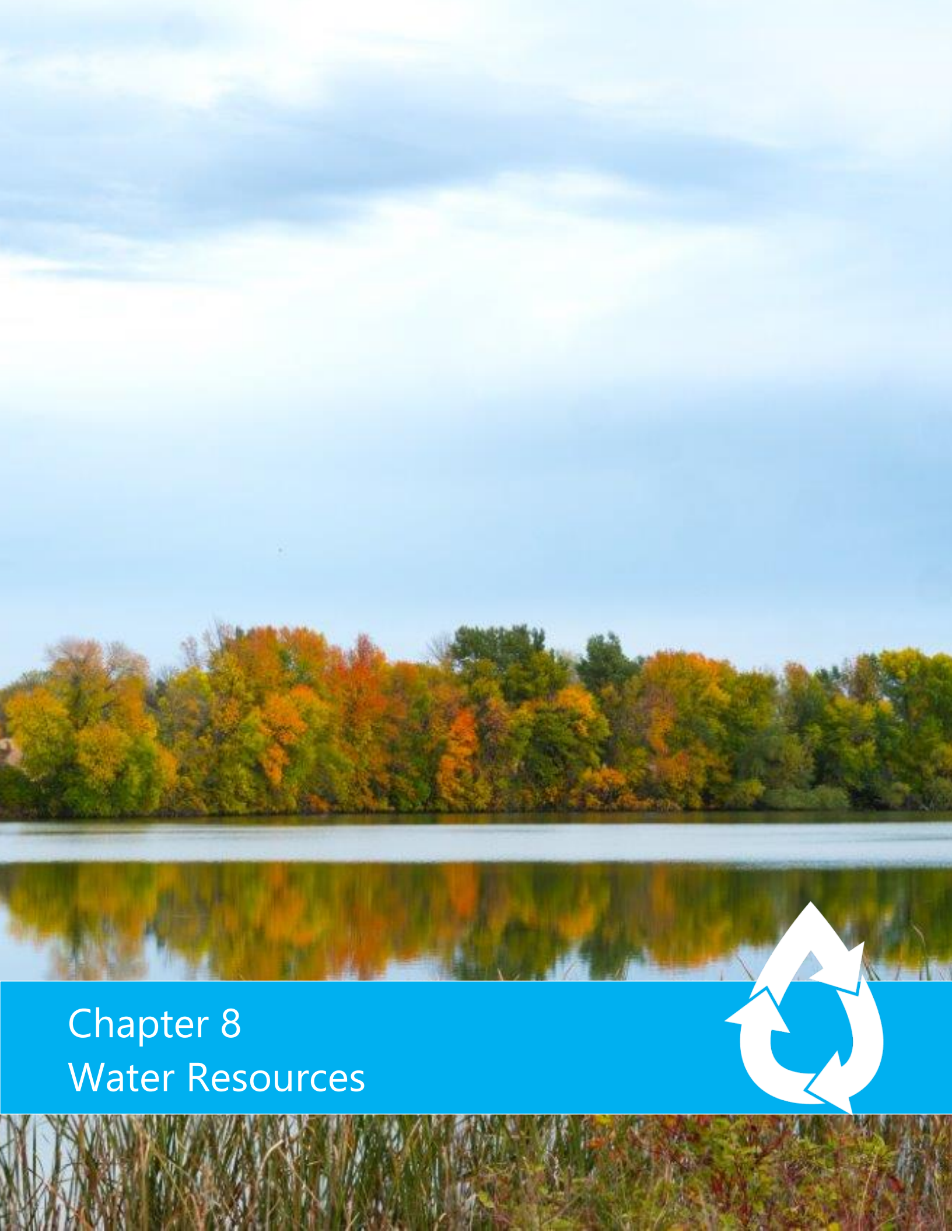


Chapter 8
Water Resources

Introduction

High-quality natural and water supply systems are critical to sustain our ecosystems and growth of our community and the health of our people and local economy. With an abundance of wetlands, lakes, rivers and streams, water resource management is a major focus for the City. Managing local water resources not only ensures a safe and sustainable water supply for human consumption, such as drinking, cooking and bathing, but also proper disposal of used water, or wastewater, as it is returned to the environment. From a resource perspective, water management strives to preserve the quality and function of natural areas and their value to the greater community. That value comes in many forms, from enhanced property values and reduced flooding potential to improved water quality for wildlife and protected groundwater for human consumption to pure personal enjoyment. Thus, preservation, conservation and enhancement of these resources are necessary for Rogers today and in 2040.

The Water Resources chapter includes a mix of policies and strategies than encourage a proactive approach and regulatory response for managing and improving the water supply, wastewater, and surface water systems. The City shall work in cooperation with landowners, developers and other government agencies to ensure these vital resources are sustained for future generations.

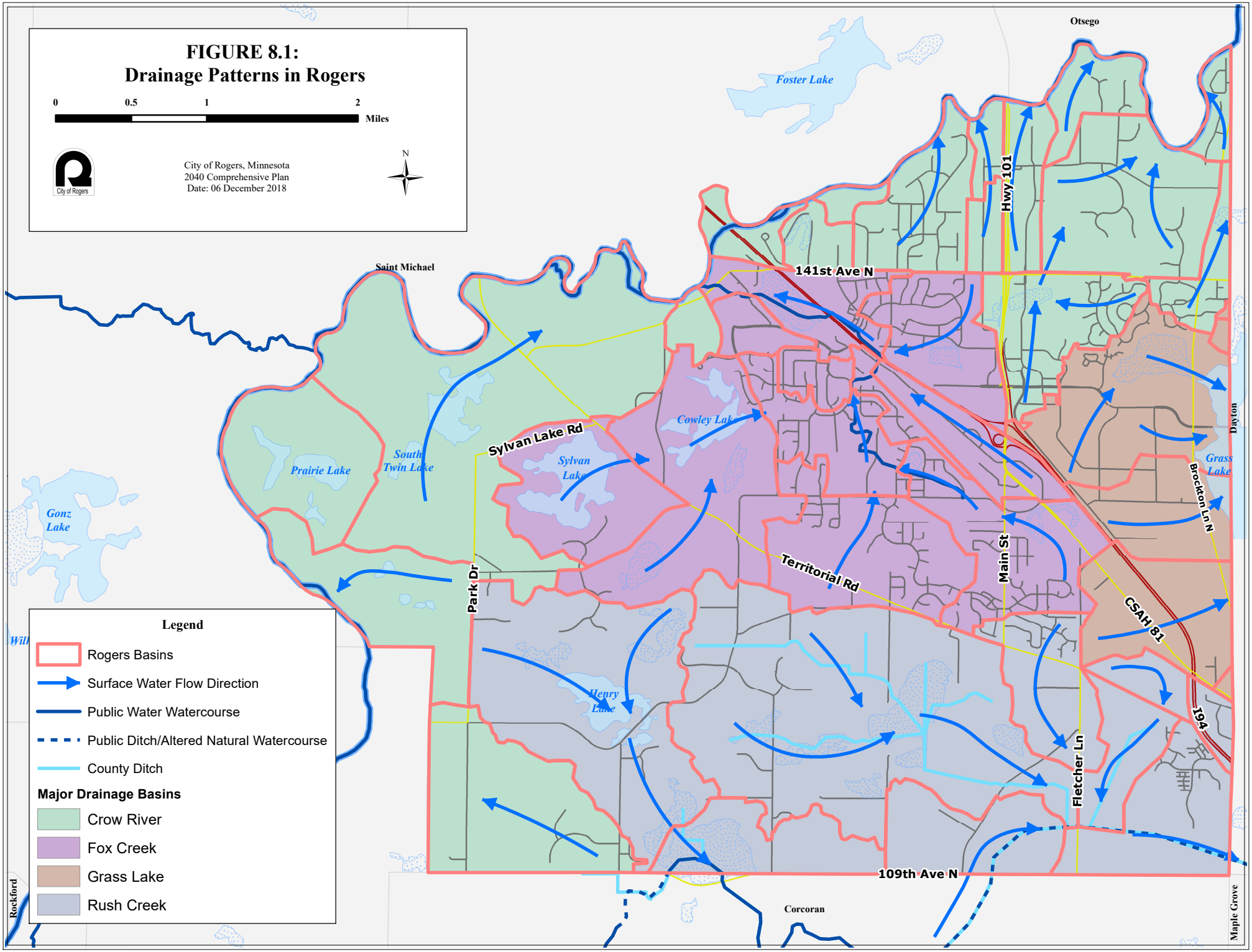
Surface Water Management Plan

Rogers has an abundance of wetlands, lakes, rivers and streams. High-quality water resources also play a major role in our local economy and livability of our community. From a purely environmental perspective surface waters not only provide valuable habitat that support our wildlife and natural ecosystems, but also help improve water quality by filtering surface water before it enters lakes, rivers and streams, and provide water storage that prevent or reduce flooding throughout the community. Three lakes in Rogers (Crowley, Henry and Sylvan) were assessed and determined to be impaired by the Minnesota Pollution Control Agency (MPCA) for Aquatic Recreation due to nutrients. A TMPL for the Elm Creek Watershed was approved by the Environmental Protection Agency (EPA) in 2017 and included an assessment of these impairments. Additionally, the North Fork of Rush Creek has also been identified as an impaired waterbody. Thus, management of our wastewater and storm water systems are critical to the health and viability of our water resources.

The City of Rogers updated its Surface Water Management Plan (SWMP) for the community in 2018 (**Appendix B**). This document serves as the guiding document for city decision making related to conserving, protecting and maintaining surface water resources. The guidance provided within the SWMP aligns with the policies identified within the Comprehensive Plan, along with the requirements of Minnesota Statute 103B. The SWMP provides a variety of information and implementation acts for the management of surface water in Rogers. Analysis completed to update the SWMP includes a review of the existing land use and water resources inventory, changes from the last SWMP, and assessment of problems and issues. This analysis was used to inform the goals, policies and implementation actions for surface water management, and are grouped into the following goals:

Water Drainage Basins

Within the City of Rogers, there are three major drainage basins directing flows to the Crow River, North Fork Rush Creek, and Diamond Lake. **Figure 8.1** highlights major drainage areas in Rogers. The Crow River Watershed drains the largest portion of Rogers (10,203 acres) and contains Sylvan Lake, Cowley Lake, and Fox Creek. North Fork Rush Creek drains largely the southern area of Rogers (5,036 acres) and contains Henry Lake. The Diamond Lake watershed mainly drains the industrial and commercial areas of east Rogers (1,556 acres).



