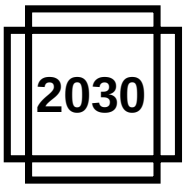

Water Resources Management

Policy Plan

Adopted May 25, 2005
Revised January 29, 2007
Amended September 8, 2010

Metropolitan Council

Metropolitan Council

Mission

The mission of the Metropolitan Council is to develop, in cooperation with local communities, a comprehensive regional planning framework, focusing on wastewater, transportation, parks and aviation systems, that guides the efficient growth of the metropolitan area. The Council operates wastewater and transit services and administers housing and other grant programs.

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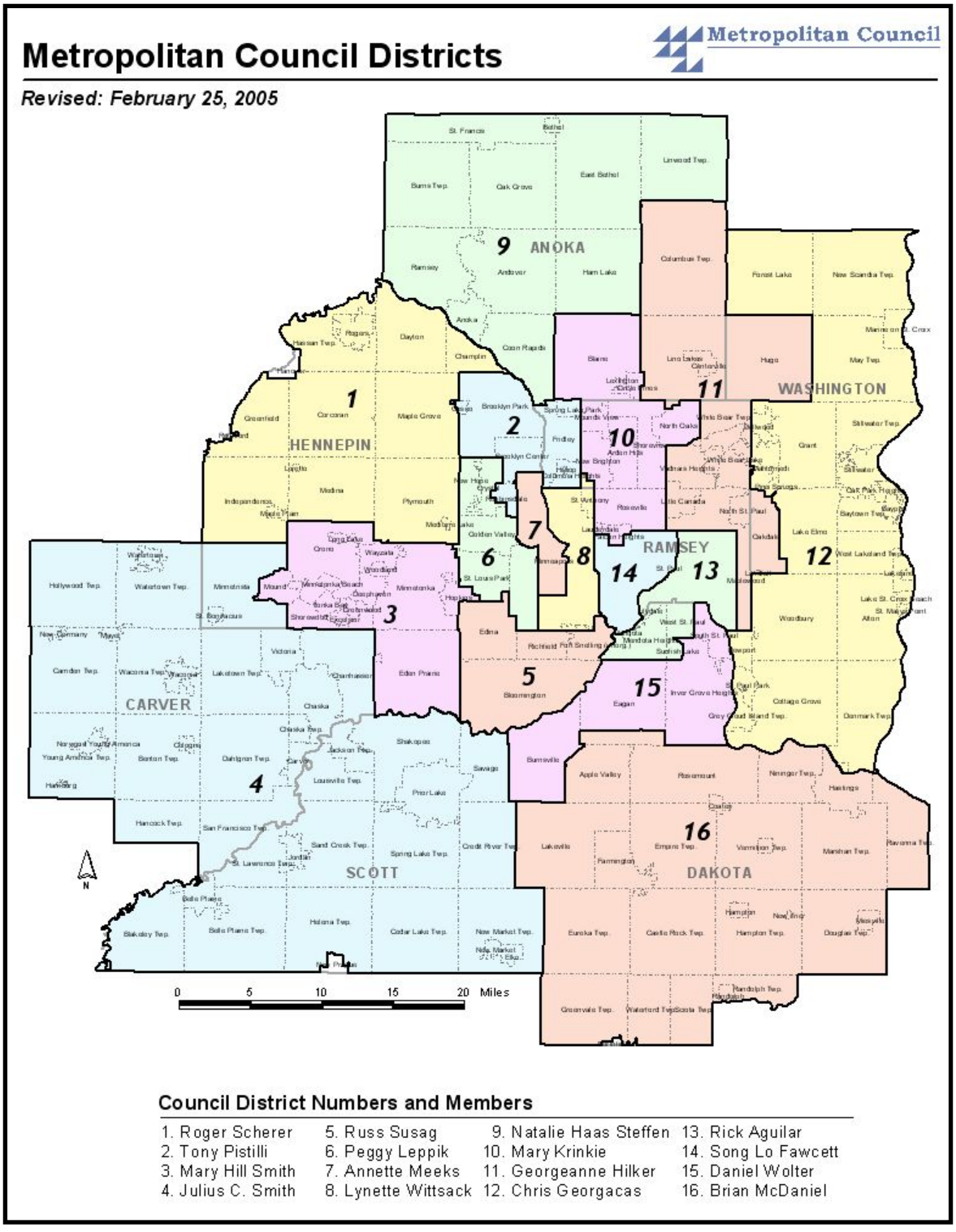
Figure 1: Metropolitan Council Members and District



Foreword

Three majestic rivers. Nine-hundred and fifty lakes. Extensive wetlands. A 1,000-foot-deep aquifer system. The Twin Cities metropolitan area was settled in the 1800s in large part because abundant water resources were available to support a new and growing population.

Although the resources remain abundant today, the region must carefully protect both the supply and quality of water so that adequate reserves remain to meet the needs of a growing population.

Water is fundamental to the region's global economic competitiveness. The region's abundant water supply supports commercial and agricultural enterprises in need of reliable, good quality water. The resource also contributes to a quality of life that attracts highly skilled workers and supports a thriving tourism industry. When many places around the U.S. and the world are suffering actual and potential water shortages, the Twin Cities region offers its residents a reliable supply of high quality water from within its seven-county border. Nonetheless, the region cannot afford to be complacent or careless about its water resources. Wise stewardship of the resource is required.

Protecting this resource and passing it on to the generations that follow in as good or better shape than we received it is one of the foremost goals of this Metropolitan Council. A commitment to environmental stewardship is translated into the policies and implementation strategies contained in this *Water Resources Management Policy Plan (Policy Plan).*

The Council will continue to provide high quality, affordable wastewater collection and treatment services while guiding growth in a manner that protects our valued water resources. The Council will also identify water supply and water quality challenges, and address them by working with all interested partners. One of the Council's primary strengths is its regional perspective, which takes into account the interrelationships of land use, growth patterns, transportation and other regional services, and water resources use and protection. This integrated perspective is the foundation of the Council's *2030 Regional Development Framework,* from which this *Policy Plan* has evolved.

Authority to Prepare the *Policy Plan*

State law (Minnesota Statutes, Section 473.145) directs the Metropolitan Council to prepare a comprehensive development guide for the metropolitan area. The development guide consists of the *2030 Regional Development Framework (Framework)* and four "system plans" for transportation, aviation, wastewater and regional recreation open space, and related policy statements, goals, standards, programs and maps describing how it will achieve its charge. This updated *Policy Plan* replaces the current plan, adopted in December 1996.

The *Policy Plan* is also prepared in response to Minnesota Statute 473.157, which states:

> *"To help achieve federal and state water quality standards, to provide effective water pollution control, and help reduce unnecessary investments in advanced wastewater treatment, the council shall adopt a water resources plan…"*

The plan includes policies and strategies for water supply, surface water management (nonpoint source issues) and wastewater treatment and collection (point source issues).

Metropolitan land-use planning law (Minn. Stat. Sec. 473.858) states that comprehensive plans of local governments cannot be in conflict with the metropolitan systems plans for airports, transportation, wastewater, and regional recreation open space. The revised *Policy Plan* contains the required system elements (wastewater and water quality).

In addition to the required system elements, the *Policy Plan* includes policies and implementation strategies for water supply and watershed-based target pollution loads. Specific legislative mandates exist for plan development in water supply and for target pollution loads.

The Metropolitan Council's *Framework* establishes a growth management strategy that incorporates system plans into overall regional development. Both the *Water Resources Management Policy Plan* and the *Framework* will be used to determine consistency of local government plans with those of the Council. Material contained in the plans can be used to determine whether there is a substantial impact on, or a substantial departure from, the metropolitan systems plans. The system plan chapter contains information on what constitutes a substantial impact or departure. The Council will also use this *Policy Plan* in its review of the water-related components of local comprehensive plans, including surface water management, water supply and wastewater.

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Executive Summary

Water resources have sustained this region for millennia, and wise use of this natural wealth can ensure a water-rich future for generations to come. Achieving sustainable water resources calls for a multifaceted regional strategy grounded in the Metropolitan Council's *2030 Regional Development Framework*. The *Framework* provides direction for the region as it grows in population from 2.6 million people in 2000 to 3.6 million in 2030.

This update of the Council's *Water Resources Management Policy Plan (Policy Plan)*, in response to the new *Framework*, seizes on the opportunity to integrate water resources management and protection with planning for the region's growth. Best management practices for surface water runoff in both new development and redevelopment protect the quality of the region's lakes and rivers and, in some cases, restore previously lost natural features. Convening local communities to create solutions to prevent localized water supply shortages ensures that residents and businesses will have the water they need without damaging the environment. Careful planning of the region's largest wastewater collection and treatment system results in the most efficient use of major public investments and protects public health.

This *Policy Plan* contains guidelines for developing and maintaining service systems that support development and for which the Council has some statutory responsibility, including wastewater service, surface water management and regional water supply.

The Council is committed to working collaboratively with state and federal agencies, local and county governments, watershed management organizations, interest groups and the public to ensure the protection of the region's rich water resources as the region continues to grow.

Water Supply

Use the Council's planning authority to support local efforts to ensure that the regional water supply is sufficient to meet the region's needs, is protected from contamination and is conserved by its users.

Surface water and groundwater sources provide the region with the water it needs for daily life. Despite the relative abundance of water in the Twin Cities area, the resource cannot be taken for granted. Potential limitations on supply include: population growth in areas not served by high-yielding aquifers; competing demand between groundwater withdrawal and protection of surface water features; reduced recharge caused by potential drought conditions and by an increase in impervious surface (rooftops and pavement); and aquifer contamination. The region must address water availability, management and use to ensure a sustainable supply for future generations.

The Council will work with communities to promote and support efficient use of water resources. It will:

- Update the regional water supply plan.
- Review local water supply plans as required by state law.
- Establish and facilitate subregional task forces as needed among communities that face water supply limitations.
- Participate in regional planning efforts for drought and emergency events.
- Promote water conservation and development practices that help protect the water supply.
- Work with partners to develop an institutional framework for coordinated regional and subregional water supply planning and management.
- Investigate reusing wastewater effluent.

Surface Water Management

Promote nonpoint source pollution control efforts to minimize pollution from runoff into rivers, lakes and streams.

Surface water management designed to protect water quality and reduce the quantity of stormwater runoff is critical to the region's continued economic prosperity and quality of life. The *Framework* established a benchmark that the water quality leaving the metropolitan area is as good as the quality of water entering the metropolitan area.

The U.S. Environmental Protection Agency indicates that over 90 percent of the pollution of the nation's waterways is from nonpoint source pollution runoff. Point source controls alone cannot adequately begin to address the pollution attributed to nonpoint sources. Without major efforts to control nonpoint source pollution, the metropolitan area will not achieve its benchmark of non-degradation.

The Council will continue to work in partnership with local governments, watershed organizations, and other public and private entities on a variety of efforts to reduce nonpoint source pollution, including:

- Ongoing monitoring of water quality in the region's lakes, rivers and streams.
- Technical assistance to help the Council's partners institute best management practices that reduce stormwater runoff, prevent erosion and flooding, and maintain or improve water quality.
- Review of local comprehensive plans, watershed management plans, local surface water management plans, environmental permits and other documents to ensure that communities are fulfilling their nonpoint source pollution reduction requirements and therefore reducing the impacts on the region's wastewater system.

Wastewater Service

Provide high-quality, efficient and cost-effective regional wastewater service to support the *2030 Regional Development Framework*.

The metropolitan wastewater collection and treatment system is a critical element in the region's future development. To keep costs within reason, metropolitan service is

focused on the urbanized area of the region. In order to accommodate its projected population growth, the region in the next 25 years will need to invest $3.7 billion to maintain, replace and expand its wastewater treatments facilities, including interceptors and treatment plants. The Council works closely with communities and regulatory agencies to ensure that costly regional infrastructure, which is designed to provide multiple communities with service decades into the future, can be efficiently built and operated. The Council will continue to implement a fair system of fees and charges that will enable it to meet wastewater regulatory requirements, maintain and repair wastewater infrastructure, and provide additional capacity for the region's growth.

A major issue threatening the efficiency of the wastewater collection and treatment system is inflow and infiltration (I/I)—clear water that finds its way into the local sewers, especially during major rainfall events. The Council, in this *Policy Plan*, explains how it will work with communities to reduce I/I to reasonable amounts so that the system continues to have adequate capacity to serve future growth. The Council will:

- Establish I/I goals for all communities discharging wastewater into the metropolitan disposal system.
- Require communities served by the metropolitan disposal system to include an I/I reduction program in their comprehensive plan.
- Potentially limit increases in service to communities with ongoing excessive I/I.
- Starting in 2007, institute a surcharge program to provide funding for I/I reduction efforts.
- Starting in 2013, institute a demand charge for communities that do not meet their I/I goals.

This *Policy Plan* also sets the Council's direction for working with Rural Growth Centers and rural areas on wastewater collection and treatment issues. The plan establishes criteria whereby the Council can evaluate requests from Rural Growth Centers which are experiencing major growth to have the Council acquire and operate local wastewater treatment facilities. The plan outlines circumstances where the Council might cost-share system improvements with local communities.

The Council will continue its policy of not allowing connections to the metropolitan disposal system in rural areas. The Council will also continue to use its review authority to ensure that communities that permit the construction of private wastewater systems ensure that these systems are installed, maintained, managed and regulated consistent with Minnesota Pollution Control Agency rules.

Regional Framework for Accommodating Growth

During the 1990s, the Twin Cities metropolitan area gained more population (353,000) than any previous decade in our history. Between 2000 and 2030, the region is expected to grow by nearly 1 million people—the equivalent population of two Denvers added to the seven-county metropolitan area.

Such robust growth is a sign of the region's economic health and vitality. With this growth will come new jobs, greater ethnic diversity, expanded economic opportunities and increased tax revenues. But accommodating growth is not always easy, as the increasing public concern about issues such as water quality and traffic congestion attests. Surveys of metropolitan area residents consistently name the environment as one of the principal reasons for living in a climate that is at times challenging.

The purpose of the Metropolitan Council's *2030 Regional Development Framework* is to provide a plan for how the Council and its regional partners can address these challenges. The Council's *Framework* and the accompanying metropolitan system plans – including this *Water Resources Management Policy Plan* – are intended to help ensure the "coordinated, orderly and economical development" of the seven-county Twin Cities metropolitan area – consisting of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington Counties (Minn. Stat. Sec. 473.851).

New directions outlined in the *Framework* set out a path for growth that protects water resources and the region's quality of life:

- **Focusing attention on the pattern of land uses.**

  The *Framework* pays more attention to *how* development occurs and less attention on how much development occurred in growing communities at the region's developing edge.

- **Recognizing that transportation and land use influence each other.**

  The *Framework* emphasizes the need for intensified development in centers with convenient access to transportation corridors and in rural centers that want to grow and lie along major highways.

- **Offering greater flexibility in the location of new development in growing communities**

  The *Framework* provides growing cities the flexibility to decide where development occurs within broader areas than that are planned and staged for development consistent with regional perspectives.

- **Emphasizing reinvestment in older areas throughout the region.**

  The *Framework* emphasizes that by investing in underused land and maintaining existing infrastructure, the region can accommodate growth on a smaller urban "footprint," slow the rate of increase in traffic congestion, ease development pressures on rural land, save billions of dollars in local sewer, water and road construction and

maintenance costs, maintain the housing stock, and strengthen the vitality of older areas.

- **Encouraging increased market-based housing production that reflects shifting demographics, employment locations and a diversity of incomes.**

  The *Framework* allows for a mix of housing types and prices to enable people to work, raise a family and retire in the same community, attract jobs and improve local economic competitiveness.

- **Encouraging the use of metropolitan-wide natural resources inventory and assessment to foster development that is more sensitive to the environment.**

  The *Framework* identifies the need to use natural resources inventories and assessments to help local governments plan development that respects the integrity of natural areas and incorporates environmental features into development projects.

In support of these new directions, the *Framework's* strategies are organized around four policies:

Policy 1: Work with local communities to accommodate growth in a flexible, connected and efficient manner. Supporting land-use patterns that efficiently connect housing, jobs, retail centers and civic uses. Encouraging growth and reinvestment in centers with convenient access to transportation corridors. Ensuring an adequate supply of developable land for future growth.

Policy 2: Plan and invest in multi-modal transportation choices, based on the full range of costs and benefits, to slow the growth of congestion and serve the region's economic needs. Improving the highway system, removing bottlenecks and adding capacity. Making more efficient use of the highway system by encouraging flexible work hours, telecommuting, ridesharing and other traffic management efforts. Expanding the bus system and developing a network of transitways, based on a thorough cost-benefit analysis.

Policy 3: Encourage expanded choices in housing location and types, and improved access to jobs and opportunities. Allowing market forces to respond to changing market needs, including increased demand for townhomes and condominiums as baby-boomers grow older. Preserving the existing housing stock to help maintain a full range of housing choices. Supporting the production of lifecycle and affordable housing with better links to jobs, services and amenities.

Policy 4: Work with local and regional partners to reclaim, conserve, protect and enhance the region's vital natural resources. Encouraging the integration of natural-resource conservation into all land-planning decisions. Seeking to protect important natural resources and adding areas to the regional park system. Working to protect the region's water resources.

The *Framework* recognizes that "one size does not fit all"—that different communities have different opportunities, needs and aspirations. It includes implementation strategies that are tailored for different types of communities—fully developed communities, communities that are still developing and four different types of rural communities.

Regional Growth Forecasts

During the last three decades, the Twin Cities metropolitan area grew by nearly 800,000 people. Between 2000 and 2030, we forecast that the region will add another 966,000 people and 471,000 households.

Table 1: Metropolitan Area Growth, 1970-2030

	1970	2000	2030	1970–2000 Increase	2000–2030 Projected Increase
Households	573,634	1,021,454	1,492,000	448,000	471,000
Population	1,874,612	2,642,056	3,608,000	767,000	966,000
Jobs	779,000	1,563,245	2,126,000	784,000	563,000

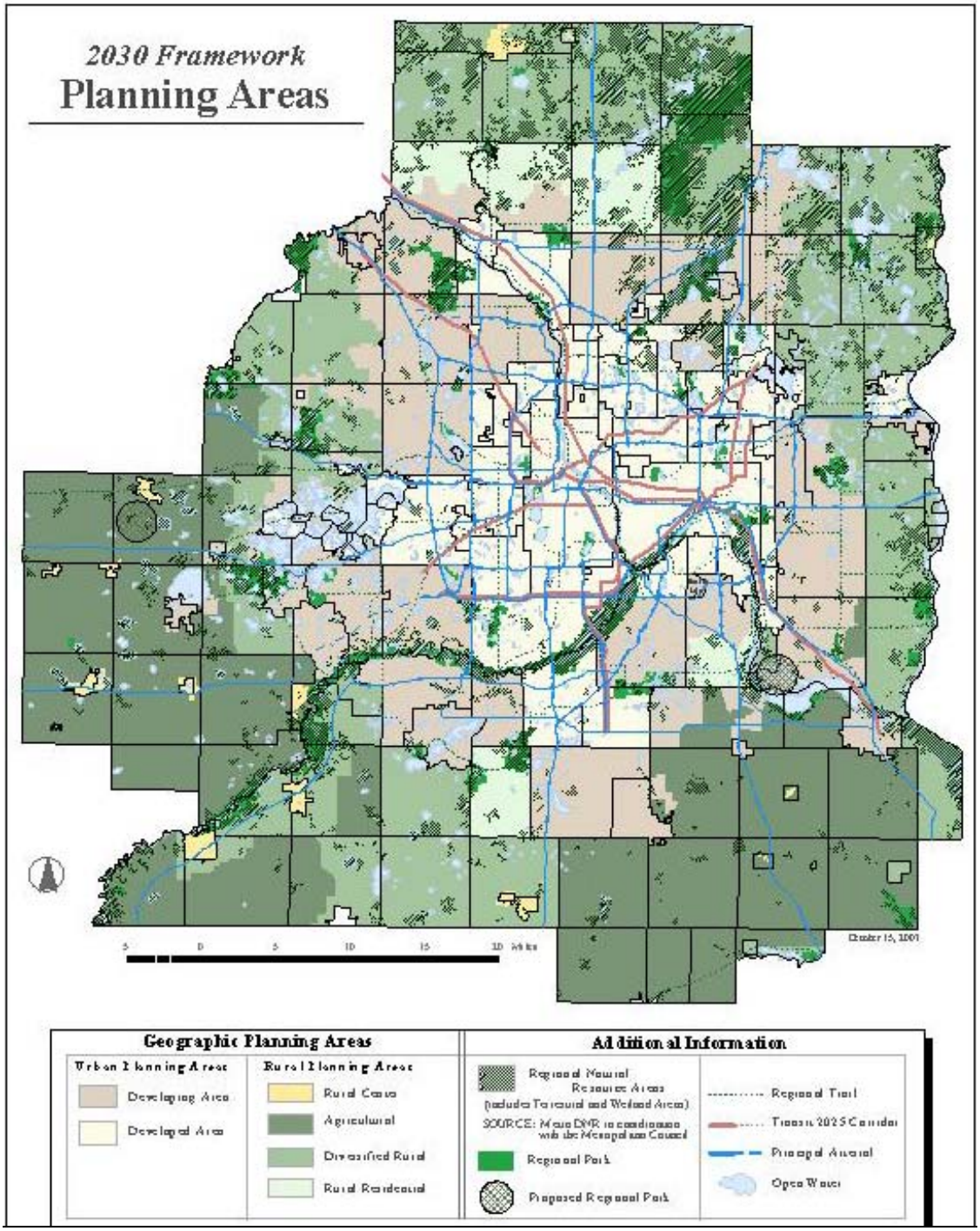
The metropolitan system plans seek to carefully integrate regional land-use, transportation, housing and natural resource policies to achieve regional goals in each area and avoid working at cross-purposes. The forecasts are used in the planning and capital-improvement-program processes to assess regional needs, land-use patterns and infrastructure investments that will be needed to serve growth in a timely, efficient and cost-effective manner.

Water Resources Management and Framework Planning Areas

The *Framework* sets out different strategies for communities based on the types of growth that are expected (see "Geographic Planning Areas" map). The *Framework* identifies an urban area and a rural area, each of which occupies approximately half of the region.

The urban area is divided into two specific geographic planning areas: the Developing Communities and the Developed Communities. The rural area is divided into four specific geographic planning areas: Rural Centers/Rural Growth Centers, the Diversified Rural Communities, the Rural Residential Areas and the Agricultural Areas. Approximately 91 percent to 95 percent of new growth is forecast to be located in the urban area—in land-use patterns that make efficient use of regional infrastructure—with the rest, five percent to nine percent, in the rural area, particularly in small towns to be designated as Rural Growth Centers.

Figure 2: Framework Geographic Planning Areas



One of the primary differences among these planning areas is the density at which they develop. The Council has established benchmarks indicating the overall densities that planned development patterns in each of the geographic planning areas can be expected to achieve. The Council negotiates a share of the regional forecasts with each community based on its geographic planning area designation(s), development trends, expected densities, available land, local interests and Council policies. The cumulative results of the community-accepted distribution of the forecasts among planning areas becomes the

basis for determining the required land supply, and for the Council's plans for and investments in regional systems such as wastewater service and highways.

The Developed Communities are the cities where more than 85 percent of the land is developed, infrastructure is well established and efforts must go toward keeping it in good repair. These communities have the greatest opportunities to adapt or replace obsolete buildings, improve community amenities, and remodel or replace infrastructure to increase their economic competitiveness and enhance their quality of life. The *Water Resources Management Policy Plan* (*Policy Plan*) and infrastructure investments will support the maintenance and enhancement of wastewater collection and treatment facilities to accommodate growth and reinvestment in the developed communities.

Developing Communities are the cities where the most substantial amount of new growth—about 60 percent of new households and 40 percent of new jobs—will occur. The amount of infill and redevelopment, and the way in which new areas are developed, directly influence when and how much additional land in Developing Communities will need urban services—services that will call for substantial new regional and local investments. The *Policy Plan* and infrastructure investments will support the staged, coordinated expansion of regional systems (wastewater treatment, transportation, parks and open space, and airports) to help ensure adequate services to communities as they grow and stage their development within an area needed to accommodate 20 years of forecasted growth.

Roughly half of the 3,000 square miles in the seven-county Twin Cities area are rural or agricultural. That includes cultivated farmland, nurseries, tree farms, orchards and vineyards, scattered individual home sites or clusters of houses, hobby farms, rural centers, gravel mines, woodlands, and many of the region's remaining important natural resources. About five percent to eight percent of new growth is forecast for the rural and agricultural area—most of it in Rural Growth Centers. The *Policy Plan* and infrastructure investments will support Rural Growth Centers and adjacent townships in their efforts to concentrate growth as a way to relieve development pressure in the rural planning area.

Water Resources Management and Land Use

Water resources management is a vital tool for preserving and enhancing the region's economic competitiveness and quality of life. Decisions about water supply, surface water management, wastewater collection and treatment, transportation, housing, natural resources and other land uses cannot be made in isolation from one another. Regional transportation and wastewater system investments and services help shape growth patterns; housing location and types affect mobility options and travel patterns; unplanned growth can put a strain on natural areas, groundwater quality and other resources.

The significant costs associated with building new wastewater facilities mean that the region will have to make targeted investments, recognizing that "one size does not fit all," and carefully weighing the options in all of the geographic planning areas of the region. The first priority for the wastewater system is to maintain the current infrastructure while reducing the excessive amount of inflow and infiltration into the system and providing additional capacity where needed. But the region must also look at ways to support growth, especially in the developing areas and the Rural Growth Centers.

The Council can support growth in developing areas by adding interceptor capacity, expanding existing treatment plants or building new treatment plants at the edge of the region. In order to support the concentration of growth in the Rural Growth Centers, the Council may need to assist the Rural Growth Center communities by agreeing to either acquire and operate the Rural Growth Center treatment plants or connect them to the Metropolitan Disposal System at their request.

The *Water Resources Management Policy Plan* seeks to integrate growth, housing, transportation, and natural resource policies with water resource management plans and investments to achieve regional goals contained in the *Framework* along with the strategies for each of the planning areas. The full potential of investments in wastewater infrastructure, transportation, housing, natural resource preservation and other factors is best realized when they are considered together in well-conceived land-use patterns. Maximizing the benefits of wastewater infrastructure plays a key role in supporting the competitive position of the region. The Council will coordinate wastewater infrastructure investments with land-use decisions to support and encourage redevelopment concentrations along transportation corridors.

Comprehensive Planning Process

The purpose of the Metropolitan Council's *2030 Regional Development Framework* is to provide a plan for how the Council and its regional partners can address these challenges. The *Framework* is prepared under the authority of state statutes, which direct the Council to:

> *…prepare and adopt…a comprehensive development guide for the metropolitan area. It shall consist of a compilation of policy statements, goals, standards, programs, and maps prescribing guides for orderly and economical development, public and private, of the metropolitan area. The comprehensive development guide shall recognize and encompass physical, social, or economic needs of the metropolitan area including but not limited to such matters as land use, parks and open space needs, the necessity for and location of airports, highways, transit facilities, public hospitals, libraries, schools, and other public buildings… (Minnesota Statutes, section 473.145)*

The *Framework* is the initial "chapter" and the unifying theme of the Council's Metropolitan Development Guide. The *Framework* is the umbrella statement of regional policies, goals and strategies that will inform the Council's metropolitan system plans for wastewater services, transportation, airports, and regional parks as well as other comprehensive development guide chapters and policies adopted by the Council.

Under state law, each city and township in the seven-county metropolitan area is required at least every 10 years to review and, if necessary, amend its local comprehensive plan to ensure that the local plan – and local fiscal devices and official controls – are consistent with the Council's metropolitan system plans (Minn. Stat. Sec. 473.864). The next round of updated local plans will be due in 2008.

Following the adoption of this *Water Resources Management Policy Plan* as required under the Metropolitan Land Planning Act, local communities then have three years to update their local comprehensive plans. These plans are reviewed by the Council for conformance with system plans, consistency with Council policies, and compatibility with adjacent and affected governmental units.

Conformance: A local comprehensive plan is in conformance with the regional system plans, planned and existing, if the plan:

1. Accurately incorporates and integrates the components of the regional system plans:
   - Wastewater system components that are properly maintained to eliminate excessive I/I provide for planned growth consistent with the Council's 2030 growth projections, and are staged consistent with the MCES development program. (Minn. Stat. 473.513).
   - Local surface water management plans consistent with requirements in the statute and Minnesota Rules Chapter 8410. (Minn Stat. 473.859, subd. 2 and Minn. Stat. 103B.235).
2. Integrates public facilities plan components (Minn. Stat. 473.859).
   - Integrates development policies and compatible land uses to accommodate forecast growth at appropriate densities and to maximize the efficiency and effectiveness of the regional system.
3. Adopts the standards and conditions under which the installation of private sewer systems will be permitted, and the areas not suitable for public or private systems because of public health, safety and welfare considerations. (Minn. Stat. 473.859, subd. 3.)

