

APPENDIX G
PRELIMINARY NORTH SEWER SERVICE AREA REPORT
MARCH 2005

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PRELIMINARY
NORTH SEWER SERVICE AREA

*Prepared by RH2 Engineering
for the City of Bonney Lake*

March 2005

RH2 Project: BON 102.009.01.017



Overview

As part of the City of Bonney Lake's effort to update its Comprehensive Sewer Plan, the City must evaluate how best to provide sewer service to its north service area, which includes the area that was delineated for sewer service in the 1984 agreement, which was a condition of Federal Funding for the construction of the 1984 WWTP located in Sumner. Roughly, this area is located along the western and northern shores of Lake Tapps and is delineated in **Figure 1**. As shown in this figure, there are undesignated and overlapping service areas. These boundaries should both be clarified prior to further planning efforts.

This document discusses the following means of wastewater treatment:

1. Metro/King County Wastewater Treatment Plant (WWTP)
2. Bonney Lake/Sumner WWTP
3. New Bonney Lake WWTP
4. Regional drainfields
5. Private drainfields

The area north of Lake Tapps has experienced rapid growth in recent years, most notably with the construction of the Lakeland Hills neighborhood. It is expected that much of this area will continue to develop at urban densities. The following developments are currently being planned for this area and are shown in **Figure 2**.

- Fairweather Cove (served by Bonney Lake)
- Kersey III (served by Auburn)
- Forest Canyon Highlands (served by Sumner)
- Terrace View Estates (served by Auburn)
- Lakeridge III (served by Bonney Lake)
- Grand Ridge II (served by Bonney Lake)

Expected flows, locations, and basins for each of these developments were considered when evaluating options, as it is likely that cost sharing opportunities would exist with the development of these properties.

For the purposes of this study, we assumed the north service area will contribute a flow of approximately one million gallons per day (MGD). This is an estimate of average design flow (ADF) based on previous discussions with the City regarding existing and proposed development as well as zoning throughout the area. A peaking factor of four is used to determine the peak design flow (PDF). The actual flow and peaking factor experienced may be significantly more or less, depending on a number of factors, including the area served. However, these approximations provide a basis for comparison.

The following criteria are discussed when comparing the various options for providing sewer service: cost, timing, capacity, potential for growth and environmental factors. A table at the end of this document ranks the alternatives by the various criteria. As more information is obtained, and if permitting and environmental regulations change, the variables and the rank of each alternative should be reevaluated.

Issues for Future Evaluation

As mentioned above, during the preparation of this report, it was discovered that there are discrepancies between various sources over boundary alignments. Before proceeding further, we recommend that the City of Bonney Lake come to agreement with the Cities of Sumner and Auburn and Pierce County regarding service areas and urban growth area boundaries.

The scope of this effort was limited to a planning level, and several factors were either not evaluated or need to be investigated further. This document does not discuss recharge of stormwater, which should be taken into account when considering whether to recharge the aquifer or streams.

This document does not include a detailed analysis of costs to the City or its customers. The components of costs are discussed under each alternative, but specific dollar amounts were not determined. Costs to customers include connection charges, capacity charges, and fees for service and have already been estimated by City staff. These charges can be significant and should be considered before making a final decision. Metro/King County is estimating the monthly capacity charge for new customers to be approximately \$34 for 15 years, which is a charge in addition to the monthly rate for service.

Another crucial factor not evaluated as part of the scope is funding. Many of the alternatives considered would likely be eligible for low-interest loans and/or grants such as the State Revolving Fund. We recommend that the City consider the likelihood of financial assistance when evaluating the financial impacts of each alternative.

One of the biggest variables, influencing both project cost and timing, is permitting. Permitting is discussed under the appropriate options; however, permitting regulations change frequently and additional applications or time for approval may be necessary.

1. Metro/King County WWTP

One option of wastewater treatment is to route the wastewater northward to Metro/King County's facilities. Currently, Metro/King County owns and operates the Lakeland Hills Pump Station, which is located just north of Oravetz Road and south of the White River. The City could either build a new interceptor through Auburn, owned and maintained by the City of Bonney Lake, or negotiate an agreement with Auburn for a joint-venture interceptor to the pump station. Either way, the City of Bonney Lake would need a new franchise agreement with Auburn. Potential alignments for routing the wastewater to the Lakeland Hills Pump Station are shown in **Figure 3**.

Currently, the City of Auburn plans to provide sewer service to Lake Tapps Elementary and Fairweather Cove. Auburn may extend their sewer service area further, after the City of Bonney Lake has completed the updated Comprehensive Sewer Plan.

Metro/King County is currently planning a new treatment plant to serve south Snohomish County and north King County. The new Brightwater Treatment Plant is necessary to expand Metro/King County's treatment capacity and will be located northeast of Woodinville. Regardless of the treatment option selected, the proposed Brightwater plant will not likely be treating flows from the Bonney Lake area. However, the addition of the plant will free capacity in Metro/King County's Renton plant, potentially benefiting residents within the Bonney Lake sewer area. Due to the existing capacity restrictions, if the new plant is not built by 2010, a system-wide building moratorium may be imposed to Metro/King County's service area.

Advantages

- Metro/King County would be responsible for all treatment.
- Capacity in the Sumner plant would be expended at a later date.
- Economy of scale is achieved.
- The City would not rely on one treatment facility for entire system.

Disadvantages

- Water would be removed from the Lake Tapps plateau (interbasin transfer).
- Several interagency agreements and franchises would be required.

Unknowns

- Terms of agreement with Auburn.
- Timing of Metro/King County's Brightwater plant.

Timing

Design of this alternative could commence when agreements are reached with Auburn and Metro, the alignment is determined and funding is acquired. It is estimated that it would be at least two years before design and construction would be completed and the interceptor would be online.

Cost

The expected cost of this option is the capital cost, plus any franchise and permit fees to Auburn. In addition, new properties will have connection charges to both the Cities of Auburn and Bonney Lake as well as Metro/King County. Metro/King County will also charge new connections with a capacity charge. The capital costs for this option vary depending on the alignment and potential cost sharing with Auburn and/or developers, but are estimated to be between five and eight million dollars, without developer contributions.

The monthly Metro rate for existing customers is \$25.60 (2005-2006) for a single family residence. New customers will pay the same monthly rate as existing customers and a capacity charge of \$34.05 per month for 15 years to pay for the Brightwater Treatment Plant. In addition, long-term rates and capacity charges will increase to pay for new system improvements. In the 2010-2015 timeframe, rates will stabilize for existing customers, and customers connecting at that time will pay for any new improvements.