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The City of Rogers has three main streams within the City boundaries, the largest being the Crow River. The Crow River flows in a general southwest to northeast direction and forms the western and northern boundary of the City. The City is generally protected from flood events from the Crow River but there are areas that do see periods of inundation during high water flows. A stream, known locally as Fox Creek, flows in a northwesterly direction and drains 4,000 acres of Rogers to the Crow River. Fox Creek also receives water during high flow from Sylvan and Cowley Lakes. The North Fork Rush Creek drains the southern portion of Rogers. A number of sections of North Fork Rush Creek are designated as a county ditch.

Water Quality

The City recognizes the importance of water quality in its water bodies and is taking steps to protect and improve these resources. These include adopting water quality management policies, collecting water quality data, reviewing projects for conformance with water quality performance standards and implementing water quality improvement projects. The quality of surface water in Rogers contains pollutants typical of urbanized areas. The City uses programs and enforcement of regulations to limit pollutant loading. These programs can be reviewed on a regular basis to ensure they respond to the community's needs and changes for development and redevelopment. Pollutant loading from developed areas may have significant negative impacts on water quality and ecological function of water resources. For lakes, ponds, and wetlands, phosphorus and chloride are pollutants of concern. Throughout the City, non-point source runoff, especially surface water runoff, is a major source of pollutant loading. The City works to limit pollutant loading from surface water runoff through its project review and permitting program, appropriate operation and maintenance of its stormwater management system, and capital projects designed to reduce the amounts of surface water generated and remove pollutants from surface water.

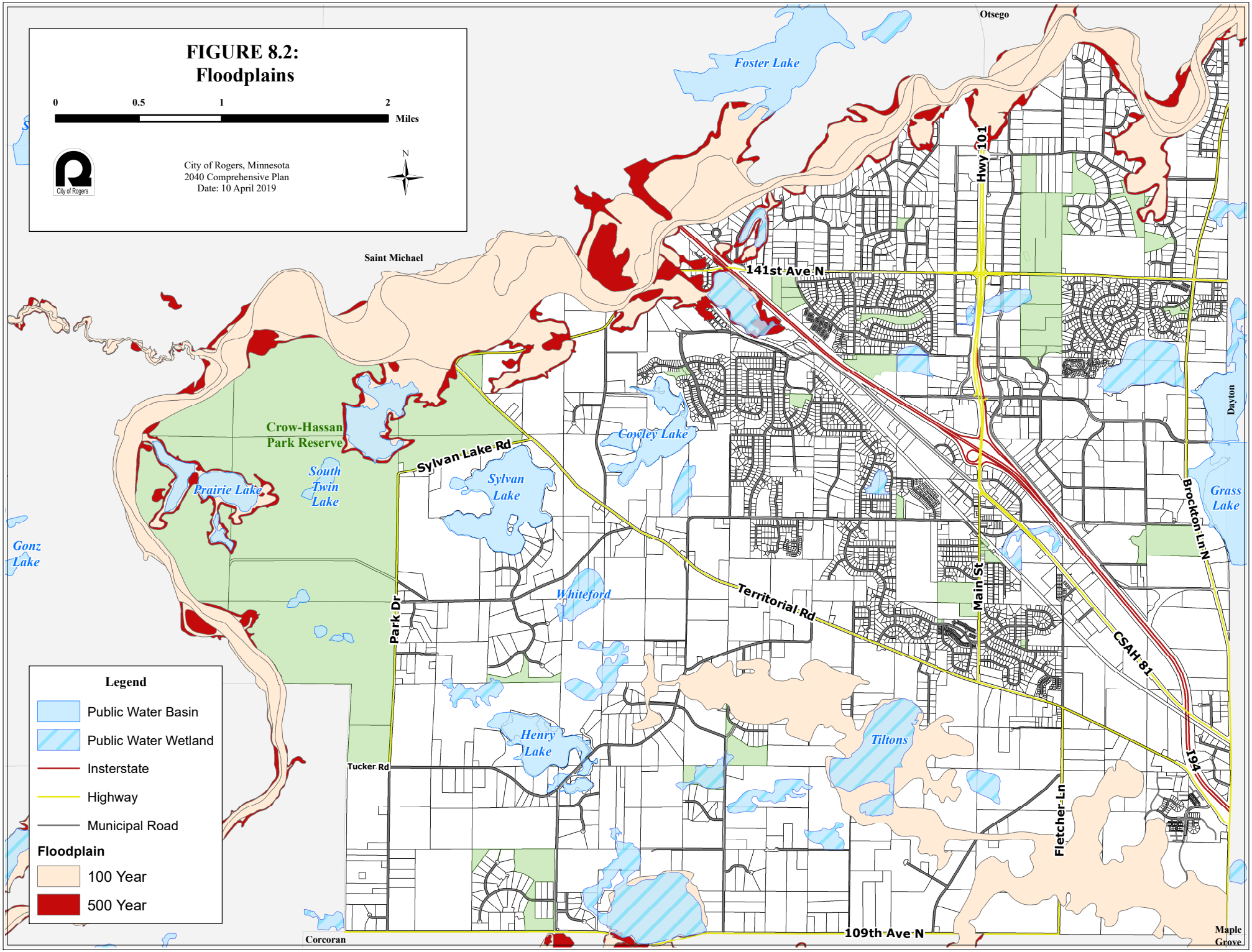
What is Point & Non-Point Runoff?

Point sources of pollution are identifiable localized sources of pollution such as industrial discharge and sewage effluent. Non-point pollution sources are things such as fertilizer or pesticides in urban and agricultural areas.

Floodplain & Wetland Management

Floodplains are important ecological features. They are the primary interface between the aquatic and terrestrial habitats. Floodplains tend to be seasonal wetlands and areas that are protected from development and encroachment, as they allow a safe place for seasonal flooding and protect homes, businesses, and infrastructure. Floodplains are based on the elevation of water that is expected to occur during certain storm events. From a regulatory standpoint, the floodplain is defined as the elevation of water caused by a precipitation event that has a 1 percent chance of being equaled or exceeded in any given year. **Figure 8.2** shows the floodplains in the City of Rogers.

Past urban development in Rogers and higher precipitation amounts have increased the rate and volume of stormwater runoff generated by precipitation, which has increased the risk of flooding. To address areas of significant flooding the City shall identify projects that improve handling of surface water runoff through constructed and natural systems. Additionally, designs within floodplain areas may warranted additional design considerations for these increased events. Reducing or eliminating the potential for flooding will protect human life and property, and help protect natural areas by reducing the potential for sedimentation build up and erosion.



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An important piece of the City's floodplain management efforts requires protection and restoration of wetlands. Prior to settlement, wetlands were a dominant landscape feature in Rogers. During the early years of development, wetland areas were drained or filled to make way for development. Today, wetlands remain a very dominant characteristic of the natural landscape, especially in the southern portions of the community. City management practices and regulations enforced by the Elm Creek Watershed Management Commission and State of Minnesota help protect wetlands and ensure they are part of the landscape for years to come.

Erosion & Sediment Control

If not managed, surface water runoff can greatly degrade the natural beauty and benefits provided by wetlands, lakes and rivers. Using the adopted Surface Water Management Plan, and working in partnership with the Elm Creek Watershed Management Commission, the City of Rogers shall work to ensure control measures are reviewed and in place with all construction projects to reduce erosion of land and sedimentation of all water resources.

Water Supply

The Rogers Comprehensive Water Supply Plan accounts for the current and future population projections and population growth, and provides a guide for how the City of Rogers will continue to efficiently and sustainably deliver safe drinking water to the community. The Water Supply Plan fulfils the City's statutory obligation under Minnesota Statue §103G.291, and is mandated by the Metropolitan Council and Minnesota Department of Natural Resources (DNR). Rogers submitted the Water Supply Plan in October 2018 and will work with DNR until the plan is approved. A copy of the Rogers Water Supply Plan is included in **Appendix C**.

Along with the Water Supply Plan, the City also has an approved Wellhead Protection Plan. Groundwater is the principal source for drinking water for Rogers. The Wellhead Protection Plan identifies strategies to prevent contamination of the public water supply to ensure it is safe and of high quality for human use and consumption. The plan identifies potential pollution sources in relation to wellhead locations throughout the City, and uses a mix of best management practices, construction regulation and day-to-day operations within the wellhead protection areas.

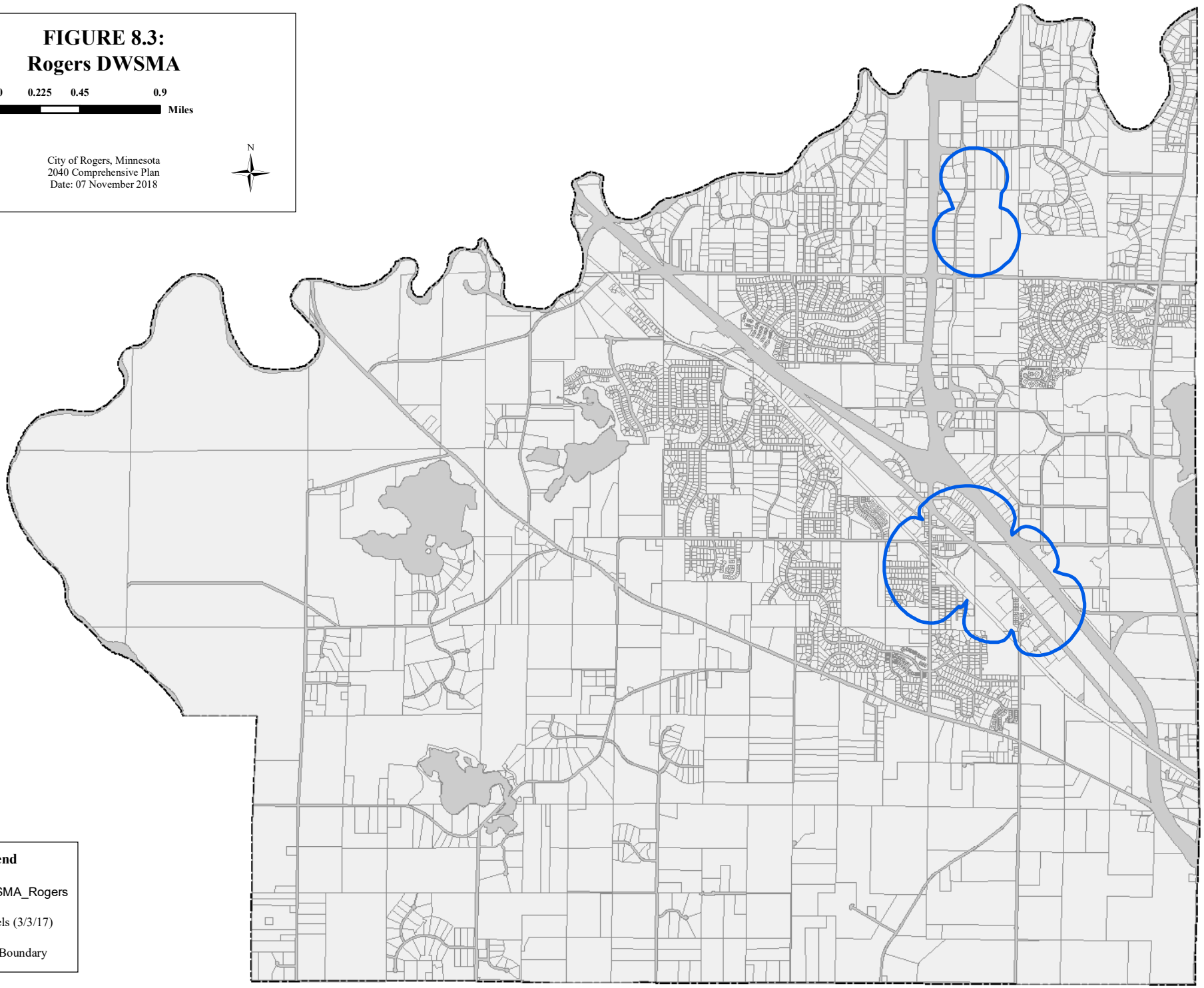
The City of Rogers currently has two wellfields – North Wellfield and South Wellfield. The Drinking Water Supply Management Areas (DWSMA) for Rogers (**Figure 8.3**) have been evaluated for vulnerability to pollutants entering the drinking water supply during the creation of the Wellhead Protection Plan. The South Wellfield has a low vulnerability and the North Wellfield has a moderate vulnerability.

