

# Wastewater Treatment & Drinking Water Supply Alternatives Analysis

Lake Sallie & Lake Melissa  
Chain of Lakes

Wenck File #1311-07

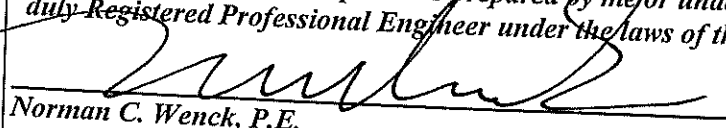
Prepared for:  
**PELICAN RIVER  
WATERSHED DISTRICT**

Prepared by:  
**WENCK ASSOCIATES, INC.**  
1800 Pioneer Creek Center  
P.O. Box 249  
Maple Plain, Minnesota 55359-0249  
(763) 479-4200

February 2008

 Wenck

*I hereby certify that this report was prepared by me or under my direct supervision and that I am a  
duly Registered Professional Engineer under the laws of the State of Minnesota.*

  
Norman C. Wenck, P.E.

2-20-08

Registration No. 8946

# Table of Contents

<b>1.0</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>1-1</b>
<b>2.0</b>	<b>INTRODUCTION.....</b>	<b>2-1</b>
2.1	General.....	2-1
2.2	Preliminary Discussion of Design Criteria .....	2-1
2.2.1	Estimated Flow .....	2-2
2.2.2	Construction.....	2-3
2.2.3	Stormwater.....	2-3
2.2.4	Assumptions.....	2-4
2.3	Previous Investigations .....	2-5
<b>3.0</b>	<b>PURPOSE.....</b>	<b>3-1</b>
3.1	Statement of Need.....	3-1
<b>4.0</b>	<b>AGENCY BACKGROUND.....</b>	<b>4-1</b>
4.1	Pelican River Watershed District.....	4-1
4.2	City of Detroit Lakes .....	4-1
4.3	Becker County .....	4-2
<b>5.0</b>	<b>ALTERNATIVES ANALYSIS.....</b>	<b>5-1</b>
5.1	Wastewater.....	5-1
5.1.1	Collection Sewer Systems – All Options.....	5-1
5.1.2	Option 1 – Cluster Wastewater Treatment Systems .....	5-1
5.1.3	Option 2 – Regional Wastewater Treatment System.....	5-3
5.1.4	Option 3 – Sewer Connection to Detroit Lakes .....	5-3
5.2	Water.....	5-4
5.2.1	Water Distribution System – All Options.....	5-4
5.2.2	Option 1 – Small Community Water System .....	5-4
5.2.3	Option 2 – Regional Water System .....	5-4
5.2.4	Option 3 – Water Supply from Detroit Lakes.....	5-5
<b>6.0</b>	<b>COST COMPARISON OF ALTERNATIVES.....</b>	<b>6-1</b>
6.1	Option 1 – Cluster Systems.....	6-1
6.2	Option 2 – Regional System .....	6-1
6.3	Option 3 – Connection to Detroit Lakes.....	6-2
6.4	Summary of Capital Costs and Annual O & M Costs .....	6-2

## Table of Contents (Cont.)

<b>7.0</b>	<b>IMPLEMENTATION STRATEGIES.....</b>	<b>7-1</b>
7.1	Implementation Steps.....	7-1
7.2	Implementing Agencies .....	7-2
7.2.1	Watershed District .....	7-2
7.2.2	Subordinate Service District .....	7-3
7.2.3	Sanitary Sewer District .....	7-3
7.2.4	Lake Improvement District.....	7-4

### **TABLES**

1	Present Development – Estimated Flow Rates
2	Present Development – Cost Estimates Cluster Wastewater Systems
3	Present Development – Cost Estimates to add Water Systems
4	Present Development – Cost Estimates for Regional Wastewater System
5	Present Development – Cost Estimates for Regional Water System
6	Present Development – Cost Estimates for Sewer Connection to Detroit Lakes
7	Present Development – Cost Estimates for Water Distribution from Detroit Lakes
8	Present Development – Comparison of Costs for Wastewater Options
9	Present Development – Comparison of Costs Wastewater Options with Water Supply

### **FIGURES**

#### Index Map

1	Service Area 1
2	Service Area 2
3	Service Area 3
4	Service Area 4
5	Service Area 5
6	Service Area 6
7	Service Area 7
8	Service Area 8
9	Service Area 9
10	Service Area 10
11	Service Area 11
12	Service Area 12

---

## Table of Contents (Cont.)

---

### APPENDICES

- A Full Development Tables 10-18
  - 10 Present Development – Estimated Flow Rates
  - 11 Present Development – Cost Estimates Cluster Wastewater Systems
  - 12 Present Development – Cost Estimates to add Water Systems
  - 13 Present Development – Cost Estimates for Regional Wastewater System
  - 14 Present Development – Cost Estimates for Regional Water System
  - 15 Present Development – Cost Estimates for Sewer Connection to Detroit Lakes
  - 16 Present Development – Cost Estimates for Water Distribution from Detroit Lakes
  - 17 Present Development – Comparison of Costs for Wastewater Options
  - 18 Present Development – Comparison of Costs Wastewater Options with Water Supply
- B Letters from the City of Detroit Lakes (October 25, 2007 and February 7, 2008)
- C Regional Wastewater Treatment: Sanitary Districts and Cooperative Agreements

## 1.0 Executive Summary

The Pelican River Water District (District) retained Wenck Associates, Inc. (Wenck) to perform a cost evaluation of feasible alternatives for wastewater treatment and water supply. The District authorized and funded the project as a direct result of requests from the Sallie/Melissa Lake Association and Lakeview Township in June 2007. The project is consistent with the District's current Water Management Plan to "promote alternative approaches for waste management in shore land zones."

The Study Area of the *Wastewater Treatment & Drinking Water Supply Alternatives Analysis* (Report) was the Lake Sallie and Lake Melissa Chain of Lakes southwest of the City of Detroit Lakes. Through a collaborative effort between the District and community members, this report is to be used as a *planning* document by residents within the District. The Report focused on the long-term options for providing wastewater treatment and water supply for an approximately eleven square mile area surrounding Lake Sallie and Lake Melissa.

In order to accurately assess the options, the Study Area was divided into twelve service areas. Three wastewater treatment and water supply options were evaluated for serving each service area separately or incorporated together:

OPTION 1: Cluster Systems for each service area

OPTION 2: Regional System near Sallie/Melissa Chain of Lakes for entire Study Area

OPTION 3: Connect to the City of Detroit Lakes for entire Study Area

Each option was evaluated to determine the estimated costs for providing the existing parcels in the service area with either a wastewater collection sewer line or a water supply distribution line. Cost estimates for full parcel development are included in Appendix A. Project assumptions about water usage, infrastructure installation, and treatment efficiencies were made to maintain the project within the scope and budget of the District.

The Report does not evaluate the intangibles with all options. Bridging the political realities of infrastructure development projects was outside the scope of the Report. Cost estimates generated for Option 2 and Option 3 assume the entire Study Area would be connected, which may prove to be a difficult task to accomplish. Estimates within the Report assume that the construction of infrastructure would be permitted and approved by the appropriate agencies.

Results indicate that Option 1, the construction of cluster wastewater systems is the second least expensive option. Average capital cost for providing a cluster wastewater system connection is approximately \$19,000/unit. Addition of a water supply connection at the time of cluster wastewater system construction would add approximately \$10,000/unit on average. When considering the time value of money over 20 years with present worth analysis and interest, the equivalent annual cost per unit for connection to a cluster wastewater system is approximately \$1,900/year and an additional \$700/year for water.

Option 2, a new regional wastewater treatment facility is the most expensive option with a capital cost of \$21,000/unit average and an equivalent annual cost per unit of approximately \$1,900/year. Option 2 adds an additional \$1,000/year for water supply. Connecting the Study Area to a sewer extension from the City of Detroit Lakes, Option 3, was the least expensive option at \$16,000/unit average and approximately \$1,600/year equivalent annual cost. Adding \$700/year for the addition of a water supply, Option 3 is also the least expensive option with the combined services.

#### Summary of Equivalent Annual Cost per Unit

	<b>OPTION 1 CLUSTER SYSTEMS</b>	<b>OPTION 2 REGIONAL SYSTEM</b>	<b>OPTION 3 CITY OF DETROIT LAKES</b>
Wastewater Only	\$1,865	\$1,865	\$1,623
Wastewater & Water	\$2,625	\$2,810	\$2,305

Various management entities exist which can provide the ownership of the infrastructure system. They include; Lake Improvement Districts, Subordinate Service Districts, Sanitary Sewer Districts, Municipalities, and Watershed Districts.

---

## **2.0 Introduction**

---

### **2.1 GENERAL**

The *Wastewater Treatment & Drinking Water Supply Alternatives Analysis* (Report) for the Pelican River Watershed District (District) Sallie/Melissa Chain of Lakes was requested by the Sallie/Melissa Lake Association/Lakeview Township and authorized at the District's July 19, 2007 meeting. The objective of the Report is to promote alternative approaches for wastewater management in shore land zones by evaluating potential wastewater treatment and water supply options for the defined Study Area.

The Report is to be viewed as a long-term (20-30 year) planning document for an orderly process and cost effective solution for wastewater treatment and water supply. Within the Report are developed concepts and a framework to provide sanitary sewer service and water supply to lake areas in the District. Lakes in this Report include Lake Sallie, Lake Melissa, Mud Lake, Fox Lake, Munson Lake, Muskrat Lake, and the north end of Mill Pond. The Study Area is depicted on the Index Map Figure and was divided into twelve service areas.

A conceptual collection system layout was developed for each of the twelve service areas. In addition, three options were evaluated for wastewater treatment and water supply.

OPTION 1: Cluster Systems for each Service Area

OPTION 2: Regional System near Sallie/Melissa Chain of Lakes for entire Study Area

OPTION 3: Connect to the City of Detroit Lakes for entire Study Area

### **2.2 PRELIMINARY DISCUSSION OF DESIGN CRITERIA**

The Study Area for the Sallie/Melissa Chain of Lakes is divided up into twelve service areas to provide flexibility in treatment systems and identifying areas of potential growth. Boundaries

may be modified or altered in the design as areas develop. Service area maps may be found on Figures 1–12 and were determined by geographic connections.

### **2.2.1 Estimated Flow**

When a series of homes, generally more than one and less than 200, are connected to a decentralized wastewater treatment system, it is commonly referred to as a cluster system. Becker County requires new cluster systems to be designed using a minimum of a Minnesota Pollution Control Agency (MPCA) Type I, three-bedroom home in accordance with Minnesota Rules Chapter 7080. A three-bedroom, Type I home is estimated to use 450 gallons per day (gpd). Estimated daily flow per home may be modified on a case per case basis, per Chapter 7080. This occurs when the size/type of home does not meet the Type I definition or when multiple dwellings are connected together on the same system.

For the Report, a 450 gpd per home was used to determine the flow rate from each service area. The number of parcels in each service area was determined using tax parcel information provided by the District. Table 1 shows the existing present developed parcels and estimated design flow rate for each service area. Tables 2-9 evaluate the options based on present development. An analysis of the full development scenario (Tables 10-18) is included in Appendix A and assumes vacant land development as residential lots 2.5 acres in size.

Each service area was evaluated for a cluster system within or near the service area boundary. As a general planning document, a detailed analysis of potential cluster system sites was not completed. Estimates for cluster system construction found in Table 2 do not assume a specific treatment system. A detailed final design would be needed at the time of project development for the collection and treatment system.



### **2.2.2 Construction**

Connection from the individual home to the collection line in the road right-of-way would be the responsibility of the homeowner. The homeowner would also be responsible for abandoning their existing septic tank as current regulations require.

Each service area was evaluated for the installation of a new collection system. Estimates for cluster system collection lines developed in Option 1 assume a gravity collection system with lift stations and force main installed where necessary. Collection systems estimates for Option 2 and Option 3 assume a gravity collection system with lift stations, force main, and an interceptor sewer to connect all service areas. Figures 1-9 depict a potential collection system layout with approximate manhole and lift station locations. The layout on the figures is for general planning purposes and did not include a detailed site design.

