CHAPTER 2

Sewer System Description

Lift Station No. 17 Pump

INTRODUCTION

This chapter presents characteristics of the City of Bonney Lake's (City) existing sewer system and sewer service area (SSA) that are important to the planning process. The term "sewer service area" used in this General Sewer Plan (Plan) is defined as the area that is served by, or will be served by, the City's existing sewer system, as adopted by the City Council, and as required by Pierce County (County) and the Washington State Department of Ecology (Ecology) through various agreements from the time the sewer system was originally built. The results of the evaluation and analyses of the existing sewer system are presented later in **Chapter 6 – *Existing System Evaluation***.

SEWER SERVICE AREA

Ownership

The City's sewer system (i.e., lift stations, force mains, and gravity mains, etc.) is owned by the City, a municipal corporation. The City is managed under the leadership of the Mayor and a seven-member council and the sewer system is operated and maintained by the City's Department of Public Services. The wastewater treatment plant (WWTP) for the City is located in the City of Sumner (Sumner) and is jointly owned by both cities; it is operated and maintained by Sumner.

History

In 1910, the Puget Sound Power & Light Company (Puget Power) diverted water from the White River to raise the level of Lake Tapps to generate electricity. The project merged Tapps, Kirtley, Crawford, and Church lakes and some marshes into the Lake Tapps reservoir. Residential subdivisions were built around Lake Tapps beginning in 1940. Early residents commuted to industrial jobs in nearby cities. After World War II, the City grew rapidly in response to greater mobility and the allure of cheaper land and quieter lifestyles. Commercial development occurred along State Route (SR) 410.

The City's earliest, and still most diverse, commercial/civic center developed around the intersection of SR 410 and the Old Sumner-Buckley Highway. The Lake Tapps Development Company sold recreational sites on the west shore of Lake Tapps beginning in 1954. Later, they marketed their lots as permanent residential sites. The company donated 20 acres to create Allan Yorke Park; Kenneth and Bertha Simmons acquired a 1,000-acre parcel from a "rodeo man" named George Logan in 1946. In 1949, the Simmons family caused the City to be incorporated.

The initial population was 275. Kenneth Simmons served three terms as Mayor. Simmons, Chet and Clarence Roberts, Robert Wheeler, Bert Filkins, and others, built the concrete block building on Locust Street in the downtown district that served as community club, city hall, and fire hall. By 1950, the new town had paved streets, a water system, electric and telephone lines, refuse disposal and a blood bank. By 1957, there were twelve businesses in the downtown district. Urban development continues to change the community and heighten demand on its facilities and services.

This chapter describes the City's existing sewer system and service area. The term "service area" refers to the area that the City is responsible for providing sanitary sewer service consistent with the City's plans and the Sanitary Sewer System Transfer Agreement between the City and the County that was executed in 2002. **Appendix A – *Sanitary Sewer System Transfer Agreement*** for a copy of the Agreement.

The following sections provide an overview of the City's sewer system history, the geography of its SSA, and summaries of the various facilities that comprise the City's existing system.

Until the 1980s, the City's wastewater disposal system consisted solely of individual subsurface disposal systems. On February18, 1975, the City, the County, and South Hill Sewer District joined together under the auspices of an interlocal agreement to develop a "Facilities Plan" to meet their regional wastewater treatment needs. Federal and state monies were received, and the City served as the lead agency for grant administration and regulatory compliance.

In 1977, "Section 201"[1] of Lake Tapps Sewerage Facilities Plan (Facilities Plan) was completed. The Facilities Plan identified the "Koperski/Alderton" location as the site for construction of a regional wastewater treatment facility (WWTP), discharging into the Puyallup River. This plan was approved by the County Board of Commissioners on February 15, 1977, and by the US Environmental Protection Agency (EPA) by letter dated February 28, 1977.

[1] Section 201 refers to the section of the federal Clean Water Act that was a large source of grant funding for sewer planning and construction throughout the 1970s and 1980s.

Design and construction of the City's sanitary sewer system began in the late 1970s. Many of the City's residential grinder pump stations, sewage collection lines, lift stations, and interceptors were installed during the period of 1977 through 1981. Grant monies were obtained from the EPA through Ecology for the design and construction of these facilities, and work was proceeding until the County Planning Commission denied an unclassified use permit for the proposed WWTP site, located on the Puyallup River near Alderton, derailing further work on the project.

Immediately thereafter, an addendum to the Facilities Plan was prepared specifying land treatment as the alternative to the Koperski/Alderton treatment plant. This approach was later abandoned in the face of delays caused by growing environmental concerns.

Finally, in 1979, Addendum 3 to the Facilities Plan was prepared that proposed conveyance of the City's wastewater to Sumner's WWTP. This concept included expanding this treatment plant to accommodate the additional wastewater flows. In addition to the expansion of the WWTP, this alternative included a gravity transmission line to the treatment plant, plus lift stations, and related interceptors. This addendum was approved by the County Board of Commissioners on March 26, 1979, and by the EPA by letter dated July 19, 1979.

