Public Utilities and Surface Water Plan

This chapter describes how the City will manage its infrastructure for wastewater conveyance and treatment, water supply and surface water management. It is essential that these major capital facilities are coordinated with other plans for land use, streets, parks and natural resource protection.

Please refer to the Utilities System Assessment, chapter 7 of this plan, for a description of the current facilities and needs.

Major Utility Systems Issues

Sanitary Sewer Issues

1. **Growth Locations**: Where are the most suitable locations to expand the sanitary waste system (and the city) based on cost, engineering feasibility, and environmental effects?
2. **High-Demand Users:** Should system improvements be made to accommodate the high demand of a very small number of industrial users? How will this decision affect the city's economic development strategy?

Water Supply and Distribution Issues

1. **Growth Locations**: Where are the most logical locations to expand the sanitary waste system based on cost, engineering feasibility, and environmental impacts?
2. **System Improvements**: What enhancements to the existing water treatment and supply system would be required to serve all areas of the city today and/or future areas of the city as it grows with additional residential, commercial, industrial, or institutional land uses?

Surface Water Management Issues

1. **Planning:** Should the city prepare a comprehensive surface water management plan?

Sanitary Sewer System

Ensure that the City's wastewater system reinforces the principle of compact growth while maintaining fees that are competitive with comparable cities.

1. Sewer Line Extension Plan

As new plats are approved, require that major lines are stubbed in each direction necessary to support continued urban expansion. Follow the system expansion plan prepared in 2004 by the City's consulting engineer. That plan will be updated as circumstances dictate to keep it relevant with the comprehensive land use and roads plans.

No major improvements to the existing system of trunk sewer lines are needed in the foreseeable future to accommodate forecast growth.

The need for additional lift (pump) stations will be determined through engineering studies as neighborhoods and districts are designed.

2. Service Only within the City

Require annexation or an annexation agreement to extend and connect to City sewer or water lines.

3. Annexation Petitions

It is the City's intention as stated in this plan to only approve residential or commercial plats that are adjacent to or very near other, existing urban development even if all of the development costs are borne privately. Consequently, each petitioner must demonstrate that sewer and water lines and local streets can be feasibly and economically extended from an adjacent neighborhood of the city.

4. Retiring On-Site Wastewater Systems

Require that building that discharge wastewater and that are on parcels abutted by a City wastewater line connect to the City's sewer system within 18 months. Refer to City Code section 810.02, Subdivisions 3 and 4. There are 40 to 50 parcels and buildings that are not served by the public sewer system but have their own on-site wastewater systems.

5. Maintaining Adequate Capacity in the Treatment Plant

Conduct a study of its wastewater treatment plant in 2018 or 2019 to ensure that it has adequate capacity for the foreseeable future for both the liquid volume and the biological loading of treatment demand.

6. Assessment Policy

Building and financing new sewer or water lines will be primarily the responsibility of the private land developers and builders. Any such improvements to the public sewer or water systems must be done in accordance with City standards and approved by the City before they are accepted.

Some extraordinary development costs, such as wastewater lift stations, may be spread beyond an immediate land development project and assessed according to Minnesota Statutes Chapter 429. The cost of rehabilitating City utilities or streets may also be financed through special assessments against benefiting properties.

7. Other Provisions of City Code

Continue to enforce its requirements related to the City wastewater collection system as presented in section 810 of the City Code. Those subjects include required use of public sewers, private sewage disposal, prohibited discharges, industrial wastes, sewer construction standards, practices and assessments, sump pumps, inspections and billing.

Water Supply System

Ensure that the City's water supply system supports land development while maintaining fees that are competitive with comparable cities.

1. Water Line Extension Plan

As new plats are approved, require that major lines are stubbed in each direction necessary to support continued urban expansion.

Some extended perimeter locations have been served with municipal water lines. Seek to annex, develop and serve intervening locations in order to recoup some of the cost of extending trunk water lines to those locations while maintaining consistency with the land use and growth management plan.

No major improvements are needed to the water source, filtration and storage system in the foreseeable future to support the forecast growth of the city.

2. Service Only within the City

Require annexation or an annexation agreement to extend and connect to City sewer or water lines.

Surface Water Management

Continue to manage surface water consistent with City, County and State regulations and guidelines for the protection of the environment and properties.

The City of Big Lake is rich in water resources, as it includes several high-quality lakes and seven miles of Elk River shoreline. At the same time, its sandy soils make the groundwater aquifer more susceptible to pollution from the surface. The City enforces State regulations and guidelines to protect water quality, control water flow and steward related natural resources.

The benefits of effective storm water runoff management include:

- Protection of wetlands and aquatic ecosystems
- Improved quality of receiving water bodies
- Conservation of water resources
- Protection of public health
- Flood control.

1. Storm Water Pollution Prevention Plan

Continue to regulate surface water runoff according to the City's *Storm Water Pollution Prevention Plan* (SWPPP).

