

## CHAPTER 6 UTILITIES ELEMENT 10-20-09

### 6.1 INTRODUCTION

The City reviews and updates the sewer and water supply system plans, as needed, to ensure the plans remain effective and serve the needs of the community. Needs may change over time as the City transitions from being a steadily growing city to a mature area.

The City's 2030 Comprehensive Plan proposes population growth by adding higher density residential neighborhoods in two key areas (Major Center Area and Golden Triangle Area), where there is only minor residential character today.

<p><b>Public Services and Facilities Goal One</b></p>
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<p>Provide adequate services and facilities required to protect and maintain the health, safety, and welfare of citizens and visitors.</p>
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#### Policies:

- Make public expenditures according to the City's prioritized capital improvements program, which shall be reviewed annually.
- Implement the recommendations of the Water Supply Plan adopted by the City in 1995.
- Continue to review and update, as needed, the sewer and water supply system plans.

### 6.2 SUMMARY OF 1995 WATER SUPPLY PLAN

Eden Prairie's adopted Water Supply Plan, completed in 1995, was prepared to comply with the Minnesota State Statutes, which require all municipal water suppliers serving more than 1,000 customers to evaluate the adequacy of their facilities to meet demands, develop emergency response procedures and prepare a water conservation program.

The 1995 Plan is summarized within this Comprehensive Plan, along with the presentation of some additional, updated information from other sources. It is the 1995 Plan that shapes water supply planning and development in the City. To obtain more details about Eden Prairie's existing and future water supply, please refer to the 1995 Water Supply plan, which is made, by reference, an Appendix to this Comprehensive Plan. The 1995 Plan was developed to project the City's needs through 2010. Based on this Plan, in 1999, the water plant's anticipated final expansion was completed for a system that would ultimately serve a projected population of approximately 64,000 to 65,000 persons.

With this Comprehensive Plan update, the City is forecasting additional population growth by adding higher density residential neighborhoods in two areas which are primarily industrial/office/retail today. These areas are the Major Center Area (MCA) and Golden Triangle Area/City West (GTA), which are discussed in detail in other chapters. Other areas of the City are almost fully developed and have a potential for limited growth.

As a result of this plan revision, the

population in 2030 is projected to be 77,400 with an employment base of 71,000.

#### **SUMMARY OF HISTORIC WATER USE**

The City of Eden Prairie began pumping water from municipal wells to residents in 1971, when the City's population was approximately 7,000 people. Over the past 35 years, there have been four expansions of the water system to accommodate growth. In 1999 the water plant's anticipated final expansion was completed for a system that would ultimately serve a projected population of 64,000 to 65,000 people. Table 6.1 indicates population, service connections and total water pumped for the last fifteen years. In 1986, the City pumped

1.29 billion gallons of water into its distribution system. Ten years later in 1996, the City pumped 2.66 billion gallons of water into the system, for an overall increase of 106 percent over this 10-yr period. For the 10-year period from 1996 to 2006, the City pumped 2.66 and 3.34 billion gallon, respectfully. This illustrates the decline in growth as the City reaches full development. During the intervening years the amount of water pumped did fluctuate due to climate conditions.

Figure 6.1 illustrates the existing wells and tanks in the City's water system. The entire water system map showing pipes and sizes can be found in the 1995 Water Supply Plan.

**Table 6.1**  
**City of Eden Prairie Summary of Historic Water Use, 1991-2006**

Year	Population		Service Connections		Water Pumped	
	Total	% Change	Total	% Change	Total (mg)	% Change
1991	40,415	2.8	11,701	3.8	1,839	1.0
1992	41,755	3.3	12,254	4.7	1,983	7.8
1993	43,159	3.4	12,930	5.5	1,725	(13.0)
1994	45,391	5.2	13,463	4.1	2,126	23.2
1995	49,819	9.7	13,812	2.6	2,266	6.6
1996	50,213	0.8	14,156	2.5	2,662	17.5
1997	51,974	3.5	14,736	4.1	2,481	(6.8)
1998	53,644	3.2	15,060	2.2	2,849	14.8
1999	54,438	1.5	15,799	4.9	2,729	(4.2)
2000	54,901	0.8	16,068	1.7	2,885	5.7
2001	57,513	4.7	16,679	3.8	2,947	2.1
2002	58,793	2.2	17,029	2.1	2,674	(9.3)
2003	60,981	3.7	17,464	2.6	3,174	18.7
2004	62,603	2.6	17,896	2.5	2,920	(8.0)
2005	64,032	2.3	18,271	2.1	2,923	1.0
2006	64,846	1.3	18,607	1.8	3,337	14.2
Average	53,405	3.2	15,370	3.2	2,635	4.5

*Source: Black & Veatch, 1999; City of Eden Prairie, 2006*

**WATER DEMANDS**

Table 6.2 indicates total and residential per capita water use between 1991 and 2006. Table 6.3 compares water demand by various customer categories based on connection and use data for 2000 and 2006. Much of the unaccounted water is a result of authorized use at the water treatment plant, public facilities and City operations, such as fire fighting and distribution main flushing.

Table 6.4 illustrates seasonal average and peak demands between 1996 and 2006. Demands in January and July were used to represent winter and summer season

demands. Winter average and maximum demands are typically low and constant compared to summer demands. In 1996, the City's maximum demand day occurred in July and was 18,001,000 gallons. Ten years later, in July 2006, the City's maximum demand day was 22,645,000 gallons.

Although water use has grown as a result of population and employment growth, the average daily per capita use (gcd) has declined. For the period from 1984 -1999, the average use was 137 gpd. From 1991-2006, the average use was 133 gpd.

**Table 6.2**  
**City of Eden Prairie Per Capita Water Use, 1991-2006**

<b>Year</b>	<b>Total Per Capita Use (gcd)</b>	<b>Residential Per Capita Use (gcd)</b>
1991	125	81
1992	130	85
1993	110	75
1994	128	87
1995	125	81
1996	145	94
1997	131	85
1998	146	95
1999	137	89
2000	143	80
2001	140	80
2002	125	70
2003	143	80
2004	128	75
2005	125	70
2006	141	79
Average	133	82

*Source: Black & Veatch, 1999; City of Eden Prairie, 2006*

**Table 6.3**  
**City of Eden Prairie Water Demand by Customer Category, 1999-2006**

Category	Connections		Water Use (mg)		% Total Use	
	1999	2006	1999	2006	1999	2006
Residential	15,038	17,686	1,656	1,875	61	56
Institutional/Commercial/Industrial	761	921	780	1,414	29	42
Unaccounted	--	--	293	48	10	2
Total	15,799	18,607	2,729	3,337	100	100

*Source: Black & Veatch, 1999; City of Eden Prairie, 2006*

**Table 6.4**  
**City of Eden Prairie Seasonal and Peak Water Demands, 1991-2006**

Year	Monthly Average Daily Demand		Maximum Daily Demand	
	January (mgd)	July (mgd)	January (mgd)	July (mgd)
1991	3.7	8.0	4.0	11.8
1992	3.8	6.7	4.0	9.4
1993	3.9	5.6	4.3	11.2
1994	4.1	8.0	4.4	13.3
1995	4.2	9.2	4.6	16.9
1996	4.5	13.4	5.0	18.0
1997	4.8	8.0	5.8	18.0
1998	4.8	12.0	5.7	18.9
2000	5.0	12.4*	5.5	18.0*
2001	4.9	17.2	6.0	22.6
2002	5.1	17.2	6.2	16.9
2003	5.2	18.4*	6.3	22.0*
2004	5.1	13.8	6.0	19.7
2005	5.2	16.6	5.9	21.6
2006	5.2	20.1	5.9	22.6

*Source: Black & Veatch, 1995; City of Eden Prairie, 2000*

\* August

## MONTHLY WATER USE

Table 6.5 illustrates monthly water use. As of 2006, the peak monthly demand in water use occurred in July 2006 at 622,037,000 gallons. January 2006, the previous winter quarter, had seen a peak monthly demand of 159,680,000 gallons.

