LE SUEUR COUNTY BOARD OF COMMISSIONERS
MEETING AGENDA
320 PLUT AVENUE, LE CENTER
4-H FAMILY CENTER
February 10, 2015

1. **Public Information Meeting**

2. **7:00 pm Peter Miller, Jared Ward and Matt Summers, Wenck Associates**
   RE: Feasibility Study Review

3. **7:30 pm Public Comments**

Le Sueur County, MN

Tuesday, February 10, 2015

German Jefferson Sewer District

Item 1

Public Information Meeting

Staff Contact:

Le Sueur County, MN

Tuesday, February 10, 2015

German Jefferson Sewer District

Item 2

7:00 pm Peter Miller, Jared Ward and Matt Summers, Wenck Associates

RE: Feasibility Study Review

Staff Contact:

WENCK File #2660-04
January 2015

German-Jefferson Subordinate Service District–Community Wastewater Collection and Treatment System Feasibility Study

Prepared for:

Le Sueur County, Minnesota

88 S. Park Avenue
Le Center, MN 56057-1644

WENCK ASSOCIATES

Responsive partner.
Exceptional outcomes.

Prepared by:

WENCK Associates, Inc.
1800 Pioneer Creek Center
Maple Plain, MN 55359
Phone: 7963-479-4200
Fax: 763-479-4242

I hereby certify that this study was prepared by me or under my direct supervision and that I am a duly Licensed Professional Soil Scientist and MPCA Advanced Designer/Inspector under the laws of the state of Minnesota.

_____
Peter G. Miller, P.S.S

January 28, 2015
Date

42636
Registration Number

I hereby certify that this study was prepared by me or under my direct supervision and that I am a duly licensed professional engineer under the laws of the state of Minnesota.

_____
Jared T. Ward, P.E.

January 28, 2015
Date

48677
Registration Number

Table of Contents

IN-TEXT TABLES

Table of Contents (cont.)

1.0 Executive Summary

The German-Jefferson Subordinate Service District (District) is located in the southern part of Le Sueur County, Minnesota and includes areas around German Lake, Jefferson Lakes, and Swede's Bay (Figures 1 and 2). Residents within the German-Jefferson Subordinate Service District are currently served by subsurface sewage treatment systems (SSTS), which include both individual and community cluster systems.

An evaluation of SSTS in the planning area performed by Wenck Associates, Inc. (Wenck) identified systems by three categories: 1) Compliant, 2) Non-compliant and failing to protect groundwater, or 3) Imminent threat to public health and safety. Of the 754 SSTS known to exist within the District, Category 1 is estimated to include 54%, Category 2 is estimated to include 45% and Category 3 is estimated to include 1%.

In addition to this study, Wenck is conducting concurrent evaluations on 11 neighborhoods to determine the feasibility of replacing non-compliant SSTS with either new individual SSTS or cluster SSTS. The purpose of this study is to evaluate long term wastewater collection and treatment alternatives for residents within the District.

The following wastewater collection and treatment alternatives are being evaluated:

- SSTS Replacement (individual onsite systems)
- Cluster Treatment Systems
- Regional collection/grinder pump pressure sewer with trunk forcemain

Of the three alternatives, the regional collection system and ISTS are the only two alternatives that could be applied to the entire District as sole alternatives. Cluster systems alone cannot apply to all connections, but in combination with the other two, can serve as a solution. ISTS alternative alone, results in over 150 holding tanks within the District. Regional collection alternative alone, or in combination with cluster systems and ISTS, could eliminate holding tanks, and provide a solution for the entire District.

A summary of estimated capital costs and estimated equivalent annual costs[1] for alternatives are shown in Table 1-1 below.

Table 1-1: Alternative Estimated Costs

Component	Capital Construction Cost / Connection	Equivalent Annual Cost / Connection[1]
SSTS Individual Replacement	$12,000 - $15,000	$2,850
Cluster Treatment Systems*	$40,000 - $60,000	$2,770
Collection System and Trunk Forcemain (St. Peter)*	$33,000 (941 Conn.) $43,700 (287 Conn.)	$1,300 (941 Conn.) $2,810 (287 Conn.)

*Cost per parcel is dependent on the number of parcels that connect to the system.
[1]Equivalent annual cost is provided for comparison of alternatives only, and is based on a 20-year present worth calculation, and is not related to assessments.

2.0 Introduction and Background

2.1 INTRODUCTION

Le Sueur County retained Wenck Associates, Inc. (Wenck) to prepare a Sanitary Sewer Feasibility Study (Study) to evaluate wastewater collection and treatment system alternatives in the German-Jefferson Subordinate Service District (District) as shown on Figures 1 and 2. The District is compelled to evaluate long term wastewater infrastructure alternatives to address aged and non-compliant Subsurface Sewage Treatment Systems (SSTS) within the District.

2.2 PURPOSE

The purpose of this feasibility study was to evaluate wastewater collection and treatment alternatives for residents within the service area in close proximity to the lakes that can provide long term wastewater infrastructure to their communities.

Current studies are evaluating Individual Onsite Septic Treatment Systems (ISTS) and Cluster Treatment Systems within the District (Figure 3). This study incorporates a regional collection alternative, in addition to information being gathered on the ISTS and Cluster System alternatives.

2.3 HISTORY AND CONDITION OF SEPTIC SYSTEMS

The Jefferson German Lakes Septic Inventory Project (JGSIP) was initiated in 2011 by Le Sueur County within the boundaries of the District. The residents of the District currently use individual and community water supply wells and SSTS. The SSTS (a.k.a. septic systems) in the District include both individual and community cluster systems. Wenck was retained to assess the compliance status of existing SSTS in the project area with respect to Minnesota Rules Chapters 7080-7081, the Le Sueur County Zoning Ordinance: Section 17 Subsurface Sewage Treatment Systems and the Interim SSTS Standards for the District.

The goal of the JGSIP was to complete as many SSTS compliance inspections within the District as possible. The JGSIP was funded through a Clean Water Legacy Grant from the Minnesota Board of Water and Soil Resources and was open and available to all property owners who have an SSTS in the District.

Through this comprehensive assessment, it was determined that 754 SSTS exist within the District. A summary of project findings was presented to the Le Sueur County Board, Le Sueur County staff, and District residents in a JGSIP Final Report dated March 2013 and are provided below.

A summary of the findings of the JGSIP is as follows:

- 754 SSTS are known to exist in the District
- 54% (409) of the known SSTS are estimated or known to be compliant
  - Properties with a tank connected to a cluster treatment area comprise 22% (92) of the compliant SSTS
  - Holding tanks comprise 24% (97) of the compliant SSTS
  - The remaining 54% (220) of the compliant SSTS have an individual sewage treatment area (mound or subsurface drain field)

- 45% (340) of the known SSTS are estimated or known to be non-compliant and fail to protect groundwater
- 1% (5) of the known SSTS are known to be non-compliant and imminent health threats

Figure 4 provides a graphic for compliance results within the District. For additional information please refer directly to the JGSIP Final Report.

Also in 2013, Le Sueur County passed an ordinance requiring all ISTS shall be in compliance with Minnesota Rules Chapter 7080, as amended by Section 17 of the Le Sueur County Zoning Ordinance, no later than December 31, 2017.

In addition to this study, Wenck is currently conducting concurrent evaluations on 11 neighborhoods to determine the feasibility of replacing non-compliant SSTS with either new individual SSTS or cluster SSTS (Figure 3).

2.4 PREVIOUS REPORTS AND INVESTIGATIONS

In 2005 and 2006, a draft Feasibility Study was prepared by Bolton and Menk to evaluate and compare the feasibility of providing a collection system to the District and pumping the flows to the City of Mankato, or installing Large Subsurface Sewage (LSTS) Treatment for properties within the District. The Study included 578 existing homes, with 268 future potential service connections in addition to existing homes. The report was completed in conjunction with the Lake Washington Sanitary Sewer District collection system project. The previous report was evaluated and where applicable, concepts adopted for the completion of this Study.

3.0 TREATMENT ALTERNATIVES

3.1 ALTERNATIVE 1 – ISTS REPLACEMENT (INDIVIDUAL ONSITE SEPTIC SYSTEMS)

3.1.1 Individual Subsurface Sewage Treatment Systems Summary

According to MN Rule 7080.1100, an SSTS is a soil-based wastewater treatment system. Wastewater passes through septic tanks and possibly other treatment devices before final distribution to a subsurface soil dispersal system. An ISTS is defined as an SSTS with a design flow less than 5,000 gpd and includes privies and holding tanks. SSTS are designed and sized based on flow rates as determined through the methods described in MN Rules 7080 and 7081. Residential design flows are based on several factors including number of bedrooms, square footage, and water using devices present. Non-residential establishment design flows are based on rates listed in MN Rule 7081 and are specific to a given type of facility.

SSTS are commonly used for rural areas or other areas that are not densely populated and are relatively cheap to operate and maintain. Septic tanks require regular pumping as solids accumulate, depending on usage, but do not otherwise require significant maintenance. SSTS do require a significant amount of land for drainfield installation, which limits the application in densely populated areas with small lots. In addition, drainfields must be located in areas with suitable soils and no groundwater or bedrock within 36 vertical inches of the soil/wastewater interface.

3.1.2 Would this Alternative be a viable option?

Many of the existing ISTS are failing to adequately protect the public and surrounding environment, as identified on Figure 4. One alternative that was examined is the replacement of existing ISTS with new systems that would satisfy the requirements for protecting the public health and the surrounding environment. However, many of the residences in the project area are on small, often steeply sloping lakeshore lots that lack suitable space for a new, compliant septic system. Such properties are limited to holding tanks as their only likely future option. Holding tanks are not desirable due to high costs of frequent pumping and limitations for property use (holding tanks are not permitted for new construction or for additions). In addition, the high cost of regular pumping can lead some holding tank owners to drain their own tanks directly onto their yards or into nearby receiving waters. As noted in the JGSIP Final Report, 154 properties in the District have only a holding tank as their future ISTS option. Nearly all of these properties have currently non-compliant ISTS or already are using a holding tank. Given the high percentage of properties with such lot limitations, the ISTS Replacement alternative is not a viable solution for many homeowners.

Costs for ISTS systems with a drain field or mound dispersal system, when feasible, are typically $12,000 to $15,000. Typical annual operations and maintenance costs range from $100 - $400 for an ISTS, $3,000 to $6,000 for a holding tank ($1,000 to $1,500 for seasonal properties).

3.2 ALTERNATIVE 2 – CLUSTER TREATMENT SYSTEMS

3.2.1 Cluster Treatment Summary

An SSTS that conveys waste from multiple properties to a communal soil based effluent treatment area is commonly known as a cluster system. Any such system with a design flow under 5,000 gpd is considered under MN Rule 7080 to be an ISTS; a system with a design flow between 5,000-10,000 gpd is a Mid-size Subsurface Sewage Treatment System (MSTS); a system with a design flow over 10,000 gpd is a Large Subsurface Sewage Treatment System (LSTS). These three different size systems each have differing design and permitting requirements.

Cluster systems are an alternative for groups of homes in relatively close proximity to one another and in proximity to open land available for siting the common treatment area. The costs of the collection system, the treatment system, land for the treatment site, maintenance, and administration are all critical to the viability of any given cluster system. Costs are spread equally among the participants, and the cost per connection generally declines with increased density of connected homes.

3.2.2 Would this Alternative be a viable option?

Currently, cluster alternatives are being explored in soil-based wastewater Feasibility Studies for eleven communities in the District, as shown on Figure 3.

Many factors need to be considered for the viability of a cluster system. The following are a few of the major factors to consider:

- Availability of land for treatment area
- Number of connections served (more connections need larger system)
- Permitting and treatment requirements (flow more than 10,000 gpd triggers additional permitting and design requirements)
- Ownership, funding and payment (in order to qualify for funding the County must own it, which allows for costs of construction to be assessed to property owners)

Based on the factors listed above, this alternative may be viable within particular areas of the District. There are currently six operating cluster systems within the District boundaries. Clusters of homes generally not in close proximity to the other communities and in close proximity to suitable land for treatment areas may present a cluster system as a viable solution.

In contrast, for residential areas that are larger, denser, and not in close proximity to suitable available land, a cluster system is not a viable solution. The lack of available land of sufficient size near these communities may be a challenge that cannot be overcome.

In summary, cluster systems may be viable for some areas, and not for others. As the existing investigations conclude, additional information can be provided. Based on information gathered to date, a cluster system constructed by the District (i.e. not in private ownership), is estimated to cost between $40,000 and $60,000 per connection with typical annual operation and maintenance costs between $800 and $1,000 per connection. The actual costs depend on the number of connections, collection system size, land costs, permitting requirements, and the bidding environment at the time of construction. An example of costs for one community, Stavenau-Holdiay Park, is included in Tables G, H & I.

3.3 ALTERNATIVE 3 - REGIONAL COLLECTION AND TREATMENT

3.3.1 Summary

This section identifies collection and trunk piping options considered with this Study. Collection and trunk systems are typically comprised of gravity systems, pressure systems, or a combination of both. This section discusses how gravity and pressure systems apply to the District, as well as the phasing of collection system construction and options for treatment at two existing municipal wastewater treatment facilities.

3.3.2 Collection Piping Options

3.3.2.1 Gravity System Summary

Conventional gravity sewers convey raw sewage through pipes to a lift station(s). In general, conventional gravity sewers are cost effective in large, densely populated urban areas where the topography allows for the average depth of pipe to be 15 feet or less. Gravity sewers are generally constructed of 8-in diameter pipe or greater and installed by open-cut excavation methods. The pipe is installed with a uniform negative gradient to maintain self-cleansing velocities of 2.0 feet per second (fps) or greater.

Conventional gravity sewers generally require a significant amount of excavation and infrastructure, which can result in considerable disturbance and impacts to existing utilities, private property, and roadways. Often lift stations are utilized to compensate for deep excavations, but they require additional excavation, appurtenances, and maintenance.

Gravity sewers also utilize manholes that are located at every major change in pipe gradient or direction, and at regular 400-foot intervals. These manholes provide access to the pipe for maintenance.

The main limitation of conventional gravity sewers is that they must be installed with uniform gradients to maintain self-cleansing velocities. The entire District service area does not have uniform gradients and many of the homes near the lakes would be lower than the mainline elevation. Multiple lift stations with deep excavations would be required and construction costs would be high due to open cut excavation throughout. Therefore, the conventional gravity sewer alternative is not a feasible option and will not be examined further.

3.3.2.2 Grinder Pump Pressure Sewer System Summary

A grinder pump pressure sewer system utilizes grinder pumps at each connection to physically macerate raw sewage and pump downstream. Grinder pumps work collectively to convey sewage to its final destination. A small footprint is required at each connection as the grinder pump is housed in a cylindrical vault. These systems require power at each connection, air release valves along the forcemain route, and require solids settling to occur at a centralized treatment location. Utilizing a pressurized grinder system significantly reduces potential inflow and infiltration (I & I). Flexible high density polyethylene (HDPE) piping is directionally drilled to match the topography. Piping can be directionally drilled within paved and forested areas leading to less clearing, grubbing and overall site disturbance.

Due to the extent of piping from the east edge of the District to the west end, and gradient to the trunk lift station, it is anticipated that multiple intermediate lift stations would be required to effectively convey wastewater to the trunk lift station (i.e. grinder pumps at each connection would not be able to pump flow all the way to the trunk lift station location). The actual number of intermediate lift stations needed would depend on the actual phasing of the project. All lift stations would include a wet well and separate valve vault. To ease operation and maintenance activities, it is recommended that each duplex lift station be equipped with the same pump model.

Operation and maintenance tasks include: monitoring flows from each connection, performing routine system inspections for atypical conditions, and responding to emergency situations. Such circumstances include broken or obstructed mains, power outage, or pump failure.

Regional collection by a grinder pump pressure sewer system is a viable option for many of the areas within the District.

3.3.3 Collection System Scenarios

When considering a regional collection system, the cost for the trunk forcemain system does not vary significantly with more or less properties that are connected to the system. However, the trunk forcemain cost per connection decreases with the higher number of connections included with a project.

This Study considers three potential scenarios for the Regional Collection System as identified in Figures 5, 6, and 7. The highlighted parcels are assumed to bear the costs of the system.

The phasing also allows for a combination of different treatment alternatives within the District. For example, if scenario 1 moves forward with a regional collection system, the additional parcels in scenarios 2 and 3 may move forward with ISTS and/or cluster systems.

The associated cost tables (Tables D, E and F) for each scenario identify the cost per connection. As previously discussed, the cost per connection decreases as more connections are included.

3.3.4 Trunk Forcemain and Treatment

3.3.4.1 City of Cleveland Trunk System and Treatment

The City of Cleveland utilizes a facultative lagoon (i.e. pond system) for wastewater treatment. Their facility has the capacity for approximately 100 additional connections. In order to accommodate more than 100 connections, the facility would require an expansion. Although the proximity of the facility to the District reduces the trunk forcemain length necessary to transfer the sewage to the treatment facility, the required facility expansion makes this alternative significantly more expensive, and thus will not be examined further.

