Treatment Plant in St. Paul. The forcemain routing to the CAB Interceptor line roughly parallels T.H. #169, located to the north and east sides of the highway, in a southeasterly and southerly direction. Lift Station #1 remains a facility of the Metropolitan Council Environmental Services – Wastewater Division (MCES) and is a duplex lift station. It utilizes Aurora Model 613 pumps with a pumping capacity of 950 g.p.m. per pump and a combined capacity of 1200 g.p.m.

The Champlin-Anoka-Brooklyn Park (CAB) Interceptor was constructed through Champlin in 1985 by the former MWCC and consists of 48" and 54" reinforced concrete pipe. The routing, as shown on Appendix I, "Champlin Trunk System Phasing Sanitary Sewer System", enters the southeastern corner of Champlin at 109th Avenue and Noble Avenue. It proceeds to the west for about 2 ¼ miles along 109th Avenue or a paralleling alignment about ¼ mile to the north (111th Avenue corridor), then turns northerly ¼ mile east of T.H. #169 to parallel the highway for about 1.5 miles to 123rd Avenue before proceeding to the west and north for another ¼ to 3/8 mile to terminate near the intersection of T.H. #169 and Hayden Lake Road. It is at this location that the forcemain for Lift Station #1 and from the Anoka WWTP ties into the CAB Interceptor line.

Inter-Community Flows

The Champlin sanitary sewer system has seven (7) locations of inter-community flows as shown on Appendix 7-3. Following is a brief description of the existing connections with neighboring communities with the existing and ultimate flows for each interconnection location provided in Table 1 below:

- a) Indiana Avenue – East side of street at West River Road in Brooklyn Park
One single family residence within Brooklyn Park connects to a Champlin lateral sanitary sewer. The sanitary sewer extends to lift station no 9

which pumps the wastewater to a lateral sanitary sewer along 109th Avenue that discharges to the CAB Interceptor on the Champlin side.

- b) 109th Avenue – Noble Avenue Neighborhood in Brooklyn Park
Ten single family residential houses on the south side of 109th Avenue, either side of Noble Avenue, in the City of Brooklyn Park are connected to a Champlin lateral sanitary sewer. The lateral sanitary sewer line conveys the wastewater into the Champlin side of the CAB Interceptor.
- c) Champlin Park High School in Brooklyn Park
The school has its sanitary sewer service extend from a lateral sanitary sewer outletting to the Champlin side of the CAB Interceptor. This connection is identified to be removed and flow conveyed through Brooklyn Park facilities in 2008. This work was not completed in 2008.
- d) Northwoods Park in Brooklyn Park
The Northwood's Park building located south of 109th Avenue across from Quebec Avenue in the City of Brooklyn Park ties into the Champlin sanitary sewer lateral system at the intersection of 109th Avenue and Quebec Avenue.
- e) Nature's Crossing in Dayton
The Nature's Crossing, located west of Goose Lake Road in Dayton, includes 125 single-family residential lots, which are proposed to be served with municipal sanitary sewer service from the City of Champlin. Flow from the Nature's Crossing extends to the Champlin sanitary sewer line constructed within Goose Lake Parkway. There are currently 60 connections with 65 future connections.
- f) Faulds Property in Dayton
The Faulds property is located west of the southeast corner of Dayton. This parcel has one residential connection to the Champlin sanitary sewer system located within Goose Lake Road. Ultimately there may be three connections.
- g) Charest - Woodland area in Champlin to Maple Grove
Municipal sewer and water utilities were constructed in the Charest Woodlawn Addition, located in the northwest quadrant of the intersection of Jefferson Highway and 109th Avenue at the southern edge of Champlin, in the late 1970s to replace a number of failing wells and septic systems in the existing homes. Since it was an isolated neighborhood in Champlin and since the CAB (Champlin-Anoka-Brooklyn Park) Interceptor construction had not yet been committed, the only available and feasible alternative for conveying the sanitary sewer flows from the Charest Woodland neighborhood was to pump it into an adjoining Maple Grove system to the southwest via Lift station #4 and a 4-inch-diameter

forcemain. This lift station serves a total of 86 single-family, residential homes and two City park buildings.