Consistency: A local comprehensive plan is consistent with Council policies and statutory requirements if the plan:

1. Addresses community role strategies contained in the *Framework*, including the planning and development of an interconnected local trunk line and lateral interceptor system that is integrated with the regional system.
2. Addresses the linkage of local land uses to local and regional wastewater systems. Meets other statutory requirements relating to:
   - Water supply plans, which must be consistent with statutes and DNR guidelines for water supply plans (Minn. Stat. 473.859, subd. 3).
   - Local surface water management (Minn. Stat. 473.859 and Minn. Stat. 103B.235).
3. Includes an implementation plan that describes public programs, fiscal devices, and other specific actions for sequencing and staging to implement the comprehensive plan and ensure conformance with regional system plans (Minn. Stat. 473.859 subd. 4).
4. Official controls
   - Capital Improvement Program (wastewater facilities, parks, transportation, water supply, and open space).

Compatibility: A local comprehensive plan is compatible with adjacent and affected governmental units, based on comments or concerns, or lack thereof from these entities. In order to be determined compatible, a community must adequately document that it has addressed the concern(s) of all adjacent and affected governmental units.

Water Supply

Beneath the surface of the Twin Cities region lies an underground system of water-bearing rock layers, or aquifers, which together with the Mississippi River provide the region with an abundant water supply. While the resource is relatively plentiful, it cannot be taken for granted. The region must address water availability, management and use to ensure a sustainable supply for future generations.

It is difficult to accurately determine the total volume of groundwater available in the region or how much is available locally before a shortage will occur. The increasing amount of impervious surface caused by development reduces groundwater recharge, but the effects have not been quantified. In addition, the impact on surface waters from groundwater withdrawals has not always been considered as water supplies have been developed. Both surface water and groundwater resources must be protected to guarantee supply for the future.

Regional Water Demand

Regional water demand in 2003 totaled over 1.3 billion gallons per day (BGD). About 65 percent of the demand was for power generation, and this water was returned to the region's three major rivers in almost the same volume as was withdrawn. The remaining 35 percent was withdrawn by municipalities (waterworks) for domestic, commercial and industrial uses; self-supplied commercial/industrial uses; agricultural and non-crop irrigation; water-level maintenance; special categories; and air-conditioning uses.

Figure 3: Twin Cities Metropolitan Area Water Use (without Power Generation)

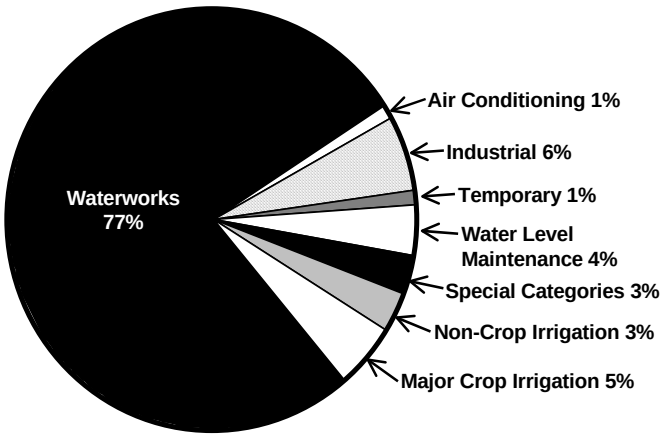
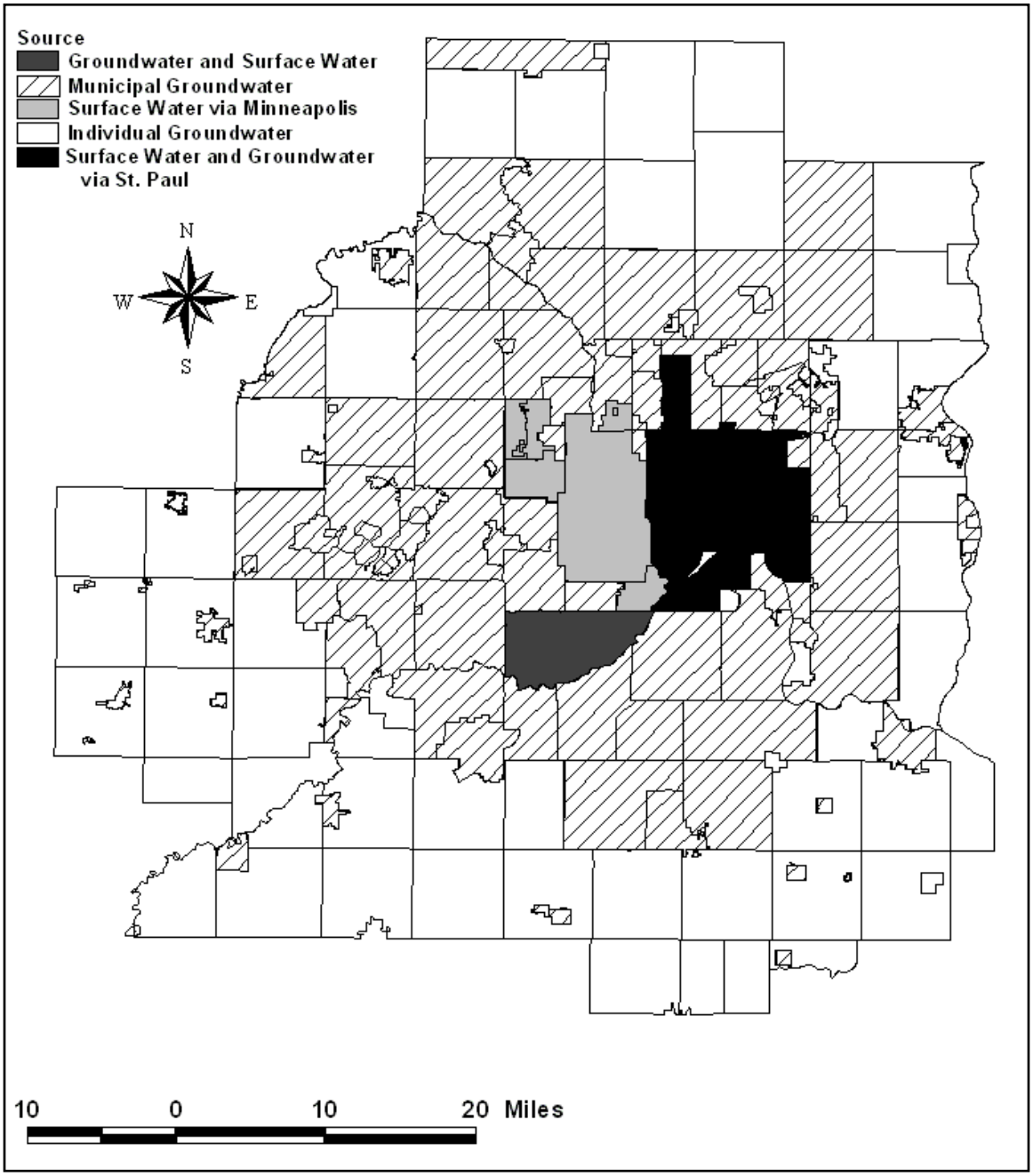


Figure 3 shows the percentage of water use for all categories except power generation. Waterworks accounts for approximately 77 percent of the water used once power generation is factored out. Modeled projections for residential, commercial, industrial, institutional and "unaccounted for" water use show a rise of about 29 percent—or about 112 million gallons per day—from 2000 to 2030 due to increases in population and associated economic activity.

Regional Water Sources

The source of water by community is shown in Figure 4. The central cities and many first-ring suburbs are served by water drawn from the Mississippi River, while the rest of the suburbs are served by groundwater. Minneapolis and the suburbs it serves rely solely on water from the Mississippi River, whereas St. Paul and its suburban clients supplement Mississippi River water with tributary inflow to its Vadnais Lake reservoir system and with high-capacity groundwater wells.

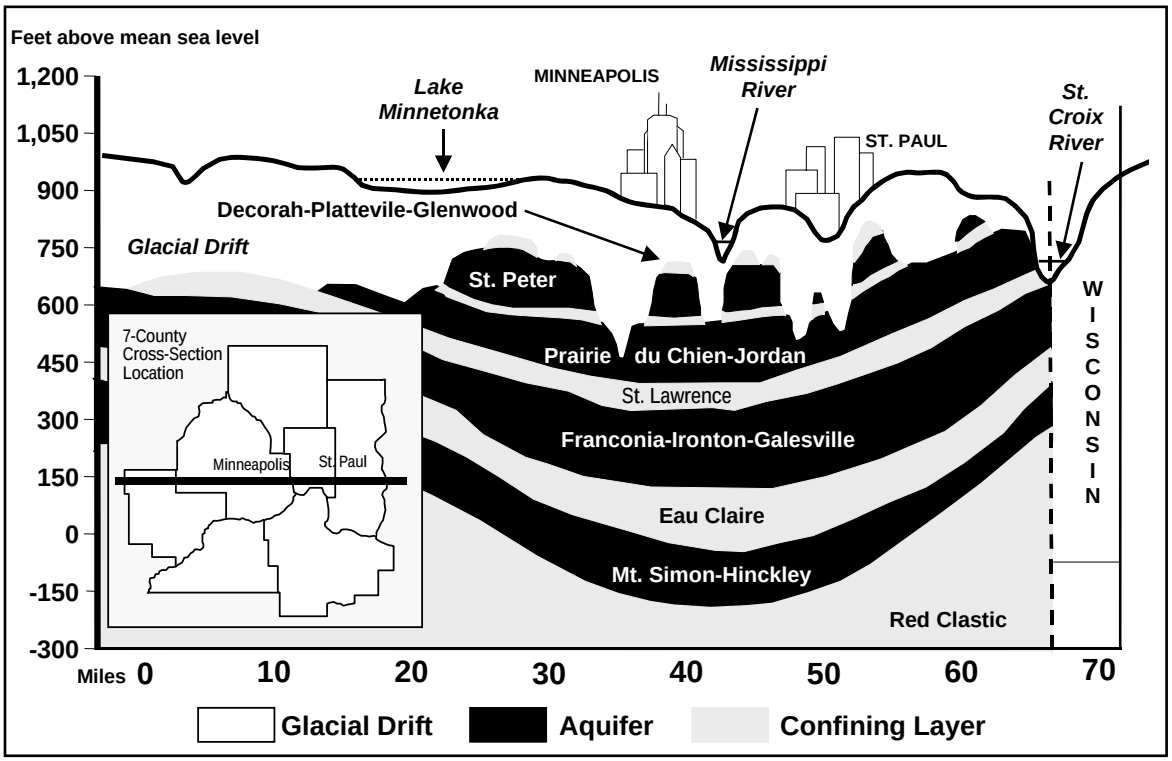
Figure 4: Twin Cities Metropolitan Area Water Sources



Note: Some communities shown as having a municipal water supply may also have a portion of the population served by private wells.

Figure 5 illustrates the 1,000-foot-thick layer of inter-bedded aquifers (water-bearing rock units) and aquitards (confining layers) that comprise the Twin Cities aquifer basin. There are five principal aquifers along with the confining layers in the basin. Nearly two-thirds of the municipal wells tap the high-yielding Prairie du Chien-Jordan aquifer. The remaining third use water from the drift (unconsolidated glacial material on top of the bedrock), and the Franconia-Ironton-Galesville and Mount Simon-Hinckley bedrock aquifers. This groundwater system is the lifeblood for growth in the suburban part of the region.

Figure 5: Twin Cities Metropolitan Area Aquifer Basin



The region's forecasted population growth of nearly one million new residents between 2000 and 2030 will place additional stress on the finite water supply available in the region. Although in most years water demands have been met without difficulty, there have been some periods, such as the drought of the late 1980s, when local scarcity became a problem. As the population increases, this region must plan to ensure a viable supply of water.

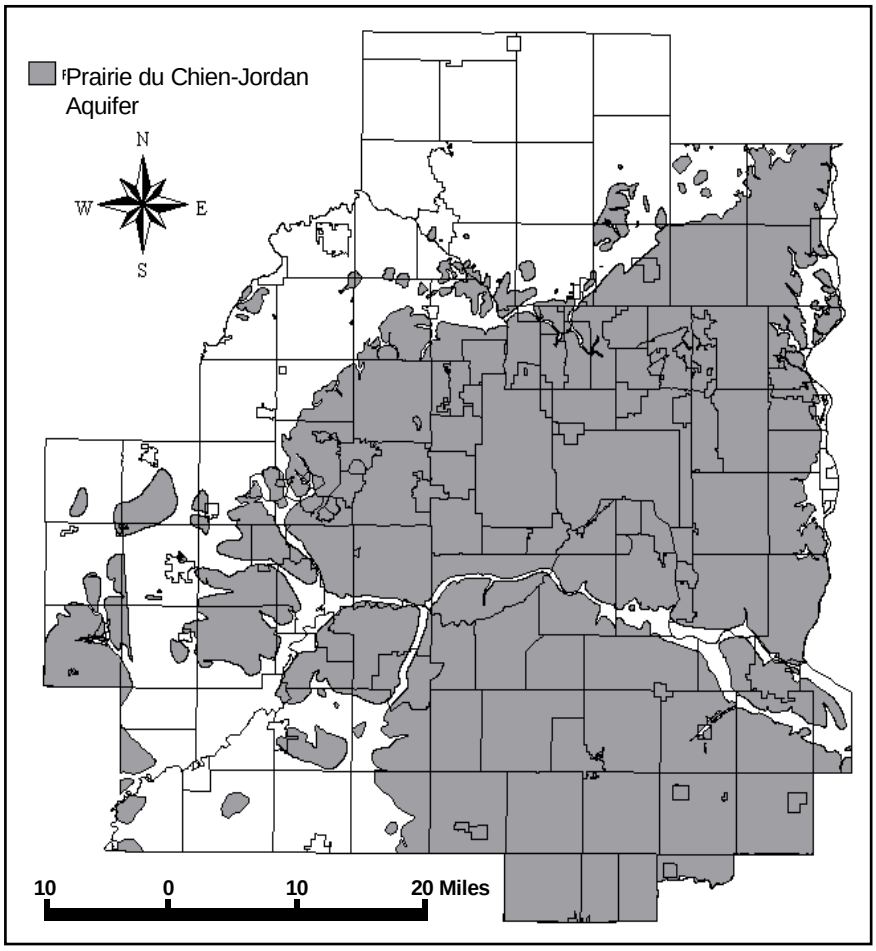
Potential Limitations on Supply

Potential water supply limitations stem from several factors, including:

- Lack of access to the Prairie du Chien-Jordan (PDCJ) aquifer in certain areas, some of which are projected for significant population growth.
- Competing demand between groundwater withdrawals and surface water features or other groundwater users in the area.
- Reduced recharge caused by land-use changes and climate variations.
- Contamination of the Mississippi River above the surface water supply intakes.
- Aquifer contamination.

Figure 6 shows that approximately one-third of the region does not have access to the high-yielding PDCJ aquifer.

Figure 6: Extent of Prairie du Chien-Jordan Aquifer in TCMA



Rapidly growing portions of the region in northern and western Hennepin County and Anoka County will need to rely on bedrock aquifers that are less productive, or on the surficial drift aquifer that is vulnerable to contamination. In areas like the southwest metro and southern Washington County, community water needs compete with the groundwater needs of natural features like trout streams, fens and bubbling springs. In other areas, the quantity of available water is limited by issues such as:

- **Nitrates.** Elevated concentrations of nitrates in groundwater originate from agricultural practices and individual sewage treatment system (ISTS or septic tank) use. Levels of nitrates approaching the drinking water standard have forced communities to suspend pumping in some wells and to blend water from high- and low-nitrate wells to reach acceptable levels.
- **Radium.** Radium occurs naturally in bedrock aquifers at varying concentrations. Naturally occurring contaminants must be treated or blended to meet drinking water quality standards, resulting in increased cost for communities that tap aquifers with elevated radium levels.
- **Industrial pollution.** Several communities have had to address water resources contaminated by industrial pollution.

Options for communities facing water supply limitations include: more and geographically scattered wells in shallower and/or deeper aquifers; inter-community sharing via pipe; increased conservation to reduce demand; tapping surface waters such as the Mississippi River; purchase of water from a large system with excess water availability; and limitations on development.

Ensuring Supplies for Future Growth

POLICY

The Metropolitan Council will work with state agencies and communities to promote and support the efficient use of water resources to ensure that supplies are adequate for the region's projected growth.

IMPLEMENTATION STRATEGIES

- *The Council will update the regional water supply plan at least every 10 years. Elements of the regional water supply plan will include:*
  - — *An evaluation of existing and expected water use and supply in the metropolitan area.*
  - — *An assessment of water supplies available in the metropolitan area.*
  - — *An assessment of alternatives to meeting water demands in areas where it is determined that there are potential limitations on future withdrawals.*

Under Minnesota 2005 First Special Session Laws, Chapter 1, the Council is required to carry out planning activities addressing the water supply needs of the metropolitan area. These activities include developing a technical information base for water supply, preparing a water supply master plan, providing guidance for local water supply systems and regional investments, and preparing recommendations addressing the governmental structure and necessary funding to improve water supply management in the metropolitan area.

- *The Council will review local water supply plans as required by state statute for consistency with Council and DNR plan requirements and Council policy.*

Minn. Stat. 473.859 requires communities to prepare water supply plans as part of the local comprehensive planning process. Appendix B2-c of this *Policy Plan* includes a list of the requirements for local water supply plans. The Council uses this format to comment on water supply issues, and to encourage communities to use water resources wisely and work together cooperatively to guarantee the efficient supply of water for the projected growth of the region. Interconnection of municipal water supplies, increased distribution of Mississippi River water where feasible, sustainable groundwater development, and water conservation are the preferred methods of meeting the region's water supply needs.

- *The Council will establish subregional task forces as needed and lead discussions among communities that may face water supply limitations. The Council will assist these communities to explore options and develop plans to meet projected demand.*

Currently Council staff facilitates the Southwest Metropolitan Groundwater Work Group. This group is working to manage the needs of several communities in Dakota and Scott Counties so that water demands are met efficiently with minimal adverse impacts to other users and natural resources. The Council also established a Northwest Metropolitan Water Supply Work Group to address the water supply needs for rapidly developing communities in northwestern Hennepin and west-central Anoka Counties. Through forums such as these, the Council facilitates solutions to regional water supply issues.

- *The Council will participate in regional planning efforts for drought and emergency conditions.*

The Mississippi River is the primary or sole source of water for 16 communities within the metropolitan area. These communities provide water service to approximately 870,000 people. The Council works with partners such as the River Defense Network and the Upper Mississippi Source Water Protection Planning Group (Appendix D) to help protect the river from drought or contamination.

- *The Council will work with partners to develop an institutional framework for coordinated regional and subregional water supply planning and management.*

In order to ensure a sustainable and reliable long-term supply of high quality water, the region needs a comprehensive water supply planning process to evaluate water resources and plan for their efficient use. Currently most supplies are developed without an assessment of the potential impact on other users or natural resources. Furthermore, water supply capital investments are typically based on local interests without looking at regional interests. No funding mechanisms exist to support water supply research and planning projects that meet local needs while also providing regional benefits. An institutional framework for water supply planning and management needs to be developed. The Council will take an active role in developing that framework.

- *The Council will promote water conservation measures in communities throughout the region.*

Efficient use of water by communities, private landowners, industries and operational organizations remains an issue in the region. Although many conservation programs are in place, implementation has been uneven. Many communities still install wells to meet peak nonessential demand for uses like watering lawns and filling swimming pools, without conservation. Eliminating the use of groundwater for once-through cooling water (air conditioning) and reducing water uses in industrial practices where possible are other ways to conserve water. The Council has a statutory responsibility to review local water supply plans, and will use this process to promote water conservation efforts.

- *The Council will encourage public and private entities to pursue environmentally sound and cooperative water use practices, joint planning efforts and implementation efforts.*

In past studies of the regional water supply system, the Council has proposed that communities could gain some economic and water resource efficiencies by sharing source, treatment and/or storage facilities. The Minneapolis and St. Paul systems provide a model for distribution of water from a central supplier. This model could be used in other places in the region where one community with access to a good supply could develop excess capacity for distribution to neighboring communities. This type of system could be successful where competing uses or local shortages exist. Another model is joint development among communities of a surface water or groundwater source, which could occur in any situation within the region where communities are close enough to share a resource.

- *The Council will investigate reusing wastewater effluent and, when cost-effective, implement reuse.*

The Council discharges significant amounts of treated wastewater to area rivers every day. Potential opportunities for reuse of wastewater effluent include irrigation, groundwater recharge, and industrial processing or cooling. For example, with the expansion of the Empire Wastewater Treatment Plant, the Council has investigated the reuse of its effluent for these purposes in order to reduce the need for higher treatment standards at this facility in the future.

A cost-benefit analysis will need to be completed to determine when and where it would be environmentally and economically feasible to reuse treated wastewater.

Protecting Water Supplies

Protection of the region's water supply is vital to the region's continued growth and economic prosperity. The Mississippi River provides surface water for the Minneapolis and St. Paul water supply systems. St. Paul also receives some of its water supply from the Vadnais Chain of Lakes and from groundwater. Historically these sources have been reliable, but they could be adversely impacted by chemical spills, terrorist activities, nonpoint source pollution and drought.

The average annual flow in the Mississippi River far exceeds the demand placed on it for water supply, but a wise-use ethic guarantees that water is not wasted and that excess pumping and treatment costs do not occur. Although water in the river has been sufficient, conservation prepares users in the event river flow dramatically drops or system infrastructure fails during low flow.

The protection of drinking water sources is both a land-planning and a pollution-management effort. Land uses with potential to contaminate runoff or cause infiltration that impacts a drinking water source need to avoid areas that contribute directly to the water supply. In addition, best management practices should be employed to avoid release of contaminants. Land management practices that could impact water supplies include animal feedlots, individual sewage treatment systems, excessive use of fertilizer on agricultural land, facilities that handle or store hazardous materials, and highway and rail lines that carry toxic materials. Effort is needed to control the use of contaminating materials near water supply sources so that spills, seepage, or similar accidents do not render a water source unusable.

The protection of drinking water sources from terrorist activities is also a concern today. The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 required all cities with water supplies serving over 3,300 people to develop vulnerability assessments of their local water supply systems and prepare or update their Emergency Response Plans. In addition, the 1996 amendments to the federal Safe Drinking Water Act requires the Minnesota Department of Health to produce source water assessments outlining potential vulnerabilities to their source waters for all Minnesota's public water systems. The groundwater suppliers in the state are also required to prepare wellhead protection plans to address potential source water contamination. Surface water suppliers are not required to prepare source water protection plans. However, several suppliers have elected to do so. For example, under the *Upper Mississippi River Source Water Protection Project* the cities of St. Paul and Minneapolis, along with St. Cloud, are working jointly to develop surface water protection plans to guide efforts to improve and protect the quality of the water that provides their public water supplies. These cities

draw most or all of their drinking water from the Mississippi River. The Metropolitan Council is a participant in and sponsor of this project.

The primary elements of these source water protection plans are 1) identify and define the source water protection area, 2) identify the point and nonpoint contaminant sources and their locations that pose threats to the quality of the source water, 3) describe practices and strategies to respond to the identified contaminant threats to the source water, and 4) formulate a plan to implement the source water protection practices and strategies.

POLICY

The Council will work with regional partners to protect the water supply system for the region.

IMPLEMENTATION STRATEGIES

- *The Council will work with local governments, regulatory agencies, water suppliers and water users to assess the use, capacity, quality and vulnerability of the regional water supply system along with identifying prime areas for recharge.*

As the region accommodates a larger population and a greater degree of growth, several factors will lead to more frequent water supply problems. These include higher demand for water, lower recharge resulting from more imperviousness, contamination of groundwater due to land use and natural compounds in geologic material, and urbanization of areas in which our most productive aquifer is absent. A comprehensive assessment of the long-term sustainability and vulnerability of current and projected withdrawals is needed.

- *The Council will promote development practices and patterns that protect the integrity of the region's water supply through the review of comprehensive plans, water supply plans, local stormwater management plans, and other environmental review documents.*

Council staff reviews local water supply plans, local comprehensive plans, and other environmental documents. Staff will continue to review these documents for consistency with regional plans, forecasts and policies, and consistency with local conservation programs and plans.

- *The Council will promote the use of best management practices for stormwater runoff to protect and improve water quality and maximize groundwater recharge.*

Groundwater recharge is necessary to ensure that the region has an adequate long-term water supply. A potential problem in this area relates to the ability of the groundwater system to recharge as land continues to be covered with impervious surfaces. It stands to reason that increasing impervious surface will decrease the amount of water that can soak through soils to recharge the groundwater aquifers. However, little research has been done in this area.

Developments that use progressive stormwater management practices can help to offset the reduction of water reaching the aquifer system caused by increased impervious surface. The Council will encourage development techniques that promote infiltration, such as rain gardens, as part of a low-impact development approach to surface water management.

Surface Water Management

"The water quality leaving the metropolitan area is as good as the water quality entering the metropolitan area, and in compliance with federal and state regulations."

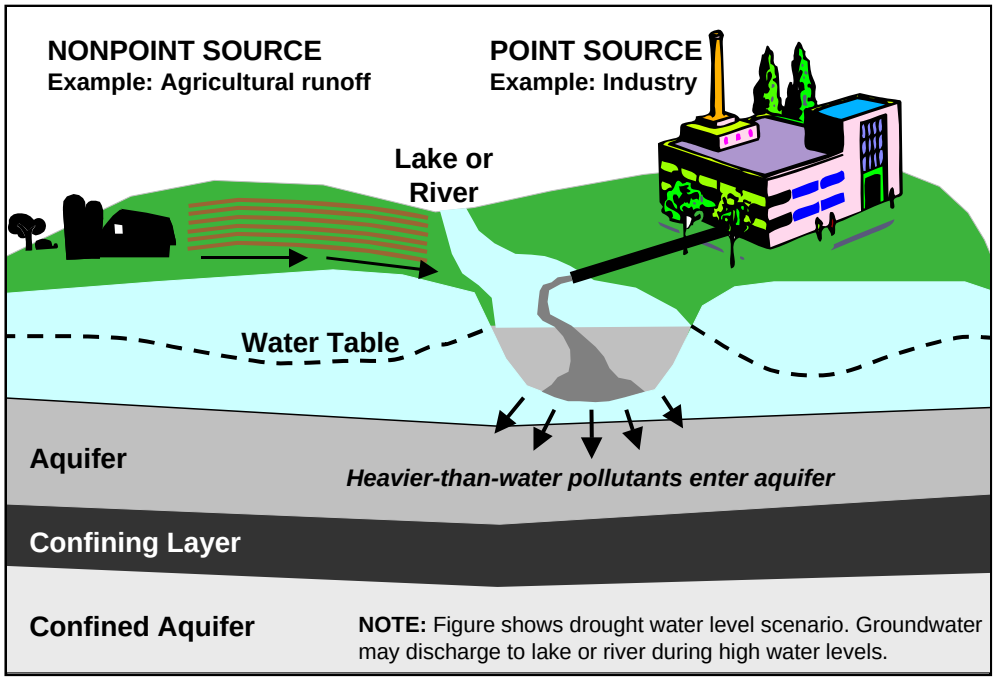
–2030 Regional Development Framework

Metropolitan Council surface water management programs deal with broad land runoff ("nonpoint" source) and specific wastewater ("point" source) pollution. Point source pollution includes the discharge of treated wastewater effluent through a pipe. Nonpoint sources of pollution result from many of the everyday activities and actions of people (Figure 7). These include applying fertilizer to lawns in an amount that exceeds what the grass can use, plowing an agricultural field such that erosion results, blowing grass clippings into the street, or driving a car that exhausts improperly burned hydrocarbons or leaks oil. All these add up to major nonpoint source pollution loading of our receiving waters.

Figure 7: Examples of Nonpoint Source Pollution

Nonpoint source pollution begins with the alteration of the landscape caused by agricultural production and urban development (Figure 8). The natural vegetative and drainage systems provide a low-impact course for water to follow. Alteration of these systems increases both the volume and rate of water runoff, and introduces polluting materials that can be transported by the runoff into receiving water bodies. This makes it harder to clearly identify the pollution source and effectively manage it. Appendix A-1 includes a list of common nonpoint source pollutants.

Figure 8: Point vs. Nonpoint Source Pollution



Protecting the quality of the region's water resources cannot be achieved in a cost-effective manner without addressing point *and* nonpoint sources of pollution. The region has spent several decades and made great strides in improving water quality by reducing point sources of pollution. The region has begun to make progress in improving water quality by reducing nonpoint sources of pollution as well, but it is apparent that nonpoint sources of pollution far exceed point sources of pollution to the region's and state's water resources.