In January 1980, the City, the City of Sumner, the County, and South Hill Sewer District consummated an interlocal agreement providing for implementation of the Facility Plan as amended. It provided for the design, construction, and operation of these regional facilities.

Later in 1980, changes in the grant funding prospects for the project from Ecology and EPA increased the amount of local matching share that would be required from 10 percent to 25 percent. This increase led the County to reevaluate and withdraw from its participation in the project.

The City also began to study local, non-regional alternatives for treatment of its wastewater. In 1982 through 1983, the City selected an alternative entailing construction of a small independent WWTP and interceptor with capacity to serve only the City. A local improvement district was formed to finance the construction of these facilities, but it was rejected by the voters in 1983, effectively eliminating that alternative. During this period, a recall campaign against the mayor of the City was initiated based primarily on the issues revolving around the City's failed attempts to complete its sewer system. Upon the recall, a majority of the City Council resigned. These two actions completely changed the political complexion of the City. The new mayor and City Council announced the abandonment of efforts in developing a sanitary sewer system.

This prompted a decision by the EPA to terminate its wastewater facility grant to the City and require repayment of more than $3 million already expended. The City appealed EPA's decision to an appeal board established for this purpose by EPA. The City and South Hill also filed suit against the County in an effort to avert the financial disaster associated with immediate repayment of the canceled EPA grants.

Settlement discussions between the County, the City, and the EPA eventually led to a resolution of both the litigation between the City and County, and also the EPA grant appeal. The WWTP expansion alternative was resuscitated, the County agreed to participate, and the parties entered another interlocal agreement. In November 1984, the Intergovernmental Contract for Wastewater Facilities Management agreement between the City, the County, Sumner, and the South Hill Sewer

District was finalized. This agreement provided for the development of interceptor conveyance facilities and for expansion of the existing sewage treatment plant in Sumner.

The principal interceptor to the WWTP, together known as the Joint Facilities, was designed and constructed, starting in 1979, as the Lake Tapps Sewage Interceptor System Project. This interceptor was funded primarily by grants from the US Economic Development Administration (USEDA), US Department of Housing and Urban Development (HUD), Ecology, and by local matching share from the City and County, and, in part, by the South Hill Sewer District. Under this agreement, the City was the lead agency responsible for the construction of these facilities.

During the mid-1980s, the City oversaw the construction of Lift Stations 8, 11, 12, 13, 14, and 17, as well as the Church Lake and SR 410 interceptors. These new facilities joined up with the existing Fennel Creek, Debra Jane Lake, and the Bonney Lake Interceptors. By mutual agreement these joint transmission lines were operated and maintained by the City, and jointly owned by the City and County. South Hill Sewer District owned a small portion of the interceptor sewer near the WWTP.

Sewer service for the City was established in 1987 with the completion of the primary interceptors comprising the joint transmission lines and the expansion of the Sumner Sewage Treatment Plant, known as the Joint Sewage Treatment Plant. While the City, County, and the South Hill Sewer District each paid for the expansion of the Joint Sewage Treatment Plant, it was agreed that Sumner would own and operate the expanded plant, and the other entities would each pay for and own a share of capacity at that plant based upon the design capacity increase apportioned in accordance with population projections within their respective service areas.

In the mid-1990s, the City was re-evaluating its role as a provider of sanitary sewer service. Simultaneously, it was developing land use plans in conformance with the Growth Management Act (GMA) and the County's Countywide Planning Policies. These processes converged with development of the Sewer Comprehensive Plan and Amendment to the Sewer Comprehensive Plan, both completed in 1996 and prepared by Kennedy/Jenks consultants. These plans included the recommendation that the City divest itself of its sewer system by transferring it to the County.

Shortly thereafter, the County commenced development of its Unified Sewer Plan in 1997. This countywide planning effort involved cities and other stakeholders throughout the County in what turned out to be a 5-year process culminating in the adoption of the Unified Sewer Plan by the County Council in 2002. As an outgrowth of the Unified Sewer Planning process, both the City and County evaluated and re-evaluated their respective roles, capabilities, and responsibilities with regard to sanitary sewer service on the Lake Tapps plateau. These deliberations resulted in a reversal of the City's 1996 mindset regarding sewer service and execution of the Sanitary Sewer System Transfer Agreement (Agreement) between the City and County executed in 2002. **Appendix A – *Sanitary Sewer System Transfer Agreement*** contains a copy of the Agreement. This Agreement dramatically expanded the City's SSA by adding significant territories both south and north of the City limits.