**Table 7-1
Existing and Projected Inter-Community Flows**

NEIGHBORHOOD AREA	EXISTING CONNECTIONS	EXISTING FLOWS (GAL/DAY)¹	ULTIMATE CONNECTIONS	ULTIMATE FLOWS (GAL/DAY)⁽¹⁾
109 th & Noble	8	1,760	20	4,400
Northwoods Park	1	274	1	274
Charest Woodlawn Avenue	88	24,112	88	24,112
Nature's Crossing	60	16,440	125	34,250
Faulds Property	1	274	3	822

* Summer usage only.

⁽¹⁾ Flows based on 274 gallons per day per Residential Equivalent Connection (REC).

Sanitary Sewer Trunk System

The Champlin Trunk Sanitary Sewer System shown on Appendix 7-3, graphically displays the existing sanitary sewer lines, 12-inches or larger in diameter, which constitute the City's trunk system. Due to the relatively small geographical area of the City, its relatively flat topography, and the routing of the CAB Interceptor line through the community, the length and pipe diameter size of Champlin's trunk system is rather small. There are no apparent operational or flow capacity problems in the existing system.

Land Usage and Population

The sizing of sanitary sewer facilities is dependent upon the hydraulic capacity required for each part of the system. Municipal wastewater generally is a mixture of domestic sewage, commercial and industrial wastes, ground water infiltration, and surface water inflow. With proper design and construction, ground water is reduced to a minor percentage of the total flow and surface water is eliminated. Hydraulic discharges, which must be handled, depend, to the greatest extent, upon the type of development and the population densities which are served.

Growth Trends

Since 1980, Champlin has seen significant increases in population, household and employment growth. The growth rate, however, has slowed dramatically in recent years due to the limited supply of developable residential land and a considerable slowdown in the housing market. While it is expected that Champlin will add around 1,500 housing units in the next 30 years, the population will not rise in proportion due to an aging of the population and a subsequent decline in the average household size. Table 1 represents population, household and employment information for the City of Champlin. Data from 1980 through 2000 is taken from the Census, 2010 through 2030 estimates were provided from Met Council as negotiated with City staff.

**Table 7-2
City Champlin Community Forecasts**

	1980	1990	2000	2010	2020	2030
Population	8,580	16,849	22,193	24,700	25,800	27,100
Households	2,749	5,423	7,425	8,500	9,200	10,000
People per Household	3.12	3.11	2.99	2.91	2.80	2.71
Employment	750	1,110	2,623	3,700	5,100	6,200

Land Use

Per the Metropolitan Council's 2030 Regional Development Framework, Champlin is designated as a "Developed" community, meaning that at least 85% of the community is developed. That is not to say that there is not new development in Champlin. However, there is little land to develop and the fast paced growth of the 1980s and 1990s is over.

The current land use patterns in Champlin are described through a series of land use categories somewhat unique to Champlin. These categories were established during prior planning efforts in the City of Champlin.

Low Density Residential: This is a residential land use intended to provide land for single and two family residences. Densities within the low-density category generally range from a low of 1.5 units per gross acre to 3.3 units per gross acre with the overall development pattern generally averaging about 2.5 units per gross acre. Acceptable densities are up to four units per gross acre. The commensurate zoning districts are Single Family Residential (R-1), Two-Family Residential (R-2) and Low Density Multi-Family Residential (R-3).

Medium Density Residential: This land use is intended to create areas for low-density multi-family residences. More medium density developments have occurred recently with the increased demand in townhome and condominium styles of living. Densities within these developments typically range between six to eight units per gross acre. Acceptable densities are between four and twelve units per gross acre. The commensurate zoning district is Medium Density Residential (R-4).

High Density Residential: This residential land use is intended to create, preserve and enhance areas for multi-family use of higher densities for both permanent and transient families in close proximity to major transportation and transit corridors, public community centers, shopping centers and employment centers. Average densities within the High-Density category are 15 units per gross acre. Acceptable densities are twelve to eighteen units per gross acre. Higher densities are only accepted under a Planned Unit Development. The commensurate zoning district is High Density Residential (R-5).