FIGURE 8.3:
Rogers DWSMA

0 0.225 0.45 0.9 Miles

City of Rogers, Minnesota
2040 Comprehensive Plan
Date: 07 November 2018

N



Legend

- DWSMA_Rogers
- Parcels (3/3/17)
- City Boundary

Created by: City of Rogers > Public Works > GIS

Existing Water Supply

The City currently owns and operates nine production wells (**Table 8.1**), two elevated storage facilities, one ground storage reservoir (**Table 8.2**), and an extensive distribution system to provide municipal water service to the community. The distribution system includes piping varying in size from 4-inch to 16-inch (**Figure 8.4**).

Table 8.1: Production Wells

MN Unique Well #	Year Installed	Capacity (GPM)	Well Depth (Feet)
161431	1983	800	370
541548	1995	1000	367
625354	1999	700	364
664853	2002	850	374
740966	2006	650	362
749842	2007	750	360
101915	2016	650	371

Table 8.2: Storage Capacity

Structure Name	Type of Structure	Year Constructed	Storage Capacity (Gal)
Orchid Ave Tower	Elevated Storage	2000	750,000
George Weber Dr. Tower	Elevated Storage	1994	400,000
James Road Ground Storage Reservoir	Ground Storage	2012	2,000,000

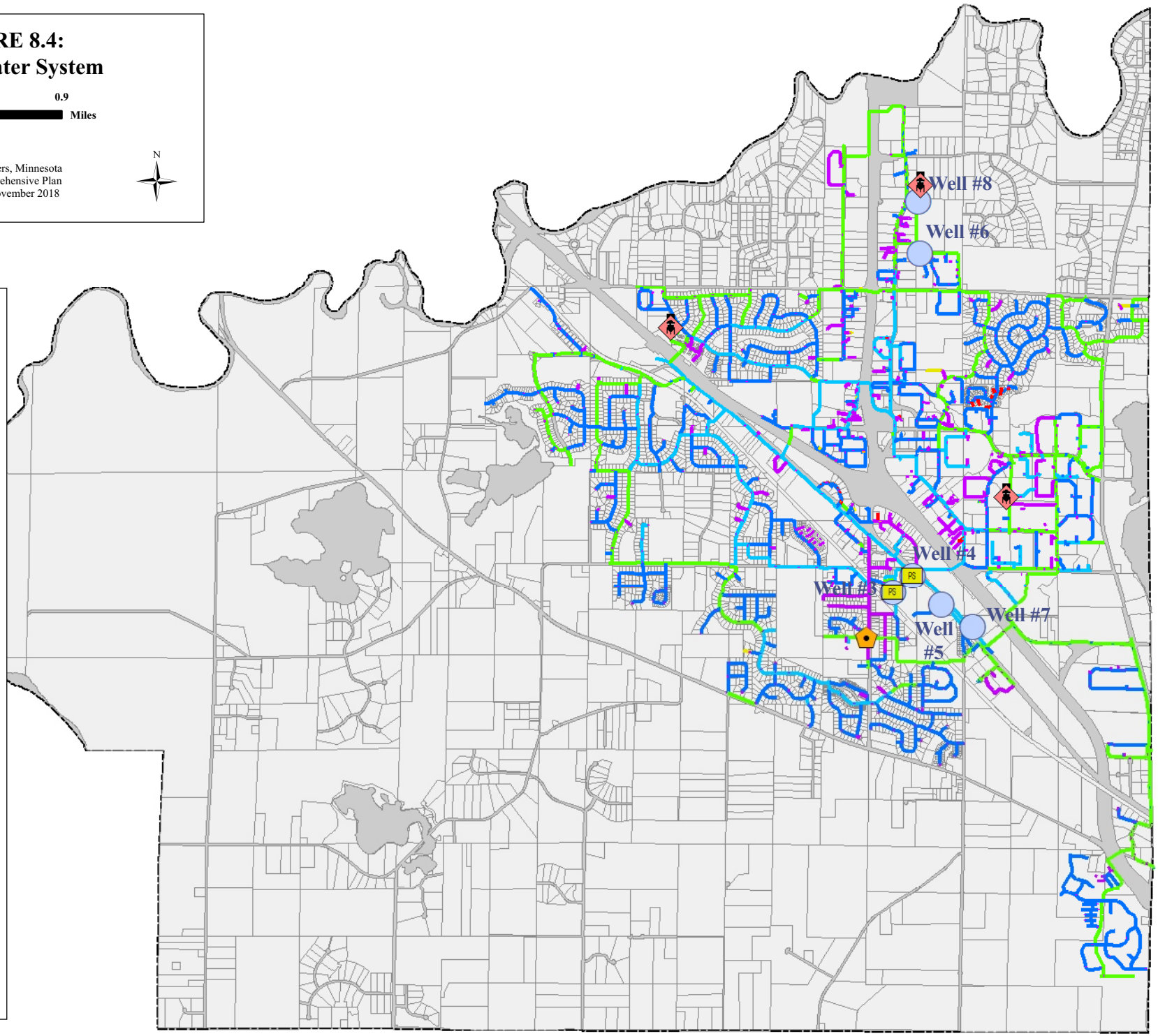
The current water supply is reliant on groundwater, with all wells drawing from the Franconia-Ironton-Galesville formations for production purposes. All City wells have emergency power supplies and are regularly monitored through a SCADA system. The City of Rogers has one intercommunity connection with the City of Dayton which can supply the Rogers community emergency water, if needed, but cannot provide necessary fire protection. An updated water model for the entire City was recently completed, demonstrating there are no major gaps in the system and is available upon request.

FIGURE 8.4:
Rogers Water System

0 0.225 0.45 0.9
Miles

City of Rogers, Minnesota
2040 Comprehensive Plan
Date: 07 November 2018

N



Legend

- BoosterStation
- Elevated Storage Tank
- Well
- Pump Station
- 6"
- 8"
- 10"
- 12"
- Unknown
- 1"
- 2"
- 3"
- 4"
- 6"
- 8"
- 10"
- 12"
- 14"
- 16"
- Parcels (3/3/17)
- City Boundary

Created by: City of Rogers > Public Works > GIS

Water Consumption

The water supply system is designed to meet current and anticipated water consumption as more people and businesses move to Rogers. Rogers experienced significant residential and business growth from 2000 to 2008 – prior to the economic recession that occurred from 2008 to 2012 – and again following the annexation of Hassan Township. From 2012 to 2017 the Rogers population experienced modest population growth. Recently, water consumption has remained stable, and in 2012 the City of Rogers began using a new inclining block rate structure to promote conservation efforts, which seems to have had a positive effect on residents and businesses to reduce water usage. However, continued population, household and employment growth is projected for Rogers through 2040, resulting in the need for continued expansion of the system and increased water consumption. Thus, the long-term sustainability of the water supply depends on the continued implementation of strategies aimed at reducing the per capita water consumption.

Table 8.3: Rogers Water Demand

Year	Population Served	Service Connections	Total Water Sold (Million Gallons)	Average Day Water Demand (MGD)
2012	8,847	2,941	574.50	1.57
2013	9,150	3,077	545.37	1.49
2014	9,250	3,249	460.28	1.26
2015	9,400	3,289	471.06	1.29
2016	9,500	3,320	463.92	1.27
2017	9,800	3,368	478.93	1.31

Table 8.4: Rogers Per Capita Water Use

Year	Population Served	Total Water Sold (Million Gallons)	Residential Sold (Million Gallons)	Residential / Capita Per Day
2012	8,847	574.50	396.08	122.66
2013	9,150	545.37	341.99	102.40
2014	9,250	460.28	295.01	87.38
2015	9,400	471.06	305.39	89.01
2016	9,500	463.92	295.00	85.07
2017	9,800	478.93	319.28	89.25

Future Water Supply System

The future water supply system for Rogers will largely rely on the continued sustainable and efficient use of the existing groundwater water supply. However, the City also recognizes the importance of diversifying the water supply to possibly include the use of surface water resources, and will continue to work with the DNR, the Metropolitan Council and neighboring communities explore those opportunities.

As growth continues in Rogers the water supply system will also need to grow and become more efficient. New production wells, water storage facilities and water treatment facilities will all likely need to be constructed in the next 20 years. The type of supply system, capital improvements, and timing and financing of such improvements are well-documented in the City's capital improvement project list. In addition to infrastructure growth, the City

identifies that expansion of water conservation efforts is necessary to ensure the most efficient use of water to conserve the availability of the water supply to 2040 and beyond. That effort shall include public outreach efforts to educate residents and businesses in ways to reduce their water consumption.