## WATER TREATMENT PLANT AND STORAGE STRUCTURE CAPACITIES (MGD)

Anticipated final expansions were made to the City's water treatment plant in 1999. The expanded water plant capacity is 28 million gallons per day. The City has designated the appropriate water plant infrastructure for development within the City consistent with 2010 projections. Continued adherence to the Water Supply Plan that was adopted by the City in 1995 will provide sufficient water service to the city through 2030.

Table 6.6 lists existing ground and elevated storage structures and their corresponding capacities. Ground Storage requires additional pumping (high service) to supply the water to the distribution system.

The storage and high service pumping facilities provide capacity to meet the estimated current maximum hour demands of approximately 30 mgd. Maximum hour demand is the greatest demand anticipated for the water system over a period of a few hours. The storage capacity has been adequate except during periods of drought, in which case lawn irrigation restrictions are implemented to reduce peak demands.

At ultimate development the 1990 Water Supply and System Facilities Plan projects a maximum hour demand of approximately 46 mgd. The 1993 Water Supply and Treatment Assessment state that an

additional 1.0 MG of storage is required to meet this demand. Before construction, the City will need to further evaluate the location for optimal utilization of the distribution system.

## WATER SOURCE SUPPLY

Two wells have been constructed since the 2000 plan update, bringing the City's total number of wells to 14. Well Number 1 has been abandoned due to its location in the Highway 312 right-of-way. The total rated capacity of the well field is approximately 29 MGD (capacity for 14 wells), and the firm capacity, assuming the largest well is out of service, is over 26 MGD (13 wells). Various well parameters are provided in Table 6.7.

During 2006, the City incurred its highest peak demand period which lasted for seven (7) days. As all wells were run continuously, their individual capacity was reduced as a result of the lowering of the ground water table. The capacity during peak demand is shown in Table 6.7.

Before the end of the planning period (2030), additional supply is required. Based on the assumption that the largest two wells are out of service and there is a peak demand of 28 mgd, an additional 10 mgd or 7,200 gpm is required. Based on the reduced capacity at peak demand this will require five (5) additional wells. If wells can be located to decrease the influence that the wells have on each other, maybe a higher capacity per well can be obtained. The City should also study if more capacity at the existing treatment plan can be obtained by implementation of advanced technology. If pressure loss can be reduced at the treatment plan, the capacity of each well will be increased.

**PROJECTED WATER DEMANDS**

The projected water demands (1995 Water Supply Plan), with potential reductions due to conservation, and peak demand reduction are present in Table 6.8B. The projections are based on historical (1995-2005) gross per capita consumptions and maximum day/average day ratios. The maximum day demands are based on a normal dry year, not drought conditions. Water restrictions may need to be implemented to reduce demands during drought and other emergency conditions.

Table 6.8 is from the 1995 Water Supply Plan. The gross per day average demand and maximum day/average day ratio has been added to the table. Table 6.8A is the actual demand for the same period. As can be seen from the two tables, the projected demand was conservative.

The projected future demands presented in Table 6.8B included the potential reductions due to implementation of the City's conservation program and use restrictions, which is anticipated to reduce the ultimate projected demands to approximately 28 mgd. The gross average day demand used to make the projection is 140 gpd but the maximum day peak ratio is reduced from the current 3.0 factor to 2.5 in 2030. Safety factors are typically included when selecting the design capacity of a water treatment facility to guard against inaccuracies in the population growth projections and periods when demands exceed supply or treatment capacity, due to drought, equipment failure or maintenance activities. The City expanded the water treatment facility to 28 mgd to meet the projected maximum day demands and to provide operational flexibility.

**Table 6.5**  
**City of Eden Prairie Monthly Water Use, 1993-2006**

Month	Total (mg)		
	1993	1999	2006
January	119	149	160
February	109	135	143
March	121	150	156
April	140	170	186
May	157	229	295
June	164	290	482
July	175	399	622
August	190	367	450
September	159	320	301
October	140	204	215
November	123	160	163
December	128	156	164
<b>Total</b>	<b>1,725</b>	<b>2,729</b>	<b>3,337</b>
<b>Average</b>	<b>144</b>	<b>227</b>	<b>278</b>

Source: Black & Veatch, 1999;  
City of Eden Prairie, 2006

**Table 6.6**  
**City of Eden Prairie Treated Water Storage, 1993 - 2006**

Facility	Capacity (mg)	
	1993	2006
Ground Storage		
Plan Clearwells	0.4	3.5
Plant Reservoirs	2.0	
Elevated Storage		
Baker Road <sup>(1)</sup>	2.0	2.0
Hidden Ponds	1.0	1.0
Marketcenter	2.0	2.0
<b>Total Storage Capacity</b>	<b>7.4 Million Gallons</b>	<b>8.5</b>

<sup>(1)</sup> Ground Standpipe, top 30 feet considered usable storage

Source: Black & Veatch, 1995; City of Eden Prairie, 2000

**Table 6.7**  
**City of Eden Prairie Summary of Well Installations, 2006**

Well No.	Unique Well No.	Date Installed	Pump Type	Rated Capacity		Casing		Well Depth (ft)	Aquifer	Capacity at Peak Demand <sup>(3)</sup>	
				(gpm)	(mgd)	Diameter (in)	Depth (ft)			(gpm)	(mgd)
2	205905	1971	VT	1,200	1.7	24/30	210/150	394	(1) (2)	600	0.9
3	112242	1978	VT	1,200	1.7	24/30	207/182	392	(1) (2)	1,100	1.6
4	147454	1981	VT	1,400	2.0	24/30	207/165	381	(1) (2)	1,000	1.5
5	147453	1981	VT	1,400	2.0	24/30	219/178	393	(1) (2)	1,000	1.5
6	147452	1981	VT	1,400	2.0	24/30	230/188	388	(1) (2)	1,100	1.6
7	424924	1987	VT	1,900	2.7	30/36	306/169	383	(2)	1,100	1.6
8	424925	1987	VT	1,900	2.7	30/36	316/153	391	(2)	1,000	1.5
9	424926	1987	VT	900	1.3	30/36	319/158	405	(2)	800	1.2
10	424927	1987	VT	2,000	2.8	30/36	308/152	401	(2)	1,600	2.3
11	541542	1994	VT	1,400	2.0	24/30/36	232/193/60	408	(1) (2)	1,100	1.6
12	541541	1994	VT	1,400	2.0	24/30	215/178	385	(1) (2)	1,300	1.8
13	622703	1999	VT	1,400	2.0	30/36	210/150	410	(1) (2)	1,100	1.6
14	603068	2000	VT	1,400	2.0	24/30	241	418	(1) (2)	1,100	1.6
15	686256	2005	VT	1,600	2.3	36/30/24	60/177/243	420	(1) (2)	1,300	1.8
<b>Total Installed Capacity</b>				<b>20,500</b>	<b>29.5</b>	n/a	n/a	n/a	n/a	<b>15,200</b>	<b>22.1</b>
<b>Firm Capacity</b>				<b>18,500</b>	<b>26.7</b>	n/a	n/a	n/a	n/a	<b>12,300</b>	<b>18.0</b>

Source: City of Eden Prairie, 2006

<sup>(1)</sup> Prairie du Chien (OPC)

<sup>(2)</sup> Jordan (CJ)

<sup>(3)</sup> Source: City of Eden Prairie Well Production Report, 2006

**Table 6.8**  
**City of Eden Prairie Projected Water Demands, 1995-2010**

Year	Population	Future Water Demands	
		Average Day Demand (mgd)	Maximum Day Demand (mgd)
1995	46,985	6.6 (140 gpd) <sup>(1)</sup>	19.7 (3.0) <sup>(2)</sup>
2000	54,485	7.6 (140 gpd) <sup>(1)</sup>	22.9 (3.0) <sup>(2)</sup>
2005	61,985	8.7 (140 gpd) <sup>(1)</sup>	26.0 (3.0) <sup>(2)</sup>
2010	63,277	8.9 (140 gpd) <sup>(1)</sup>	26.6 (3.0) <sup>(2)</sup>