To continue our success and to minimize impacts to the wastewater system from increased regulatory requirements to reduce pollution, the Council needs to encourage a combination of point and nonpoint source pollution strategies.

Local governmental units also have a role. They need to address the impacts from increased stormwater runoff as a result of increased imperviousness related to additional growth. Without local actions, projects and permits for future wastewater treatment plant expansions may be required to meet higher standards, making them more expensive.

Assessing and Protecting Regional Water Resources

Progress toward achieving any water quality goal cannot be assessed without a good database that measures change. The Council has a water quality monitoring program that measures the quality of effluent leaving metropolitan wastewater treatment facilities, ambient water quality conditions in rivers and lakes, and the quality of water leaving tributary watersheds.

The ambient river water quality monitoring program helps the Council evaluate the condition of river water quality across the region, assess whether or not water quality standards are being met, and define where attention is needed. The Council also helps communities identify appropriate point and nonpoint source pollution abatement measures.

The Council's watershed outlet monitoring program collects data about baseflow and runoff (snowmelt and rainfall) events. The data provide an accurate depiction of the water quality for the entire volume of water leaving the watershed. Monitoring sites are located and sampled by the Council and its partners across the metropolitan area. Where monitoring sites exist, data is available for local partners, watershed organizations, state agencies and others to use to help them assess the condition of streams in their area.

The Council's lake monitoring program has allowed the Council and its partners to collect data on over 150 of the region's 950 lakes. The lake data not only show current conditions in the lakes, but they help to assess the general condition of metropolitan area lakes and to see how lake conditions are changing over time. All of the Council's lake water quality data is available to the Council's partners to assess their lakes and to determine when management efforts are needed to improve water quality.

The Council has also used the lake data in conjunction with geographic information system data to complete an aquatic resources assessment. The aquatic resource assessment was one piece developed as part of the Council's Natural Resources Inventory and Assessment, completed in 2003. One result of this aquatic resources assessment was a new priority lake list (Appendix A-2). The Council uses the priority lake list to focus its limited resources. This list is also used in the environmental review process to determine which lakes need to have a nutrient budget analysis completed if they are impacted by a proposed project.

The Council conducts special studies that look at specific aspects of water quality management. For example, the Council has collected mercury data throughout the region to characterize how it occurs and behaves.

Much of the built-up inner cities and first- and second-ring suburbs developed with no runoff management practices whatsoever. If anything, water was routed away fast to get rid of it. Redevelopment in these areas presents an excellent opportunity to expose runoff to infiltration, vegetative uptake, and settling through a number of successful "best management practices" (BMPs). The Council's *Minnesota Urban Small Sites BMP Manual* includes management practices for small development sites.

POLICY

The Council will provide technical assistance and resource assessment information to assist others in their efforts to implement practices that will protect water resources (wetlands, lakes, streams, rivers, and natural drainage courses). Best management practices help to maintain and improve water quality, control runoff rates and volumes to reduce streambank erosion and flooding, and preserve designated beneficial uses.

IMPLEMENTATION STRATEGIES

- *The Council will continue to monitor and assess lakes, streams, and rivers to measure the progress in achieving the goal of no adverse impact on water resources in the region.*
- *The Council will work with watershed organizations, local units of government, state and federal agencies, and other stakeholders to promote the protection of area lakes, wetlands, streams, and rivers with a special emphasis on priority lakes to achieve the goal of no adverse impact on water quality in the region.*
- *The Council will encourage and support the use of the most effective nonpoint source pollution reduction technologies. These include low impact development practices and best management practices aimed at protecting water quality and maintaining stormwater runoff rates and volumes at or below predevelopment conditions.*

Promoting Surface Water Management

Collectively, nonpoint and point source programs form the policy basis for achieving the no-adverse-impact goal: "The quality of water leaving the metropolitan area is as good as the water quality entering the metropolitan area, and in compliance with federal and state regulations."

To meet this goal, the Council has made a policy decision that ties together the control of pollution from point and nonpoint sources. If a community does not have a local surface water management plan and a stormwater/erosion and sediment control ordinance as part of their comprehensive plan, the Council will determine that the plan is incomplete for review. If they have a plan and ordinance and the plan or ordinance does not meet MPCA requirements for stormwater ordinances, or Council requirements for local surface water management plans, the comprehensive plan will be determined to be more likely than not to have an impact to our system, thus requiring a plan modification. Such a finding would require that the local plan be modified.

The premise behind this requirement is that the Council will not be able to obtain permits from the MPCA for our projects if these items are not satisfactorily completed.

Nonpoint source pollution management begins with the surface water management process in place within the region. Some form of watershed management organization (WMO) covers the entire region (Figure 9). Under state law, WMOs are charged with the preparation of a plan to manage surface water. Watershed programs are intended to: effectively protect and improve surface and groundwater quality; establish uniform local policies and official controls for surface and groundwater management; prevent the erosion of soil into surface waters; promote groundwater recharge; and minimize public capital expenditures needed to correct flooding and water quality problems.

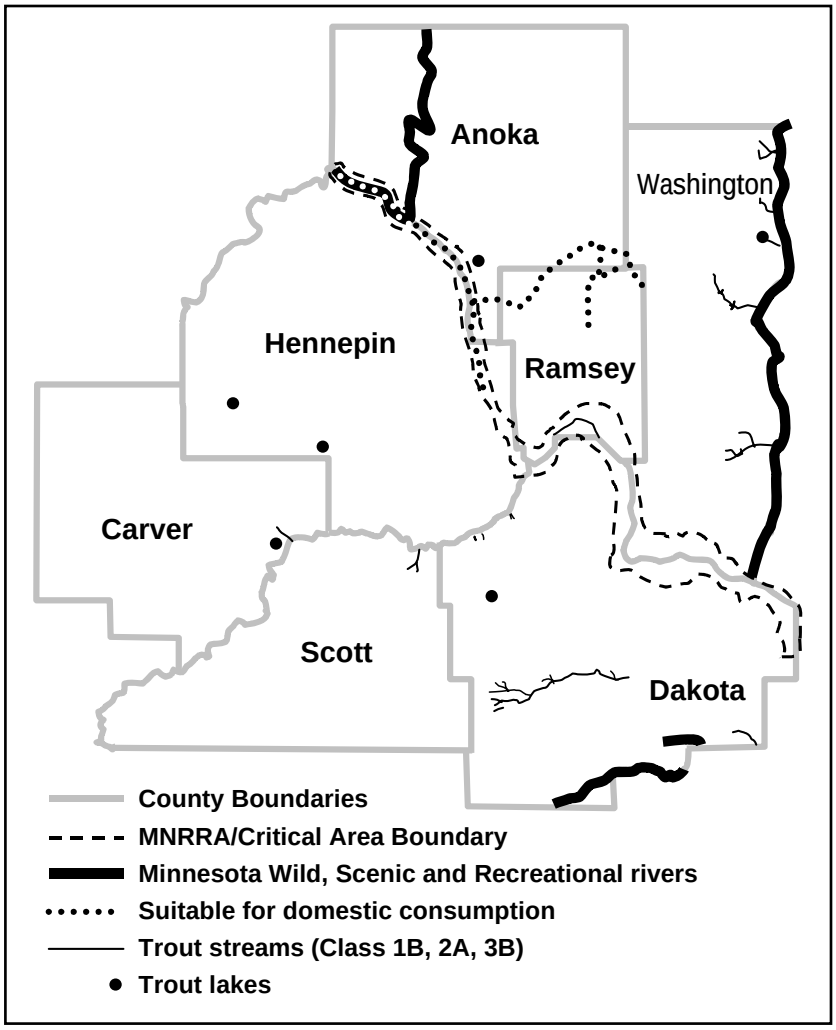
Once WMO plans are prepared, local governments must prepare local surface water plans that meet the standards and requirements of the applicable WMO plans. Local surface water management plans are required under state law and as part of the Metropolitan Land Planning Act. Appendix B2-b includes more information on the requirements for local surface water management plans. Most local units of government and WMOs have criteria that must be met for activities that would generate nonpoint source pollution. For example, erosion and sediment control ordinances require developers to use various best management practices to control erosion from construction sites.

Figure 9. Secondary Watersheds in Twin Cities Metropolitan Area

In addition to WMO and local programs to reduce nonpoint source pollution and improve water quality, several state programs are designed to improve water quality. Figure 10 illustrates the stream classification system of the State of Minnesota. Specific water quality standards exist for each of these classifications. Pollutant discharge levels from point sources of pollution are designed to meet these in-stream standards. Reaches of stream where water quality levels are not maintained, either from point or nonpoint source inputs, are identified by the Minnesota Pollution Control Agency (MPCA) and put on an "impaired waters" list for attention.

The "Section 303(d)" (of the Clean Water Act) listing sets the stage for determination of a Total Maximum Daily Load (TMDL), which is a calculation determining the allowable pollution load that can be discharged into the impaired water such that the water is not impaired. Information on the MPCA's TMDL program can be found at their web site, located at www.pca.state.mn.

Figure 10: State Classification of Surface Waters in the Twin Cities Metropolitan Area



In recent years, some overlap between nonpoint and point source pollution occurred when the U.S. Environmental Protection Agency (EPA) began a program of permitting certain nonpoint source activities. The current National Pollutant Discharge Elimination System (NPDES) Phase I nonpoint source program, implemented in Minnesota through

the MPCA, issues permits for certain activities that generate pollution, such as construction on sites greater than five acres, uncovered storage of chemicals, and unprotected industrial equipment that could contribute toxic material when exposed to precipitation. Phase I applied to cities with large populations, including the Cities of Minneapolis and St. Paul.

Phase II of this program increases coverage to essentially all of the urbanized and urbanizing parts the metropolitan area, and will cover construction activity that disturbs an area equal to or greater than one acre. Operators of "municipal separate storm sewers systems" and small construction activity are required to apply for NPDES permit coverage and to implement best management practices for stormwater. NPDES Phase II permit coverage began in 2003. A list of metropolitan area cities required to meet NPDES Phase II permit requirements is included in Appendix A-3.

In 1990, the Minnesota Legislature charged the Metropolitan Council (Minn. Stat. 473.157) with the preparation of "target pollution loads for watersheds in the metropolitan area." Target pollution loads will be used by the Council to identify current water quality of the sub-watershed outlets to the Mississippi, Minnesota and St. Croix rivers, and to set goals for future water quality that are aimed at having no adverse impact on the rivers as water passes through the metropolitan area. The Council's target pollution loads will be available to the MPCA to aid in their efforts and development of Total Maximum Daily Load (TMDL) for metropolitan area water bodies and the NPDES Phase II permit program for nonpoint sources of pollution.

POLICY

The Council will review local comprehensive plans, watershed management plans, local surface water management plans, local stormwater ordinances, environmental permits and other environmental documents to ensure that the local units of government are fulfilling their nonpoint source reduction requirements and therefore not impacting the metropolitan disposal system.

IMPLEMENTATION STRATEGIES

- *The Council will review environmental documents to ensure that actions of others are not causing a wastewater system impact.*
- *The Council will develop target pollution loads for the major watershed basins by 2008 and work in conjunction with the MPCA in the development of Total Maximum Daily Loads (TMDLs) to reduce the effects of nonpoint source pollution on the region's wetlands, lakes, streams and rivers.*

Wastewater Service

"The water quality leaving the metropolitan area is as good as the water quality entering the metropolitan area, and in compliance with federal and state regulations."

– 2030 Regional Development Framework

Controlling point source pollution is part of a total management program that includes effective nonpoint source pollution control. To achieve the *Framework* goal stated above, the Council will need to collaborate with other regional partners. Point source pollution control efforts over the last 30 years have resulted in a significant reduction in pollutant discharges. For example, the Council has been successful in reducing the amount of phosphorus that is discharged to the major rivers in the metropolitan area using a mix of point source and nonpoint source reduction strategies.

Nonpoint source pollution, however, remains behind in correction efforts, primarily because of the diffuse sources, the diverse entities involved and a significantly different regulatory approach than point source pollution control. In order to minimize impacts to the wastewater system from increased regulatory requirements to reduce pollution, the Council needs to encourage a combination of point and nonpoint source pollution strategies. The Council will focus on cost-effective strategies that result in the best use of regional funds.

Current Wastewater Services

The Metropolitan Council currently provides wastewater collection and treatment services to 2.5 million people in 103 communities. The existing Metropolitan Disposal System (MDS) was designed to provide long-term wastewater services to only a part of the metropolitan area and thus may not have adequate capacity to provide sanitary sewer services to all portions of the developing communities, as shown on the *Framework* planning areas map (Figure 2; page 8).

The wastewater system is operated through the Metropolitan Council's Environmental Services Division (MCES). The current MDS—consisting of eight wastewater treatment plants (Metropolitan, Empire, Rosemount, Blue Lake, Seneca, Eagles Point, Hastings, and St. Croix Valley) and approximately 600 miles of regional interceptors (Appendix E). The treatment system processes up to 300 million gallons of wastewater per day, which includes high-strength industrial waste from about 800 dischargers permitted by

MCES. The treatment system processes waste while maintaining a compliance rate with its state and federal water quality permits of over 99 percent.

The Metropolitan Council's responsibilities for operation of the MDS extend beyond merely collecting and treating domestic wastewater, industrial wastewater, and leachate from its service area. MCES also accepts septage from individual sewage treatment systems (ISTS), community and/or cluster systems, biosolids from municipal wastewater plants located within the rural metropolitan area and, as capacity permits, biosolids from areas located within surrounding counties and Wisconsin. MCES also accepts leachate from throughout Minnesota.

Additional information on the existing wastewater system can be found in the "Wastewater System Plan" section (pages 47–66) of this *Policy Plan*.

Serving Future Growth

The Council's updated wastewater system plan for the seven-county metropolitan area includes a specific plan for how wastewater service will be expanded to serve the region's projected 2030 growth, and a general plan to serve the region's growth well beyond 2030 (map is attached). The wastewater system plan has a longer planning horizon than local comprehensive plans, because sewers have a long useful life (80 years or longer), high capital cost, and significant disruption during construction, especially in developed areas. The wastewater system plan also supports achievement of regional goals for water quality, cost-effective service, and local community flexibility.

The attached map shows the long-term service areas for the wastewater treatment plants currently owned and operated by the Council. The service areas have been determined through a process as follows:

1) Estimation of the capacity of each treatment plant site based on potential long-term effluent discharge limits;
2) Estimation of the potential developable area that could be served by the plant, in addition to currently served areas; and
3) Analysis of existing interceptor capacity and future interceptor capacity, feasibility, and costs to determine the most cost-effective service-area configuration.

The system plan also recognizes the following future needs: wastewater treatment for Rural Growth Centers; future acquisition and expansion of the Rogers Plant; a new Hastings Plant; potential future regional plants in Carver and Scott Counties, discharging to the Minnesota River, and in northwest Hennepin County, discharging to the Crow River; and potential tertiary wastewater treatment with rapid infiltration (groundwater recharge) for moderate-size sewered development in suitable areas of Anoka County.

POLICY

The Metropolitan Council will use the wastewater system plan to support the orderly and economic development of the metropolitan area, including the long-term service area of communities. The long-term service area will be generally defined by a community or watershed boundary. A community's comprehensive plan and plan amendments are expected to meet the forecasts and densities specified in the Council's *2030 Regional Development Framework*. Inconsistencies will provide

the Council with grounds for finding that the community's plan is more likely than not to have a substantial impact on, or contain a substantial departure from, the metropolitan system plan, thus requiring modifications to the local comprehensive plan.

In order to provide cost-effective and efficient use of existing and planned infrastructure on a regional basis, local land-use planning must be consistent with the Council's adopted long-range policy plans, system plans and capital improvement programs for regional wastewater service, and all communities currently served by the Metropolitan Disposal System must remain in the system.

IMPLEMENTATION STRATEGIES

- *The Council will provide a level of wastewater service commensurate with the needs of the growing metropolitan area, and in an environmentally sound manner.*
- *The Council will provide sufficient sewer infrastructure capacity to meet the 20-year growth projections and long-term service area needs identified in local comprehensive plans. Any capital improvements that the Council needs to provide will be scheduled so that the infrastructure is available at least two years prior to the need identified in the approved comprehensive plan.*

The Council will work cooperatively with communities, regulatory agencies and the citizens of the region to help ensure that costly regional infrastructure, which is designed to provide multiple communities with service decades into the future, can be efficiently built and operated. The Council is responsible for developing system plans for the region that are consistent with the *2030 Regional Development Framework*. In response to the system plans, system statements with community-specific information are prepared and sent to each community to guide their local comprehensive planning. The communities prepare local comprehensive plans/sewer plans consistent with the systems statements. Local comprehensive plans/sewer plans are submitted to the Council. The Council reviews the comprehensive plans and, if the plans are consistent with the *Framework* and system plans, allows them to be put into effect.

- *New wastewater treatment plants, owned and operated by MCES, will be built to serve developing communities if they meet established criteria.*

Where it is not technically or financially feasible to extend the Councils interceptor system beyond the long-term wastewater treatment plant service areas, it will be necessary to construct new wastewater treatment plants to continue to allow for the urban development of the communities. New regional wastewater treatment plants will be built to serve those portions of developing communities that cannot be served through the existing MDS if they meet the following criteria:

  - The development of the area not served by the MDS results in wastewater flow of at least 500,000 gallons per day.
  - The communities adopt a satisfactory inflow/infiltration program to eliminate excessive inflow and infiltration.

- *The Council may implement early land acquisition and work closely with communities to preserve utility corridors when it is necessary to expand its facilities or locate new facilities needed to implement the wastewater system plan.*

Siting a wastewater treatment plant is challenging, especially if the need is imminent and development has already encroached on most potential sites. Acceptable corridors for the construction of future interceptor systems are becoming both harder to locate as new construction occurs and more expensive to buy. For this reason, it will be necessary to work with the developing communities early on in the planning process to set aside future wastewater treatment plant sites as well as possible utility corridors for future interceptor systems.

- *The Council will continue to provide wastewater services to communities based on the definition of a metropolitan interceptor.*

The Council seeks to contain the costs of the MDS as much as possible. One strategy is to minimize the number of points at which a regional interceptor meets a community's local sewer system. In providing new interceptor service to a community, the Council's responsibility is to provide the service to the community's border.

Definition: A metropolitan interceptor must meet at least one of the following criteria:

— Be designed to receive an average flow of at least 500,000 gallons per day from, or serve at least 1,000 developable acres in, local governments other than the one in which it is primarily located.

— Is located in one local government unit and conveys or is designed to convey at least 90 percent of the ultimate wastewater flow originating in an upstream local government.

— Is needed to directly connect other facilities owned or to be constructed by the Council.

Rural Growth Centers

The Council recognizes that some of the Rural Growth Centers located within the metropolitan area are under extreme pressure to add housing and employment to their communities, while others are not and do not want to take on large quantities of growth. If a rural center is willing to expand to accommodate the increased growth as forecasted by the Council, it may need the Council's Environmental Services division to become involved in the possible acquisition, operation and betterment of the wastewater treatment plant located in that community.

IMPLEMENTATION STRATEGIES

- *Existing wastewater treatment plants in rural centers (centers that do not want significant growth) will not be owned and operated by the Metropolitan Council.*

- *Existing wastewater treatment plants owned and operated by Rural Growth Centers (centers that want to grow) will be acquired and operated by MCES upon request and established Council criteria. The request for acquisition must be made to the Council through a comprehensive plan amendment. Alternately, the Rural Growth Center may request that the Council own and operate a new wastewater treatment plant to serve the community, following the same criteria and process.*

As these communities plan for the Council-projected growth for their communities, they may request that the Council acquire their wastewater treatment plants (WWTP) through

the comprehensive planning process. Acquisition of wastewater treatment plants in Rural Growth Centers will be based on the following criteria:

1. As part of the comprehensive planning process, the community must accept the Council's 2030 growth projections as well as preserve areas for growth post-2030.
   - — Counties with land-use planning authority must preserve areas surrounding the Rural Growth Centers for future growth.
   - — Surrounding townships and cities that have land-use planning and zoning authority must preserve areas surrounding the Rural Growth Center for future growth.
   - — A mechanism must be in place at the time of acquisition that provides for staged orderly growth in the surrounding area.
2. The wastewater treatment plant must be determined to be expandable.
   - — The existing WWTP site must provide an opportunity for expansion, or there must be an acceptable site available for a new wastewater treatment plant.
   - — There must be feasible and economical discharge options.

The following procedure would be used by a Rural Growth Center that wants the Council to consider acquisition of its wastewater treatment plant:

1. The community makes an official request to the Council to consider acquisition of its wastewater treatment plant.
2. The Council and local governmental units meet to discuss the wastewater treatment acquisition criteria, possible scheduling of needed wastewater treatment plant improvements, and administrative issues dealing with billing and permit requirements.
3. The community amends its comprehensive plan, requesting that it become a Rural Growth Center, and documents the mechanism to the Council to provide for staged orderly growth.
4. The Council reviews the comprehensive plan and, if all of the criteria are met, approves the comprehensive plan.
5. The Council and the community enter into a plant acquisition agreement.

- *If it is determined that a Rural Growth Center's wastewater treatment plant (WWTP) should be phased out and served by the Metropolitan Disposal System (MDS), then the Council will construct an interceptor from the existing treatment plant site or point of collection to a connection point within the existing MDS. The Rural Growth Center will be responsible to decommission the WWTP and take over the ownership of the interceptor from the WWTP or point of collection to their corporate limits.*

The Council will review, on a case-by-case basis, requests from Rural Growth Centers that the Council acquire and operate the community's wastewater treatment plant. In some cases it may be more efficient for the region to phase out the treatment plant by extending the MDS to the Rural Growth Center. If so, the Council will not acquire the plant. The Rural Growth Center will be responsible for decommissioning its treatment plant. The Council will construct and pay for the new interceptor and deed that portion of the interceptor located within the community to the community upon completion of the

project. In this scenario, the last step in the procedure would be an interceptor service agreement.

- *If comprehensive plans demonstrate that a Rural Growth Center will become contiguous to urban development, the Rural Growth Center will be reclassified under the 2030 Regional Development Framework as a developing community.*

In some cases the urban service area has or will be expanding within the 2030 time frame to a point where urban development is now contiguous to the Rural Growth Center. In these cases the Rural Growth Center will be reclassified under the guidelines for a developing community as shown in the *2030 Development Framework.* Then the Council will determine if it is in the best interest of the region to either acquire the existing WWTP or extend interceptor service. The community will be charged for its services consistent with the Council's guidelines for serving urban communities within the MDS.

All communities brought within the MDS must comply with the Waste Discharge Rules (including industrial permits), SAC procedures, infiltration/inflow rules, and other rules or conditions established for existing service areas.

Redevelopment

The *2030 Regional Development Framework* supports higher density redevelopment within the developed communities. The existing interceptor system that provides wastewater services to these communities may not have adequate capacity for the expanded growth. In these circumstances it may be necessary to reconstruct a portion of the existing MDS to provide the additional services to the community.

IMPLEMENTATION STRATEGIES

- *When proposed redevelopment is consistent with the 2030 growth projections, the Council will support redevelopment by funding improvements to the MDS for those communities that meet the established criteria.*

The Council will fund improvements to the MDS for those communities that are meeting the MCES-established inflow/infiltration goals or have an adopted inflow/infiltration elimination program.

- *When the proposed redevelopment exceeds the 2030 growth projections, the Metropolitan Council will consider cost-sharing improvements to the MDS for those communities that meet the established criteria if a cost-effective solution is available. Cost sharing will be determined on a case-by-case basis. Cost sharing will attempt to limit undue hardship for communities.*

Cost Sharing

Cost sharing between the Council and local governments may occur when either 1) the Council builds new regional facilities or makes needed improvements to existing facilities that provide added benefits to local communities, in addition to the expected regional benefits; and 2) when additional costs are incurred by the Council to provide the local benefit.

IMPLEMENTATION STRATEGY

- *The Council will consider the financial implications and the community will share the cost of providing the additional services when construction of new regional facilities provides added benefits to local communities in addition to the expected regional benefits, and when additional costs are incurred by MCES to provide the local benefits.*

The Council will use the current procedures under the existing cost sharing policy, when applicable, to negotiate cost-sharing agreements. Applicable cost sharing situations include, but are not limited to, the following:

— A local government seeks to change the timing, capacity, location, or staging of regional facilities to meet local needs.

— An interceptor provides trunk or lateral sewer benefits to a local community.

— MCES and communities undertake joint construction projects.

Rural Area

The *2030 Regional Development Framework* provides direction for development in the rural part of the region with the goal of preserving rural character and continuing to provide landscape diversity. The rural character surrounding the developed part of the metropolitan area provides the region with agricultural production, low-density rural housing, groundwater infiltration opportunities, and a sense of openness that adds to the region's quality of life.

In the Agricultural Preservation Area, regional wastewater investments are to be avoided. If constructing sewer lines across the Agricultural Preservation Area is the only practical solution, the Council will not allow service connections to be made to these interceptors. But since the interceptors are designed to provide for the long-term growth of the region (50 to 80 years) it may be prudent to design the interceptors with adequate capacity to serve the planned long-term service area to the interceptor at the time of its initial construction. These actions will limit the amount of development in these areas, thus preserving the agricultural character while maintaining a reasonable cost of service for the long-term needs of the region. The Council will work with communities through the local comprehensive planning process to determine when and where wastewater service is needed and how it can be provided in a technically sound and economical manner.

POLICY

The Metropolitan Council will not allow connections to the Metropolitan Disposal System within the rural planning area. The Council may provide capacity for the long-term needs of the rural and agricultural planning areas.

IMPLEMENTATION STRATEGY

- *Service will not be provided until the Council, in consultation with the appropriate community, designates the area as a developing community and the community amends its comprehensive plan accordingly.*

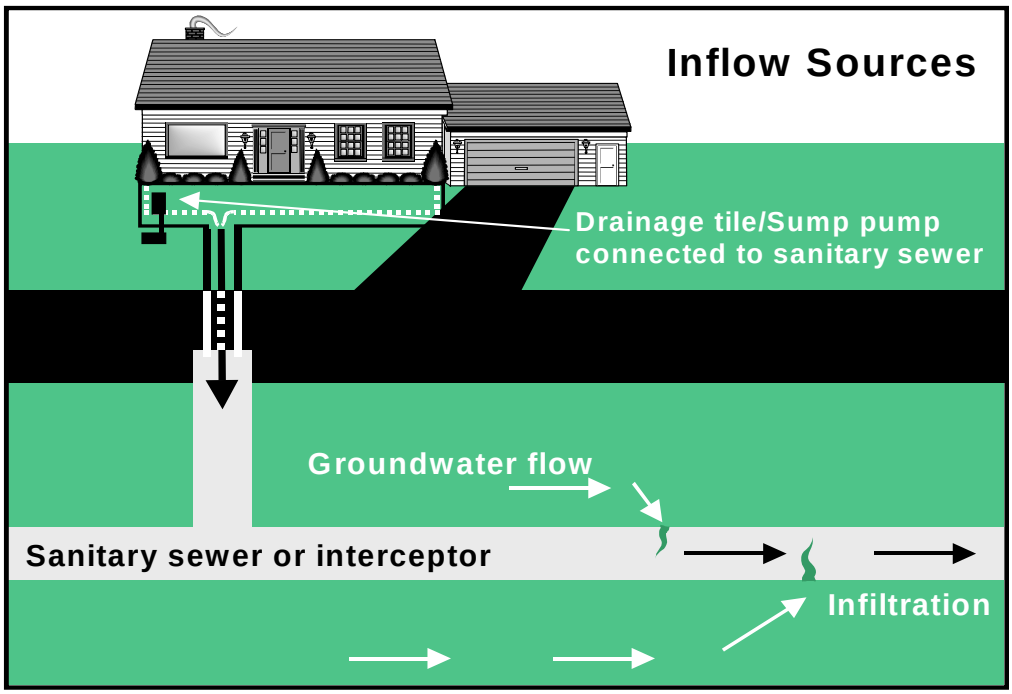
Management of the Wastewater System

Inflow and Infiltration

Infiltration is the seepage of groundwater into sewer pipes through cracks or joints. Inflow is typically flow from a single point, such as discharge from sump pumps and foundation drains, or stormwater entering openings in the sewer access covers (Figure 11). This water is considered an unnecessary addition to the volume of water being conveyed by the sewer.

Inflow during major rainfall events results in large quantities of flow entering the system very quickly in time periods that vary from a few hours to several days. During these periods, the Metropolitan Disposal System (MDS) is taxed to its limits, causing hydraulic surcharging, system backups and wastewater flow bypasses to occur. These high-peak events consume most if not all of the available capacity within the MDS and limit the available capacity needed to serve the projected growth for the region.