Options

The two options for routing the wastewater through Auburn are discussed below. The first option involves the City of Bonney Lake building a new interceptor through Auburn, which would be owned and maintained by the City of Bonney Lake. The second option is negotiating an agreement with Auburn for a joint-venture interceptor to the pump station.

A. Interceptor Built Solely by Bonney Lake

Under this alternative, the City of Bonney Lake would design, construct, own, and maintain an interceptor through Auburn to Metro/King County's Lakeland Hills Pump Station. There would be no cost sharing with the City of Auburn. This line would only need to be sized to serve Bonney Lake's needs and would not include service customers within Auburn service area.

One potential alignment for the new interceptor would be along Lakeland Hills Parkway, East Valley Highway and Oravetz Road. This alignment would likely require an additional lift station on East Valley Highway, as well as, approximately 33,900 feet of force main and 8,700 feet of gravity pipe.

Another potential alignment is along Kersey Way. This route would require approximately 23,100 feet of force main and 15,200 feet of gravity pipeline.

B. Interceptor Built as a Joint Venture Between Auburn and Bonney Lake

Under this alternative, the City of Bonney Lake would partner with the City of Auburn in the design, construction and maintenance of an interceptor to Auburn's sewer system. If Auburn extends their service area, the length of pipe that the City of Bonney Lake is responsible for would be reduced. The alignments for this option are the same as for Bonney Lake constructing its own interceptor. The difference is that costs for this option

would be shared with developers and the City of Auburn, achieving a more reasonable economy of scale. It is likely that Auburn's system, between the new tie-in and Metro/King County's Lakeland Hills Pump Station would have to be upsized for the additional flow.

Design of an interceptor along Lakeland Hills Parkway, East Valley Highway and Oravetz Road would be coordinated with the developer for Terrace View Estates, a proposed 400-unit multi-family development that will be located north of the Parkway and east of East Valley Highway. This development is being designed by Pacific Engineers and its completion date is unclear. This alignment would require the construction of a new lift station at the bottom of the Parkway to pump to Oravetz Place. According to the City of Auburn, the existing 15-inch sewer from Oravetz Place through the school easements would need to be upsized. Close coordination with the school district would be required for this construction, so as not to interfere with school activities.

With the second alignment along Kersey Way, the City of Bonney Lake would share costs with the City of Auburn and the developer for the Kersey Three property, located on approximately 170 acres between the Lakeland development and Kersey Way. Currently, the developer of this property prefers to pump into existing pipes in the Lakeland Hills development on an interim basis. However, even if the developer pumps to Lakeland, they will have to pay for a portion of the cost of the Kersey Way sewer main, as shown in Auburn's Comprehensive Sewer Plan. If the Kersey Way interceptor is not constructed as part of the Kersey Three development, it will probably not be constructed until large adjacent properties, such as the Segale property, are developed, which may not happen in the next 15 to 20 years.

2. Bonney Lake/Sumner WWTP

Another option for treatment of the City of Bonney Lake's wastewater is to send it to the Bonney Lake/Sumner treatment plant. Three options will be considered: 1) the City of Bonney Lake constructing and maintaining its own interceptor through Sumner; 2) the City of Bonney Lake participating in a joint venture with the City of Sumner, partially funded by a developer; and 3) the City of Bonney Lake routing wastewater through its existing facilities. Potential alignments for the first two options are shown in **Figure 4**.

The Cities of Sumner and Bonney Lake are in the process of upgrading their treatment facility to a capacity of 4.6 million gallons per day. The City of Bonney Lake's current share of this plant is 50 percent with the option of purchasing an additional 5 percent of the capacity, giving a total capacity of 2.53 million gallons per day. It is estimated that the City of Bonney Lake's existing capacity in the Sumner plant will be expended by the years 2014 or 2018, depending on how much of the service area flows to the Sumner plant. If the City's north service area flows to the plant, the capacity will be expended even sooner.

Advantages

An advantage of sending the wastewater to the Bonney Lake/Sumner treatment plant is cost, as the City has already paid for the plant and capacity. Another advantage is control over future growth, since the City, along with Sumner has control over the capacity of the plant.

Disadvantages

Disadvantages to treating the wastewater in the Bonney Lake/Sumner plant are the following:

- The upgraded treatment plant capacity would be reached sooner than it would with other options.
- There is interbasin transfer of the water as it is removed from the plateau, reducing the recharge of local aquifers.

- Continuing to treat all of the City's wastewater in the Sumner Plant does not provide a redundant treatment facility.

Timing

Design of this alternative could commence when an agreement is reached with Sumner, alignments are determined, and funding permits are acquired. It is estimated that it would be at least two years before design and construction would be completed for any of the three options considered.

Cost

The expected cost of routing to the Bonney Lake/Sumner Treatment Plant is the capital cost plus any franchise and permit fees to Sumner. In addition, new properties will have a connection charge to the City of Bonney Lake. The capital costs for this option vary depending on the alignment and potential cost sharing with Sumner and/or developers. Without developer contributions, costs are expected to be between seven and eight million dollars for this option.

Options

The three options for routing the wastewater through Sumner are discussed below.

A. Interceptor Built Solely by Bonney Lake

Under this alternative, the City of Bonney Lake would design, construct, own and maintain an interceptor through Sumner to the Bonney Lake/Sumner Treatment Plant. There would be no cost sharing with the City of Sumner under this alternative.

A potential alignment for the new interceptor is down Sumner-Tapps Highway then along 60th Street East to the treatment plant. This alignment would likely require an additional lift station on 60th Street East, approximately 38,800 feet of force main and 8,400 feet of gravity pipe.

Another potential alignment for the new interceptor is along Forest Canyon Road, 24th Street East, 142nd Avenue East and West Main Street to the treatment plant. This alignment would likely require an additional lift station on 24th Street, approximately 26,000 feet of force main and 10,100 feet of gravity pipe.

B. Interceptor Built as a Joint Venture Between Sumner and Bonney Lake.

Under this alternative, the City of Bonney Lake would partner with the City of Sumner in the design, construction and maintenance of an interceptor to Sumner's sewer system. An advantage of this option is shared costs with the developer of the Forest Canyon Highlands property and the City of Sumner, achieving a more reasonable economy of scale.

The alignment for this option would be down Forest Canyon Road, East Valley Highway and 24th Street East and would require a lift station at the intersection of East Valley Highway and 24th Street East. The interceptors from Bonney Lake to the intersection of 24th Street East and 142nd Avenue East would be new construction.