3.3.4.2 City of St. Peter Trunk System and Treatment

Trunk Forcemain

Three trunk forcemain route alternatives were evaluated to convey the flows to St. Peter (Figure 8). All routes are able to utilize an alignment within existing local township and county roadway easements and right-of-way.

One alternative was to utilize the existing Lake Emily Lift Station and Forcemain located adjacent to the Kasota Railroad, west of Lake Emily. It has been communicated that this lift station and forcemain was installed to serve the properties around Lake Emily at one time, but is currently not being utilized. The feasibility of utilizing this existing system depends on several factors including, but not limited to the following:

- What is the cost to cross the vein of shallow bedrock, located between Lake Emily and the existing lift station along the railroad?
- Is the existing forcemain sufficient for ultimate design flows?
- What is the long term plan for the Lake Emily area for sewer service?

The other two alternatives are to install a forcemain directly to St. Peter's gravity collection system west of the Minnesota River. Two alignment options are identified, and both would require crossing the river, and potentially a short segment of shallow bedrock along Highway 99. Both options would be within existing local township and county roadway easements and right-of-way. Figure 8 presents the trunk forcemain alignment options. Estimated trunk forcemain costs are included in Table C for each alternative.

Treatment

St. Peter treats its wastewater with a Class A biological aerated filters (BAF) treatment facility. The facility consists of a drum screen with grit removal, a primary treatment stage consisting of parallel plate clarifiers, secondary treatment consisting of biological aerated filters, and ultraviolet light (UV) disinfection system. Biosolids generated are treated by chemical addition and dewatering by belt filter press. The plant has an average dry weather design flow of 2.0 million gallons per day (MGD) and average wet weather design flow of 4.0 MGD. The facility is permitted with a continuous discharge to the Minnesota River.

St. Peter would require: an upfront trunk connection fee of $10,000 per inch diameter of pipe (10" pipe = $100,000); a $2,000 sewer availability charge (SAC) per connection as connections are made; and treatment, collection, and debt costs totaling $9.12 per 1,000 lineal feet of sanitary sewer pipe. These costs were provided by the City of St. Peter based on 2014 information, and could change in the future.

3.3.4.3 Would this Alternative be a viable option?

A regional collection and trunk forcemain system to the St. Peter treatment facility is a technically viable alternative to serve much of the District and is lower in cost than the City of Cleveland alternative. Although each area within the District may have multiple treatment solutions, this alternative provides a feasible solution for a significant number of properties.

Operation and maintenance (O&M) of the system would be the responsibility of the District. O&M would include: administrative duties, inspection of lift stations and collection system, maintenance and replacement of pumps, valve and break repairs, managing as an underground utility, and other items. These duties are typically handled by contracting to O&M companies, hiring staff and completing in house, or contracting with a local agency in

the area to extend their services to the District. O&M costs are dependent on many variables, many of which are currently unknown. The costs assumed for this Study are based on typical costs to contract the services of a private company. Estimated O&M costs have been provided for scenarios 1, 2 and 3 in Table B.

The construction cost estimate for this alternative was prepared utilizing scaled topographic mapping information completed by Wenck in 2014. The estimated initial capital cost for the collection and trunk forcemain option ranges from $11 million to $29 million. The resulting estimated capital cost per connection ranges from approximately $33,000 to $43,700. The cost per connection is significantly dependent on the number connections included in the project, as the trunk forcemain costs are divided by the total number of connections. The more connections that are included, the lower the cost per connection. Estimated construction costs for each scenario are included in Tables D, E, and F. The estimated cost per connection is provided at the bottom of each cost table, and includes trunk forcemain costs.

For the purposes of this study costs are based on existing parcels in close proximity to the chain of lakes. Undeveloped land adjacent to the collection system may be considered for future connection, and would then bear a portion of the costs. Additional connections considered would typically lower the cost per parcel from what has been identified in this study.

4.0 Regional Collection Design Criteria

4.1 INTRODUCTION

In 2011, the District initiated the JGSIP to evaluate ISTS compliance, and Wenck is currently conducting a study reviewing the feasibility of ISTS replacement and/or community cluster systems. In order to evaluate all alternatives, the District requested Wenck look at the feasibility of regional collection and trunk conveyance to an existing treatment facility.

This section of the study discusses the design criteria reviewed for the collection and trunk conveyance alternative.

4.2 INFLUENT FLOWS AND LOADS

The project involves an existing unsewered community. Therefore, limited water usage data is available. As a result, a number of assumptions and calculations are required to develop the influent flow criteria. Sources used for this determination include:

- US Census data (2009-2013) for persons per household in Le Sueur County
- "Design Flow and Loading Determination Guidelines for Wastewater Treatment Plants", MPCA for design flow (100 gal/person/day)
- 10 States Standards for lift station peaking factor

The estimated design flows that were used for the sizing of the trunk forcemain are shown in Table 4-1.

Table 4-1: Raw Wastewater Daily Design Flows

Parameter	Units	Value
Scenario 1	gal/day	328,000
Scenario 2	gal/day	835,000
Scenario 3	gal/day	977,000

4.3 DESIGN STANDARDS

Design standards for the collection system would be based on 10 States Standards, MPCA Guidelines, and other applicable design guidance and regulations.

5.0 Conclusion

5.1 CONCLUSION SUMMARY

The District is compelled to evaluate long term wastewater infrastructure alternatives to address aged and non-compliant Subsurface Sewage Treatment Systems (SSTS) within the District.

An evaluation of SSTS in the planning area performed by Wenck Associates, Inc. (Wenck) identified systems by three categories: 1) Compliant, 2) Non-compliant and failing to protect groundwater, or 3) Immanent threat to public health and safety. Of the 754 SSTS known to exist within the District, Category 1 is estimated to include 54%, Category 2 is estimated to include 45% and Category 3 is estimated to include 1%.

The District has been provided several alternatives within this Study. Selecting an alternative is not a one size fits all due to the varying property types and locations within the District. The outcome of this process may result in one, or a combination of alternatives.

Location of the property within the District may affect the feasibility of a given treatment alternative due to:

- Size of property for individual SSTS
- Available adjacent lands for Cluster Systems
- Isolation from other properties with non-conforming systems
- Distance from potential collection system routes

To assist in comparing the different alternatives, in addition to capital and O&M costs, an equivalent annual cost has been calculated for this study. This cost is based on the 20-year present worth of each alternative, and divided among the number of connections included for each alternative. This cost is for provided for another way to compare alternatives, and is not related to assessments. Tables A and G provide a summary of the present worth for each alternative.

Based on the alternatives discussed within this study to address the failing SSTS within the District, the following conclusions can be made:

- Individual SSTS (i.e. ISTS and Tanks):
  - As a sole solution, over 150 properties would resort to holding tanks as the only alternative. Holding tanks will restrict future use of the parcels, and provide exposure to negative surface and groundwater impacts.
  - ISTS replacement for properties where applicable combined with regional collection and/or cluster systems could address resorting to holding tanks.
  - Operation and maintenance would be the responsibility of the property owner.
  - O&M costs are typically $100 - $400 for an ISTS, $3,000 to $6,000 for a holding tank ($1,000 to $1,500 for seasonal properties).
  - Typical estimated costs for an ISTS is between $12,000 and $15,000.
  - Estimated equivalent annual cost is $2,850 (20-year present worth)[1]

[1]Equivalent annual cost is provided for comparison of alternatives only, and is based on a 20-year present worth calculation, and is not related to assessments.

- Cluster Treatment Systems
  - Clusters are an alternative for groups of homes in the District within relatively close proximity to a larger property that is available for purchase. They appear to be the most practical along the south and east of the lakes due to open and potentially available land and remote communities.
  - Clusters would not be a viable alternative for groups of homes a far distance from available land as the collection system costs would be too expensive in comparison to other alternatives. For example, these systems appear not to be practical along the west and north extents of the lakes due to unavailable land to accommodate the large number of connections.
  - Cluster systems would be built in conjunction with ISTS for those larger properties that can self-sustain an individual system on their property.
  - The Cluster Systems under District ownership require: operations, maintenance, testing, permitting, and annual reporting conducted in accordance with the MPCA requirements.
  - O&M costs are typically $800 to $1,000 per connection annually. (includes treatment costs)
  - Typical estimated costs for Cluster Systems are between $40,000 and $55,000 per connection. The actual cost per connection is dependent on the number of connections, collection system size, and land costs.
  - Estimated equivalent annual costs are $2,770 per connection (20-year present worth)[1].
  - More information will come available once the remaining area studies as shown on Figure 3 are completed.

    [1]Equivalent annual cost is provided for comparison of alternatives only, and is based on a 20-year present worth calculation, and is not related to assessments.

- Regional Collection and Trunk Forcemain
  - Treatment sites considered included St. Peter and Cleveland. Cleveland had a higher cost due to the required facility expansion, and was not considered further. St. Peter was feasible from an engineering and facility capacity perspective, and three forcemain alignments were feasible.
  - Regional collection system is a feasible alternative, and more economical in locations of the District where large communities of homes are located without available, affordable land.
  - Remote communities within the District may find a collection system less economical.
  - More connections to the regional collection system equates to lower cost per connection.
  - Operation and maintenance of the system would be the responsibility of the District.
  - Treatment and permitting responsibilities would be the responsibility of the City of St. Peter.
  - Treatment costs are subject to change based on the City of St. Peter.
  - O&M Costs are typically $1,000 to $1,200 per connection annually (includes treatment costs).
  - Typical estimated costs for regional collection is between $33,000 and $43,700 per connection. The actual cost per connection is dependent on the number connections included in the project.
  - Estimated equivalent annual costs are $1,300 to $2,810 per connection(20 year present worth)[1].

    [1]Equivalent annual cost is provided for comparison of alternatives only, and is based on a 20 year present worth calculation, and is not related to assessments.

As the District moves forward, it is recommended that Le Sueur County consult with their financial advisor regarding funding of any improvements related to this study.

6.0 Discussion of Alternative Selection

6.1 ALTERNATIVE SELECTION DISCUSSION

Table 6-1 provides several factors to consider when making a decision on the solution(s). Likely, the solution is a combination of alternatives, and discussion of these factors can assist decision makers during that process. Additional rows at the end of the table have been intentionally left blank for items added during discussion.

Table 6-1: Alternative Discussion Table

Factor	ISTS	Cluster System	Regional Collection and Trunk Forcemain
Capital Construction Costs (per connection)	$12-$15,000	$40-$60,000	$33-$43,700
O&M Costs (annual per connection)	$100-$400 $3-$6,000(HT)	$800-$1,000	$1,000-$1,200
Equivalent annual cost (per connection based on 20 year present worth)	$2,850	$2,770	$1,300 - $2,810
Ownership	• Private	• District or Private	• District
Administration/Operation	• Private	• District or Private	• District
Regulation/Permitting	• Private	• District or Private	• St. Peter (treatment owner)
Homeowner Impacts	• Holding tank only Alt. • Coordination among residents	• Coordination among residents • New ISTS recently. • Cost	• New ISTS recently • Cost
Phasing	• Private replacement	• System size impacts cost/conn.	• Which is best • Has Cost Impact • Add. O&M if over sized • Limit future conn. if under sized
Assessments	• Private cost	• Who • Length • Trunk charge	• Who • Length • Trunk charge
Future Connections	• Private replacement	• Time to connect • Add. O&M • Trunk charge	• Time to connect • Add. O&M • Trunk charge
Holding Tanks	• Over 150 tanks	• Eliminate if combined with regional collection	• Eliminate

Tables

TABLE A

PRESENT WORTH COST SUMMARY FOR COLLECTION AND TRUNK SYSTEM ALTERNATIVE TO ST. PETER
GJLSSD
LE SUEUR COUNTY

CAPITAL COSTS	SCENARIO 1 (287 CONNECTIONS)	SCENARIO 3 (941 CONNECTIONS)
Initial Construction Costs	$12,510,000	$30,750,000
20-Year Present Worth of Replacement Costs	$238,246	$718,449
O&M COSTS		
20-Year Present Worth of O&M Costs*	$5,044,000	$13,939,000
SALVAGE VALUE		
20-Year Present Worth of Slavage Values	$1,674,059	$3,929,505
TOTAL PRESENT WORTH-20 YR	**$16,118,186**	**$41,477,943**
ESTIMATED AVERAGE EQUIVALENT ANNUAL COST PER PROPERTY	**$2,810**	**$1,300**

Notes:
*Includes direct operating costs only, not reserves

TABLE B

ESTIMATED ANNUAL O&M COSTS FOR EVALUATED COLLECTION AND TRUNK SYSTEM ALTERNATIVE TO ST. PETER
GJLSSD
LE SUEUR COUNTY

COLLECTION ANNUAL O&M COSTS	SCENARIO 1 (287 CONNECTIONS)	SCENARIO 3 (941 CONNECTIONS)
Routine Grinder O&M	$43,050	$141,150
Routine Lift Station O&M	$10,800	$21,600
Administrative and Billing Costs	$20,000	$50,000
Property Insurance	$0	$0
Professional Services	$2,500	$2,500
Gopher State One Call and Locating Contracts	$30,000	$30,000
NPDES Permitting		
Reissuance fee (5 years)	$0	$0
Annual fee	$0	$0
Lab Testing	$0	$0
Miscellaneous Emergency Repairs	$18,000	$54,000
High Speed Data Service	$960	$1,920
Generator Fuel	$350	$700
Electricity		
Collection System Lift Stations	$34,000	$53,600
TOTAL ANNUAL COLLECTION O&M COSTS	**$159,926**	**$355,886**
ANNUAL TREATMENT COSTS	**$167,189**	**$548,170**
TOTAL ANNUAL O&M COSTS	**$327,115**	**$904,056**
20-Year Present Worth of Annual Costs	**$4,077,000**	**$11,267,000**
20-Year Present Worth of Annual Increase	**$967,000**	**$2,672,000**
20-YEAR PRESENT WORTH OF TOTAL O&M COSTS	**$5,044,000**	**$13,939,000**

TABLE C

TRUNK FORCEMAIN ESTIMATED COSTS
GJLSSD
LE SUEUR COUNTY

	Interceptor/Forcemain/Lift Station - GJLSSD to St. Peter (Lake Emily LS)	Est. Qty	Unit	Unit Price	Cost
1	10-inch Forcemain - Trenchless	40,450	LF	$45	$1,820,250
2	Bedrock Directional Boring	4,000	LF	$100	$400,000
3	Steel Casing Pipe - County and State Road Crossings	450	LF	$450	$202,500
4	Lift Station (Pumps, Wet Well, Valves, Valve Vault, Site Work)	1	EA	$325,000	$325,000
5	Electrical and Controls	1	EA	$25,000	$25,000
6	Emergency Generator for Lift Station	1	EA	$65,000	$65,000
7	Air Release Manhole	10	EA	$8,000	$80,000
8	Metering Manhole and Appurtenances	1	LS	$20,000	$20,000
9	Sampler and Appurtenances	1	LS	$7,000	$7,000
10	Monitoring Station Building	1	LS	$18,000	$18,000
11	Connect to Existing Lift Station Wet Well	1	LS	$7,000	$7,000
	Construction Subtotal				**$2,969,750**
	Bonds and Insurance (5%)				**$148,500**
	Contingencies (5%)				**$148,500**
	Legal/Engineering/Admin (15%)				**$445,500**
	Subtotal				**$3,712,250**

	Interceptor/Forcemain/Lift Station - GJLSSD to St. Peter (Downtown)	Est. Qty	Unit	Unit Price	Cost
1	10-inch Forcemain - Trenchless	41,580	LF	$45	$1,871,100
2	10-inch Forcemain - Trenchless - River Crossing	2,100	LF	$100	$210,000
3	Bedrock Directional Boring	1,500	LF	$100	$150,000
4	Steel Casing Pipe - County and State Road Crossings	450	LF	$450	$202,500
5	Lift Station (Pumps, Wet Well, Valves, Valve Vault, Site Work)	1	EA	$325,000	$325,000
6	Electrical and Controls	1	EA	$25,000	$25,000
7	Emergency Generator for Lift Station	4	EA	$65,000	$260,000
8	Air Release Manhole	12	EA	$8,000	$96,000
9	Metering Manhole and Appurtenances	1	LS	$20,000	$20,000
10	Sampler and Appurtenances	1	LS	$7,000	$7,000
11	Monitoring Station Building	1	LS	$18,000	$18,000
12	Connect to Existing Manhole	1	LS	$10,000	$10,000
	Construction Subtotal				**$3,194,600**
	Bonds and Insurance (5%)				**$159,800**
	Contingencies (5%)				**$159,800**
	Legal/Engineering/Admin (15%)				**$479,200**
	Subtotal				**$3,993,400**