### **2.2.3 Stormwater**

The District has adopted a permit program which requires property owners to obtain approval for several types of land-disturbing activities. One such activity is the construction or reconstruction of highways, roads, streets, parking lots, or public water accesses. A stormwater management plan is required if the total impervious surface after construction is greater than one acre or greater than 10,000 square feet within the Shoreland District. Shoreland District includes land located within 1,000 linear feet of a lake or 300 linear feet of a stream or river.

It is likely that the proposed collection system from all options would be installed within the existing road right-of-way either at the road centerline or in the ditch. If installed in the ditch, a storm water management plan would not be required. However, if installed at the road centerline, reconstruction of the road surface would require preparation of a stormwater management plan.

Previous City of Detroit Lakes' road reconstruction projects developed stormwater management plans that use the ditch area to satisfy rate control and water quality requirements. Permanent rock or earthen ditch checks were installed to hold, infiltrate, and release stormwater runoff at acceptable levels. Costs for restoration of the roads and disturbed areas assume these stormwater management practices and like kind surface replacement.

#### **2.2.4 Assumptions**

Cost estimates generated for Option 1 assume that the residents within an individual service area would agree to be connected to a cluster system at the same time. Project development within an individual service area would likely re-define properties interested in connecting, which could have an impact on the estimated costs. Cost estimates generated for Option 2 and Option 3 assume the entire Study Area would be connected. A substantial planning and public education effort would be needed for either Option 2 or Option 3 consuming a significant period of time.

Grinder pumps or other small diameter pressure sewers were not included in the analysis per discussion with the District Board of Managers and the City of Detroit Lakes (see Section 4.2). The collection system proposed would provide for a connection to a cluster system in the short term. In addition, the same collection system could be used without additional construction when a City of Detroit Lakes extension becomes available.

Estimates for Option 2 assume a stabilization pond system with spray irrigation for final disposal. Connection to the City of Detroit Lakes in Option 3 assumes that the city would expand its existing wastewater facilities, if needed, to accommodate the additional flow. City staff has indicated that the only connection charge at this time is \$70 per connection for water and sewer. City staff further indicated that on average a sewer and water service on past projects averages \$20,000-\$25,000 per 150 foot lot.

The Report assumes that if only one infrastructure component was installed it would be for wastewater. A water supply system would be constructed only in addition to a wastewater

system. Estimates for adding water supply in all options are to be reviewed with the knowledge that a water line could be installed at the same time as the wastewater collection line.

Table 3 for Option 1 also highlights the cost to install a dormant water line at the same time as the installation of the wastewater collection system. This assumes the dormant water line would become active some time in the future at additional costs to provide the water.

Further assumptions for water system construction include: usable water is located in a near surface aquifer; two wells installed for redundancy within 1,000 feet of each other; and basic treatment with chlorine and fluoride only. Option 2 regional water system would include adequate storage capacity for peak flows; however, the Option 1 small community water systems would use only available storage in a hydropneumatic tank.

### **2.3 PREVIOUS INVESTIGATIONS**

Wastewater treatment alternatives in and around the Study Area has been reviewed for the past 30+ years. The District provided copies of wastewater facilities plans from 1978, 1981, and 1984 for a portion of the Study Area. The area of concern in the previous reports included the south and west shore of Detroit Lake. While it appears that area has been annexed in the City of Detroit Lakes, the plans recommended for the Lake Sallie and Lake Melissa properties were never developed.

As far back as 1978, studies were completed in the Study Area for the collection of wastewater and treatment through cluster systems or a regional treatment system. Cost estimates from the previous reports are outdated, and the assumptions have changed based on lessons learned and new regulations.

## **3.0 Purpose**

### **3.1 STATEMENT OF NEED**

The District authorized and funded this study as a direct result of requests from the Sallie Melissa Lake Association and Lakeview Township in June 2007. While the District's mission and focus is primarily on water quality, this study was not authorized by the District as a water quality improvement project. The District understands that upgrading antiquated ISTS may have an added water quality improvement benefit; however without a detailed analysis, it is currently not quantified.

District residents requested this study because of the large number of substandard lots. Many of the densely developed areas around the Sallie/Melissa Lakes area are experiencing redevelopment. Seasonal cottages are upgraded to or replaced with larger year-round homes. Re-development often triggers additional requirements by the zoning ordinance including new wells and ISTS. However, these upgrades are difficult to implement on many lots.

The District recognizes the need for long-term wastewater treatment within lakeshore areas. The Study Area is currently served almost exclusively by ISTS. Antiquated septic systems serving the existing residences or lack of an approved septic system have the potential for increased nutrient loading to the lakes. In addition, the properties that do have a compliant system may not have the next generation system that will be needed for long term treatment.

Becker County Planning and Zoning has indicated that a majority of the septic systems in the Study Area are greater than 25 years old. Many of the residences cannot be serviced by a standard septic system and rely on a holding tank or an experimental/performance septic system requiring continuous maintenance. Using holding tanks and experimental/performance systems is becoming the norm in the much of the Study Area primarily due to small lot sizes.

Septic systems are an excellent wastewater treatment option when parcel sizes and appropriate zoning is in place. Past development of small lakeshore lots is not conducive to long-term, onsite soil based wastewater treatment. In addition, the size of many lots and required setbacks do not allow residents to upgrade shallow wells.

Residents of the area recognize the need and have supported the District's development of this planning document. Community members are interested in alternatives for long term wastewater collection and treatment. A previous investigation within a portion of the Study Area now ten years old was not implemented. Assumptions, cost estimates, and area within the previous document have been updated and expanded within this Report. This Report is intended to encourage residents to organize themselves and take ownership in a project.

## **4.0 Agency Background**

### **4.1 PELICAN RIVER WATERSHED DISTRICT**

A scoping meeting was held with representatives of the District, Sallie/Melissa Lake Association, Lakeview Township, and Wenck on August 16, 2007. Direction was given on the scope of the Report and determination made on the service area boundaries. A site visit was conducted to the Study Area to assist in determining the service area boundaries while determining project constraints.

### **4.2 CITY OF DETROIT LAKES**

City of Detroit Lakes' representatives attended a meeting on October 15, 2007, with District representatives and Wenck to discuss city policies for sewer and water service. City staff indicated they will be assessing their long-term wastewater treatment needs in the near future. The City intends to include an analysis of future development and extension of service outside the current service boundaries.

Annexation is a policy of the city when considering a sewer and water service extension. The City prefers to work with the affected Township through orderly annexation or through a petition of the affected residents. In both cases, sewer and water services can be extended from the City in an efficient manner over a period of time when an annexation agreement is in place.

City staff shared policies in regard to the type of sewer collection system it uses. Gravity collection sewer is the preferred method whenever possible. City staff indicated that the use of small diameter pressure sewers from grinder pump systems at each home, have undesirable maintenance issues for the City and the homeowner. A letter sent by the City regarding their policies is included in Appendix B.

#### **4.3 BECKER COUNTY**

Becker County Planning and Zoning was contacted on December 12, 2007, to discuss the status of the ISTS program and current cluster system permitting. County staff indicated that many of the properties in the Study Area are developed on small lots that have available area for only a holding tank. Many of the ISTS were upgraded in the 1980s; however, due to rule changes since that time and the age of the systems (20-30 year useful life), there is concern for the long-term viability of next generation ISTS in this area.

County staff further provided the information regarding the estimated daily flow discussed in Section 2.2.1. Cluster systems in the County are becoming more popular with upgrades of ISTS on small lots becoming more difficult. One cluster system currently exists on the east side of Lake Melissa using an SJE-Rhombus Environmental membrane filter.

## **5.0 Alternatives Analysis**

### **5.1 WASTEWATER**

#### **5.1.1 Collection Sewer Systems – All Options**

Conceptual design for the collection sewer systems for each service area uses the 10 States Standards as a minimum guideline. In general, gravity collection is planned with manholes spaced 300 feet apart. Localized lift stations with force main will be needed in many areas to surpass topographic gradients. Estimates for collection system components were generated using the present parcel development shown on Table 1 and the conceptual layout shown on Figures 1-12.

Discussion with the City of Detroit Lakes regarding gravity collection sewer influenced the direction of the Report. Using small diameter pressurized sewers with a grinder pump or septic tank effluent pump (STEP) system was not explored.

Collection lines are assumed to be constructed in road right-of-ways. Restoration to occur after construction does not assume an upgrade to the road surface. Each home will be required to abandon their septic tank and connect to the collection line at the road right-of-way. Landowners will not be required to provide an easement for the connection as infrastructure on their property is in their ownership.

#### **5.1.2 Option 1 – Cluster Wastewater Treatment Systems**

Option 1 utilizes cluster wastewater treatment systems for individual service areas. Service areas will be served by a decentralized treatment and disposal system. It was assumed for the Report that a suitable site is available in the service area or within one-half mile.



Several small flow package wastewater treatment systems are available. A Detroit Lakes company, SJE-Rhombus Environmental, has recently begun to distribute one such system using a membrane filtration process. An SJE system was installed on Lake Melissa in 2006. Other types of package wastewater treatment systems primarily use extended aeration or packed bed filter technology.

Cluster wastewater systems serving greater than 22 homes (using 450 gpd/home) are permitted through the MPCA with a State Disposal System (SDS) permit. These facilities are classified by the MPCA as a Large Sewage Treatment System (LSTS). In 2005, the MPCA produced the first LSTS Guidance Document for site evaluation and design of these cluster systems.

Within the guidance document, the MPCA initiated a new policy regarding nitrogen. MPCA Nitrate Nitrogen Policy states that an LSTS facility must achieve a nitrate-nitrogen concentration of 10 mg/l or less in ground water at the property boundary or nearest receptor (drinking water well). The source of the nitrogen in the ground water is from subsurface disposal of treated, nitrified effluent. Instituting this new policy has increased capital costs and maintenance requirements of cluster systems to ensure compliance.

Other options for disposal of treated effluent exist and include: spray irrigation, drip irrigation, and surface discharge to wetlands. However, these other options have limitations of land area requirements and phosphorus concentration limits. For the purpose of the Report, the assumption is made that the cluster systems will comply with the nitrogen policy and use soil based disposal (i.e., drain fields or rapid infiltration basins).

Cluster wastewater treatment systems require the purchase of land adequate in size and suitable for subsurface disposal for the existing homes. Available areas for the cluster systems still need to be identified. In addition, an equal size location must be identified for the secondary subsurface disposal system. Based on experience with cluster systems in another watershed district, annual operation and maintenance costs, including replacement reserve, are estimated at \$480/parcel. Table 2 and 3 presents the cost estimate breakdown for Option 1.

### **5.1.3 Option 2 – Regional Wastewater Treatment System**

Option 2 is a new regional wastewater treatment system for the entire Study Area. This option assumes that a suitable land area will be available within 2 miles of the Study Area. Two system types were evaluated, a stabilization pond system and a mechanical treatment plant. Capital costs for the two systems when considering all factors were within 10 percent. The stabilization pond system with spray irrigation discharge had a lower operation and maintenance cost and was therefore selected for this option analysis.

Option 2 system will meet MPCA requirements for permitting a new facility including; biological oxygen demand (BOD), total suspended solids (TSS), and phosphorus discharge levels.

It is assumed that the entire Study Area is connected for this cost analysis. Annual operation and maintenance costs were obtained from similar facilities and are estimated at \$300/parcel. Table 4 and 5 presents the cost estimate breakdown for Option 2.

### **5.1.4 Option 3 – Sewer Connection to Detroit Lakes**

Option 3 proposes to connect the entire Study Area via an inceptor sewer to the existing wastewater treatment facilities at the City of Detroit Lakes. In the meeting with the City, it was understood that the current capacity of the wastewater treatment system may not support the entire Study Area. Along with the issues discussed in Section 4.2, assurance of the City to accept the wastewater will need to be further developed.

It is assumed that the entire Study Area is connected for this cost analysis. Information provided by City staff indicates annual operation and maintenance costs estimated at \$420/parcel. Table 6 and 7 presents the cost estimate breakdown for Option 3.

## **5.2 WATER**

### **5.2.1 Water Distribution System – All Options**

The Report also explores the option of providing water supply to the Study Area along with wastewater treatment. The Report assumes that water supply would not be provided alone but rather only in addition to wastewater collection and treatment. Cost estimate tables break down costs for installing service/distribution lines separately. Dormant water lines could be installed at the time of a wastewater collection system installation.