Commercial: The commercial land use provides for businesses, professional services, and retailers to meet the needs of residents in Champlin. This land use is supported by various Commercial zoning districts.

Office: This land use is intended to create areas for office development to provide employment opportunities in locations providing unique amenities benefiting office settings. The Commercial Office District (C-1) is most appropriate for this land use.

Industrial: This land use is intended to create areas for warehousing with office uses to provide employment opportunities and business complexes in locations accessible to high-level infrastructure. Industrial land use is represented by the Industrial zoning district (I-1).

Parks/Schools/Public Open Space: This category covers all public uses. It is intended to create areas for public recreation, public education, government services and open space.

Open water: Any public waters of the state as defined by Minn. Stat. 103G.005, Subd.15 (the state's county-by-county inventory of lakes, rivers and other public waterways in the public domain).

The following table outlines land uses found in Champlin broken down by acres that are developed and vacant acres that could be further developed.

**Table 7-3
Existing Land Use**

LAND USE CATEGORY	DEVELOPED ACRES	VACANT ACRES	Total / Percent of Total
Low Density Residential	2,740	220	2,960 / 55.5 %
Medium Density Residential	198	4	202 / 3.8 %
High Density Residential	43	5	48 / 0.9 %
Commercial	198	29	227 / 4.3 %
Office	5	10	15 / 0.3 %
Industrial	95	2	97 / 1.8 %
RESTRICTED LANDS	ACRES		
Parks, Schools, Open Space	1,308		1,308 / 24.5 %
Major Road Right-of-way	322		322 / 6.0 %
Open Water	158		158 / 2.9 %
TOTAL LAND AREA	5,404		5,404 / 100 %

Detached single family homes comprise over half of Champlin's land area. Attached and multi-family residential areas, located at the periphery of single-family neighborhoods along major streets, make up another 4.7 percent. Table 2.2 presents the net density of Champlin's residential development. Overall, the City's residential density is 3.05 units per acre, which exceeds the Metropolitan Council's minimum of three units per net developable acre.

**Table 7-4
Net Density of Residential Development, 2008**

LAND USE	NUMBER OF UNITS	ACRES IN LAND USE (LESS WETLANDS & ARTERIAL ROAD ROW)	NET DENSITY (UNITS/ACRE)
Single-Family Detached	6,541	2,550	2.57
Duplex, Townhome, Condo	1,187	190	6.25
Apartment	763	40	19.08
TOTAL	8,491	2,780	3.05

Commercial, office and industrial uses comprise just over six percent of the City's land area.

The remaining acreage (nearly 35 percent) is set aside for parks, schools and public open space.

Future Land Use

The future land use plan identifies the location and intensity of future development within the City, and establishes a framework in which future development will occur. The Land Use Plan Map can be amended through a publicly-advertised process either on its own initiative or in response to landowner application. However, it is the City's Zoning Map and Zoning Ordinance, not the Land Use Plan map, which ultimately regulates land use and development.

The future land use plan does not differ significantly in terms of land use changes. The following narrative describes the key elements that comprise the future land use plan and development potentials:

Gateway Plans

The Champlin Economic Development Authority (EDA) has developed a preferred concept plan for a 3.5-acre area adjacent to the Mississippi River and Anoka-Champlin Bridge. The plan includes a restaurant site and a mixed use building with 16,900 square feet of commercial space and 58 residential units.

Northwest Area

In the northwest portion of the community, 170 acres of vacant, un-platted residential land is available for urban development. Sanitary sewer was made available to this area with the Dayton – Champlin interceptor constructed by the MCES in 2008.

The adopted Northwest Area plan envisioned 25 – 35% of the housing units to be townhouses or twinhomes, which are typically medium density. To meet the plan's housing goals, 30 of the remaining 170 acres would need to be guided medium density residential, totaling approximately 180 housing units. However, based on City Council consensus, the Northwest Area Visioning Plan shall be amended to indicate that the City may support up to 60 medium density housing units or approximately 10 acres of medium density land use

Emery Village - High Density Site

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Located in Emery Village is a three acre parcel originally planned for a high-density senior cooperative facility. Though not yet formally guided for high-density residential (presently guided Industrial), the vision of the Council and Centex Homes for this site is high-density residential.