	Interceptor/Forcemain/Lift Station - GJLSSD to Cleveland	Est. Qty	Unit	Unit Price	Cost
1	10-inch Forcemain - Trenchless	22,700	LF	$45	$1,021,500
2	Steel Casing Pipe - County and State Road Crossings	400	LF	$450	$180,000
3	Lift Station (Pumps, Wet Well, Valves, Valve Vault, Site Work)	1	EA	$325,000	$325,000
4	Electrical and Controls	1	EA	$25,000	$25,000
5	Emergency Generator for Lift Station	2	EA	$65,000	$130,000
6	Air Release Manhole	8	EA	$8,000	$64,000
7	Metering Manhole and Appurtenances (including Chart Recorder)	1	LS	$20,000	$20,000
8	Sampler and Appurtenances	1	LS	$7,000	$7,000
9	Monitoring Station Building	1	LS	$15,000	$15,000
10	Connection to Influent Piping With Structure	1	LS	$20,000	$20,000
	Construction Subtotal				**$1,807,500**
	Bonds and Insurance (5%)				**$90,400**
	Contingencies (5%)				**$90,400**
	Legal/Engineering/Admin (15%)				**$271,200**
	Subtotal LS & FM				**$2,259,500**
Cleveland Plant Upgrades					
	Estimated Plant Expansion Costs *(B&M 2014 Capacity Memo)*	1	LS	$3,500,000	$3,500,000
	Subtotal Expansion				**$3,500,000**
	Summary of Cleveland Costs				
	Subtotal LS & FM				$2,259,500
	Subtotal Expansion				$3,500,000
	Total				**$5,759,500**

TABLE D

REGIONAL COLLECTION SYSTEM - SCENARIO 1
ESTIMATED COSTS
LE SUEUR COUNTY

Item	Description	Scenario 1			
		Est. Qty	Unit	Unit Price	Cost
German Jefferson Sevice Area - Service Laterals					
1	1-1/4-inch Pressure Lateral - Trenchless	35,875	LF	$12.50	$448,437.50
2	1-1/4-inch Isolation Valve	287	EA	$1,500.00	$430,500.00
3	4-inch PVC Service Lateral (Schedule 40 Pipe)	5,740	LF	$50.00	$287,000.00
4	Abandon Septic Tank	287	EA	$1,000.00	$287,000.00
5	Simplex Grinder Pump Station Standard 8'	270	EA	$9,000.00	$2,428,020.00
6	Duplex Grinder Pump Station Standard 8'	17	EA	$12,000.00	$206,640.00
7	Grinder Pump Diagnostic Tools Set	1	LS	$3,000.00	$3,000.00
8	Grinder Pump Electrical Connection	287	EA	$750.00	$215,250.00
9	Grinder Pump Access Extensions	29	EA	$1,200.00	$34,440.00
10	50 ft. Grinder Pump and Float Cables	201	EA	$400.00	$80,360.00
11	75 ft. Grinder Pump and Float Cables	86	EA	$475.00	$40,897.50
	Construction Subtotal				**$4,461,545.00**
	Contingencies (5%)				**$223,077.25**
	Subtotal				**$4,684,622.25**
German Jefferson Sevice Area - Collection System					
1	Mobilization	1	LS	$80,000.00	$80,000.00
2	Traffic Control	1	LS	$6,000.00	$6,000.00
3	Locate Private Utilities (Water, Irrigation, Propane, Electric, etc.)	1	LS	$12,000.00	$12,000.00
4	Turf Restoration	1	LS	$15,000.00	$15,000.00
5	2-inch Pressure Sewer - Trenchless	10,500	LF	$14.00	$147,000.00
6	3-inch Pressure Sewer - Trenchless	2,600	LF	$15.00	$39,000.00
7	4-inch Pressure Sewer - Trenchless	8,700	LF	$20.00	$174,000.00
8	6-inch Forcemain - Trenchless	23,000	LF	$26.00	$598,000.00
9	Underwater Trenchless Construction	1,300	LF	$40.00	$52,000.00
10	Cleanout Assembly Connection	85	EA	$750.00	$63,750.00
11	Flushing Connection	76	EA	$1,500.00	$114,000.00
12	Flushing Connection 2-inch Isolation Valve and Box	8	EA	$1,500.00	$12,000.00
13	Flushing Connection 3-inch Isolation Valve and Box	3	EA	$2,000.00	$6,000.00
14	Flushing Connection 4-inch Isolation Valve and Box	7	EA	$2,500.00	$17,500.00
15	Flushing Connection 6-inch Isolation Valve and Box	19	EA	$2,800.00	$53,200.00
16	Isolation Valve Key	5	EA	$150.00	$750.00
17	Erosion & Sediment Control	1	LS	$10,000.00	$10,000.00
18	Drainage Pipe Repair/Replacement	1	LS	$11,000.00	$11,000.00
19	Pipe Locate Markers	23	EA	$140.00	$3,220.00
20	Aggregate Surfacing CL 2 Limestone	320	TON	$25.00	$8,000.00
21	Bituminous Repair 7 and 9 Ton	2,200	SY	$60.00	$132,000.00
22	Remove and Replace Concrete Drive or Sidewalk	300	SQ FT	$10.00	$3,000.00
23	Intermediate Lift Station w/Pumps, Wet Well, Valves & Valve Vault	1	EA	$150,000.00	$150,000.00
24	Emergency Generator for Intermediate Lift Station	1	EA	$50,000.00	$50,000.00
25	3-Phase Power Allowance	1	EA	$3,000.00	$3,000.00
26	Check Valve Structure	5	EA	$6,500.00	$32,500.00
27	Air Release Structure Manhole	5	EA	$10,000.00	$50,000.00
	Construction Subtotal				**$1,842,920.00**
	Bonds and Insurance (5% of Service Laterals and Collections)				**$315,223.25**
	Contingencies (5%)				**$92,146.00**
	Legal/Engineering/Admin (15% of Service Laterals and Connections)				**$945,669.75**
	Subtotal				**$3,195,959.00**

Cost Summary Collection System & Service Laterals	Scenario 1
Service Laterals Subtotal	$4,684,622.25
Collection System Subtotal	$3,195,959.00
Total	**$7,880,581.25**
Number of Parcles	287
Estimated Collection and Lateral Cost Per Parcel	$27,458.47
Trunk Interceptor/Forcemain/LS Cost Per Parcel	$13,937.28
St. Peter Connection Charges	$2,209.06
Total Estimated Construction Cost Per Parcel	**$43,604.81**

**Estimated Construction Costs do not include O&M, and Rate costs*

**This estimate is associated with Figure 5

TABLE E

REGIONAL COLLECTION SYSTEM - SCENARIO 2
ESTIMATED COSTS
LE SUEUR COUNTY

Item	Description	Scenario 2			
		Est. Qty	Unit	Unit Price	Cost
German Jefferson Sevice Area - Service Laterals					
1	1-1/4-inch Pressure Lateral - Trenchless	99,375	LF	$12.50	$1,242,187.50
2	1-1/4-inch Isolation Valve	795	EA	$1,500.00	$1,192,500.00
3	4-inch PVC Service Lateral (Schedule 40 Pipe)	15,900	LF	$50.00	$795,000.00
4	Abandon Septic Tank	795	EA	$1,000.00	$795,000.00
5	Simplex Grinder Pump Station Standard 8'	747	EA	$9,000.00	$6,725,700.00
6	Duplex Grinder Pump Station Standard 8'	48	EA	$12,000.00	$572,400.00
7	Grinder Pump Diagnostic Tools Set	3	LS	$3,000.00	$9,000.00
8	Grinder Pump Electrical Connection	795	EA	$750.00	$596,250.00
9	Grinder Pump Access Extensions	80	EA	$1,200.00	$95,400.00
10	50 ft. Grinder Pump and Float Cables	557	EA	$400.00	$222,600.00
11	75 ft. Grinder Pump and Float Cables	239	EA	$475.00	$113,287.50
	Construction Subtotal				**$12,359,325.00**
	Contingencies (5%)				**$617,966.25**
	Subtotal				**$12,977,291.25**
German Jefferson Sevice Area - Collection System					
1	Mobilization	1	LS	$190,000.00	$190,000.00
2	Traffic Control	1	LS	$16,000.00	$16,000.00
3	Locate Private Utilities (Water, Irrigation, Propane, Electric, etc.)	1	LS	$31,500.00	$31,500.00
4	Turf Restoration	1	LS	$40,500.00	$40,500.00
5	2-inch Pressure Sewer - Trenchless	21,440	LF	$14.00	$300,160.00
6	3-inch Pressure Sewer - Trenchless	30,640	LF	$15.00	$459,600.00
7	4-inch Pressure Sewer - Trenchless	9,800	LF	$20.00	$196,000.00
8	6-inch Forcemain - Trenchless	43,300	LF	$26.00	$1,125,800.00
9	Underwater Trenchless Construction	2,000	LF	$40.00	$80,000.00
10	Cleanout Assembly Connection	230	EA	$750.00	$172,500.00
11	Flushing Connection	223	EA	$1,500.00	$334,500.00
12	Flushing Connection 2-inch Isolation Valve and Box	17	EA	$1,500.00	$25,500.00
13	Flushing Connection 3-inch Isolation Valve and Box	24	EA	$2,000.00	$48,000.00
14	Flushing Connection 4-inch Isolation Valve and Box	8	EA	$2,500.00	$20,000.00
15	Flushing Connection 6-inch Isolation Valve and Box	34	EA	$2,800.00	$95,200.00
16	Isolation Valve Key	5	EA	$150.00	$750.00
17	Erosion & Sediment Control	1	LS	$17,500.00	$17,500.00
18	Drainage Pipe Repair/Replacement	1	LS	$26,000.00	$26,000.00
19	Pipe Locate Markers	60	EA	$140.00	$8,400.00
20	Aggregate Surfacing CL 2 Limestone	800	TON	$25.00	$20,000.00
21	Bituminous Repair 7 and 9 Ton	6,000	SY	$60.00	$360,000.00
22	Remove and Replace Concrete Drive or Sidewalk	930	SQ FT	$10.00	$9,300.00
23	Intermediate Lift Station w/Pumps, Wet Well, Valves & Valve Vault	3	EA	$150,000.00	$450,000.00
24	Emergency Generator for Intermediate Lift Station	3	EA	$50,000.00	$150,000.00
25	3-Phase Power Allowance	3	EA	$3,000.00	$9,000.00
26	Check Valve Structure	10	EA	$6,500.00	$65,000.00
27	Air Release Structure Manhole	9	EA	$10,000.00	$90,000.00
	Construction Subtotal				**$4,341,210.00**
	Bonds and Insurance (5% of Service Laterals and Collections)				**$835,026.75**
	Contingencies (5%)				**$217,060.50**
	Legal/Engineering/Admin (15% of Service Laterals and Connections)				**$2,505,080.25**
	Subtotal				**$7,898,377.50**

Cost Summary Collection System & Service Laterals	Scenario 2
Service Laterals Subtotal	$12,977,291.25
Collection System Subtotal	$7,898,377.50
Total	**$20,875,668.75**
Number of Parcles	795
Estimated Collection and Lateral Cost Per Parcel	$26,258.70
Trunk Interceptor/Forcemain/LS Cost Per Parcel	$5,031.45
St. Peter Connection Charges	$2,100.63
Total Estimated Construction Cost Per Parcel	**$33,390.78**

**Estimated Construction Costs do not include O&M, and Rate costs*

**This estimate is associated with Figure 6

TABLE F

REGIONAL COLLECTION SYSTEM - SCENARIO 3
ESTIMATED COSTS
LE SUEUR COUNTY

Item	Description	Scenario 3			
		Est. Qty	Unit	Unit Price	Cost
German Jefferson Sevice Area - Service Laterals					
1	1-1/4-inch Pressure Lateral - Trenchless	117,625	LF	$12.50	$1,470,312.50
2	1-1/4-inch Isolation Valve	941	EA	$1,500.00	$1,411,500.00
3	4-inch PVC Service Lateral (Schedule 40 Pipe)	18,820	LF	$50.00	$941,000.00
4	Abandon Septic Tank	941	EA	$1,000.00	$941,000.00
5	Simplex Grinder Pump Station Standard 8'	885	EA	$9,000.00	$7,960,860.00
6	Duplex Grinder Pump Station Standard 8'	56	EA	$12,000.00	$677,520.00
7	Grinder Pump Diagnostic Tools Set	4	LS	$3,000.00	$12,000.00
8	Grinder Pump Electrical Connection	941	EA	$750.00	$705,750.00
9	Grinder Pump Access Extensions	94	EA	$1,200.00	$112,920.00
10	50 ft. Grinder Pump and Float Cables	659	EA	$400.00	$263,480.00
11	75 ft. Grinder Pump and Float Cables	282	EA	$475.00	$134,092.50
	Construction Subtotal				**$14,630,435.00**
	Contingencies (5%)				**$731,521.75**
	Subtotal				**$15,361,956.75**
German Jefferson Sevice Area - Collection System					
1	Mobilization	1	LS	$220,000.00	$220,000.00
2	Traffic Control	1	LS	$18,500.00	$18,500.00
3	Locate Private Utilities (Water, Irrigation, Propane, Electric, etc.)	1	LS	$37,000.00	$37,000.00
4	Turf Restoration	1	LS	$46,000.00	$46,000.00
5	2-inch Pressure Sewer - Trenchless	32,600	LF	$14.00	$456,400.00
6	3-inch Pressure Sewer - Trenchless	40,400	LF	$15.00	$606,000.00
7	4-inch Pressure Sewer - Trenchless	28,500	LF	$20.00	$570,000.00
8	6-inch Forcemain - Trenchless	43,300	LF	$26.00	$1,125,800.00
9	Underwater Trenchless Construction	2,000	LF	$40.00	$80,000.00
10	Cleanout Assembly Connection	240	EA	$750.00	$180,000.00
11	Flushing Connection	210	EA	$1,500.00	$315,000.00
12	Flushing Connection 2-inch Isolation Valve and Box	25	EA	$1,500.00	$37,500.00
13	Flushing Connection 3-inch Isolation Valve and Box	31	EA	$2,000.00	$62,000.00
14	Flushing Connection 4-inch Isolation Valve and Box	22	EA	$2,500.00	$55,000.00
15	Flushing Connection 6-inch Isolation Valve and Box	34	EA	$2,800.00	$95,200.00
16	Isolation Valve Key	5	EA	$150.00	$750.00
17	Erosion & Sediment Control	1	LS	$20,000.00	$20,000.00
18	Drainage Pipe Repair/Replacement	1	LS	$30,000.00	$30,000.00
19	Pipe Locate Markers	70	EA	$140.00	$9,800.00
20	Aggregate Surfacing CL 2 Limestone	900	TON	$25.00	$22,500.00
21	Bituminous Repair 7 and 9 Ton	6,900	SY	$60.00	$414,000.00
22	Remove and Replace Concrete Drive or Sidewalk	900	SQ FT	$10.00	$9,000.00
23	Intermediate Lift Station w/Pumps, Wet Well, Valves & Valve Vault	3	EA	$150,000.00	$450,000.00
24	Emergency Generator for Intermediate Lift Station	3	EA	$50,000.00	$150,000.00
25	3-Phase Power Allowance	3	EA	$3,000.00	$9,000.00
26	Check Valve Structure	10	EA	$6,500.00	$65,000.00
27	Air Release Structure Manhole	10	EA	$10,000.00	$100,000.00
	Construction Subtotal				**$5,184,450.00**
	Bonds and Insurance (5% of Service Laterals and Collections)				**$990,744.25**
	Contingencies (5%)				**$259,222.50**
	Legal/Engineering/Admin (15% of Service Laterals and Connections)				**$2,972,232.75**
	Subtotal				**$9,406,649.50**

Cost Summary Collection System & Service Laterals	Scenario 3
Service Laterals Subtotal	$15,361,956.75
Collection System Subtotal	$9,406,649.50
Total	**$24,768,606.25**
Number of Parcles	941
Estimated Collection and Lateral Cost Per Parcel	$26,321.58
Trunk Interceptor/Forcemain/LS Cost Per Parcel	$4,250.80
St. Peter Connection Charges	$2,106.27
Total Estimated Construction Cost Per Parcel	**$32,678.65**

**Estimated Construction Costs do not include O&M, and Rate costs*

**This estimate is associated with Figure 7

TABLE G

PRESENT WORTH COST SUMMARY FOR STAVENAU-HOLIDAY PARK ISTS & CLUSTER SYSTEM
GJLSSD
LE SUEUR COUNTY

CAPITAL COSTS	ALTERNATIVE 1 PRIVATE ISTS PROGRAM*	ALTERNATIVE 2 LSTS CLUSTER
Initial Construction Costs	$160,000	$1,620,000
20-Year Present Worth of Replacement Costs	$0	$57,961
O&M COSTS		
20-Year Present Worth of O&M Costs*	$655,000	$286,000
SALVAGE VALUE		
20-Year Present Worth of Slavage Values	$17,714	$86,526
TOTAL PRESENT WORTH-20 YR	**$797,286**	**$1,877,434**
ESTIMATED AVERAGE EQUIVALENT ANNUAL COST PER PROPERTY	**$2,850**	**$2,770**