Geography

The City lies on the southwest shore of Lake Tapps in north central portion of the County. The City is southwest of Sumner, its nearest municipal neighbor, and about 4 miles south of Auburn, its nearest municipal neighbor in King County. **Figure 2-1 – *Political Boundaries*** provides a visual perspective of the proximity of the City's limits with the corporate limits of nearby cities, such as Puyallup, Sumner, and Auburn; of the County; as well as the County's urban growth boundaries (UGB).

Geology

The geology of the SSA is the result of two major geologic events: the glaciation of the last glacial epoch, and the Osceola mudflow. During the glacial period, at least two separate and distinct glacial events occurred. These two periods were defined by the advance and recession of major ice fields that carved many valleys and ridges into the terrain. The Osceola mudflow occurred about 4,800 years ago and smoothed the area by filling many of the valleys with mud and silt.

Topography

Elevations within the SSA range from approximately 100 feet to 710 feet above mean sea level (AMSL). However, most of the service area is located on southwest side of the Bonney Lake Plateau. The plateau is dominated by Lake Tapps, with a normal high water level of 543 feet AMSL. Several other small lakes are located throughout the SSA, including Lake Bonney, Debra Jane Lake, Hidden Lake, and Church Lake. There are also a number of wetlands and small creeks throughout the service area. The side slopes of the plateau consist of steep grades that range from 25 percent to 50 percent. The terrain on the plateau is undulating with numerous depressions of lakes and former lake beds. Most of the undeveloped areas are heavily forested. The largest transportation corridor within the City's service area is SR 410, which runs east/west through the southern portion of the plateau.

Climate

The climate of the SSA is typical Puget Sound-area weather. Since 1997, rainfall within the City's SSA has been monitored on a monthly basis at two locations: Victor Falls Springs and Grainger Springs. In late 2006, the City added a third station at Tacoma Point. Average annual rainfall at these three stations from 2007 through 2014 was 48.87 inches. Historically, the months of July and August are the driest and have the biggest impact on water demand. For the last 8 years, the average rainfall at these three stations during the summer months of July and August was 0.99 inches per month. The weather data indicates that the last 8 years have been drier than the historical 19-year average of 1.38 inches per month, therefore the demand factors calculated should be slightly conservative for the last 8 years.

Water Supply Sources within the Sewer Service Area

Many well and spring sources of potable water exist within the City's SSA. Some of these are quite significant, including the City's own sources of Victor Falls Springs, Grainger Springs, Ball Park Wells, and the Tacoma Point Wellfield. In addition, both the cities of Sumner (County Springs and Sumner Springs) and Puyallup (Salmon Springs) have major water supply sources in the City's SSA. **Figure 2-2 – *Water Systems and Sources*** shows the location of known Group A and Group B sources of supply in the vicinity of the City's SSA.

Wastewater Treatment Facilities

As previously described, the City's jointly owns the WWTP with Sumner. The various agreements defining the ownership between the City and Sumner are included in **Appendix B - *Intergovernmental Agreement for Improvements and Expansion of the Sumner Wastewater Treatment Facility***. The WWTP is the destination for all wastewater currently generated within the City's SSA. It is also the planned destination for projected future flows for at least the next 10 to 20 years. There are seven other WWTPs within 20 miles of the City. Their general locations are shown on **Figure 2-3 – *WWTP in the Puyallup River Basin***. None of these other seven plants currently represents a reasonable alternative for treatment of wastewater from the City's SSA.

Other Sewer Utilities

Several other sewer utilities exist in the area, including the City of Auburn, City of Puyallup, the City of Pacific, and the South Prairie Sewer District. Both the cities of Auburn and Pacific send their respective wastewater flows north to the King County-East Division Reclamation Plant in the City of Renton. The City of Puyallup and the Town of South Prairie both own and maintain their own wastewater treatment facilities. Further east, the City of Enumclaw and the City of Buckley each have their own collection and treatment facilities.

Sewer Service Area

The City currently only provides sewer service to its Core Sewer Service Area (CSSA), which is primarily made up of the City's corporate limits, its Potential Annexation Areas (PAA), portions of the Falling Water development, and two master-planned developments in the Connells Prairie area. However, the City is also committed to provide service in the future to areas that are south and north of the City. These areas are known as the South Sewer Service Area (SSSA) and the North Sewer Service Area (NSSA).

The total existing SSA encompasses approximately 13.8 square miles. It is estimated that the CSSA area is approximately 8.3 square miles, or 60 percent of the total SSA by area. The SSSA is approximately 2.9 square miles, or 21 percent of the total SSA by area. The NSSA is approximately 2.6 square miles, or 19 percent of the total SSA by area.