Service lines are assumed to be constructed in roadway right-of-ways. Restoration to occur after construction does not assume an upgrade to the road surface. Each home will be required to connect to the service line at the road right of way. Landowners will not be required to provide an easement for the connection as infrastructure on their property is in their ownership.

### **5.2.2 Option 1 – Small Community Water System**

Option 1 utilizes a small community water system for individual service areas. Service areas will be served by a well, hydropneumatic tank, and chlorine/fluoride treatment. It was assumed for the Report that a suitable site is available in the service area or within one-half mile. Based on costs of similar systems annual operation and maintenance costs are estimated at less than \$100/parcel. Table 3 presents the cost estimate breakdown for each service area for Option 1.

### **5.2.3 Option 2 – Regional Water System**

Option 2 is a regional water system for the entire Study Area. This option assumes that a suitable site will be available within 1 mile of the Study Area. Option 2 system would meet MPCA requirements for drinking water supply and include two wells, storage, booster, and chlorine/fluoride treatment.

Based on costs of similar systems annual operation and maintenance costs are estimated at less than \$100/parcel. Table 5 presents the cost estimate breakdown for the Study Area for Option 2.

#### **5.2.4 Option 3 – Water Supply from Detroit Lakes**

Option 3 proposes to connect the entire Study Area to the existing water facilities at the City of Detroit Lakes. Along with the issues discussed in Section 4.2, assurance of the city to provide the water will need to be further developed. Information from City staff indicates annual operation and maintenance costs estimated at less than \$100/parcel. Table 7 presents the cost estimate breakdown for the Study Area for Option 3.

---

## **6.0 Cost Comparison of Alternatives**

---

All options evaluated are summarized on Table 8 and 9. Table 8 presents a Comparison of Wastewater Option Costs and shows the estimated Total Present Worth, the estimated Total Equivalent Annual Cost, and the estimated Equivalent Annual Cost per Unit. Annualized capital costs are developed using terms of 20 years and 4 percent interest. Equivalent Annual Cost per Unit is the sum of annual operation and maintenance cost and the annualized capital costs. Equivalent Annual Cost per Unit in Tables 8 and 9 uses present development levels. Table 9 provides a Comparison of Costs of Wastewater Options with Water Supply when the construction of both wastewater and water systems occurs simultaneously.

Below is a brief summary of the three options evaluated. The analysis indicates that Option 3, City of Detroit Lakes connection, is the least expensive at present and full development levels if the entire Study Area is connected.

### **6.1 OPTION 1 – CLUSTER SYSTEMS**

Cluster wastewater systems and small community water systems are the second least expensive of the three options at present development levels. Option 1 is the most flexible since it can be constructed on an as-needed basis for individual service areas and does not need a consensus of the entire Study Area. As the City of Detroit Lakes grows and the area further develops, it may be more feasible to move toward Option 3. Collection and distribution systems evaluated in Option 1 will allow for a connection to a city extension (Option 3) when presented.

### **6.2 OPTION 2 – REGIONAL SYSTEM**

Option 2 would be the most expensive from the analysis and requires the entire Study Area to connect. The District or other entity could consider constructing a new regional system and provide capacity back to the city to absorb costs. In the future, the City may consider new regional systems in addition to their existing systems if extension of service is part of their long-term plan.

### 6.3 OPTION 3 – CONNECTION TO DETROIT LAKES

Option 3 was determined to have the lowest cost of the three options at present and full development levels. Option 3 is technically feasible but requires annexation, assurance of capacity from the City, and assumes the entire Study Area would connect. City Staff indicated that past projects have an average fee of \$20,000-\$25,000 per connection for sewer and water. Estimates in this Report estimate \$26,000 per connection at present development levels and \$18,000 per connection at full development levels for combined sewer and water service.

### 6.4 SUMMARY OF CAPITAL COSTS AND ANNUAL O & M COSTS

<b>PRESENT DEVELOPMENT SCENARIO*</b>			
<b>AVERAGE CAPITAL COSTS PER UNIT</b>			
	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>
<b>WASTEWATER</b>	\$ 19,000	\$ 21,000	\$ 16,000
<b>WATER</b>	\$ 10,000	\$ 12,000	\$ 10,000
<b>TOTAL</b>	\$ 29,000	\$ 33,000	\$ 26,000

\*Only the existing homes would be connected to the system.

<b>FULL DEVELOPMENT SCENARIO**</b>			
<b>AVERAGE CAPITAL COSTS PER UNIT</b>			
	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>
<b>WASTEWATER</b>	\$ 14,000	\$ 15,000	\$ 11,000
<b>WATER</b>	\$ 7,000	\$ 8,000	\$ 7,000
<b>TOTAL</b>	\$ 21,000	\$ 23,000	\$ 18,000

\*\*Forecasts new homes on undeveloped land connected to the system.

<b>ESTIMATED ANNUAL O &amp; M COSTS</b>			
	<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>
<b>WASTEWATER</b>	\$ 480	\$ 300	\$ 420
<b>WATER</b>	\$ 100	\$ 100	\$ 100
<b>TOTAL</b>	\$ 580	\$ 400	\$ 520

---

## **7.0 Implementation Strategies**

---

### **7.1 IMPLEMENTATION STEPS**

Implementation of a project requires up front planning by the residents. The Report has been structured such that a group of homeowners can organize themselves geographically when the desire and need is presented to construct a system. When considering the design of a cluster system, the service areas can be further refined dependent on the homeowner's readiness to proceed. This puts the burden of developing a new project on the individual homeowner who will benefit from the construction.

When the lake association, service area residents, or other geographically linked group of parcels wants to determine specific project strategies, an existing ISTS inventory is the first step. An onsite inspection of each ISTS will be completed to determine system status, site complexities, and compatibility for connection to a cluster system.

During the completion of the ISTS inventory, land acquisition sites can also be identified for cluster systems. Results of the inventory will provide the data needed for an Engineer's Report for the cluster system. Project specific plans and defined cost estimates in the Engineer's Report will allow property owners to make an informed decision to move forward with the project.

Property owners have legal management and financial vehicles to consider when interested in developing a project for a water pollution problem. Section 7.2 includes information regarding different Districts' ability to form, construct, manage, and finance a project while also operating and owning the system constructed. A detailed summary of these alternatives is included in Appendix C.

## 7.2 IMPLEMENTING AGENCIES

### 7.2.1 Watershed District

The District is a proven management entity for the conservation of natural resources within its boundary and surrounding area. Minnesota statute allows a Watershed District to provide for sanitation. The Board of Managers has the authority to incur debts, sue, exercise eminent domain, levy taxes, and initiate projects to achieve the purposes of the District.

When approached by a group of homeowners interested in an infrastructure project, the District can manage the project on behalf of the residents including design, permitting, construction, and operation. The District can determine the benefiting properties from a project and assess costs/fees appropriately. The timeline of project completion is outlined below:

1. Property owners (25 percent minimum) in a service area petition district for a project.
  - Property owners are accepting responsibility for project costs up to and including Engineer's Report unless District agrees to accept a portion of the costs.
2. District reviews petition and decides to accept the petition.
3. District orders the Engineer's Report to determine;
  - if the project is in the public interest
  - the project scope, layout, and cost
  - if the project is feasible
4. Project is determined feasible and in the public interest, District orders Appraiser's Report to determine;
  - benefit per parcel
  - parcel damages
5. District holds Public Hearing
6. District Board of Managers Decision to Proceed or Terminate Project
7. Order Plans and Specifications
8. Authorize Project Bidding
  - Bid within 30 percent of engineer's estimate – Award Contract



## 9. Project Construction

## 10. Ownership, Operation, and Maintenance

- District determines most appropriate way to collect user fees.
- District hires system operator.
- District creates replacement reserve account for long term system operation and maintenance.

### 7.2.2 Subordinate Service District

A Subordinate Service District (SSD) is a defined area within a town that will receive a government service financed through revenues received from the benefiting properties in the SSD. At least 50 percent of property owners in a defined area can petition the Township Board for the formation of the SSD. After a Public Hearing, and when the Township Board decides to approve the formation of the SSD, a Resolution is created defining the SSD area, the type of service to be provided, method of financing, and date of inception.

The Township Board will be the managing authority over the SSD and services provided. SSD's have the ability to incur debts, sue, exercise eminent domain, levy taxes, and initiate projects to achieve the purposes of the district. Typically SSD boundaries are small, encompassing an individual subdivision of land.

### 7.2.3 Sanitary Sewer District

A Sanitary Sewer District (SD) is a government authority created for the special purpose of resolving a regional pollution problem. A petition must be submitted to the MPCA with the governing bodies in the area signing the petition for the formation of the SD. No SD can be created within 25 miles of the boundary of any first class city without approval of the governing body of the city. An SD has the same ownership of infrastructure and tax levy/assessment abilities as other districts. SD's can be difficult to form when in close proximity to a city providing sanitary sewer service.

#### **7.2.4 Lake Improvement District**

A Lake Improvement District (LID) is a local unit of government that provides for greater landowner involvement in lake management activities. A petition of greater than 50 percent of the proposed LID property owners must be submitted to the county board. Once established, the county board would appoint the Board of Directors. As with all districts acting as a local unit of government, the LID would have the ability to own and operate infrastructure, as well as levy special assessments against benefited property owners of a project. When a Watershed District is already in place, a county board is not likely to form a similar district, such as a LID.

---

# Tables

---

## PRESENT DEVELOPMENT

TABLE 1: Estimated Flow Rates Pelican River Watershed District Lake Sallie and Lake Melissa		
Service Area	Present Development Parcels	Present Development Flow Gallons/Day
1	34	15,300
2	117	52,650
3	37	16,650
4	235	105,750
5	158	71,100
6	49	22,050
7	88	39,600
8	108	48,600
9	157	70,650
10	96	43,200
11	39	17,550
12	113	50,850
Total	1,231	553,950

# OPTION 1: CLUSTER WASTEWATER SYSTEMS

**TABLE 2: Cost Estimates Cluster Wastewater Systems**

Service Area	Treatment System	Land Acquisition	Legal, Eng & Admin	Contingency	Collection System	Total Cost Estimate	Cost/Unit
1	\$ 300,000	\$ 30,000	\$ 50,000	\$ 60,000	\$ 600,000	\$ 1,000,000	\$ 29,000
2	\$ 700,000	\$ 70,000	\$ 120,000	\$ 140,000	\$ 1,600,000	\$ 2,600,000	\$ 22,000
3	\$ 300,000	\$ 30,000	\$ 50,000	\$ 60,000	\$ 800,000	\$ 1,200,000	\$ 32,000
4	\$ 1,200,000	\$ 120,000	\$ 200,000	\$ 230,000	\$ 1,600,000	\$ 3,400,000	\$ 14,000
5	\$ 800,000	\$ 80,000	\$ 140,000	\$ 160,000	\$ 1,200,000	\$ 2,400,000	\$ 15,000
6	\$ 400,000	\$ 40,000	\$ 70,000	\$ 80,000	\$ 600,000	\$ 1,200,000	\$ 24,000
7	\$ 600,000	\$ 60,000	\$ 100,000	\$ 120,000	\$ 1,000,000	\$ 1,900,000	\$ 22,000
8	\$ 600,000	\$ 60,000	\$ 100,000	\$ 120,000	\$ 800,000	\$ 1,700,000	\$ 16,000
9	\$ 800,000	\$ 80,000	\$ 140,000	\$ 160,000	\$ 1,200,000	\$ 2,400,000	\$ 15,000
10	\$ 600,000	\$ 60,000	\$ 100,000	\$ 120,000	\$ 1,100,000	\$ 2,000,000	\$ 21,000
11	\$ 300,000	\$ 30,000	\$ 50,000	\$ 60,000	\$ 600,000	\$ 1,000,000	\$ 26,000
12	\$ 700,000	\$ 70,000	\$ 120,000	\$ 140,000	\$ 1,100,000	\$ 2,100,000	\$ 19,000
<b>Total</b>	<b>\$ 7,300,000</b>	<b>\$ 800,000</b>	<b>\$ 1,300,000</b>	<b>\$ 1,500,000</b>	<b>\$ 12,200,000</b>	<b>\$ 23,100,000</b>	<b>\$ 19,000</b>