Figure 11: Inflow and Infiltration (I/I) into Local and Regional Wastewater Systems



Through its metering system, MCES continuously measures the volume of wastewater received in the MDS. These flow measurements include clear water entering the sewer system as well as the wastewater generated by customers. The flow includes rain-induced clear water that enters the local sewer system through leaks in the publicly owned sewer and manholes, as well as private property sources: rain leaders, sump pumps, foundation drains, and leaking house laterals. MCES flow records show a direct correlation between precipitation and the volume of clear water flow from many communities served by the regional wastewater system.

The addition of clear water into the local sewer systems creates two problems. First, the additional flow takes capacity that was originally designed for growth and, in some cases, the additional flow exceeds the available sewer system capacity. When the capacity of the sewer is exceeded, the wastewater backs up into basements or spills out of a manhole.

These occurrences are not allowable under federal and state regulations. Second, MCES charges communities the same rate for its clear water as it does for sewage. Communities, therefore, have a fiscal as well as a public policy reason for ensuring that the total system functions effectively and conforms to federal and state regulations.

The Metropolitan Council has projected significant growth in the metropolitan area by 2030. These population and employment projections are used to predict wastewater flows throughout the interceptor system and at each treatment plant. For the interceptor system, peak-hour flows are projected; and for the treatment plants, annual average, peak-month, and peak-hour flows are projected. The infiltration/inflow (I/I) component of peak-hour flow rates is estimated based on a computer model simulation of how rainfall generates I/I in areas tributary to the interceptor system.

The results of simulating the projected conditions in 2030 using current levels of I/I indicate the need for a significant investment in relief sewers and pump stations. Peak-hour flows to each plant in 2030 were projected with the interceptor model using 25-year and 100-year storm events. The peak flow to the Metropolitan Plant could reach over 1.3 billion gallons per day if enough relief sewers were constructed. This is nearly twice the rate that the twin-barrel joint interceptor can carry into the plant today. Doubling the hydraulic capacity of the Metropolitan Plant is not feasible because of site constraints. Thus, simply adding more capacity to convey and treat I/I is not a feasible option.

On April 8, 2003, the Metropolitan Council appointed individuals to serve on the Infiltration and Inflow Task Force. The task force was charged with reviewing the I/I issues, and formulating and proposing implementation strategies to reduce excessive I/I in local and regional wastewater collection systems. The task force recommendations were accepted by the Council for public meetings. This policy plan incorporates the task force recommendations.

Sewers, pump stations and treatment plants are designed to convey and treat wastewater. Facilities are sized to handle a projected wastewater flow rate. For conveyance facilities, the flow rate is usually the maximum rate expected for a one-hour duration. For treatment plants, the structures must pass not only the maximum rate, but the processes are designed to meet permit limits, usually specified as peak-month and peak-week conditions. Consequently, the maximum 30-day and 7-day average flows are important for sizing treatment plants.

The Council developed its peak hourly design standards in the early 1970s (Table 2). These standards were analyzed by the I/I task force and found acceptable for continued use by the Council in the design of the MDS. These standards will be used to establish I/I goals for each of the communities served by the MDS. Communities will be asked to develop an I/I reduction plan to reduce their peak hourly flows to meet these design standards. Those communities that discharge flows into the MDS at rates higher than the design standards put the system at risk of overflows and, therefore, have a substantial impact on the MDS.

The actual I/I goal will vary over time based on the average base flow for the community, which changes over time.

Table 2: MCES Flow Variation Factors

Average Flow (MGD)	Peak Hourly Flow Factor		Average Flow (MGD)	Peak Hourly Flow Factor
0.00 - 0.11	4.0		1.90 - 2.29	2.8
0.12 - 0.18	3.9		2.30 -2.89	2.7
0.19 - 0.23	3.8		2.90 - 3.49	2.6
0.24 - 0.29	3.7		3.50 - 4.19	2.5
0.30 - 0.39	3.6		4.20 - 5.09	2.4
0.40 - 0.49	3.5		5.10 - 6.39	2.3
0.50 - 0.64	3.4		6.40 - 7.99	2.2
0.65 - 0.79	3.3		8.00 - 10.39	2.1
0.80 - 0.99	3.2		10.4 - 13.49	2.0
1.00 - 1.19	3.1		13.5 - 17.99	1.9
1.20 - 1.49	3.0		18.0 - 29.99	1.8
1.50 - 1.89	2.9		over 30.00	1.7

POLICIES

The Council will not provide additional capacity within its interceptor system to serve excessive inflow and infiltration.

The Council will establish inflow and infiltration goals for all communities discharging wastewater to the Metropolitan Disposal System based on the designed peak-hour capacity of the interceptor(s) serving the community. Communities that have excessive inflow and infiltration in their sanitary sewer systems will be required to eliminate the excessive inflow and infiltration within a reasonable time period.

IMPLEMENTATION STRATEGIES

- *The Council will continue to use the current design standards for interceptors.*
- *The Council will develop inflow and infiltration goals for all communities based on the designed peak-hour capacity of the interceptor(s) serving the community as well as guidelines for the preparation of the local inflow and infiltration programs.*
- *The Council will ask all communities served by the MDS to begin the development and implementation of an inflow and infiltration program as soon as practicable and require the communities to include that program within their next comprehensive plan.*

Communities with excessive I/I will need to develop plans that reduce their I/I. Communities currently within their I/I goals will need to develop plans for maintaining acceptable levels as the local infrastructure ages. The Council will provide the communities with a tool box of I/I reduction options that can be used by the communities in the preparation of their plans.

- *Peak inflow during wet weather conditions will be measured by either the MCES metering system or by installation of temporary monitoring equipment in the sanitary sewer system.*

The Council will use its metering system to monitor wet weather events and notify communities when their peak hourly flows exceed the I/I goals for their communities. Meter data by stormwater events are available and can be provided to the communities upon request to help them evaluate their sanitary sewer systems.

- *The Council will require the community to reduce its inflow and infiltration to reach the design flow standard for each connection point to the MDS by no later than 2012.*

Under the requirements of the Metropolitan Land Planning Act communities have three years to update their comprehensive plans once the *Water Resources Management Policy Plan* has been updated. Thus, the Council expects all communities to have an updated plan by 2008. As part of the comprehensive plan, the Council is requiring that the community include an I/I program that will study I/I issues and adopt a five-year schedule for improvements to their system to meet the I/I goals.

- *The Council will limit increases in service within those communities where excessive inflow and infiltration jeopardizes MCES's ability to convey wastewater without an overflow or backup occurring, or limits the capacity in the system to the point where the Council can no longer provide additional wastewater services. MCES will work with those communities on a case-by-case basis, based on the applicable regulatory requirements.*

If at any time the excessive I/I from a community reaches a level that jeopardizes MCES's ability to convey wastewater without an overflow occurring, MCES will notify the community of the problem, meet with the community and attempt to arrive at an acceptable local solution to the problem. If no timely solution can be found then the Council will recommend to the MPCA that no new sanitary sewer extensions should be approved until the issue is resolved.

There are locations in the MDS where the excessive wet weather flow from several communities is using up the capacity designed for regional growth. But this growth restriction is not always limited to communities that aren't addressing their I/I problem. Other communities served by the same interceptor system that want to grow, and have either no excessive I/I or are taking action to eliminate excessive I/I, are also having their growth restricted. In these cases, the Council will provide wastewater conveyance facilities to serve both regional growth and to convey excessive I/I in the interim until the tributary communities achieve their I/I goals. Wherever possible the investment made to initially convey or treat the excessive I/I will be recovered to provide for long-term dry weather capacity for future growth as the excessive I/I is eliminated from the system.

- *MCES will work with communities to implement an initial inflow and infiltration reduction program during 2007 through 2011.*

  MCES will estimate the cost of I/I reduction to eliminate the sources of excessive peak flows. MCES will allow communities to undertake work to reduce inflow and infiltration using local funds, as long as those funds equal or exceed the estimated cost of I/I reduction. If a community does not voluntarily undertake this work, MCES will add an equivalent surcharge to the community's municipal wastewater charges. Upon community request, MCES may allow communities to undertake up to 50% of its 2011 work during 2012.

- *Starting in 2013, the Council will initiate an on-going, second phase of the I/I reduction program. Elements of the on-going program include: (1) continuation of the allowable peak hour flow by metershed approach; (2) adjustment of average baseline flow by metershed to normalize the effects of precipitation variability (drought and wet periods), to avoid penalizing communities for successful water conservation and I/I mitigation, and to account for growth; (3) adjustment of measured peak flow by subtracting estimated peak I/I into MCES interceptors in the metershed; and (4) continuation of appeal process that recognizes unusual conditions that contributed to a peak flow event, such as construction that may have temporarily allowed storm water entry into the sanitary sewer or other extraordinary circumstances.*

- *The Council may institute a wastewater rate demand charge for those communities that have not met their inflow and infiltration goals(s), if the community has not been implementing an effective I/I reduction program in the determination of the Council, or if regulations and/or regulatory permits require MCES action to ensure regulatory compliance. The wastewater demand charge will include the cost of wastewater storage facilities and/or other improvements necessary to avoid overloading MCES conveyance and treatment facilities, plus the appropriate service availability charges for use of MCES conveyance and treatment facilities.*

- *The Council will work with the Public Facilities Authority to make funds available for inflow and infiltration improvements.*

Currently, I/I projects on private property are not eligible for Public Facility Authority low-interest loans. I/I-related public projects typically receive a lower ranking than other public facility projects. The Council will support a change in the program or a new state program to facilitate discounted funding for all I/I removal projects.

Interceptor Reconveyance

The Council has statutory authority to convey interceptors by determining that the interceptor no longer serves a regional benefit. The Council identifies the local beneficiary(s) and puts the facility on an official pending reconveyance list.

The Council intends to convey existing interceptors that no longer meet the definition of a regional interceptor to benefited communities, thus shifting management and costs to the appropriate government and providing regional service at competitive and equitable rates. If an interceptor has no local benefit, the interceptor and related facilities will be abandoned.

POLICY

Interceptors and related facilities that are no longer a necessary part of the Metropolitan Disposal System will be reconveyed, abandoned, or sold pursuant to related statutes.

IMPLEMENTATION STRATEGY

- *The Council will declare interceptors that no longer function in the role of a metropolitan interceptor as being no longer needed to be part of the Metropolitan*

Disposal System, and convey the interceptor and ancillary facilities to the appropriate local governmental unit.

An interceptor (or segment of it) no longer has a regional role when it serves primarily as a local trunk sewer (including service to an upstream community for 200,000 gallons per day or less of wastewater flow) or if it conveys only stormwater. In the case where smaller communities have no other outlet for their wastewater, the Council will consider the interceptor as a metropolitan interceptor under the following conditions:

— The interceptor has been designed to provide wastewater service to all or substantially all of the upstream community, but the forecasted flows are less then 200,000 gallons per day; or

— The flow from the upstream community, although less then 200,000 gallons per day, is greater than 50 percent of the total forecasted flow within all reaches of the interceptor.

Rules and Regulations

The Metropolitan Waste Control Commission, before it merged with the Metropolitan Council in 1994, adopted Waste Discharge Rules for the Metropolitan Disposal System (MDS). These rules were adopted to provide for the efficient, economic, and safe operation of the MDS, and for the protection of the health, safety, and general welfare of the public in the metropolitan area.

POLICY

The Metropolitan Council, the delegated pretreatment authority, will implement and enforce the Council's Waste Discharge Rules for the Metropolitan Disposal System.

IMPLEMENTATION STRATEGY

- *To achieve the efficient and effective use of the MDS, the Council regulates the quantity and quality of waste discharges into public sewers.*

Operation of Wastewater Treatment Plants

MCES owns and operates eight wastewater treatment plants. The treatment plants process approximately 300 million gallons of wastewater each day, and discharge treated wastewater into the Mississippi, Minnesota, St. Croix and Vermillion Rivers. (By 2007, wastewater from the Empire WWTP will no longer be discharged into the Vermillion River.) Each year MCES achieves near-perfect compliance with its environmental permits, and is committed to continue this high level of performance.

The Council has developed two strategies designed to reduce phosphorus and mercury pollution and continue the high quality of wastewater treatment.

In implementing its Phosphorus Reduction Strategy, all Council treatment plants have initiated or achieved significant phosphorus reductions. More than 96 percent of all treated wastewater effluent is achieving <1 mg/l total phosphorus.

A highlight of the Council's Mercury Reduction Strategy is the Voluntary Mercury Amalgam Recovery Program. This award-winning program, developed in partnership

with the Minnesota Dental Association, will ensure reductions of mercury coming into the sewer system.

POLICY

The Council will ensure that the MCES treatment plants will continue to meet the stringent permit conditions imposed by the Minnesota Pollution Control Agency.

IMPLEMENTATION STRATEGY

- *The Council will continue to maintain the high quality of service of its wastewater system while meeting requirements of its environmental permits, supporting growth in a timely fashion and maintaining a reasonable cost for service.*

Septage

Because sewer service is not provided throughout the seven-county metropolitan area, there remains a need to accept septage that is removed as part of private wastewater treatment systems (individual sewage treatment systems and community or cluster systems). In addition, MCES accepts other hauled liquid wastes including holding tanks, portable toilet waste, landfill leachate, biosolids, commercial wastes and approved industrial waste loads. MCES may accept hauled liquid waste from outside the metropolitan area on a case-by-case basis.

MCES provides for the collection and treatment of hauled liquid wastes at designated disposal sites. The Council has assumed this responsibility to enable proper treatment of septage and other hauled liquid wastes originating from communities within the metropolitan area. During 2004, MCES completed a study to evaluate the effectiveness of this system and the impact that hauled liquid wastes have on its collection and treatment system to determine the most efficient and cost-effective method for treatment and disposal. The recommended plan provides for increased disposal site security, methods to record and monitor loads received, and minimization of adverse infrastructure impacts related to hauled liquid wastes (corrosion, sediment buildup and odors). Implementation will include disposal site improvements at several sites, as well as closures of a number of sites that are currently deficient. Fees collected from the liquid waste haulers (the users of the service) will fund the program at a level that fully recovers the costs for these services.

POLICY

The Council will accept septage, biosolids and other hauled liquid waste at designated sites. All hauled liquid wastes from within the region will be accepted at the full cost of service.

IMPLEMENTATION STRATEGY

- *The Council will continue to accept septage, biosolids and other hauled liquid wastes at designated sites for communities located within the metropolitan area. The Council may accept septage from communities beyond the seven-county metropolitan area as system capacity allows.*

- *Upon Council approval, the system-wide plan for hauled liquid waste acceptance will be implemented in order to provide this service in the most efficient and cost-effective manner.*

Rates and Charges

POLICIES

The Council will design and adopt fees and charges using a regional cost-of-service basis:

- **Municipal wastewater charges will be allocated to communities uniformly, based on flow. For communities determined by the Council to have excessive inflow and infiltration, surcharges and/or demand charges may be added.**
- **Industrial wastewater strength and load charge rates will each be uniform, and proportionate to the volume and strength of discharges.**
- **Load charges for septage, portable toilet waste, holding tank wastewater and out-of-region wastes will be uniform for each type of load, and based on the volume of the load and the average strength of the types of loads.**
- **Service Availability Charges (SAC) will be uniform within the urban service area of the region. SAC for a Rural Growth Center where a treatment facility is owned by the Council will be based on the reserve capacity of the plant and the Council's debt service specific to the Center. SAC for a Rural Growth Center where interceptor facility(s) are owned by the Council will be the urban SAC charge plus a charge based on the reserve capacity of the specific interceptor(s) and the Council's debt service specific to the Center.**

The Council will seek customer input prior to, and give at least three months notice of, any material changes in the design of fees and charges.

The Council will maintain wastewater rates for MCES that enable the division to:

- **Meet wastewater regulatory requirements;**
- **Implement MCES infrastructure rehabilitation and repair needs; and**
- **Provide wastewater capacity for growth consistent with the Council's *2030 Regional Development Framework.***

The goals for the allocation method and rate structure continue to be equitable, competitive rates and SAC fees, which completely cover the cost of the Council's wastewater systems and services. The Council's rate structure is designed to collect funds for the operation, maintenance, capital and debt services costs of the system in a way that is equitable to all users of the system and contributes to efficient economics for the region. The SAC rate and financial projections will be analyzed annually by MCES staff, and rate increases submitted to the Council for approval. In addition, staff will review the SAC program and financials at least biennially. Except in a multi-year regional economic downturn, the Council will set SAC rates to maintain a SAC reserve fund with a minimum balance requirement at the end of each year. That minimum balance would allow MCES to meet its SAC debt-service requirement in each of the following five years, even if SAC revenues are 20 percent below projections in each of those years.

A regional approach to defining municipal wastewater and industrial rates is used to ensure that decisions made are optimal for the region's environment and economy as a whole.

The Council's approach to rate design is based on a regional cost-of-service philosophy. Communities pay for the flow originating within their borders. New users pay for the capacity they demand through SAC. Industries pay for the cost of treating their higher strength discharges through a strength charge. Haulers pay for wastewater loads based on the cost of managing the loads. In other words, users are charged for the costs that the Council incurs to provide the specific services used.

The *2030 Regional Development Framework* and this *Policy Plan* allows the Rural Growth Centers that meet certain criteria to request that MCES acquire their wastewater treatment plants. The Council will establish separate and higher SAC rates for the Rural Growth Centers. These rural SAC rates will be separate from the current SAC that all current (urban) communities are charged, and will pay for the reserve capacity portion of the debt service for each individual Rural Growth Center. Rural Growth Center communities will be charged the same municipal wastewater charges and industrial fees as all communities served by the MDS.

Management of Private Wastewater Treatment Systems

Private Wastewater Treatment Systems

There are more than 75,000 individual sewage treatment systems (ISTS) and many more community systems in the metropolitan area. Cities and townships located within the rural area have allowed higher density development using community systems that are permitted by the MPCA. Both individual and community systems largely serve the parts of the region where wastewater collection and treatment is not available. The Council's intent is to work with communities to ensure that ISTS do not cause water quality problems in areas where urban-level sewer service is not available.

POLICIES

The Council will continue to use the Council's review authority under the Metropolitan Land Planning Act to ensure that communities that permit the construction of private wastewater treatment systems within their communities (community systems and individual sewage treatment systems) ensure that these systems are installed, maintained, managed and regulated by the community consistent with Minnesota Pollution Control Agency rules.

The community is responsible for permitting all private wastewater treatment systems. The Council will not provide financial support to assist communities if these systems fail.

The Council will allow the community to connect a failing private wastewater treatment system to the Metropolitan Disposal System, where there is available capacity, at the community's expense.

IMPLEMENTATION STRATEGIES

- *The Council, through the comprehensive planning process, requires that communities demonstrate that they have the capability to ensure that these systems (private wastewater treatment systems) are operated effectively within the standards required by the Minnesota Pollution Control Agency.*
- *The Council will support State rules for individual sewage treatment systems and work with local governments to assist in their implementation.*
- *The Council will support the Minnesota Pollution Control Agency's regulatory approach to community treatment systems.*

The Council's approach to avoid water contamination from private wastewater treatment systems has been to support Minnesota Rules, Chapter 7080, and to provide educational materials on the proper installation and maintenance of these systems.

- *The Council will require that copies of individual sewage treatment system ordinances and information on the management programs be submitted to the Council as part of the comprehensive planning process.*

The Council expects all communities to have an approved ISTS ordinance that is consistent with MPCA Rules, Chapter 7080. Figure 12 shows where the ISTS occur in the region. Most of these ISTS occur in the rural portion of the region.

In addition, the Council expects all communities or counties with ISTS authority to have an ISTS management program. The ISTS management program needs to ensure that facilities are operational and that ISTS are properly installed, maintained, remediated and managed. An ISTS management program would be one that at a minimum:

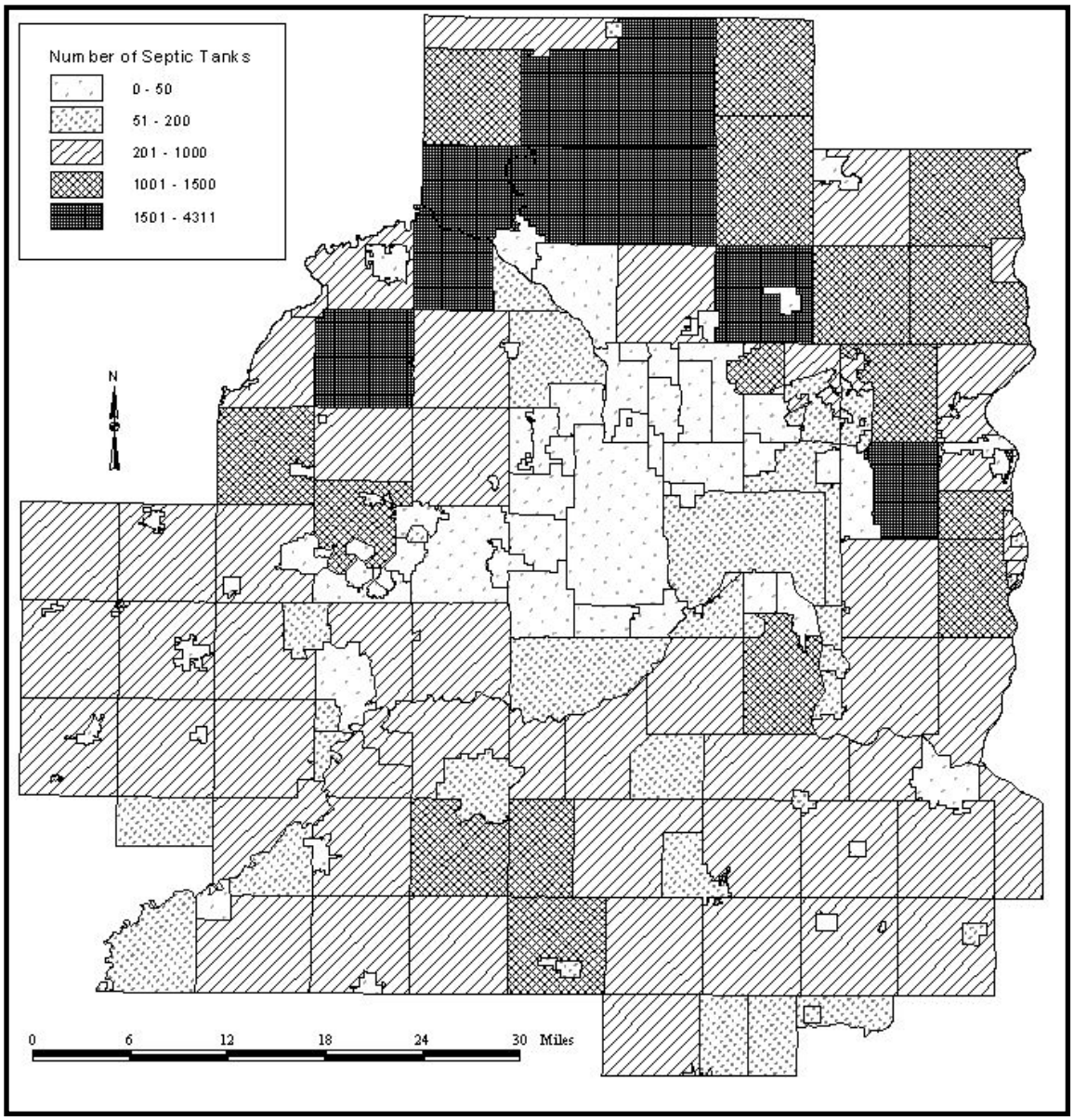
- — Requires inspections or pumping of all systems no less frequently than every three years.
- — Requires repair or replacement of failing systems within five years.
- — Requires replacement of systems that pose an imminent public health or safety threat within 10 months.
- — Include current number of systems.

— Establishes a tracking and notification database that includes items such as the year the system was built, the date each ISTS was inspected, the condition of the system, the volume and date the septage was pumped out, and information on whether or not systems are compliant with 7080 rules.

— Has an enforcement provision that allows the community to address systems found to be failing and/or imminent public health threats.

ISTS management program data and related information are expected to be submitted to the Council as part of the Council's annual ISTS survey.

Figure 12: Individual Sewage Treatment Systems in Twin Cities Metropolitan Area



Wastewater System Plan

Existing Wastewater Conveyance and Treatment System

The Metropolitan Council currently provides wastewater collection and treatment services to 2.5 million people in 103 communities, which represents about 90 percent of the seven-county metropolitan area's pollution.

The Council owns and operates the Metropolitan Disposal System (MDS). The MDS includes eight wastewater treatment plants: Metropolitan, Empire, Rosemount, Blue Lake, Seneca, Eagles Point, Hastings, and St. Croix Valley; it also includes approximately 600 miles of regional interceptors that connect flow from 5,000 miles of sewers owned by local communities. The system treats up to 300 million gallons per day of wastewater from homes, industries, and commercial businesses.

The system is operated through the Council's Environmental Services Division (MCES). MCES works with more than 800 industrial clients to substantially reduce the amount of pollution entering the wastewater collection system. Wastewater is reliably treated to high levels of pollutant removal. Permit limits continue to achieve near-perfect compliance with federal and state clean water standards. The map in Appendix E shows the location of all metropolitan interceptor sewers and wastewater treatment plants in the metropolitan area.

The Metropolitan Council's responsibilities for operation of the MDS extend beyond merely collecting and treating domestic wastewater, industrial wastewater, and leachate from its service area. MCES also accepts septage from individual sewage treatment systems (ISTS), community and/or cluster systems, biosolids from municipal wastewater plants located within the rural metropolitan area and, as capacity permits, biosolids from areas located within surrounding counties and Wisconsin. MCES also accepts leachate collected from landfills throughout Minnesota.

The following sections describe the system in more detail.

MCES Wastewater Treatment Plants

Metropolitan Wastewater Treatment Plant (Metropolitan Plant). Built in St. Paul in 1938, the Metropolitan Plant was the first wastewater treatment plant in a major city located on the Mississippi River. The plant has an average annual treatment capacity of 251 million gallons per day (Table 3). The Metropolitan Plant is the largest treatment facility in Minnesota and is among the nation's largest with 332 miles of regional interceptors, averaging 203 million gallons of wastewater every day from 62 communities (1.8 million people) and over 800 industries. About 75 percent of the wastewater generated in the metropolitan area is treated at the Metropolitan Plant.

The Metropolitan Plant utilizes the activated sludge process for treating wastewater, including phosphorus and ammonia nitrogen removal, prior to discharge to the Mississippi River. Sludge is processed by thickening, centrifugal dewatering, and fluid-bed incineration with energy recovery (steam and electricity). These processing facilities were completed in 2004 as part of a major rehabilitation and upgrade program at the plant. Ash from incineration is landfilled.

Empire Wastewater Treatment Plant. Built in 1979, the Empire Wastewater Treatment Plant is located in Empire Township and includes 16 miles of interceptors to serve approximately 100,000 people (Table 3). The Empire Plant serves Apple Valley, Lakeville, Farmington and portions of Empire Township and Rosemount. The plant currently discharges its wastewater to the Vermillion River.

The Empire Plant is being expanded from 12 mgd to 24 mgd, utilizing the activated sludge process for phosphorus and ammonia nitrogen removal. Biosolids are digested and spread on farmland. A new 13-mile pipeline is being constructed to convey treated wastewater through Rosemount to the Mississippi River, which will be completed by 2007. Concurrently, an interceptor is being constructed to convey wastewater from Rosemount to the Empire Plant, enabling closure of the Rosemount Plant in 2007.

Rosemount Wastewater Treatment Plant. The Rosemount Plant is MCES's smallest facility, treating an average of 800,000 gallons per day (Table 3). The plant uses conventional biological treatment with an aerated pond system. Secondary treatment is provided with effluent discharged to the Mississippi River. Solids production is minimized in the aerated pond process; accumulated biosolids will be removed as needed.

The facility serves most of the city of Rosemount (approximately 7,000 people) through eight miles of interceptors. The current capacity of the plant is 1.3 million gallons per day. Due to growth in the plant service area and overall economics, MCES will close the Rosemount Plant and convey the wastewater to the Empire Wastewater Treatment Plant starting in 2007.

Eagles Point Wastewater Treatment Plant. The Eagles Point Wastewater Treatment Plant began service in 2002, replacing the Cottage Grove Plant that had been in operation since 1962. The plant is located in and serves Cottage Grove (approximately 28,000 people) and will eventually serve much of Woodbury.

The Eagles Point Plant has a capacity to treat 10 million gallons of wastewater per day (Table 3). It removes phosphorus and ammonia nitrogen before discharging wastewater to the Mississippi River. Biosolids are processed and transported to the Metropolitan Plant.

Hastings Wastewater Treatment Plant. The Hastings Plant is located in Hastings along the Mississippi River. The plant serves approximately 18,000 residents in Hastings, discharging an average of 1.8 million gallons per day of wastewater to the Mississippi River (Table 3).