<sup>(1)</sup> Average Day Demand: gallons per capita per day

<sup>(2)</sup> Maximum Day/Average Day Ratio

*Source: Black & Veatch, 1995 Water Supply Plan, Table I-8*

**Table 6.8A**  
**City of Eden Prairie Actual Water Demands, 1995-2005**

Year	Population	Actual Water Demands	
		Average Day Demand (mgd)	Maximum Day Demand (mgd)
1995	49,819	6.2 (124 gpd) <sup>(1)</sup>	16.9 (2.7) <sup>(2)</sup>
2000	54,901	7.9 (144 gpd) <sup>(1)</sup>	18.0 (2.3) <sup>(2)</sup>
2005	64,032	8.0 (125 gpd) <sup>(1)</sup>	21.6 (2.7) <sup>(2)</sup>

<sup>(1)</sup> Average Day Demand: gallons per capita per day

<sup>(2)</sup> Maximum Day/Average Day Ratio

*Source: City of Eden Prairie, 2006*

**Table 6.8B**  
**City of Eden Prairie Projected Water Demands, 2010-2030**

Year	Population	Future Water Demands	
		Average Day Demand (mgd)	Maximum Day Demand (mgd)
2010	65,000 <sup>(3)</sup>	9.8 (140 gpd) <sup>(1)</sup>	26.3 (2.9) <sup>(2)</sup>
2015	67,450 <sup>(3)</sup>	10.3 (140 gpd) <sup>(1)</sup>	26.4 (2.8) <sup>(2)</sup>
2020	69,900	10.5 (140 gpd) <sup>(1)</sup>	26.4 (2.7) <sup>(2)</sup>
2025	73,512	10.6 (140 gpd) <sup>(1)</sup>	26.7 (2.6) <sup>(2)</sup>
2030	77,124 <sup>(3)</sup>	10.8 (140 gpd) <sup>(1)</sup>	26.9 (2.5) <sup>(2)</sup>

*Source: SRF Consulting Group, 2007*

<sup>(1)</sup> Average Day Demand: gallons per capita per day

<sup>(2)</sup> Maximum Day/Average Day Ratio

<sup>(3)</sup> Demographic Projections, City of Eden Prairie 2006

## PROCEDURE FOR AUGMENTING WATER SUPPLIES

Interconnections with Adjacent Communities: Interconnections with adjacent distribution systems can be used for emergency and auxiliary water supply. However, consideration must be given to water quality and pressure differences between distribution systems when evaluating interconnections. Eden Prairie utilizes a softening treatment process to reduce the total hardness of the treated water. The adjacent communities, except Bloomington, do not utilize a softening process. Therefore, the stability of the mixed water may result in precipitation of calcium carbonate in the piping in the vicinity of the interconnections. Other water quality problems may occur as a result of the differences in water quality. Existing interconnections have not typically been used except during infrequent flow testing. New and existing interconnections will be periodically exercised.

Potential Surface Supply Source: The only potential surface supply of any significance would be the Minnesota River Based on information presented by the Metropolitan Council in *The Effects of Low Flow on Water Quality in the Metropolitan Area, Working Paper No. 6*, the Minnesota River would serve as a poor water supply source due to thigh algal growth and other organic loadings and seasonally low flow rates. Nonpoint discharges into tributaries and the river from urbanized areas also can result in high concentrations of suspended solids and various contaminants. The City decided to use deep wells for ultimate demand needs as a result.

Conjunctive Use of Surface and Ground Waters: The water treatment plant is designed to treat ground water, which is of

much higher quality than typical surface supplies. Treatability studies are required to determine the necessary modifications for treatment of surface supply. The bed rock aquifer is overlaid by a gravel alluvial deposit. The depth from the ground surface is 200-feet to 300-feet. The City will investigate whether this could be an alternate supply source.

## DEMAND REDUCTION PROCEDURES

It is projected that implementation of the conservation measures listed in the Section on Implementation Strategies will ultimately reduce peak demands by approximately five percent. Under emergency conditions, additional water demand reduction measures may be needed. It is anticipated that severe emergency conditions could be accommodated through appropriate restrictions on outdoor use. A total ban on outdoor use could reduce demand to levels approaching the annual average day demands.

Adopt Short-Term Demand Reduction Procedures: State statutes have established an emergency water allocation priority system that must be considered in determining reduction procedures. A staged response to emergency conditions will be implemented based on appropriate trigger conditions. The requested customer response will be in proportion to the existing or predicted emergency condition and as dictated by State Statues.

Procedures for Water Allocation: Water will be allocated as previously discussed with restrictions targeted at Priority 6 use initially and with progressively increasing restrictions on other priority uses. Public education and enforcement will be implemented as required to ensure compliance.

## WATER SUPPLY PROTECTION

Analysis for Previous Supply Problems: The City's water supply system is relatively new. The oldest components were installed in the early 1970's and there have not been any significant supply problems. The most significant maintenance has been the infrequent redevelopment of wells. In addition, a distribution system leak detection and repair program was implemented in 1994. The City operates a maintenance program where all equipment is continually monitored, serviced and repaired to ensure proper operation. Replacement and repair parts are stocked for components that require the most frequent maintenance.

Wellhead Protection: In 2004, the City completed a Part 2, Wellhead Protection Plan (WHPP) in accordance with Minnesota rules, Chapter 4720.5200. The Plan was prepared for the City by Summit Envirosolutions. The area from which water is supplied to the City wells is identified as the Wellhead Protection Area (WHPA). The area around it, which is to be protected and managed, is defined as the Drinking Water Supply Management Area (DWSMA). The location of these areas are delineated in the Plan and were approved by the Minnesota Department of Health on March 18, 2003.

It was determined that the City of Eden Prairie has relatively young well water, and as a result, is considered more susceptible to contamination from activities at the land surface. Chapters 2 through 5 of the plan provide rationale for the management strategies that the City has developed. Due to the vulnerable rating of the aquifer, land use is of concern and these management strategies address land use and public awareness.

The following action items were developed:

- Proactive management of existing, unsealed and unused wells
- Proactive management of other potential sources of contamination
- Develop public education programs on wellhead protection
- Review ordinances to determine if they provide adequate protection and enforcement
- Continue to monitor well water levels, pump draw down and present of possible contaminants.

## IMPLEMENTATION STRATEGIES

### Water Conservation Measures

The City has enacted several water conservation measures since the adoption of the 1995 Water Plan. The purpose of the City's water conservation program is to efficiently manage the wise use of groundwater. The City has learned since it first began pumping water in 1971 that its water system cannot be cost effectively sized to handle the full demand of lawn irrigation during the summer. In addition, groundwater is a precious commodity that needs to be conserved.

Official Controls: The City believes that a conservation program based primarily on public education and the promotion of wise water use will be successful. However, regulations and ordinances are included in the program where applicable. The following ordinances and regulations are being used to achieve the objectives of the Water Supply Plan:

- Lawn Irrigation Restrictions: The City Council enacted an ordinance that has two parts that affect lawn irrigation. First, water customers may only use

water on an odd/even schedule. Secondly, no lawn irrigation is allowed between the hours of noon and 5:00 p.m. on any day. This ordinance is in place to ensure that everyone has enough water for personal needs and yet still enables the City to provide an adequate reserve for fire fighting and allow the water system an opportunity to recover from high daily demands. The current ordinance provides for a non-compliance fee to be added to water bills for violations. The water conservation ordinance does have a 30-day exemption for newly installed sod from the odd/even watering schedule.