With this option, some of Sumner's system will likely have to be upsized between the intersection of 24th Street East and 142nd Avenue East and the treatment plant. Sumner already has plans to increase the capacity of their 142nd Street Pump Station, though it's not scheduled in their CIP until the years 2018 to 2020. If the City of Bonney Lake routes flow from the north service area through this pump station, improvements will probably be necessary sooner, depending on expected flows. It is also likely that lift station and 6-

inch force main at 142nd Street will have to be upsized to accommodate the additional flow.

In addition to the upgrades to Sumner’s system, this alignment would likely require a lift station on 24th Street and approximately 26,000 feet of force main and 10,100 feet of gravity pipe.

C. Bonney Lake’s Existing Interceptor to the WWTP

Under this alternative, the City of Bonney Lake would use the existing facilities to route wastewater to the Bonney Lake/Sumner treatment plant. According to the City of Bonney Lake’s 1996 Sewer Comprehensive Plan, the capacity of Lift Station 17 is approximately 5 million gallons per day (mgd). The capacity of one of the 16-inch force mains from Lift Station 17 ranges from 2.7 mgd at a velocity of 3 feet per second to 7.2 mgd at a velocity of 8 feet per second. As discussed above, the City of Bonney Lake’s share of the treatment plant is currently 2.3 million gallons per day. From the 1999 Treatment Plant facility plan, the average daily maximum month flow at buildout is projected to be 2.55 MGD and the peak hourly flow at buildout is 4.9 MGD, for a plant peaking factor of 1.9. Using Bonney Lake’s share of the existing plant capacity, which is 2.3 MGD, the peak hourly flow capacity can then be calculated at 4.4 MGD. As shown from the table below, this option would require either an expanded or new lift station.

	Lift Station 17	Force Main*	WWTP
Existing Flow (ADF)	0.35	0.35	0.77
Peak Factor	4	4	1.9
Existing Peak Flow	1.4	1.4	1.5
Projected Additional Flow	4	4	1.9
Total Projected Flow	5.4	5.4	3.4
Capacity	5	7.2	4.4

All units are in MGD

*One of Two 16-Inch Force Mains

Improvements required for this alternative include routing flow from the City of Bonney Lake’s north service area south into its existing system. Potential alignment is shown in **Figure 5**. This alignment would likely require improvement to the City’s existing collection system, an expansion of Lift Station 17 and approximately 27,700 feet of force main.

3. New Bonney Lake WWTP

This option involves the construction of a new wastewater treatment plant to serve the Bonney Lake area. The *Bonney Lake Wastewater Reclamation Preliminary Feasibility Report* from 2000 discusses this option in further detail by evaluating potential participants, wastewater discharge or use alternatives, potential treatment plant locations and project costs and timing. For this analysis, the proposed treatment plant will serve only the north service area and will be located on the west side of Lake Tapps, as shown in **Figure 6**. Total length of force main for this option is approximately 22,000 feet.

Advantages

Building a new treatment plant to serve the Bonney Lake service area would allow the City of Bonney Lake to control costs and timing of future expansions. This option would also give the City full control over how quickly growth can occur within its service area. Other benefits include retaining the water on the plateau rather than transferring it to another basin, maintaining a high level of control over water quality and being able to use the reclaimed water.

Disadvantages

- Cost.
- Timing.

Unknowns

It is unknown whether Department of Ecology would accept this alternative. It's likely that acceptance of this alternative would depend on the extent of environmental and/or civic benefit, such as the use of reclaimed water. The following section discusses the advantages, disadvantages and potential uses of reclaimed water.

Options for Reclaimed Water

A comprehensive financial analysis that includes capital costs as well as avoided cost of water services is necessary to accurately assess the various alternatives for the reclaimed water. Some potential benefits of reusing the reclaimed water include:

1. Aquifer storage and recharge.
2. Stream flow supplementation/environmental benefit.
3. Lake augmentation.
4. Irrigation and washing.

The following paragraphs discuss potential applications of reclaimed water in further detail.

A. Aquifer Storage/Recharge

Aquifer storage/recharge (ASR) involves storing treated wastewater in an aquifer to not only recharge the aquifer but also to use during low-flow periods or dry weather months. Applicability of this option needs to be verified with Ecology. The wastewater stored in the aquifer could be pumped and used for irrigation, streamflow supplementation, or for potable use during high demand periods. ASR has a number of advantages:

- No large infrastructure required for storage
- Reduced risk of contamination
- No evaporation or aquatic growth
- Reduced dependency on water rights

Disadvantages to ASR include increased permitting requirements. Also, prior to implementing an ASR program, testing must be conducted to determine the effects of injecting and withdrawing from the aquifer. Effluent must be treated via reverse osmosis or flow through soil prior to entering the aquifer.

B. Stream Flow Supplementation/Environmental Benefit

Stream flow supplementation could benefit Fennel Creek. Fennel Creek has been identified as potential habitat for Chinook Salmon and Bull Trout, both of which have been identified as "threatened" species. Treated effluent could be infiltrated and cooled

through natural ground water next to the creek and used to augment flows during low-flow periods. In addition to augmenting flows, if the effluent is colder than the stream in the hotter summer months, it could be used to lower stream temperatures.

C. Augmenting Lake Tapps

Properly treated wastewater could be discharged into Lake Tapps. However, the Cascade Water Alliance (CWA) may develop Lake Tapps as a drinking water reservoir, though that is not likely to happen in the next several years. If, or when, this does happen, discharge of wastewater effluent to the Lake would not be easily accepted by the public. An extensive public relations and public education effort would be necessary for this application.

D. Irrigation and Washing

One beneficial use of reclaimed water is to irrigate a park, wetland, or botanical garden or for washing purposes, such as car washes, laundromats and street sweeping. Class A compost produced from treated biosolids could be applied to the grounds of parks. However, the largest amounts of reclaimed water would be available in the winter months, when irrigation and car washing are infrequent, minimizing the benefit to the water utility. In addition, costs of constructing a second system to deliver the reclaimed water could make this option cost prohibitive.

Timing

Getting a new treatment plant online depends on several factors and is likely to take several years. If a new plant involves more than just the City's service area, an interlocal agreement between participants in the new plant will be required, which could take up to two years to complete. Permits for the plant and reclamation could also take several years. Site acquisition, design, and construction would all add to the length of time requisite to have the plant online. It is reasonable to expect that a new treatment plant would not be operational for seven years, or more.