Wastewater

The Metropolitan Land Planning Act requires local governments to prepare comprehensive plans and submit them to the Metropolitan Council to determine their consistency with metropolitan system plans. The local comprehensive plan is to include a wastewater plan element covering the collection and disposal of wastewater generated by the community. Similarly, the Metropolitan Sewer Act requires local governments to submit a Comprehensive Sewer Plan (CSP) describing current and future service needs.

The Metropolitan Council's 2040 Water Resources Policy Plan (2040 WRPP) lays out requirements for the wastewater plan element of the comprehensive plan as well as the CSP. For simplicity, the Metropolitan Council has combined the required elements of both plans into a single set of criteria, contained in the 2040 WRPP.

This 2017 Rogers CSP addresses the criteria of the 2040 WRPP. It provides growth projections, design parameters for the existing sanitary sewer system, future responsibilities of flows as related to the current Rogers wastewater treatment plant and the future Regional Crow River Wastewater Treatment Plant. The 2017 Rogers CSP also addresses the projected timing and projected flows of the City's overall sanitary sewer system.

Existing Sanitary Sewer System

Sanitary sewer systems consist of two elements: collection and treatment (**Figure 8.5**). The City's sanitary sewer system collects wastewater within the City's borders and a limited portion of Dayton, conveying that water to the Rogers Wastewater Treatment Plant (WWTP) and the Elm Creek Interceptor (ECI) for treatment and disposal.

Table 8.5: Average Wastewater Flow

Year	Flow (MG)
2008	296.711
2009	279.456
2010	311.151
2011	318.544
2012	291.218
2013	306.588
2014	327.952
2015	298.274
2016	309.817
2017	316.75
10-Year Average	**305.646**

The existing wastewater flow for Rogers consumes approximately 68 percent of the current capacity of the WWTP under annual average wastewater flow considerations as shown in **Table 8.5**. Based on SewerCAD modeling the existing sewer system and treatment capacity are adequate for existing wastewater flows. The Metropolitan Council Environmental Services (MCES) is planning to construct a new groundwater recharge facility in northwestern Rogers. In anticipation of the new MCES facility, MCES has taken over operation of the existing Rogers WWTP. Once open the WWTP will be decommissioned and the land re-opened for development.

FIGURE 8.5:
Existing Sanitary Sewer System

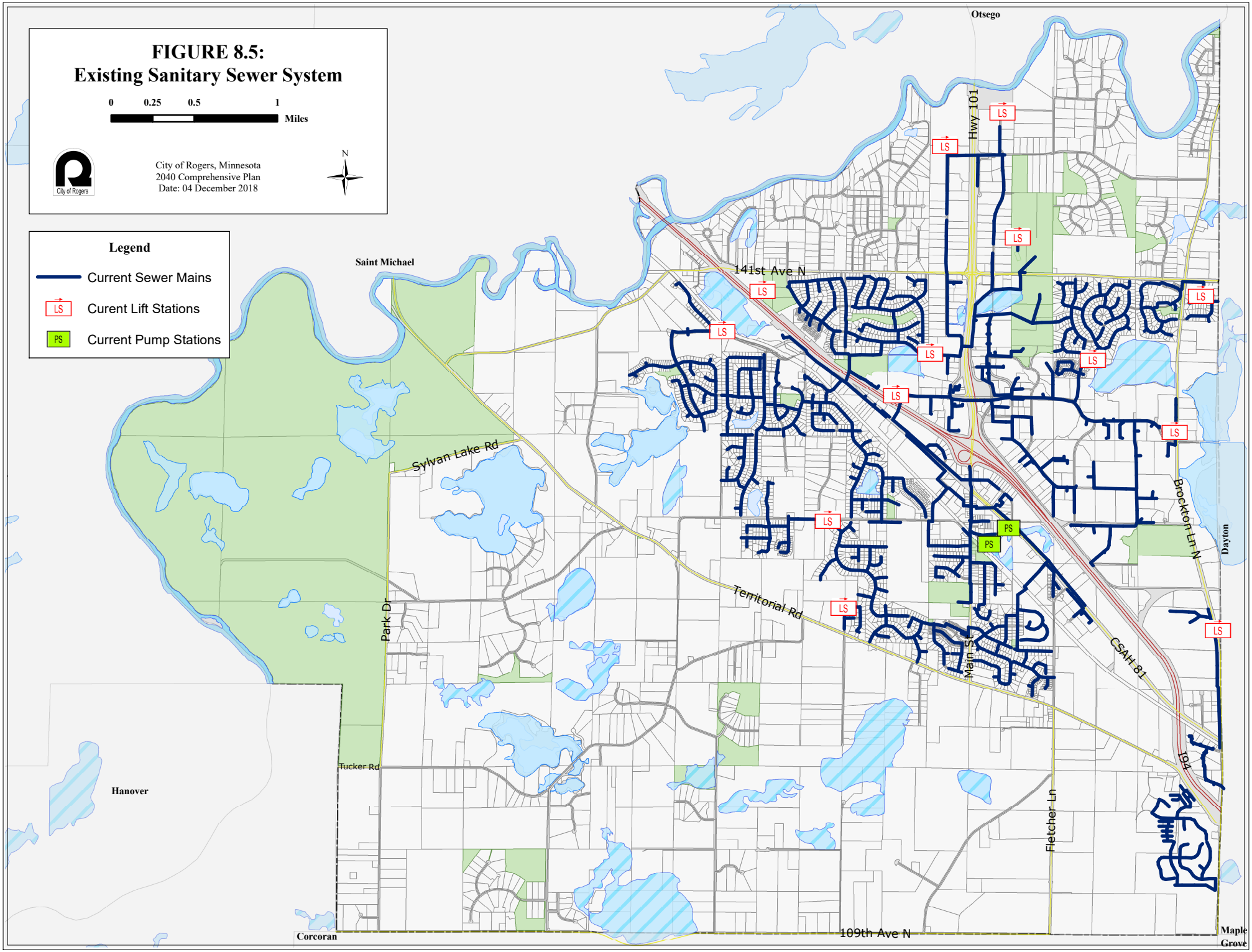
0 0.25 0.5 1 Miles

City of Rogers, Minnesota
2040 Comprehensive Plan
Date: 04 December 2018

N

Legend

- Current Sewer Mains
- LS — Curent Lift Stations
- PS — Current Pump Stations



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Population, Household & Employment Projections

The Metropolitan Council has established projections of population, households, and employees for the City of Rogers (**Table 8.6**) from the 2040 Water Resources Policy Plan**.** Rogers uses Metropolitan Council projections as the basis for its sewer planning efforts. The facilities described in this report are designed to serve the City under conditions of ultimate development. Actual growth rates will affect only the timing of trunk sewer construction and not the actual design of the system.

Table 8.6: Metropolitan Council City-Wide Projections

	1990	2000	2010	2017	2020	2030	2040
Population	698	3,588	11,197	12,753	14,200	18,400	22,800
Household	259	1,195	3,748	4,184	5,000	6,700	8,500
Employment	1,775	4,208	7,907	9,714	11,400	13,100	14,800

The 2040 population, household and employment projections were further refined to review growth within each sanitary sewer service area, according to the land use plan and staging plan identified in the Land Use Chapter. It is anticipated all growth with occur within an existing service area and will be connected to sanitary service. **Table 8.7** identifies the 2040 population, household and employment growth by service district. This information was used to calculate the projected flows. Summary projections for the Rogers WWTP and the ECI are in **Table 8.8**.

Table 8.7: Population, Employment and Household Projections by Service District by Year

Service District		2014-2020	2020-2030	2030-2040
C-1	*Household*	--	40	--
	Employment	--	--	--
	Population	--	90	--
C-2	*Household*	--	44	--
	Employment	--	3	--
	Population	--	107	--
C-3	*Household*	--	68	28
	Employment	--	121	120
	Population	--	152	87
C-4	*Household*	--	59	38
	Employment	--	145	113
	Population	--	127	103
C-5	*Household*	--	265	225
	Employment	--	550	660
	Population	--	610	491
E-1	*Household*	140	--	--
	Employment	442	50	--
	Population	331	--	--

Service District		2014-2020	2020-2030	2030-2040
E-2	*Household*	--	--	--
	Employment	--	192	--
	Population	--	--	--
E-3	*Household*	--	--	--
	Employment	--	--	--
	Population	--	--	--
E-4	*Household*	--	74	66
	Employment	--	--	--
	Population	--	226	209
E-5	*Household*	--	68	62
	Employment	--	185	185
	Population	--	169	157
E-6	*Household*	--	107	--
	Employment	--	--	--
	Population	--	248	--
NE-1	*Household*	--	84	78
	Employment	--	92	97
	Population	--	202	194
NE-2	*Household*	--	88	--
	Employment	--	177	--
	Population	--	181	--
NE-3	*Household*	--	61	--
	Employment	--	--	--
	Population	--	146	--
NW-1	*Household*	--	70	66
	Employment	--	-1	1
	Population	--	173	167
NW-2	*Household*	--	--	12
	Employment	--	--	--
	Population	--	--	25
S-1	*Household*	3	--	--
	Employment	--	--	--
	Population	7	--	--
S-2	*Household*	--	40	39
	Employment	--	--	-1
	Population	--	96	89

Service District		2014-2020	2020-2030	2030-2040
S-3	*Household*	--	66	49
	Employment	--	61	61
	Population	--	173	129
S-4	*Household*	--	200	197
	Employment	--	238	230
	Population	--	525	522
S-5	*Household*	--	23	16
	Employment	--	--	--
	Population	--	57	43
SE-1	*Household*	--	--	--
	Employment	--	--	--
	Population	--	--	--
SE-3	*Household*	--	197	178
	Employment	--	230	179
	Population	--	473	407
SE-5	*Household*	--	--	--
	Employment	--	220	--
	Population	--	--	--
SE-6	*Household*	--	168	143
	Employment	--	150	12
	Population	--	411	336
SE-7	*Household*	--	155	121
	Employment	--	220	41
	Population	--	360	260
SE-8	*Household*	122	190	--
	Employment	43	68	--
	Population	258	428	--
SW-1	*Household*	--	144	146
	Employment	--	-1	1
	Population	--	331	360
SW-2	*Household*	--	54	51
	Employment	--	--	--
	Population	--	138	132
SW-3	*Household*	--	--	168
	Employment	--	--	--
	Population	--	--	396

Service District		2014-2020	2020-2030	2030-2040
SW-4	*Household*	--	--	19
	Employment	--	--	--
	Population	--	--	50
W-1	*Household*	--	65	36
	Employment	--	--	1
	Population	--	155	65
W-2	*Household*	--	24	22
	Employment	--	--	--
	Population	--	65	58