The Hastings Plant utilizes biological treatment technology. Biosolids are processed and transported to the Metropolitan Plant. The plant was designed to treat an average wastewater flow of 2.9 million gallons per day. The plant will reach the end of its useful life sometime between 2010 and 2015, by which time it will be relocated and expanded.

St. Croix Valley Wastewater Treatment Plant. The St. Croix Valley Plant is located on the St. Croix River, a nationally protected waterway. The plant is located in Oak Park Heights and provides service to Bayport, Oak Park Heights, and Stillwater (approximately 21,000 people) through one-third mile of interceptors. The plant currently treats an average of 3.4 million gallons of wastewater per day and has a design capacity of 4.5 million gallons of wastewater per day (Table 3).

The St. Croix Valley Plant utilizes the activated sludge process with chemical addition for phosphorus removal. Biosolids are processed and transported to the Metropolitan Plant. The plant also utilizes extensive odor control facilities to protect neighbors from nuisance odors.

Seneca Wastewater Treatment Plant. The Seneca Wastewater Treatment Plant is MCES's second-largest facility, and includes 46 miles of interceptors. The plant serves approximately 234,000 people in the communities of Eagan, Bloomington, Burnsville, Savage and parts of Inver Grove Heights, Lakeville, and Apple Valley. Built in 1972, the plant is the third largest in the state (after the Metropolitan Plant and a facility in Duluth).

The plant is located on the Minnesota River in Eagan. The plant's current capacity is 39 million gallons per day (Table 3). The Seneca Plant utilizes the activated sludge process for treating wastewater, including phosphorus and ammonia nitrogen removal, prior to discharge to the Minnesota River. Sludge is processed by thickening, centrifugal dewatering, and multiple hearth incineration. The resulting ash is landfilled.

Blue Lake Wastewater Treatment Plant. Blue Lake, the third largest MCES plant, is the fourth largest plant in Minnesota. Located on the Minnesota River in Shakopee, the Blue Lake Plant treats an average of 28 million gallons of wastewater per day. The plant provides service to 27 communities (approximately 236,000 residents) and includes 108 miles of interceptors.

The Blue Lake Plant has a design capacity to treat 37 million gallons of wastewater per day (Table 3). The Blue Lake Plant utilizes the activated sludge process for treating wastewater, including phosphorus and ammonia nitrogen removal, prior to discharge to the Minnesota River. Biosolids are processed by a solids handling facility. The solids handling facility is operated under a joint venture between MCES and the New England Fertilizer Company. The sludge produced at Blue Lake is dewatered, dried, and pelletized for use as a fertilizer.

Table 3. Metropolitan Disposal System Wastewater Treatment Facilities, 2004

Treatment Plant	Design Capacity (MGD)	Current Flow (MGD)	River Receiving Effluent	Liquid Treatment (4)	Solids Processing
Blue Lake	37	28	Minnesota	B, N, S (5)	Drying/ Pelletization
Eagles Point	10	3.8	Mississippi	B, N, P, S	Haul to Metropolitan
Empire	12 (1)	8.3	Vermillion (3)	B, N, S (6)	Digestion/Land Application
Hastings	2.9	1.8	Mississippi	B, S (7)	Haul to Metropolitan
Metropolitan	251	203	Mississippi	B, N, P, S	Incineration and Energy Recovery
Rosemount	1.3 (2)	0.8	Mississippi	B, P, S	Store in Ponds
St. Croix Valley	4.5	3.4	St. Croix	B, P, S	Haul to Metropolitan
Seneca	39	25	Minnesota	B, N, S (5)	Incineration

Notes: 1. Being expanded to 24 MGD by 2006.
2. Being eliminated by 2007; flow will be treated at Empire.
3. Outfall to Mississippi River being constructed by 2007.
4. B = Biochemical Oxygen Demand
N = Ammonia Nitrogen
P = Phosphorus
S = Suspended Solids
5. Plants are operated to remove phosphorus. Upgrades to meet phosphorus limits will be Completed by 2008.
6. Plant expansion includes phosphorus removal.
7. Phosphorus removal will be included in new plant, scheduled for operation in 2010.

Interceptor System Facilities

The Metropolitan Disposal System serves 103 communities in the seven-county area and has plans to serve several more communities in the near future. Each of these 103 communities maintains the sanitary sewer pipes that collect wastewater from homes, businesses, and industries. MCES operates and maintains a network of 600 miles of interceptor sewers, wastewater pumping stations, and flow metering stations that transport wastewater from the community sewer systems to eight wastewater treatment plants.

Lift Stations. Sixty-one lift (pumping) stations are currently active. Although most of the interceptor system relies on gravity to convey wastewater to treatment plants, variations in topography make it necessary for lift stations to pump wastewater to a higher elevation so that it can flow downhill toward the treatment plant.

Metering Stations. There are 188 metering stations used to determine wastewater flow from the 103 communities served by the MDS. The flow meters are regularly calibrated and maintained to provide accurate measurements of wastewater flow rates and volumes from each community. Flow measurements are used to establish wastewater service charges for each community.

Centralized Monitoring Facility. The operation of the interceptor system is centrally monitored at the Regional Maintenance Facility in Eagan. The interceptor network is closely monitored by a sophisticated computerized telemetry system that provides continuous data and monitors the status of MCES's facilities, lift stations, and flow meters. Unusual conditions trigger an alarm display on the monitor so that appropriate service personal can be dispatched to investigate and correct the problem. Dispatchers staff the center 24 hours a day, 365 days a year.

Non-MDS Wastewater Treatment Plants

There are 17 municipal wastewater treatment plants in the metropolitan area that are not currently owned or operated by MCES. These treatment plants are owned and operated by the municipality where they are located: Belle Plaine, Bethel, Carver, Cologne, East Bethel, Elko-New Market, Hamburg, Hampton, Jordan, Loretto, Mayer, New Germany, Norwood-Young America, Rogers, St. Francis, Vermillion, and Watertown.

The locally owned treatment plants are all required to treat to secondary treatment standards. The smallest plant, Bethel, has an average design capacity of 37,500 gallons per day (Table 4). The largest plant, Rogers, has a maximum month design capacity of 1.6 million gallons per day. Most of the Rural Growth Center treatment plants discharge to some type of surface water such as a creek, ditch, or rivers; however, the Bethel and St. Francis wastewater treatment plants discharge to the groundwater through a rapid infiltration system.

The Council recognizes that some rural centers in the metropolitan area are under extreme pressure to add housing and employment to their communities, and thus expand their municipally owned wastewater treatment plants, while others are not and do not want to take on large quantities of growth. If a rural center is willing to expand to accommodate the increased growth as forecasted by the Council, it may need MCES to become involved in the possible acquisition, operation and betterment of the wastewater treatment plant located in that community.

Table 4. Municipal (Non-MDS) Wastewater Treatment Plants

Treatment Plant	Design Capacity, gpd (1)		Receiving Water	Effluent Limits (2)
	Max Month	Average		
Belle Plaine	974,000	839,000	Minnesota River	B, P, S
Bethel	-	37,500	Ground Water	Aerated Pond
Carver	361,000	255,000	Carver Creek (to Minnesota)	B, N, S
Cologne	325,000	260,000 (4)	Ditch to Lake Benton	B, P, S
East Bethel	120,000	96,000	Minard Lake	B, P, S
Elko-New Market (3)	95,000	76,000 (4)	Vermillion River	B, N, S
Hamburg	-	63,000	Ditch to Bevens Creek (to Minnesota)	B, S
Hampton	-	101,000	Ditch to Vermillion River	B, S
Jordan	1,289,000	580,000	Sand Creek (to Minnesota)	B, N, P, S
Loretto		61,000	Slough to Spurzem Creek	B, P, S
Mayer (3)	135,000	108,000 (4)	Crow River	B, N, P, S
New Germany	-	46,000	Crow River	B, S
Norwood-Young America	-	517,000	Ditch to Bevens Creek (to Minnesota)	B, S
Rogers	1,602,000	1,280,000 (4)	Ditch to Creek to Crow River	B, P, S
St. Francis	540,000	432,000 (4)	Ground Water	B, N, P, S
Vermillion	-	54,000	Ditch to Vermillion River	B, S
Watertown	1,262,000	362,000	Crow River	B, N, S

Notes: 1. Flow as stated in NPDES Permits, except as described in note 4
2. Effluent Limits:
B = Biochemical Oxygen Demand
N= Ammonia Nitrogen
P = Phosphorus
S = Suspended Solids
3. Expansion proposed
4. Average flow estimated, based on maximum month flow times 0.8

Wastewater Flow Projections

The wastewater flow projections that are used in the preparation of this System Plan are based on the sewered population, household and employment projections for each community as shown in Appendix B1-a. Table 5 provides a summary of sewered population, household and employment projections for each wastewater treatment plant service area.

Table 5. Sewered Population, Household, and Employment Forecasts (Thousands)

Wastewater Treatment Plant	Population				Households				Employment			
	2000	2010	2020	2030	2000	2010	2020	2030	2000	2010	2020	2030
Blue Lake	237	314	386	419	90	124	156	171	162	196	224	243
Eagles Point	48	71	99	121	16	26	38	48	13	23	34	45
Empire	108	162	210	242	36	57	78	92	30	42	51	58
Hastings	18	23	27	30	7	9	11	13	8	9	9	9
Metropolitan	1,735	1,932	2,118	2,243	693	786	872	932	1,118	1,272	1,382	1,462
St. Croix Valley	21	28	30	32	8	10	11	12	18	21	23	25
Seneca	234	253	269	280	92	102	112	118	182	212	228	246
Rogers	4	10	17	25	1.2	3.3	6.2	9.3	4.2	9.1	12	16

The wastewater flow projections that are shown in Appendix B1-b were calculated using 75 gallons per day (gpd) per person and 25 gpd per employee from new development, and gradual reduction of wastewater flow from existing development, which reflects water conservation and reduction of inflow and infiltration. These projections represent annual average flow conditions for each community served by the Metropolitan Disposal System; these projections will be submitted to the communities as guidelines to be used in the preparation of the comprehensive plans. MCES will use sewered population, household and employment information to estimate system flows and schedule needed improvements to the Metropolitan Disposal System.

Table 6 provides a summary of wastewater flow projections for each wastewater treatment plant service area. The low figure in the range of projected flows is based on the above projection method. The high figure is based on 85 gallons per day (gpd) per person and 30 gpd per employee from new development.

Table 6. Wastewater Flow Projections (Million Gallons Per Day)

Wastewater Treatment Plant	2000	2010	2020	2030
Blue Lake	28.3	34.0 - 34.9	39.4 – 41.2	41.7- 43.9
Eagles Point	3.8	5.6 - 5.9	7.8 - 8.5	9.6 - 10.5
Empire	9.8	13.8 – 14.4	17.2 - 18.3	19.5 - 21.0
Hastings	1.8	2.1 - 2.2	2.4 – 2.6	2.6 - 2.9
Metropolitan	202	213 – 216	225 - 230	229 - 235
St. Croix Valley	3.4	3.7 - 3.8	3.9 – 4.2	4.1 - 4.5
Seneca	24.9	25.5 – 25.7	27.1 – 27.7	27.6 – 28.4
Rogers	0.54	1.1 - 1.2	1.7 - 1.9	2.4 - 2.7

When planning new interceptors and treatment plants it is prudent to use more conservative methods of flow projections to provide flexibility in the system to accommodate future development. For this reason, MCES has also projected each community's flows using two additional methods. The first method uses 274 gpd per household and 30 gpd per employee to project flows through 2030. The second method,

to project the long-term needs of the region, uses 800 gpd per developable acre for the developing communities and adds 10 percent post-2030 growth for redevelopment in the developed communities. These more conservative methods of flow projection were used in the following sections to program interceptor system improvements.

Long-Term Wastewater Service Areas

The wastewater system plan includes a specific plan to serve the region's projected 2030 growth and a general plan to serve the region's growth well beyond 2030. The wastewater system plan has a longer planning horizon than local comprehensive plans, because sewers have a long useful life (80 years or longer), high capital cost, and significant disruption during construction, especially in developed areas. The wastewater system plan also supports achievement of regional goals for water quality, cost-effective service, and local community flexibility.

Existing Metropolitan Disposal System

Beneficial water use classifications and water quality standards to protect those uses are promulgated by the Minnesota Pollution Control Agency (MPCA) for the waters of the state, which includes lakes, rivers, and groundwater. Wastewater treatment removes organics, suspended solids, and nutrients (nitrogen and phosphorus) to meet discharge permit limits established by MPCA to maintain compliance with their water quality standards. Control of urban and agricultural runoff is also important for protecting water quality, especially for phosphorus and suspended solids.

Wastewater treatment costs increase as effluent limits become more stringent. Effluent discharge limits for major rivers tend to be less stringent than effluent discharge limits for smaller rivers, lakes, and groundwater, because major rivers have a higher capacity to cleanse themselves through natural processes. Consequently the Metropolitan Disposal System supports the coordinated, economical and orderly development of the region by serving major portions of the region and discharging treated wastewater primarily to the Minnesota and Mississippi Rivers, along with one small discharge to the St. Croix River, which is a National Scenic River and Outstanding Resource Value Water.

The attached map shows the long-term service areas for the wastewater treatment plants currently owned and operated by the Council. The service areas have been determined through a process as follows:

1. Estimate the capacity of each treatment plant site based on potential long-term effluent discharge limits;
2. Estimate the potential developable area that could be served by the plant, in addition to currently served areas; and
3. Analyze existing interceptor capacity, future interceptor capacity, feasibility and costs to determine the most cost-effective service area configuration.

These long-term service areas consider development and redevelopment potential well beyond 2030 by analyzing wastewater capacity on the basis of developable area, which excludes lakes, rivers, wetlands, steep slopes, and parks. The areas are established based on a wastewater generation rate of 800 gallons per acre per day for developing communities and by including 10 percent post-2030 growth for developed communities. In areas with other significant natural resources or circumstances requiring more area devoted to stormwater management, such as trout stream watersheds and/or tight soils

(making infiltration of stormwater more difficult), the area effectively available for future development will be further reduced.

Several developing communities have areas of large-lot (e.g. 2½ acres) development served by septic systems. These areas could potentially be redeveloped at higher densities served by sewers, and could be served by the Metropolitan Disposal System. The MDS has been designed to provide future wastewater services to large undeveloped portions of the region as shown on the long-term wastewater service area map. Communities should address the staging of growth for these areas through 2030 as well as the protection of the remaining rural areas for future sewered development in their local comprehensive plan updates and surface water management plans. The wastewater system plan addresses these issues on a case-by-case basis. The system is conservatively designed, because the increased incremental cost (typically one pipe-size difference) is small.

Long-Term System Development

The long-term wastewater service areas show 2020 Metropolitan Service Area (MUSA) and 2020-2040 Reserve areas from the 1998 local comprehensive plan updates as areas for which regional wastewater service is committed, although capacity may be staged and not yet fully in place. The regional wastewater system can be expanded to serve areas beyond the current 2020 MUSA and 2040 Reserve areas. These potential service areas, as shown on the long-term wastewater service area map, include: (a) areas that are contiguous to the current service area; (b) areas that are contiguous to non-MDS plants, e.g. Rogers and Rural Growth Centers; and (c) areas that can be served by future MDS plants. Those areas that can be served by expansion of the service area of existing MDS plants are shown on the map. The other areas are conceptual and will be defined more clearly in the future through discussions with local communities and counties and through feasibility studies on a case-by-case basis. Although the actual expansion of the MDS is based on providing wastewater system capacity to facilitate development in communities consistent with their approved comprehensive sewer plans, the most efficient expansion of the regional wastewater system is to serve, in order:

1. The areas in the 2020 MUSA and 2020-2040 Reserve Area;
2. The potential service areas of the existing regional wastewater treatment plants; and
3. Non-MDS plants (Rogers and Rural Growth Center plants) which become part of the MDS, as well as potential future MDS plants, such as Crow River, Carver County, Scott County, and Anoka County.

This reflects the economy of scale of the existing regional wastewater treatment plants, as well as the broader infrastructure efficiency of contiguous sewered development at a density of three units per acre or greater. To meet the overall goals and policies of the *2030 Regional Development Framework*, it will likely be necessary to develop these three elements of the long-term regional system concurrently. When resources are limited, the staging of the capital improvement program will consider the relative life cycle costs of each project specific to these three elements of the regional wastewater system, balanced to meet the needs of local communities and the region as a whole.

Non-MDS Wastewater Treatment Plants

The City of Rogers owns and operates its own wastewater treatment plant, which also serves part of Hassan Township and a small portion of Dayton. Rogers has requested that the Council acquire its plant within the next several years. Because the local comprehensive plans in the northwest area show contiguous development by 2020, the regional wastewater system plan includes acquisition and expansion of the Rogers plant. An alternative, which may be considered, is the acquisition of a new treatment plant site and construction of a new plant to serve Rogers and Hassan and, in the long-term, other areas of the Crow River watershed (see discussion of future wastewater treatment plants).

There are 15 municipal wastewater collection and treatment systems serving Rural Centers. These are the focus of the Rural Growth Center policy in the Wastewater Service chapter in this plan. The regional wastewater system plan will not address the specific method for wastewater handling for each of these plants. That will be addressed through the Council's capital improvement program following plant acquisition via voluntary agreement between the city and the Council. Communities should plan on a five- to seven-year implementation period for expanding wastewater capacity, following the voluntary agreement.

The following specific provisions are included in the system plan:

- ***Elko-New Market*** will be served by an interceptor to the Empire Plant by 2010.
- ***Carver*** will be served by an interceptor to the Blue Lake Plant by approximately 2010, depending on local request.
- ***Loretto*** will be served by the Metropolitan Plant via the Elm Creek Interceptor. Timing should be coordinated with surrounding development in Medina, which is currently designated as 2020-2040 Reserve Area in Medina's comprehensive plan.
- ***Jordan and Belle Plaine*** along the Highway 169 corridor are potential candidates for future incorporation into a regional wastewater treatment plant. This corridor is designated as Reserve Area in the Scott County comprehensive plan.
- ***Hampton and Vermillion*** are potential candidates for incorporation into the Empire Plant service area. However, timing of interceptor service should be coordinated, not only with these communities following their request, but also with the plans of adjacent townships. Expansion of these cities' wastewater treatment plants will be challenging, because increased discharge to the Vermillion River is environmentally sensitive. Spray irrigation on farmland may be a viable interim expansion alternative.
- ***East Bethel*** along the Highway 65 corridor is a Rural Growth Center which will be served by a new wastewater treatment plant and rapid infiltration basin (groundwater recharge) system. Wastewater treatment system capacity will be staged to accommodate growth. Long-term wastewater service capacity for East Bethel is being planned based on groundwater recharge capacity of suitable rapid infiltration basin sites in East Bethel. This long-term wastewater service capacity is estimated at 5,000,000 gallons per day, which is the amount of wastewater generated from approximately 25,000 households. This long-term wastewater service capacity closely matches the projected wastewater flow generated by the long-term wastewater service area delineated in the draft East Bethel Comprehensive Plan. If additional rapid infiltration basins can be site in Ham Lake and/or Oak Grove, the wastewater

treatment plant could be further expanded to serve portions of Ham Lake and/or Oak Grove.

Potential Future Wastewater Treatment Plants

Crow River Watershed. The Rogers Plant can be expanded to serve the needs of Rogers and Hassan (that portion planned for sewered development). The eastern portion of Corcoran can be served by the Elm Creek Interceptor, as well as a small portion of southwestern Corcoran. However, there is likely to be long-term development in western Corcoran and portions of the Crow River watershed. Further, permanent location of the Rogers Plant in the center of Rogers will probably face community opposition eventually, especially given its proximity to the commercial area at Interstate 94/Highway 101. Consequently, it is likely that a new wastewater treatment plant will eventually be needed for the Crow River watershed to serve Rogers, Hassan, western Corcoran, Greenfield, and Independence. As discussed earlier, it may be prudent to site a new plant sooner rather than later.

Carver County. The potential wastewater generation from the long-term service area of the Blue Lake Plant could exceed the build-out capacity of the plant site sometime after 2030. The plan to address this possibility is a service area revision that diverts wastewater from western communities, such as Waconia, Laketown Township, Minnetrista, and St. Bonifacius, to a new regional wastewater treatment plant in Carver County, with effluent discharged to the Minnesota River. This new plant should probably be located south of Highway 212, so that it could also serve development along the corridor between Chaska and Cologne, as well as replacing the Cologne Plant.

Scott County. In Scott County, the Blue Lake Plant can serve Prior Lake, Shakopee, Jackson Township, and northern Spring Lake Township. The service area along Highway 169, including Louisville Township, Sand Creek Township, St. Lawrence Township, Belle Plaine Township, and Blakely Township needs a long-term wastewater service plan. Near-term service is expected to be provided by Jordan and Belle Plaine. This area is a candidate for a long-term regional wastewater treatment plant.

Anoka County. The Metropolitan Plant service area extends to Lino Lakes, Blaine, Andover, and Ramsey in Anoka County. The Rum River has been designated as an Outstanding Resource Value Water by the MPCA. Consequently, future wastewater treatment systems in northwest Anoka County will need to provide a high level of treatment followed by rapid infiltration to groundwater. This method is used by Bethel and St. Francis and could be used to serve future sewered development beyond the service area of the Metropolitan Plant. For example, a new sewered community could be developed along Highway 65 in East Bethel or along Highway 47 in Burns Township/ Oak Grove.

Hastings. A new Hastings Plant is planned to replace the existing plant located near downtown. The new plant will be expandable, with a long-term service area which may include portions of Marshan, Nininger, and Vermillion Townships.

Capital Improvement Program

Base Plan

Annually the Council adopts a capital improvement program, authorized capital program (funding authorizations for projects), and capital budget (annual funding appropriation for projects). This section of the system plan presents an overall capital improvement plan for the 2005 to 2030 period. The three objectives of the capital improvement plan are:

1. Maintain the infrastructure investment through rehabilitation/replacement;
2. Expand the system capacity through treatment plant and interceptor expansions and interceptor extensions; and
3. Improve the quality of the system by upgrading the wastewater treatment process, improving odor control and flow metering, increasing system reliability, and other performance improvements.

Table 7 presents a general description of projected capital improvement needs by wastewater treatment plant and associated interceptor system, and a statement of project objective, timing, and estimated cost. Capital cost estimates are presented using three percent annual inflation.

Total projected capital cost for 2005 to 2030 is approximately $3.8 billion. On an annual spending basis, with adjustment for inflation, this equals the level of spending during 1970 to 2004. Total projected capital costs by objective are approximately 55 percent for infrastructure maintenance, 42 percent for growth, and 3 percent for quality improvement. These cost estimates do not include the costs to comply with future regulatory requirements, nor to store, convey, and treat excessive infiltration/inflow.

The regional wastewater system capital improvements are financed by Metropolitan Council general obligation bonds and Minnesota Public Facilities Authority loans. During the 1970s and 1980s, most of the capital improvements were funded by federal and state construction grants. Consequently, wastewater system debt service will increase higher than the inflation rate through 2010, which completes the 20-year transition from grants to 100 percent metropolitan funding. Thereafter, debt service is projected to increase approximately at the rate of inflation. Operating costs are expected to increase at approximately the rate of inflation plus growth.

Infiltration/Inflow

Currently, many communities in the service areas of the Blue Lake Plant and Metropolitan Plant generate peak wastewater flows that exceed the MDS design standards. If this excessive infiltration/inflow is not removed, it must be stored, conveyed, and treated. Estimated capital costs are approximately $290 million for storage/conveyance and $170 million for treatment.

A major adverse regional wastewater system impact of excessive inflow and infiltration is that wastewater treatment plant capacity is utilized (sites have a finite capacity). The total estimated loss of wastewater treatment capacity for growth is 60 mgd, which could serve 75,000 acres of developable land.

Table 7. Regional Wastewater System Plan – Capital Improvement Plan (Costs in $1,000,000s)

Facility/Area	Project	Objective	2005 - 2010	2011 - 2020	2021 - 2030
Wastewater Treatment Plants					
Metropolitan	Liquid Treatment: Retrofit plant to provide biological phosphorus removal; rehabilitate/replace process equipment, electrical and mechanical systems, and disinfection system.	R, Q	$14		
	Solids Processing: Replace solids processing system with new dewatering and incineration system with energy recovery and improved air pollution control, including mercury removal; provide facilities to chemically stabilize and store a portion of the solids for land application.	G, R, Q	$20		
	Equipment/Utilities: Rehabilitate/replace major process equipment, power distribution, and plant utility systems, which are not included in the liquid treatment and solids processing systems.	R		$100	
	Odor Control: Covers for remaining area of primary tanks and treatment of ventilation air.	Q		$15	
	Disinfection: On-site sodium hypochlorite generation.	Q		$15	
	Expansion: Primary clarifier; two aeration tanks; four final clarifiers; effluent filters.	G			$350
Blue Lake	Expansion/Upgrade: Retrofit plant to provide biological phosphorus removal; replace disinfection system; expand liquid treatment and solids processing; rehabilitate utility systems.	G, R, Q	$34	$90	
	Rehabilitation: Rehabilitate/replace process equipment in liquid treatment and solids processing.	R		$15	$50
Eagles Point	Solids Processing: Provide solids dewatering to reduce truck haul volume.	G		5	
	Rehabilitation: Rehabilitate/replace process equipment and control system.	R			$25
	Expansion: Expand plant to 15 mgd.	G			$45
Empire	Expansion/Outfall: Plant expansion to 24 mgd; 13-mile effluent outfall to Mississippi River.	G, Q	$90		
	Solids Processing: Additional digestion, dewatering and storage.	G		$10	
	Process Equipment: Additional pumps, blowers; control system.	G		$5	
	Outfall Phase 2: Second forcemain and/or on-site effluent storage to provide capacity and reliability.	G			$15
	Plant Expansion: Plant expansion to 30 mgd.	G			$80

Table 7. Page 2

Facility/Area	Project	Objective	2005 - 2010	2011 - 2020	2021 - 2030
Hastings	New Plant: Site acquisition; conveyance from existing plant site; new 4 mgd plant with phosphorus and ammonia removal.	G, R, Q	$50		
Rogers	Plant Acquisition/Expansion: Acquire plant and expand to 3 mgd.	G	$17		
Seneca	Disinfection/Phosphorus: Retrofit plant to provide biological phosphorus removal; replace disinfection system; rehabilitate older portions of plant.	R, Q	$15		
	Solids Processing: Replace existing solids processing facilities.	R		$80	
	Liquid Treatment: Rehabilitate primary and secondary treatment facilities.	R			$40
St. Croix Valley	Rehabilitation: Rehabilitate/replace process equipment.	R		$15	
	Expansion: Expand plant to 6 mgd.	G			$25
Rural Growth Centers	Acquisition/Expansion: Based upon voluntary agreement between cities and Council, acquire plants and expand to serve agreed upon growth.	G	$50	$50	$40
TOTAL: WASTEWATER TREATMENT PLANTS			**$260**	**$400**	**$700**
Interceptor System					
Metropolitan					
Northeast System	L3 Flow Attenuation: Provide temporary above-ground storage tanks to shave peak flows until downstream sewer relief projects are implemented.	G	$8		
	White Bear Relief: Provide new interceptor through White Bear Lake to relieve Interceptor 6901; connect to Upper Beltline Interceptor.	G	$43		
	Middle Beltline Relief: Provide parallel gravity interceptor through St. Paul to expand capacity.	G	$9		
	Upper Beltline Relief: Provide parallel gravity interceptor between St. Paul and White Bear Lake to expand capacity.	G	$2	$98	
	Hugo-Forest Lake Relief: Provide parallel gravity interceptors; rehabilitate, expand, and upgrade L2 and L3; add dual forcemains.	G, R	$2	$40	
	Mahtomedi Relief; L7: Provide parallel gravity interceptor; rehabilitate, upgrade, and expand L7.	G		$12	
	Interceptor 1-VH-422: Relocate portion of interceptor to accommodate highway construction at I-694/I-35E.	R	$3		

Table 7. Page 3

Facility/Area	Project	Objective	2005 - 2010	2011 - 2020	2021 - 2030
Northwest System	Elm Creek Interceptor: Extend service to Corcoran, Dayton, Hassan, Medina; re-locate section along Hwy 610/CR 81.	G	$30		
	Dayton-Champlin Interceptor: Extend service to northeast Dayton.	G	$10		
	Elm Creek Interceptor: Storage facilities to shave peaks and increase average flow capacity.	G		$25	
	Brooklyn Park Interceptor Rehabilitation: Restore integrity by in-place lining.	R	$15		
	Anoka System Improvement: Expand capacity to serve Ramsey by expanding L42 and L67 and associated dual forcemains.	G	$4	$10	
	Champlin: L33 Rehabilitation/Replacement.	R		3	
	CAB Interceptor Diversion: Divert flow at junction with Elm Creek Interceptor to new tunnel under Mississippi River and construct lift station on east side to pump flow into Coon Rapids Interceptor.	G	$60	$80	
	CAB Relief Interceptor: Add gravity interceptor to relieve CAB Interceptor through Champlin and northern Brooklyn Park; also relieve downstream portion of Elm Creek Interceptor.	G	$10	$25	
	Brooklyn Park L.S. and Tunnel: Construct new tunnel under Mississippi River and construct new lift station to lift flow into Fridley Interceptor.	R		$50	
	Coon Rapids Interceptor: Extend gravity interceptor to CAB Diversion lift station; eliminate L34.	R		$14	
	Blaine Interceptor Relief: Provide second gravity sewer through southern Blaine, Circle Pines, and Lexington.	G		$10	
	Mounds View Improvements: Rehabilitate L35; replace forcemain with two new forcemains.	R		$10	
	New Brighton Interceptor: Relocate portion of interceptor to accommodate development; increase capacity of upstream section.	R	$3	$2	