- **Water Conservation Regulations:** Also in an effort to promote a higher awareness regarding the primary use of water in the summer (due to lawn irrigation, recreational uses, etc.), the City Council enacted a Water Conservation Surcharge that imposes additional charges for higher water use. A conservation surcharge line item appears on a citizen's water bill when they use 50 percent more water than their winter time use, or the City average, whichever is higher. In other words, if a resident typically uses 24,000 gallons of water during the winter quarter, they would be allowed the use of 36,000 gallons of water during any subsequent quarter before an additional \$1.00 per 1,000 gallons is added to their water bill.
- **Water-Efficient Plumbing Fixtures:** The City reviews building plans and inspects new construction to verify that the appropriate fixtures are being provided, as required by state law. The City is considering the use of water-efficient irrigation systems for all new commercial construction.
- **Water Conservation Rebates:** In 1998,

the City began administering an appliance rebate program. The City has budgeted \$12,000 to \$12,500 per year. \$12,500 of the funds collected from the conservation surcharge are earmarked for \$50 to replace an old toilet with a new low-flush model and \$100 to purchase new appliances that are designed to conserve water (dish washers and clothes washing machines). In the last four years, payments have exceeded the budget:

- 2002: \$12,450
- 2003: \$12,150
- 2004: \$12,500
- 2005: \$12,600
- 2006: \$12,500
- 2007: \$12,600
- 2008: \$12,700

In 2008 the City began a trial rebate program for upgrading irrigation systems to include a rain sensor or smart controller. In 2008, \$2,000 was budgeted and the funds were distributed prior to June 30th. The program was a success and the rebate program is likely to continue in the future depending on determination of how effective the fixtures are for conserving water.

### **Regional Programs and Demonstration Projects**

Environmental Learning Center: The "Environmental Learning Center" is located inside the Water Treatment Plant and provides a facility for teaching the city's residents water conservation and environmental stewardship. The capital costs for the project (including public education rooms and native landscaping test plots) were included as part of the water treatment plant budget. The City of Eden Prairie has committed to ongoing funding for the ELC, allowing it to become a

component of the City's water quality, recycling and general environmental education program well into the future.

The Center includes an interactive exhibit and teaching facility that is geared to all ages, but holds special interest for school age children. The Center contains approximately 3,500 square feet of space, in three separate sections. Space one focuses on understanding the hydrologic cycle and the part the community's citizens play in that cycle. Space two is geared toward daily personal impacts on water use and the environment (water usage, non-point source reduction, groundwater, water treatment, conservation techniques and recycling issues). Space three is devoted to a teaching laboratory for experiments which evaluate water quality issues and provide an understanding of the process that is used in drawing water from the ground and delivering into the City's homes. A laboratory within the water treatment plant allows more advanced or intricate experiments for high school and college students. Students visiting the Center can also tour the water treatment plant as part of the education process.

The main goals of the project included reducing City water consumption by at least five percent through educating students on water resource protection. The main objective of the Center is to inform and motivate students and establish a model learning site specifically, it is meant to inform and motivate students to help them understand cause and effect relationships between attitudes and behavior and the environment. Educational objectives will be designed to promote student research on real problems related to the community and watershed that are connected to current and future water use and abuse outcomes so they can become informed citizens who make

environmentally conscious decisions about environmental issues, water protection and conservation.

The Environmental Learning Center opened in the fall of 1998. An on-going goal is to encourage utilization of the facility by third through fifth grade students. Independent School District 272 (ISD #272) has committed to providing transportation to and teaching staff during the tours.

### **Capital Improvement Program**

Funded Capital Projects: The following programs will continue to be included in the City's annual operating budgets:

- Distribution system interconnections
- Meter installation and repair program
- Water auditing and accounting of water usage
- System leak detection and repair program
- Enforcement of regulations regarding water-efficient plumbing fixtures
- Environmental Learning Center

## **6.3 SANITARY SEWER PLAN SUMMARY**

Sanitary sewage is collected from each home and business through City-owned trunk sewers and is conveyed to larger interceptor sewers. The interceptor sewers ultimately carry the sewer flow to the Blue Lake Treatment Plant, where it is treated prior to discharge to the Minnesota River. The interceptors and wastewater treatment plant system is part of a regional system that is owned and operated by the Metropolitan Council Environmental Services (MCES).

The City's first comprehensive trunk sewer plan was adopted in 1969. The City is

currently following its Comprehensive Sewer Policy Plan that was prepared in 1985. The City's system includes approximately 15 miles of MCES interceptor sewers, 12 trunk systems, and ten lift stations. The MCES interceptors, which also serve southwest Hennepin County and portions of Carver County, enter Eden Prairie in three locations to the north at the Minnetonka border and one location to the west at the Chanhassen border, and exit Eden Prairie on the south at the Minnesota River. The sewage flow is conveyed to the Blue Lake Wastewater treatment plant in Shakopee, in Scott County. Figure 6.2 illustrates the existing regional interceptors that serve the City's sewer system. The entire sewer system map showing trunk sewers and sizes can be found in the City's 1985 Comprehensive Sewer Policy Plan.

The City's trunk facility system is entirely built. Eden Prairie expanded its urban service area in 1997 to include an additional 850 acres of developable residential land in the southwest portion of the City, and this is the extent to which the City expects the MUSA to reach. The only part of the City that is not included in the MUSA is the Minnesota Valley Wildlife Refuge and Minnesota River bluffs, and there is no likelihood that development will occur in this area. Therefore there will be no need for extension of the sewer system into this area in the future.

Three changes have been made to the sewer system since the adoption of the Comprehensive Sewer Policy Plan in 1985. First, the Trunk Highway Number 5 interceptor that was originally part of the

MCES interceptor system in this area was converted to a municipal trunk sewer in the late 1980s. Then, after the expansion of the MUSA in 1997, the boundaries of the Red Rock Interceptor were also expanded to generally reflect a new southern boundary that followed the new MUSA line. Lastly, the MCES has constructed the Red Rock Interceptor Sewer.

### **Flow Estimates**

The total metered sewage flow as measured by the MCES in 2006 was 1.846 billion gallons, or an average of 5.1 million gallons per day. The City estimates that approximately 57 percent of the sewage flow was created by the residential population and 43 percent was generated by commercial, institutional and industrial users. For the purpose of determining projected sewer flows through 2030 for this comprehensive plan, the City used as its base measurement the metered flow by MCES for the period 2000-2006 and the projected population (See Table 6.9.) For planning purposes, a slightly more conservative value of 90 gpd is used and reflected in Table 6.9A.

The City used this constant rate because as it approaches buildout in both residential and commercial/industrial uses by 2025-2030, it anticipates that the proportion of developed residential property versus developed commercial/industrial will also remain constant. Additionally, the City anticipates that population and employment numbers through 2030 will closely parallel each other.

**Table 6.9**  
**City of Eden Prairie**  
**Annual and Average Daily Sanitary Sewer Flow, 2000-2006**

<b>Year</b>	<b>Population</b>	<b>Annual (mg)</b>	<b>Average Daily (mgd)</b>	<b>Daily Flow Per Capita (gpd)</b>
<b>2000</b>	54,901	1864.7	5.11	93
<b>2001</b>	57,513	1930.9	5.29	92
<b>2002</b>	58,793	1772.2	4.86	82
<b>2003</b>	60,981	1700.1	4.66	76
<b>2004</b>	62,603	1810.1	4.96	79
<b>2005</b>	64,032	1844.0	5.05	79
<b>2006</b>	64,405	1845.9	5.06	78
<b>Average</b>				83

*Source: MCES Metered Flows, City of Eden Prairie, 2006*

**Table 6.9A**  
**City of Eden Prairie Projected**  
**Annual and Average Daily Sanitary Sewer Flow, 2010-2030**

<b>Year</b>	<b>Population</b>	<b>Annual (mg)</b>	<b>Average Daily (mgd)</b>	<b>Daily Flow Per Capita (gpd)</b>
<b>2010</b>	65,000	2135.2	5.85	90
<b>2015</b>	67,450	2215.7	6.07	90
<b>2020</b>	69,900	2296.2	6.29	90
<b>2025</b>	76,200	2414.8	6.62	90
<b>2030</b>	77,124	2533.5	6.94	90

*Source: City of Eden Prairie, 2006*

## Septic Systems

There are 244 ISTS, single family, remaining in the City. There are 24 ISTS at the Flying Cloud Airport. The City has adopted an ISTS ordinance. A program is underway to provide sanitary sewer and City water availability to all remaining neighborhoods and septic system will eventually be phased out. The Cedar Forest, Crestwood Terrace, Highview and Hilltop Road neighborhoods have been provided with City water and sewer since 2000. City sewer to the Flying Cloud Airport along Highway 212 is completed to Pioneer Trail and is available for the Metropolitan Airports Commission to make connections.