Cost

Costs of a new treatment plant were evaluated in the *City of Bonney Lake Wastewater Reclamation Preliminary Feasibility Report* and were estimated between \$11.5 million and \$27.6 million, depending on the manner in which financing is structured, the size and location of the plant. This cost could be reduced through the sale of the treatment capacity that Bonney Lake could relinquish at the Sumner Wastewater Treatment Plant and the potential sale of reclaimed water.

4. Regional Drainfields

This option involves routing the wastewater flows through sewer lines to regional drainfields, which would be used to treat the wastewater from the basin. The drainfields would be owned and maintained by the City of Bonney Lake.

Advantages

- Reduced likelihood of contamination or failure compared with traditional septic systems, due to City's program to maintain the systems.
- More convenient upgrades than individual on-site systems.
- Inexpensive treatment.
- Water retained on the plateau, allowing local aquifers to be recharged.

Disadvantages

- Reduced control over ground water quality than WWTP options.
- Potential difficulty in siting due to adjacent drinking water sources (Sumner, Bonney Lake and Puyallup) located along the west edge of the Plateau.
- Risk of failure
- May not be acceptable to the Tacoma Pierce County Health Department.

The Tacoma Pierce County Health Department (TPCHD) views on-site septic systems, including community septic systems, to be temporary until a public sewer system is available. In considering wastewater disposal designs, the TPCHD requires designs to be considered in the following order:

1. Public sewers.
2. Individual on-site septic systems.
3. Community on-site septic systems.
4. Individual sewage disposal systems with one or more components on another property.

The applicant for the project may not propose a lower priority option unless they demonstrate by clear and convincing evidence that the higher priority option(s) can not adequately serve the proposed project. Therefore, it is possible that community septic systems would not be an acceptable alternative to the TPCHD in many cases.

Unknowns

Siting the regional drainfields would require additional information on the following:

- Geology and hydrogeology.
- Soil conditions at the site.
- Wetland and/or environmentally sensitive areas.
- Community springs and/or wells.
- Private springs and/or wells.
- Future water sources.
- Groundwater/recharge/aquifer protection regulations for Sumner and/or Puyallup.
- Feasibility of local membrane wastewater treatment.

Drainfields provide a means of aquifer recharge as well as a source of nitrates. While the Cities of Sumner and/or Puyallup may want to eliminate or limit drainfields within recharge areas for their water sources, doing so may impact groundwater levels. The City of Bonney Lake should coordinate with both Sumner and Puyallup regarding any changes within their recharge areas.

Cascade Water Alliance's potential development of Lake Tapps into a drinking water reservoir could render this alternative unfeasible if potential sites are located within Lake Tapps recharge area. However, from preliminary studies, it appears that the groundwater in this area flows toward the northwest, eliminating any influence on Lake Tapps from the properties considered in this report. The hydrogeology in this area would need to be studied in greater detail prior to siting the drainfields.

The feasibility of combining regional drainfields with local membrane treatment should be explored. Using the membrane treatment, the nitrogen could be removed to acceptable levels and a receiving body of water is not necessary to dispose of the effluent. Also, the water quality would be much higher than from septic tanks alone, and there would likely be wider public acceptance.

Timing

Construction of the regional drainfields could take place as soon as siting, permitting and design are completed. Future development would pay for the drainfields, and the timing of development may affect the timing of the construction. It is estimated that it would be at least four years before completion of the design and construction of the community systems.

Cost

Costs for this option will include capital as well as O&M costs. Approximately 13 drainfields would need to be constructed.

5. Private Drainfields

The no-action option is to allow new development to use individual drainfields. The drainfields would be privately owned and maintained.

Advantages

- No capital or O&M costs to the City.
- No engineering costs to the City.
- Timing is immediate.
- Flows to local aquifer would be augmented.

Disadvantages

- Need for effective oversight over old or failing septic systems.
- Establishment of a reliable effective monitoring program.
- Nitrates discharged groundwater.
- May be short-term solution.

As mentioned above, this may be a short-term solution. The Tacoma-Pierce County Board of Health will allow on-site sewage treatment systems only on an interim basis. When the septic system fails, or the property undergoes a remodel, the property must then connect to the sewer system if it is available.

Unknowns

It is unknown what effect the development of Lake Tapps into a drinking water reservoir will have on individual septic systems near the lake. It is possible that CWA would have some authority under the Safe Drinking Water Act to reduce or eliminate the drainfields in areas that affect the water quality of Lake Tapps. With this option, there would be multiple sites of individual drainfields (both existing and proposed), and it is likely that some of them would fall into areas affecting Lake Tapps' water quality. However, as stated previously, if Lake Tapps becomes a drinking water reservoir, it would not be for several more years.

Timing

Timing of this option is immediate, as it is the current method of treatment for Bonney Lake's north service area.

Cost

Capital and O&M costs are paid by the developer of the property. There is no expected cost to the City.

Comparison of Options

The following table shows the lengths of force main and gravity pipe necessary for each of the alternatives discussed above. For the Auburn and Sumner alternatives, approximate pipe lengths are shown for each alignment considered. Additional improvements necessary include the proposed lift stations for each option and upgrades to the existing collection systems.

Approximate Pipe Lengths (ft)

Lift Sta	Auburn				Sumner				WWTP	Bonney Lake
	A-Kersey		B-Pkwy		Sumner-Tapps		Forest Canyon			
	FM	Grav	FM	Grav	FM	Grav	FM	Grav		
Total	23,100	15,200	33,900	8,700	38,800	8,400	26,000	10,100	22,000	27,700