The SWPPP includes six topics:

- Public education
- Public participation and involvement
- Illicit discharge detection and elimination
- Construction site storm water runoff control
- Post construction storm water management
- Pollution prevention / "good housekeeping".

These topics are addressed through City ordinances, City capital spending and City operations.

The current Big Lake SWPPP was required and re-authorized approved by the Minnesota Pollution Control Agency in 2013. That agency enforces the terms of the federal Clean Water Act as described in the State's Municipal Separate Storm Sewer System (MS4) permit.

Since 2013, the City has updated ordinances, mapping and inspection practices to fulfill the terms of the permit. In addition, the City coordinates with Sherburne County and the Sherburne Soil and Water Conservation District to accomplish this mission. A fee is assessed to every land parcel in the city to cover these costs.

2. Local Controls

Continue to enforce the following local ordinances to accomplish the objectives of its Storm Water Pollution Prevention Plan.

Shorelands

Continue to enforce the provisions of its Shorelands Overlay zoning district (City Code section 1065).

That ordinance applies to land within 1,000 feet of 12 identified lakes and 300 feet of the Elk, Snake and St. Frances Rivers. It supplements and limits the "underlying" zoning district by regulating land use, development, building setbacks, impervious coverage, roads, vegetative alteration, water supply and sewage treatment.

Shoreland regulations are required in cities and counties by the Minnesota Department of Natural Resources.

Wetlands

Continue to enforce the provisions of its Wetlands Overlay zoning district (City Code section 1066).

That ordinance includes a definition and general map of local wetlands. It requires that prior to grading or construction each site be inspected by a licensed professional for the presence of wetlands. Identified wetlands must not be harmed by construction or subsequent water runoff. A setback and vegetated buffer strip are required around each identified wetland. Some wetlands are not obvious from casual inspection of the surface.

The City is the Local Governmental Unit responsible for enforcing the federal Wetland Conservation Act within its borders.

Floodplains

Continue to enforce the provisions of its Floodplain Overlay zoning district (City Code section 1064).

The floodplain overlay zoning district supplements and limits the "underlying" zoning regulations. It has been adopted to maintain the community's eligibility in the national flood insurance program, to limit property damage from floods and to protect riparian natural resources. It applies to lands shown on the official flood insurance rate map prepared by the Federal Emergency Management Agency. A floodway and a flood fringe district are mapped, and regulations vary between the two.

The ordinance regulates the types of allowable land uses, the amount of impervious coverage, the minimum basement elevation of buildings, the placement and elevation of on-site sewage facilities, the protections for public utilities, railroads, roads and bridges.

Mississippi River Recreational River District

The City of Big Lake includes a small tract of land along the Mississippi River that is used for its wastewater treatment plant. Therefore, it was required to adopt an overlay zoning district to enforce the provisions of the state's management plan for the Mississippi River. It is intended to protect the natural and scenic values of the river.

As an overlay district, this ordinance supplements the "base" zoning. It applies to a narrow band of parcels near the river (in this case, just one City-owned parcel). The ordinance addresses lot size, structure setback from the bluff line, alterations of natural vegetation and topography, and protection for steep slopes.

Subdivision Code

The City's subdivision regulations include at least two sections that directly implement the Storm Water Pollution Prevention Plan:

- Storm Water Management, Section 1108.07
  Requires builders to submit a surface water management plan that complies with the SWPPP and describes how surface water will be managed during and after construction. It addresses water quality, volume and flow rate.
- Erosion and Sediment Control, Section 1108.08
  Requires builders to submit a plan for limiting and controlling erosion during and after construction.

Stormwater Discharge Fee

Section 820 of the Big Lake City Code establishes a Storm Water Drainage Utility for the purpose managing and funding the construction and maintenance of the drainage system. It allows the City to levy a fee as part of its utility billing system and establishes a formula to calculate the fee for each land parcel based on its size and zoning district.

3. Sherburne Soil and Water Conservation District

Continue to partner with the Sherburne Soil and Water Conservation District (SWCD) to accomplish projects related to public education, guidance or physical improvements related to conservation.

SWCDs have been established across the state for those and related purposes, including wetland delineation and evaluation. Some cost-share funding is available for projects of priority concern. Much of their work involves direct service to land owners such as assistance in natural resource planning or applying "best management practices."

The Sherburne SWCD was the primary author of the *Sherburne County Water Management Plan*, 2007 and 2018, with assistance from Sherburne County. That document identified subjects of highest concern and recommended responses by cities, the county, the SWCD, land owners, associations and state or federal agencies.

The three priority concerns of the 2018 plan were:

- **Surface water quality:** The cumulative impacts of land use in directly connected and/or riparian areas which have a direct impact on surface water quality.

  The City will help address this concern by following its multi-faceted Storm Water Pollution Prevention Plan.