Table 8.8: Population, Household, and Employment Growth by System

		Existing	2020	2030	2040
Rogers WWTP	Population	9,197	11,098	12,751	15,334
	Household	3,093	3,930	4,591	5,647
	Employment	9,714	11,156	11,669	12,846
Elm Creek Interceptor	Population	0	258	2,685	4,382
	Household	0	122	1,121	1,825
	Employment	0	43	1,230	1,753
Unsewered Areas	Population	2,844	2,844	2,964	3,084
	Household	948	948	988	1,028
	Employment	201	201	201	201
Total	Population	12,041	14,200	18,400	22,800
	Household	4,041	5,000	6,700	8,500
	Employment	9,915	11,400	13,100	14,800

Table 8.9 outlines the existing flows to the Rogers WWTP and projected flows until 2030, at which time the flow will be redirected to the Crow River Reclamation Plant. Current sewer flows are currently being treated by both the WWTP and MCES through the ECI that began conveying wastewater in 2017. It is projected that flows handled by the ECI will continue until the Crow River Reclamation Plant is online in 2030. Flow projections are in **Table 8.9.**

Table 8.9: Rogers WWTP and Rogers Elm Creek Interceptor Flow Projections

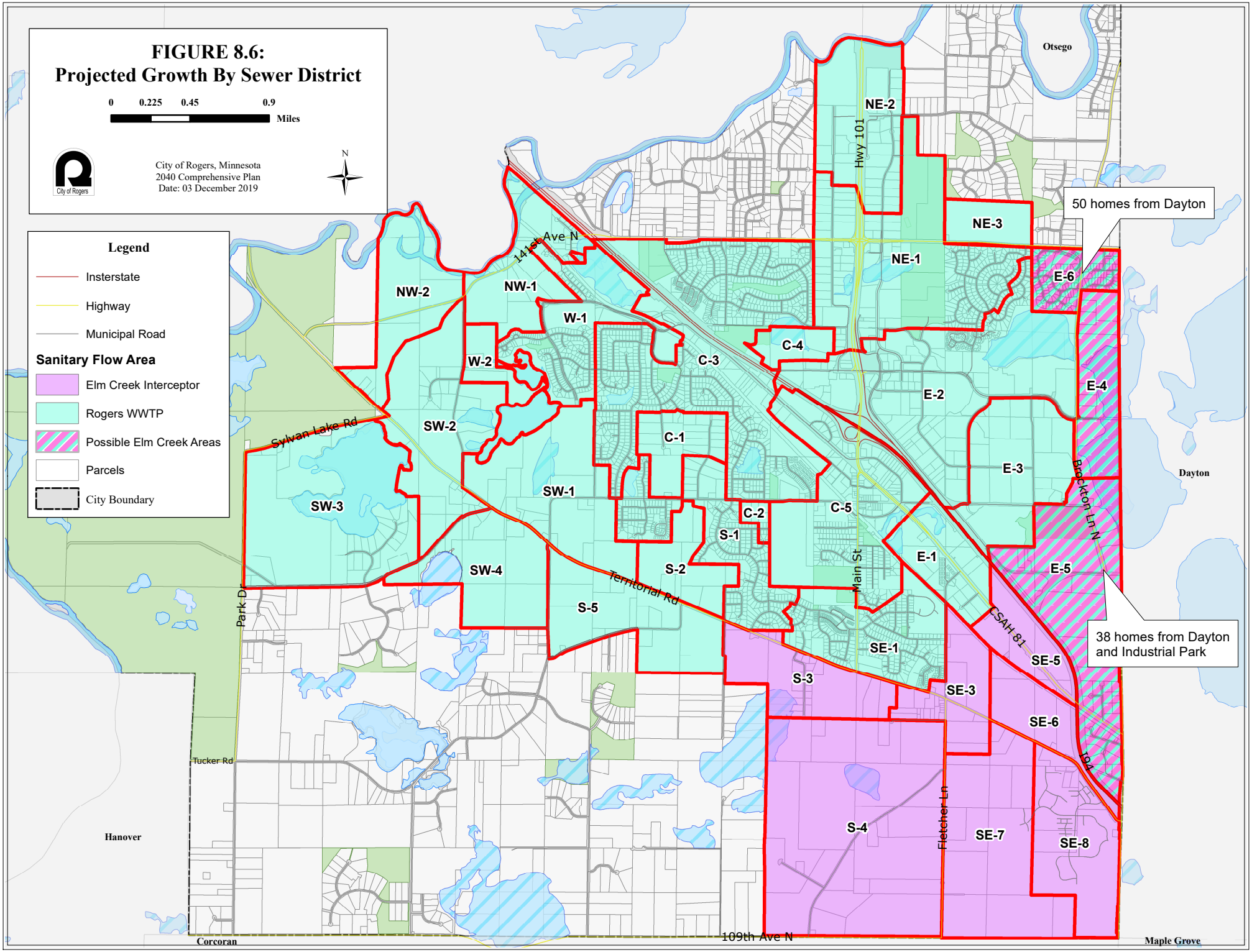
		Existing Flows (GPD)	2014-2020 Flows (GPD)	2020-2030 Flows (GPD)	2030-2040 Flows (GPD)
Rogers WWTP Flows	C-1	525	--	4,925	5,341
	C-2	700	--	4,933	--
	C-3	236,910	--	11,214	12,001
	C-4	6,220	--	5,291	5,505
	C-5	81,482	--	43,688	35,530
	E-1	21,031	18,379	--	--
	E-2	131,555	--	--	--

		Existing Flows (GPD)	2014-2020 Flows (GPD)	2020-2030 Flows (GPD)	2030-2040 Flows (GPD)
Rogers WWTP Flows (Cont.)	E-3	70,315	--	3,015	--
	E-4	--	3,015	9,409	9,504
	E-5	58,527	--	17,414	15,596
	E-6	44,100	--	44,694	--
	NE-1	108,063	--	12,018	7,980
	NE-2	38,058	--	39,122	--
	NE-3	--	--	9,237	--
	NW-1	--	--	8,855	9,295
	NW-2	--	--	--	2,228
	S-1	66,325	400	--	--
	S-2	--	--	6,439	6,746
	S-5	--	--	2,772	2,884
	SE-1	72,758	--	--	--
	SW-1	--	--	23,187	24,052
	SW-2	--	--	8,791	8,871
	SW-3	--	--	8,616	8,697
	SW-4	--	--	--	3,257
	W-1	54,935	--	8,161	8,772
	W-2	--	--	3,115	3,135
Elm Creek Interceptor Flows	S-3	--	--	8,269	8,359
	S-4	--	--	45,236	35,892
	SE-3	--	--	31,040	31,023
	SE-5	--	--	1,600	1,572
	SE-6	--	--	19,715	20,073
	SE-7	--	--	20,556	17,883
	SE-8	14,875	22,996	27,882	--
Total Flows		**1,006,379**	**44,790**	**429,194**	**284,196**

Flow projections stated in **Table 8.10** accounts for identified sewer flow districts (**Figure 8.6**) that could be redirected, if necessary, from the existing Rogers Wastewater Treatment Plant to the ECI to gain additional capacity at the existing Rogers WWTP facility prior to the construction of the Crow River Plant.

Table 8.10: Projected Flows By Service Districts

	Existing	2020	2030	2040
Rogers WWTP	991,104	1,013,297	1,111,035	0
Elm Creek Interceptor	14,875	37,871	369,328	0
Crow River Regional Plant	0	0	0	1,764,558



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The 2030 flow of 1.94 MGD is the projected flow that will be treated by the Crow River Reclamation Plant. The flow projections only represent the City of Rogers and do not include the planned portions of Dayton or Corcoran. The projected wastewater flows to be directed to the Crow River Plant are shown in **Table 8.11**.

Table 8.11: Metropolitan Council Average Wastewater Flow Projections

Year	Rogers Projected Average Flow (MGD)
2010	0.00
2020	0.00
2030	1.94
2040	2.17

Source: Metropolitan Council 2040 Water Resources Policy Plan.

Sanitary Sewer 2040 Design Criteria

Land Use

The Rogers 2040 Land Use Plan serves as the basis for the development of the sanitary sewer flow projections and analysis of the trunk system. The phased flows are not intended to dictate in what order individual properties will receive urban services, but rather, the projected growth of the system. Using the 2040 Land Use Plan, the area of each land use was determined within each sewershed. Detailed descriptions of the various land uses are found in the **Chapter 4**. Areas of each land use by sewershed are in **Appendix D**.

Estimated Average Wastewater Flows

Municipal wastewater is made up of a mixture of domestic wastewater, commercial and industrial wastes, groundwater infiltration and surface water inflows. With proper design and construction, groundwater infiltration and surface water inflows, infiltration/inflow (I/I), can be minimized. The flows due to I/I are accounted for in the analysis and design of the sewer system. The anticipated average wastewater flows from the various sewersheds were determined by applying unit flow rates to each of the 2040 land use categories. Flow rates are presented in **Table 8.12** and in **Appendix E**. Unit rates per acre were used to generate average flow projections for land uses.

Table 8.12: System Design Wastewater Unit Flow Rates

Land Use Type	Gal/Acre/Day
Low Density	600
Medium Density	1,000
High Density	1,500
Mixed Use Regional	1,500
Mixed Use Downtown	1,500
Mixed Used Neighborhood	1,500
Commercial	1,200
Institutional	1,500
Industry	800

Sanitary Sewer Trunk System

The trunk sewer system layout for Rogers is presented in **Figure 8.5**. This map shows the main sanitary sewersheds, existing and proposed trunk sanitary sewers, existing and proposed Metropolitan Council interceptors and meter station. In addition, the exhibit shows existing and proposed lift stations and forcemains. The modeling of the sanitary sewer system was based on a variety of parameters, such as: land use, population density, standard wastewater generation rates and topography. Based on the topography of the undeveloped areas, the sewersheds were created, and the most cost-effective locations for future trunk line facilities were determined. The location of smaller sewer laterals and service lines are dependent upon future land development plats and cannot be accurately located from a study of this type.

Wastewater Treatment

As discussed previously, the City of Rogers owns and operates a Publicly Owned Treatment Works. The facility is permitted by the MPCA every five years. The existing treatment plant is designed to treat an annual average wastewater flow of 1.28 MGD, average wet weather flow of 1.602 MGD, and an average dry weather flow of 1.1 MGD. Average wet weather flow is the daily average flow for the wettest 30 consecutive days (30-day average wet weather flow) for mechanical treatment plants and the average dry weather flow is the daily average flow when the ground water is at or near normal and a runoff condition is not occurring. MCES defines annual average wastewater flow capacity as 80% of average wet weather flow capacity. Annual average wastewater flow is the estimated average flow to the existing WWTP over a calendar year.

The existing treatment capacity for Rogers is adequate for existing wastewater flows. The existing annual average wastewater flow for Rogers is approximately 68 percent of its capacity. There are many different effluent discharge limitations included in the City's NPDES permit, but the permitted average wet and dry weather design flows provide a general estimation of WWTP capacity remaining. Additionally, effluent discharge permit limitations are subject to change at each permit cycle.

Evaluation of Existing Facilities

The existing system capacity analysis was completed by modeling the existing trunk sewer system using SewerCAD software and field verification by City Staff by performing sewer metering and calibration. A SewerCAD model was developed for the existing trunk sewer system based on City GIS data and available record drawings. Wastewater flows were estimated and verified for each sewer district, as discussed in the preceding sections, and modeled to enter the existing sewer system based on manholes nearest development within each sewer district. **Table 8.13** shows the estimated existing wastewater flows in each sewer district included in the existing sewer system model.

Table 8.13: Existing Sewer District Estimated Average Wastewater Flow

Sewer District	Estimated Annual Average Flow of Existing Sewer System Model (MGD)
101	0.184
293	0.035
375	0.096
655	0.248
901	0.268
North	0.011
North Central	0.092
Northwest	0.018
Total System	**0.954**
May – August 2012 Flow	**0.893**
Annual Average Flow Capacity (MGD)	**1.280**
Flow Percentage of Annual Average Flow	**70.0%**

Lift Stations

The City currently has twelve lift stations in operation as shown in **Figure 8.7**. The total capacity, estimated existing flow, and remaining capacity for each lift station is listed in **Table 8.13**. Existing peak wastewater flows were estimated based on peaking factors determined through flow monitoring. Results from modeling indicated all existing lift stations have adequate capacity to convey existing peak wastewater flows. As shown in **Table 8.14**, all lift stations are utilizing 51 percent or less of their capacity.

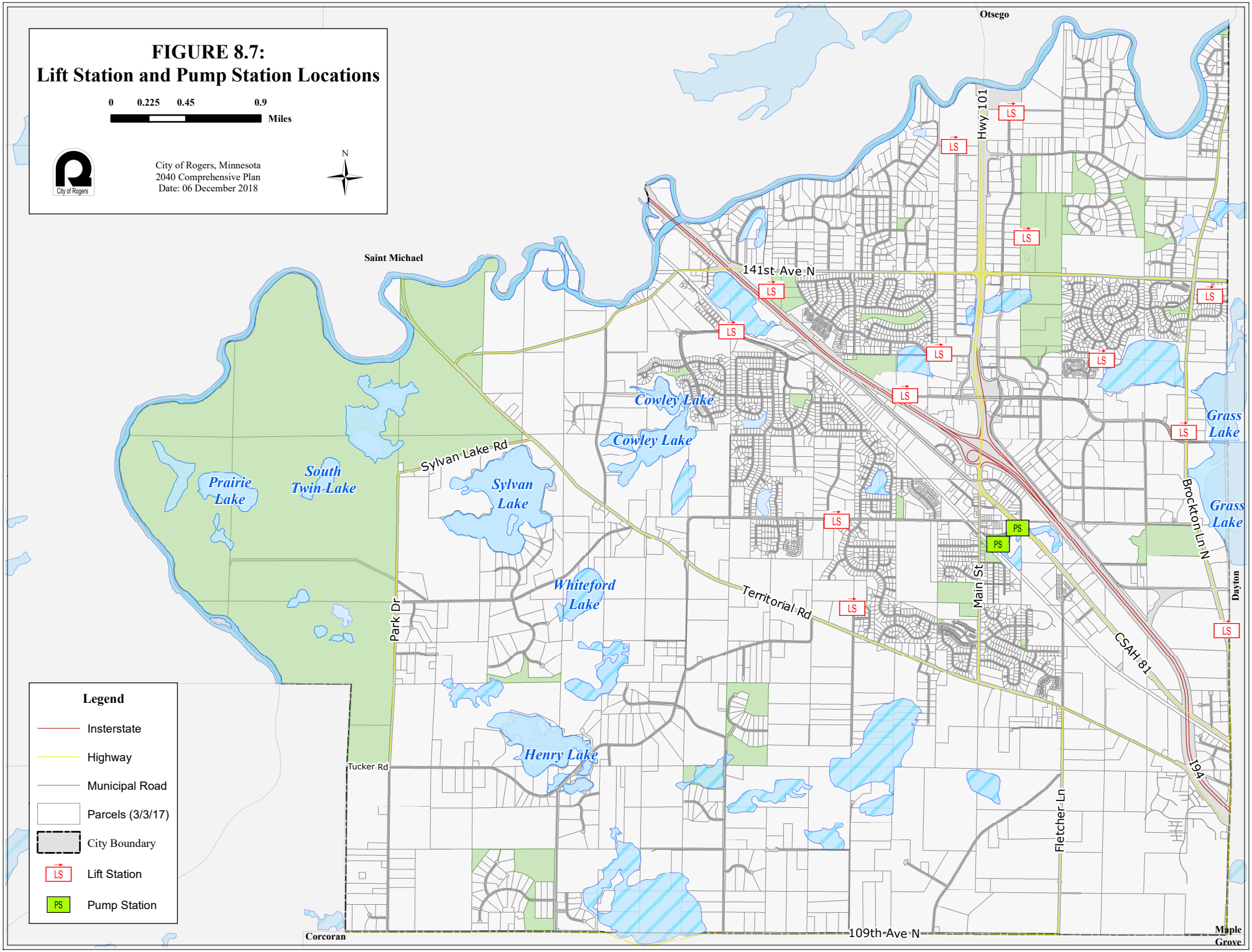
Table 8.14: Existing Lift Station Capacities and Flows

Lift Station Name	Average Flow May through August 2012		Estimated Peak flow May through August 2012		Remaining Lift Station Capacity		Flow Percentage of Capacity (%)
	GPD	GPM	GPD	GPM	GPD	GPM	
Industrial Blvd	15,054	10.45	48,171	33.45	144,000	100	33.5
Hassan Elementary	1,113	0.77	3,561	2.47	187,200	130	1.9
Northdale Blvd	1,922	1.33	6,149	4.27	345,600	240	1.8
James Rd	Future Service Area						
Well #6	1,457	1.01	4,661	3.24	108,000	75	4.3
Monarch Ln	13,312	9.24	35,942	24.96	230,400	160	15.6
137th Ave	290,271	201.58	724,951	503.44	1,152,000	800	31.5
Wellstead Dr	12,712	8.83	34,323	23.84	288,000	200	11.9
South Diamond Lake Road	14,094	9.79	38,054	26.43	403,200	280	9.4
129th Ave	43,572	30.26	139,430	96.83	273,600	190	51.0
Tilton Trail	4,808	3.34	15,387	10.69	100,800	70	15.3
Kinghorn	1,922	1.33	6,149	4.27	345,600	240	1.8

FIGURE 8.7:
Lift Station and Pump Station Locations

0 0.225 0.45 0.9 Miles

City of Rogers, Minnesota
2040 Comprehensive Plan
Date: 06 December 2018



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Trunk Mains

The current Rogers sanitary sewer system is comprised of gravity sewers ranging in size from 8 inches in diameter to 18 inches in diameter. The City trunk sanitary sewer system consists of gravity sewer of a 10-inch or greater diameter. As discussed previously, a SewerCAD model was developed to determine any deficiencies within the City's existing trunk sewer system. **Table 8.15** below shows the estimated peak flows for trunk sewer lines in the City and the capacity remaining. Currently the trunk sewer system has sufficient remaining capacity for future flows in existing sewer districts.

Table 8.15: Existing System Peak Flows

Sewer District	Estimated Average Flow (MGD)	Cumulative Peak Flow (MGD)	Existing Trunk Main Size (IN)	Existing Trunk Main Capacity (MGD)	Flow Percentage of Capacity (%)
C3	0.184	0.557	18	2.517	22.14
E3	0.035	0.200	12	1.035	19.33
SE1 & E1	0.096	0.298	12	0.661	45.17
E2	0.248	0.820	15	1.613	50.87
C5	0.268	1.093	15	2.201	49.65
NE2	0.011	0.036	10	0.72	5.02
NE1	0.092	0.329	18	2.64	12.50
W1	0.018	0.058	15	1.795	3.25
Total System	0.954				

Inflow & Infiltration

Infiltration is water in the sanitary sewer system that enters through defects in the sewer pipes, joints, manholes, and service laterals, or by deliberate connection of building foundation drains. Water that enters the sanitary sewer system from cross connections with storm sewer, sump pumps, roof drains or manhole covers is considered inflow. Water from inflow and infiltration (I/I) can consume available capacity in the wastewater collection system and increase the hydraulic load on the treatment facility. In extreme cases, the added hydraulic load can cause bypasses or overflows of raw wastewater, or cause backups. This extra hydraulic load also necessitates larger capacity collection and treatment components, which results in increased capital, operation and maintenance, and replacement costs. Therefore, it is imperative that I/I be reduced whenever it is cost effective to do so.

Based on flow monitoring data, the Rogers sanitary sewer system does exhibit a limited amount of I/I during storm events. Most of the I/I influence appears in the downtown area, where the oldest pipes in the system are located. The Rogers downtown area has the only clay pipe left in the system and will be replaced with the reconstruction of Main Street in 2020 or 2021.

In 2011, the Rogers City Council adopted a sanitary sewer maintenance policy which outlays the purpose and procedures for maintaining the sanitary collection system. The maintenance policy includes the schedule for cleaning of sanitary sewer lines on a set schedule. Problem areas cleaned every year, which include known areas of grease accumulation and shallow slope pipes; clay lines are cleaned on a three-year schedule, and pvc lines are cleaned on a five-year schedule. The cleaning of lines also gives operators the opportunity to inspect

manholes and identify potential I/I problem areas. City operators track the sewer cleaning maintenance and inspection of manholes through ArcGIS online and flag manholes that require future repairs.

The sewer maintenance policy includes televising inspection with the goal to televise all sewer mains on a 10-year schedule. The City also requires all new sewer lines installed with projects to be televised with an inspection report before the City accepts the new sewer lines.

City Code §46-139(g) prohibits any connection of roof and foundation drains, and sump lines to the sanitary sewer system. The City has focused its attention to lining older pipes in the system, and repairing manholes that have cracked to combat I/I. With the replacement of the clay pipe downtown sanitary sewer mains, scheduled for 2020 or 2021, the City will begin to shift I/I focus on private connections and residences of older homes in the community where I/I is more likely to occur. There are currently 66 buildings connected to the City of Rogers sanitary sewer system that were constructed before 1970 (Figure xx), which is roughly 2% of all homes currently connected to municipal utilities. The City has not yet completed an investigation to quantify exact locations of I/I. Completion of that study will help to determine and employ best management practices for reducing and eliminating I/I

The City's strategy for maintaining low levels of I/I include the following tasks:

- using manholes with concealed pick holes
- leak testing and televising new sanitary sewer construction
- observing of construction of new sanitary sewer mains and connections
- prohibiting connection of roof and foundation drains to the sanitary sewer system
- enforcing separate house drain systems from sump pumps on all new home construction
- televising and replacing or lining sanitary sewer mains with street construction, if in poor condition
- continuing annual sanitary sewer main cleaning and manholes inspections

Additional City efforts to identify higher risk properties that may contribute I/I – homes built before 1970 and in the City's service area – is documented in **Figure 8.8**. As the figure demonstrates more than half of the properties discharge to the Main Street sanitary sewer section, which is programmed for complete replacement. The remaining sections have received cured in place linings to minimize infiltration. Based on MCES and MPCA definitions for excessive I/I Rogers does not currently exhibit excessive I/I.

Intercommunity Flows

Currently a small portion of homes and industrial/commercial areas of the City of Dayton flow into Rogers. The two communities work collaboratively together to find solutions for utilities as noted by the utility agreements entered into by both Cities that can be viewed in **Appendix F**.

FIGURE 8.8:
Pre-1970 Buildings on City Sewer

0 0.25 0.5 1
Miles

City of Rogers, Minnesota
2040 Comprehensive Plan
Date: 12 September 2019

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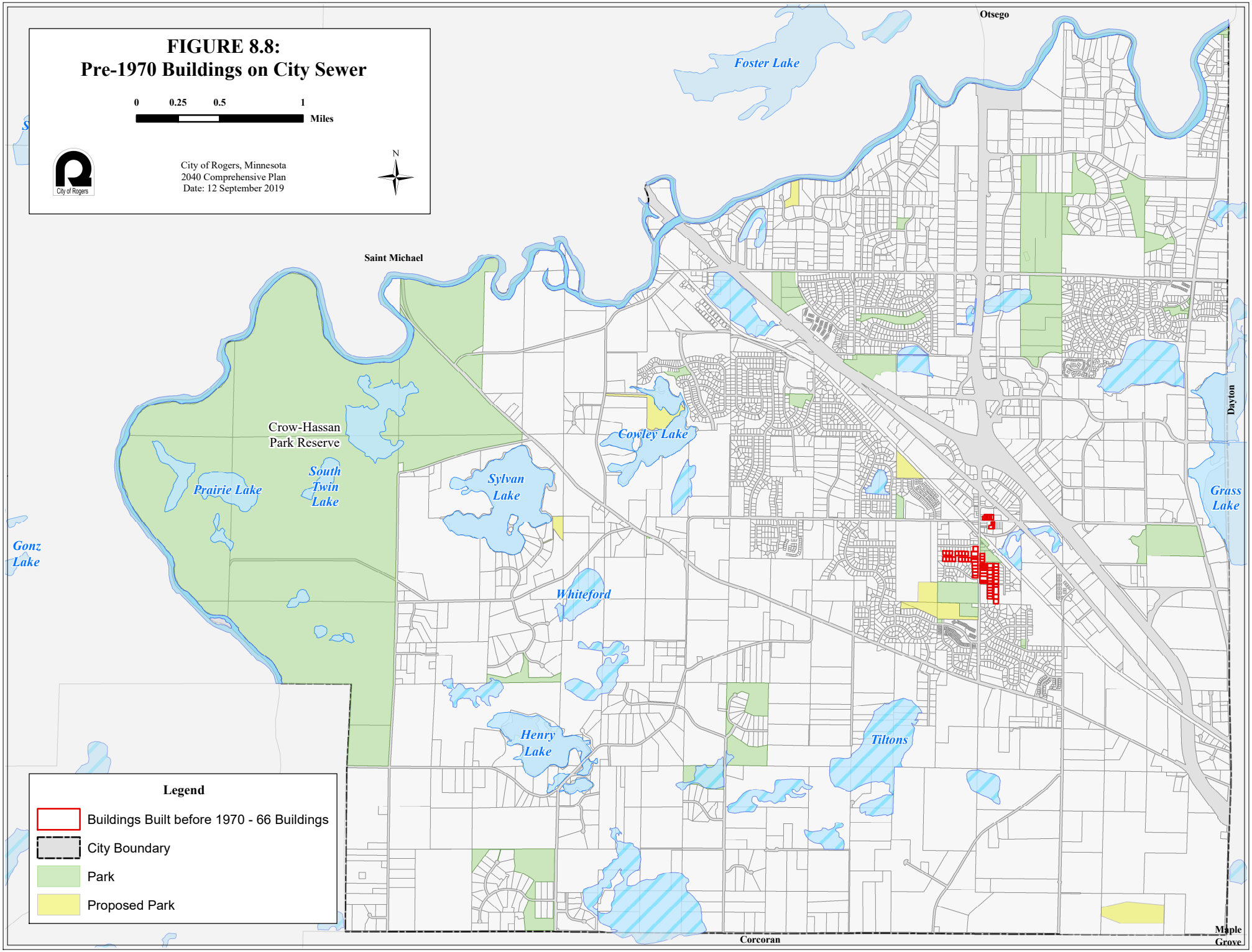


Legend

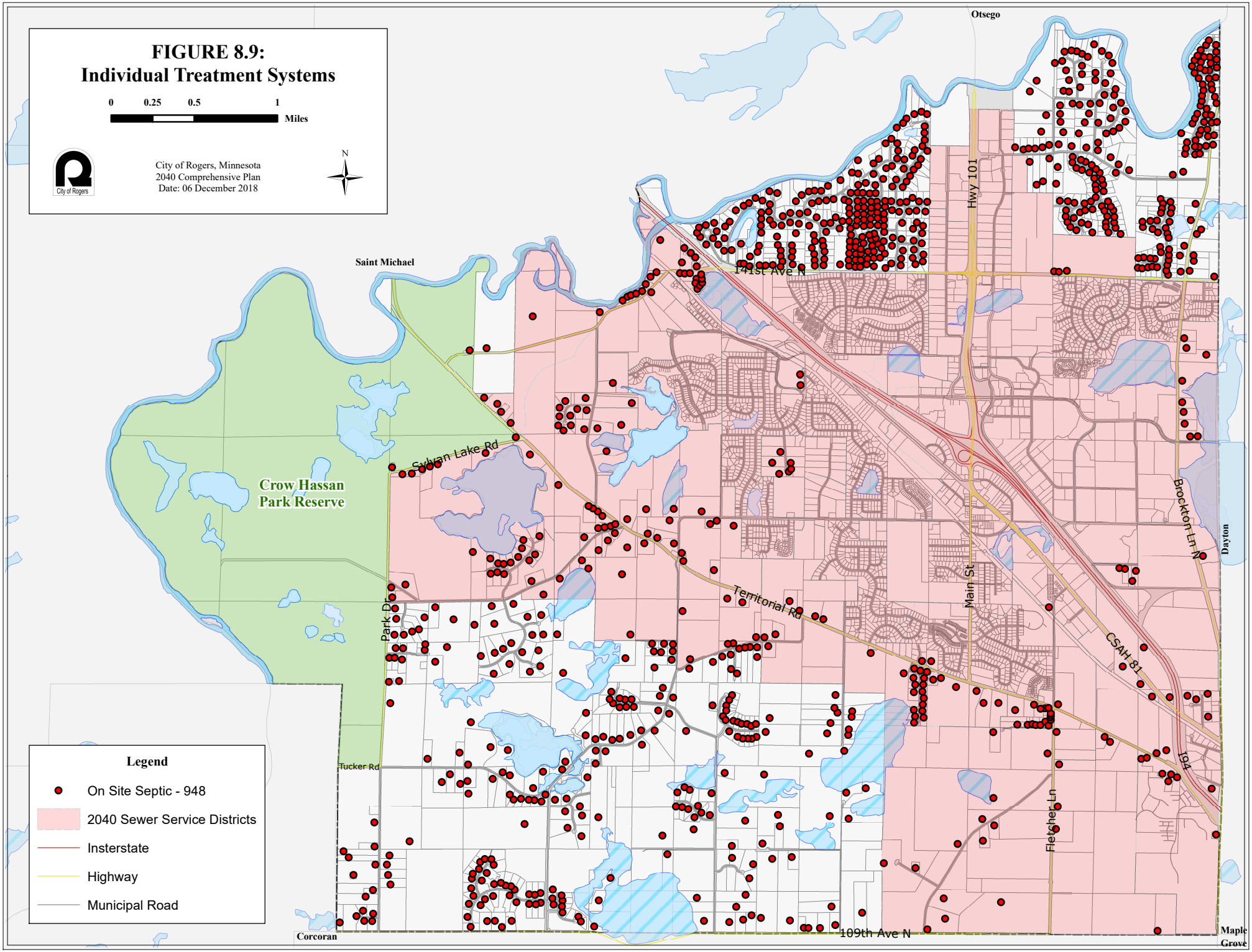
- Buildings Built before 1970 - 66 Buildings
- City Boundary
- Park
- Proposed Park

Created by: City of Rogers > Public Works > GIS

Private Subsurface Sewage Treatment Systems

Rogers has a relatively large number of private subsurface sewage treatment systems within the City boundary. Most of the on-site septic systems exist from the annexation of former Hassan Township. Hassan Township existed of large lot rural residential and commercial lots with limited connectivity to the existing sanitary sewer system of Rogers. The City and Hassan Township partnered on a few trunk sewer and trunk water projects which did allow for some residents and businesses the ability to hook-up to City water and sewer. **Figure 8.9** highlights the individual septic systems within the City of Rogers.

At this time, Hennepin County is responsible for review, inspection, and enforcement of septic systems within the City of Rogers. The City is committed to providing City water and sewer services to existing homes with on-site treatments primarily through two methods. The first being that residents and businesses have the option to petition the City to construct a public improvement project that extends City services. The second option is the extension of services through the development process which extends services close enough to residents and businesses to make it financially viable for hook-up. The City of Rogers has incentivized property owners to hook-up to City services by offering a reduced hook-up fee for existing properties.