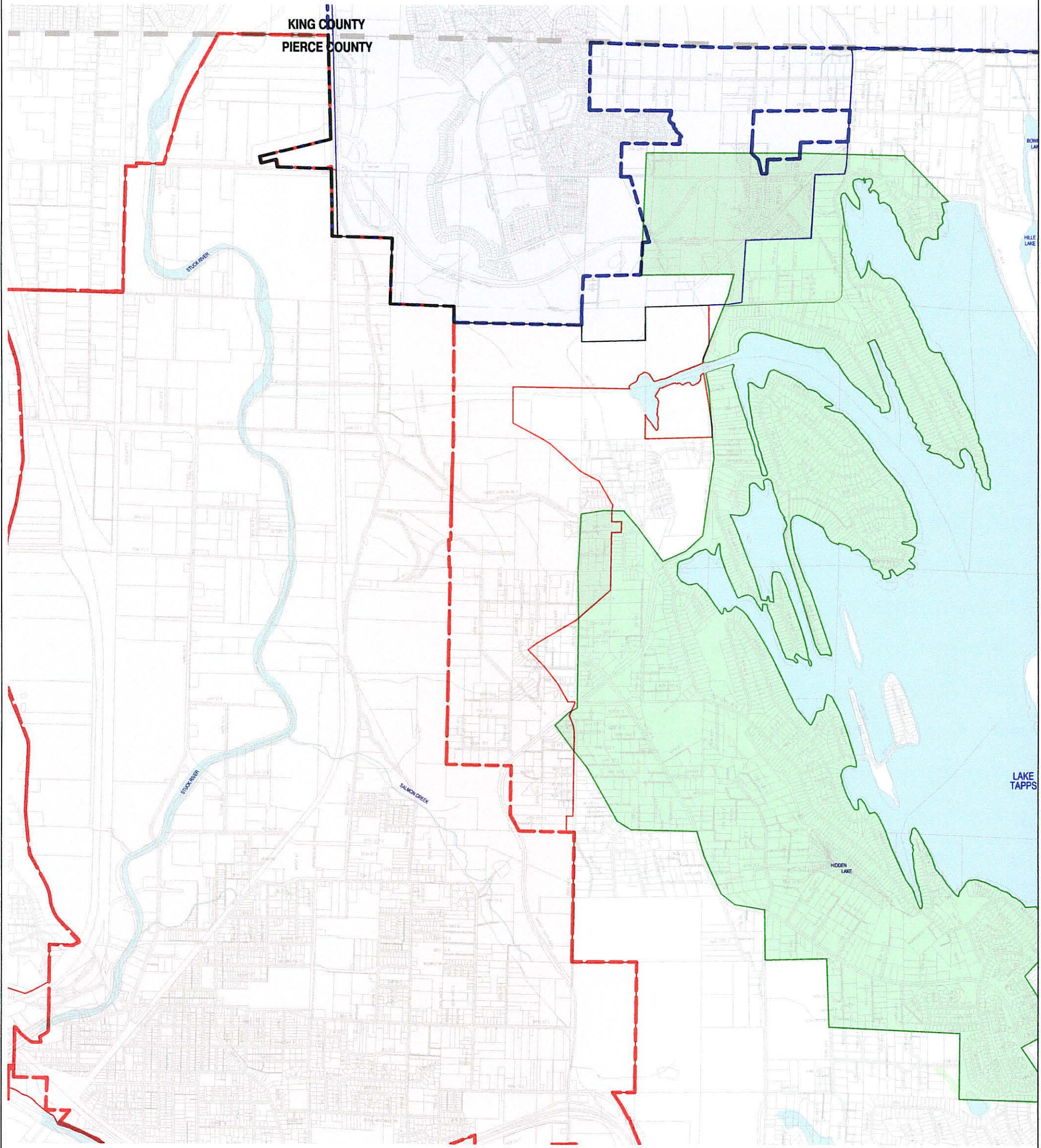
* Lift Station is not necessary under this scenario.

The following table summarizes the alternatives discussed above and ranks the alternatives based on the following criteria:








- Cost (1 = least expensive to 5 = most expensive).
- Timing (1 = shortest schedule to 5 = longest schedule).
- Environmental Impact (1 = least impact to 5 = most impact).
- Growth Potential (1 = easily expanded to 5 = difficult to expand).

Alternative	Rank			
	Cost	Timing	Environmental Impact	Growth Potential
Auburn/Metro	4	3	5	3
Sumner WWTP	3	4	4	5
New Bonney Lake WWTP	5	5	3	4
Regional Drainfields	2	2	1	2
Private Drainfields	1	1	2	1

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LEGEND

-  CITY OF BONNEY LAKE SEWER SERVICE AREA PER 1984 WWTP AGREEMENT
-  CITY OF AUBURN SEWER SERVICE AREA PER 2001 COMPREHENSIVE SEWER PLAN
-  CITY OF SUMNER URBAN GROWTH/SEWER SERVICE AREA PER 2003 COMPREHENSIVE PLAN
-  PROPOSED BASIN BOUNDARY
-  COUNTY LINE
-  AUBURN CITY LIMITS PER PIERCE COUNTY GIS
-  SUMNER CITY LIMITS PER PIERCE COUNTY GIS