Table 7. Page 4

Facility/Area	Project	Objective	2005 - 2010	2011 - 2020	2021 - 2030
Central System	Oakdale: L11 Rehabilitation.	R	$3		
	St. Paul: L12 Rehabilitation.	R	$4		
	Interceptor 1-MN-303: Rehabilitate gravity sewer in Minneapolis.	R	$3		
	Interceptor 1-MN-320: Rehabilitate gravity sewer in Minneapolis.	R	$4		
	Mpls./St. Paul Interceptor Improvements: Rehabilitate large gravity sewers in core areas.	R	$50	$75	$100
	Riverview Siphon: Rehabilitate gravity sewer in St. Paul, including river crossing.	R	$10		
	Roseville Interceptor: Rehabilitate gravity sewer in Roseville.	R		$32	
	Upper Trout Brook Interceptor: Relieve/replace Interceptor 8851, serving Roseville.	G		$10	
	South St. Paul: Rehabilitate lift station; add second forcemain; rehabilitate/replace old forcemain.	R	$22		
	Battle Creek Interceptor: Rehabilitate/relocation portions of interceptor in St. Paul.	R	$10		
	St. Louis Park Interceptor: Rehabilitate gravity sewer.	R	$2		
	Trout Brook Interceptor: Rehabilitate original gravity sewer.	R	$4		
	Joint Interceptor: Parallel Joint Interceptor; rehabilitate original interceptor.	R			$400
West System	Crystal Improvements: Rehabilitate/replace L30; replace forcemain with two new forcemains; improve gravity sewer.	R		$10	
	Hopkins Improvements: Replace L27 and forcemain with new gravity sewer tunnel.	R	$44		
	Plymouth Improvements: Rehabilitate forcemains.	R	$5		
	Plymouth-New Hope System: Replace L29, L41 and forcemains with gravity sewer tunnel system.	R		$90	
	Golden Valley: Provide relief gravity sewer for portions of Golden Valley interceptor.	G		$9	

Table 7. Page 5

Facility/Area	Project	Objective	2005 - 2010	2011 - 2020	2021 - 2030
Blue Lake					
Mound Area	Minnetrista to Mound L25: Replace and upgrade L39 and L40 and associated sewers.	R		$15	
	Mound L25 to L38: Replace L25 with gravity sewer to new, deeper, expanded L38.	G, R	$15		
	Mound L38 to Victoria L23: Replace single L38 forcemain with two new forcemains.	G, R		$30	
Victoria Area	L22, L23, L24, and associated sewers: Replace L22 and L23 with gravity sewer tunnel; replace L24 and replace forcemain with two new forcemains.	G, R	$30		
Excelsior Area	L18, L19, L20, L47, L48 and Associated Sewers: Rehabilitate/replace lift stations and forcemains, including adding dual forcemains; replace with gravity sewer tunnel where feasible.	R	$15	$20	
Orono-Wayzata	L26, L44, L45, L46, L49, L59, and associated sewers: Rehabilitate/replace lift stations and forcemains, including adding dual forcemains; replace with gravity sewer tunnel where feasible.	R	$12	$40	
Maple Plain	L63 and Forcemain: Rehabilitate L63 and add second forcemain.	R		$15	
Chanhassen	Lake Ann Interceptor Relief: Add parallel Lake Ann gravity sewer to provide additional capacity.	G		$45	
Prior Lake	Interceptor Relief: Add parallel gravity sewer to provide additional capacity through Shakopee to Prior Lake.	G		$15	
Chaska	Chaska West Interceptor: Gravity sewer to serve Chaska, Carver and adjacent future developing areas.	G	$1		
	Chaska Lift Station: New larger lift station to serve Chaska, Carver, and adjacent areas.	G	$9		
Minnetonka	Interceptor 7073: Replace section of interceptor along Hwy 101.	R	$2		
Waconia	Waconia Interceptor: Replace old forcemain with new, larger forcemain.	G, R	$4		

Table 7. Page 6

Facility/Area	Project	Objective	2005 - 2010	2011 - 2020	2021 - 2030
Eagles Point	South Washington County Interceptor: Convey flow from Cottage Grove, Woodbury, and possibly southern Lake Elmo, to the new Eagles Point Plant.	G	$16		
Empire	Rosemount Interceptor: New interceptor to convey flow to Empire Plant; eliminates Rosemount Plant.	G	$22		
	Elko-New Market Extension: New interceptor to convey flow to Empire Plant; eliminates local WWTP.	G	$29		
	Castle Rock Extension: First phase of extension to expanded service area.	G		$20	
	Eureka Extension: Second phase of extension to expanded service area.	G			$60
Seneca	Burnsville Interceptor: Rehabilitation of deteriorated sections.	R	3		
Systemwide	Interceptor Rehabilitation/Lining	R	$40	$60	$200
	Lift Station and Forcemain Rehabilitation	R	-	-	$100
	Meter Improvements	Q	$6	10	$10
	Security Improvements	Q	$5	-	$5
	Septage Handling Improvements	R	$5	-	-
	Small System Improvements	R	$12	20	$20
	Standby Power Improvements	R	$5	-	5
	Supervisory Control & Telemetry	R	**$3**	**-**	**$10**
TOTAL: INTERCEPTOR SYSTEM			**$604**	**$900**	**$900**
GRAND TOTAL			**$864**	**$1,300**	**$1,600**

Objectives:

1. G = Growth (Capacity)
2. R = Rehabilitation/Replacement
3. Q = Quality Improvement

Note:

1. Capital cost estimates include 3% annual inflation.
2. Capital cost estimates exclude facilities to convey excessive I/I.
3. Capital costs incurred on projects prior to 2005 are excluded.

Other Long-Term Issues

Wastewater Reuse

Treated wastewater can be reused for two purposes: irrigation of crop and forest land, as well as golf courses and park land; and industrial water uses, such as cooling water. Wastewater reuse for irrigation has two major benefits: reduced discharge to surface waters and reduced groundwater demand. Wastewater reuse for industrial purposes also reduces demands on groundwater and may provide opportunities for industrial expansion in areas that may be constrained by inadequate or unreliable groundwater supplies.

The Council will undertake studies to further evaluate the feasibility and cost-effectiveness of these wastewater reuse opportunities. The most feasible application in the near-term will most likely be the Empire Plant effluent, since the plant is near agricultural areas and the new outfall will traverse the Pine Bend industrial area.

Regulatory Scenarios for Wastewater Treatment Plants

The MPCA establishes water quality standards for surface waters (lakes and rivers) and effluent discharge limits for wastewater treatment plant discharges. The capital improvement program for the Regional Wastewater System Plan is based on current water quality standards and effluent discharge limits. Current effluent limits for the regional system typically include 1 mg/l phosphorus limit as an annual average, seasonal (summer) ammonia nitrogen limits, and seasonal organic loading limits.

Regulatory requirements have become increasingly more stringent over the last 30 years, and that trend is likely to continue. Potential regulatory scenarios for effluent discharge limits include the following:

- 0.4 mg/1 Phosphorus: Requires chemical addition, solids side-stream treatment, and effluent filtration to enhance biological phosphorus removal. Estimated capital cost for the Metropolitan Plant is approximately $100 million (2004 prices).
- Winter Ammonia Limit: Requires approximately 25 percent additional biological treatment tankage. Estimated capital cost for the Metropolitan Plant is approximately $50 million (2004 prices).
- 10 mg/1 Total Inorganic Nitrogen Limit: Current biological treatment technology converts ammonia nitrogen to nitrate nitrogen to meet effluent ammonia limits. Concern about "hypoxia" effects in the Gulf of Mexico has caused the U.S. Environmental Protection Agency to discuss imposition of this total inorganic nitrogen limit on discharges to the Mississippi River, which flows into the Gulf of Mexico. Wastewater treatment modifications will be needed to convert nitrate to nitrogen gas (denitrification). Estimated capital cost for the Metropolitan Plant is approximately $200 million (2004 prices).

These three examples have an estimated capital cost of $350 million for the Metropolitan Plant, or approximately $1.40 per gallon per day capacity. Capital costs to upgrade the other regional wastewater treatment plants are estimated at approximately $2 per gallon per day times 125 mgd capacity, or approximately $250 million. Thus, total estimated capital costs to meet these stringent future regulatory scenarios are approximately $600 million at 2004 prices, or approximately $1 billion with inflation in the 2011 to 2030 period.

Substantial Impacts and Substantial Departures from the Metropolitan Wastewater System Plan

The *2030 Regional Development Framework* and the regional system plans comprise the Council's Metropolitan Development Guide, which is the region's plan to ensure orderly, coordinated, and economical development of the region. Local comprehensive plans and plan amendments that have substantial impacts on—or contain substantial departures from—the metropolitan wastewater system plan affect how the Council constructs, operates, and maintains the Metropolitan Disposal System (MDS) and can result in system inefficiencies if the nonconforming plans are permitted to occur. Substantial impact or departures may result either from over-utilization or under-utilization. Over-utilization is local development that will use more regional capacity than currently is available or planned. Under-utilization is low-density development that uses less than currently available or planned regional capacity, and is likely to require additional infrastructure elsewhere in the region to accommodate household growth that reasonably would have been expected to occur in the local governmental unit.

As permitted by Minnesota Statutes section 473.175, subdivision 1, the Council may require a local governmental unit to modify any comprehensive plan or part thereof that is inconsistent with the metropolitan system plan if the Council concludes that the local plan is more likely than not to have either a substantial impact on, or to contain a substantial departure from, the Council's adopted policy plans and capital budgets for metropolitan wastewater service. Inconsistencies will provide the Council with grounds for requiring modifications to the local comprehensive plan.

A system impact to the Metropolitan Disposal System (MDS) may occur under various circumstances including, for example:

- When a local governmental unit proposes a land-use change to, and/or expansion of, its local sewer service area that results in projected flows in excess of the capacity within the existing MDS;
- When a community does not adequately address nonpoint source pollution control issues through its local surface water management plan; or
- When excessive inflow and infiltration reduces the regional system's capacity to convey and treat wastewater.

A substantial system impact occurs under various scenarios, including when:

- The MDS was not designed to provide wastewater service for the proposed sewer service area; or
- The projected flow from the sewer service area is greater than planned; or
- The timing for the proposed growth is prior to implementation of a planned improvement to the MDS and greater than what can be accommodated by the MDS; or
- The peak wet-weather flows from the local governmental unit exceeds its designed capacity within the MDS, and thus there is inadequate capacity to accommodate the planned growth for the local governmental unit or tributary local governmental units.

A system departure occurs when 1) a local governmental unit proposes forecasts for sewered development densities that are lower than Council forecasts or lower than density standards that

are the basis for regional infrastructure planning purposes; or 2) when a local governmental unit proposes densities in rural areas that exceed Council policy (i.e., one unit per 10 acres in diversified rural areas and one unit per 40 acres in agricultural areas). This may result in an under-utilization of the available or planned regional wastewater system capacity.

A substantial departure also may occur under different circumstances including when:

- A local governmental unit's sewered household and employment forecasts, within the existing or planned service area of a metropolitan facility, are at least 20 percent lower than the Council's forecasts of growth for the community; or
- A local governmental unit is not achieving the Council's density standards for sewered development; or
- A local governmental unit is planning to allow development that proposes densities in rural areas (i.e., areas not currently served by public sewers) that exceed Council policy, such as development on 2 1/2–acre lots that would preclude future economical sewered development.

Appendices

Appendix A-1: Nonpoint Source Pollutants

Appendix A-1 identifies common nonpoint source pollutants and their sources. In addition, the table identifies typical impacts from the pollutants.

Stormwater Pollutant	Examples of Sources	Related Impacts
Nutrients: Nitrogen, Phosphorus	Animal waste, fertilizers, failing septic systems	Algal growth, reduced clarity, other problems associated with eutrophication (oxygen deficit, release of nutrients and metals from sediments)
Sediments: Suspended and Deposited	Construction sites, other disturbed and/or non-vegetated lands, eroding banks, road sanding	Increased turbidity, reduced clarity, lower dissolved oxygen, deposition of sediments, smothering of aquatic habitat including spawning sites, sediment and benthic toxicity
Organic Materials	Leaves, grass clippings	Oxygen deficit in receiving water body, fish kill
Pathogens: Bacteria Viruses	Animal waste, failing septic systems	Human health risks via drinking water supplies, contaminated swimming beaches
Hydrocarbons: Oil and Grease, PAHs (Napthalenes, Pyrenes)	Industrial processes, automobile wear, emissions and fluid leaks, waste oil	Toxicity of water column and sediment, bioaccumulation in aquatic species and through food chain
Metals: Lead, Copper, Cadmium, Zinc, Mercury, Chromium, Aluminum, others	Industrial processes, normal wear of auto brake linings and tires, automobile emissions and fluid leaks, metal roofs	Toxicity of water column and sediment, bioaccumulation in aquatic species and through the food chain, fish kill
Pesticides: PCBs, Synthetic Chemicals	Pesticides (herbicides, insecticides, fungicides, rodenticides, etc.), industrial processes	Toxicity of water column and sediment, bioaccumulation in aquatic species and through the food chain, fish kill
Chlorides	Road salting and uncovered salt storage	Toxicity of water column and sediment
Trash and Debris	Litter washed through storm drain networks	Degradation of the beauty of surface waters, threat to wildlife

Appendix A-2: Priority Lakes List

Lakes on the priority lakes list were chosen based on their size, and whether they had a high regional recreation value (boat access and an adjacent park), whether they were a primary water supply lake, or whether they had exceptional water clarity (a typical summer average water clarity greater than 3 meters).

Lake Name	County	Area (acres)	Recreation	Water Supply	Good Water Clarity
Centerville	Anoka	472.8	Y	Y	
Coon	Anoka	1532.8	Y		
Crooked	Anoka	118.9	Y		
East Twin	Anoka	96.8			Y
George	Anoka	491.5	Y		
Ham	Anoka	180.5	Y		
Linwood	Anoka	570.3	Y		
Martin	Anoka	249.4	Y		
Otter	Anoka	294.6	Y		
Peltier	Anoka	573.4	Y	Y	
Rice	Anoka	370.2	Y		
Round	Anoka	263.5	Y		
Ann	Carver	116.3	Y		
Auburn	Carver	287.2	Y		
Eagle	Carver	179.9	Y		
Hydes	Carver	219.4	Y		
Lotus	Carver	242.2	Y		
Maria	Carver	168.8	Y		
Minnewashta	Carver	686.0	Y		
Parley	Carver	255.9	Y		
Patterson	Carver	234.3	Y		
Piersons	Carver	291.6	Y		
Rice	Carver	239.3	Y		
Riley	Carver	295.4	Y		
Steiger	Carver	169.7	Y		
Tiger	Carver	385.6	Y		
Waconia	Carver	3088.1	Y		
Wassermann	Carver	166.2	Y		
Zumbra-Sunny	Carver	225.4	Y		
Byllesby	Dakota	750.4	Y		
Crystal	Dakota	287.1	Y		
Lac Lavon	Dakota	67.0			Y

Lake Name	County	Area (acres)	Recreation	Water Supply	Good Water Clarity
Marion	Dakota	573.1	Y		
Orchard	Dakota	236.0	Y		
Spring Lake / U.S. Lock & Dam #2 Pool	Dakota	5869.8	Y		
Bryant	Hennepin	176.1	Y		
Bush	Hennepin	189.0	Y		Y
Calhoun	Hennepin	414.8	Y		
Christmas	Hennepin	268.2			Y
Dutch	Hennepin	173.8	Y		
Eagle	Hennepin	294.2	Y		
Fish	Hennepin	234.8	Y		
Harriet	Hennepin	338.5	Y		
Independence	Hennepin	834.1	Y		
Little Long	Hennepin	85.6			Y
Long	Hennepin	297.9	Y		
Medicine	Hennepin	922.3	Y		
Minnetonka	Hennepin	14185.0	Y		
Mitchell	Hennepin	114.4	Y		
Nokomis	Hennepin	200.4	Y		
Nordmyr (Normandale)	Hennepin	108.4	Y		
Pike	Hennepin	57.4	Y		
Rebecca	Hennepin	265.6	Y		
Staring	Hennepin	163.2	Y		
Weaver	Hennepin	149.2	Y		
Whaletail	Hennepin	518.1	Y		
Bald Eagle	Ramsey	1044.0	Y		
Charley	Ramsey	35.2		Y	
Deep	Ramsey	71.6		Y	
Johanna	Ramsey	210.6	Y		
Josephine	Ramsey	114.1	Y		
Owasso	Ramsey	371.2	Y		
Phalen	Ramsey	197.4	Y		
Pleasant	Ramsey	601.7		Y	
Snail	Ramsey	148.0	Y		
Sucker	Ramsey	61.7		Y	
Turtle	Ramsey	439.1	Y		
Vadnais	Ramsey	603.4		Y	
Cedar	Scott	793.6	Y		

Lake Name	County	Area (acres)	Recreation	Water Supply	Good Water Clarity
Cleary	Scott	146.4	Y		
Fish	Scott	175.9	Y		
Lower Prior	Scott	966.9	Y		
O'Dowd	Scott	317.9	Y		
Spring	Scott	593.0	Y		
Thole/Schneider	Scott	161.3	Y		
Upper Prior	Scott	387.4	Y		
Battle Creek	Washington	105.9	Y		
Big Carnelian	Washington	451.6	Y		Y
Big Marine	Washington	1889.6	Y		
Bone	Washington	222.6	Y		
Clear	Washington	429.2	Y		
DeMontreville	Washington	157.0	Y		Y
Elmo	Washington	294.3	Y		Y
Forest	Washington	2282.9	Y		
Jane	Washington	152.7	Y		Y
Little Carnelian	Washington	156.7			Y
Olson	Washington	87.0			Y
Oneka	Washington	393.3	Y		
South Twin	Washington	54.2			Y
Square	Washington	201.9	Y		Y
Sylvan	Washington	107.3			Y
West Boot	Washington	64.4			Y
White Bear	Washington	2416.7	Y		

Appendix A-3: MPCA NPDES Phase I and II Metropolitan Area Communities

The following table lists the communities required to meet MPCA NPDES Phase I and II permit requirements as of April 2005.

Anoka County	***Carver County***	***Dakota County***	***Ramsey County***
Andover	Carver	Apple Valley	Arden Hills
Anoka	Carver County	Burnsville	Falcon Heights
Anoka County	Chanhassen	Dakota County	Gem Lake
Blaine	Chaska	Eagan	Lauderdale
Burns Township	Chaska Township	Empire Township	Little Canada
Centerville	Laketown Township	Farmington	Maplewood
Circle Pines	Victoria	Inver Grove Heights	Mounds View
Columbia Heights		Lakeville	New Brighton
Coon Rapids		Lilydale	North Oaks
East Bethel		Mendota	North St. Paul
Fridley		Mendota Heights	Ramsey County
Ham Lake		Rosemount	Roseville
Hilltop		South St. Paul	St. Anthony
Lexington		Sunfish Lake	St. Paul
Lino Lakes		West St. Paul	Shoreview
Oak Grove			Vadnais Heights
Ramsey			White Bear Lake
Spring Lake Park			White Bear Township

Hennepin County		***Scott County***	**Washington County**
Bloomington	Medicine Lake	Credit River Township	Birchwood
Brooklyn Center	Medina	Jackson Township	Cottage Grove
Brooklyn Park	Minneapolis	Louisville Township	Dellwood
Champlin	Minnetonka	Prior Lake	Grant
Corcoran	Minnetonka Beach	Savage	Hugo
Crystal	Minnetrista	Scott County	Lake Elmo
Dayton	Mound	Shakopee	Landfall
Deephaven	New Hope	Spring Lake Township	Mahtomedi
Eden Prairie	Orono		Newport
Edina	Osseo		Oakdale
Excelsior	Plymouth		Pine Springs
Fort Snelling	Richfield		St. Paul Park
Golden Valley	Robbinsdale		Washington County
Greenwood	St. Bonifacius		West Lakeland
Hennepin County	St. Louis Park		Willernie
Hopkins	Shorewood		Woodbury
Independence	Spring Park		
Long Lake	Tonka Bay		
Loretto	Wayzata		
Maple Grove	Woodland		
Maple Plain			

Appendix B-1: Wastewater Treatment Facilities

a. Sewered Population, Household, and Employment Forecasts (MDS)

Location	Population			Households			Employment		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Blue Lake WWTP									
Carver	4,680	4,630	4,560	1,800	1,850	1,900	200	200	230
Chanhassen	26,800	34,500	38,000	9,900	12,800	14,800	13,030	15,200	15,600
Chaska	27,000	33,000	35,700	10,000	12,500	14,000	12,800	15,100	16,600
Dahlgren Township	700	12,450	15,000	250	4,560	5,650	500	2,000	2,800
Deephaven	3,900	3,900	3,900	1,450	1,500	1,500	1,000	1,100	1,200
Eden Prairie	61,154	62,500	63,000	24,200	25,500	26,500	55,000	62,000	65,000
Excelsior	2,500	2,700	2,800	1,250	1,330	1,400	1,980	2,250	2,450
Greenfield	143	240	280	53	85	100	0	0	0
Greenwood	760	770	780	320	330	330	220	230	250
Independence	603	780	1,000	232	260	300	0	0	0
Laketown Township	650	600	0	222	222	0	0	0	0
Long Lake	2,100	2,250	2,450	900	1,000	1,100	2,600	2,700	2,700
Maple Plain	2,553	2,570	2,600	922	950	1,000	2,350	2,800	3,300
Medina	930	986	1,023	325	340	350	0	0	0
Minnetonka	51,500	51,500	53,500	22,300	23,111	24,000	53,800	56,000	58,600
Minnetonka Beach	640	658	658	236	238	238	210	210	210
Minnetrista	4,000	6,750	10,500	1,600	2,700	4,200	820	1,150	1,330
Mound	10,400	11,000	11,400	4,350	4,600	4,800	1,860	2,020	2,170
Orono	5,800	7,000	7,300	2,256	2,950	3,020	1,230	1,420	1,500
Prior Lake	27,500	40,000	39,500	10,500	16,000	17,000	12,000	15,100	17,200
Shakopee	39,500	48,500	52,000	15,000	19,500	21,500	17,800	21,300	22,800
Shorewood	7,850	8,000	8,100	2,750	2,870	2,960	990	1,160	1,180
Spring Park	1,850	2,000	2,100	1,000	1,080	1,130	1,330	1,690	1,800
St. Bonifacius	2,850	2,750	2,900	1,100	1,100	1,200	520	600	700
Tonka Bay	1,800	1,800	1,800	744	760	780	200	240	280

Location	Population			Households			Employment		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Victoria	10,700	19,600	28,000	4,000	7,200	10,200	2,000	3,600	5,100
Waconia	10,600	20,000	25,000	4,500	8,000	10,000	7,000	9,900	13,000
Wayzata	4,300	4,500	4,700	2,100	2,200	2,200	6,200	6,400	6,550
Woodland	75	75	90	23	25	30	0	0	0
Totals	313,838	386,009	418,641	124,283	155,561	171,188	195,640	224,370	242,550
Eagles Point WWTP									
Cottage Grove	33,700	44,600	53,000	11,800	16,200	20,000	8,450	9,950	11,450
Lake Elmo	1,416	6,330	12,030	515	2,175	4,375	0	4,950	12,000
Woodbury	33,166	47,232	56,486	12,876	19,600	23,536	14,150	21,400	24,200
Totals	71,066	98,872	120,706	26,226	38,180	47,616	22,600	33,750	44,850
Empire WWTP									
Apple Valley	59,667	67,053	69,153	21,557	25,350	26,680	16,030	19,260	21,010
Elko	2,650	6,400	10,200	970	2,350	3,900	200	550	750
Empire Township	2,050	4,100	5,950	700	1,400	2,100	250	300	340
Farmington	20,500	27,100	32,000	7,500	10,500	12,500	6,600	8,400	9,900
Lakeville	53,425	70,700	80,200	18,115	25,609	30,255	10,700	11,900	12,960
New Market	3,050	6,700	10,600	1,150	2,500	4,100	200	350	500
Rosemount	20,800	28,110	33,800	7,300	10,500	12,800	8,400	10,100	12,200
Totals	162,142	210,163	241,903	57,292	78,209	92,335	42,380	50,860	57,660
Hastings WWTP									
Hastings	23,000	27,500	30,000	8,800	11,000	12,500	8,700	8,950	9,400
Metropolitan WWTP									
Andover	25,480	33,130	35,699	8,993	11,693	12,693	4,200	4,800	5,200
Anoka	19,000	19,800	20,800	7,900	8,500	9,000	14,400	15,200	16,200
Arden Hills	11,200	13,500	22,500	3,800	4,600	8,000	15,200	17,100	20,000
Birchwood	950	930	930	360	370	370	0	0	0
Blaine	64,800	76,100	78,000	24,000	29,300	31,200	20,870	22,440	23,900

Location	Population			Households			Employment		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Brooklyn Center	29,500	30,500	29,500	11,800	12,200	12,100	18,150	18,550	19,000
Brooklyn Park	73,860	80,500	85,000	28,168	32,000	35,000	26,900	29,100	32,000
Centerville	3,700	4,100	4,700	1,340	1,600	1,850	520	630	670
Champlin	23,700	24,500	25,800	8,500	9,200	10,000	3,700	5,100	6,200
Circle Pines	5,400	5,300	5,400	2,050	2,100	2,200	2,250	2,400	2,450
Columbia Heights	20,000	21,400	21,700	8,600	9,200	9,300	6,600	6,750	7,000
Columbus Township	0	1,040	1,620	0	350	560	250	420	520
Coon Rapids	65,650	66,000	65,000	25,560	26,500	27,000	24,200	26,000	27,800
Corcoran	5,200	13,000	16,500	1,800	4,500	5,500	2,500	5,100	6,100
Crystal	22,700	22,800	23,500	9,700	10,100	10,500	6,600	7,250	8,050
Dayton (pt.)	2,615	18,000	27,400	1,000	7,000	10,500	3,900	5,750	6,850
Edina	49,000	50,000	51,500	21,600	22,000	22,500	57,100	60,000	62,400
Falcon Heights	6,100	6,100	6,100	2,350	2,400	2,500	3,900	4,050	4,200
Forest Lake	19,227	25,205	31,675	7,540	10,082	12,670	7,910	9,000	10,400
Fridley	27,000	26,900	27,500	11,600	11,900	12,300	30,200	33,000	35,300
Gem Lake	116	360	490	44	140	190	180	300	330
Golden Valley	22,700	23,000	24,000	9,000	9,200	9,600	31,650	33,100	34,500
Grey Cloud Township	750	3,000	6,532	250	1,000	2,400	0	0	0
Hassan Township	0	2,082	0	0	718	0	0	0	0
Hilltop	770	770	770	410	410	410	350	420	470
Hopkins	17,827	18,527	18,900	8,518	8,818	9,000	13,600	14,800	16,300
Hugo	15,640	25,900	36,867	5,900	9,900	14,400	2,050	2,270	3,350
Inver Grove Heights	31,439	37,000	39,520	13,043	15,500	16,000	9,250	10,900	12,100
Lake Elmo	0	2,400	2,270	0	825	825	1,000	1,000	1,000
Landfall	700	700	700	300	300	300	60	70	90
Lauderdale	2,400	2,600	2,600	1,160	1,250	1,250	730	750	800
Lexington	2,250	2,250	2,300	910	950	1,000	880	1,050	1,120
Lilydale	930	930	930	580	580	580	480	500	550
Lino Lakes	15,500	24,500	28,955	5,000	8,000	9,500	2,950	3,300	3,550