The ISTS management program shall incorporate a three year cycle of inspection maintenance for all systems, including maintenance tracking of all systems, a notification system to remind ISTS owners when to inspect, maintain their systems, and enforcement element to insure the maintenance was performed in a timely fashion.

## Infiltration and Inflow

Infiltration, inflow and blockage are typical issues of concern to any sanitary system. The City has not found these issues to be a significant problem, given the relatively young age of the sewer system and that of the City's residences and other structures. In 2004, MCES began a program to identify communities with "excessive infiltration" based on rainfall events. As the result of the rainfall on September 4, 2005, Eden Prairie was designated as having excessive infiltration. The MCES Program identifies steps a community must take or they are subject to a substantial surcharge. The City has entered into an agreement with MCES to

identify sources of infiltration. The Study was completed in the north one-half of the city in 2006, and is scheduled to be completed for the entire city in 2008. Based on the finding of the study, the City will begin a program to reduce infiltration. These studies, by an agreement with MCES, remove the City from any surcharge.

The City undertakes a policy of proactive management of its system, including the strict adherence to the design and installation standards of the City's Building Code and through building inspections that occur during the course of the construction process.

## 6.4 NATURAL RESOURCES: SURFACE WATER PLANNING

The City of Eden Prairie is very fortunate to have a wide range of lakes, wetlands, creeks and stormwater ponds within the City, including 15 lakes, 513 wetlands, 177 stormwater ponds and 3 creek systems. Because of the prominence of lakes, creeks and wetlands in Eden Prairie, protecting these resources is important. The City has initiated many projects over the years to control flooding caused by storm water runoff. In addition, it has taken steps to protect and improve the water quality of our wetlands and lakes.

The City is traversed by three creeks, Riley, Purgatory, and Nine Mile, which are the major collectors of stormwater runoff within the City. These creeks discharge into the Minnesota River. In addition, runoff from portions of the southern edge of the City flows directly down the steep slopes into the marshy areas adjacent to the Minnesota River.

### Natural and Cultural Resources Goal One

Maintain a balance between conservation/management of natural and cultural resources and the need for residential, commercial, industrial and other urban uses.

#### Policies:

- Identify and designate environmentally sensitive and critical areas, and establish development policies for public or private management of these resources.
- Reserve and manage all natural resource amenities that are viable and sustainable.
- Encourage development that provides, reserves, and manages natural resource amenities that are viable and sustainable.
- Identify and designate specific boundaries of all natural resource areas.
- Prepare and practice a program of resource management for public conservation/resource areas.

### SUMMARY OF LOCAL WATER MANAGEMENT PLAN

The three major watershed districts that participate in the management of stormwater in the City are the Riley-Purgatory-Bluff Creek, Nine Mile Creek and the Lower Minnesota River Watershed Districts. The City enforces floodplain and shoreland management ordinances, which are part of Chapter 11 (Zoning Ordinance) of the City Code to protect the integrity of the topography and the water of the creeks.

The City's Local Water Management Plan was adopted in December 2004 and will be updated in 2008 to include the Phase II

NPDES Stormwater Requirements. The plan describes strategies for integrating stormwater management with the City's water resources. The LWMP was developed to consolidate information on the City's overall surface water management objectives, including management of our lakes, wetlands, stormwater ponds and creeks.

The document includes water quality protection measures and a capital improvement program. The officially approved Local Water Management Plan is included, by reference, as an Appendix to the Comprehensive Plan. To obtain more details about Eden Prairie's surface water systems, please see the Local Water Management Plan.

### STORMWATER INVENTORY AND MANAGEMENT

The LWMP included a baseline stormwater basin inventory. The intention was to summarize pond maintenance issues, identify significant maintenance needs and costs, and address known pond complaints. A total of 245 basins were inspected by MWH in 2001. City staff have inventoried an additional 562 basins since 2002 for a total of 807 basins. These basins include constructed stormwater ponds as well as wetlands, creeks and lakes that receive stormwater inflow. The City will address these repairs as part of the ongoing capital improvement program detailed in the Local Water Management Plan.

### Natural and Cultural Resources Goal Two

Strive to protect the City's high and exceptional quality natural resources and environmental assets as the City continues to develop.

**Policies:**

- Implement ecologically based plans to sustain the City's environmentally sensitive areas, with consideration given to water quality, wetland protection preservation of wildlife habitat, erosion control regarding bluff and steep slope stabilization, and woodland preservation.
- Implement and enforce the priorities and recommendations of the Comprehensive Wetland Protection and Management Plan adopted by the City in January 2000.
- Implement and enforce the priorities and recommendations of the Local Water Management Plan adopted by the City in December 2004 and updated in 2008.
- Implement and enforce the priorities and recommendations of the Stormwater Pollution Prevention Plan (SWPPP) adopted by the City in May 2006.
- Develop, update and implement development ordinances to ensure adequate setbacks, provide appropriate slope and shoreline buffers, guarantee Best Management Practices, and set forth procedures to assist public and private property owners in the maintenance and conservation of the City's natural resources.
- Consider opportunities where it may be in the public interest to acquire natural resources throughout the City to ensure their protection from degradation and assure their availability to the public as environmental assets.
- Develop partnerships with other governmental agencies to ensure protection of the City's natural resources.

- The City will establish an ongoing inspection system and permit issuance program for septic systems consistent with the guidelines and regulations as stated in the local sewer plan.

## **6.5 WETLAND PROTECTION AND MANAGEMENT PLAN**

In 2000, the City of Eden Prairie adopted a Comprehensive Wetland Protection and Management Plan (CWPMP). The CWPMP was the first step in completing the City's Local Water Management Plan. The Local Drainage Plan Update was also completed in 1999. The recommended strategies and actions from the CWPMP are summarized here while technical data and inventory results are not included. The wetland data is stored in a City database not included with the CWPMP. The CWPMP is referenced in the Appendix of this Comprehensive Plan. To obtain more details about Eden Prairie's wetland system, please see the 1999 Comprehensive Wetland Protection and Management Plan. The development of the CWPMP led to the City's adoption of Standards for the Protection of Wetlands that were adopted in February 2000 and updated in 2008. Those standards can be found in the Eden Prairie Zoning Ordinance, Section 11.51.

The City developed the CWPMP to start the process of integrating stormwater management and wetland protection within the development policies of the City. Wetlands and their impacts on the water quality of the City are important considerations during the development review process and in planning for the future. The City objectives of the CWPMP include the following:

- To determine high and exceptional

quality wetlands that will require additional protection considerations;

- To provide mechanisms for consistent wetland protection, management, restoration and mitigation;
- To evaluate the potential to establish a wetland banking program to foster the retention of wetland functions and values within the City;
- To evaluate the potential delegation to the City of state and federal regulatory programs, including adoption of Local Governmental Unit status under the Minnesota Wetland Conservation Act;
- To establish a set of development review guidelines for development adjacent to existing wetlands and stormwater ponds; and;
- To develop an educational program on wetlands and stormwater management for City residents.

to be developed, which will help maintain their integrity.

As part of the development of the CWPMP, a total of 537 water bodies were inventoried during the summer of 1997. Wetland boundaries were estimated using visual observation and vegetation evaluations. Water bodies were broken down into 478 wetlands, 15 lakes, and 44 non-jurisdictional stormwater ponds. Using GIS, the City has calculated that there are just under 3,450 acres of wetlands and ponds. This number also includes 574 acres of the City's lakes.