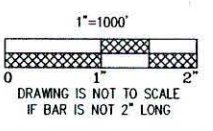


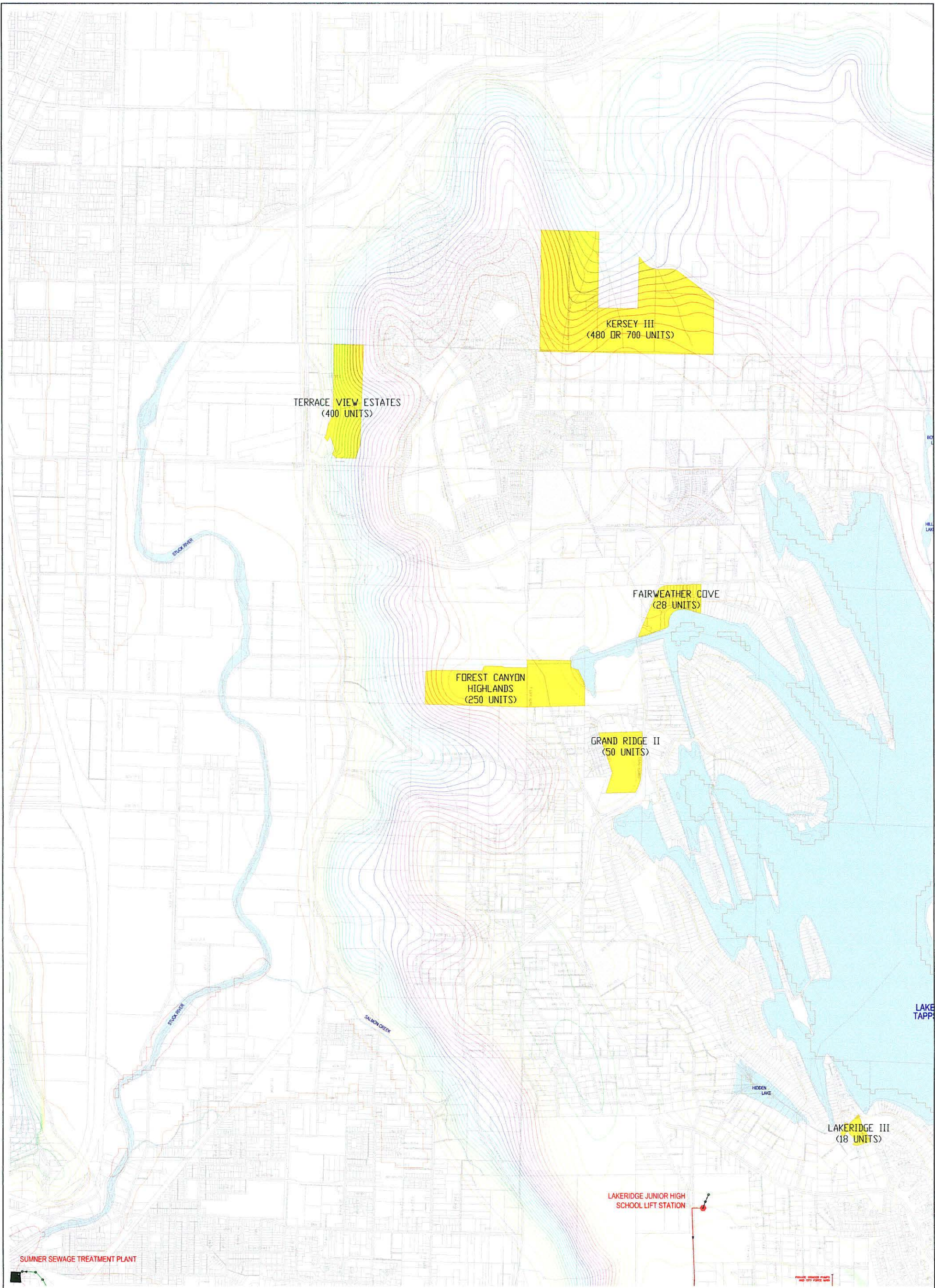


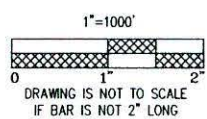
FIGURE 1
CITY OF BONNEY LAKE
NORTH SEWER SERVICE AREA
ADJACENT SERVICE AREA BOUNDARIES



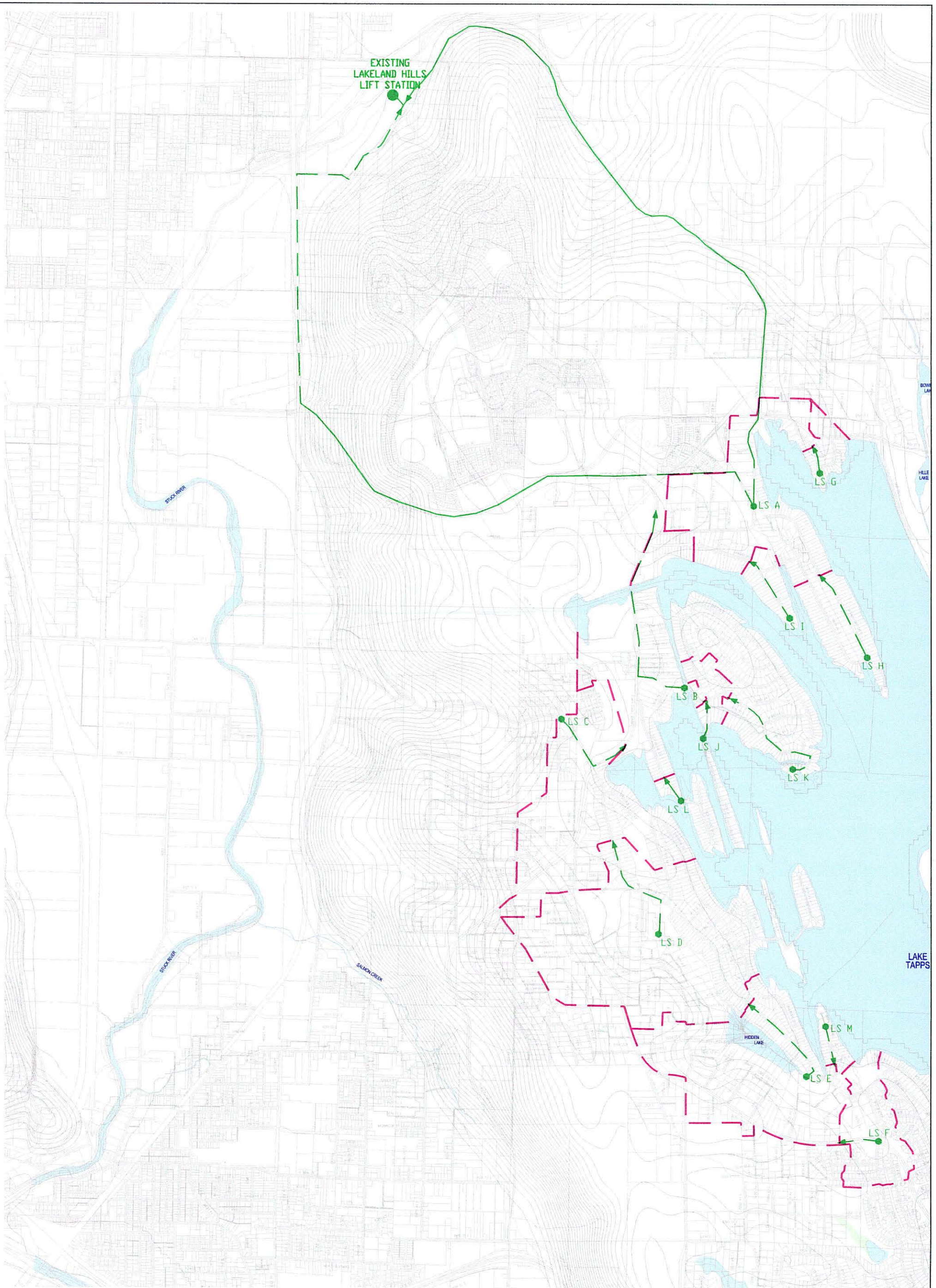
LEGEND

- LARGER THAN 5 ACRES
- VACANT COMMERCIAL
- VACANT RESIDENTIAL
- VACANT WITH BUILDING RESTRICTIONS OR PROBLEMS
- PROPOSED DEVELOPMENT



**FIGURE 2
CITY OF BONNEY LAKE
NORTH SEWER SERVICE AREA
UNDERDEVELOPED AND UNDEVELOPED PROPERTIES**





LEGEND

- PROPOSED BASIN BOUNDARY
- PROPOSED FORCE MAIN TOWARD METRO/KING COUNTY SYSTEM
- PROPOSED GRAVITY MAIN TOWARD METRO/KING COUNTY SYSTEM

