Wastewater Treatment & Water Supply Alternatives Analysis

Floyd Lake Chain of Lakes

Prepared for

Pelican River Watershed District

February 2008

Wastewater Treatment & Drinking Water Supply Alternatives Analysis

Floyd Lake
Chain of Lakes

Wenck File #1311-07

Prepared for:
PELICAN RIVER
WATERSHED DISTRICT

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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.

2-20-08

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Table of Contents

Table of Contents (Cont.)

TABLES

FIGURES

Table of Contents (Cont.)

APPENDICES

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 Floyd Shores Lake Association 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 Floyd Lake Chain of Lakes north 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 six square mile area surrounding Floyd Lake, Little Floyd Lake, and Tamarack Lake.

In order to accurately assess the options, the Study Area was divided into nine 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 Floyd Lake 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 with a small community water supply, is a viable option and the least expensive. Average capital cost for providing a cluster wastewater system connection is approximately $21,000/unit. Addition of a water supply connection at the time of cluster wastewater system construction would add approximately $12,000/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 $2,000/year and an additional $900/year for water.

Option 2, a new regional wastewater treatment facility is the most expensive option with an equivalent annual cost per unit at approximately $2,300/year with an additional $1,500/year for water supply. Connecting the Study Area to a sewer extension from the City of Detroit Lakes, Option 3, was approximately the same cost as Option 1 for wastewater. Adding $1,200/year for the addition of a water supply, Option 3 is slightly higher in costs than Option 1 with the combined services.

Summary of Equivalent Annual Cost per Unit

	OPTION 1 CLUSTER SYSTEMS	**OPTION 2 REGIONAL SYSTEM**	**OPTION 3 CITY OF DETROIT LAKES**
Wastewater Only	$2,066	$2,337	$2,009
Wastewater & Water	$2,969	$3,827	$3,172

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) Floyd Lake Chain of Lakes was requested by the Floyd Shores Lake Association 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 Floyd Lake, Little Floyd Lake, and Tamarack Lake. The Study Area is depicted on the Index Map Figure and was divided into nine service areas.

A conceptual collection system layout was developed for each of the nine 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 Floyd Lake 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 Floyd Lake Chain of Lakes is divided up into nine 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 1–9 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. Homeowners 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 system 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 assumed 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 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 have been raised in the past. The District provided a copy of a report titled; *Wastewater Facility Plan for Big Floyd Lake Detroit Township Becker County, Minnesota* (Widseth Smith Nolting January 1998). The planning area for this study was the south end and east side of Floyd Lake.

Detroit Township requested that a report be prepared to identify alternatives for wastewater collection and treatment. The report identified alternatives including; stabilization pond with spray irrigation and stabilization pond with rapid infiltration basins. The report recommended that a gravity collection system with stabilization pond treatment and rapid infiltration basin disposal would be the best alternative. The report also discussed the use of Individual Sewage Treatment Systems (ISTS) and the limited use of cluster systems.

A separate document titled; *Water System Feasibility Study for Big Floyd Lake Detroit Township Becker County, Minnesota* (Widseth Smith Nolting December 1997) was also prepared at the request of Detroit Township. This report identified alternatives for water supply and

distribution. The recommended alternative was a regional water system using a rural style distribution.

Detroit Township formed a Subordinate Service District in 1997 around the study area identified in these two reports. Financial assistance requests were made to state and federal programs for the projects. It was concluded that these programs would not offer subsidized financing for the projects due to the proximity to the City of Detroit Lakes. Without these funding options project development ceased.

3.0 Purpose

3.1 STATEMENT OF NEED

The District authorized and funded this study as a direct result of requests from the Floyd Shores Lake Association 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 Floyd 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, Floyd Lake Association, 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 new cluster system currently proposed is located on the golf course near Little Floyd Lake for 21 new homes.

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 1-9.

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

Based on costs from 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.

A cost discrepancy exists between individual service areas for each option. Some service areas have low population density over a large land area elevating cost estimates. For example removing Service Area 1 from the calculations would reduce the average capital cost/unit over the entire Study Area by greater than $1,000. Residents interested in a project near their property should look at the individual service area calculations. Those service areas with higher cost/unit could look to partner with adjacent service areas or a subset thereof to lower overall project costs.

Below is a brief summary of the three options evaluated. The analysis indicates that Option 1, Cluster Wastewater and Small Community Water Systems, is the least expensive at present development levels. When evaluating the Study Area at the full development scenario, Option 3, City of Detroit Lakes connection, is the least expensive option.

6.1 OPTION 1 – CLUSTER SYSTEMS

Cluster wastewater systems and small community water systems are the 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 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 second lowest cost of the three options at present 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 are approximately 30 percent higher than the fees given by the City at present development levels. However, when evaluating the full development scenario (Tables in Appendix A) the connection to the City is the lowest cost option at $23,000 average per unit for sewer and water.

6.4 SUMMARY OF CAPITAL COSTS AND ANNUAL O & M COSTS

PRESENT DEVELOPMENT SCENARIO*			
AVERAGE CAPITAL COSTS PER UNIT			
	Option 1	**Option 2**	**Option 3**
WASTEWATER	$ 21,000	$ 28,000	$ 21,000
WATER	$ 12,000	$ 19,000	$ 17,000
TOTAL	$ 33,000	$ 47,000	$ 38,000

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

FULL DEVELOPMENT SCENARIO**			
AVERAGE CAPITAL COSTS PER UNIT			
	Option 1	**Option 2**	**Option 3**
WASTEWATER	$ 16,000	$ 18,000	$ 13,000
WATER	$ 7,000	$ 12,000	$ 10,000
TOTAL	$ 23,000	$ 30,000	$ 23,000

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

ESTIMATED ANNUAL O & M COSTS			
	Option 1	**Option 2**	**Option 3**
WASTEWATER	$ 480	$ 300	$ 420
WATER	$ 100	$ 100	$ 100
TOTAL	$ 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.

As discussed, Tables 1-9 are based on the existing parcels identified in the Study Area. Preliminary costs estimates for a scenario with full development of large tracts of vacant land are included in Appendix A. When considering a municipal connection, economies of scale can be achieved with the addition of future development. Analysis of the same options using parcels fully developed indicates that a City of Detroit Lakes connection is the least expensive alternative.

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 statue 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. The SSD has the ability to incur debts, sue, exercise eminent domain, levy taxes, and initiate projects to achieve the purposes of the SSD. 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. A 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.