Location	Population			Households			Employment		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Little Canada	10,900	11,900	12,800	4,900	5,300	5,700	6,400	6,850	7,250
Mahtomedi	7,970	8,000	8,000	2,850	3,000	3,100	1,870	2,350	2,500
Maple Grove	63,500	75,359	84,000	24,500	30,144	34,000	32,450	42,900	45,900
Maplewood	37,500	38,100	39,300	15,600	16,500	17,500	36,600	41,000	44,500
Medicine Lake	420	440	470	180	190	200	60	70	70
Medina	2,270	5,514	8,477	793	1,900	2,900	5,500	6,700	7,900
Mendota	210	230	270	90	100	120	130	150	170
Mendota Heights	12,000	12,000	12,100	4,600	4,800	5,000	9,100	9,800	10,300
Minneapolis	402,000	423,000	435,000	172,000	181,000	187,000	353,400	369,700	384,400
Mounds View	12,900	13,000	13,400	5,350	5,600	6,000	7,400	8,900	9,400
New Brighton	22,700	22,500	22,800	9,400	9,800	10,000	12,850	14,400	15,600
New Hope	21,500	22,000	22,500	9,100	9,600	9,800	13,850	14,500	15,100
Newport	3,800	4,407	4,890	1,573	1,849	2,130	3,900	5,200	6,500
North Oaks	779	1,125	1,500	303	450	600	1,060	1,100	1,070
North St. Paul	12,555	12,700	13,400	5,083	5,400	6,000	5,900	7,500	8,500
Oakdale	28,000	28,400	30,000	11,300	12,000	13,000	9,250	10,600	11,900
Osseo	2,600	2,850	3,300	1,090	1,200	1,400	2,700	2,950	3,050
Plymouth	73,000	76,000	78,500	29,000	31,500	33,300	59,900	63,400	64,500
Ramsey	21,164	38,839	42,644	7,500	14,000	16,000	6,700	9,100	11,300
Richfield	37,700	41,300	45,000	16,500	18,000	19,500	17,100	17,600	18,100
Robbinsdale	15,200	16,600	16,500	6,500	7,000	7,000	8,100	8,800	9,600
Roseville	36,000	37,000	38,300	15,500	16,000	16,500	42,450	44,700	46,100
Shoreview	28,500	29,000	29,000	10,960	11,300	11,300	14,200	15,800	16,800
South St. Paul	19,900	20,000	20,700	8,300	8,600	9,000	8,050	8,300	8,500
Spring Lake Park	6,700	6,700	6,910	2,750	2,800	3,000	4,600	4,800	4,850
St. Anthony	9,100	9,400	10,000	4,000	4,300	4,600	4,350	5,000	5,450
St. Louis Park	47,000	49,300	51,500	22,000	23,000	24,000	46,200	50,500	52,500
St. Paul	305,000	320,000	331,000	120,000	127,000	133,000	196,600	210,000	220,600

Location	Population			Households			Employment		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
St. Paul Park	5,700	6,400	7,100	2,160	2,500	2,900	1,400	1,600	1,600
Vadnais Heights	13,800	14,300	16,800	5,600	6,100	7,400	7,950	8,500	9,100
West St. Paul	20,100	21,100	21,700	8,900	9,300	9,600	10,700	12,000	13,000
White Bear Lake	26,940	27,585	27,710	11,225	11,494	11,800	13,390	14,350	15,070
White Bear Township	12,700	13,100	13,100	4,700	4,900	5,000	4,150	5,900	6,800
Willernie	550	550	570	230	240	250	140	140	150
Woodbury	25,572	26,268	27,514	10,130	10,900	11,464	11,800	12,800	12,800
Totals	1,932,334	2,117,839	2,243,223	786,443	872,060	931,607	1,271,930	1,382,060	1,462,280
Seneca WWTP									
Apple Valley	2,060	2,060	2,060	820	820	820	720	840	990
Bloomington	87,500	90,500	93,000	37,700	39,200	40,000	118,600	126,200	137,500
Burnsville	60,800	62,400	64,400	24,952	26,778	28,500	37,700	41,200	43,300
Eagan	67,000	68,000	69,000	26,500	28,000	29,000	48,300	52,000	54,200
Lakeville	4,675	6,600	8,600	1,585	2,391	3,245	1,200	1,300	1,440
Savage	31,000	39,000	42,700	10,700	14,500	16,000	6,000	6,850	8,700
Totals	253,035	268,560	279,760	102,257	111,689	117,565	212,520	228,390	246,130
St. Croix Valley WWTP									
Bayport	4,606	5,322	6,000	1,138	1,298	1,500	5,200	5,700	6,300
Oak Park Heights	5,500	5,400	5,700	2,175	2,300	2,500	3,900	4,500	5,100
Stillwater	18,300	20,550	19,200	7,254	7,800	8,300	11,550	12,500	13,600
Totals	28,406	31,272	30,900	10,567	11,398	12,300	20,650	22,700	25,000
East Bethel WWTP		7,800	13,300		2,900	5,100		1,800	3,000

Appendix B-1: Wastewater Treatment Facilities

b. Wastewater Flow Projections

The following wastewater flow projections are based on the projected sewered population, household and employment projections as shown for each community in Appendix B1-b using 75 gpd per person and 25 gpd per employee from new development to project future flows. Communities may use the flow projection method that is most appropriate to them, and indicate methodology and assumptions used as part of their comprehensive plans. Metropolitan Council Environmental Services will use the projected sewered population, household and employment information to estimate system flows and schedule needed improvements to the Metropolitan Disposal System.

Community Flow Projections

	2010 (MGD)		2020 (MGD)		2030 (MGD)
Andover	1.63		2.17		2.32
Anoka	2.04		2.07		2.11
Apple Valley	4.87		5.37		5.44
Arden Hills	1.28		1.47		2.26
Bayport	0.67		0.72		0.78
Birchwood	0.08		0.08		0.08
Blaine	5.06		5.82		5.87
Bloomington	10.26		10.42		10.63
Brooklyn Center	2.97		2.97		2.82
Brooklyn Park	5.80		6.16		6.37
Burnsville	5.82		5.84		5.87
Carver	0.33		0.32		0.32
Centerville	0.28		0.30		0.34
Champlin	1.70		1.73		1.78
Chanhassen	2.92		3.49		3.71
Chaska	2.94		3.39		3.58
Circle Pines	0.45		0.43		0.43
Columbia Heights	1.53		1.58		1.56
Columbus Township	0.01		0.09		0.13
Coon Rapids	6.19		6.00		5.86
Corcoran	0.45		1.10		1.39
Cottage Grove	2.42		3.19		3.78
Crystal	2.26		2.21		2.22
DahlgrenTownship	0.07		0.98		1.20
Dayton (pt.)	0.29		1.49		2.23
Deephaven	0.45		0.44		0.43
Eagan	6.90		6.87		6.82
East Bethel			0.63		1.07
Eden Prairie	5.53		5.65		5.60
Edina	6.45		6.46		6.49
Elko	0.18		0.47		0.75
Empire Township	0.14		0.29		0.43
Excelsior	0.29		0.31		0.31
Falcon Heights	0.91		0.89		0.88

	2010 (MGD)		2020 (MGD)		2030 (MGD)
Farmington	1.92		2.42		2.79
Forest Lake	2.00		2.52		3.01
Fridley	5.07		5.05		5.07
Gem Lake	0.03		0.05		0.06
Golden Valley	3.20		3.19		3.24
Greenfield	0.01		0.02		0.02
Greenwood	0.06		0.06		0.06
Hassan Township	0.00		0.27		0.00
Hastings	2.04		2.33		2.48
Hilltop	0.10		0.10		0.09
Hopkins	1.85		1.88		1.90
Hugo	1.18		1.95		2.79
Independence	0.02		0.03		0.05
Inver Grove Heights	2.39		2.77		2.92
Lake Elmo	0.13		0.80		1.40
Laketown Township	0.07		0.06		0.00
Lakeville	5.48		6.83		7.59
Landfall	0.06		0.06		0.06
Lauderdale	0.29		0.30		0.30
Lexington	0.13		0.13		0.13
Lilydale	0.10		0.10		0.10
Lino Lakes	1.24		1.89		2.20
Little Canada	1.30		1.36		1.41
Long Lake	0.28		0.29		0.30
Mahtomedi	0.59		0.58		0.55
Maple Grove	6.02		7.03		7.60
Maple Plain	0.32		0.33		0.34
Maplewood	4.57		4.62		4.69
Medicine Lake	0.05		0.05		0.05
Medina	0.55		0.82		1.07
Mendota	0.02		0.02		0.02
Mendota Heights	1.64		1.63		1.61
Minneapolis	57.54		57.82		58.52
Minnetonka	6.70		6.60		6.66
Minnetonka Beach	0.07		0.07		0.06
Minnetrista	0.34		0.55		0.83
Mound	1.03		1.05		1.05
Mounds View	1.46		1.47		1.47
New Brighton	2.29		2.25		2.23
New Hope	2.20		2.19		2.18
New Market	0.22		0.50		0.80
Newport	0.37		0.44		0.50
North Oaks	0.09		0.12		0.15
North St. Paul	1.38		1.40		1.44

	2010 (MGD)		2020 (MGD)		2030 (MGD)
Oak Park Heights	0.69		0.69		0.71
Oakdale	2.81		2.79		2.86
Orono	0.63		0.70		0.71
Osseo	0.23		0.25		0.28
Plymouth	8.20		8.31		8.33
Prior Lake	2.58		3.55		3.52
Ramsey	1.62		2.98		3.30
Richfield	3.99		4.17		4.35
Robbinsdale	1.45		1.53		1.50
Rogers	0.74		0.86		1.62
Rosemount	1.92		2.15		2.59
Roseville	4.47		4.50		4.54
Savage	2.55		3.11		3.38
Shakopee	4.13		4.83		5.07
Shoreview	2.96		2.96		2.91
Shorewood	0.80		0.79		0.78
South St. Paul	3.55		3.51		3.50
Spring Lake Park	0.68		0.67		0.67
Spring Park	0.32		0.34		0.34
St. Anthony	1.01		1.02		1.06
St. Bonifacius	0.23		0.22		0.23
St. Louis Park	6.47		6.62		6.70
St. Paul	30.63		31.23		31.46
St. Paul Park	0.61		0.65		0.69
Stillwater	2.53		2.68		2.57
Tonka Bay	0.24		0.23		0.23
Vadnais Heights	1.35		1.36		1.52
Victoria	0.85		1.56		2.23
Waconia	1.01		1.77		2.13
Wayzata	0.63		0.64		0.65
West St. Paul	2.43		2.48		2.49
White Bear Lake	2.91		2.91		2.86
White Bear Township	1.11		1.16		1.15
Willernie	0.05		0.06		0.05
Woodbury	5.16		6.34		7.06

Appendix B-2: System Plan Requirements

The Council looks for provisions in a community's comprehensive plan that provide for wastewater service commensurate with the needs of expected future development. The Council's requirements for the wastewater, surface water management and water supply sections of a comprehensive plan are listed below.

Under state law, local governments are required to submit both a wastewater plan element to their comprehensive plan as well as a comprehensive sewer plan (CSP) describing service needs from Metropolitan Council Environmental Services (MCES). Before any local government unit in the metropolitan area may proceed with a sewer extension, the CSP must be consistent with the Council's Wastewater Systems Plan and be approved by the Council. In the past, the required information in the CSP has been broader in scope than the information required for the comprehensive plan and has provided more detailed engineering information. To simplify this process and allow the Council to review both documents simultaneously, the Council has combined the required elements of both plans into the following criteria:

a. Wastewater Plan Elements

This section is divided into two parts:

Requirements for communities that are served by MCES's regional system, also known as the Metropolitan Disposal System (MDS).

Requirements for all other communities (and/or parts of communities) in the region.

Requirements for Areas Served by the Regional System

1. Adopted community forecast of households and employment in five-year increments to 2030, based on the Council's 2030 forecasts with any subsequent negotiated modifications.
2. A map or maps showing the following information:
   a. The community's existing sanitary sewer system identifying lift stations, waste disposal sites, existing connections points to the MDS, and the future connection points for new growth if needed.
   b. Inter-community connections and any proposed changes in government boundaries based on orderly annexation agreements.
   c. The location of all private and public wastewater treatment plants.
   d. The map should designate each existing or future connection point to the MDS as a local sewer service district.
3. A table or tables that provide the following information:
   a. Capacity and design flows for existing trunk sewers and lift stations.
   b. Information on the number of existing and potential connections by local sewer service district, and projected flow volume in five-year increments through 2030 and build out. There is no preferred method for projecting interceptor flows. Communities may use the method that is most appropriate, and indicate methodology and assumptions used.
   c. Proposed time schedule for the construction of new trunk sewer systems that require connections to the MDS.

d. Accompanying information on the type and capacity of the treatment facilities, whether municipally or privately owned, copies of their appropriate National Pollutant Discharge Elimination System (NPDES) or State Disposal System (SDS) permit.

4. City goals, policies and strategies for preventing and reducing excessive infiltration and inflow (I/I) in the local sewer system, including:
   a. Requirements and standards for minimizing inflow and infiltration and the disconnection of illegal sump pump and foundation drain connections to the sanitary sewer system. Copies of ordinances prohibiting the discharge of foundation drains and/or roof leaders to the sanitary disposal system as well as copies of ordinances requiring the disconnection of existing foundation drains, sump pumps and roof leaders from the sanitary disposal system should be included.
   b. Information on the extent, source and significance of existing I/I problems along with an analysis of costs for remediation.
   c. Implementation plan including program strategy, priorities, scheduling, and financing mechanisms for eliminating and preventing excessive I/I from entering the system.

Requirements for Areas Not Served by the Regional System

1. Adopted community forecast of households and employees in 10-year increments to 2030 (based on Council's 2030 forecasts with any subsequent negotiated modifications).
2. Description of community's management program for on-site sewage treatment to comply with MPCA 7080, and a copy of the community's current on-site ordinance.
3. Map showing the locations of existing public and private treatment systems, if any, including package treatment plants and group on-site systems.
4. Map identifying location of on-site sewage disposal systems. Location of known non-conforming systems or systems with known problems should be identified.
5. Description of conditions under which private, community treatment systems (for example, package treatment plants, community drainfields) would be allowed. Examples of such conditions should include allowable land uses, installation requirements, management requirements, and local government responsibilities.
6. Capacity of and existing flows to public and private treatment systems.
7. Brief description of the community's sewer system plan (proposed to 2030) including the following information:
   a. Projected flows in 2010, 2020 and 2030.
   b. Local objectives, policies and strategies for preventing and reducing excessive infiltration and inflow including sump pumps and drain tile in the local sewer system.
   c. Proposed timing and financing of any expanded/new wastewater treatment facilities.
   d. Copies of facility planning reports for the upgrading of the wastewater treatment plants.

8. Map showing the service areas through 2030, staging plan if available, and any proposed changes in governmental boundaries affecting the community, including any areas designated for orderly annexation.

b. Local Surface Water Management Plan Elements

Background

In the Twin Cities Metropolitan Area, all cities and townships are covered by one or more watershed management organization (WMO). WMOs are required to prepare plans to address watershed management issues (see Minn. Stat. Sec. 103B.201). Cities and townships are required to prepare local water management plans that are consistent with all applicable WMO plans (see Minn. Stat. 103B.235). In addition, Phase I and II NPDES MS4 permit communities are required to prepare stormwater pollution prevention plans (SWPPPs). Some MS4 communities are listed as nondegradation communities and required to provide information in their SWPPP related to nondegradation. With the multitude of planning requirements, there is a need to coordinate and consolidate all of these different planning documents. Comprehensive local water management plans (plans that address all of the water management planning requirements out there) are crucial in helping the region meet its goal of no adverse impact on area waterbodies.

In 1995, the Metropolitan Land Planning Act was amended to require that each city and township's comprehensive plan include a local water management plan. Local water management plans need to be consistent with the requirements in Minnesota Statutes 103B and in the Metropolitan Land Planning Act. Local water management plans are reviewed by the Metropolitan Council (Council) as part of the local comprehensive planning process prior to their approval by the WMO and adoption by the city or township. Local water management plans are crucial in helping the region meet the challenge of cost-effective management of water quality and quantity.

Local Water Plan Requirements

Minnesota Rules Chapter 8410 (Metropolitan Area Local Water Management), requires the local water management plans to address the specific elements. In the Council's *2030 Regional Development Framework*, the Council adopted a water management goal for the region, "the quality of water leaving the metropolitan area is as good as the water quality entering the metropolitan area, and in compliance with federal and state regulations." To meet this goal, the Council has linked the control of pollution from point and nonpoint sources. The 2030 *Water Resources Management Policy Plan* states that if a community does not have a local water management plan as part of its 2008 comprehensive plan update, the comprehensive plan will be found incomplete for review. If the community has a plan that does not meet Council requirements for local water management plans, the Council will likely find the plan to have an impact on our system, thus requiring a plan modification.

The following list is an expansion of the requirements under Chapter 8410. The list is intended to clarify, through additional detail, what communities should do to ensure that their local water management plan is consistent with the Council's *2030 Water Resources Management Policy Plan.*

1. Purpose of plan
2. Water resource management related agreements
3. Executive summary
4. Land and water resources inventory (For this requirement and others that follow, communities are encouraged to use as much of the WMO plan as they can. The community should be aware that not all WMO plans will contain the level of detail needed for the community and in those instances, the community will need to provide additional information).
5. Establishment of policies and goals
   A. All communities need a strong policy statement to show that they are committed to a goal of no adverse impact (nondegradation) for area water resources.
   B. All communities need goals for their lakes consistent with Watershed Management Organization plan goals.
   C. The Council's *2030 Regional Development Framework* classified communities as urban planning areas (developing and developed areas) and rural planning areas (rural centers, agricultural, diversified rural and rural residential areas). Communities classified as developed or developing and MS4 communities in the rural planning area need to include actions that show the community is committed to the goal of no adverse impact or nondegradation goal for area water resources. Actions should include:
      i. Adopting erosion and sediment control ordinances that are consistent with NPDES Construction Stormwater permit and MS4 permit requirements
      ii. Preparing wetland management plans (refer to 8G for more details of what should be in a wetland management plan)
      iii. Adopting ordinances that control peak runoff (Suggested guidance - Minnesota Stormwater Manual)
      iv. Adopting best management practices for development that will result in TSS and TP reductions of 80% and 50% respectively
      v. Adopting best management practices for redevelopment that will result in TSS and TP reductions (Suggested guidance - Minnesota Stormwater Manual)
      vi. Including funding mechanisms that support implementation and enforcement
   D. Developing and developed communities that are a Phase I or Phase II NPDES MS4 permit community need to integrate their Stormwater Pollution Prevention Plan policies and goals into their local water management plan, in accordance with MPCA requirements and schedules.
   E. Developed and developing communities listed as nondegradation communities as part of their NPDES MS4 permit need to revise their Stormwater Pollution Prevention Plan to include the required information for nondegradation. Nondegradation policies and goals should be summarized or integrated into their local water management plans.
   F. Rural planning area (rural centers, agricultural, diversified rural and rural residential) communities need to include actions that show the community is

committed to the goal of no adverse impact (nondegradation goal) for area water resources. Actions should include:

i. Adopting erosion and sediment control ordinances that are consistent with NPDES Construction Stormwater permit and MS4 permit requirements where applicable
ii. Preparing wetland management plans (refer to 8G for more details of what should be in a wetland management plan)
iii. Adopting ordinances that control peak runoff
iv. Including funding mechanisms that support implementation and enforcement

6. Assessment of problems and corrective actions for problems identified
   A. All communities need to assess the water quality and quantity related problems in their community, prioritize the problems and include actions to adequately solve the problems that were identified.
   B. All communities must acknowledge and list any impaired waters within their jurisdiction as shown on the current MPCA 303d Impaired Waters list. A TMDL is a calculation that determines the allowable pollutant load that can be discharged into the impaired water such that the water is not impaired. A community that discharges water to an impaired waterbody within or adjacent to the community, needs to explain how and if it intends to be involved with the development of the Total Maximum Daily Load (TMDL) study.
      i. If a TMDL study is not completed, the city should identify the priority it places on addressing impaired waters and how the city intends to participate in the development or implementation of TMDL studies.
      ii. If the city is not directly involved in the TMDL study, the city should show how it intends to implement the study findings once the study is completed by the responsible party.
      iii. If a TMDL study is completed for the impaired water, the community needs to include an implementation strategy including funding mechanisms that will allow them to carry out the TMDL requirements.
      More information on the MPCA's TMDL program can be found on the MPCA's web site at http://www.pca.state.mn.us/water/tmdl/index.html.

7. Financial considerations
   A. All communities need to include a 5-year CIP that includes funds to solve the problems identified in number 6 above.
   B. All communities need to include funding in their CIP or operating budget for ongoing maintenance of their stormwater infrastructure.

8. Implementation priorities and program
   A. Developed, developing and any MS4 communities in the rural planning area need to provide information on how they intend to manage stormwater:
      i. Include an erosion and sediment control ordinance consistent with NPDES Construction Stormwater permit and MS4 permit requirements
      ii. Identify ways to control runoff rates (suggested guidance - Minnesota Stormwater Manual) so that land-altering activities do not increase peak stormwater flow from the site for a 24-hour precipitation event with a return frequency of 1or 2, 10, and 100 years.

iii. Require criteria for wet detention basin minimum pollutant removal efficiency to protect and improve stormwater runoff quality. Best management practices for development and redevelopment should result in TSS and TP reductions (suggested guidance - Minnesota Stormwater Manual).
iv. Require infiltration of the first ½ inch of runoff from the impervious areas created by new projects where there are A and B soils. Use of infiltration techniques is prohibited in some potential stormwater hotspot areas, e.g. vehicle fueling areas (suggested guidance - Minnesota Stormwater Manual).
v. Recommend adding a soil amendment and requiring soil ripping 1 ½- 2 feet after mass grading is complete for all soil types.
vi. Require infiltration in wellhead protections areas to be based on the community's wellhead protection plan and at the discretion of the local government.
vii. Require pretreatment of stormwater prior to discharge into all lakes and streams.

B. Rural planning area communities, excluding MS4 communities, need to provide information on how they intend to manage stormwater:
   i. Include an erosion and sediment control ordinance consistent with NPDES Construction Stormwater permit requirements
   ii. Identify ways to control runoff rates so that land-altering activities do not increase peak stormwater flow from the site for a 24-hour precipitation event with a return frequency of 1or 2 years
   iii. Require criteria for wet detention basin minimum pollutant removal efficiency to protect and improve stormwater runoff quality for areas where development is occurring. Best management practices for redevelopment (suggested guidance - Minnesota Stormwater Manual) should result in TSS and TP reductions.

C. All communities with designated trout streams must identify actions in their plan to address the thermal pollution effects from development.

D. All communities with special waters, such as outstanding resource value waters, need to meet state requirements for development near these waters (see Appendix A part B.1-8 of the Minnesota Construction General Permit for a list of these waters and Appendix A part C.1-5 for specific requirements).

E. All communities need to consider the use of stormwater practices that promote infiltration/filtration and decrease impervious areas (better site design and integrated stormwater management), where practical.

F. All communities need to include information on the types of best management practices to be used to improve stormwater quality and quantity and the maintenance schedule for the best management practices.

G. All communities need to include a wetland management plan or a process and timeline to prepare a plan. At a minimum, the wetland management plan should incorporate a function and value assessment for wetlands. Other items to address in the plan include the pretreatment of stormwater prior to discharge into all wetland types, and the use of native vegetation as buffers for high quality wetlands. Buffers should be consistent with the functions and values identified in the plan.

H. Developed and developing communities that are a Phase II NPDES MS4 permit community need to include information on how the community is meeting the permit conditions for required Stormwater Pollution Prevention Plans:
    i. Public education and outreach
    ii. Public participation/involvement
    iii. Illicit discharge detection and elimination
    iv. Construction site runoff control
    v. Post-construction runoff control
    vi. Pollution prevention/good housekeeping.
    vii. Activities planned to be undertaken along with numerical goals, strategies, and timelines
    viii. Funding source for the various required activities.

I. Developed and developing communities which are required to revise their Stormwater Pollution Prevention Plan to include the required nondegradation information as part of their NPDES MS4 permit need to summarize or integrate the nondegradation information into the local water management plan.

9. Amendment procedures: Each local plan must include year the plan extends to and establishes the process by which amendments may be made.

c. Water Supply Plan Elements

The Metropolitan Land Planning Act requires all communities in the metropolitan area that have a municipal water supply system to prepare a water supply plan. The Council's water supply guidelines are based on Minn. Stat. Sec. 473.859, Subd. 3 (4). The Council's and the Minnesota Department of Natural Resources' guidelines for water supply plans follow.

DEPARTMENT OF NATURAL RESOURCES - DIVISION OF WATERS and METROPOLITAN COUNCIL
WATER EMERGENCY AND CONSERVATION PLANS

These guidelines are divided into four parts. The first three parts, Water Supply System Description and Evaluation, Emergency Response Procedures and Water Conservation Planning apply statewide. Part IV, relates to comprehensive plan requirements that apply only to communities in the Seven-County Twin Cities Metropolitan Area. If you have questions regarding water emergency and conservation plans, please call (651) 296-0512 or (651) 297-2835 or e-mail your question to wateruse@dnr.state.mn.us. Metro Communities can also direct questions to the Metropolitan Council at watersupply@metc.state.mn.us or (651) 602-1066.

DNR Water Appropriation Permit Number(s)	
Name of Water Supplier	
Address	
Contact Person	
Title	
Phone Number	
E-Mail Address	

PART I. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION

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

A. ANALYSIS OF WATER DEMAND.

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

TABLE 1 Historic Water Demand

Year	Total Population	Population Served	Total Connections	Residential Water Sold (MG)	C/I/I Water Sold (MG)	Wholesale Deliveries (MG)	Total Water Sold (MG)	Total Water Pumped (MG)	Percent Unmetered/ Unaccounted	Average Demand (MGD)	Maximum Demand (MGD)	Residential gallons/ capita/day	Total gallons/ capita/day

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

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

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

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

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

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

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

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

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

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

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

Customer	**Gallons per year**	**% of total annual use**

B. TREATMENT AND STORAGE CAPACITY.

TABLE 3(A) Water Treatment

Water Treatment Plant Capacity	Gallons per day
Describe the treatment process used (ie, softening, chlorination, fluoridation, Fe/Mn removal, reverse osmosis, coagulation, sedimentation, filtration, others). Also, describe the annual amount and method of disposal of treatment residuals, if any.	

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

Total Storage Capacity		**Average Day Demand** (average of last 5 years)
Gallons		Gallons per day
Type of Structure	Number of Structures	Gallons
Elevated Storage		
Ground Storage		
Other:		

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

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

Total Capacity of Sources	Gallons per minute
Firm Capacity (largest pump out of service)	Gallons per minute

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

Well # or name	Unique Well Number	Year Installed	Well & Casing Depth (ft)	Well Diameter (in)	Capacity (GPM)	Geologic Unit	Status

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

TABLE 4(C) Surface Water Sources

Intake ID	Resource name	Capacity (GPM/MGD)

GPM – Gallons per Minute MGD – Million Gallons per Day

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

Water Supply System	Capacity (GPM/MGD)	Wholesale or retail

GPM – Gallons per Minute MGD – Million Gallons per Day

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

Water Supply System	Capacity (GPM/MGD)	Note any limitations on use

GPM – Gallons per Minute MGD – Million Gallons per Day

D. DEMAND PROJECTIONS.

TABLE 5 Ten Year Demand Projections

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

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

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

E. RESOURCE SUSTAINABILITY

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

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

TABLE 6 Monitoring Wells - List all wells being measured.

Unique well number	**Type of well (production, observation)**	**Frequency of Measurement (daily, monthly etc.)**	**Method of Measurement (steel tape, SCADA etc.)**

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

Ground Water Level Monitoring – DNR Waters in conjunction with federal and local units of government maintain and measure approximately 750 observation wells around the state. Ground water level data are available online www.dnr.state.mn.us/waters. Information is also available by contacting the Ground Water Level Monitoring Manager, DNR Waters, 500 Lafayette Road, St. Paul, MN 55155-4032 or call (651) 296-4800.

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

Sustainability. Evaluate the adequacy of the resource to sustain current and projected demands. Describe any modeling conducted to determine impacts of projected demands on the resource.

Source Water Protection Plans. The emergency procedures in this plan are intended to comply with the contingency plan provisions required in the Minnesota Department of Health's (MDH) Wellhead Protection (WHP) Plan and Surface Water Protection (SWP) Plan.	
Date WHP Plan Adopted:	
Date for Next WHP Update:	
SWP Plan:	☐ In Process ☐ Completed ☐ Not Applicable

F. CAPITAL IMPROVEMENT PLAN (CIP)

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

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

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

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

PART II. EMERGENCY RESPONSE PROCEDURES

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

Federal Emergency Response Plan

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

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

Emergency Response Plan	Contact Person	Contact Number
Emergency Response Lead		
Alternate Emergency Response Lead		
Emergency Response Plan Certification Date		

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

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

EMERGENCY RESPONSE PROCEDURES

A. Emergency Telephone List. A telephone list of emergency contacts must be included as Attachment to the plan (complete template or use your own list). The list should include key utility and community personnel, contacts in adjacent communities, and appropriate local, state and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list on a regular basis (once each year recommended). In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Responsibilities and services for each contact should be defined.