Planning area sizes in terms of acres and square miles and a delineation of their relative size compared to the overall sewer service area is presented in **Table 2-1 – *Sewer Plan Area.***

Table 2-1
Sewer Plan Areas

Location	Area		Portion of SSA
	(acres)	(square miles)	(%)
City Limits (corporate boundary)	4,701	7.3	53%
Potential Annexation Areas (PAA)	158	0.2	2%
Master Planned Developments (MPD)	211	0.3	2%
Core Sewer Service Area (CSSA)	5,340	8.3	60%
South Sewer Service Area (SSSA)	1,827	2.9	21%
North Sewer Service Area (NSSA)	1,666	2.6	19%
Total Sewer Service Area (SSA)	**8,833**	13.8	100%

EXISTING SEWER FACILITIES

This section provides a detailed description of the existing sewer system and the current operation of the facilities. The analysis of the existing sewer facilities is presented in **Chapter 6 – *Existing System Evaluation***.

EXISTING WASTEWATER FLOW CHARACTERISTICS

Connections

The City's sewer system grew from approximately 3,199 connections in 2000 to over 6,069 connections in 2015. Approximately 98 percent of these connections are residential (i.e., either single-family or multi-family). **Table 2-2 – *Sewer Connections by Type (Number of Accounts)*** shows the changes in numbers of connections by year and type from 2000 through 2015.

Table 2-2
Sewer Connections by Type (Number of Accounts)

Customer Class	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Commercial/Public	71	79	84	91	94	101	106	112	118	123	126	130	131	131	131	139
Single-Family	3,001	3,123	3,351	3,652	3,842	4,256	4,641	4,857	4,992	5,047	5,130	5,234	5,321	5,533	5,718	5,803
Multi-Family	118	120	40	42	65	75	81	88	93	99	112	114	114	102	109	120
Parks	5	5	5	5	6	9	4	4	3	3	3	2	2	0	0	0
Schools	4	4	4	5	7	8	8	8	9	9	9	7	7	7	7	7
Total Connections	**3,199**	**3,331**	**3,484**	**3,795**	**4,014**	**4,449**	**4,840**	**5,069**	**5,215**	**5,281**	**5,380**	**5,487**	**5,575**	**5,773**	**5,965**	**6,069**
Total Residential Connections	3,119	3,243	3,391	3,694	3,907	4,331	4,722	4,945	5,085	5,146	5,242	5,348	5,435	5,635	5,827	5,923
Percent Residential	97%	97%	97%	97%	97%	97%	98%	98%	98%	97%	97%	97%	97%	98%	98%	98%

Quantity

Flows within the City's system are predominantly residential in character and are typical of what would be expected from a predominantly residential system. With no significant commercial, manufacturing, or industrial wastewater generators currently being served, flow patterns follow the typical diurnal curve of a peak in the morning hours between approximately 6:00 a.m. and 9:00 a.m., followed by a somewhat higher flow peak in the evening hours between approximately 4:00 p.m. and 8:00 p.m. As expected with this type of service area, flows are at their lowest between the hours of approximately midnight and 4:00 a.m.

Residential Equivalency

To facilitate system analysis and planning, a value for the amount of wastewater generated by a typical single-family unit has been calculated. This number is called a "Residential Equivalent" or "RE". For the City sewer system, this value is 267 gallons per day (gpd) per single-family unit. This number correlates with the average monthly flow for the maximum month of the year. A number of components and considerations go into development of this value. Some of them include the amount of water used by a typical single-family residence in the wintertime (as measured from the City's water system accounts). Another component is household size, or the number of people that typically reside in a single-family residence. Household size is a variable that has been declining for decades, and must be considered when developing both population and household forecasts. See **Chapter 3 – *Land Use and Population*** for a discussion of the forecasting methodologies used in this Plan. Another component of the RE value is the quantity of rainfall or stormwater that makes its way into the sewer system. This water is called Infiltration and Inflow (I&I). Infiltration is stormwater that leaks into the system through cracks, joints, and manholes. Inflow is stormwater that is routed into the system primarily through illegal connections of roof drains or cross-connection of stormwater pipes with the sanitary collection system.

For the City's system, a typical residential unit generated an average of 180 gpd of wastewater flow, based on the 5-year average annual flows at the WWTP for the period of January 2011 to December 2015. Over that same period, the minimum month flow per residential unit was 129 gpd per RE (gpd/RE), and the maximum month flow per residential unit was 271 gpd/RE. Subtracting these two numbers results in a rough estimate of 142 gpd/RE of I&I. **Table 2-3 – *RE Components*** displays these values in tabular form.