Figure 6.3 shows the City's inventoried wetlands as of 2004. Table 6.10 shows how wetlands are included in each guided land use category. Most of the City's wetlands (2,526 acres or 69 percent) are guided for Park/Open Space. Of this acreage, about 47 percent is located outside of the MUSA, or owned by the US Fish and Wildlife Service as part of the Minnesota Valley National Wildlife Refuge in areas not likely

**Table 6.10**  
**Wetlands and Guided Land Use Acreage, 2000-2020**

<b>Guided Land Use</b>	<b>Wetland Acres</b>	<b>% Total Wetland Acres</b>	<b>Total Guided Acres</b>	<b>% Total Guided Acres</b>
<b>Residential</b>	<b>548.18</b>	<b>14.93%</b>	<b>7,821.53</b>	<b>7.01%</b>
Low Density Residential	421.11	11.47%	6,346.19	6.64%
Medium Density Residential	112.80	3.07%	1,265.23	8.92%
Medium Density Residential/ Industrial/Office	n/a	n/a	21.05	n/a
High Density Residential	14.27	0.39%	189.06	7.55%
<b>Commercial</b>	<b>45.63</b>	<b>1.24%</b>	<b>647.83</b>	<b>7.04%</b>
Regional Commercial	34.45	0.94%	513.37	6.70%
Community Commercial	8.80	0.24%	69.62	12.64%
Neighborhood Commercial	2.38	0.06%	64.84	3.67%
<b>Office</b>	<b>56.74</b>	<b>1.55%</b>	<b>598.76</b>	<b>9.48%</b>
Office	52.70	1.44%	525.07	10.04%
Office/Industrial	4.04	0.11%	52.65	7.67%
Medium Density Residential/ Industrial/Office	n/a	n/a	21.04	n/a
<b>Industrial</b>	<b>112.44</b>	<b>3.06%</b>	<b>1,485.48</b>	<b>7.57%</b>
Industrial	106.97	2.91%	1,383.32	7.73%
High Density Residential/Industrial	1.44	0.04%	28.48	5.06%
Office/Industrial	4.03	0.11%	52.64	7.66%
Medium Density Residential/ Industrial/Office	n/a	n/a	21.04	n/a
<b>Park/Open Space</b>	<b>2,526.49</b>	<b>68.81%</b>	<b>4,969.61</b>	<b>50.84%</b>
<b>Public/Quasi-Public</b>	<b>233.28</b>	<b>6.08%</b>	<b>1,773.81</b>	<b>22.68%</b>
<b>Church/Cemetery</b>	<b>13.74</b>	<b>0.37%</b>	<b>221.05</b>	<b>6.22%</b>
<b>Water</b>	<b>n/a</b>	<b>n/a</b>	<b>1,927.68</b>	<b>n/a</b>
<b>Right-of-way</b>	<b>145.36</b>	<b>3.96%</b>	<b>3,151.79</b>	<b>4.61%</b>
<b>Total</b>	<b>3,671.86</b>	<b>100%</b>	<b>22,597.54</b>	<b>16.25%</b>
<i>Inside of MUSA</i>	<i>2,682.73</i>	<i>72.50%</i>	<i>19,796.62</i>	<i>13.55%</i>
<i>Outside of MUSA</i>	<i>989.13</i>	<i>27.50%</i>	<i>2,800.92</i>	<i>35.31%</i>

*Source: City of Eden Prairie, 2000*

**MANAGEMENT OBJECTIVES**

The Local Water Management Plan, which compliments the City's Local Drainage Plan Update (1999) and its Comprehensive Wetland Protection and Management Plan (1999) identifies a number of specific wetland management objectives for the City to follow, as summarized below:

Wetland Banking: Because there is a shortage of wetland mitigation sites within the City, a number of wetland impacts within the City have been mitigated at locations outside City limits. While this has been done appropriately in accordance with the Minnesota Wetlands Conservation Act (WCA), the City finds it desirable to replace lost wetland functions within the City to the fullest extent possible. The City will continue to analyze the feasibility of restoring those wetlands that have been identified as potentially restorable, and will evaluate establishing a City-administered wetland banking program.

Shoreland Management: The City's shoreland ordinance largely applies to lakes and deepwater habitats and generally does not include wetlands. The current shoreland ordinance, steep slope protections and the WCA appear to adequately protect shoreland values around these water bodies. The CWPMP, therefore, did not include any additional shoreland management objectives.

Erosion and Sediment Control: The City's floodplain and stormwater management ordinances contain guidelines for preventing erosion and sedimentation. The City is currently reviewing these existing enforcement guidelines, the results of which will be included in the Local Water Management Plan.

Water Quality Monitoring in Wetlands: If new development occurs within the immediate sub-watershed of any exceptional floristic quality wetland, the developer is required to collect and monitor water quality data through the use of an independent laboratory.

Buffer Guidelines: Wetland buffer zones are currently enforced by the City based on the quality of the wetland, which must be determined in accordance with the Minnesota Routine Assessment Methodology (MnRAM) for the vegetation diversity and integrity function.

Water Level Fluctuations: The City requires limits on water level fluctuations in newly developed areas. Special design considerations will be required as referenced in the Local Water Management Plan.

**Table 6.11  
Wetland Buffer Strips and Setbacks**

<b>Buffer/Setback</b>	<b>Exceptional</b>	<b>High</b>	<b>Moderate</b>	<b>Low</b>
Wetland Buffer Strip Minimum Width	40 ft.	30 ft.	20ft.	10 ft.
Wetland Buffer Strip Minimum Average Width	60 ft.	60 ft.	40 ft.	20 ft.
Structure Setback (from Wetland Buffer Strip)	15 ft.	15 ft.	15 ft.	15 ft.
Total Minimum Average	85 ft.	85 ft.	55 ft.	35 ft.

*Source: Eden Prairie City Code, Chapter 11, Section 11.51, Subd. 6, 2008*

### **DEVELOPMENT REVIEW PROCESS**

The City Code, Chapter 11, Section 11.51 Standards for the Protection of Wetlands, includes specific submittal criteria for developers and homeowners as part of the City's development review process for development that occurs in the vicinity of wetlands for the purpose of avoiding the alteration and destruction of wetlands. The Local Water Management Plan identified a number of other areas related to surface water management where a modified approach to development review will likely yield improvements to surface water quality: The plan states that a number of design and engineering measures will be evaluated during the traditional design review process. See Section 7.0 of the Local Water Management Plan for details.

### **IMPLEMENTATION STRATEGIES**

The Local Water Management Plan (and by reference the Comprehensive Wetland Protection and Management Plan) recommended the following projects, with the primary goal of protecting the City's wetlands as the City continues to develop.

Integrate Wetland and Stormwater Management Planning: The City's Local Water Management Plan was prepared to integrate wetland functions and values into stormwater management planning for sub-

watersheds that are yet to develop. The approved document is intended to guide City decision making through 2014. This structure to the city's decision making framework will ensure that ecologically sensitive areas are protected as much as possible during development. The use of Integrated Management Practices (IMPs) will be encouraged for new development and redevelopment as a means of controlling and treating runoff at its source, rather than downstream.

Administer and Enforce Erosion and Sediment Control: The City will evaluate procedures in place to enforce the proper installation, maintenance, and up-keep of sediment control Best Management Practices. This is particularly important where buffers are being used to protect sensitive wetland resource.

Assumption of Local Governmental Unit Status: The City has assumed Local governmental Unit (LGU) responsibilities for Lower Minnesota River Watershed District (LMRWD) and Riley-Purgatory-Bluff Creek Watershed District. Nine Mile Creek Watershed District will continue to responsibilities for wetland and stormwater management activities.

Wetland Mitigation Banking: The City will analyze the feasibility of potential wetland

restoration sites identified in the CWPMP. If any sites prove feasible, the City will pursue the development of a wetland banking account that would make mitigation credit available for both public and private projects. The City will also evaluate potential sites within the City for enhancement of existing wetlands, preferably in conjunction with a wetland mitigation-banking project.

Educational Programs: The City has committed to ongoing funding for the Environmental Learning Center, to increase public awareness on water resource issues including wetlands, buffers, lawn care practices, and water quality monitoring. As part of surface water management, the City also encourages property owners to install rain water gardens in strategic locations, subject to meeting zoning and other code requirements. Rain water gardens are miniature ecosystems created by growing plants in a small depression designed to infiltrate water quickly (within 24 hours). Examples of installing water gardens for surface water management include their use as basins receiving water from roof drains, sump pumps, agricultural discharge and overland stormwater drainages.

Reference Wetlands: The City will work with private landowners where necessary to discuss land care options, including placing the reference wetland into a conservation or scenic easement or maintenance agreement for long-term monitoring by the City. The City will also work with private landowners to encourage maintenance of adequate buffers around the City's wetlands for protection and will evaluate City properties for adequate buffers.

US Army Corps of Engineers Regulations: The City will monitor changes in the Corps of Engineers proposed permit policy changes and incorporate any relevant

changes into the CWPMP as they occur.

## 6.6 PRIVATE UTILITIES

In addition to water, sanitary sewer and stormwater management, development in the City relies on private utilities, including electric, gas and communications services. The City's electric service is provided by Excel Energy and natural gas is provided by Reliant Energy Minnegasco. The local telephone company that services the City is Quest Communications and the local cable television service is provided by Comcast Cable.

There is a high demand from other telecommunication industries for the installation and use of fiber optic cable in the City's right-of-way. Some of the other companies that provide telecommunication services to the City through fiber optic cable include GNL Communications, Metrocom Cable, Comunicor, Inc., KMC Telecom, McLeod USA, Aerial Communications and Underground Piercing.

New technologies have spurred higher demand for varied communication services. While meeting this demand is important, it is also important for telecommunication companies to pursue ways of sharing conduit and other facilities to provide for the most efficient provision of services with limited negative visual impacts and non-duplicative use of the right-of-way.

The Williams Pipeline runs through the southern portion of the City. The pipeline enters the City from Chanhassen and exists to the south through the Minnesota River Valley. Graphics depicting the approximate location of the pipeline are available through the City's Engineering Division.

**Fiscal and Economic Goal Two**

Establish and maintain charges and fees for resident and development services at a fiscally sound and equitable level.

fulfilling the City's objectives pertaining to tax base and rates as well as development quality and staging.

**Policies:**

- Maintain its practice of requiring development to provide and pay for infrastructure improvements where necessary to minimize development impact.
- Reflect the cost of City Staff services that are attributable to development activities in the cost of application, development, and permit fees, where possible.
- Monitor land use and development patterns to determine if new growth is

**Sources:**

Black & Veatch, City of Eden Prairie Water Supply and System Facilities Plan, 1990

Black & Veatch, City of Eden Prairie Water Supply and Treatment Assessment, 1993

Black & Veatch, City of Eden Prairie Water Supply Plan, 1995

City of Eden Prairie Comprehensive Plan, 2000

City of Eden Prairie City Code, Chapters 11 and 12

Metropolitan Council, Water Resources Management Policy Plan, December 1996

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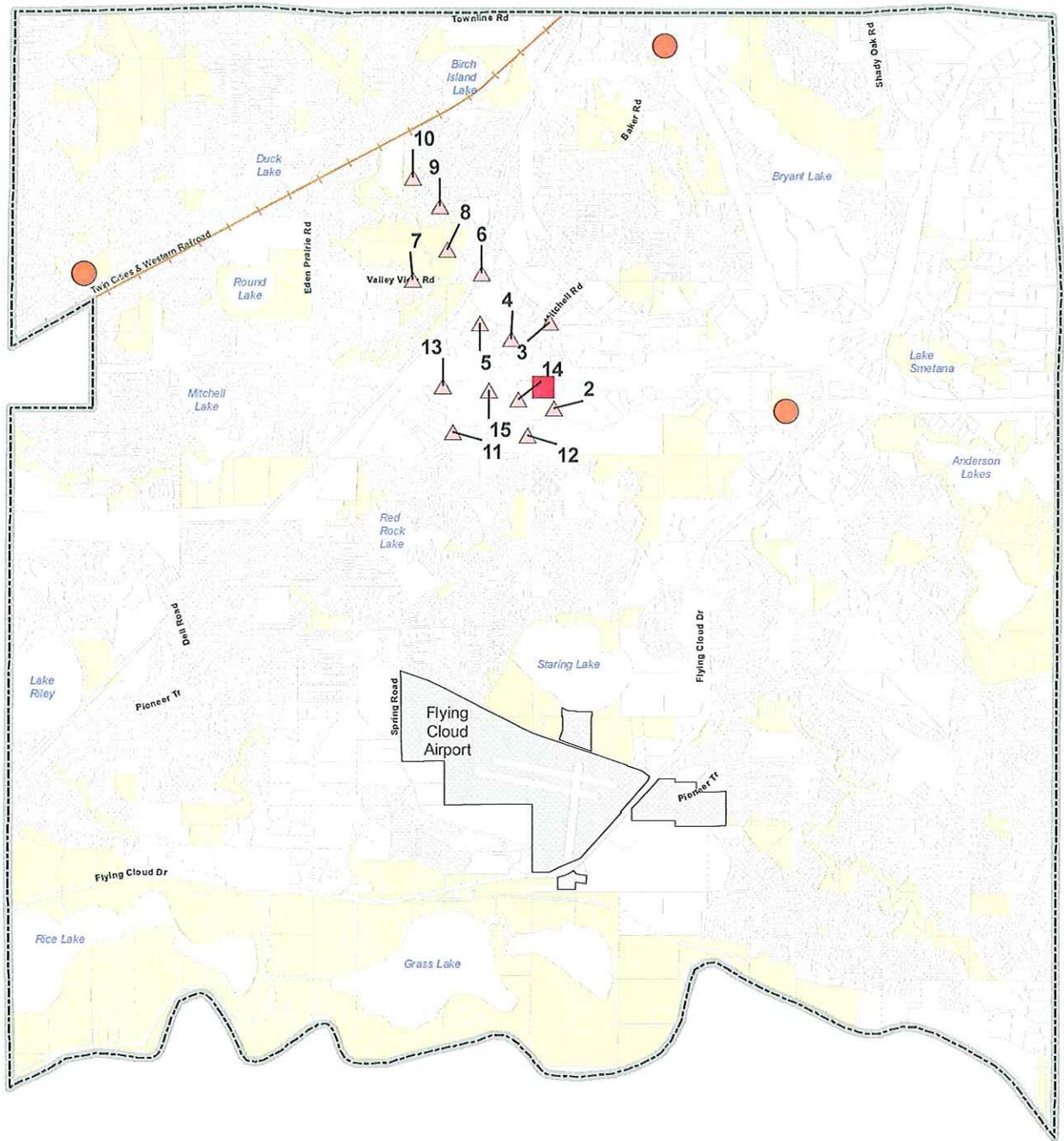
Rieke, Carroll, Muller Associates, City of Eden Prairie Local Comprehensive Sewer Policy Plan for Eden Prairie, MN, November 1985

City of Eden Prairie, Comprehensive Wetland Protection and Management Plan November 1999

City of Eden Prairie, Wellhead Protection Plan, Part 2, July 2004

City of Eden Prairie, Local Water Management Plan, December 2004 (Updated November 2008)

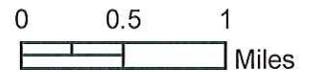
City of Eden Prairie, Senior Issues Task Force Report, January 2006