Notes:
* Assumes 90 days of use for seasonal holding tank properties

TABLE H

CLUSTER SYSTEM - STAVENAU-HOLIDAY PARK
ESTIMATED OPERATIONS & MAINTENANCE COSTS
GJLSSD
LE SUEUR COUNTY

WASTEWATER COLLECTION ANNUAL O, M, & R COSTS	
Personnel (labor, benefits, insurance, training, etc.)	$2,000
Administrative Costs (office supplies, printing, etc.)	$150
Miscellaneous Repairs/Service	$640
Electricity	
Grinder Pumps & Controls	$440
Equipment Replacement	$4,817
TOTAL ANNUAL COLLECTION O&M COSTS	**$8,047**

WASTEWATER TREATMENT ANNUAL O, M, & R COSTS	
WWTP Facility Classification	
Personnel (labor, benefits, insurance, training, etc.)	$2,000
Administrative Costs (office supplies, printing, etc.)	$150
Property Insurance	$600
Miscellaneous Repairs/Service	$640
Sludge Hauling/Disposal	$1,050
Data Service	$600
Electricity	
WWTP Pumps, Blower, & Controls	$3,915
Equipment Replacement	$1,483
TOTAL ANNUAL TREATMENT O&M COSTS	**$10,438**

TOTAL ANNUAL O&M COSTS	**$18,485**
20-Year Present Worth of Annual Costs	**$231,000**
20-Year Present Worth of Annual Increase	**$55,000**
20-YEAR PRESENT WORTH OF TOTAL O&M COSTS	**$286,000**

TABLE I

CLUSTER SYSTEM - STAVENAU-HOLIDAY
PARK ESTIMATED CONSTRUCTION COSTS
GJLSSD
LE SUEUR COUNTY

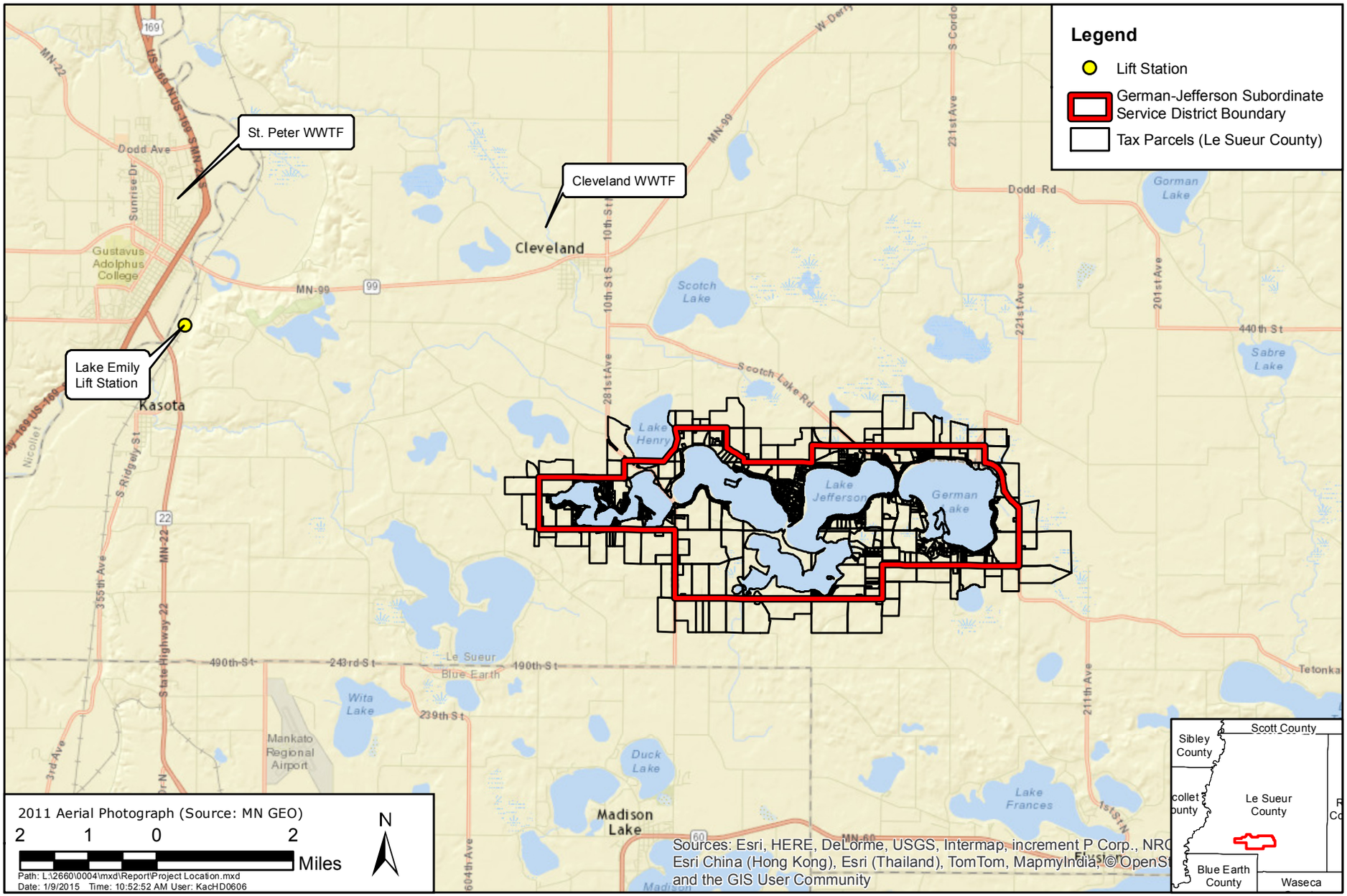
Collection		Est. Qty	Unit	Unit Price	Cost
1	Septic Tank Abandonment	34	EA	$1,000.00	$34,000
2	STEP Pump Package and Controls	34	EA	$9,000.00	$306,000
3	Residential Electrical Installation	34	EA	$750.00	$25,500
4	Building Sanitary Sewer Cleanout	34	EA	$500.00	$17,000
5	4" Gravity Building Sanitary Sewer	1,190	LF	$45.00	$53,550
6	2" Pressure Sewer	2,500	LF	$20.00	$50,000
7	2" Pressure Sewer Lateral	2,000	LF	$25.00	$50,000
8	Air/Vacuum Release Valve and Manhole	4	EA	$5,500.00	$22,000
9	Isolation Valve	4	EA	$1,250.00	$5,000
10	Pressure Sewer Cleanout	4	EA	$3,250.00	$13,000
11	2" Curb stops	34	EA	$1,250.00	$42,500
12	Insulation (4")	850	SY	$25.00	$21,250
13	Lawn Seeding/Restoration	1	LS	$25,000.00	$25,000
14	Class V Roadway Patch	700	TON	$20.00	$14,000
15	Mobilization and Demobilization	1	LS	$20,000.00	$20,000
	Subtotal				**$698,800**

Treatment		Est. Qty	Unit	Unit Price	Cost
16	Stilling	6,000	GAL	$1.50	$9,000
17	Equalization Tank	12,000	GAL	$1.50	$18,000
18	MicroFAST 9.0 ATU Tank	12,000	GAL	$1.50	$18,000
19	NitriFAST 9.0 ATU Tank	12,000	GAL	$1.50	$18,000
20	Clarifier Dose Tank	6,000	GAL	$1.50	$9,000
21	ABC-N Clarifier	12,000	GAL	$1.50	$18,000
22	MicroFAst 4.5 ATU Tank	6,000	GAL	$1.50	$9,000
23	Mound Dose Tank	6,000	GAL	$1.50	$9,000
24	Treatment Tank Installation	72,000	GAL	$1.25	$90,000
25	Aluminum Access Hatch	7	EA	$1,250.00	$8,750
26	Tank Riser Pipe	40	LF	$75.00	$3,000
27	Tank Riser/tank Adapter	8	EA	$75.00	$600
28	Riser Fiberglass Lid	8	EA	$200.00	$1,600
29	Effluent Screen	1	EA	$1,000.00	$1,000
30	Submersible Dose Pump	7	EA	$1,500.00	$10,500
31	Pump Guide Rails & Discharge Piping	7	EA	$2,500.00	$17,500
32	Main Treatment System Control Panel	1	LS	$20,000.00	$35,000
33	Float Switch Sensors	8	EA	$720.00	$5,760
34	Aerobic Treatment Unit	1	EA	$35,000.00	$35,000
35	Mound System	975	LF	$125.00	$121,875
36	Control Building	1	LS	$10,000.00	$10,000
37	Yard Piping	1,500	LF	$10.00	$15,000
38	Insulation (4")	500	SY	$25.00	$12,500
39	Protection Bollard	8	EA	$400.00	$3,200
40	Gravel Access Road	100	LF	$65.00	$6,500
41	Woven Wire Fence	1,600	LF	$12.50	$20,000
42	Clearing & Grubbing	2	ACRE	$0.00	$0
43	Site Restoration	3	ACRE	$5,000.00	$12,500
44	Erosion Control	1	LS	$5,000.00	$5,000
45	Electrical Service to Treatment Site	150	LF	$60.00	$9,000
46	Telephone Service Extension	1	LS	$1,000.00	$1,000
47	Electrical Component Installation Costs	1	LS	$25,000.00	$25,000
48	Mobilization	1	LS	$20,000.00	$20,000
	Subtotal				**$578,285**

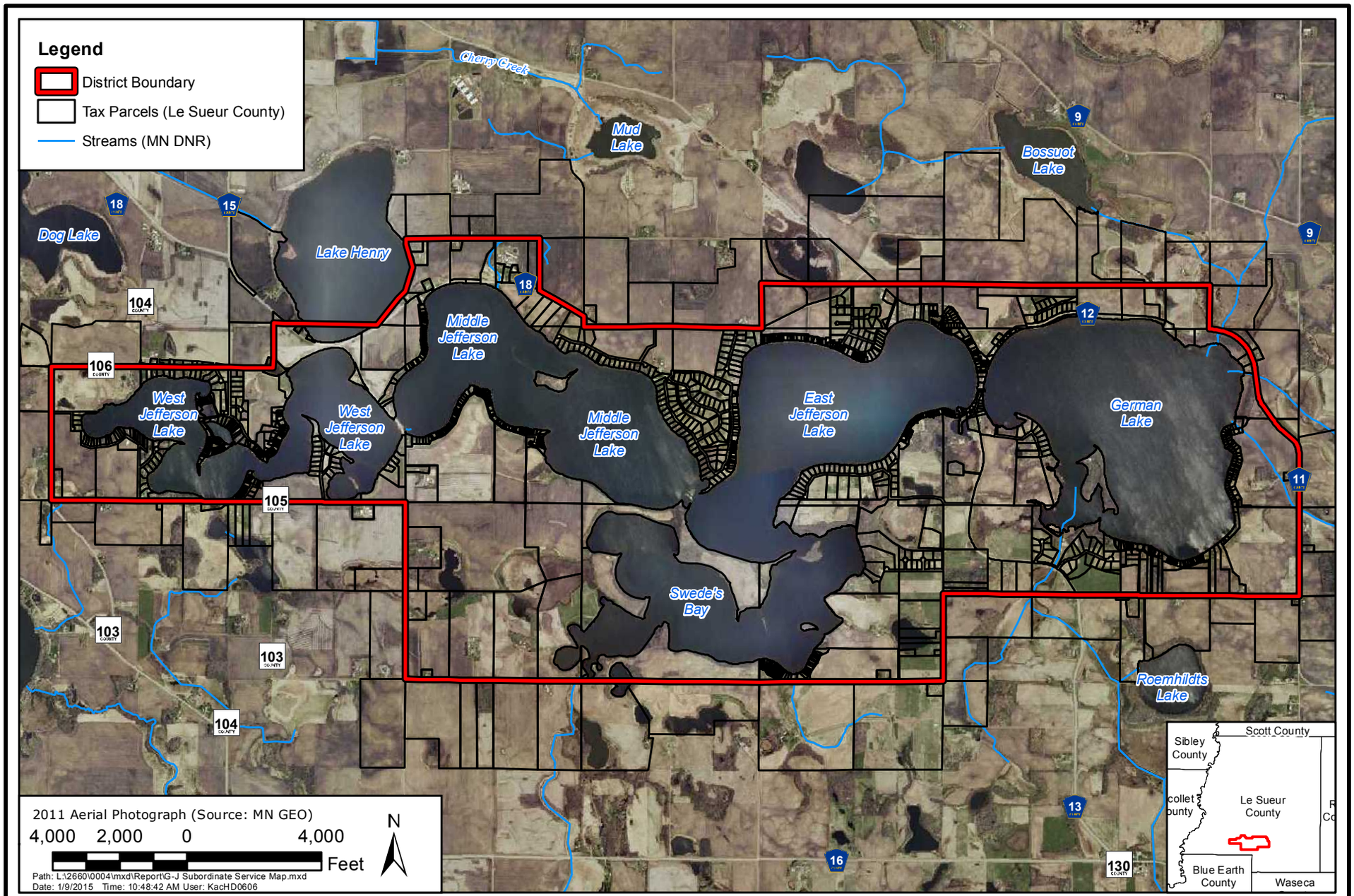
Collection & Treatment Subtotal	**$1,277,085**
Land Acquisition	**$34,000**
18% Engineering (Design & Construction)	**$230,000**
2% Legal & Admin	**$26,000**
10% Contingency	**$128,000**
TOTAL COST ESTIMATE	**$1,695,090**