Future Land Use Development Summary

The City of Champlin projects it will contain 10,000 households by 2030. This requires an additional 1,509 housing units being built by 2030. Table 2.3 outlines the development capacity of identified vacant acreage in Champlin. It is expected that 50 percent of the housing units that comprise the projected growth will occur on identified vacant sites, the remaining growth will occur via existing platted lots, scattered in-fill sites and redevelopment areas.

**Table 7.5
Future Land Use Development Capacity**

LAND USE TYPE	NET VACANT ACRES	DEVELOPMENT INTENSITY	UNITS
Low Density Residential	180	2.5 units/acre	450
Medium Density Residential	34	5 units/acre	272
High Density Residential	5	18 units/acre	90
Mixed Use	2	29 units/acre	58
In-Fill Sites & Existing Vacant Platted Lots			639
TOTAL	234		1509

**Table 7-6
Population Projections for City Of Champlin**

Year	MET Council Demographic Forecasts	Comprehensive Water System Plan	Comprehensive Sanitary Sewer Plan
2000	22,500	22,500	21,500
2005	-	24,160	23,800
2010	24,700	24,700	24,700
2020	25,800	25,800	25,800
2030	27,100	27,100	27,100
2040	27,100	27,100	27,100

Wastewater Flow History

In order to project anticipated future wastewater flows for the City of Champlin, it is necessary to review and analyze the historical data from past years. Table 7-7 identifies the following data for the years 1971 through 2007 when available:

- Champlin's total population;
- Champlin's recorded number of Residential Equivalent Connections (REC's);
- Champlin's average daily wastewater flow, in gallons per day, as recorded by the Metropolitan Waste Control Commission or Metropolitan Council Environmental Services Wastewater Division;
- Champlin's average daily wastewater flow per Residential Equivalent Connection (REC), recorded in gallons per day.

The average daily wastewater flows generated by the City of Champlin as well as the average daily flow generated per Residential Equivalent Connection (REC) are found on Table 7-7. Of particular significance are several noticeable changes in the average daily flow rate per REC. The most notably is the dramatic upward trend from 1991 through 1995 followed by a downward trend from 1996 through 1998. During the period of 1971 through 1975, the daily flow per REC remained relatively constant in the 175 to 180 gallons per day range. Then in 1985, the daily rate per REC unit increased by about 10% into the 190 to 195 gallons per day range for the 1985 through 1990 time period. From 1991 to 1995 the daily flow per REC unit demonstrated a dramatic increase from 210 to 230 gallons per day with a peak rate of nearly 240 gallons per day per REC recorded in 1993. However, in 1996 and 1997, the rate per REC unit dropped to about 215 gallons per day followed by another 10% reduction in 1998 to about 195 gallons per day per REC.

**Table 7-7 (Updated May 1999)
Champlin Sanitary Sewer Flow History**

YEAR	TOTAL POPULATION	NUMBER OF REC'S	MCES AVERAGE DAILY FLOW (GAL/DAY)	AVERAGE DAILY FLOW PER REC (GAL/DAY)
1971	-	970	175,858	181.3
1972	-	994	175,290	176.3
1973	-	1022	178,658	174.8
1974	-	1041 (Est.)	184,083	176.8
1975	-	1091 (Est.)	194,981	178.7
1976	-	-	192,902	-