Table 2-3
RE Components

Parameter	Flow (gpd/RE)
Average Daily Flow	180
Maximum Month Flow	271
Minimum Month Flow	129
Infiltration & Inflow	142

Quality

The City's influent quality, as measured at the WWTP, is also typical of residential flows. For the period from January 2011 to December 2015, Biochemical Oxygen Demand (BOD) averaged approximately 276 milligrams per liter (mg/L) and Total Suspended Solids (TSS) averaged approximately 299 mg/L. The high-low monthly extremes for these parameters ranged from 386 to 232 mg/L BOD and 391 to 232 mg/L for TSS. See **Table 2-4 – *Mean Monthly Wastewater Quality*.**

Table 2-4
Mean Monthly Wastewater Quality

Parameter (2011 to 2015)	Average Concentration (mg/L)	Minimum Concentration (mg/L)	Maximum Concentration (mg/L)
Biochemical Oxygen Demand	276	174	386
Total Suspended Solids	299	199	391

Existing Collection System

The City's existing system is comprised of approximately 89 miles of gravity sewers and force mains. Within the current collection system, wastewater flow is generally routed from the northern and southern areas of the City to the SR 410 interceptor. **Figure 2-4 – *Sewer Service Basins*** provides an overview of the City's collection system. Most of the wastewater collected in the system routes through at least one of the 25 lift stations serving the system. **Figure 2-4 - *Sewer Service Basins*** is color-coded to show which sections of pipe are linked to which lift stations.

This interceptor then carries all flow from the Lake Tapps plateau to the WWTP to be treated prior to discharge to the White River. The interceptor to the treatment plant is about 5 miles long and includes sections of 16-inch, 18-inch, 24-inch, and 30-inch diameter pipe. **Figure 2-4 – *Sewer System Basins*** shows the configuration of this interceptor as it descends down the steep edge of the Lake Tapps plateau to the WWTP.

Table 2-5 – *Inventory of Sewer System Pipes by Size and Type* summarizes the pipes comprising the City's system by size and type.

Table 2-5
Inventory of Sewer System Pipes by Size and Type

Diameter	Force Main	Gravity	Interceptor	Total[1]	Percent
(inches)	(feet)	(feet)	(feet)	(feet)	%
2	4,938	0	0	**4,938**	1%
2 1/2	297	0	0	**297**	0%
3	5,677	0	0	**5,677**	1%
4	19,222	0	0	**19,222**	4%
6	20,615	0	0	**20,615**	4%
8	10,681	310,380	0	**321,061**	68%
10	9,187	22,537	0	**31,724**	7%
12	0	12,778	0	**12,778**	3%
16	0	0	12,721	**12,721**	3%
18	0	10,960	3,418	**14,378**	3%
24	0	7,937	1,489	**9,426**	2%
30	0	8,408	7,923	**16,331**	3%
Total	**70,617**	**373,000**	**25,551**	**469,168**	**100%**
Miles	13	71	5	**89**	

Note:
[1]Included in this total is 19,398 feet of dry sewer main that is owned and maintained by the City.

As is common with many sewer systems of the City's character, the majority of the systems' pipes (68 percent) are gravity 8-inch diameter pipes. Because of the undulating topography of the City's service area the City also operates 25 lift stations of varying sizes and configurations. The characteristics of these lift stations are summarized in **Table 2-6 – *Sewage Lift Stations***. A summary of existing lift station conditions is in **Appendix L – *Lift Station Field Evaluations***.

Table 2-6
Sewage Lift Stations

Lift Station	Location	Pump Capacity (gpm)	TDH per Pump (feet)	Pump Size (hp)	Pump Type	No. of Pumps	Pump Model
1	95th Street Loop	120	68	7.5	CS	2	Flyght 3127
2	Sky Island	88	221	32	CS	2	Pumpex Model K-89 VE1211
3	BL Elementary	135	44	5	CS	2	Flyght 3102
4	Lake Bonney	145	43	5	CS	2	Flyght 3102
5	Myers Road	120	75	10	CS	2	Flyght 3127
6	Debra Jane South	100	47	5	CS	2	Flyght 3102
7	McGhee	120	46	5	CS	2	Flyght 3102
8	Debra Jane West	140	65	10	CS	2	Flyght 3127
9	Mt. Creek	120	89	23	CS	2	Flyght 4-inch 3153
10	White River	298	91.5	18	CS	2	Flyght N-3153
11	Interlake Island	145	30	3	CS	2	Flyght 3085
12	Inlet Island	270	63	10	CS	2	Flyght 3127
13	Church Lake Drive	820	48	20	CS	2	Flyght 3153
14	Flume	720	40	20	CS	2	Flight 3152
15	Vandermark	100	47	5	CS	2	Flyght 3102
16	Maple Point	100	47	5	CS	2	Flyght 3102
17	SR 410	1,200	155	70	CS	4	Flyght 3202
18	Safeway	500	68	20	CS	2	Flyght 3153
19	Willowbrook	1,200	160	75	VS	2	FM D5434M
20	Spring Haven	381	89	18	CS	2	Flyght 3127
21	Panorama West	300	195	50	VS	4	FM D5435
22	Brookfield	174	88.3	10	CS	2	Flyght 3127
23	Eastown	459	80	20	VS	2	Flyght
24	Fennel Creek	330	153	35	VS	2	Flyght 3171
25	Bonney Lake Estates	284	72	11	CS	2	Flyght 3127

Abbreviations:
gpm - gallons per minute
TDH - Total Dynamic Head
hp - horsepower
CS - Constant Speed
VS - Variable Speed

Treatment Plant

As described previously, the City conveys all of its sewage to the WWTP and is a financial partner with Sumner in the expansion, ownership, and operation of this plant. This plant was recently upgraded in 2015 to have a design flow (maximum month) of 6.10 million gallons per day (MGD). The City's agreement with Sumner allows it to use up to 54 percent of the plant's capacity; subject to payment of capital and operations and maintenance (O&M) costs. This presents an upper capacity limit for the City of approximately 3.30 MGD. The average annual flow for the entire plant over the last 5 years is 2.21 MGD (67 percent of capacity) based on WWTP records. In 2015, the maximum month flow, or Average Design Flow (ADF), for the City was 1.91 MGD (58 percent of capacity). **Table 2-7 - *WWTP Flow Capacity*** summarizes the current usage and design capacity of the WWTP.

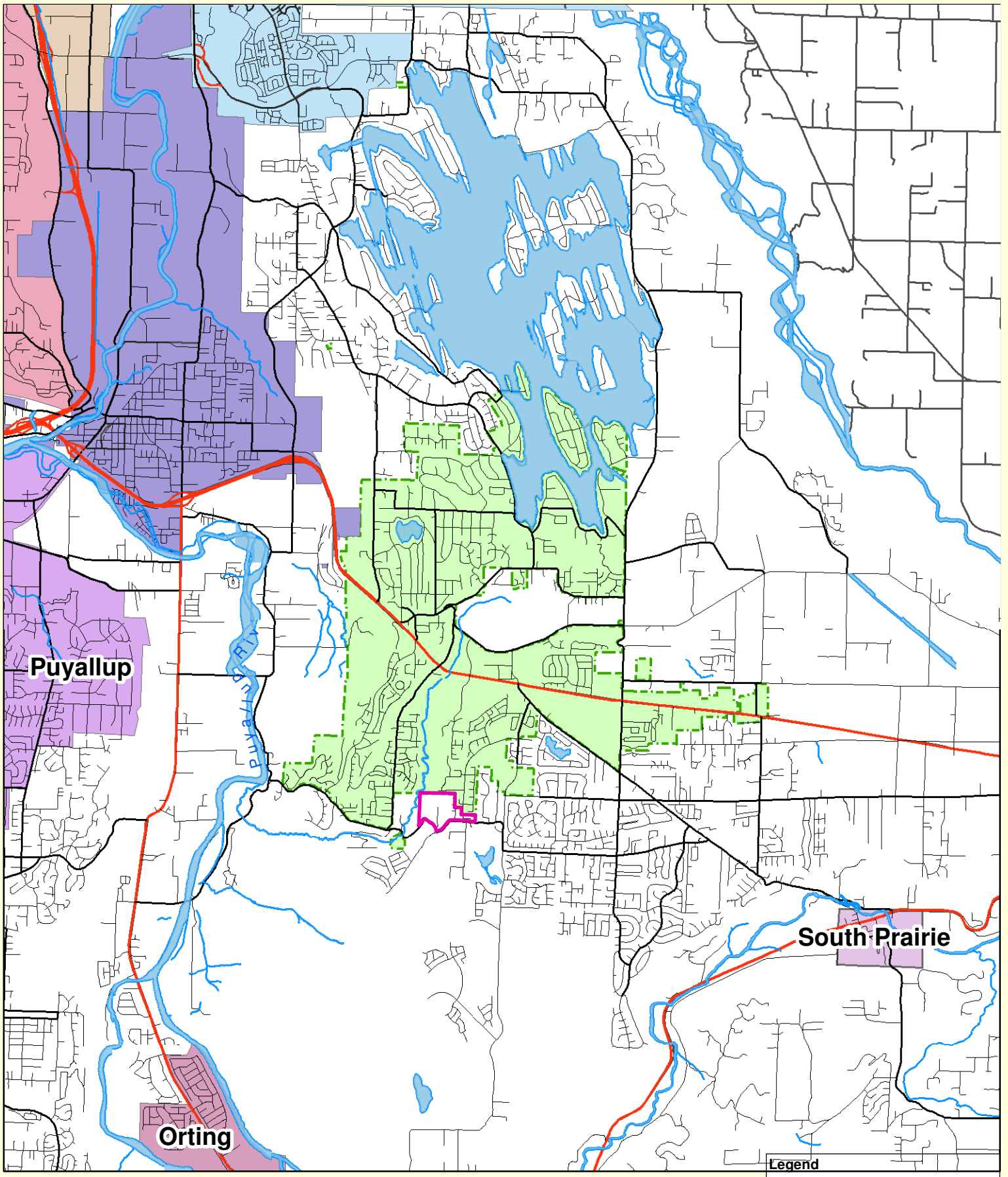
Table 2-7
WWTP Flow Capacity

Owner	2015 Flow Rate	Capacity	
	(MGD)	(MGD)	% Used
Bonney Lake	1.91	3.30	58%
Sumner	1.59	2.80	57%
Total	**3.50**	**6.10**	**57%**

Telemetry and Control System

Successful operation of any municipal sewer system requires gathering and using accurate sewer system information. A telemetry and supervisory control system gathers information and can efficiently control a system by automatically optimizing facility operations. A telemetry and supervisory control system also provides instant alarm notification to operations personnel in the event of equipment failure, operational problem, flood, fire, or other emergency situations.