**TABLE 3: Cost Estimates to add Water System**

Service Area	Supply, Storage, & Treatment	Land Acquisition	Legal, Eng & Admin	Contingency	Service Lines <sup>1</sup>	Total Cost Estimate	Cost/Unit
1	\$ 140,000	\$ 15,000	\$ 30,000	\$ 30,000	\$ 270,000	\$ 500,000	\$ 15,000
2	\$ 190,000	\$ 15,000	\$ 30,000	\$ 40,000	\$ 1,060,000	\$ 1,300,000	\$ 11,000
3	\$ 110,000	\$ 15,000	\$ 20,000	\$ 20,000	\$ 400,000	\$ 600,000	\$ 16,000
4	\$ 380,000	\$ 25,000	\$ 60,000	\$ 70,000	\$ 1,330,000	\$ 1,900,000	\$ 8,000
5	\$ 250,000	\$ 20,000	\$ 40,000	\$ 50,000	\$ 930,000	\$ 1,300,000	\$ 8,000
6	\$ 150,000	\$ 15,000	\$ 30,000	\$ 30,000	\$ 400,000	\$ 600,000	\$ 12,000
7	\$ 180,000	\$ 15,000	\$ 30,000	\$ 40,000	\$ 670,000	\$ 900,000	\$ 10,000
8	\$ 170,000	\$ 15,000	\$ 30,000	\$ 30,000	\$ 670,000	\$ 900,000	\$ 8,000
9	\$ 250,000	\$ 20,000	\$ 40,000	\$ 50,000	\$ 930,000	\$ 1,300,000	\$ 8,000
10	\$ 190,000	\$ 15,000	\$ 30,000	\$ 40,000	\$ 670,000	\$ 900,000	\$ 9,000
11	\$ 120,000	\$ 15,000	\$ 20,000	\$ 30,000	\$ 400,000	\$ 600,000	\$ 15,000
12	\$ 180,000	\$ 15,000	\$ 30,000	\$ 40,000	\$ 800,000	\$ 1,100,000	\$ 10,000
<b>Total</b>	<b>\$ 2,310,000</b>	<b>\$ 200,000</b>	<b>\$ 390,000</b>	<b>\$ 470,000</b>	<b>\$ 8,530,000</b>	<b>\$ 11,900,000</b>	<b>\$ 10,000</b>

<sup>1</sup> Cost for installing a "dormant" water line at the time of collection system installation.

## OPTION 2: REGIONAL WASTEWATER SYSTEM

**TABLE 4: Cost Estimates for Regional Wastewater System**

Service Area	Treatment System <sup>1</sup>	Land Acquisition <sup>1</sup>	Collection System & Interceptor Sewer	Legal, Eng. & Admin.	Contingency	Total Cost Estimate	Cost/Unit <sup>2</sup>
1	\$ 155,000	\$ 80,000	\$ 600,000	\$ 200,000	\$ 200,000	\$ 1,200,000	\$ 37,000
2	\$ 310,000	\$ 160,000	\$ 1,800,000	\$ 400,000	\$ 500,000	\$ 3,200,000	\$ 28,000
3	\$ 155,000	\$ 80,000	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,300,000	\$ 37,000
4	\$ 465,000	\$ 240,000	\$ 1,600,000	\$ 400,000	\$ 500,000	\$ 3,200,000	\$ 14,000
5	\$ 465,000	\$ 240,000	\$ 800,000	\$ 300,000	\$ 300,000	\$ 2,100,000	\$ 15,000
6	\$ 155,000	\$ 80,000	\$ 800,000	\$ 200,000	\$ 200,000	\$ 1,400,000	\$ 30,000
7	\$ 155,000	\$ 80,000	\$ 1,400,000	\$ 300,000	\$ 300,000	\$ 2,200,000	\$ 26,000
8	\$ 155,000	\$ 80,000	\$ 900,000	\$ 200,000	\$ 300,000	\$ 1,600,000	\$ 15,000
9	\$ 465,000	\$ 240,000	\$ 1,400,000	\$ 400,000	\$ 400,000	\$ 2,900,000	\$ 20,000
10	\$ 155,000	\$ 80,000	\$ 900,000	\$ 200,000	\$ 300,000	\$ 1,600,000	\$ 17,000
11	\$ 155,000	\$ 80,000	\$ 600,000	\$ 200,000	\$ 200,000	\$ 1,200,000	\$ 32,000
12	\$ 310,000	\$ 160,000	\$ 1,500,000	\$ 300,000	\$ 400,000	\$ 2,700,000	\$ 25,000
To Site			\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	
Total	\$ 3,100,000	\$ 1,600,000	\$ 13,900,000	\$ 3,500,000	\$ 4,000,000	\$ 26,100,000	\$ 21,000

**TABLE 5: Cost Estimates for Regional Water System**

Service Area	Supply, Storage & Treatment <sup>1</sup>	Land Acquisition <sup>1</sup>	Service Lines & Distribution System	Legal, Eng. & Admin.	Contingency	Total Cost Estimate	Cost/Unit <sup>2</sup>
1	\$ 90,000	\$ 5,000	\$ 400,000	\$ 100,000	\$ 100,000	\$ 700,000	\$ 21,000
2	\$ 180,000	\$ 5,000	\$ 1,000,000	\$ 200,000	\$ 300,000	\$ 1,700,000	\$ 15,000
3	\$ 90,000	\$ 5,000	\$ 400,000	\$ 100,000	\$ 100,000	\$ 700,000	\$ 20,000
4	\$ 270,000	\$ 5,000	\$ 1,100,000	\$ 300,000	\$ 300,000	\$ 2,000,000	\$ 9,000
5	\$ 270,000	\$ 5,000	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,400,000	\$ 9,000
6	\$ 90,000	\$ 5,000	\$ 400,000	\$ 100,000	\$ 100,000	\$ 700,000	\$ 15,000
7	\$ 90,000	\$ 5,000	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,200,000	\$ 14,000
8	\$ 90,000	\$ 5,000	\$ 600,000	\$ 200,000	\$ 200,000	\$ 1,100,000	\$ 10,000
9	\$ 270,000	\$ 5,000	\$ 900,000	\$ 200,000	\$ 300,000	\$ 1,700,000	\$ 11,000
10	\$ 90,000	\$ 5,000	\$ 600,000	\$ 200,000	\$ 200,000	\$ 1,100,000	\$ 12,000
11	\$ 90,000	\$ 5,000	\$ 300,000	\$ 100,000	\$ 100,000	\$ 600,000	\$ 16,000
12	\$ 180,000	\$ 5,000	\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,500,000	\$ 14,000
To Site			\$ 400,000	\$ 100,000	\$ 100,000	\$ 600,000	
Total	\$ 1,800,000	\$ 60,000	\$ 8,400,000	\$ 2,200,000	\$ 2,400,000	\$ 15,000,000	\$ 12,000

<sup>1</sup> These costs are proportionally divided among the service areas.

<sup>2</sup> Cost/unit includes the proportional share for construction to/from the site.

## OPTION 3: CONNECTION TO DETROIT LAKES

**TABLE 6: Cost Estimates for Sewer Connection to Detroit Lakes**

Service Area	Connection Fee <sup>1</sup>	Land Acquisition	Collection System & Interceptor Sewer	Legal, Eng. & Admin.	Contingency	Total Cost Estimate	Cost/Unit <sup>2</sup>
1	\$ 2,000	\$ -	\$ 600,000	\$ 100,000	\$ 200,000	\$ 900,000	\$ 28,000
2	\$ 5,000	\$ -	\$ 1,800,000	\$ 300,000	\$ 400,000	\$ 2,500,000	\$ 22,000
3	\$ 2,000	\$ -	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,100,000	\$ 31,000
4	\$ 9,000	\$ -	\$ 1,600,000	\$ 300,000	\$ 300,000	\$ 2,200,000	\$ 10,000
5	\$ 6,000	\$ -	\$ 800,000	\$ 200,000	\$ 200,000	\$ 1,200,000	\$ 9,000
6	\$ 2,000	\$ -	\$ 800,000	\$ 200,000	\$ 200,000	\$ 1,200,000	\$ 26,000
7	\$ 4,000	\$ -	\$ 1,400,000	\$ 300,000	\$ 300,000	\$ 2,000,000	\$ 23,000
8	\$ 4,000	\$ -	\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	\$ 13,000
9	\$ 6,000	\$ -	\$ 1,400,000	\$ 300,000	\$ 300,000	\$ 2,000,000	\$ 14,000
10	\$ 4,000	\$ -	\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	\$ 14,000
11	\$ 2,000	\$ -	\$ 600,000	\$ 100,000	\$ 200,000	\$ 900,000	\$ 25,000
12	\$ 4,000	\$ -	\$ 1,500,000	\$ 300,000	\$ 300,000	\$ 2,100,000	\$ 20,000
To Site			\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	
Total	\$ 50,000	\$ -	\$ 13,900,000	\$ 2,900,000	\$ 3,200,000	\$ 20,050,000	\$ 16,000

**TABLE 7: Cost Estimates for Water Distribution from Detroit Lakes**

Service Area	Connection Fee <sup>1</sup>	Land Acquisition	Service Lines & Distribution System	Legal, Eng. & Admin.	Contingency	Total Cost Estimate	Cost/Unit <sup>2</sup>
1	\$ 2,000	\$ -	\$ 400,000	\$ 100,000	\$ 100,000	\$ 600,000	\$ 19,000
2	\$ 5,000	\$ -	\$ 1,000,000	\$ 200,000	\$ 200,000	\$ 1,400,000	\$ 12,000
3	\$ 2,000	\$ -	\$ 400,000	\$ 100,000	\$ 100,000	\$ 600,000	\$ 17,000
4	\$ 9,000	\$ -	\$ 1,100,000	\$ 200,000	\$ 200,000	\$ 1,500,000	\$ 7,000
5	\$ 6,000	\$ -	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,100,000	\$ 8,000
6	\$ 2,000	\$ -	\$ 400,000	\$ 100,000	\$ 100,000	\$ 600,000	\$ 13,000
7	\$ 4,000	\$ -	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,100,000	\$ 13,000
8	\$ 4,000	\$ -	\$ 600,000	\$ 100,000	\$ 200,000	\$ 900,000	\$ 9,000
9	\$ 6,000	\$ -	\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	\$ 9,000
10	\$ 4,000	\$ -	\$ 600,000	\$ 100,000	\$ 200,000	\$ 900,000	\$ 10,000
11	\$ 2,000	\$ -	\$ 300,000	\$ 100,000	\$ 100,000	\$ 500,000	\$ 14,000
12	\$ 4,000	\$ -	\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	\$ 12,000
To Site			\$ 400,000	\$ 100,000	\$ 100,000	\$ 600,000	
Total	\$ 50,000	\$ -	\$ 8,400,000	\$ 1,900,000	\$ 2,100,000	\$ 12,400,000	\$ 10,000

<sup>1</sup> The City of Detroit Lakes indicated the connection charge is \$35 per connection for sewer and \$35 for water.

<sup>2</sup> Cost/unit includes the proportional share for construction to/from the site.