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YEAR	TOTAL POPULATION	NUMBER OF REC'S	MCES AVERAGE DAILY FLOW (GAL/DAY)	AVERAGE DAILY FLOW PER REC (GAL/DAY)
1977	-	-	206,043	-
1978	-	-	202,014	-
1979	8580	-	196,661	-
1980	8879	-	219,334	-
1981	9655	-	275,248	-
1982	10,517	-	302,152	-
1983	11,739	-	349,261	-
1984	12,069	-	454,665	-
1985	12,759	-	538,526	-
1986	13,621	3843	750,938	195.4
1987	14,310	4572	0.87	190.2
1988	15,259	5140	0.94	182.8
1989	16,207	5528	1.06	192.3
1990	16,831	5920	1.15	193.6
1991	17,304	6090	1.28	210.2
1992	17,777	6313	1.35	213.8
1993	18,250	6485	1.57	242.1
1994	18,723	6690	1.52	227.2
1995	19,196	7117	1.63	229.0
1996	19,668	7346	1.58	215.1
1997	20,141	7464	1.59	213.0
1998	20,614	7786	1.52	195.2
1999	21,000	8010	1.55	193.5
2000	21,500	8292	1.59	191.8
2001	22,193	8496	1.76	207.2
2002	22,600	8752	1.83	209.1
2003	23,000	9034	1.64	181.5
2004	23,400	9220	1.67	181.1
2005	23,800	9281	1.78	191.8
2006	23,900	9392	1.76	187.4
2007	24,200	9460	1.80	190.3
2008	24,400	9496	1.77	186.1

Since, Champlin's sanitary sewer system is relatively new due to the City's high construction standards and aggressive annual maintenance program, stormwater inflow and groundwater infiltration are not suspected to be major contributors to the sanitary flow. Although the per capita consumption of water for domestic purposes and the resulting sanitary flows have increased, City

utility staff felt the major contributor to the dramatic increase in sanitary flow per REC in the early 1990's was probably due to cross connections of stormwater sump pumps and foundation drains outletting to the sanitary sewer collection system. The City implemented an aggressive program in 1994 to address and rectify this abuse and misuse of the sanitary sewer collection system. The significantly lower flow rates per REC from 1996 through 2007 indicates the success of those programs and strategies. The average daily flow per REC has averaged 186.4 over the past 5 years.

City Wastewater Flow Projections

Utilizing an estimated population base of 24,400 persons in Champlin on December 31, 2008, as well as 9,496 Residential Equivalent Connections (REC) being served by its sanitary sewer collection system, Table 7-8 projects the anticipated Average Daily Sanitary Sewer Flow from the City of Champlin for each year from 2008 through Year 2030 when Champlin is expected to be fully developed with a population of 27,100. Based on Champlin's Land Use Plan and its current population projections, the number of Residential Equivalent Connections (REC) for each land use as well as the inter-community connections are estimated for each year.

The following information and assumptions are incorporated into the preparation of Table 7-7:

- 1) Champlin's annual population increase is converted to Residential Equivalent Connections (REC's) based on 2.92 persons per single family residential unit. The 2020 year consensus is 2.8 persons per single family residential unit and 2030 is 2.71 persons per single family residential unit.
- 2) The existing eighty-six (86) REC's in the Charest-Woodlawn Addition, which currently outlet into the Maple Grove collection system, will continue to flow into that system;
- 3) The inter-community connections with Brooklyn Park in the 109th Avenue and Noble Avenue area and the Northwood's Park building remain.
- 4) The sixty-five (65) remaining inter-community connections from the Bangston Addition in Dayton are made during years 2009 to 2020.
- 5) Approximately 20 acres of commercial, industrial, and office zoned land is expected to develop by 2020.

- 6) Nine (9) Residential Equivalent Connections (REC's) per acre are used for projecting flows from the commercial/industrial/office zoned lands based on a projected water usage of 2,000 gallons per day per acre.
- 7) The Total Projected Average Daily Flows, measured in gallons, assume a flow rate of 274 gallons per day per REC.
- 8) All remaining ISTS systems within the City will be connected to the public sanitary sewer system by the year 2030.

The estimated total contributing REC's, the City's Total Projected Average Daily Flow, and anticipated population for years 2007 through 2030 are shown on Table 7-8.