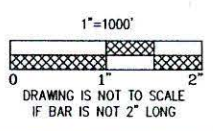
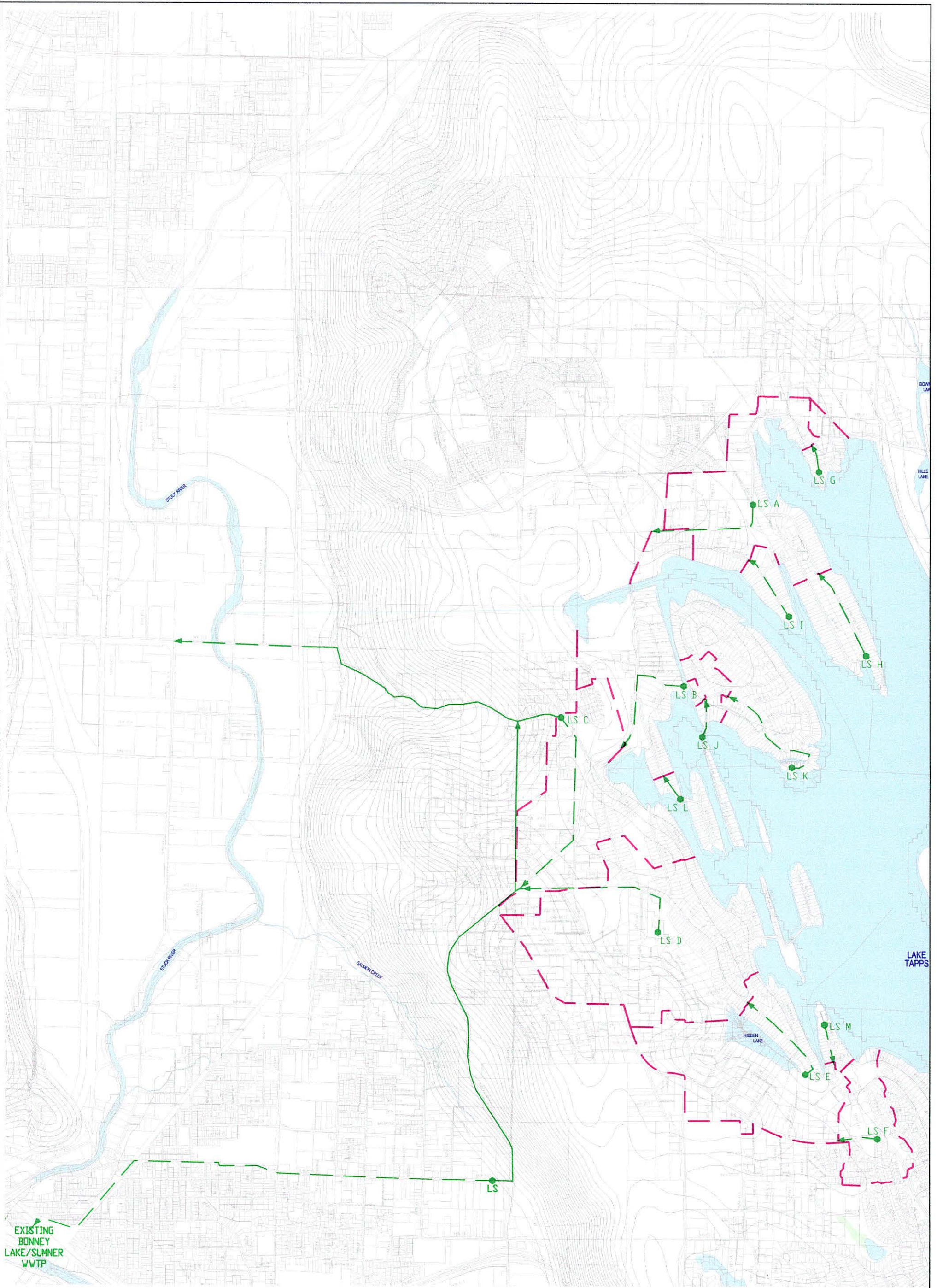


FIGURE 3
CITY OF BONNEY LAKE
NORTH SEWER SERVICE AREA
SERVICE THROUGH AUBURN





LEGEND

- - - PROPOSED BASIN BOUNDARY
- - - PROPOSED FORCE MAIN TOWARD BONNEY LAKE/SUMNER WWTP
- PROPOSED GRAVITY MAIN TOWARD BONNEY LAKE/SUMNER WWTP

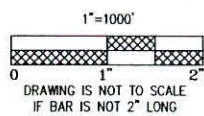
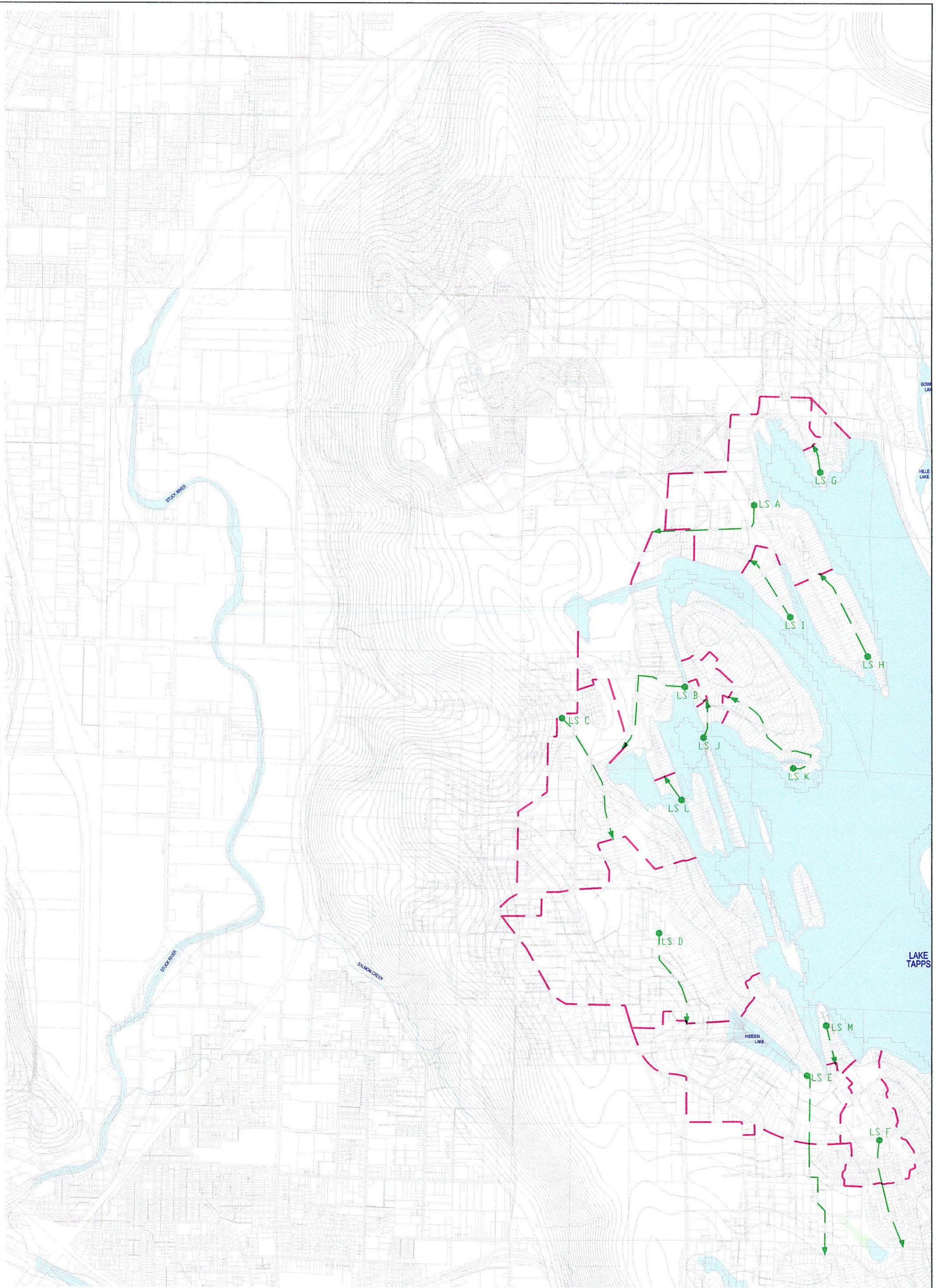