## SUMMARY OF OPTIONS

**TABLE 8: Comparison of Costs for Wastewater Options**

	<b>Option 1 Cluster Systems</b>	<b>Option 2 Regional System</b>	<b>Option 3 Connect to Detroit Lakes</b>
<b>Total System Costs</b>	\$ 23,100,000	\$ 26,100,000	\$ 20,050,000
<b>Annual Operation &amp; Maintenance Costs (20 year present worth value)</b>	\$ 8,100,000	\$ 5,100,000	\$ 7,100,000
<b>Estimated Total Present Worth</b>	\$ 31,200,000	\$ 31,200,000	\$ 27,150,000
<b>Estimated Total Equivalent Annual Cost</b>	\$ 2,296,320	\$ 2,296,320	\$ 1,998,240
<b>Estimated Equivalent Annual Cost per Unit</b>	\$ 1,865	\$ 1,865	\$ 1,623

**TABLE 9: Comparison of Costs Wastewater Options with Water Supply**

	<b>Option 1 Cluster Wastewater &amp; Small Community Water Systems</b>	<b>Option 2 Regional Wastewater &amp; Water System</b>	<b>Option 3 Sewer &amp; Water Detroit Lakes System</b>
<b>Total System Costs</b>	\$ 35,000,000	\$ 41,100,000	\$ 32,450,000
<b>Annual Operation &amp; Maintenance Costs (20 year present worth value)</b>	\$ 8,900,000	\$ 5,900,000	\$ 6,100,000
<b>Estimated Total Present Worth</b>	\$ 43,900,000	\$ 47,000,000	\$ 38,550,000
<b>Estimated Total Equivalent Annual Cost</b>	\$ 3,231,040	\$ 3,459,200	\$ 2,837,280
<b>Estimated Equivalent Annual Cost per Unit</b>	\$ 2,625	\$ 2,810	\$ 2,305



---

# Figures

---





### Legend

- Service Areas
- Pelican River Watershed District Parcels
- Proposed Sewer Lines
- Manhole
- Lift Station



Service Area 1

# Lake Sallie/Lake Melissa Sewer Collection System

**COPYRIGHT**



# Wenck

**Wenck Associates, Inc.** 1800 Pioneer Creek Center  
Environmental Engineers Maple Plain, MN 55359-0429

FEB 2008

Figure 1





## Service Area 2

Lake Sallie/Lake Melissa Sewer Collection System

COPYRIGHT

**Wenck**  
Wenck Associates, Inc. 1800 Pioneer Creek Center  
Environmental Engineers Maple Plain, MN 55359-0429

FEB 2008

Figure 2








Service Area 4	Lake Salille/Lake Melissa Sewer Collection System
----------------	---

Service Area 4	Lake Salille/Lake Melissa Sewer Collection System
----------------	---

**Wenck Associates, Inc.**  
1800 Pioneer Creek Center  
Maple Plain, MN 55359-0429  
Environmental Engineers


**Wenck**



COP-RIGHT

**Wenck Associates, Inc.**  
1800 Pioneer Creek Center  
Maple Plain, MN 55359-0429  
Environmental Engineers

**Wenck**



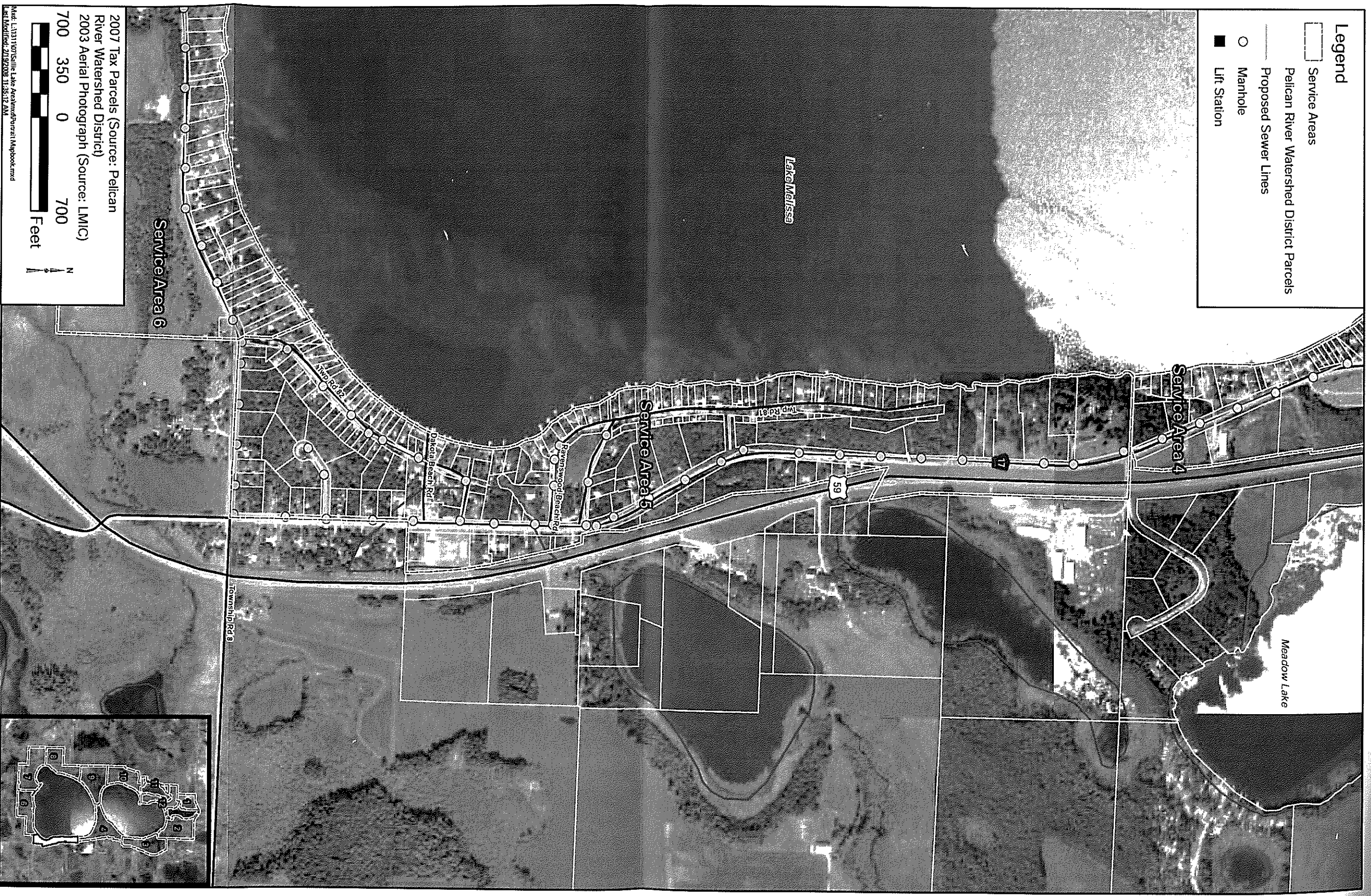
COP-RIGHT

FEB 2008	Figure 4
----------	----------

FEB 2008	Figure 4
----------	----------







Service Area 5

## Lake Sallie/Lake Melissa Sewer Collection System

**COPYRIGHT**



**Wenck Associates, Inc.** 1800 Pioneer Creek Center  
Environmental Engineers Maple Plain, MN 55359-0429

FEB 2008

Figure 5



Lake Sallie/Lake Melissa Sewer Collection System  
Service Area 6

Copyright  
Wenck Associates, Inc. 1800 Pioneer Creek Center  
Environmental Engineers Maple Plain, MN 55359-0429  
**Wenck**

FEB 2008  
Figure 6







2007 Tax Parcels (Source: Pelican River Watershed District) 2003 Aerial Photograph (Source: LMIC)

700 350 0 700 Feet

North Arrow

Map Modified: 2/19/2008 11:31:34 AM  
Mapbook.mxd

- Legend**
- Pelican River Watershed District Parcels
  - Service Areas
  - Proposed Sewer Lines
  - Proposed Lift Station
  - Proposed Manhole

Lake Sallie/Lake Melissa Sewer Collection System

Service Area 7

Copyright  
Wenck Associates, Inc. 1800 Pioneer Creek Center  
Environmental Engineers Maple Plain, MN 55359-0429

**Wenck**

FEB 2008

Figure 7





**Legend**

- Service Areas
- Pelican River Watershed District Parcels
- Proposed Sewer Lines
- Manhole
- Lift Station

2007 Tax Parcels (Source: Pelican River Watershed District)  
2003 Aerial Photograph (Source: LMIC)

700 350 0 700  
Feet

Map: L:\171107\Saline Lake Area\Mapbook\Mapbook.mxd  
Last Modified: 2/15/2008 11:53:17 AM

Service Area 8

Lake Sallie/Lake Melissa Sewer Collection System

COPYRIGHT  
 **Wenck**  
Wenck Associates, Inc. 1800 Pioneer Creek Center  
Environmental Engineers Maple Plain, MN 55359-0429

FEB 2008

Figure 8









COPYRIGHT  
 Wenck Associates, Inc. 1800 Pioneer Creek Center  
 Environmental Engineers Maple Plain, MN 55359-0429

FEB 2008  
 Figure 10



**Legend**

- Service Areas
- Pelican River Watershed District Parcels
- Proposed Sewer Lines
- Manhole
- Lift Station



2007 Tax Parcels (Source: Pelican River Watershed District)  
 2003 Aerial Photograph (Source: LMIC)

700 350 0 700 Feet

N

Map: L11110715Lake Sallie and Pearl Mapbook.mxd  
 User: hmc@pelicanriver.org  
 Date: 2/15/2008 11:55:12 AM

Service Area 11

Lake Sallie/Lake Melissa Sewer Collection System

COPYRIGHT

**Wenck**

Wenck Associates, Inc. 1800 Pioneer Creek Center  
 Environmental Engineers Maple Plain, MN 55359-0429

FEB 2008

Figure 11





---

## **Appendix A**

---

### **Full Development Tables 10-18**

- 10. **Full Development – Estimated Flow Rates**
- 11. **Full Development – Cost Estimates Cluster Wastewater Systems**
- 12. **Full Development – Cost Estimates to add Water Systems**
- 13. **Full Development – Cost Estimates for Regional Wastewater System**
- 14. **Full Development – Cost Estimates for Regional Water System**
- 15. **Full Development – Cost Estimates for Sewer Connection to Detroit Lakes**
- 16. **Full Development – Cost Estimates for Water Distribution from Detroit Lakes**
- 17. **Full Development – Comparison of Costs for Wastewater Options**
- 18. **Full Development – Comparison of Costs Wastewater Options with Water Supply**



## FULL DEVELOPMENT

TABLE 10: Estimated Flow Rates Pelican River Watershed District Lake Sallie and Lake Melissa		
Service Area	Full Development Parcels	Full Development Rate Gallons/Day
1	69	31,050
2	187	84,150
3	89	40,050
4	312	140,400
5	159	71,550
6	99	44,550
7	204	91,800
8	199	89,550
9	207	93,150
10	180	81,000
11	43	19,350
12	144	64,800
Total	1,892	851,400



# FULL DEVELOPMENT

## OPTION 1: CLUSTER WASTEWATER SYSTEMS

**TABLE 11: Cost Estimates Cluster Wastewater Systems**

Service Area	Treatment System	Land Acquisition	Legal, Eng & Admin	Contingency	Collection System	Total Cost Estimate	Cost/Unit
1	\$ 500,000	\$ 50,000	\$ 90,000	\$ 100,000	\$ 600,000	\$ 1,300,000	\$ 19,000
2	\$ 900,000	\$ 90,000	\$ 150,000	\$ 180,000	\$ 1,600,000	\$ 2,900,000	\$ 16,000
3	\$ 600,000	\$ 60,000	\$ 100,000	\$ 120,000	\$ 800,000	\$ 1,700,000	\$ 19,000
4	\$ 1,600,000	\$ 160,000	\$ 270,000	\$ 310,000	\$ 1,600,000	\$ 3,900,000	\$ 13,000
5	\$ 800,000	\$ 80,000	\$ 140,000	\$ 160,000	\$ 1,200,000	\$ 2,400,000	\$ 15,000
6	\$ 600,000	\$ 60,000	\$ 100,000	\$ 120,000	\$ 600,000	\$ 1,500,000	\$ 15,000
7	\$ 1,000,000	\$ 100,000	\$ 170,000	\$ 200,000	\$ 1,000,000	\$ 2,500,000	\$ 12,000
8	\$ 1,000,000	\$ 100,000	\$ 170,000	\$ 200,000	\$ 800,000	\$ 2,300,000	\$ 12,000
9	\$ 1,000,000	\$ 100,000	\$ 170,000	\$ 200,000	\$ 1,200,000	\$ 2,700,000	\$ 13,000
10	\$ 900,000	\$ 90,000	\$ 150,000	\$ 180,000	\$ 1,100,000	\$ 2,400,000	\$ 13,000
11	\$ 300,000	\$ 30,000	\$ 50,000	\$ 60,000	\$ 600,000	\$ 1,000,000	\$ 23,000
12	\$ 800,000	\$ 80,000	\$ 140,000	\$ 160,000	\$ 1,100,000	\$ 2,300,000	\$ 16,000
<b>Total</b>	<b>\$ 10,000,000</b>	<b>\$ 1,000,000</b>	<b>\$ 1,700,000</b>	<b>\$ 2,000,000</b>	<b>\$ 12,200,000</b>	<b>\$ 26,900,000</b>	<b>\$ 14,000</b>