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SANITARY SEWER

**TABLE 7-8
CHAMPLIN SANITARY SEWER FLOW PROJECTIONS**

YEAR	Annual Residential REC Growth					Champlin Commercial/Industrial Annual Growth		Annual REC Increase	Total Contributing REC's	Total Projected Average Daily Flow MGD
	Population	Champlin Population Increase	Champlin REC Increase	Inter-Communities ISTS REC Increase	Total Residential REC Increase	Acres	REC's			
2007	24,325								9460	1.76
2008	24,400	75	28	4	32	.45	4	36	9496	1.76
2009	24,600	200	64	4	68	.45	4	72	9568	1.77
2010	24,700	100	64	10	74	.45	4	78	9646	1.78
2011	24,800	100	70	8	78	2.	18	96	9742	1.78
2012	24,900	100	70	8	78	2.	18	96	9838	1.79
2013	25,000	100	70	8	78	2.	18	96	9934	1.79
2014	25,100	100	70	8	78	2.	18	96	10,030	1.80
2015	25,200	100	70	8	78	2.	18	96	10,120	1.80
2016	25,300	100	70	8	78	2.	18	96	10,222	1.81
2017	25,400	100	70	8	78	2.	18	96	10,318	1.81
2018	25,600	200	70	8	78	2.	18	96	10,414	1.82
2019	25,700	100	70	8	78	2.	18	96	10,510	1.82
2020	25,800	100	70	8	78	.65	4	96	10,606	1.83
2021	25,930	130	68	4	72			72	10,678	1.83
2022	26,060	130	65	4	69			69	10,747	1.84
2023	26,190	130	65	4	69			69	10,816	1.84
2024	26,320	130	65	4	69			69	10,885	1.85
2025	26,450	130	65	4	69			69	10,954	1.85
2026	26,580	130	65	0	65			65	11,019	1.86
2027	26,710	130	65	0	65			65	11,084	1.87
2028	26,840	130	65	0	65			65	11,149	1.88
2029	26,970	130	65	0	65			65	11,214	1.88
2030	27,100	130	65	0	65			65	11,279	1.89
TOTALS		2775	1509	118	1627	20	178	1819		

Metropolitan Council Sewer Flow Projections

The forecasts of population, households, employment, and wastewater flows for Champlin have been estimated by the Metropolitan Council staff and identified in their *Water Resources Management Policy Plan*. These forecasts are for sewer development. The sewer housing forecasts were estimated based on SAC data, annual city reports, current trends and other information relating to Champlin. The wastewater flows are based on historical wastewater flow data and the projected sewer housing and employment data.

The flow projections represent the Council's commitment to a level of service, assuming that the Council's underlying demographic forecasts are maintained. Adjustments may be required based on verified growth or lack of growth.