Cost per home (34 properties)	**$49,900**

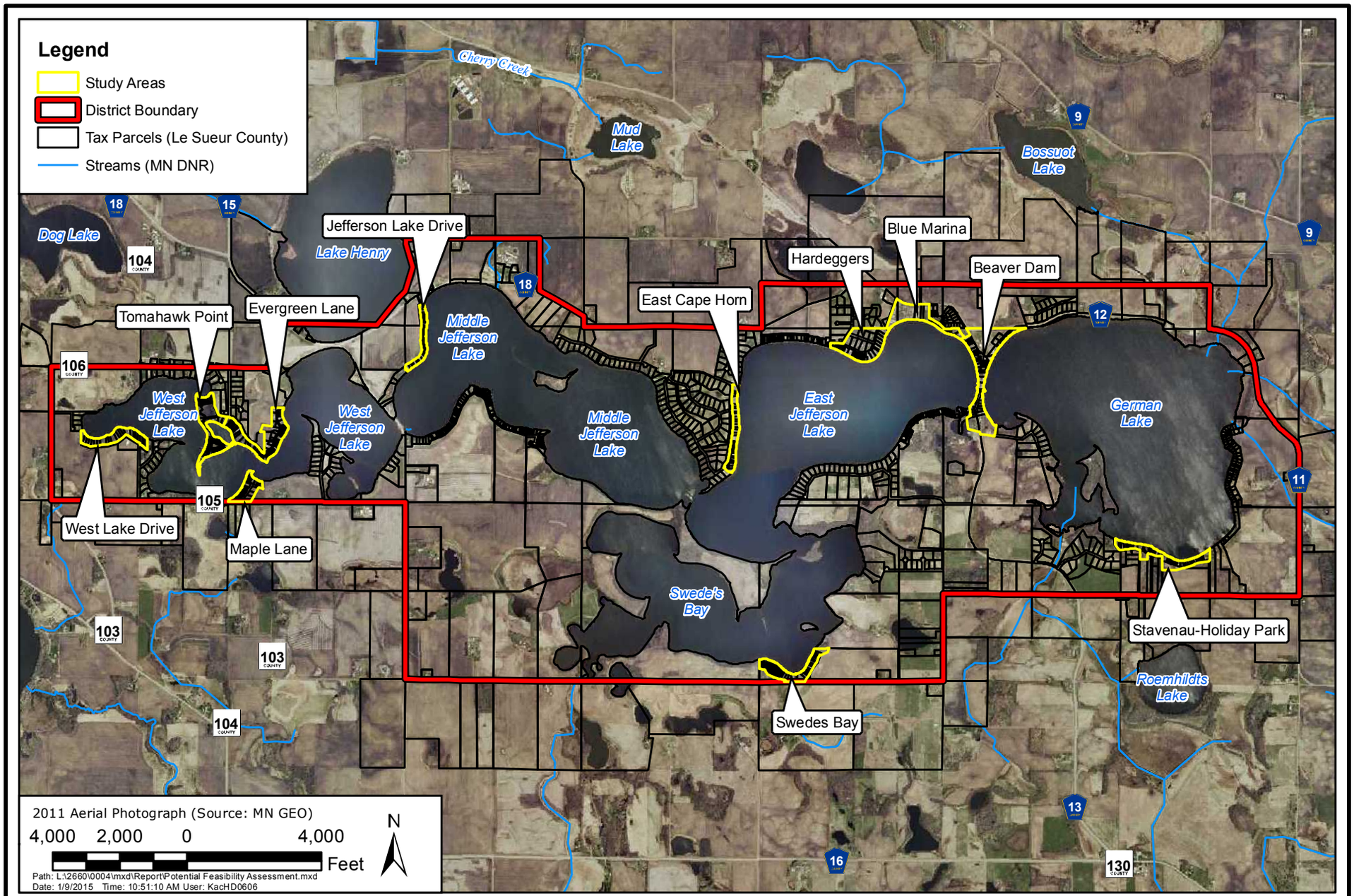
Figures



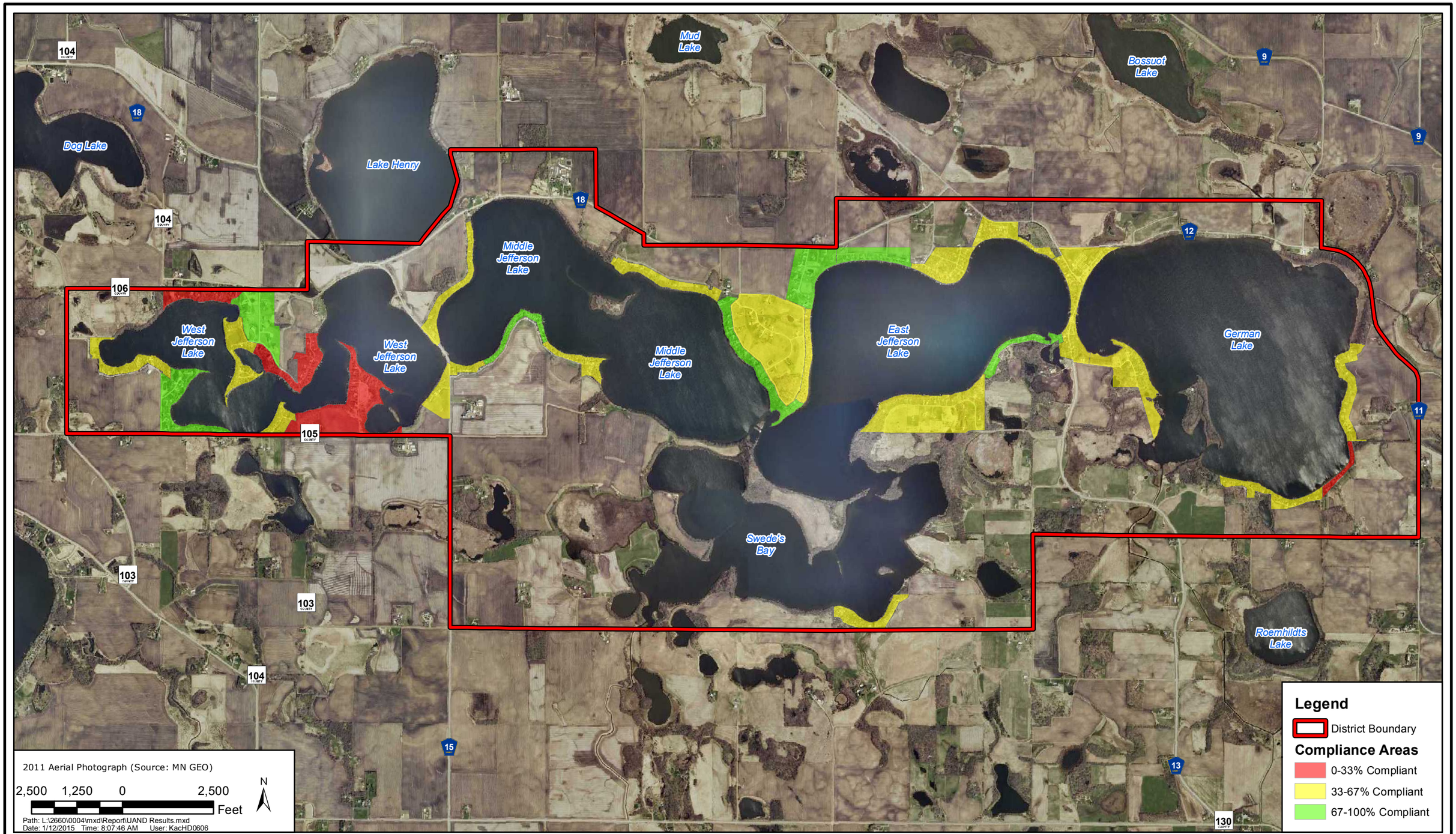
LE SUEUR COUNTY	WENCK ASSOCIATES Responsive partner. Exceptional outcomes.	JAN 2015
Project Location Map		Figure 1



LE SUEUR COUNTY	WENCK ASSOCIATES Responsive partner. Exceptional outcomes.	JAN 2015
German-Jefferson Subordinate Service District Map		Figure 2

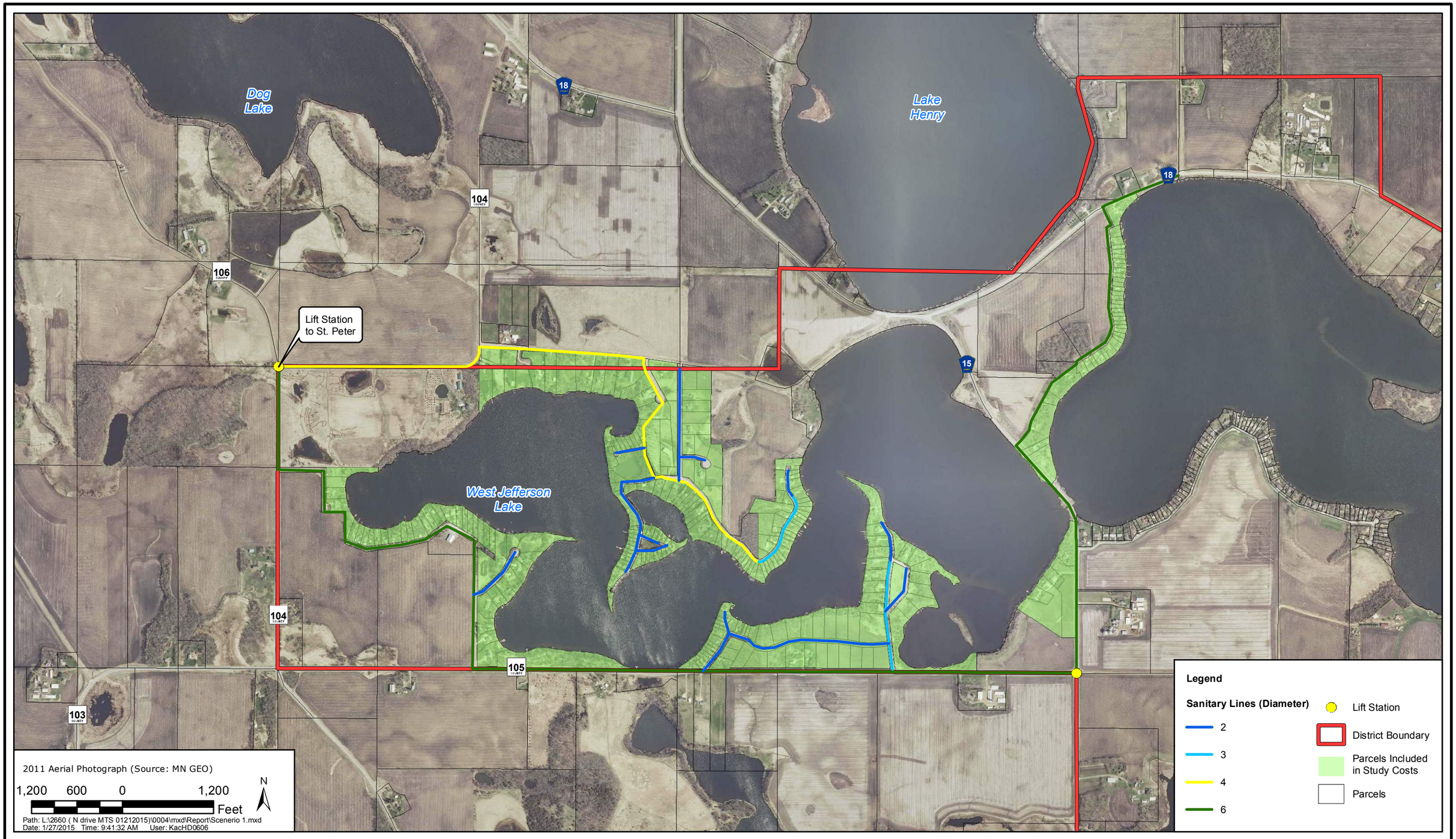


LE SUEUR COUNTY	WENCK ASSOCIATES Responsive partner. Exceptional outcomes.	JAN 2015
Potential Feasibility Assessment Map		Figure 3

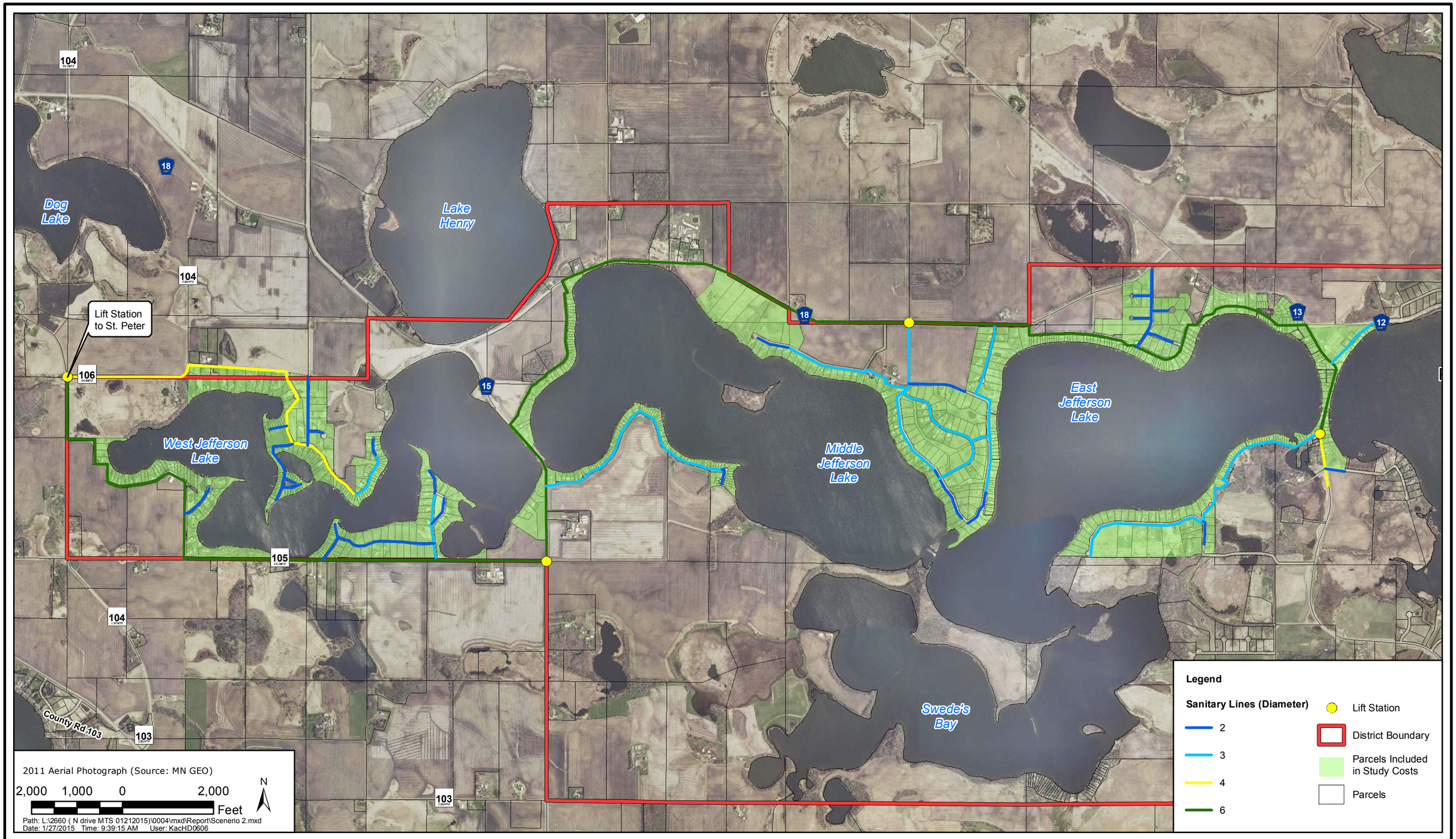


LE SUEUR COUNTY	JAN 2015
Compliance Inspection Results (UAND Results)	Figure 4

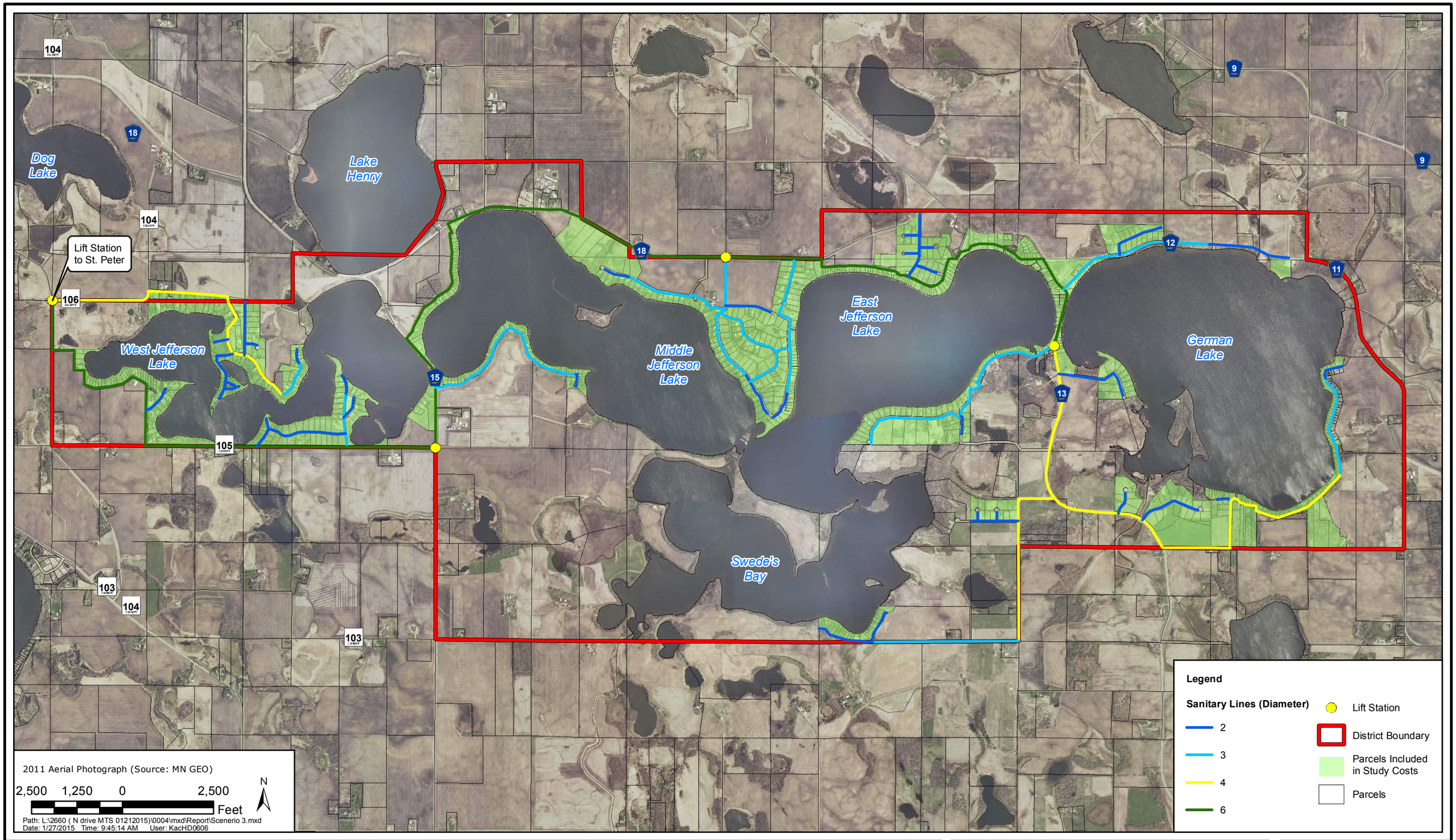
WENCK ASSOCIATES
Responsive partner. Exceptional outcomes.