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Future Wastewater Treatment Systems

Rogers Wastewater Treatment Plant

The City of Rogers has owned and operated its wastewater treatment plant in its current location along Interstate 94 since 1960. Since this original simple stabilization pond treatment plant was constructed, several expansions have been performed to convert the treatment process to a fully mechanical modern wastewater facility. The treatment plant was last expanded in 1996 to a capacity of 1.602 million gallons per day. The current 2018 wastewater flow treated at the City's wastewater treatment plant is an average of just under a million gallons of daily flow.

To coincide with the Metropolitan Council comprehensive planning process, the City completes a Comprehensive Sewer Plan (CSP) every 10 years at a minimum. The latest update of the Rogers CSP was approved by Met Council Environmental Services (MCES) in 2016. The previous update included the newly merged service area with former Hassan Township and the City of Rogers. With this approved CSP, the City of Rogers stated that the city's current wastewater plant was to be phased out over the next ten years, only to be replaced by the development of a MCES owned and operated regional facility on the Crow River.

The City and MCES will continue to operate the Rogers WWTP in its current location until the development of the Regional Crow River Reclamation Plant. During this transition the current treatment plant will be permitted by the MCPA every five years as part of the NPDES permitting process. During this transitional time between the current flows to the Rogers WWTP and the startup of the Crow River Plant, sewer flow capacity will be split between the Rogers wastewater treatment plant and the Elm Creek interceptor. The interceptor will receive flow directly from the MCES metering station located in southeast Rogers, as well as flow from multiple discharge points through the city of Dayton coordinated through in place utility agreements between the two cities.

MCES Elm Creek Interceptor

The Metropolitan Council Environmental Services (MCES) completed the installation of the Elm Creek Interceptor (ECI) extension to the City of Rogers in the Spring of 2018. This connection of the ECI has allowed for the discharge of sanitary sewer of new homes and businesses to MCES for the first time in the City of Rogers history. Currently, the ECI connection point in Rogers serves three communities – Rogers, Dayton and Corcoran. In the future the three community's sewer flows is expected to exceed the capacity of the existing ECI and for that reason MCES has planned for a new wastewater treatment plant along the Crow River to handle the three community's future sewer flows.

MCES Crow River Reclamation Plant

As mentioned above, to support the long-term sewer development of the region a new wastewater treatment plant has been identified in northwest Hennepin County along the Crow River. The Metropolitan Council Environmental Services (MCES) and the City of Rogers have been working to locate a new wastewater reclamation plant in western Rogers. This plant will eventually serve all of Rogers, a portion of Corcoran, western Dayton, and provide long term capacity relief to the Elm Creek Interceptor. To this end, MCES has recently acquired the land necessary construct such a facility along the Crow River in western extremity of the City. The Rogers City Council, in attempt to support and facilitate this long-range regional asset, has provided a Resolution of support to MCES and Three Rivers Park District to perform a land exchange to help develop the future Regional Plant at this location.

The adopted Metropolitan Council 2040 Water Resource policy plan has integrated this Regional Wastewater Treatment Plant in both the future wastewater treatment plant facilities and the long-range capital improvements plan. The City of Rogers has acknowledged this long-term planning objective for the Region, and has incorporated the phase out of the existing City-owned facility in the Intergovernmental Agreement that outlines this orderly transition between the City and MCES.

Future Wastewater Flows

Planning for the 2040 sewer system was highly dependent on the existing Rogers WWTP capacity, MCES Elm Creek Interceptor capacity, and future MCES Crow River Reclamation Plant construction timing. Based on the information provided by the Metropolitan Council adopted 2040 Water Resources Policy Plan and internal conversations between the City of Rogers and MCES, the Rogers 2040 Wastewater System is anticipating to maximize wastewater flow to the Rogers WWTP and the Elm Creek Interceptor until the construction of the Crow River Reclamation Plant.

The future wastewater system (**Figure 8.10**) includes approximate locations of City trunk sewer lines and MCES Regional trunk sewer lines. The future system map also includes the location of new sewer districts and the location for the proposed Crow River Reclamation Plant.

Since wastewater flow will be treated by two different entities, the City of Rogers and MCES until the construction of the Crow River Reclamation Plant, flows have been divided into major sewersheds that will be responsible for the treatment of wastewater.

City of Rogers plans to accommodate the growth in population projected by Metropolitan Council of 22,800 by 2040 as represented in the following table. **Table 8.16** provides an abbreviated breakdown of the population trends, building permit trends, and wastewater flow trends and projections for the City of Rogers by year until 2040. In providing for the population projection and growth of the City system the combination of the current rogers WWTP and the ECI will provide adequate treatment capacity until the construction of the Crow River Reclamation Plant construction in 2030.

Table 8.16: Rogers 2040 Wastewater Flows

Year	Population	Annual Wastewater Flow (MG)	Total Residential Building Permits	Total Commercial Building Permits	Rogers WWTP Daily Flow	Elm Creek Interceptor Daily Flow	Crow River Daily Flow
2015	12307	298.274	44	5	817,189	-	-
2020	14200	382.744	140	10	959,514	89,100	-
2025	16300	501.004	140	10	1,129,614	243,000	-
2030	18400	619.264	140	10	1,299,714	396,900	1,761,414
2035	20500	698.104	140	10	-	-	1,912,614
2040	22800	767.089	140	10	-	-	2,101,614

FIGURE 8.10:
Future Sanitary Sewer System

0 0.25 0.5 1 Miles

City of Rogers, Minnesota
2040 Comprehensive Plan
Date: 04 December 2018

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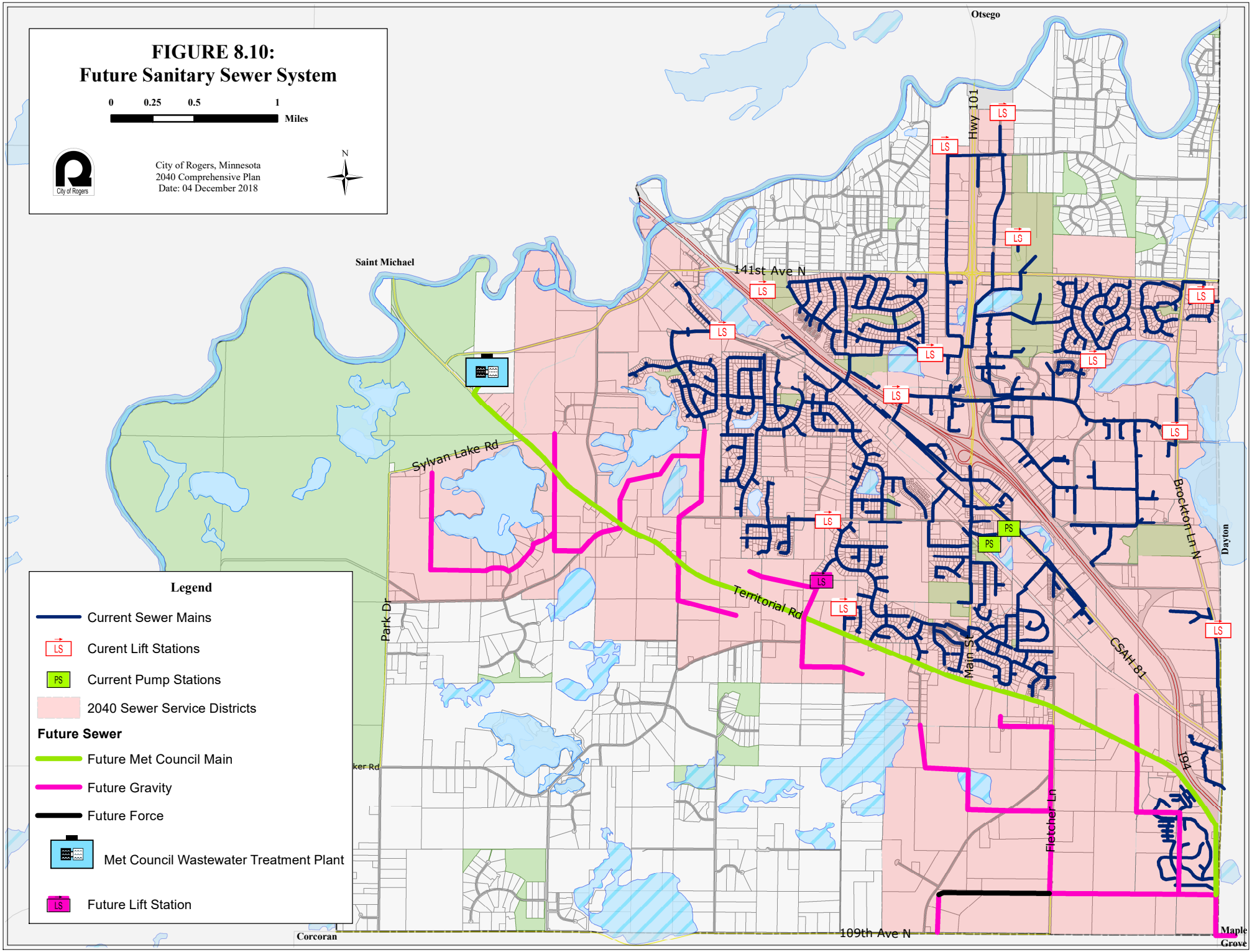

Legend

- Current Sewer Mains
- Curent Lift Stations
- Current Pump Stations
- 2040 Sewer Service Districts

Future Sewer

- Future Met Council Main
- Future Gravity
- Future Force
- Met Council Wastewater Treatment Plant
- Future Lift Station

Created by: City of Rogers > Public Works > GIS

Capital Improvements & Financing

The City of Rogers annually updates its Capital Improvement Plan for the sanitary sewer system to ensure the proper funding is available for the functionality of the trunk sewer system. As of 2018 the total estimated projects had an estimated cost of $6,200,000 (**Table 8.17**), which includes trunk sewer projects, lift stations and forcemains, road crossings, and studies. A full breakdown of the trunk sewer CIP can be found in **Appendix G**.

Table 8.17: Abbreviated Capital Improvement Project List

Project Type	Number of Projects	Cost Estimate
Trunk Projects	15	$3,868,000
Lift Stations	4	$1,634,000
Crossings	2	$659,000
Engineering Studies	1	$50,000
	Total Cost	**$6,211,000**

The current policy of the City of Rogers is to finance new trunk sanitary sewer through the platting of new developable areas. Sanitary sewer upgrades and replacement of existing systems are financed through assessments and user fees collected through the City's enterprise funds. The Rogers Sewer Availability Charge (SAC) is based on the current MCES SAC Manual. These fees are applied for both the new construction and modifications of existing buildings that are connected to the City system through the building permit process.