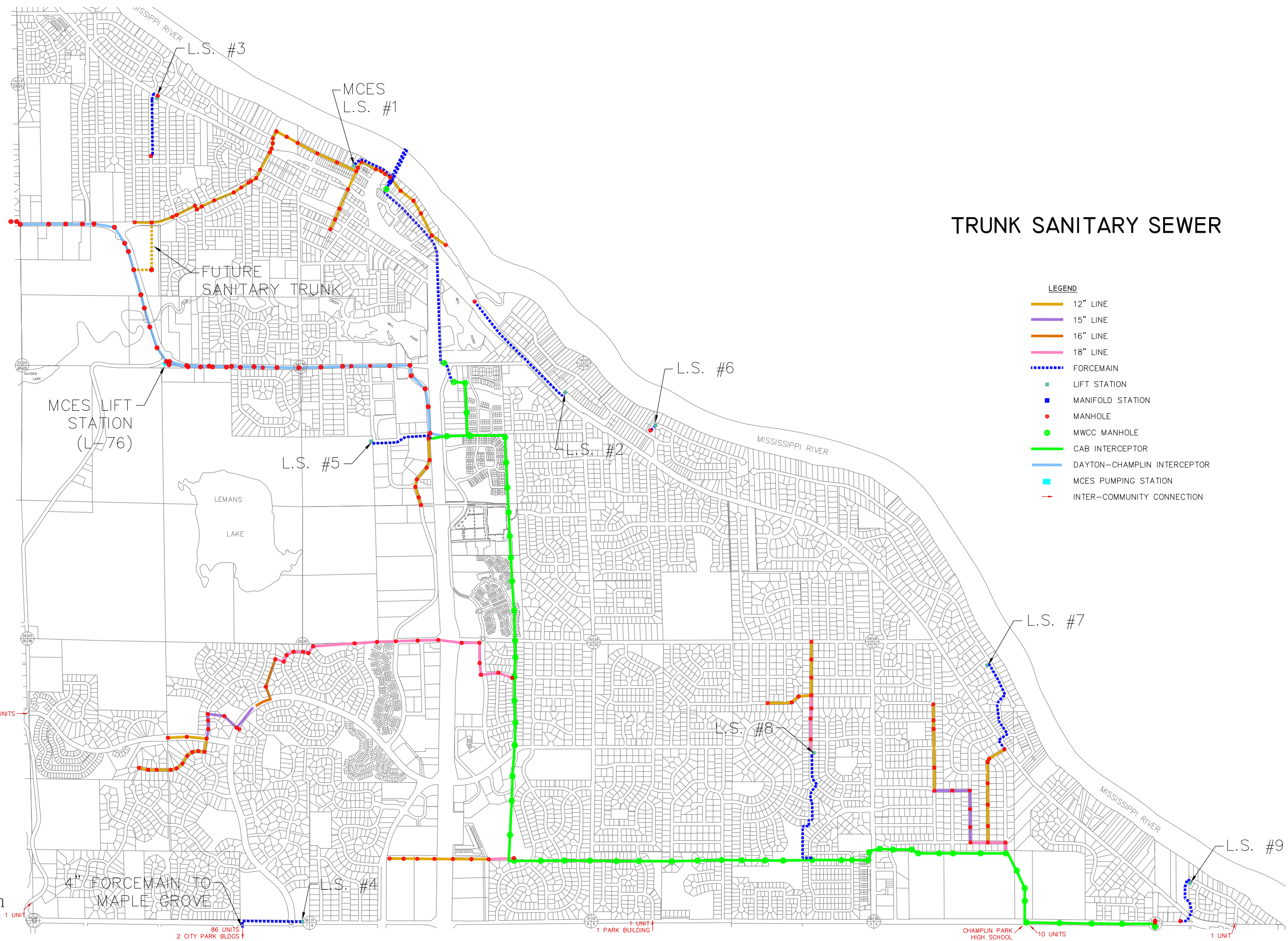
**Table 7-9
MCES Projected Sewage Flows for the City Of Champlin**

YEAR	FLOW (MILLION GALLONS/YEAR) MG	CITY AVERAGE DAILY FLOW	MCES AVERAGE DAILY FLOW
1990	418.3	1.15	1.15
1995	593.6	1.63	1.63
2000	579.3	1.59	1.59
2005	649.8	1.78	1.73
2010	658.4	1.85	1.78
2020	658.5	2.11	1.83
2030	658.7	2.30	1.89

A comparison of the projected sanitary sewer flows for the City of Champlin by the Metropolitan Council staff and by the City staff, as shown in Table 7-9 above, shows very similar projections for years 2010. Minor divergence occurs in years 2020 and 2030. Although the same population projections are utilized, the additional flow per REC accounts for part of the divergence.

7.5 CAPITAL IMPROVEMENTS PROGRAM

A Capital Improvement Program based on estimated sanitary sewer system improvements is presented in Appendix 7-8 of this chapter. The Capital Improvement Program includes upgrades and maintenance improvements to the City's pumping stations, pipe rehabilitation, and data information improvements for the City's sanitary sewer system.



TRUNK SANITARY SEWER

- LEGEND**
- 12" LINE
 - 15" LINE
 - 16" LINE
 - 18" LINE
 - FORCEMAIN
 - LIFT STATION
 - MANIFOLD STATION
 - MANHOLE
 - MWCC MANHOLE
 - CAB INTERCEPTOR
 - DAYTON-CHAMPLIN INTERCEPTOR
 - MCES PUMPING STATION
 - INTER-COMMUNITY CONNECTION