FIGURE 4
CITY OF BONNEY LAKE
NORTH SEWER SERVICE AREA
SERVICE THROUGH SUMNER





LEGEND

- PROPOSED BASIN BOUNDARY
- PROPOSED FORCE MAIN TOWARD BONNEY LAKE SEWER SYSTEM

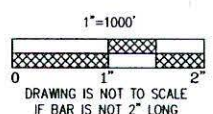
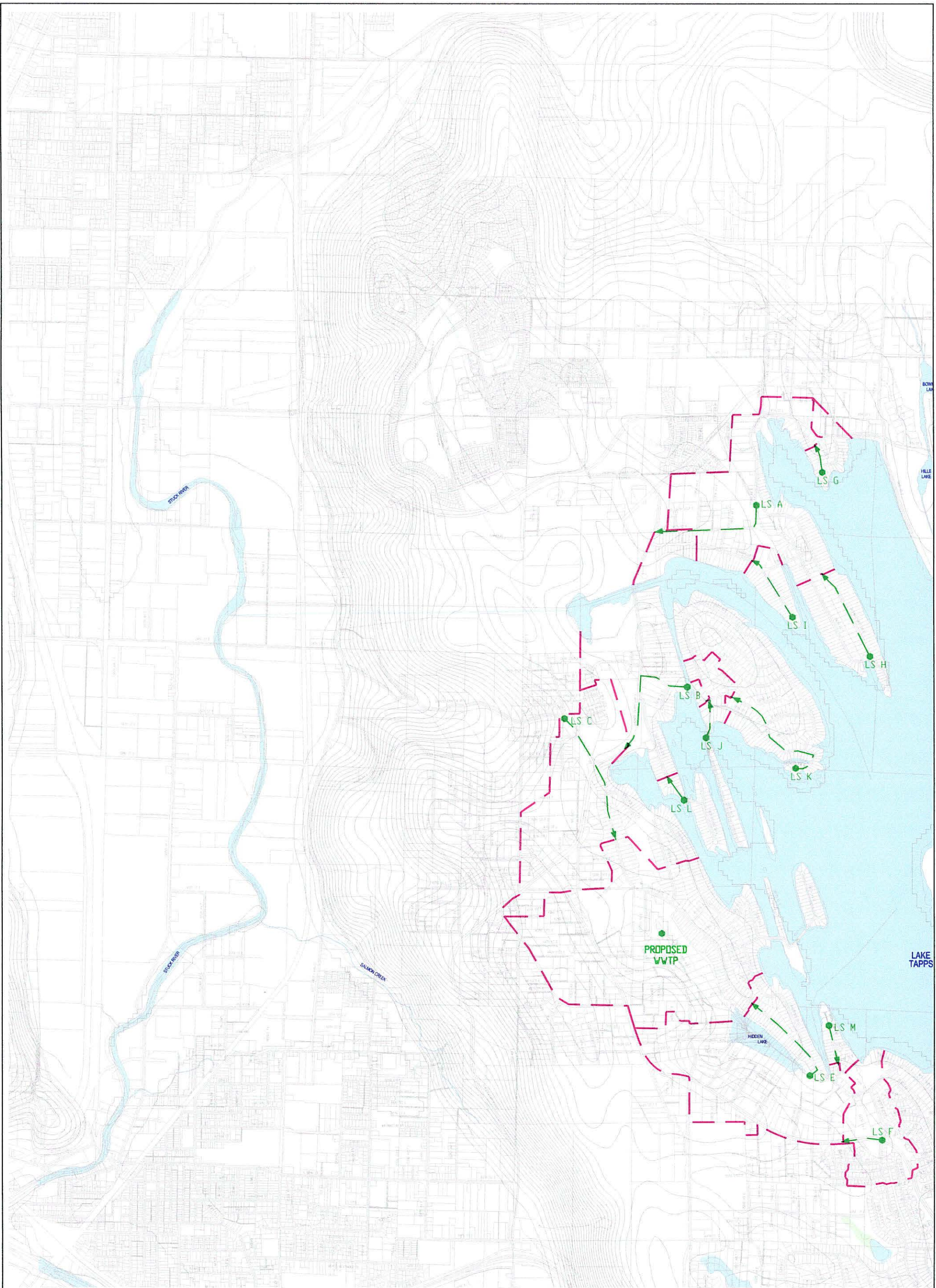


FIGURE 5
CITY OF BONNEY LAKE
NORTH SEWER SERVICE AREA
SERVICE THROUGH BONNEY LAKE





LEGEND

- - - PROPOSED BASIN BOUNDARY
- PROPOSED FORCE MAIN TOWARD NEW WWTP

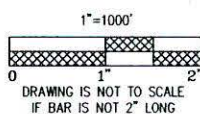


FIGURE 6
CITY OF BONNEY LAKE
NORTH SEWER SERVICE AREA
SERVICE TO NEW WWTP