LE SUEUR COUNTY	WENCK ASSOCIATES Responsive partner. Exceptional outcomes.	JAN 2015
Collection System - Scenerio 1		Figure 5



LE SUEUR COUNTY	WENCK ASSOCIATES Responsive partner. Exceptional outcomes.	JAN 2015
Collection System - Scenerio 2		Figure 6



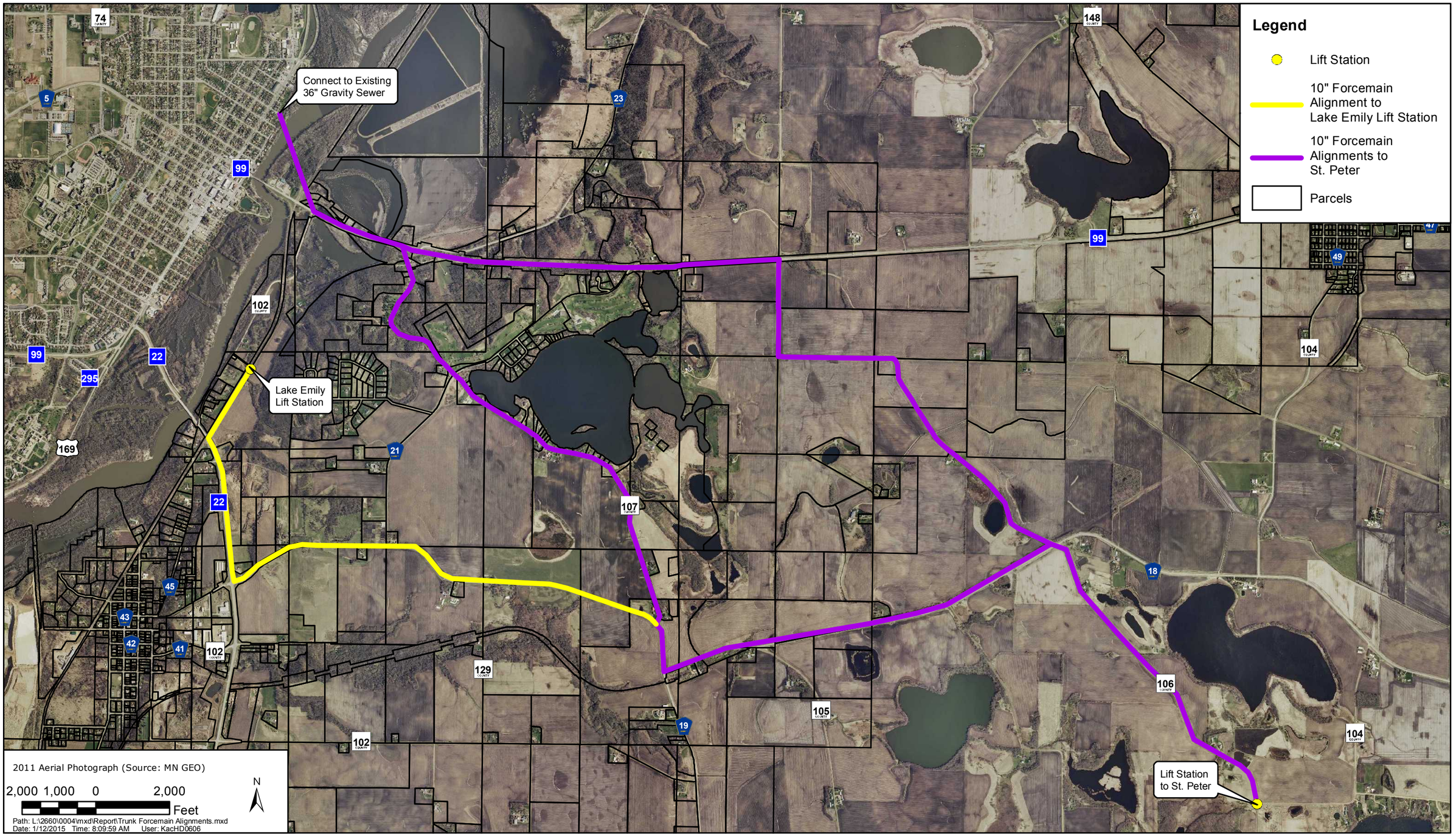
LE SUEUR COUNTY

Collection System - Scenario 3

WENCK ASSOCIATES
Responsive partner. Exceptional outcomes.

JAN 2015

Figure 7



LE SUEUR COUNTY	WENCK ASSOCIATES Responsive partner. Exceptional outcomes.	JAN 2015
Trunk Forcemain Alignments		Figure 8

Appendix A

JGSIP Final Report, March 2013

Wenck File #2660-01

MARCH 2013

Jefferson German Septic Inventory Project Final Report

Prepared for:

Le Sueur County, Minnesota

CLEAN WATER LAND & LEGACY AMENDMENT

Prepared by:

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

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Registered Professional Soil Scientist and MPCA Advanced Designer/Inspector under the laws of the State of Minnesota.

Peter G. Miller, P.S.S. ***Registration No. 42636***

Table of Contents

TABLES

Table of Contents (Cont.)

FIGURES

1.0 Introduction

1.1 BACKGROUND

The Jefferson German Lakes Septic Inventory Project (JGSIP) was initiated in 2011 by Le Sueur County within the boundaries of the German-Jefferson Subordinate Service District (Figure 1). The residents of the District currently use individual and community water supply wells and subsurface sewage treatment systems (SSTS). The SSTS (a.k.a. septic systems) in the District include both individual and community "cluster" systems. Wenck Associates, Inc. (Wenck) was retained to assess the compliance status of any existing SSTS in the project area with respect to Minnesota Rules Chapters 7080-7081, the Le Sueur County Zoning Ordinance: Section 17 Subsurface Sewage Treatment Systems, and the Interim SSTS Standards for the German-Jefferson Subordinate Service District.

The goal of the JGSIP was to complete as many SSTS compliance inspections within the District as possible. The JGSIP was funded through a Clean Water Legacy Grant from the Minnesota Board of Water and Soil Resources and was open and available to all property owners who have an SSTS in the District. The Le Sueur County Board decided to make participation in the JGSIP voluntary with the following incentives for participation.

- Grant funded septic system compliance inspection valid for three years that could be used for obtaining a zoning permit or selling a property.
- Grant funded septic tank pumping.
- Grant funded minor repairs of unsafe tank lids, inspection pipe caps, connections, etc.
- Non-compliant septic systems given up to five years from the end of project until (December 2017) to reach compliance.

In order to be included in the JGSIP the homeowner was required to fill out a survey form and return it to Wenck with a signature affirming their participation in the program. Once the homeowner survey with permission signature was received, the property was placed within the active properties and the SSTS compliance inspection process began. All properties that did not choose to participate in the JGSIP were evaluated for likely septic system compliance via an Unsewered Area Needs Documentation[1] (UAND).

The purpose of this Findings Report is to provide the District residents, Le Sueur County Board, and Le Sueur County staff a summary of results of the inspections for participating properties and a summary of UAND results. Property owners had the opportunity to sign up for participation in the program from July 2011 through the end of September 2012. Three mailings were sent to the property owners giving them the opportunity to sign up for an inspection.

1.2 PROJECT PURPOSE AND NEED

The purpose of the JGSIP is to determine to what extent a septic system compliance problem exists within the District. Much discussion has occurred in the past about a solution for the District without accurately identifying the problem. The septic system compliance status data is needed to assist in future decision making about possible long term infrastructure options.

1.3 PREVIOUS INVESTIGATIONS

Le Sueur County issues SSTS permits for the properties in the District when individual homeowners and groups of homeowners construct new systems. In addition, Le Sueur County requires compliance inspections during property transfers and as a precondition for obtaining zoning permits. Past permit information available at Le Sueur County for individual properties

[1]Unsewered Area Needs Documentation (UAND) is an assessment procedure created by the MN Pollution Control Agency used to identify the condition of existing septic systems using methods other than an onsite compliance inspection

was reviewed and incorporated into the findings of individual compliance inspections and this report.

1.4 WORK PERFORMED

A brief timeline of events completed to date as part of the JGSIP is as follows

- June 7, 2011-Wenck Associates, Inc. retained by Le Sueur County to complete work as part of JGSIP.
- July 13, 2001-Cover letter inviting participation, homeowner survey, and Kick-off Meeting announcement sent to all District residents.
- July 23, 2011-JGSIP Kick-off Meeting cohosted by Wenck and Le Sueur County.
- August 3, 2011-Field work begins, first round of site visits completed in JGSIP area.
- December 6, 2011-Final field inspection of 2011 completed, field work suspended for winter.
- April 2012-Field inspection commences for the 2012 round of inspections.
- September 31, 2012-Wenck accepts final request for inspection.
- October 2012-Wenck begins UAND for non-participating properties.
- November 2012-Wenck completes final tank inspection and UAND activities.

Field investigation and county file review has been completed simultaneously since field work began in August 2011 to assess the compliance of SSTS for participating properties. Data collected as part of the JGSIP inspections included:

- Type of residence (seasonal residential, permanent residential, business, vacant, community building, etc.)
- Source of drinking water
- Number of bedrooms served by SSTS at residential properties
- Type of SSTS serving property
- Compliance status of existing SSTS components (tanks and treatment/dispersal areas)

- Location of SSTS components
- Status of SSTS components when compared with required setbacks
- Depth to seasonally saturated soil conditions (i.e. redoximorphic features) as observed via soil borings relative to each SSTS
- Likely future SSTS to serve each property

Data collected as part of the UAND included:

- Permit information on file with Le Sueur County, including:
    - Year of system installation
    - Type of system
    - Soil verification information, if applicable
    - Parcel size and configuration as shown in Le Sueur County GIS database
    - If system meets required setbacks
- Visual observations of the system from the nearest public right-of-way, including:
    - Noted imminent health threats
    - Confirmation or refutation of system type for systems with permits on file
    - Estimate of system type for properties with no septic permit on file
- Available soil data for each SSTS, including:
    - Publically-available soil maps
    - Soil borings conducted on adjacent participating properties
    - Soil information from the SSTS permit, if available
- Estimate of compliance status using combination of county records, visual observations, available soil information, and results from inspections of neighbors

2.0 Compliance Inspection Results

2.1 INTRODUCTION

This section summarizes the methods and findings of the compliance inspections and UAND. All the properties evaluated were served by an SSTS, some of which are holding tank systems. A determination of SSTS compliance status was made at each property.

2.2 COMPLIANCE INSPECTION METHODS

Prior to commencement of field work, Le Sueur County provided property information for the District, including available past permitting/design/inspection records for individual parcels as well as the GIS shape file of the parcels. From the GIS shape file, a spreadsheet of property addresses was created. Homeowner survey forms were created to send to each occupied parcel with a mailing address in the District. These forms were intended for use as a means of documenting agreement to participate in the study and to gain further knowledge of the parcel occupancy status, water supply, and wastewater treatment infrastructure. The surveys were also used to evaluate seasonal and parcel specific water usage and wastewater generation and to provide a baseline for parcel investigation and evaluation.

In order to inform residents of the District about the JGSIP and invite participation, cover letters were sent with homeowner survey forms and invitations to attend an informational kick-off meeting. Completed homeowner survey forms were collected at the end of the kick-off meeting. Interested residents who were not present at the meeting or who did not sign up at the time were able to submit completed homeowner surveys via mail, fax, and electronic submission (i.e. scan and email). A website was developed to keep residents current on the

status of the project and for posting of important forms, such as blank homeowner surveys (http://www.wenck.com/septic-inventory-project/).

Wenck created maps and forms for use when doing compliance inspections. A parcel data spreadsheet was also created for storing data and tracking participation and project progress. Regional soil and geological history were reviewed prior to commencement of field work to gain a better understanding of expected soil and groundwater properties. Wenck also relied upon the Le Sueur County staff to answer certain parcel specific questions related to past permitting efforts and the history of local SSTS policy and installation.

Upon completion of background work, Wenck began the field work phase of the JGSIP. Site visits were completed to participating properties. The purpose of the site visits was to obtain:

- type of SSTS (if any) currently serving the residence,
- the compliance status of the SSTS,
- information on source of drinking water,
- the type of dwelling or wastewater generator contained within the parcel, and
- the most likely next ISTS to serve the dwelling.

To make the best use of resources and for the convenience of septic pumpers and utility locators, it was decided that Wenck would make an initial data-gathering and compliance visit to the participating properties. Operations generally performed as part of the first visit included:

- locating wells and wastewater treatment system components,
- storing component locations via GPS,
- probing tanks,

- evaluating the system with regards to Imminent Threats to Public Health or Safety (ITPHS)[2] status,
- evaluating the system setback from wells, buildings, surface water, and property lines,
- evaluating the system for need of minor repairs (such as pipe covers),
- evaluating the need for tank pumping,
- evaluating the need for a soil boring and
- flagging a potential soil boring location for utility locators (if necessary)

The initial site visit was followed by tank pumping (if necessary) and a utility locate to clear soil borings (if necessary). Tank pumping was completed by an MPCA-licensed Maintainer. Upon completion of utility locates and notification from the maintainer that tanks had been pumped, a second inspection was completed by Wenck. Not all properties required a second visit, as a compliance determination could be made at some properties without tank pumping or soil borings (e.g., cesspools, empty holding tanks at first visit, etc.). Tasks commonly completed during the second visit included:

- completion of minor repairs (where applicable)
- inspection of the empty tanks
- soil borings to evaluate depth to redoximorphic features
- probing of soil dispersal area to determine depth to bottom of dispersal area
- evaluation of tank compliance status
- evaluation of soil treatment area compliance status

The site visits included a compliance assessment to obtain the information found in Section 2.3. At properties where an SSTS soil treatment area existed, the vertical separation between the seasonally high groundwater (as determined using soil borings) and the bottom of the effluent

[2] ITPHS is defined in 2011 MN Rules Chapter 7080.1500 Subp. 4A. "…a system that is an imminent threat to public health or safety is a system with a discharge of sewage or sewage effluent to the ground surface, drainage systems, ditches, or storm water drains or directly to surface water; systems that cause a reoccurring sewage backup into a dwelling or other establishment; systems with electrical hazards; or sewage tanks with unsecured, damaged, or weak maintenance hole covers."

dispersal area was determined. Properties with less than 31 inches of vertical separation were determined to be likely non-compliant failure to protect groundwater[3] (FTPG) systems. Additionally, an evaluation was made to determine if a suitable area exists onsite for a future individual subsurface treatment system (ISTS) and what type of system would most likely be installed.

Upon completion of the compliance evaluation at each property, Compliance Inspection Forms were filled out and mailed to the system owners. Copies of the Compliance Inspection Forms were also provided electronically to Le Sueur County.

2.3 COMPLIANCE INSPECTION FINDINGS

The number of inspections completed during the JGSIP was 344. This accounts for a participation rate of 51% of the District residents (total number of parcels in JGSIP area was 1,239; however, the number of properties with a structure generating wastewater was first estimated at 691 in 2011, and then later refined to 675 in 2012). Fourteen property owners sent in surveys indicating a willingness to participate but later changed their minds and cancelled or refused inspections. Table 1 illustrates the participation numbers.

Table 1: Participation in JGSIP

Property Status	Number	Percentage of Total
Letter Sent to Address Inviting Participation in JGSIP	675	100%
Number Participating in JGSIP	344	51%
Cancelled/Refused Inspection	14	2.1%

[3] Failure to protect groundwater is defined in 2011 MN Rules Chapter 7080.1500 Subp. 4B. "…a system that is failing to protect groundwater is a system that is a seepage pit, cesspool, drywell, leaching pit, or other pit; a system with less than the required vertical separation distance described in items D and E; and a system not abandoned in accordance with part 7080.2500." 2011 MN Rules Chapter 7080.1500 Subp. 4D allows the County, for Compliance Inspection purposes, to apply a 15% reduction from the vertical separation distance of 36 inches required at installation. This 15% reduction renders 31 inches the vertical separation distance needed to be deemed complaint.

2.3.1 SSTS Types

Table 2 provides a breakdown of the SSTS types in the District identified at participating properties where an inspection was performed. The descriptions listed in this table are common names.

Table 2: Existing SSTS Types

SSTS Type	Number	Percentage of Completed Inspections
Holding Tanks	59	17%
Mounds	65	19%
At-grades	9	3%
Drainfields	129	37%
Tanks with connection to cluster mound	41	12%
Advanced Treatment Systems (Type IV)	14	4%
Cesspools	24	7%
Rented portable toilets only	2	1%
Unknown	1	<1%
Total	344	100%

2.3.2 SSTS Compliance Status

Upon visiting each individual parcel a determination was made regarding if the SSTS for the dwelling(s) was compliant or non-compliant with Minnesota Rules Chapter 7080 and Le Sueur County ordinance.