B. Current Water Sources and Service Area. Quick access to concise and detailed information on water sources, water treatment, and the distribution system may be needed in an emergency. System operation, water well and maintenance records should be maintained in a central secured location so that the records are accessible for emergency purposes and preventative maintenance. A detailed map of the system showing the treatment plants, water sources, storage facilities, supply lines, interconnections, and other information that would be useful in an emergency should also be readily available. Check here ☐ if these records and maps exist and staff can access the documents in the event of an emergency.

C. Procedure for Augmenting Water Supplies. List all available sources of water that can be used to augment or replace existing sources in an emergency. In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Copies of cooperative agreements should be maintained with your copy of the plan and include in Attachment . Be sure to include information on any physical or

chemical problems that may limit interconnections to other sources of water. Approvals from the MN Department of Health are required for interconnections and reuse of water.

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

Water Supply System	Capacity (GPM/MGD)	Note any limitations on use

GPM – Gallons per Minute MGD – Million Gallons per Day

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

Name	Capacity (GPM/MGD)	Note any limitations on use

GPM – Gallons per Minute MGD – Million Gallons per Day

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

Water Use Priorities (Minnesota Statutes 103G.261)

First Priority. Domestic water supply, excluding industrial and commercial uses of municipal water supply, and use for power production that meets contingency requirements.

NOTE: Domestic use is defined (MN Rules 6115.0630, Subp. 9), as use for general household purposes for human needs such as cooking, cleaning, drinking, washing, and waste disposal, and uses for on-farm livestock watering excluding commercial livestock operations which use more than 10,000 gallons per day or one million gallons per year.

Second Priority. Water uses involving consumption of less than 10,000 gallons per day.

Third Priority. Agricultural irrigation and processing of agricultural products.

Fourth Priority. Power production in excess of the use provided for in the contingency plan under first priority.

Fifth Priority. Uses, other than agricultural irrigation, processing of agricultural products, and power production.

Sixth Priority. Non-essential uses. These uses are defined by Minnesota Statutes 103G.291 as lawn sprinkling, vehicle washing, golf course and park irrigation, and other non-essential uses.

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

Table 8 Water Use Priorities

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

GPD – Gallons per Day

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

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

- ☐ Water Demand
- ☐ Treatment Capacity
- ☐ Storage Capacity
- ☐ Groundwater Levels
- ☐ Surface Water Flows or Levels
- ☐ Pump, Booster Station or Well Out of Service
- ☐ Water Main Break
- ☐ Loss of Production
- ☐ Security Breach
- ☐ Contamination
- ☐ Other (list in Table 9)
- ☐ Governor's Executive Order – Critical Water Deficiency (required by statute)

Table 9 Demand Reduction Procedures

Condition	Trigger(s)	Actions
Stage 1 (Mild)		
Stage 2 (Moderate)		
Stage 3 (Severe)		
Critical Water Deficiency **(M.S. 103G.291)**	Executive Order by Governor & as provided in above triggers	Stage 1: Restrict lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses Stage 2: Suspend lawn watering, vehicle washing, golf course and park irrigation and other nonessential uses

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

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

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

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

Declaration and conservation.

(a) If the governor determines and declares by executive order that there is a critical water deficiency, public water supply authorities appropriating water must adopt and enforce water conservation restrictions within their jurisdiction that are consistent with rules adopted by the commissioner.

(b) The restrictions must limit lawn sprinkling, vehicle washing, golf course and park irrigation, and other nonessential uses, and have appropriate penalties for failure to comply with the restrictions.

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

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

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

☐ Utility Manager ☐ City Manager ☐ City Council or Utility Board

☐ Other (describe):

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

PART III. WATER CONSERVATION PLAN

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

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

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

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

Residential Gallons Per Capita Demand (GPCD)	
Average residential GPCD use for the last 5 years (use data from Table 1)	GPCD
In 2002, average residential GPCD use in the Twin Cities Metropolitan Area was 75 GPCD. Describe goals to reduce residential demand if the average for the last 5 years exceeds 75 GPCD.	

Total Per Capita Demand: From Table 1, is the trend in overall per capita demand over the past 10 years ☐ increasing or ☐ decreasing? If total GPCD is increasing, describe the goals to lower overall per capita demand or explain the reasons for the increase.

Peak Demands (calculate average ratio for last five years using data from Table 1)	
Average maximum day to average day ratio	
If peak demands exceed a ratio of 2.6, describe the goals for lowering peak demands.	

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

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

TABLE 10 (A) Customer Meters

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

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

TABLE 10 (B) Water Source Meters

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

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

Frequency of water audits: ☐ each billing cycle ☐ yearly ☐ other:

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

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

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

Billing Frequency: ☐ Monthly ☐ Bimonthly ☐ Quarter
☐ Other (describe):

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

Conservation Rate Structures

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

Conservation Neutral Rate Structure

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

Non-conserving Rate Structures

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

Other (describe):

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

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

Current Water Rates. Include a copy of the actual rate structure in Attachment or list current water rates including base/service fees and volume charges below.

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

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

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

State and Federal Regulations (mandated)

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

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

Enforcement. Are ordinances enforced? ☐ Yes ☐ No If yes, indicate how ordinances are enforced along with any penalties for non-compliance.

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

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

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

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

A packet of conservation tips and information can be obtained by contacting DNR Waters or the Minnesota Rural Water Association (MRWA). The American Water Works Association (AWWA) www.awwa.org or www.waterwiser.org also has excellent materials on water conservation that are available in a number of formats. You can contact the MRWA 800/367-6792, the AWWA bookstore 800/926-7337 or DNR Waters 651/296-0512 for information regarding educational materials and formats that are available.

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

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

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

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

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

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

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

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

METROPOLITAN COUNCIL

PART IV. ITEMS FOR METROPOLITAN AREA PUBLIC SUPPLIERS

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

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

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

A. Demand Projections

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

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

PLAN SUBMITTAL AND REVIEW OF THE PLAN

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

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

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

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

Appendix C: Summary of Policies and Implementation Strategies

List of All *Water Resources Management Policy Plan* Policies and Implementation Strategies

Water Supply

Policies

- The Metropolitan Council will work with state agencies and communities to promote and support the efficient use of water resources to ensure that supplies are adequate for the region's projected growth.
- The Council will work with regional partners to protect the water supply system for the region.

Implementation Strategies

- The Council will update the regional water supply plan at least every 10 years. Elements of the regional water supply plan will include:
  - An evaluation of existing and expected water use and supply in the metropolitan area.
  - An assessment of water supplies available in the metropolitan area.
  - An assessment of alternatives to meeting water demands in areas where it is determined that there are potential limitations on future withdrawals.
- The Council will review local water supply plans as required by state statute for consistency with Council and DNR plan requirements and Council policy.
- The Council will establish subregional task forces as needed and lead discussions among communities that may face water supply limitations. The Council will assist these communities to explore options and develop plans to meet projected demand.
- The Council will participate in regional planning efforts for drought and emergency conditions.
- The Council will work with partners to develop an institutional framework for coordinated regional and subregional water supply planning and management.
- The Council will promote water conservation measures in communities throughout the region.
- The Council will encourage public and private entities to pursue environmentally sound and cooperative water use practices, joint planning efforts and implementation efforts.
- The Council will investigate reusing wastewater effluent and, when cost-effective, implement reuse.
- The Council will work with local governments, regulatory agencies, water suppliers and water users to assess the use, capacity, quality and vulnerability of the regional water supply system along with identifying prime areas for recharge.
- The Council will promote development practices and patterns that protect the integrity of the region's water supply through the review of comprehensive plans, water supply plans, local stormwater management plans, and other environmental review documents.
- The Council will promote the use of best management practices for stormwater runoff to protect and improve water quality and maximize groundwater recharge.

Surface Water Management

Policies

- The Council will provide technical assistance and resource assessment information to assist others in their efforts to implement practices that will protect water resources (wetlands, lakes, streams, rivers, and natural drainage courses). Best management practices help to maintain and improve water quality, control runoff rates and volumes to reduce streambank erosion and flooding, and preserve designated beneficial uses.
- The Council will review local comprehensive plans, watershed management plans, local surface water management plans, local stormwater ordinances, environmental permits and other environmental documents to ensure that the local units of government are fulfilling their nonpoint source reduction requirements and therefore not impacting the metropolitan disposal system.

Implementation Strategies

- The Council will continue to monitor and assess lakes, streams, and rivers to measure the progress in achieving the goal of no adverse impact on water resources in the region.
- The Council will work with watershed organizations, local units of government, state and federal agencies, and other stakeholders to promote the protection of area lakes, wetlands, streams, and rivers with a special emphasis on priority lakes to achieve the goal of no adverse impact on water quality in the region.
- The Council will encourage and support the use of the most effective nonpoint source pollution reduction technologies. These include low impact development practices and best management practices aimed at protecting water quality and maintaining stormwater runoff rates and volumes at or below predevelopment conditions.
- The Council will review environmental documents to ensure that actions of others are not causing a wastewater system impact.
- The Council will develop target pollution loads for the major watershed basins by 2008 and work in conjunction with the MPCA in the development of Total Maximum Daily Loads (TMDLs) to reduce the effects of nonpoint source pollution on the region's wetlands, lakes, streams and rivers.

Wastewater Service

Policies

- The Metropolitan Council will use the wastewater system plan to support the orderly and economic development of the metropolitan area, including the long-term service area of communities. The long-term service area will be generally defined by a community or watershed boundary. A community's comprehensive plan and plan amendments are expected to meet the forecasts and densities specified in the Council's *2030 Regional Development Framework.* Inconsistencies will provide the Council with grounds for finding that the community's plan is more likely than not to have a substantial impact on, or contain a substantial departure from, the metropolitan system plan, thus requiring modifications to the local comprehensive plan.
- In order to provide cost-effective and efficient use of existing and planned infrastructure on a regional basis, local land-use planning must be consistent with the Council's adopted long-range policy plans, system plans and capital improvement programs for regional wastewater service, and all communities currently served by the Metropolitan Disposal System must remain in the system.

- The Metropolitan Council will not allow connections to the Metropolitan Disposal System within the rural planning area. The Council may provide capacity for the long-term needs of the rural and agricultural planning areas.
- The Council will not provide additional capacity within its interceptor system to serve excessive inflow and infiltration.
- The Council will establish inflow and infiltration goals for all communities discharging wastewater to the Metropolitan Disposal System based on the designed peak-hour capacity of the interceptor(s) serving the community. Communities that have excessive inflow and infiltration in their sanitary sewer systems will be required to eliminate the excessive inflow and infiltration within a reasonable time period.
- Interceptors and related facilities that are no longer a necessary part of the Metropolitan Disposal System will be reconveyed, abandoned, or sold pursuant to related statutes.
- The Metropolitan Council, the delegated pretreatment authority, will implement and enforce the Council's Waste Discharge Rules for the Metropolitan Disposal System.
- The Council will ensure that the MCES treatment plants will continue to meet the stringent permit conditions imposed by the Minnesota Pollution Control Agency.
- The Council will accept septage, biosolids, and other hauled liquid waste at designated sites. All hauled liquid wastes from within the region will be accepted at the full cost of service.
- The Council will design and adopt fees and charges using a regional cost-of-service basis:
  - Municipal wastewater charges will be allocated to communities uniformly, based on flow.
  - Industrial wastewater strength and load charge rates will each be uniform, and proportionate to the volume and strength of discharges.
  - Load charges for septage, portable toilet waste, holding tank wastewater and out-of-region wastes will be uniform for each type of load, and based on the volume of the load and the average strength of the types of loads.
  - Service Availability Charges (SAC) will be uniform within the urban service area of the region. SAC for a Rural Growth Center where a treatment facility is owned by the Council will be based on the reserve capacity of the plant and the Council's debt service specific to the Center. SAC for a Rural Growth Center where interceptor facility(s) are owned by the Council, will be the urban SAC charge plus a charge based on the reserve capacity of the specific interceptor(s) and the Council's debt service specific to the Center.
- The Council will seek customer input prior to, and give at least three months notice of, any material changes in the design of fees and charges.
- The Council will maintain wastewater rates for MCES that enable the division to:
  - Meet wastewater regulatory requirements;
  - Implement MCES infrastructure rehabilitation and repair needs; and
  - Provide wastewater capacity for growth consistent with the Council's *2030 Regional Development Framework.*

- The Council will continue to use the Council's review authority under the Metropolitan Land Planning Act to ensure that communities that permit the construction of private wastewater treatment systems within their communities (community systems and individual sewage treatment systems) ensure that these systems are installed, maintained, managed, and regulated by the community consistent with Minnesota Pollution Control Agency rules.
- The community is responsible for permitting all private wastewater treatment systems. The Council will not provide financial support to assist communities if these systems fail.
- The Council will allow the community to connect a failing private wastewater treatment system to the Metropolitan Disposal System, where there is available capacity, at the community's expense.

Implementation Strategies

- The Council will provide a level of wastewater service commensurate with the needs of the growing metropolitan area, and in an environmentally sound manner.
- The Council will provide sufficient sewer infrastructure capacity to meet the 20-year growth projections and long-term service area needs identified in local comprehensive plans. Any capital improvements that the Council needs to provide will be scheduled so that the infrastructure is available at least two years prior to the need identified in the approved comprehensive plan.
- New wastewater treatment plants, owned and operated by MCES, will be built to serve developing communities if they meet established criteria.
- The Council may implement early land acquisition and work closely with communities to preserve utility corridors when it is necessary to expand its facilities or locate new facilities needed to implement the wastewater system plan.
- The Council will continue to provide wastewater services to communities based on the definition of a metropolitan interceptor.
- Existing wastewater treatment plants in rural centers (centers that do not want significant growth) will not be owned and operated by the Metropolitan Council.
- Existing wastewater treatment plants owned and operated by Rural Growth Centers (centers that want to grow) will be acquired and operated by MCES upon request and established Council criteria. The request for acquisition must be made to the Council through a comprehensive plan amendment.
- If it is determined that a Rural Growth Center's wastewater treatment plant (WWTP) should be phased out and served by the Metropolitan Disposal System (MDS), then the Council will construct an interceptor from the existing treatment plant site or point of collection to a connection point within the existing MDS. The Rural Growth Center will be responsible to decommission the WWTP and take over the ownership of the interceptor from the WWTP or point of collection to their corporate limits.
- If comprehensive plans demonstrate that a Rural Growth Center will become contiguous to urban development, the Rural Growth Center will be reclassified under the *2030 Regional Development Framework* as a developing community.
- When proposed redevelopment is consistent with the 2030 growth projections, the Council will support redevelopment by funding improvements to the MDS for those communities that meet the established criteria.

- When the proposed redevelopment exceeds the 2030 growth projections, the Metropolitan Council will consider cost-sharing improvements to the MDS for those communities that meet the established criteria if a cost-effective solution is available. Cost sharing will be determined on a case-by-case basis. Cost sharing will attempt to limit undue hardship for communities.
- The Council will consider the financial implications and the community will share the cost of providing the additional services when construction of new regional facilities provides added benefits to local communities in addition to the expected regional benefits, and when additional costs are incurred by MCES to provide the local benefits.
- Service will not be provided until the Council, in consultation with the appropriate community, designates the area as a developing community and the community amends its comprehensive plan accordingly.
- The Council will continue to use the current design standards for interceptors.
- The Council will develop inflow and infiltration goals for all communities based on the designed peak-hour capacity of the interceptor(s) serving the community as well as guidelines for the preparation of the local inflow and infiltration programs.
- The Council will ask all communities served by the MDS to begin the development and implementation of an inflow and infiltration program as soon as practicable and require the communities to include that program within their next comprehensive plan.
- Peak inflow during wet weather conditions will be measured by either the MCES metering system or by installation of temporary monitoring equipment in the sanitary sewer system.
- The Council will require the community to reduce its inflow and infiltration to reach the design flow standard for each connection point to the MDS by no later than 2012.
- The Council will limit increases in service within those communities where excessive inflow and infiltration jeopardizes MCES's ability to convey wastewater without an overflow or backup occurring, or limits the capacity in the system to the point where the Council can no longer provide additional wastewater services. MCES will work with those communities on a case-by-case basis.
- MCES will work with communities to initiate an inflow and infiltration reduction program. Either option A or B listed below will be acceptable.

  Option A – The Council will initiate an inflow and infiltration financial assistance/surcharge program. In order to provide financial assistance in 2008, the Council will initiate the surcharge program in 2007. This program will allow MCES to surcharge communities exceeding their inflow and infiltration goals in order to collect revenue for the community to use for solving its inflow and infiltration problem.

  Option B – The Council will allow communities with an inflow and infiltration reduction program in place to continue with their programs and not participate in MCES's surcharge program. This will allow communities to undertake activities for inflow and infiltration reduction using local funds, as long as those funds are equal to or greater than the surcharge program funds.

- Starting in 2013, the Council will limit future increases in wastewater service within those communities that have not met their inflow and infiltration goal(s), until the problem is solved. MCES will work with communities not meeting goals on a case-by-case basis.
- Starting in 2013, the Council will institute a wastewater rate demand charge program for those communities that have not met their inflow and infiltration goal(s). The intent of the program will be to help defray the cost of providing attenuation within the MDS to avoid overloading downstream facilities. MCES will continue to review communities' progress and work with them on a case-by-case basis.
- The Council will work with the Public Facilities Authority to make funds available for inflow and infiltration improvements.
- The Council will declare interceptors that no longer function in the role of a metropolitan interceptor as being no longer needed to be part of the Metropolitan Disposal System and convey the interceptor and ancillary facilities to the appropriate local governmental unit.
- To achieve the efficient and effective use of the MDS, the Council regulates the quantity and quality of waste discharges into public sewers.
- The Council will continue to maintain the high quality of service of its wastewater system while meeting requirements of its environmental permits, supporting growth in a timely fashion and maintaining a reasonable cost for service.
- The Council will continue to accept septage, biosolids and other hauled liquid wastes at designated sites for communities located within the metropolitan area. The Council may accept septage from communities beyond the seven-county metropolitan area as system capacity allows.
- Upon Council approval, the system-wide plan for hauled liquid waste acceptance will be implemented in order to provide this service in the most efficient and cost-effective manner.
- The Council, through the comprehensive planning process, requires that communities demonstrate that they have the capability to ensure that these systems (private wastewater treatment systems) are operated effectively within the standards required by the Minnesota Pollution Control Agency.
- The Council will support State rules for individual sewage treatment systems and work with local governments to assist in their implementation.
- The Council will support the Minnesota Pollution Control Agency's regulatory approach to community treatment systems.
- The Council will require that copies of individual sewage treatment system ordinances and information on the management programs be submitted to the Council as part of the comprehensive planning process.

Appendix D: Definitions

Agricultural Preservation Area: Agricultural Preservation Areas are large, contiguous land areas planned and zoned to maintain agriculture as the primary long-term land use. Communities containing large Permanent Agricultural Areas are located on the region's best soils. This soils resource supports agriculture as the most important element of the local economy, and a community's choice of this land-use designation signals its intent to ensure that the agricultural economy remains strong. To support these local aspirations, the Council forecasts nominal growth for this policy area, indicating the Council's expectation that no nonfarm-related housing development should occur in these areas.

Aquifer: A saturated geologic formation that will yield a sufficient quantity of water to serve as a private or public water supply.

Assessment: An appraisal, judgement or evaluation based on information provided by inventories and informed by specified criteria.

Best Management Practices: Recommendations pertaining to the development and maintenance of varied land uses, aimed at limiting the effects of development, such as soil erosion and stormwater runoff, on the natural environment. See the Council's *Urban Small Sites Best Management Practices Manual* for specific examples of best management practices.

Cesspool: An underground pit or seepage tank into which raw sewage is discharged and from which the liquid seeps into the surrounding soil, bedrock, or other soil materials.

Chapter (of *Metropolitan Development Guide*): Any one of the four regional systems policy plans (transportation, water quality, recreation open space, and aviation) or the *Regional Development Framework.*

Clustering: A technique to allow a reasonable amount of land development while conserving rural character, such as farmland, natural areas, and open views.

Community Drainfields: See *on-site septic systems.*

Comprehensive Plan: A plan for the development of an area, which recognizes the physical, economic, social, political, aesthetic, and related factors of the community involved. (Compare with *local comprehensive plan.*)

Conservation: The management of natural resources to prevent waste, destruction or degradation.

Density: The number of dwelling units per net residential acre of land.

Design Average Flow: The design average flow is calculated as the product of the long-term service area times 800 gallons per acre per day. This value represents an annual average flow from a service area for long-term development.

Design Peak-to-Average Flow: The design peak-to-average ratio is the ratio of the peak-hour flow used for hydraulic design divided by the design-average flow.

Design Peak-Hour Flow: The design peak-hour flow is calculated as the product of the design-average flow times the MCES specified peak-to-average ratio.

Developable Land: Land that is suitable as a location for structures and that can be developed free of hazards to, and without disruption of, or significant impact on, natural resource areas including surface waters, wetlands, floodplains, parks, steep slopes.

Diversified Rural Area: Sparsely developed parts of the region outside of Rural Settlements, Rural Residential Areas and the Permanent Agriculture Area that contain the widest variety of farm and nonfarm land uses in patterns often referred to as "rural character." These are the parts of the region designated as appropriate locations for a mix of large-lot residential and clustered housing with agriculture and other uses, including facilities and services of value to the metropolitan area but requiring a rural location (nurseries, campgrounds, etc.).

Excessive I/I: a) I/I that results in the communities wet-weather flows to be in violation of the Metropolitan Council's established I/I goals for the community.

b) I/I that causes the peak hourly flow to exceed the value determined by multiplying the average flow by the value of the peak-to-average ratio used by MCES to design interceptors and pump stations.

Failing System: Any system that discharges sewage to a seepage pit, cesspool, drywell, or leaching pit, and any system with less than three feet of soil or sand between the bottom of the distribution medium and the saturated soil level or bedrock. In addition, any system posing an imminent threat to public health or safety shall be considered failing.

Forecast: In the *Framework*, a calculation of growth in population, households and jobs based on data about current conditions (e.g., the 2000 Census) that is extrapolated into the future.

Groundwater: The supply of freshwater in an aquifer.

Growth Strategy: The Council's selection of an urban growth and development pattern for the region and the measures to implement it.

Household: The group that consists of all the people who occupy a housing unit.

Imminent threat to public health or safety: Situations with the potential to immediately and adversely impact or threaten public health and safety.

Individual On-Site Septic System: See *on-site septic treatment systems.*

Individual Sewage Treatment System (ISTS): A system for disposing and treating human and domestic waste, such as a septic tank and soil absorption system or other system allowed by the state and city. This includes community drainfields, where a common on-site system serves several properties.

Infill: Development or redevelopment of land that has been bypassed, remained vacant, and/or is underused.

Infiltration: The seepage of groundwater into sewer pipes through cracks or joints in the pipes.

Inflow: Flow from a single point into sewer pipes, such as discharges from sump pumps and foundation drains, or stormwater that enters openings in the sewer access covers.

Infrastructure: Fixed facilities, such as sewer lines and roadways, that serve existing and new development and redevelopment.

Investments, Regional Investments: Investments made by the Metropolitan Council into regional infrastructure.

Land Planning Act, Metropolitan Land Planning Act: The sections of Minnesota Statutes directing the Council to adopt long-range, comprehensive policy plans for transportation, airports, wastewater services, and parks and open space. It authorizes the Council to review the comprehensive plans of local governments.

Land Supply: Available amount of developable land.

Local Comprehensive Plan: Plans prepared by cities, townships and, in some cases, counties, for local land use and infrastructure.

Local Government: Municipal units of government, such as counties, cities and townships.

MDS: Metropolitan Disposal System.

Measured Wet-Weather Peak-to-Average Ratio: The observed peak-hour flow during wet weather divided by the target annual flow.

Metropolitan Area, Metro Area: See *region.*

Metropolitan Development Guide: The collection of regional plans that includes the *Regional Development Framework* and the plans for the four regional systems: transportation, wastewater service, airports, and parks and open space.

Metropolitan Urban Service Area (MUSA): The area in which the Metropolitan Council ensures that regional services and facilities under its jurisdiction are provided.

Multifamily Housing: Residential structure with two or more separate dwelling units.

NPDES: National Pollutant Discharge Elimination System.

Observed Peak-Hour Flow: The observed peak-hour flow is the highest flow rate over one hour duration during a 24-hour period that has been measured and reported.

Observed Peak-to-Average Ratio: The observed peak-to-average ratio is the observed peak-hour flow divided by the annual average flow.

On-Site Septic System: See individual sewage treatment systems.

Ordinance: A law or regulation set forth and adopted by a governmental authority, usually a city or county.

Policy: A specific statement of guiding actions that expresses the general direction that the Metropolitan Council intends to follow in order to meet its goals.

Policy Plan: See *system plans.*

Predevelopment conditions: Runoff rates and volumes that are consistent with the rates and volumes of the property's current uses before the property is changed by development or redevelopment.

Redevelopment: The process by which an existing building, structure, or developed area is adaptively reused, rehabilitated, restored, renovated and/or expanded.

Region: Area pertaining to the Metropolitan Council's jurisdiction, including the seven counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington.

Regional Infrastructure: Infrastructure pertaining to any of the Council's four systems: wastewater services, transportation, parks and open space, and airports. (See also *regional systems.*)

Regional Parks System: The regional parks system includes 75 parks and park reserves, trails and special recreation areas. Parks are operated by 10 partnering agencies--cities and counties. The agencies work with the Metropolitan Council to acquire and develop parks and trails to protect natural resources and to provide outdoor recreation for public enjoyment.

Regional Recreation Open Space: According to Minn. Stat. 473.121, Subd. 14, land and water areas, or interests therein, and facilities determined by the Metropolitan Council to be of regional importance in providing for a balanced system of public outdoor recreation for the metropolitan area including, but not limited to, park reserves, major linear parks and trails, large recreation parks, and conservatories, zoos, and other special use facilities.

Regional Systems: Systems for which the Metropolitan Council is the responsible planning and/or operating authority. The systems consist of wastewater services, transportation, parks and open space, and airports.

Reinvestment: An investment in redevelopment, infill or adaptive reuse.

River Defense Network: The River Defense Network is a group of local, regional, state and federal agencies as well as other public and private organizations that worked together to purchase a series of spill response equipment along the Mississippi River upstream of the Minneapolis, St. Paul and St. Cloud municipal water intakes. The River Defense Network also conducted modeling to characterize the flow in the Mississippi River to use for predicting travel times of spills.

Runoff: The rainfall, snowmelt, or irrigation water flow that has not evaporated or infiltrated into the soil, but flows over the ground surface.

Septage: Solids and liquids removed during periodic maintenance of an individual sewage treatment system, or solids and liquids which are removed from toilet waste-treatment devices such as a holding tank.

Septic System : See *on-site septic treatment systems.*

Seven-County Area: See *region.*

Sewershed: The area tributary to the MCES interceptor system at a single point is a sewershed.

Stormwater: Surplus surface water generated by rainfall and snowmelt that does not seep into the earth but flows overland to rivers, lakes or streams.

Surcharging: To fill beyond the capacity of the pipe; overflow.

Surface Water: Water on the earth's surface exposed to the atmosphere such as rivers, lakes and creeks.

Sustainable Development: Development that maintains or enhances economic opportunity and community well-being while protecting and/or restoring the natural environment upon which people and economies depend. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.

System Plans: Long-range comprehensive policy plans for the regional systems - transportation, airports, wastewater services, and parks and open space.

System Statements: Statements sent to communities that include system plan information used to guide the preparation of the local comprehensive plan.

Upper Mississippi River Source Water Protection Planning Group: The Upper Mississippi River Source Water Protection Planning Group is comprised of the cities of St. Paul, Minneapolis, and St. Cloud, the Minnesota Department of Health, the Minnesota Pollution Control Agency, the Metropolitan Council, Minnesota Rural Water, and other interested parties. The Group is working together to develop source water protection plans for the cities of Minneapolis, St. Paul and St. Cloud. The purpose of the plans is to protect the water quality of the surface water resources that supply municipal water to the three communities.

Urban Area: The area consisting of two *Framework*-defined planning areas—Developed Communities and Developing Communities—occupying about 50 percent of the region's land area.

Urban Reserve: A transition area beyond the current MUSA line identified in a local comprehensive plan that is being held in a rural condition until it is included in the urban area.

Wastewater: Water carrying waste from homes and commercial and industrial facilities.

Wastewater Treatment Plant: A facility designed for the collection, removal, treatment, and disposal of wastewater generated within a given service area.

Wet-Weather Peak Ratio: Average of three highest peak days divided by the average daily flow.

Appendix E:

Regional Wastewater System Long-Term Service Areas