Successful operation of any municipal sewer system also requires a comprehensive O&M program that includes gathering and using accurate sewer flow information. A telemetry and supervisory control system gathers information and efficiently controls a system by automatically optimizing facility operations and cataloging system demands. The City recently started updating its supervisory control and data acquisition (SCADA) system to replace the Master Telemetry Unit (MTU) and to add dual monitors for the water and sewer systems.



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BONNEY Lake

Figure 2-1
Political Boundaries
City of Bonney Lake
General Sewer System Plan

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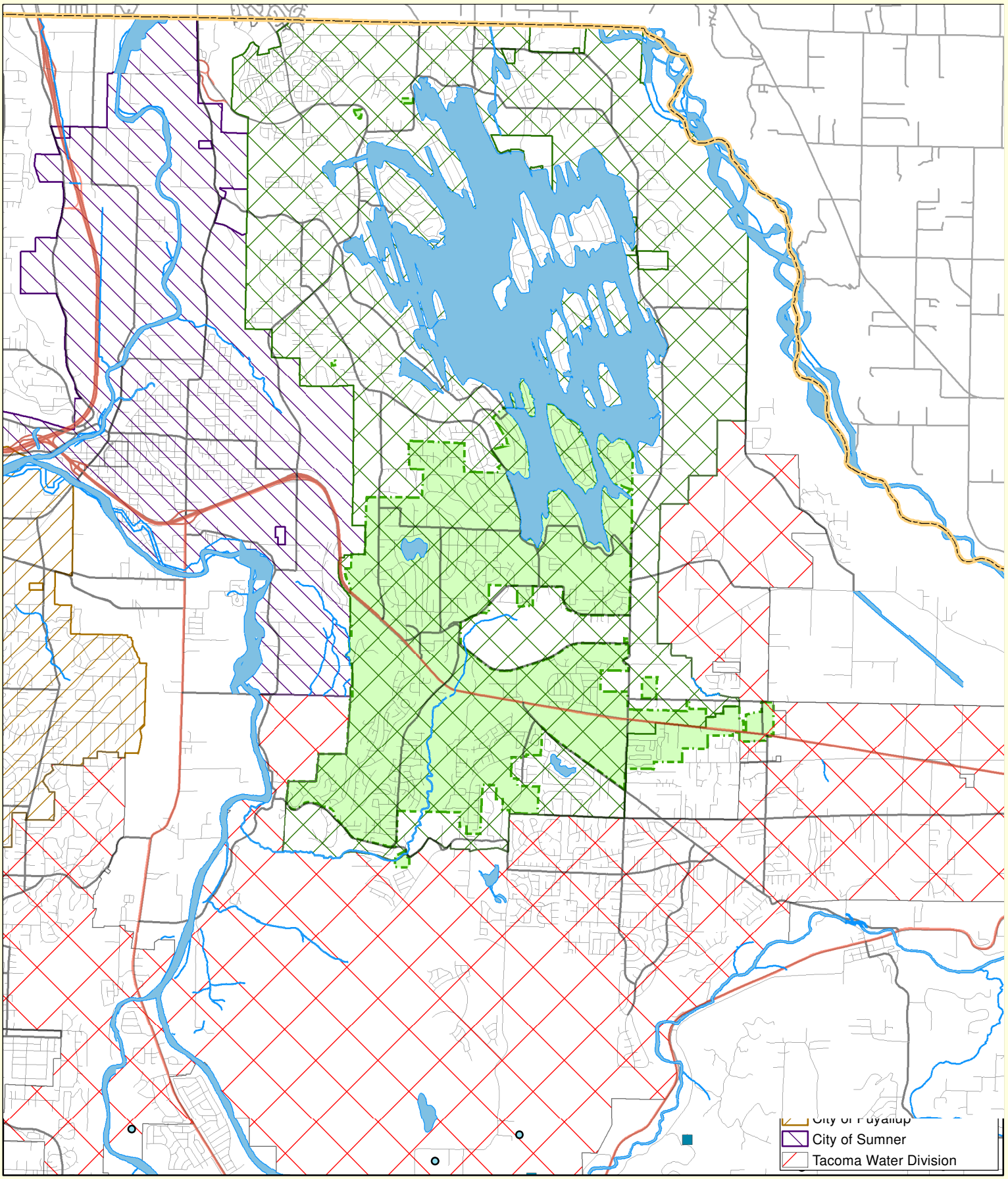

Figure 2-2
Water Systems and Sources
City of Bonney Lake
General Sewer System Plan

1 inch = 6,000 feet

0 6,000 Feet

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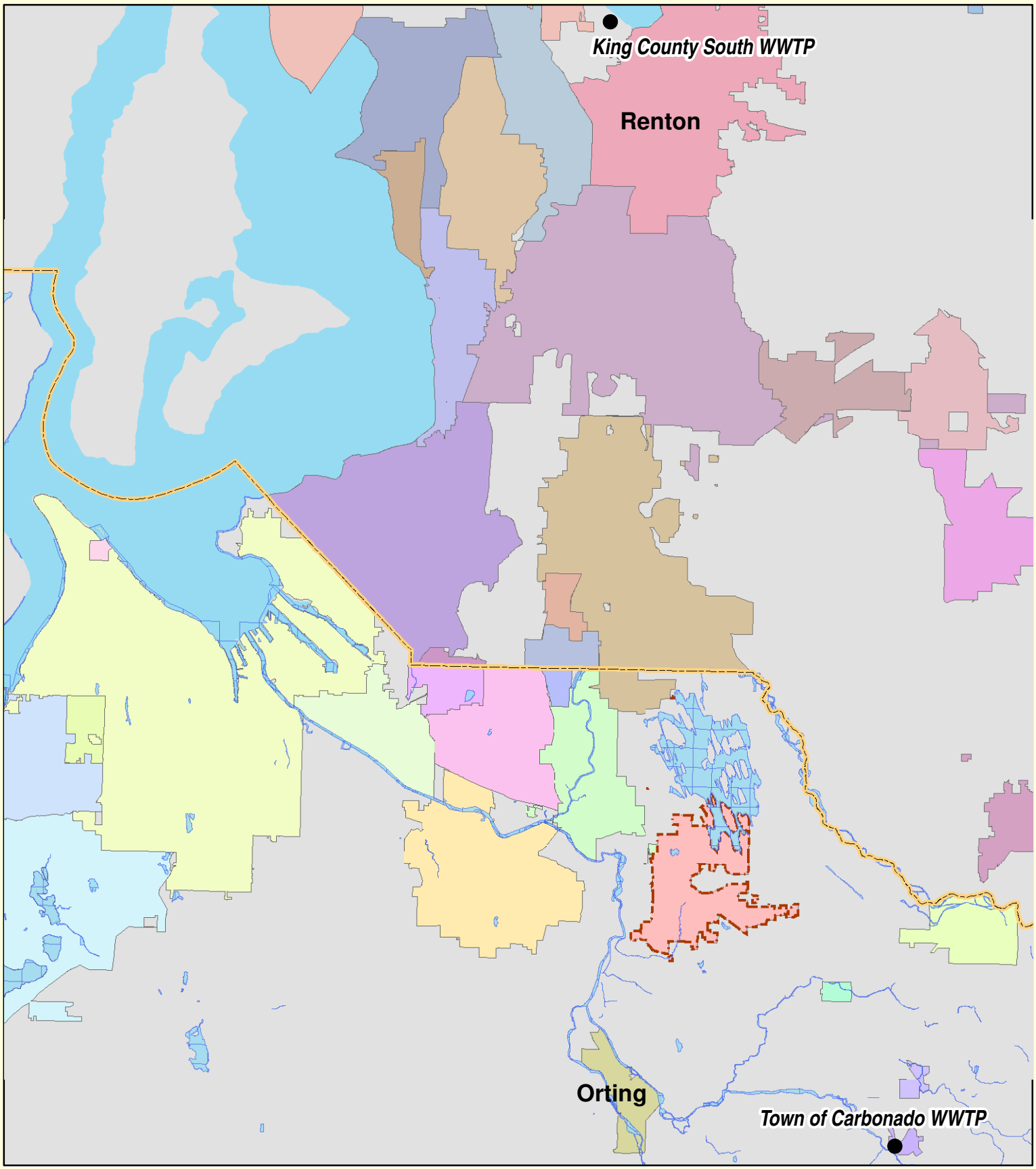

Figure 2-3
WWTP In the Puyallup River Basin and Within Twenty Miles of BonneyLake

City of Bonney Lake
General Sewer System Plan

1 inch = 18,000 feet

0 Feet 18,000

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LEGEND

- SCHOOL
- CLEANOUT
- CITY OWNED GRINDER
- MANHOLE
- FLOW DIRECTION
- LS - # LIFT STATION
- 8" PIPE DIAMETER (INCHES)
- FORCE MAIN
- GRAVITY MAIN (COLOR BY BASIN)
- BONNEY LAKE CITY LIMITS
- BONNEY LAKE UGA

SCALE: 1" = 1000'

FIGURE 2-4

City of Bonney Lake

General Sewer System Plan

SEWER SERVICE BASINS

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BONNEY Lake

1/26/2017

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