The SSTS that are non-compliant were identified as such for one of two reasons; 1) ITPHS as identified from site reconnaissance, or 2) failure to protect groundwater (FTPG). During the course of completing inspections, one property was identified as ITPHS with a discharge of raw sewage to the ground surface during the first visit; however, the homeowner was notified (a pump was not functioning) and the problem was corrected within the day. Five properties were identified with an ITPHS during the second visit. Two properties shared a tank that was

structurally unsound. Three other properties had an imminent or actual discharge of raw or partially treated sewage to the ground surface at the soil treatment area.

Table 3 summarizes the SSTS compliance status data for the properties. Compliance status is based on county permit information, soils data, information provided by county staff and property owners, and our site visits.

Table 3: SSTS Compliance Status

Status	Number	Percentage of Completed Inspections
Compliant on Cluster	42	12%
Compliant Holding Tank	57	17%
Compliant Individual Soil Treatment	100	29%
Non-Compliant Failure to Protect Groundwater	140	41%
Non-Compliant Imminent Threat to Public Health and Safety	5	1%
Total	344	100%

2.3.3 Existing Septic Tank Compliance

Even though a property's SSTS soil treatment area may be non-compliant, a septic tank may exist at a property that meets current compliance requirements and could be used in a future SSTS or community cluster system. During field reconnaissance, tanks were evaluated (probed, pumped and inspected via camera, permit records reviewed, and evaluated based on information provided by residents) for water tightness below the outlet of the tank. For properties where there was more than one tank, all tanks were evaluated for compliance. Table 4 summarizes the tank compliance status.

Table 4: Tank Compliance Status

Property Status	Number	Percentage of Completed Inspections
All Tanks Compliant	307	89%
One or More Tanks Non-Compliant	35	10%
No Tanks On Property	2	1%

2.3.4 Compliance Inspection Results Summary

Of the 344 SSTS that participated in the JGSIP and had Compliance Inspections completed, 42% (145 systems) are non-compliant. The SSTS are considered non-compliant due to a failure to protect groundwater (140 systems) or an imminent threat to public health and safety (5 systems). Removing the properties that currently can only be served by a holding tank because of small lot size, the non-compliant rate would rise to 51%

Although the overall rate of SSTS non-compliance is in excess of 40%, only 10% of the properties inspected had a septic tank that is non-compliant.

3.0 Unsewered Area Needs Documentation

3.1 INTRODUCTION

Using the guidance of the MPCA Clean Water Revolving Fund Unsewered Area Needs Documentation (UAND) this section summarizes the findings regarding the existing condition of all known SSTS within the District. The UAND was applied to the properties that did not volunteer for a compliance inspection. The County requested Wenck to complete the UAND to have a comprehensive assessment of the entire district.

3.2 METHODS

The UAND is intended to document the wastewater needs of an unsewered area. A tabular assessment is required to identify the existing SSTS condition of all wastewater generating dwellings. Four categories (shown below from MPCA form wq-wwtp2-10) of existing system condition need to be identified with more than one condition possible for an individual SSTS.

A. System condition per Minn. R. chs. 7080 and 7082:

1. Imminent threat to public health or safety (Minn. R. 7080.1500, subp. 4A).
2. Failure to protect groundwater — Cesspools, seepage pits and/or systems lacking three (3) feet of vertical separation from seasonal high groundwater or bedrock (Minn. R. 7080.1500, subp. 4B). Type V systems defined in Minn. R. 7080.2400 that fail consistently.
3. Setback issues --- Properties that cannot conform to setback requirements from water supply wells or piping, buildings, property lines, or high water level of public waters (Minn. R. 7080.2150, subp. 2F).
4. Conforming system --- SSTS system is in conformance.

Privies/outhouses are a special class of SSTS that have their own set of regulations. The regulations governing privies from *Minnesota Rules Chapter 7080.2280 Privies* can generally be summarized as follows:

1. If unsealed, the privy shall have three feet of vertical separation to seasonally high groundwater or bedrock.
2. If sealed, the privy shall employ a water-tight tank.
3. The pit or vault must have sufficient capacity for the dwelling it serves, but must have at least 25 cubic feet of capacity.
4. The sides of the pit shall be curved to prevent cave-in.
5. The privy must be easily maintained and insect proof. The door and seat must be self-closing. All exterior openings, including vent openings, shall be screened.
6. Privies must be adequately vented.

Privies that do not meet these requirements are generally considered as failures to protect groundwater, although vectors such as insects and rodents having access to privy contents can pose a public health threat as well. In general, based on Wenck's experience inspecting privies across the state, most public privies (such as privies at Minnesota State Parks) meet privy compliance requirements and pose minimal threat of impact to water quality. Based on Wenck's experience inspecting private privies across the state, most private privies do not meet privy compliance requirements and pose a threat to groundwater.

Another concern associated with privies is the disposal of graywater generated in the house or cabin. Graywater means sewage that does not contain toilet wastes (bathing, laundry, culinary operations, etc.). Often, although not always, graywater at sites containing only privies is disposed of by discharging directly onto the soil surface or nearby body of water. *Minnesota Rules Chapter 7080.1500 subp. 4* states that discharge to the ground surface of any sewage, including graywater, is an imminent threat to public health and safety.

Several methods to determine the existing SSTS condition are identified by the MPCA UAND guidance. One method includes completing a Compliance Inspection; however a Compliance Inspection is not required to determine existing SSTS condition. The six methods to determine existing SSTS condition identified by the MPCA are shown below:

B. Methods of determining project need include:

1. Visual site inspection --- A visual site inspection to document obvious threats to public health and safety, such as residential connections to a drain tile, overflow pipes, cesspools, or other unacceptable discharge locations.
2. Soil survey data review --- A review of existing soil survey data to reasonably conclude if appropriate wastewater treatment technologies are being used on site. For example, seasonal high ground-water conditions may dictate the need for a mound system. If there are no mounds, the systems are considered failing.
3. Site investigation with soil borings --- A site investigation including enough soil borings to create a soils map of the area. Complete an evaluation of the soil conditions to determine compatibility with existing wastewater treatment systems. For example, the soils map may dictate the need for a mound system. If mounds currently do not exist, treatment systems are considered failing.
4. Review of government records --- A review of local government records of the systems. If none exist, the system is unlikely to be in compliance. Existing records should be verified for accuracy.
5. Review of plat maps --- A review of plat maps and other records to determine if any code setbacks, such as distance between SSTS and potable water wells or surface water, cannot be met based on lot size. Systems on lots with inadequate size for setbacks should be considered noncompliant.
6. Compliance inspection per Minn. R. 7082.0700, subp. 2 --- A compliance inspection per Minn. R. 7082.0700, subp. 2 is completed.

For this investigation, Wenck was not given permission to complete a Compliance Inspection on the existing SSTS at non-participating properties; furthermore we did not have access to individual properties to extensively identify the location of imminent threats to public health, straight pipe discharges, pit privies, and other conditions that may pose potential public health threats.

Our investigation did include using a combination of approved methods given the time and site access constraints. Wenck started by obtaining from the County the available historic permitting information. The data included the year of SSTS installation, type of SSTS installed, parcel size and geometry, and known compliance information and notes since installation. The data was collected, compiled, and entered into a master spreadsheet and maps to use during field visits. Field visits were limited to right of way access and did not include extensive property investigation. Even with limited access this type of investigation is practical due to the fact that most properties can be easily viewed from the right of way. Soils data was compiled and reviewed for visited properties based on permit records, published resources, and Wenck's knowledge of local soils gained through soil borings at neighboring and adjacent properties. These data sources were used in concert to determine a likely system condition for non-participating properties with septic systems in the District. For properties participating in the JGSIP, the Compliance Inspection was used to determine the system condition.

3.3 UNSEWERED AREA NEEDS DOCUMENTATION FINDINGS

Table 5 shows the results of the UAND, which estimates approximately 45% of the total SSTS in the District are non-compliant. Figure 2 depicts the cumulative results of the compliance inspections and the UAND in a visual and spatial format. It is important to note that the final total in Table 5 differs from the final total in Table 1 because it counts SSTS, not properties. A number of properties exist where more than one SSTS is present on the same property (resorts, properties with separate systems for home and garage, etc.) or where there is one owner of

multiple properties who received one invite to participate in the JGSIP (rather than a separate invite for each property or SSTS).

Table 5: UAND Results

Status	Number	Percentage of SSTS
Compliant Connected to Cluster Soil Treatment Area	92	12%
Compliant Holding Tank Only	97	13%
Compliant Individual Soil Treatment with No Variance for Setbacks	189	25%
Compliant Individual Soil Treatment with Variance to Meet Setbacks	31	4%
Non-Compliant Failure to Protect Groundwater	340	45%
Non-Compliant Imminent Threat to Public Health and Safety	5	1%
Total	754	100%

When cluster systems and holding tanks are removed from the equation, it is estimated that only 25% of individual soil treatment areas (i.e. “standard” septic systems) in the District meet required setbacks and are compliant. An additional 5% of the remaining individual soil treatment areas are compliant but do not meet required setbacks and had a variance issued at the time of system construction. This data indicates that if a property is not connected to a cluster system or on a holding tank, there is approximately a 30% probability of the septic system being compliant.

A breakdown of system types installed in the District and compliance status by system type is presented in Table 6. The system type and compliance percentage ranges are based on results from Compliance Inspections and the UAND.

Table 6: Percent of Total Installed and Likely Compliance Status by System Type

SSTS Type	Estimated Percent of Total SSTS in District	Estimated Percent Non-compliant
Cluster Treatment Area	12%	0%
Holding Tanks	14%	0-5%
Advanced Treatment Systems (Type IV)	4%	5-10%*
Mounds	19%	10-15%
At-grades	3%	30-35%
Drainfields	31%	75-80%
Cesspools, drywells, privies	5%	100%
Unknown System Type/No Permit on Record	12%	100%

*5-10% of Type IV systems are estimate to be in non-compliance and failing to protect resources; however, 55-60% of Type IV systems are not in compliance with operating permit requirements.

Systems that employ a type of advanced treatment (aerobic tank, recirculating media filter, peat pods, etc., known as Type IV systems) have an additional compliance measure beyond protecting environmental resources in that system owners are required by operating permit to submit annual monitoring records to the County. In the case of Type IV system owners who participated in the JGSIP, 57% of Type IV systems were considered non-compliant for a failure to keep up with operating permit requirements. If all Type IV system owners participating in the JGSIP submit the required annual monitoring records to the County, only 7% of Type IV systems would remain non-compliant for a failure to protect groundwater or an imminent health threat.

4.0 Summary and Next Steps

4.1 SUMMARY

A summary of the findings of the Compliance Inspections completed during the JGSIP is as follows:

- 344 SSTS had a compliance inspection completed during the JGSIP
- 58% (199) of the inspected SSTS are compliant
    - Properties with a tank connected to a cluster treatment area comprise 21% (42) of the compliant SSTS
    - Holding tanks comprise 29% (57) of the compliant SSTS
    - The remaining 50% (100) of the compliant SSTS have an individual sewage treatment area (mound or subsurface drain field)
- 41% (140) of the inspected SSTS are non-compliant and fail to protect groundwater
- 1% (5) of the inspected SSTS were imminent health threats
- 17% (59) of the inspected SSTS are holding tanks
- 59% (145) of the inspected SSTS that are not holding tanks or connected to a cluster system (245 total) are non-compliant and fail to protect groundwater or pose an imminent threat to public health

A summary of the findings of the UAND completed during the JGSIP is as follows:

- 754 SSTS are known to exist in the District
- 54% (409) of the known SSTS are estimated or known to be compliant
    - Properties with a tank connected to a cluster treatment area comprise 22% (92) of the compliant SSTS
    - Holding tanks comprise 24% (97) of the compliant SSTS

    - The remaining 54% (220) of the compliant SSTS have an individual sewage treatment area (mound or subsurface drain field)
        - Of the compliant individual sewage treatment areas onsite, 14% (31) do not meet one or more required setbacks and required variances for installation
        - 86% (189) are compliant onsite individual sewage treatment systems and meet required setbacks to wells, property lines, buildings, and surface water features
- 45% (340) of the known SSTS are estimated or known to be non-compliant and fail to protect groundwater
- 1% (5) of the known SSTS are known to be non-compliant and imminent health threats
- Compliance status can be estimated from system type, as follows:
    - Cluster treatment area: 0% non-compliant
    - Holding tanks: 0-5% non-compliant
    - Advanced treatment systems (Type IV systems): 5-10% non-compliant
    - Mounds: 10-15% non-compliant
    - At-grades: 30-35% non-compliant
    - Drainfields: 75-80% non-compliant
    - Cesspools, drywells, privies: 100% non-compliant
    - Unknown system/no permit from Le Sueur County: 100% non-compliant

4.2 NEXT STEPS

The following describes a future action that could be completed within the District if the District desires to have a Compliance Inspection completed on every SSTS in the District.

- The Sewer District may require everyone that did not participate in the JGSIP and who does not have a current certificate of compliance on file with Le Sueur County to submit a completed compliance inspection (paid for by the system owner) within 1 year after the end of the study (December 31, 2013).

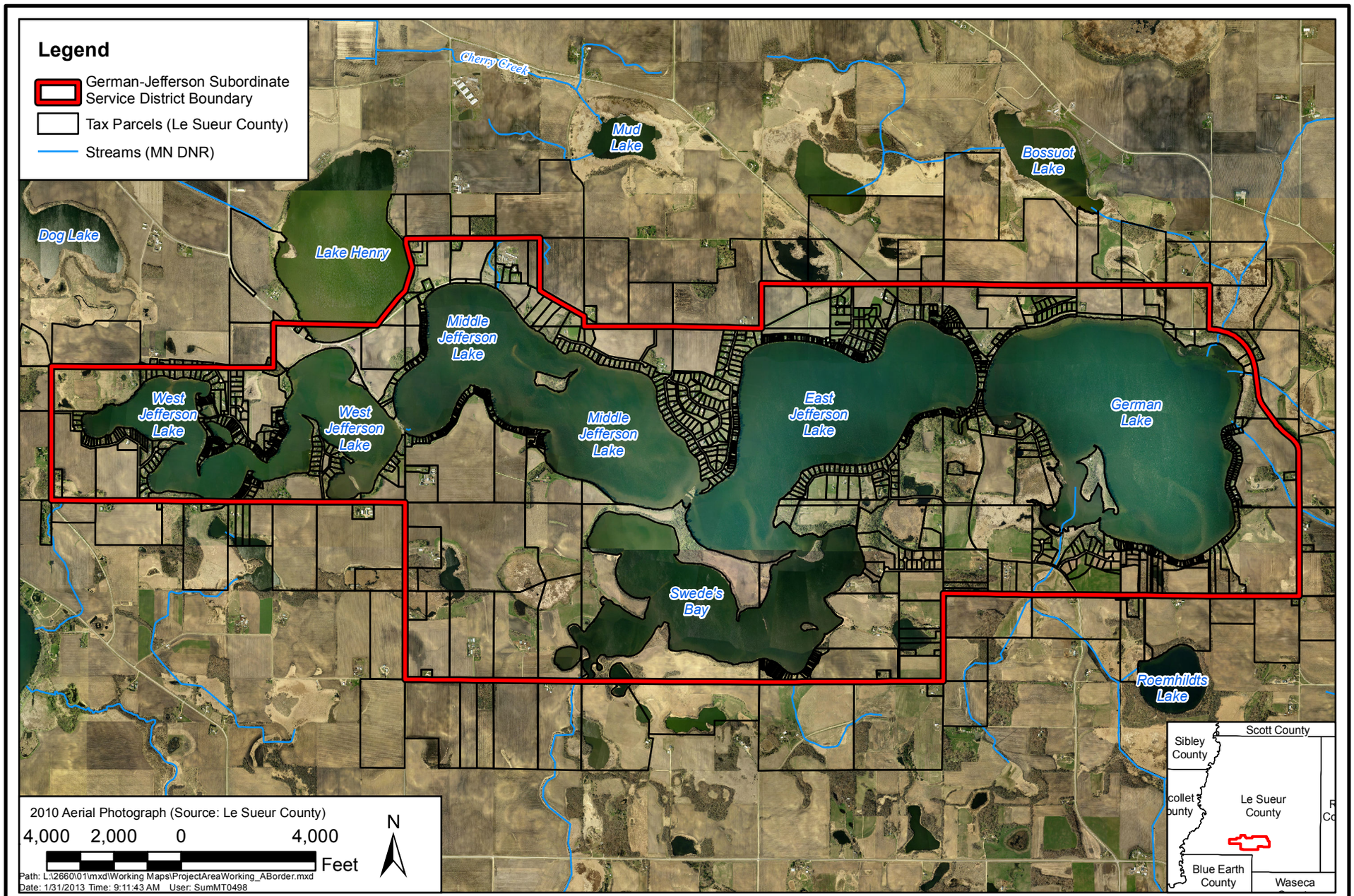
Based on the results of this study, Wenck recommends the following steps.