Source: City of Eden Prairie; Metropolitan Council; Minnesota DNR

### Legend

- △ Well
- Water Tower
- Water Treatment Plant



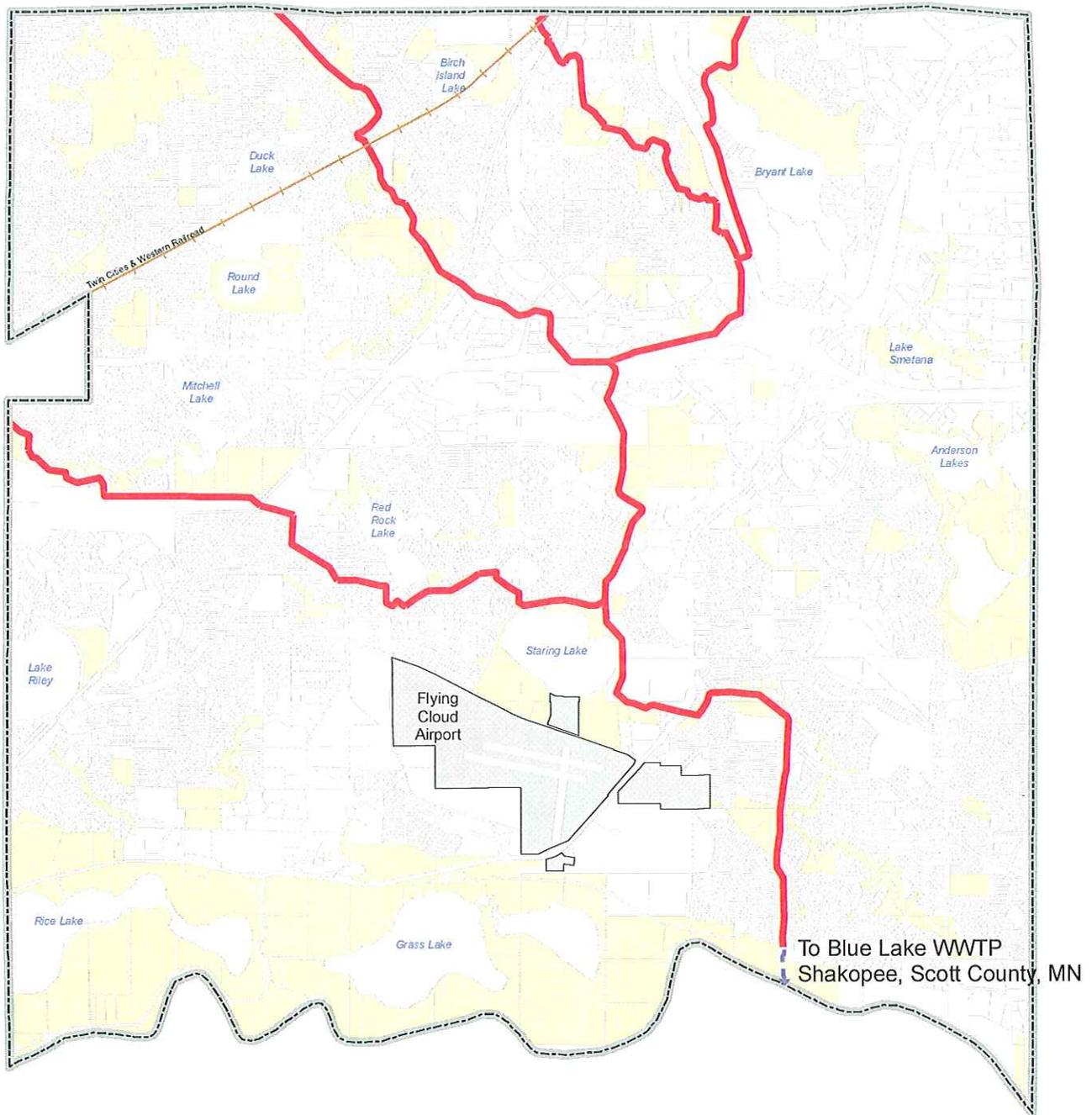
## WATER TOWERS AND WELLS

COMPREHENSIVE PLAN UPDATE 2007

Nov. 2007

Figure 6.1

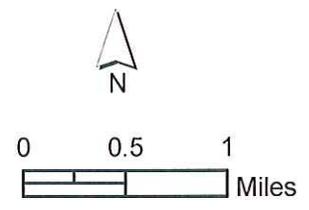
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Source: City of Eden Prairie; Metropolitan Council; Minnesota DNR

### Legend

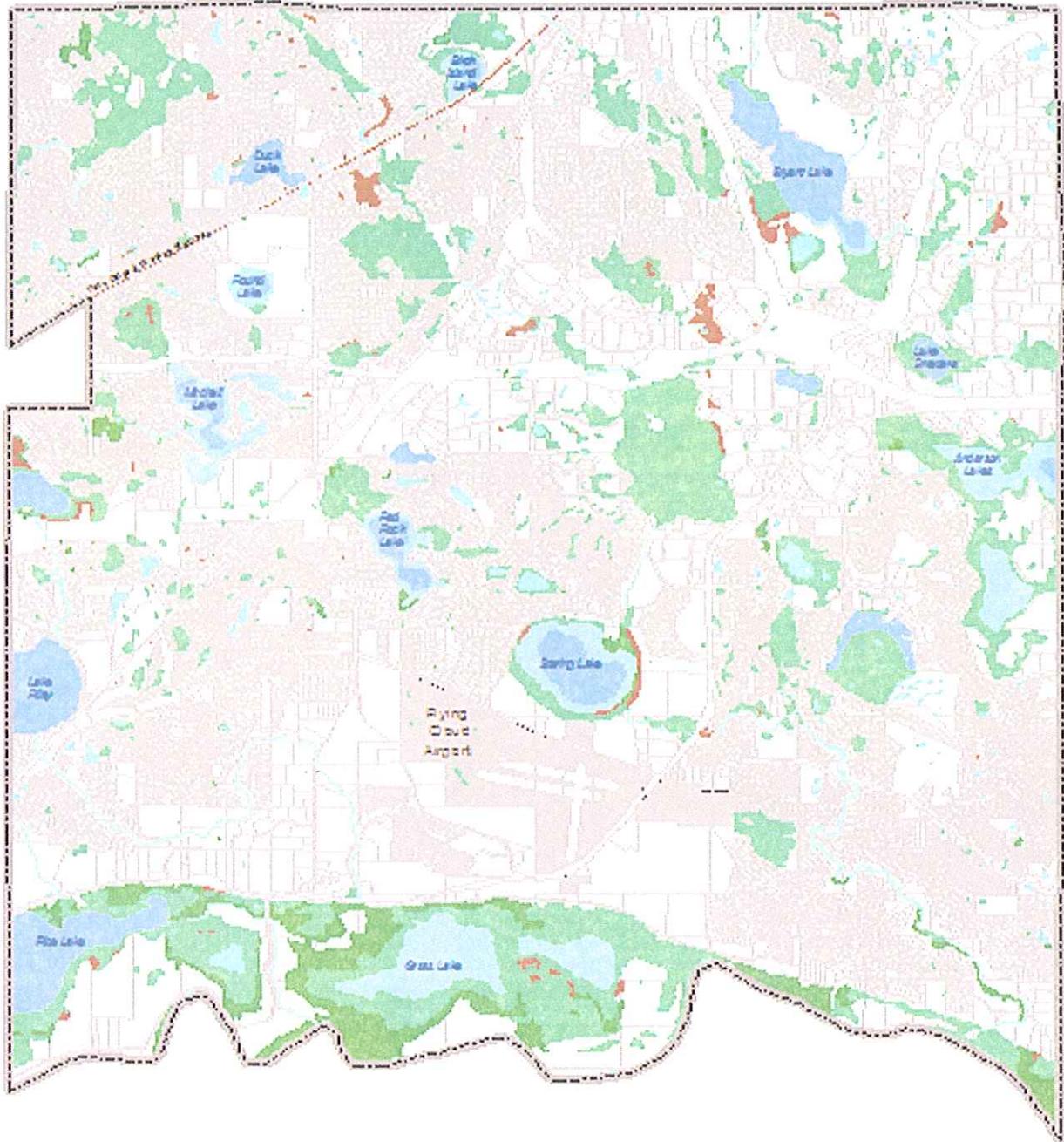
- Gravity Interceptor
- - - Force Main



## REGIONAL SANITARY SEWER INTERCEPTORS

COMPREHENSIVE PLAN UPDATE 2007  
 Nov. 2007

Figure 6.2

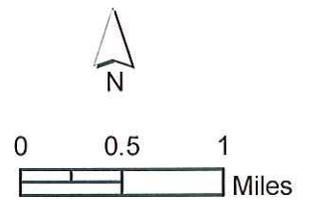


Source: City of Eden Prairie; Metropolitan Council; NWI

### Legend

#### National Wetlands Inventory

- |   |                       |   |                              |
|---|-----------------------|---|------------------------------|
|  | Littoral              |  | Shallow Marsh / Fresh Meadow |
|  | Limnetic              |  | Forested Wetland             |
|  | Unconsolidated Bottom |  | Shrub Scrub                  |
|   |                       |  | Rocky Shore                  |



## WETLANDS AND WATER BODIES

COMPREHENSIVE PLAN UPDATE 2007

Nov. 2007

Figure 6.3