**TABLE 12: Cost Estimates to add Water System**

Service Area	Supply, Storage, & Treatment	Land Acquisition	Legal, Eng & Admin	Contingency	Service Lines <sup>1</sup>	Total Cost Estimate	Cost/Unit
1	\$ 170,000	\$ 15,000	\$ 30,000	\$ 40,000	\$ 270,000	\$ 500,000	\$ 7,000
2	\$ 300,000	\$ 25,000	\$ 50,000	\$ 60,000	\$ 1,060,000	\$ 1,500,000	\$ 8,000
3	\$ 180,000	\$ 15,000	\$ 30,000	\$ 40,000	\$ 400,000	\$ 700,000	\$ 8,000
4	\$ 500,000	\$ 30,000	\$ 80,000	\$ 100,000	\$ 1,330,000	\$ 2,000,000	\$ 6,000
5	\$ 250,000	\$ 25,000	\$ 50,000	\$ 50,000	\$ 930,000	\$ 1,300,000	\$ 8,000
6	\$ 200,000	\$ 15,000	\$ 40,000	\$ 40,000	\$ 400,000	\$ 700,000	\$ 7,000
7	\$ 330,000	\$ 25,000	\$ 60,000	\$ 70,000	\$ 670,000	\$ 1,200,000	\$ 6,000
8	\$ 320,000	\$ 25,000	\$ 60,000	\$ 70,000	\$ 670,000	\$ 1,100,000	\$ 6,000
9	\$ 330,000	\$ 25,000	\$ 60,000	\$ 70,000	\$ 930,000	\$ 1,400,000	\$ 7,000
10	\$ 290,000	\$ 25,000	\$ 50,000	\$ 60,000	\$ 670,000	\$ 1,100,000	\$ 6,000
11	\$ 130,000	\$ 15,000	\$ 30,000	\$ 30,000	\$ 400,000	\$ 600,000	\$ 14,000
12	\$ 230,000	\$ 15,000	\$ 40,000	\$ 50,000	\$ 800,000	\$ 1,100,000	\$ 8,000
<b>Total</b>	<b>\$ 3,300,000</b>	<b>\$ 255,000</b>	<b>\$ 580,000</b>	<b>\$ 680,000</b>	<b>\$ 8,600,000</b>	<b>\$ 13,200,000</b>	<b>\$ 7,000</b>

<sup>1</sup> Cost for installing a "dormant" water line at the time of collection system installation.

# FULL DEVELOPMENT

## OPTION 2: REGIONAL WASTEWATER SYSTEM

**TABLE 13: Cost Estimates for Regional Wastewater System**

Service Area	Treatment System <sup>1</sup>	Land Acquisition <sup>1</sup>	Collection System & Interceptor Sewer	Legal, Eng. & Admin.	Contingency	Total Cost Estimate	Cost/Unit <sup>2</sup>
1	\$ 190,000	\$ 135,000	\$ 600,000	\$ 200,000	\$ 200,000	\$ 1,300,000	\$ 20,000
2	\$ 380,000	\$ 270,000	\$ 1,800,000	\$ 400,000	\$ 500,000	\$ 3,400,000	\$ 19,000
3	\$ 190,000	\$ 135,000	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,400,000	\$ 16,000
4	\$ 570,000	\$ 405,000	\$ 1,600,000	\$ 400,000	\$ 500,000	\$ 3,500,000	\$ 11,000
5	\$ 570,000	\$ 405,000	\$ 800,000	\$ 300,000	\$ 400,000	\$ 2,500,000	\$ 16,000
6	\$ 190,000	\$ 135,000	\$ 800,000	\$ 200,000	\$ 200,000	\$ 1,500,000	\$ 16,000
7	\$ 190,000	\$ 135,000	\$ 1,400,000	\$ 300,000	\$ 400,000	\$ 2,400,000	\$ 12,000
8	\$ 190,000	\$ 135,000	\$ 900,000	\$ 200,000	\$ 300,000	\$ 1,700,000	\$ 9,000
9	\$ 570,000	\$ 405,000	\$ 1,400,000	\$ 400,000	\$ 500,000	\$ 3,300,000	\$ 16,000
10	\$ 190,000	\$ 135,000	\$ 900,000	\$ 200,000	\$ 300,000	\$ 1,700,000	\$ 10,000
11	\$ 190,000	\$ 135,000	\$ 600,000	\$ 200,000	\$ 200,000	\$ 1,300,000	\$ 32,000
12	\$ 380,000	\$ 270,000	\$ 1,500,000	\$ 400,000	\$ 400,000	\$ 3,000,000	\$ 21,000
To Site			\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	
Total	\$ 3,800,000	\$ 2,700,000	\$ 13,900,000	\$ 3,600,000	\$ 4,300,000	\$ 28,300,000	\$ 15,000

**TABLE 14: Cost Estimates for Regional Water System**

Service Area	Supply, Storage & Treatment <sup>1</sup>	Land Acquisition <sup>1</sup>	Service Lines & Distribution System	Legal, Eng. & Admin.	Contingency	Total Cost Estimate	Cost/Unit <sup>2</sup>
1	\$ 120,000	\$ 10,000	\$ 400,000	\$ 100,000	\$ 100,000	\$ 700,000	\$ 11,000
2	\$ 240,000	\$ 10,000	\$ 1,000,000	\$ 200,000	\$ 300,000	\$ 1,800,000	\$ 10,000
3	\$ 120,000	\$ 10,000	\$ 400,000	\$ 100,000	\$ 100,000	\$ 700,000	\$ 8,000
4	\$ 360,000	\$ 10,000	\$ 1,100,000	\$ 300,000	\$ 300,000	\$ 2,100,000	\$ 7,000
5	\$ 360,000	\$ 10,000	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,500,000	\$ 10,000
6	\$ 120,000	\$ 10,000	\$ 400,000	\$ 100,000	\$ 100,000	\$ 700,000	\$ 7,000
7	\$ 120,000	\$ 10,000	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,200,000	\$ 6,000
8	\$ 120,000	\$ 10,000	\$ 600,000	\$ 200,000	\$ 200,000	\$ 1,100,000	\$ 6,000
9	\$ 360,000	\$ 10,000	\$ 900,000	\$ 200,000	\$ 300,000	\$ 1,800,000	\$ 9,000
10	\$ 120,000	\$ 10,000	\$ 600,000	\$ 200,000	\$ 200,000	\$ 1,100,000	\$ 6,000
11	\$ 120,000	\$ 10,000	\$ 300,000	\$ 100,000	\$ 100,000	\$ 600,000	\$ 15,000
12	\$ 240,000	\$ 10,000	\$ 900,000	\$ 200,000	\$ 300,000	\$ 1,700,000	\$ 12,000
To Site			\$ 400,000	\$ 100,000	\$ 100,000	\$ 600,000	
Total	\$ 2,400,000	\$ 120,000	\$ 8,400,000	\$ 2,200,000	\$ 2,500,000	\$ 15,600,000	\$ 8,000

<sup>1</sup> These costs are proportionally divided among the service areas.

<sup>2</sup> Cost/unit includes the proportional share for construction to/from the site.

# FULL DEVELOPMENT

## OPTION 3: CONNECTION TO DETROIT LAKES

**TABLE 15: Cost Estimates for Sewer Connection to Detroit Lakes**

Service Area	Connection Fee <sup>1</sup>	Land Acquisition	Collection System & Interceptor Sewer	Legal, Eng. & Admin.	Contingency	Total Cost Estimate	Cost/Unit <sup>2</sup>
1	\$ 3,000	\$ -	\$ 600,000	\$ 100,000	\$ 200,000	\$ 900,000	\$ 14,000
2	\$ 7,000	\$ -	\$ 1,800,000	\$ 300,000	\$ 400,000	\$ 2,500,000	\$ 14,000
3	\$ 4,000	\$ -	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,100,000	\$ 13,000
4	\$ 11,000	\$ -	\$ 1,600,000	\$ 300,000	\$ 300,000	\$ 2,200,000	\$ 7,000
5	\$ 6,000	\$ -	\$ 800,000	\$ 200,000	\$ 200,000	\$ 1,200,000	\$ 8,000
6	\$ 4,000	\$ -	\$ 800,000	\$ 200,000	\$ 200,000	\$ 1,200,000	\$ 13,000
7	\$ 8,000	\$ -	\$ 1,400,000	\$ 300,000	\$ 300,000	\$ 2,000,000	\$ 10,000
8	\$ 7,000	\$ -	\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	\$ 7,000
9	\$ 8,000	\$ -	\$ 1,400,000	\$ 300,000	\$ 300,000	\$ 2,000,000	\$ 10,000
10	\$ 7,000	\$ -	\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	\$ 8,000
11	\$ 2,000	\$ -	\$ 600,000	\$ 100,000	\$ 200,000	\$ 900,000	\$ 22,000
12	\$ 6,000	\$ -	\$ 1,500,000	\$ 300,000	\$ 300,000	\$ 2,100,000	\$ 15,000
To Site			\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	
Total	\$ 73,000	\$ -	\$ 13,900,000	\$ 2,900,000	\$ 3,200,000	\$ 20,000,000	\$ 11,000

**TABLE 16: Cost Estimates for Water Distribution from Detroit Lakes**

Service Area	Connection Fee <sup>1</sup>	Land Acquisition	Service Lines & Distribution System	Legal, Eng. & Admin.	Contingency	Total Cost Estimate	Cost/Unit <sup>2</sup>
1	\$ 3,000	\$ -	\$ 400,000	\$ 100,000	\$ 100,000	\$ 600,000	\$ 9,000
2	\$ 7,000	\$ -	\$ 1,000,000	\$ 200,000	\$ 200,000	\$ 1,400,000	\$ 8,000
3	\$ 4,000	\$ -	\$ 400,000	\$ 100,000	\$ 100,000	\$ 600,000	\$ 7,000
4	\$ 11,000	\$ -	\$ 1,100,000	\$ 200,000	\$ 200,000	\$ 1,500,000	\$ 5,000
5	\$ 6,000	\$ -	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,100,000	\$ 7,000
6	\$ 4,000	\$ -	\$ 400,000	\$ 100,000	\$ 100,000	\$ 600,000	\$ 6,000
7	\$ 8,000	\$ -	\$ 700,000	\$ 200,000	\$ 200,000	\$ 1,100,000	\$ 6,000
8	\$ 7,000	\$ -	\$ 600,000	\$ 100,000	\$ 200,000	\$ 900,000	\$ 5,000
9	\$ 8,000	\$ -	\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	\$ 6,000
10	\$ 7,000	\$ -	\$ 600,000	\$ 100,000	\$ 200,000	\$ 900,000	\$ 5,000
11	\$ 2,000	\$ -	\$ 300,000	\$ 100,000	\$ 100,000	\$ 500,000	\$ 12,000
12	\$ 6,000	\$ -	\$ 900,000	\$ 200,000	\$ 200,000	\$ 1,300,000	\$ 9,000
To Site			\$ 400,000	\$ 100,000	\$ 100,000	\$ 600,000	
Total	\$ 73,000	\$ -	\$ 8,400,000	\$ 1,900,000	\$ 2,100,000	\$ 12,400,000	\$ 7,000

<sup>1</sup> The City of Detroit Lakes indicated the connection charge is \$35 per connection for sewer and \$35 for water.

<sup>2</sup> Cost/unit includes the proportional share for construction to/from the site.

# FULL DEVELOPMENT SUMMARY OF OPTIONS

**TABLE 17: Comparison of Costs for Wastewater Options**

	Option 1 Cluster Systems	Option 2 Regional System	Option 3 Connect to Detroit Lakes
<b>Total System Costs</b>	\$ 26,900,000	\$ 28,300,000	\$ 20,000,000
<b>Annual Operation &amp; Maintenance Costs (20 year present worth value)</b>	\$ 12,400,000	\$ 7,800,000	\$ 10,800,000
<b>Estimated Total Present Worth</b>	\$ 39,300,000	\$ 36,100,000	\$ 30,800,000
<b>Estimated Total Equivalent Annual Cost</b>	\$ 2,892,480	\$ 2,656,960	\$ 2,266,880
<b>Estimated Equivalent Annual Cost per Unit</b>	\$ 1,529	\$ 1,404	\$ 1,198

**TABLE 18: Comparison of Costs Wastewater Options with Water Supply**

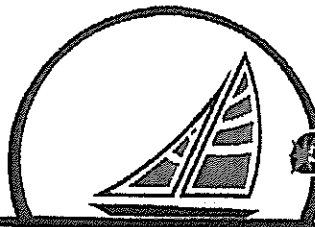
	Option 1 Cluster Wastewater & Small Community Water Systems	Option 2 Regional Wastewater & Water System	Option 3 Sewer & Water Detroit Lakes System
<b>Total System Costs</b>	\$ 40,100,000	\$ 43,900,000	\$ 32,400,000
<b>Annual Operation &amp; Maintenance Costs (20 year present worth value)</b>	\$ 13,700,000	\$ 8,700,000	\$ 9,300,000
<b>Estimated Total Present Worth</b>	\$ 53,800,000	\$ 52,600,000	\$ 41,700,000
<b>Estimated Total Equivalent Annual Cost</b>	\$ 3,959,680	\$ 3,871,360	\$ 3,069,120
<b>Estimated Equivalent Annual Cost per Unit</b>	\$ 2,093	\$ 2,046	\$ 1,622

---

## **Appendix B**

---

**Letters from the City of Detroit Lakes  
October 25, 2007 and February 7, 2008**



## **City of Detroit Lakes**

1025 Roosevelt Ave., P.O. Box 647 Detroit Lakes MN 56502

---

October 25, 2007

Mr. Dennis Kral, Chairman  
Pelican River Watershed District  
801 Roosevelt Avenue  
Detroit Lakes, MN 56501

Dear Dennis:

We wanted to follow-up on the questions discussed at our meeting on October 15, regarding the feasibility of installing a sewer system on Lakes Floyd, Little Floyd, Mellissa and Sallie being conducted by the Watershed District. Two questions were discussed. What are the City's standards for installation of sewer service and does the City have plans to extend sewer service to any of these areas in the near future?

To thoroughly answers these questions a number of policy as well as technical issues must be addressed. The City designs its sewer systems to be gravity flow in all but the most extreme situations. The City has found over the long term grinder pumps and pressurized collection systems have significantly more maintenance requirements for both the City and home owners which make them less desirable for both parties.

Your Engineer, Mr. Wenke could obtain more technical specifications from City Engineer Gary Nansen. Gary can be reached at (218) 847 - 5607.

As we mentioned the City of Detroit Lakes policy is to provide sewer and water service to areas willing to be annexed to the City. As a general policy the City has only annexed property when it has received a request for annexation from the affected property owners. The annexations have been either by petition of the property owners or through an Orderly Annexation Agreement approved by both the City and the affected Township.

When residents on the south and east sides of Detroit Lake approached the City for sewer and water services, they opted to seek annexation by a petition of a majority of the property owners in the affected area. The township chose to contest the annexation. A hearing was required and the process required several years to complete.

---

The City of Detroit Lakes is an equal opportunity service provider

Larry G. Buboltz  
**MAYOR**  
E-Mail: [cityofd@lakesnet.net](mailto:cityofd@lakesnet.net)

Office of City Administration  
218-847-5658 FAX 218-847-8969  
[www.ci.detroit-lakes.mn.us](http://www.ci.detroit-lakes.mn.us)

Richard Grabow  
**CITY ADMINISTRATOR**

In the case of Long Lake the property owners approached the City and Township seeking annexation and sewer and water services from the City. In this case the City and Township negotiated an Orderly Annexation Agreement, which provided for phased annexation of the area over a 12 year period extending to 2015.

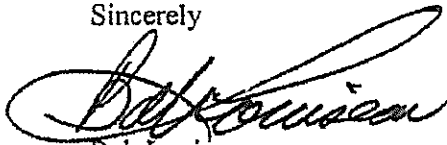
Sewer and water services are being extended around Long Lake in the most efficient manner possible. In some cases the services are available prior to the area actually being annexed to the City. In those situations residents desiring to connect to the system pay a connection fee and which is credited against the assessments which are levied against their property once it is annexed to the City.

As we mentioned at the meeting the City will likely be looking at its long term wastewater treatment needs in the near future. This assessment will include an analysis of future development and the extension of service to areas outside our current boundaries. Coordinating this assessment with any plans for sewer services being developed by the Watershed District seems to be a logical.

While it is unlikely the City will change its policy of annexation upon request, we certainly recognize the value of working with Watershed District and the surrounding Townships to provide for the long term orderly growth of the area. Should the Watershed District desire to pursue the orderly extension of sewer and water services and orderly annexation; the City would be willing to participate in the discussions with residents and Township officials.

If you have any questions regarding this matter, please contact me at 847-5658 or [blouiseau@lakesnet.net](mailto:blouiseau@lakesnet.net).

Sincerely

A handwritten signature in black ink, appearing to read 'Bob Louiseau', with a large, stylized flourish extending from the end of the signature.

Bob Louiseau  
City Administrator

CC: Mayor Buboitz  
City Council Members

February 7, 2008

Ms. Tera Guetter  
Pelican River Watershed District  
801 Roosevelt Avenue  
Detroit Lakes, MN 56501

Re: Wastewater Treatment and Water Supply Alternatives  
Lake Sally and Lake Melissa Chain and Floyd Lake Chain

Dear Tera:

Thank you for the opportunity to comment on the Wastewater Treatment and Water Supply Reports for Lake Sallie and Melissa and Floyd and Little Floyd Lakes. Given the general nature of the report, our comments will pertain to both reports.

To begin with, I thought it important to clarify the status of the City's Wastewater Treatment Facility. The Detroit Lakes Wastewater Treatment Facilities are permitted to process 1,640,000 gallons of wastewater per day. The current average daily flows are 1,148,000 (70%) gallons per day. Discharges from the system are well below permitted limits for all monitored standards.

In reviewing the report, we noted the estimated volume of wastewater appears to be greater for both study areas than we would have anticipated. As an example in the Lake Sallie - Melissa area, the report projects a daily wastewater flow of 553,950 gallons per day. This nearly equals the total daily flow generated by the City of Perham (580,000 gpd). Perham has a population of over 2700 people and three major food processing industries which together produce over 200,000 gpd of this total.

It appears the report proposes the installation of cluster systems as a prelude to eventual connection to the City's system in the future. It is unclear, however, if or how much cost inefficiencies would be associated with the use of the cluster systems in the short term. These costs should be carefully analyzed to insure property owners get the best value for their investment over the long term.

It would also be very important to analyze the design of the cluster system to insure it would be compatible with sewer system design standards used by the City. The City typically does not use a "mini" lift station system to pump wastewater from groups of



residents to a sewer main. Wherever feasible, the City connects individual residents and businesses to the sewer mains serving their area.

The City does this to minimize the lifecycle cost of the sewer collection system. We have found the fewer pump stations, force mains and similar items are used in the system, the lower the system's long term operation and maintenance costs. We have found most of our sewer collection system has a useful life of 40 years or more, while the pumps, controls and other equipment need major servicing and repair several times during this life cycle.

The assessments to property owners of \$33,000 per lot for sewer and water is higher than the assessments the City has incurred for Phase I and II of the Long Lake improvement. The assessment for a 150 foot lot in the Long Lake projects has been approximately \$20,000. This would include the sewer and water mains along with the services stubbed out to the edge of the property for the property owner to connect to and restoration of the road.

The City Assessment Policy includes a general cost sharing of the expenses with residents. Residents were not assessed for the full cost of the sewer and water when these services were extended around Detroit Lake or in Phases I and II of the Long Lake improvements.

Both reports include a significant connection fee to be able to connect to the City's sewer system; the City's current connect fee is \$35 for water and \$35 for sewer.

The design information for the small community water system purposed seems to be substantially different than would be provided by the City. The City's system includes treatment of the water for iron and manganese, which may be required. The City would also provide adequate volume and pressure to meet fire flow requirements for the area being served.

We hope these comments will be of assistance to you. As we mentioned in our previous letter we would be happy to meet with the Watershed District, Townships, Lake Associations or other groups to discuss the provision of water and sewer to these area. If you have any questions for us, please let me know.

Sincerely

Bob Louiseau  
City Administrator

cc: Mayor Buboltz  
Council Members  
Curt Punt, Utilities Superintendent  
Gary Nansen, Ulteig Engineering

---

## **Appendix C**

---

### **Regional Wastewater Treatment: Sanitary Districts and Cooperative Agreements**



Minnesota  
Pollution  
Control  
Agency

Municipal  
Division

Municipal  
Wastewater  
Section

# Regional Wastewater Treatment: Sanitary Districts and Cooperative Agreements

Water Quality/Wastewater Treatment Plants #3.04, November 2005

*PLEASE NOTE: This document is intended to be only an informal aid. Individuals should not rely solely on this document and should instead make themselves fully aware of all the requirements of each of the following ways to establish a sanitary district or sewer system by consulting Minnesota Statutes and Rules.*

## Contents:

Sanitary Districts.....	1
Authority of Cities and Counties .....	2
Initiating a District or System by County Board or District Court.....	2
Special Legislation.....	3
Cooperative Agreements Between Governing Bodies.....	3
Subordinate Service Districts.....	3
Authority of Towns.....	3
Contractual Agreements for Wastewater Treatment .....	3
Lake Improvement Districts.....	4
Watershed Districts.....	5

Ensuring that wastewater is properly treated prior to discharge has important environmental and public health benefits. In the state of Minnesota, there are several methods to address a regional water pollution problem. These approaches range from organizing a sanitary district to forming cooperative agreements between governing bodies. The following is a brief overview of each of these methods.

## Sanitary Districts

(Minn. Stat. §§ 115.18 to 115.37)

In order to address a regional water pollution problem, the Minnesota Pollution Control Agency (MPCA) may be petitioned for the formation of a sanitary district. These districts are created "for the purpose of promoting the public health and welfare by providing an adequate and efficient system and means of collecting, conveying, pumping, treating and disposing of domestic sewage and garbage and industrial wastes within the district." (Minn. Stat. § 115.19)

The petition to the MPCA must be signed by an officer of the governing body of the city, town or county in which all or a part of the proposed district is to be located. In lieu of the petition being signed by an officer of the county, the petition may also be signed by 20 percent of voters residing and owning land within the proposed district.

The governing body of the territory in which the district is to be located must adopt a resolution. The petition shall be signed 40 days after the publication of the resolution in a qualified newspaper. In addition, a public meeting must be held to inform landowners in the proposed district of the intent to create the district.

If the MPCA determines that there is sufficient documentation of the need to create a district and the petitioners have met all statutory requirements, the MPCA will publish a notice of intent to approve the formation of the district in the *State Register*. After this notice is printed, there is a 30-day comment period during which landowners opposed to the proposal may request a hearing on the matter.

Finally, the MPCA will publish the Findings of Fact, Conclusions and Order (Order) in the *State Register*. The MPCA will either order the district to be created or deny the creation of the proposed district. If it is ordered that the district will be created, there will be a 30-day appeal period that will allow landowners to appeal the decision to the Court of Appeals. Upon expiration of the appeal period and if no appeals have been filed, the MPCA will file the order with the Secretary of State, at which time the district will be deemed complete. In order to annex or detach an area adjacent to the district,





the petitioners must proceed in a similar manner as prescribed for the creation of a district under Minn. Stat. § 115.20.

A board of managers of the district will be chosen as the governing body, which will have control of the funds, property and affairs of the district. The sanitary district will have the authority to construct, install, improve, maintain and operate a system for the prevention of water pollution.

### **Authority of Cities and Counties** (Minn. Stat. § 444.075)

Under Minn. Stat. § 444.075, cities (except cities with populations greater than 100,000) are given the authority to "build, construct, reconstruct, repair, enlarge, improve" or obtain waterworks systems, sewer systems and storm sewer systems. Counties, except those in the seven-county metropolitan area, are also given this authority. In order to finance one of these systems, the governing body of a city or county may assess taxes and impose charges for connections to the water or sewer system. The governing body may also acquire the land necessary for construction of the system.

### **Initiating a District or System by County Board or District Court** (Minn. Stat. Ch. 116A)

A county has the authority to put in a water and/or sewer system without forming a district. County boards and district courts (courts) have the authority to make arrangements in order to construct and maintain public water or sewer systems. A petition for the establishment of a water and/or sewer system and a governing board must be signed by at least 50 percent of the landowners in the area and must be submitted to the county auditor if the proposed system is within a county or the clerk of the district court if the system crosses two or more counties. Each landowner who signs the petition grants an easement to use the owner's land for construction or maintenance of the system. A bond of not less than \$2,000 dollars is required to ensure that the expenses incurred by the county or the court will be paid if the establishment of the system is dismissed.

Within 30 days of the time the petition and bond are filed, the board or court will appoint an engineer who will

survey the affected territory to determine whether the proposed project is necessary and feasible. A preliminary hearing will be scheduled after receipt of the engineer's report. At the hearing, the board or court will determine whether the establishment of the system is necessary, feasible, will be of public benefit, and will promote public health. The board or court will then file the findings and order. The engineer will be ordered to make a detailed survey of the area, to furnish plans and specifications, and to estimate the cost of the project. It will also be ordered that three disinterested residents of the area affected should be appointed as "viewers," who will report on the estimated damages to land and properties that will result from the project.

A second hearing will be scheduled to discuss the reports of the engineer and the viewers. All oral and written testimony, the petition and the reports will be considered. The board or court will by order establish the water or sewer improvement if it is found that all proceedings have been in accordance with law, the benefits of the proposed system are greater than the costs, the system will be of public utility and benefit, public health will be promoted, and the system is practicable.

After the system has been ordered to be formed, the auditor(s) will proceed to let the job of constructing the system. The assessments will be determined by the procedures outlined in Minn. Stat. §§ 116A.17 – .18.

The county board is allowed to issue bonds to defray the cost of establishing and constructing a system and may issue certificates of indebtedness. A commission will be appointed with a number of representatives proportionate to the population of each area of the system. Any property occupied by a water and/or sewer commission is exempt from taxation by the state or any political subdivision of the state.

A county board may also initiate the establishment of a water or sewer system by adopting a resolution. After passing the resolution, the proceedings for establishment of the system under Minn. Stat. Ch. 116A are identical to those for the formation of a district by petition, except that a bond is not required. Furthermore, a county board may, without filing a petition, form a water and/or sewer district within the county without the board or court first ordering the establishment of a system.



## Special Legislation

A sanitary district may be created by the legislature through enactment of a special law providing for such district and its governing board.

## Cooperative Agreements Between Governing Bodies

(Minn. Stat. § 471.59)

Two or more governing bodies may enter into a joint or cooperative agreement to exercise any power common to the parties. The agreement between the two contracting parties must state the purpose of the cooperation and provide the manner in which the power will be exercised. If the agreement calls for the formation of a joint board, all of the parties must be fairly represented. Public funds may be used to carry out the purposes of the agreement. The cooperation between the contracting parties may continue until terminated according to the terms of the agreement.

## Subordinate Service Districts

(Minn. Stat. Ch. 365A)

A subordinate service district is a defined area within a town, but not embracing an entire town, that will receive a government service to be financed from revenues from the area to receive the service. A petition may be submitted to a town board to request formation of a subordinate service district. The petition must be signed by at least 50 percent of the property owners in the proposed district, should include the territorial boundaries of the district, and indicate the services to be provided. A public hearing will then be held to determine whether the district should be established. The town board will pass a resolution to approve or disapprove the establishment of the district, which will be published in a qualified newspaper and sent to each affected property owner. This district will begin 60 days after publication of the resolution or at a later date specified in the resolution. The town board will adopt a budget for operation of the district, which will include a property tax and/or a service charge.

If a petition for referendum is signed by at least 25 percent of landowners and received before the district is established, there will be a reverse referendum to vote on whether the district shall be formed. If a majority of property owners support the creation of the district, the district will be formed at the time the town clerk certifies the vote.

A district may also be expanded through the procedure outlined above for formation of a district. Only those individuals residing within the territory to be added to the district will be able to vote in the election for expansion, unless at least 25 percent of property owners in the district petition to be included in the election.

A subordinate service district can also be terminated. If a petition for removal of the district is signed by at least 75 percent of the property owners and presented to the town board, a public hearing will be held. The town board will then decide to discontinue or continue the district or take some other action.

## Authority of Towns

(Minn. Stat. § 115.50)

All towns in Minnesota have the authority to "construct, install, acquire, maintain and operate disposal systems...." The towns may levy taxes and make other assessments to fulfill the purposes outlined in Minn. Stat. § 115.50.

## Contractual Agreements for Wastewater Treatment

(Minn. Stat. § 115.49)

If the MPCA determines after a hearing on the subject matter that cooperation between two or more municipalities is necessary to provide for areawide wastewater management and treatment, the agency may issue an order for a contract between the municipalities. The MPCA may specify the general purposes and terms of the proposed contract and may direct the municipalities involved to formulate and execute the contract.

A contract between two or more municipalities may be renegotiated and modified if all parties are in agreement. A municipality which is party to the contract and which operates a plant for disposal of sewage, industrial wastes or other wastes may put forward new rates and charges for the service performed under the contract. The entity requesting the change must hold a hearing to determine the proper rates and charges. If any party to the contract is dissatisfied with the new rates and charges, it may submit written notice to the other parties. The dispute will be brought forward to a board of arbitration, which will make a decision on the proper rates and charges. The rates and charges for the operation and maintenance of the sewage and waste disposal plant must be reasonable and may not result in a profit.



A contract may be reformed or terminated if there is agreement among all municipalities in the contract and an application is submitted to and approved by the MPCA. If an application is submitted to the MPCA by only one party to the contract, the MPCA may order reformation or termination of the contract or may hold a public hearing to hear evidence on the matter.

### **Lake Improvement Districts** (Minn. Stat §§ 103B.501 to 103B.581)

A lake improvement district (district) may be formed in order to "preserve and protect the lakes of the state and to increase and enhance the use and enjoyment of the lakes." (Minn. Stat. § 103B.511) The program will be administered by the commissioner of the Department of Natural Resources (DNR), who shall adopt rules to provide guidelines, criteria, and standards for the establishment of lake improvement districts. The borders of the district are encouraged to be consistent with natural hydrologic boundaries, and may extend into more than one county if a cooperative agreement between the counties is formed.

There are several ways to form lake improvement districts: (1) a resolution by the county board, (2) petition to the county board and (3) petition to the DNR. If the hydrologic boundaries of a proposed district extend into more than one county, several county boards may cooperatively form a district.

The first method for forming a lake improvement district is by a county board adopting a resolution declaring its intent to form one. The resolution must provide information on the boundaries of the district, management programs, finances and supervising, and must set a date for a hearing on the resolution. A copy of the resolution shall be sent to the town board(s) in the area of the district, who shall be encouraged to provide input on the proposed creation of the district. A public hearing must be held for the purpose of determining whether the district should be formed. Interested parties may share their opinions on the necessity of the proposed district and possible effects of its formation. Objections may be filed with the county auditor before the date of the hearing.

The county board may order the establishment of the lake improvement district if the board determines that (a) the proposed district is necessary or will further the public welfare, (b) property in the district will be benefited or (c) formation of the district will not cause long-range

environmental pollution. The order must contain the above-mentioned information. An order establishing a district must also state the name of the district, boundaries, management programs to be undertaken, financing, and details on the board of directors. The order shall be published once in the official newspapers of counties where the district is located and shall be filed with the Secretary of State, the MPCA and the DNR. Unless otherwise specified, the establishment of the district is effective 30 days after publication of the order.

If a lake improvement district is established by order of a county board, 26 percent of landowners may petition for a referendum on the establishment of the district at any time before the effective date of the order. The county board must issue an order staying the establishment until a referendum vote is taken. The election shall take place in July or August and the county auditor must certify the vote. The results of the election will determine whether the district is established.

There is a second way of forming a district through a petition. A petition for formation of a lake improvement district must be signed by 26 percent of the property owners in the territory of the proposed district and filed with the county auditor. The petition must be addressed to the county board and must include the name of the proposed district, the necessity to promote public health or welfare, the benefits to property, the boundaries, a map, the number of proposed directors and a request for establishment of the district.

Within 30 days of being notified by the county auditor that the signatures are verified, the board must hold a public hearing. Within 30 days of the holding of the hearing, the board must issue an order establishing or denying the establishment of the lake improvement district.

A third way of forming a district is possible if the county board has disapproved the establishment of a district. A petition for creation of the district may be submitted to the commissioner of the DNR. The petition should include the same information as called for in a petition to the county board.

After the county verifies the signatures on the petition, the DNR may hold a hearing within 30 days at the expense of the county board. The DNR shall consider the reasons why the petition was disapproved by the county board in making its decision to have a public hearing.



If a hearing is held within 30 days of the verification of signatures or after a hearing is held, the DNR shall approve or disapprove the establishment of the district by order. The order may contain modifications of the boundaries, functions, financing or organization that what were proposed in the petition.

The county board shall appoint persons to serve on the board of directors for the district and residents of the district must make up a majority of the directors. The district shall have an annual meeting, at which elections, approval of the budget, approval of projects that cost more than \$5,000 and consideration of other issues shall occur. Each year an annual report must be prepared which shall be submitted to the county board, town boards and cities within the area of the district, the DNR and the MPCA within four months of the annual meeting. The county board has the authority to assess the costs of projects, impose service charges and levy taxes.

The boundaries of a district may be enlarged in a similar manner as provided for the creation of a district. The termination of a lake improvement district may be initiated by a petition signed by 26 percent of property owners.

### **Watershed Districts** (Minn. Stat. Ch. 103D)

A watershed district may be formed in order to "conserve the natural resources of the state by land use planning, flood control, and other conservation projects by using sound scientific principles for the protection of the public health and welfare and the provident use of the natural resources." (Minn. Stat. §§ 103D.210)

A petition for the establishment of a watershed district may be filed with the Board of Water and Soil Resources (Board) and should include the name, the territory, the reasons for formation, why the district would be conducive to public health and welfare, a map of the district, the number of proposed managers and nominees for the manager positions. The petition must be signed by (1) one-half or more of the counties in the district, (2) counties having 50 percent or more of the area within the district, (3) a majority of the cities within the district or (4) 50 or more residents within the proposed district. The petition must be filed with the county auditors of the affected counties.

After the Board receives the petition, the director must prepare a preliminary map and report about the watershed

district that shall recommend whether the district should be established. A rulemaking hearing must be conducted to determine whether the watershed district shall be formed. The hearing will allow all interested parties to give testimony. The Board shall determine whether the district should be formed and will issue an order establishing or dismissing the establishment of the district. In the case of noncontroversial plans to form a watershed district, the Board may give notice of the petition and conduct a hearing only if a request for a hearing is received within 30 days of the notification. If rulemaking proceedings are not conducted, a local unit of government or 25 or more residents may demand a contested case hearing, which would be presided over by an administrative law judge. A party may appeal the final decision of the Board to the Court of Appeals. Territory of a district may be withdrawn, enlarged or consolidated by petition to the Board. A watershed district may be terminated by petition to the Board as well.

A board of managers of the watershed district will be appointed by the counties that shall only include voting residents and individuals who are not public officers of the county, state or federal government (except a soil and water conservation supervisor). The managers must elect officers of the board, adopt a seal, keep a record of all proceedings, meet at least annually to conduct business, and adopt bylaws. The managers may employ a chief engineer, professional assistants and other employees and shall provide for their compensation. The managers shall appoint an advisory committee consisting of at least five members to make recommendations to the managers on watershed district issues.

The board of managers has a number of authorities, including the ability to incur debts, sue, exercise eminent domain, levy taxes and initiate projects to achieve the purposes of the district. The managers may operate water supply systems, control the use of water, take over drainage systems, provide for sanitation and public health, and implement water-resource-management programs. The board of managers must maintain projects that are implemented.

The managers must adopt rules to accomplish the purposes of the watershed district, prepare an annual report, have an annual audit, and adopt a watershed-management plan. A violation of a rule or order of the managers is an enforceable action that could result in a criminal prosecution. An order made by the board can be appealed by any party to the board or the district court.



### For More Information

The MPCA has staff available to answer your questions about sanitary districts. Please contact Deb Lindlief at (218) 529-6268; toll-free at (800) 657-3864; or TTY at (651) 282-5332; or via Email at [deb.lindlief@pca.state.mn.us](mailto:deb.lindlief@pca.state.mn.us). Additional information can be found at the MPCA web site, <http://www.pca.state.mn.us>.