  Prime examples are the use of ponds and swales to infiltrate and cleanse runoff, and regular street sweeping to remove debris from runoff. Salt in the lakes is an emerging problem; the use of storm ponds is a good way to catch that salt before it gets to the lakes. However, ponds are not always feasible in the small and highly developed watersheds of Big and Mitchell Lakes.

  Also, in 2016, the City, the SWCD and the Lakes Association (see below) collaborated on a study of shoreline habitat loss and erosion around Big and Mitchell Lakes.

- **Ground water quality and quantity:** High levels of nitrates in groundwater and quantity in areas identified as sensitive.

  Nitrate pollution is caused primarily by chemical fertilizers, so this is primarily an agricultural issue. However, Big Lake will help by promoting the use of low-nitrogen lawn fertilizers and by integrating practices such as rain gardens and trench drains.

- **Aquatic invasive species:** The introduction and spread of aquatic invasive species and their negative effect on water quality, navigation, recreation and fisheries.

  The City will continue to partner with the Big Lake Community Lake Association, Sherburne SWCD and Minnesota Department of Natural Resources to manage current aquatic invasive species infestations (AIS) and educate watercraft operators on AIS transport and laws.

The fact that the County and the local lakes association have prepared comprehensive water management plans indicates that there is probably not a need for the City of Big Lake to prepare its own plan.

4. Private Coordination

Continue to coordinate with the Big Lake Community Lake Association.

This voluntary group of riparian property owners has prepared a lake management plan and an invasive species response plan, tests water quality in the lakes, watches for invasive species and stocks walleyes.

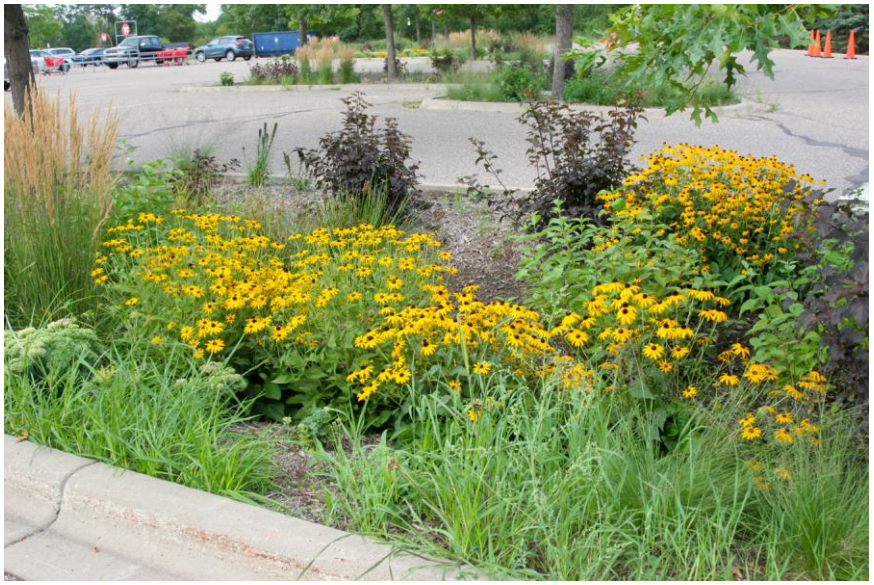
5. Overflow Routes

Study the feasibility of a man-made outlet to Big and Mitchell Lakes that is less prone to overflowing than the present structure.

Study the need for and feasibility of an overflow route to the Mississippi River from the southern part of the city.

6. Neighborhood Ponds

Consistent with the principles of the Storm Water Pollution Prevention Plan, aim to infiltrate surface water on-site to the extent feasible. Use ponds, swales and "rain gardens" to add beauty and interest to every type of development as they reduce the need for storm sewers and recharge the aquifer.



Small surface water catchments, sometimes called rain gardens, can be designed into commercial, industrial or residential areas to filter water and add beauty. Plants are used that can thrive during periods of both drought and flood.

This low area was preserved during the platting process to occasionally catch and infiltrate surface water while providing neighborhood open space.

Plan Action Steps

The City will take the following steps to implement the recommendations of the Public Utilities Plan.

Table 13-1
Major Public Utilities Plan Actions

Action	Timing
Follow the 2004 sanitary **sewer system expansion plan**.	Continuous
Require annexation or an **annexation agreement** to extend and connect to City sewer or water lines.	Continuous
Approve residential or commercial **plats** that are adjacent to or very near other, existing urban development.	Continuous
Seek to annex, develop and serve **intervening locations** in order to recoup some of the cost of extending trunk water lines to those locations while maintaining consistency with the land use and growth management plan	Continuous
Continue to **manage surface water** consistent with City, County and State regulations and guidelines for the protection of the environment and properties.	Continuous
Continue to **regulate surface water** runoff according to the City's *Storm Water Pollution Prevention Plan*	Continuous
Study the feasibility of a man-made **outlet to Big and Mitchell Lakes** that is less prone to overflowing than the present structure.	By 2022