- Complete wastewater feasibility assessments for the eleven areas identified on Figure 3.
    - The eleven areas identified on Figure 3 are considered as areas that have a high non-compliance rate, high density, and generally small lots. A feasibility assessment will evaluate the feasibility and costs of various wastewater infrastructure solutions for properties with non-compliant SSTS. The eleven areas are:
        - Blue Marina: 22 SSTS, 9% compliant with soil treatment area
        - Maple: 21 SSTS, 14% compliant with soil treatment area
        - Jefferson Lake Drive: 24 SSTS, 17% compliant with soil treatment area
        - East Cape Horn: 29 SSTS, 17% compliant with soil treatment area
        - Tomahawk Point: 36 SSTS, 19% compliant with soil treatment area
        - Evergreen Lane: 46 SSTS, 22% compliant with soil treatment area
        - West Lake Drive: 21 SSTS, 33% compliant with soil treatment area
        - Stavenau-Holiday Park: 33 SSTS, 42% compliant with soil treatment area
        - Beaver Dam: 38 SSTS, 50% compliant with soil treatment area
        - Swedes Bay: 30 SSTS, 53% compliant with soil treatment area
        - Hardeggers: 36 SSTS, 67% compliant with soil treatment area
    - The reports feasibility assessments evaluate the feasibility and costs of various wastewater infrastructure solutions (e.g. cluster systems).
    - Complete upgrades to wastewater treatment infrastructure in each of the eleven areas based on feasibility assessment findings to protect water quality. Apply for grant funding to help reduce/eliminate costs to residents for wastewater treatment upgrades based on eligibility of each area for available grants.
- Educate homeowners within the District on septic systems.
    - Educate on what qualifies as a compliant septic system.
    - Educate on what makes a septic system non-compliant and the effects of such a system to public health and the environment.

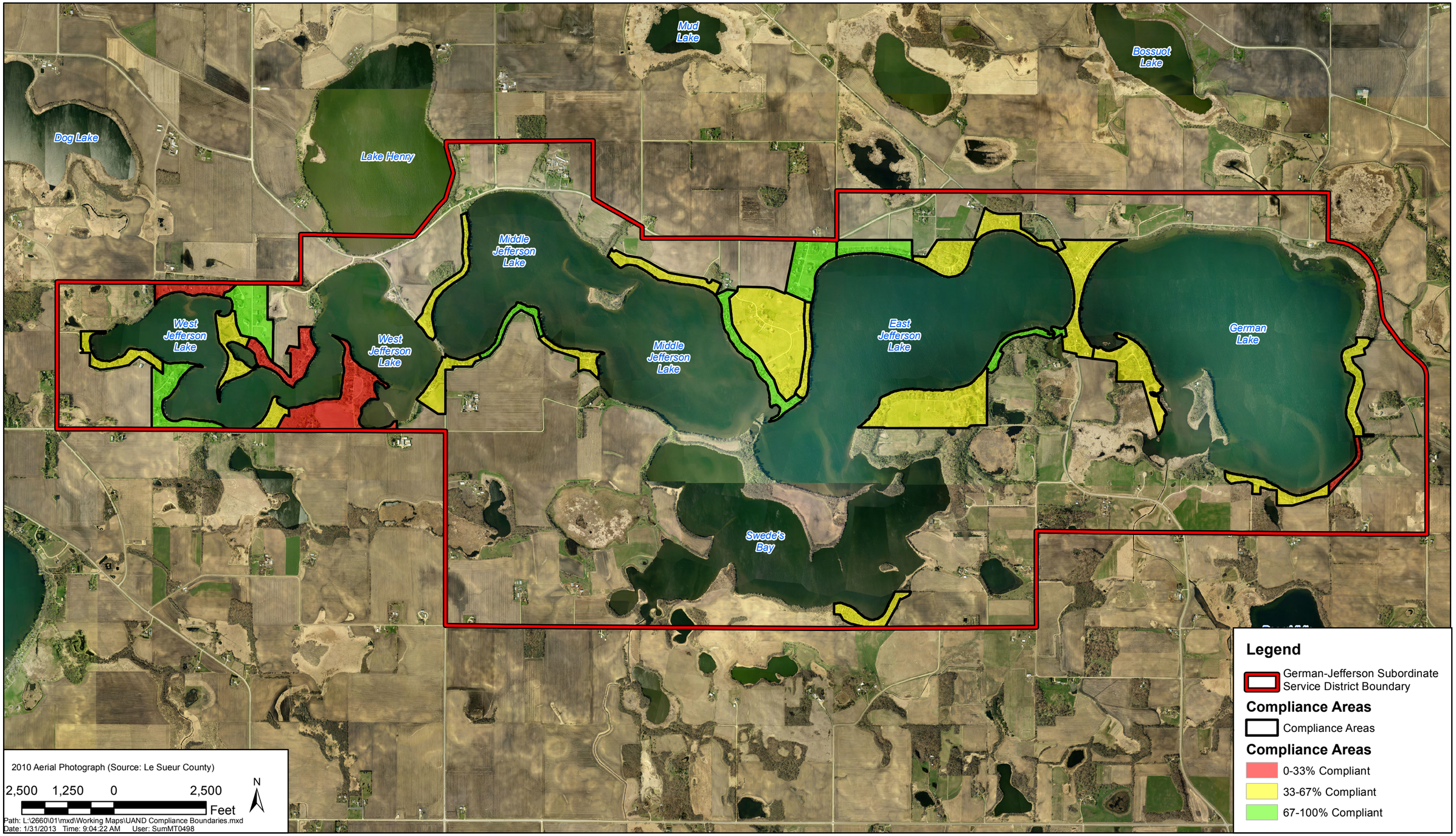
- Educate on operation and maintenance of septic systems to prevent system failure and to prolong the life of existing compliant septic systems.

- Encourage upgrades to non-compliant septic systems.
  - Continue requiring point of sale septic inspections, preferably by an inspector who did not complete the design or installation of the system to avoid conflicts of interest.
  - Continue requiring septic inspections at time of zoning permit issue, again preferably by an inspector who did not complete the design or installation of the system to avoid conflicts of interest.
  - Provide recognition from the lake association giving recognition to those who either currently have compliant septic systems.
    - Yard signs
    - Recognition on the website
    - Plaques, magnets, other for home/business
  - Encourage inspection of system at time of system maintenance
    - Example: car maintenance
      - Oil change = tank pumping.
      - Inspection of tires, shocks, engine, etc. = system inspection.
    - Encourage local system maintainers to offer inspection package with tank pumping.

Figures



LE SUEUR COUNTY	Wenck Engineers - Scientists Business Professionals www.wenck.com 1800 Pioneer Creek Center Maple Plain, MN 55359-0429 1-800-472-2232	DEC 2012
Site Location Map		Figure 1



LE SUEUR COUNTY

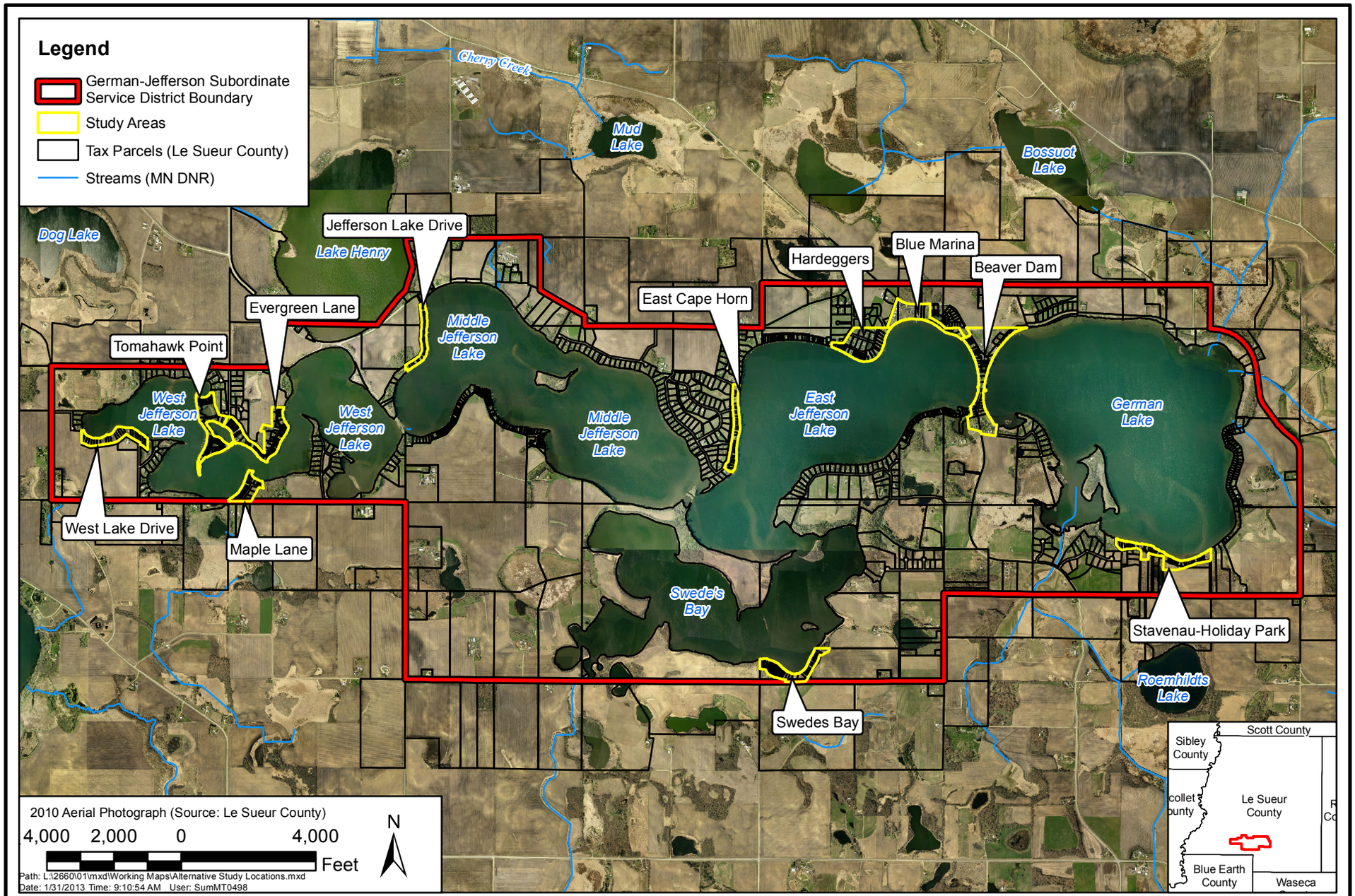
Summary of Results

Engineers - Scientists
Business Professionals
www.wenck.com

Wenck
1800 Pioneer Creek Center
Maple Plain, MN 55359-0429
1-800-472-2232

JAN 2013

Figure 2



LE SUEUR COUNTY	Wenck Engineers - Scientists Business Professionals www.wenck.com 1800 Pioneer Creek Center Maple Plain, MN 55359-0429 1-800-472-2232	DEC 2012
Potential Feasibility Assessment Map		Figure 3

Appendix B

City of Cleveland
Wastewater Treatment Ponds (WWTP) – Capacity Memo


Current Sewer Treatment
Holding Ponds
Three 6.5-Acre Ponds
0.137 MGD Capacity
Approx. 32 Acres
Two 8-Acre and One 7-Acre
Treatment Holding Ponds
Approx. Addional
0.161 MGD Capacity
148
108
15
48
46
49
47
46
"Friendly People, Our Greatest Asset"
Cleveland
Legend
Roads
Trunk Highways
County Roads
Local Roads
NWI
Protected Waters - Basins
Protected Waters - Watercours
0
596 Feet
© Bolton & Menk, Inc - Web GIS 6/9/2014 4:57 PM
Cleveland
WWTP
Disclaimer:
This drawing is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information, and data located in various city, county, and state offices, and other sources affecting the area shown, and is to be used for reference purposes only. The City of Cleveland is not responsible for any inaccuracies herein contained.

BOLTON & MENK, INC.
Consulting Engineers & Surveyors
1960 Premier Drive • Mankato, MN 56001-5900
Phone (507) 625-4171 • Fax (507) 625-4177
www.bolton-menk.com

MEMORANDUM

Date: June 16, 2014

To: **Honorable Mayor and Distinguished Council - City of Cleveland**

From: **Jason L. Femrite. P.E., Cleveland City Engineer**

Subject: Wastewater Treatment Ponds (WWTP) - Capacity
City of Cleveland
Project No.: M15.108144

As a result of conversations with the German/Jefferson Lakes Association about possible connection to the City of Cleveland's Wastewater Treatment Ponds (WWTP), we have reviewed the existing capacity of the current facility. The City of Cleveland has three wastewater treatment ponds north and west of the City. During our review we utilized the Discharge Monitoring Reports (DMR's) over the past four(4) years to determine the existing usage of the ponds.

The following is our review of the current Wastewater Treatment Pond WWTP System:

WWTP Design Capacity	0.137	million gallons per day (mgd)
Cleveland 2012 Population	713	Persons
Cleveland Sewer Connections - Existing	291	Connections
Cleveland Occupancy per Lot	2.45	Persons

Current Average Monthly In-Flow, mgd

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly Avg
2010	0.056	0.046	0.119	0.064	0.056	0.089	0.066	0.04	0.091	0.056	0.052	0.057	0.066
2011	0.059	0.075	0.159	0.127	0.11	0.091	0.071	0.033	0.027	0.027	0.028	0.029	0.070
2012	0.028	0.028	0.031	0.035	0.074	0.041	0.028	0.027	0.027	0.029	0.028	0.03	0.034
2013	0.029	0.028	0.036	0.09	0.072	0.076	0.045	0.034	0.031	0.034	0.031	0.03	0.045
Monthly Avg	0.043	0.044	0.086	0.079	0.078	0.074	0.053	0.034	0.044	0.037	0.035	0.037	
		Wettest 6 Mo. Average-->	0.106	mgd									

Existing Average Wet Weather (AWW) Flow = **0.106 mgd**

WWTP Design Capacity = **0.137 mgd**

2014 Available Capacity of WWTP's: 0.137 – 0.106= **0.031 mgd**

DESIGNING FOR A BETTER TOMORROW
Bolton & Menk is an equal opportunity employer

Understanding the City of Cleveland will have growth over the next 20-years, we have reviewed the available capacity after a 0.5% growth rate for 20-years. The Capacity is outlined below:

Current System Capacity		
City Growth*	0.5%	
Current Pop.	713	persons
Design Life	20	yrs
20 yr. Pop.	788	persons
20 yr Pop. Increase	75	persons
20 yr # connect. Increase	31	connections
20 yr total connections	322	connections
ADF per Capita	100	gpd
20 yr. Additional ADF	7500	gpd
20 yr. Additional ADF	0.0075	mgd
Calculated 2034 Flow	0.113	mgd
20 Yr. WWTP Excess Capacity, mgd	0.024	mgd
Current Capacity for Jeff/Germ Area	98	connections

Current capacity of the existing City of Cleveland WWTP for the German/Jefferson Lakes Area is approximately **100 Connections or 0.024 mgd**. This is based on the assumption of 2.45 persons per connection with 100 gpd/person.

It is my understanding that West Jefferson has approximately 200 connections which is more than the capacity of 100 connections. It is also our understanding that the entire German/Jefferson Lakes area is approximately 750 connections. The following is an expansion option for the WWTP for the entire 750 connections:

WWTP Expansion		
Size of Current WWTP	19.5	acres
Current Design Capacity	137000	gpd
Current Design Capacity/Ac.	7026	gpd per acre
Est. Construction Cost	$ 150,000.00	per acre
	Current	
Total Connections needed	754	connections
ADF for Additional Connect.	184730	gpd
ADF Currently Avail.	24001	gpd
Additional ADF Req'd	160729	gpd
WWTP Expansion req'd	**22.9**	acres (surface water only)
Est. Construction Cost	**$ 3,431,616**	For Ponds Only

Notes: Possibly Eligible for 25% Grant
Cost w/ Grant: $ 2,573,712
Cost to install force main from lakes approx. 80,000/mile
Distance from West Jefferson to WWTP is approx. 3.5 mi ($280,000.00)

Responsive partner.
Exceptional outcomes.

Toll Free: 800-472-2232 **Email: wenckmp@wenck.com** **Web: wenck.com**

MINNESOTA
Maple Plain
763-479-4200
Bloomington
952-831-5408
Windom
507-831-2703
New Hope
800-368-8831
Woodbury
651-294-4580

COLORADO
Denver
602-370-7420

GEORGIA
Roswell
678-987-5840

NORTH DAKOTA
Fargo
701-297-9600
Mandan
701-751-3370
Williston
800-472-2232

SOUTH DAKOTA
Pierre
605-222-1826

WYOMING
Cheyenne
307-634-7848
Sheridan
307-675-1148

Le Sueur County, MN

Tuesday, February 10, 2015

German Jefferson Sewer District

Item 3

7:30 pm Public Comments

Staff Contact: