

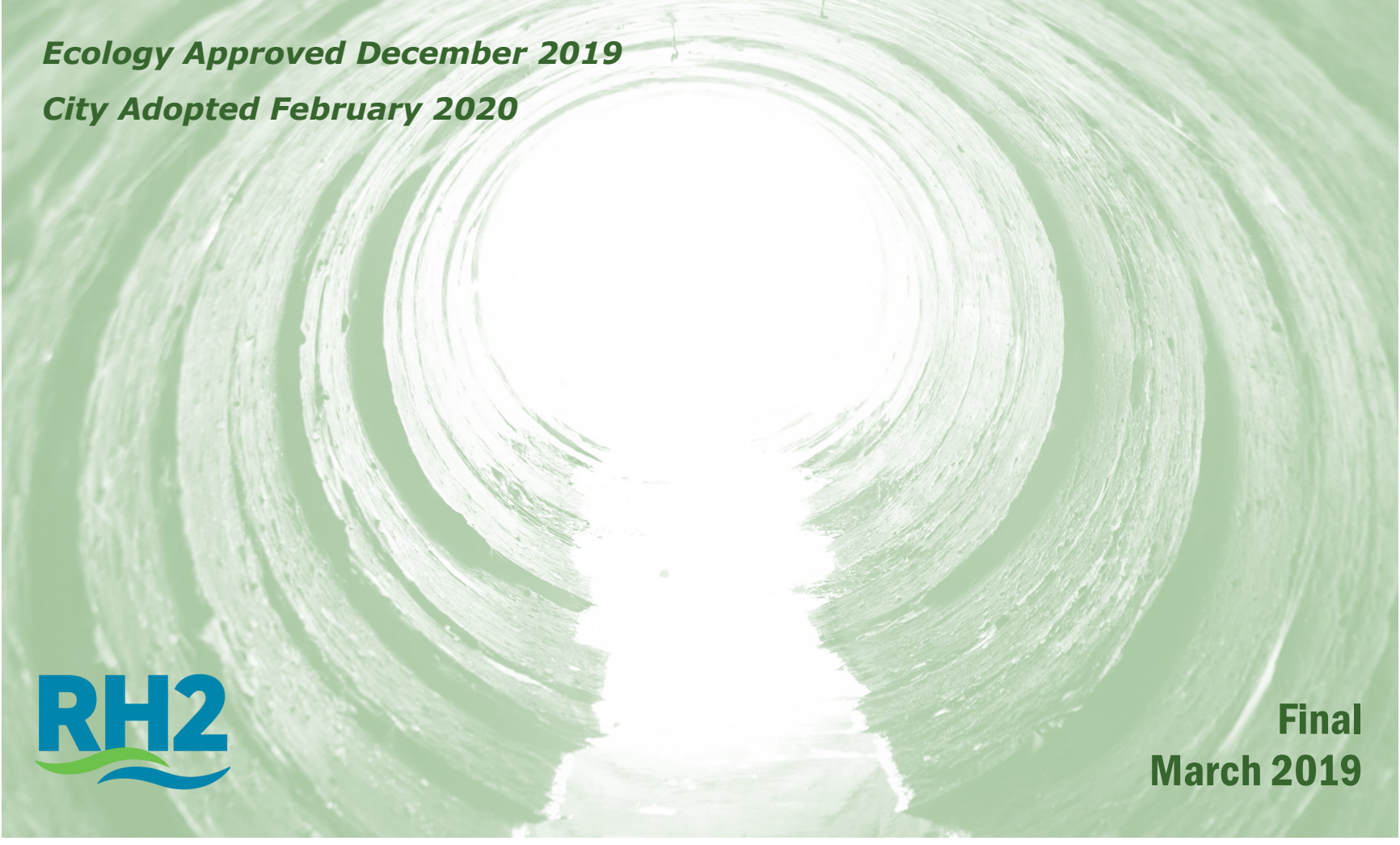


City of Bonney Lake

GENERAL SEWER SYSTEM PLAN



Ecology Approved December 2019
City Adopted February 2020



Final
March 2019

City of Bonney Lake General Sewer System Plan

***Final
March 2019***

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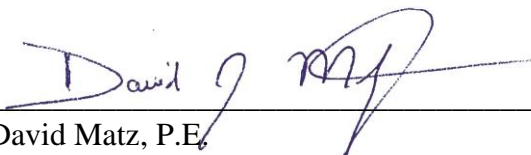
This General Sewer System Plan for the City of Bonney Lake was prepared under the direction of the following registered professional engineers.

This Plan was adopted by the City of Bonney Lake Council on _____
via Ordinance No. _____.



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David Matz, P.E.



City of Bonney Lake General Sewer System Plan Table of Contents

EXECUTIVE SUMMARY

Sewer System Changes.....	ES-1
Infrastructure Changes.....	ES-2
Plan Strategy.....	ES-3
Ensure Safety and Reliability	ES-4
Promote Stewardship of Water Resources	ES-4
Support Planned Growth and Development	ES-5
Proposed Water System Improvements and Financing Plan	ES-5
Summary of Major Recommendations	ES-5

CHAPTER 1 – INTRODUCTION

Introduction	1-1
Sewer System Ownership and Management.....	1-1
Overview of the Existing Sewer System	1-1
Authorization and Purpose	1-2
Summary of Plan Contents	1-3
Definition of Terms	1-3
List of Abbreviations	1-5

CHAPTER 2 – SEWER SYSTEM DESCRIPTION

Introduction	2-1
Sewer Service Area	2-1
Ownership	2-1
History.....	2-2
Geography	2-5
Geology	2-5
Topography	2-5
Climate	2-5
Water Supply Sources Withing the Sewer Service Area.....	2-6
Wastewater Treatment Facilities	2-6
Other Sewer Utilities	2-6
Sewer Service Area	2-6
Existing Sewer Facilities	2-7
Existing Wastewater Flow Characteristics	2-7
Connections	2-7
Quantity	2-9
Residential Equivalency	2-9
Quality	2-10
Existing Collection System	2-10
Treatment Plant	2-13
Telemetry and Control System	2-13

City of Bonney Lake General Sewer System Plan Table of Contents

CHAPTER 3 – LAND USE AND POPULATION

Introduction	3-1
Compatibility with Other Plans	3-1
Introduction	3-1
Growth Management Act	3-2
Land Use.....	3-3
City of Bonney Lake	3-3
Pierce County	3-3
Existing Land Use	3-5
Proposed Land Use.....	3-7
Population.....	3-7
Existing and Future Population	3-7
Household Trends.....	3-9
Saturation Projections.....	3-9

CHAPTER 4 – PROJECTED GROWTH AND FUTURE SERVICE AREAS

Projected Growth and Future Service Areas.....	4-1
Introduction	4-1
Existing and Future Service Areas.....	4-2
Existing Core Sewer Service Area	4-2
South Sewer Service Area	4-2
North Sewer Service Area	4-2
Forecast Sewage Flows and Planning Considerations	4-3
Forecast Growth Methodology	4-3
PSRC Source Data	4-3
Pierce County GIS Data	4-3
Forecast Conversions to Sanitary Service	4-3
Forecast Residential Equivalents	4-4
Forecast Flow and Distribution	4-4
RE Flow Components and Calculations.....	4-5
Forecast Flow Values.....	4-7
Reuse Potential.....	4-9
Seasonal Irrigation	4-9
Aquifer Storage and Recovery (ASR).....	4-9
Forecast Flows and Planned Development	4-9
Easttown	4-9
South Sewer Service Area	4-10
SSSA Wastewater Flows.....	4-10
Pump to CSSA and WWTP	4-10
Flow to New Bonney Lake WWTP	4-11
New Interceptor to Sumner WWTP	4-11
Recommended Option.....	4-11
North Sewer Service Area	4-11
NSSA Wastewater Flows.....	4-12
Metro/King County WWTP.....	4-12
Bonney Lake/Sumner WWTP.....	4-14
New Bonney Lake WWTP.....	4-17
Recommended Option.....	4-17
CSSA (Downtown, Midtown, and the Neighborhoods)	4-17
Interceptor Improvements.....	4-18
WWTP Improvements	4-19
Summary of Recommended Improvements	4-19

City of Bonney Lake General Sewer System Plan Table of Contents

CHAPTER 5 – POLICIES AND DESIGN CRITERIA

Introduction	5-1
Sewer Service Policies.....	5-3
Wastewater Treatment	5-3
Conservation.....	5-4
Service Area Policies.....	5-4
Annexations.....	5-4
Service Area	5-5
Facility Policies	5-5
Sewer Mains	5-5
Lift Stations	5-6
Maintenance	5-6
Temporary and Emergency Services	5-6
Reliability	5-7
Joint Use.....	5-7
Organizational Policies.....	5-7
Structure	5-7
Staffing	5-7
Relationship with Other Departments	5-7
Planning and Regional Participation	5-8
Financial Policies.....	5-8

CHAPTER 6 – EXISTING SYSTEM EVALUATION

Introduction	6-1
Collection System.....	6-2
Angeline Road/Sky Island Truck Line	6-2
SR 410 Trunk Line	6-2
WWTP Interceptor	6-3
Individual Grinder Pumps	6-3
Lift Stations	6-4
Lift Station Design Review	6-7
Wastewater Treatment Plant.....	6-8

CHAPTER 7 – OPERATIONS AND MAINTENANCE

Introduction	7-1
Normal Operations	7-2
Organizational Structure.....	7-2
Communication	7-4
Equipment	7-4
Routine Operations and Preventative Maintenance.....	7-4
Lift Station Maintenance	7-4
Pipeline Maintenance	7-6
Manhole Maintenance	7-6
Safety.....	7-6
Inspections.....	7-6
Records.....	7-7
Staffing.....	7-8
Emergency Operations Plan	7-10

City of Bonney Lake

General Sewer System Plan

Table of Contents

CHAPTER 7 – OPERATIONS AND MAINTENANCE (Continued)

Sewer System Construction Standards	7-10
Operation and Maintenance Evaluation	7-10
Deficiencies and Recommendations	7-10
Manhole Inspection and Rehabilitation	7-11
Manhole Inflow Reduction Program	7-11
Odor Control	7-11
Pipeline Video Inspection Program	7-11
Critical Pipe Section Monitoring Program	7-12
Standard Procedures and Recordkeeping	7-12
Power or Equipment Failures at Lift Stations	7-13
Flushing Program	7-13

CHAPTER 8 – SEWER SYSTEM IMPROVEMENTS

Introduction	8-1
Description of Improvements	8-2
Sewer Main Improvements	8-7
CIP C-01: Flume Trestle Rehabilitation	8-7
CIP C-02: SR 410 Sewer Main Improvements (East of LS 17)	8-7
CIP C-03: Mt. Creek Force Main Replacement	8-7
CIP C-04: Inflow and Infiltration (I&I) Reduction Program	8-7
CIP C-05: 192nd Sewer Main Extension	8-8
Lift Station Improvements	8-8
CIP LS-01: LS 18 Improvements	8-8
CIP LS-02: LS 17 Improvements	8-8
CIP LS-03: LS 20 Repairs	8-8
CIP LS-04: LS 17 Improvements	8-8
Facility Improvements	8-8
CIP F-01: SCADA – Telemetry System Upgrade	8-9
CIP F-02: Public Works Complex (PWC)	8-9
CIP F-03: WWTP Equipment Upgrade	8-9
CIP F-04: Emergency Power Generator Replacements	8-9
CIP F-05: Vehicle from Interfund Transfer Balance	8-9
CIP F-06: Sumner WWTP Expansion	8-10
Planning and General Improvements	8-10
CIP G-01: Inflow and Infiltration (I&I) Reduction Program	8-10
CIP G-02: Lift Station 17 Upgrade Analysis Study and Interceptor Evaluation	8-10
CIP G-03: Sewer System Plan Update	8-10
CIP RR: Replacement Program	8-10
Annual Programs	8-10
CIP A-01: Lift Station Improvements	8-10
CIP A-02: Equipment Upgrades	8-11
CIP A-03: Manhole Repair and Replacement	8-11
CIP A-04: SCADA Telemetry System Maintenance and Repair	8-11
CIP A-05: Replacement and Unscheduled Projects	8-11
CIP A-06: Falling Water LOSS (Large On-site Septic System) Repairs	8-11
Estimating Costs of Improvements	8-12

City of Bonney Lake General Sewer System Plan Table of Contents

CHAPTER 9 – FINANCIAL ANALYSIS

Introduction	9-1
Capital Funding Options	9-2
Governmental Grant and Loan Programs	9-2
Publicly Issued Debt.....	9-3
Utility Cash Resources and Revenue.....	9-3
Projection of Financial Performance	9-3
Capital Funding Strategy	9-4
Fiscal Policies.....	9-4
Revenue Requirements.....	9-4
Rate Assessment.....	9-5
Rate Levels.....	9-5

TABLES

Table ES-1 – Sewer System Date
Table 1-1 – Sewer System Data
Table 1-2 – Abbreviations
Table 2-1 – Sewer Plan Areas
Table 2-2 – Sewer Connections by Type (Number of Accounts)
Table 2-3 – RE Components
Table 2-4 – Mean Monthly Wastewater Quality
Table 2-5 – Inventory of Sewer System Pipe by Size and Type
Table 2-6 – Sewage Lift Stations
Table 2-7 – WWTP Flow Capacity
Table 3-1 – Existing Land Use by Area
Table 3-2 – Existing Land Use by Percentage
Table 3-3 – Population Trends and Projections
Table 3-4 – Housing Units and Population Served in CSSA
Table 4-1 – Historical Flows and Rainfall
Table 4-2 – Residential Equivalent Values
Table 4-3 – Growth Projections (REs)
Table 4-4 – WWTP Capacity
Table 6-1 – Sewer Lift Station Locations and Capacities
Table 6-2 – Sewer Lift Station Capacities Compared to Existing Flows
Table 6-3 – Sewer Lift Station Capacities Compared to Forecast Growth Flows
Table 7-1 – Public Works Equipment Summary
Table 7-2 – Staffing Requirements
Table 8-1 – Proposed Improvements Implementation Schedule (6-year CIP)
Table 8-2 – Proposed Improvements Implementation Schedule (10-year CIP)
Table 8-3 – Proposed Improvements Implementation Schedule (20-year CIP)
Table 8-4 – Sewer Main Unit Costs

CHARTS

Chart ES-1 – Total Customers Served Projections (REs)
Chart 4-1 – Total Customers Served Projections (REs)
Chart 7-1 – Organizational Structure

City of Bonney Lake General Sewer System Plan Table of Contents

FIGURES

- Figure 2-1 – Political Boundaries
- Figure 2-2 – Water Systems and Sources
- Figure 2-3 – WWTP in the Puyallup River Basin and within Twenty Miles of Bonney Lake
- Figure 2-4 – Sewer Service Basins
- Figure 3-1 – Existing Land Use
- Figure 3-2 – City of Bonney Lake Proposed Land Use
- Figure 3-3 – Unincorporated Proposed Land Use
- Figure 4-1 – Existing Sewer System Area
- Figure 4-2 – Sewer Service Area (2016)
- Figure 4-3 – Potential Reuse Locales
- Figure 4-4 – Eastown Future Sewer Service Area
- Figure 4-5a – South Future Sewer Service Area through Bonney Lake Alternative
- Figure 4-5b – South Future Sewer Service Area Service to New WWTP
- Figure 4-5c – South Future Sewer Service Area New Interceptor to Existing WWTP
- Figure 4-6a – North Future Sewer Service Area through Auburn Alternative
- Figure 4-6b – North Future Sewer Service Area through Sumner Alternative
- Figure 4-6c – North Future Sewer Service Area through Bonney Lake Alternative
- Figure 4-6d – North Future Sewer Service Area through Bonney Lake Alternative
- Figure 4-7 – Future Sewer Service Area
- Figure 4-8 – Proposed Sewer System Improvements
- Figure 6-1 – City Owned Individual Grinder Pumps
- Figure 6-2 – Individual Sewer Basins

APPENDICES

- Appendix A – March 2002 Sanitary Sewer System Transfer Agreement; Bonney Lake and Pierce County
- Appendix B – May 2002 Intergovernmental Agreement for Improvements and Expansion of the Sumner Wastewater Treatment Facility; Bonney Lake and Sumner
- Appendix C – Sumner Wastewater Treatment Plant NPDES Permit
- Appendix D – EPA Order for Providing Service to West Lake Tapps
- Appendix E – Residential Equivalency Calculations
- Appendix F – Standard Details
- Appendix G – Preliminary North Sewer Service Area Report
- Appendix H – Ordinance No. 1341
- Appendix I – Septic System Abatement Plan
- Appendix J – SEPA Checklist
- Appendix K – Land Use Figures
- Appendix L – Lift Station Field Evaluations

Executive Summary



In November 2015, the City authorized RH2 Engineering, Inc., (RH2) to update its General Sewer System Plan (Plan) in accordance with Washington Administrative Code (WAC) 173-240-050. The previous Plan was prepared for the City in 2009. The *2016 General Sewer System Plan* documents the City’s existing sewer system and outlines improvement strategies and programs to help guide the City in planning for future sewer customers. This document provides the foundational analysis and planning direction consistent with Washington Department of Ecology and Growth Management Act (GMA) requirements and can be used by the City to adequately operate and maintain its sanitary sewer system.

SEWER SYSTEM CHANGES

Since the last sewer planning effort was completed in 2009 (based on 2008 data) the number of sewer customers has increased by approximately 12 percent and the Wastewater Treatment Plant (WWTP) at Sumner has also been increased by approximately 44 percent.

Few changes have occurred to the overall sewer service area (SSA) and the City is still planning on serving the same service area including the South Sewer Service Area (SSSA) and the North Sewer Service Area (NSSA). Growth over the next 10 years will occur primarily as infill in the City’s Core Sewer Service Area (CSSA) and as a few planned developments in the SSSA. **Table ES-1 – Sewer System Data** summarizes the changes in the major components in the sewer system over the last seven years.

**Table ES-1
Sewer System Data**

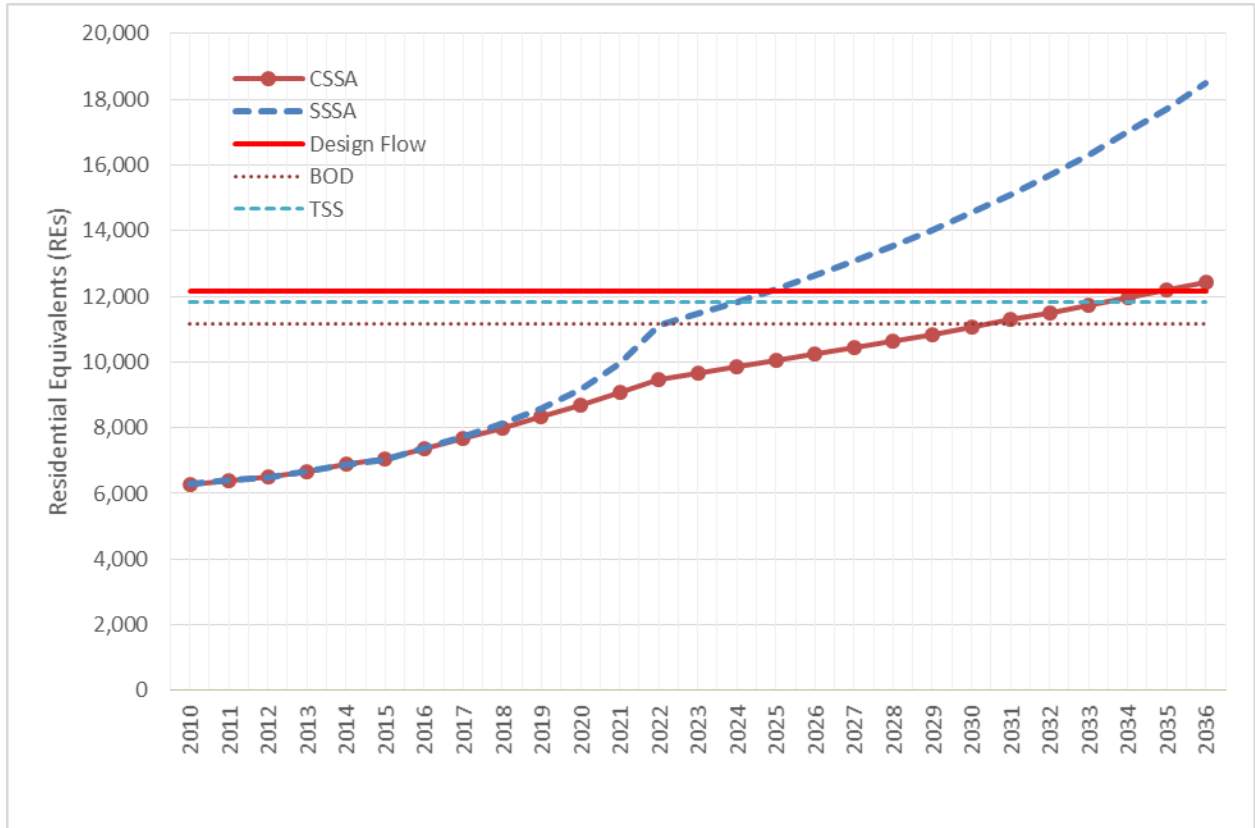
Sewer System Data	2008	2015	Change
Population Served	16,182	17,148	106%
City Limits and Potential Annexation Areas	4,831 acres	4,859 acres	101%
Total Customers	6,307 REs	7,045 REs	112%
Total Length Sewer Pipe	81.2 miles	88.9 miles	109%
Number of Pump Stations	22	25	114%
Average Design Flow per RE	275 gpd/RE	271 gpd/RE	99%
Treatment Capacity (Bonney Lake's Share)	2.30 MGD	3.30 MGD	144%

INFRASTRUCTURE CHANGES

To accommodate the increase in customers served by the system, the City participated with the City of Sumner in a large capacity upgrade at the joint WWTP. Improvements at the WWTP included increasing capacity to about 6.1 million gallons per day (MGD) for maximum month flow. Bonney Lake’s share of the expanded plant is 54 percent of capacity, or about 3.3 MGD. This capacity, along with currently proposed improvements, will provide capacity for both Bonney Lake’s existing and planned new customers in the CSSA through the year 2030. However, if major developments occur in the SSSA then existing capacity at the WWTP will only accommodate growth through 2022. Developers in the SSSA will need to work with the City to plan for additional capacity at the joint WWTP or elsewhere.

Projected growth in terms of residential equivalents (REs) compared to existing treatment capacity at the WWTP, also expressed in terms of REs, is presented in **Chart ES-1 -Total Customers Served Projections (REs)**. This chart shows that the limiting factor at the WWTP is the plant’s ability to treat Biochemical Oxygen Demand (BOD), and that capacity will be reached by 2030 for the CSSA and by 2022 if growth in the SSSA is also included.

**Chart ES-1
Total Customers Served Projections (REs)**



While the improvements to the WWTP are visible and critical, other improvements to the Bonney Lake system, in the form of new lift stations, force mains and collection mains, have been added continuously since 2008. Most notably the addition of three new lift stations and almost complete replacement/upgrades to the main interceptor that conveys sewage from the City to the WWTP.

PLAN STRATEGY

The strategies, programs, improvements and facilities recommended in the 2016 Plan address the following three major principles.

1. Safety and Reliability
2. Resource Stewardship
3. GMA Consistency

These principles are addressed while presenting a plan that conforms to Ecology’s requirements for plans of this type.

Executive Summary

Ensure Safety and Reliability

This Plan addresses safety and reliability in two fundamental ways. First, from an operational perspective, it carefully looked at the system's components, its vulnerabilities and its reliabilities. Based on these assessments, the Plan recommends a number of steps, including adding additional staff to the Sewer Utility to properly address the day-to-day operational needs of a system that relies heavily on mechanical components (see **Chapter 7**).

Second, also related to reliability, the Plan recognizes the nearly total dependence of the system on the continuous and nearly flawless operation of Lift Station 17. Unless alternatives are developed, dependency on Lift Station 17 will increase with concomitant increases in risk associated with any failure of the station. Accordingly, the Plan recommends both short and long-term steps to improve the system's safety and reliability as it relates to Lift Station 17. In the near term, improvements in and around Lift Station 17 are recommended to better prepare for possible failure or shut-down. Long term, the plan recommends further detailed analysis of the construction of decentralized wastewater treatment plants in both the SSSA and NSSA (see **Chapter 4**) and alternative ways in conveying flows to the WWTP in Sumner. Decentralized WWTPs would allow the City to divert flows that would otherwise need to go through Lift Station 17 to a new WWTP. The Plan also recommends evaluating the option of constructing a secondary interceptor to the Sumner WWTP along Angeline and Rhodes Lake Road East.

Promote Stewardship of Water Resources

Bonney Lake's responsibility for water resource stewardship extends beyond safely and reliably managing wastewater collection and treatment. Bonney Lake also operates and protects a major potable water supply system that is largely dependent on local groundwater resources. Bonney Lake also borders a major water body (Lake Tapps) that, in reality, is a man-made storage reservoir created for hydro-power generation. As a general purpose local government, Bonney Lake also has obligations to protect and preserve surface water quality and hydrology. It is in this context that the City's Plan includes provisions to wisely manage wastewater resources.

To that end, this Plan includes specific recommendations regarding wastewater reuse. These include investigation of artificial aquifer storage and recovery (ASR) that could, if feasible, retain water in a more natural hydrologic cycle on the Lake Tapps plateau, rather than piping it down the hill for treatment and direct discharge to surface water.

In concert with the concept of ASR, as well as in support of improved safety and reliability, the Plan recommends the option of constructing at least two membrane bio-reactor wastewater treatment plants that could produce high quality water (Class A effluent), which would be suitable for reuse. Reuse options include relatively straight-forward applications, such as irrigation, as well as more technically challenging options, such as ASR or surface water augmentation.

Support Planned Growth and Development

Bonney Lake’s sewer service area includes all of the City and its designated Potential Annexation Area (PAA), as well as two large areas of unincorporated Pierce County. Both the City and Pierce County have adopted comprehensive plans under the Growth Management Act (GMA) that call for and plan for residential and employment growth that is dependent on sanitary sewer service. This Plan was developed using the most current land use plans and GMA forecasts from the PSRC. The infrastructure improvements programmed in the Capital Improvement Program (CIP) (see **Chapter 8**) and the studies and reports recommended throughout the plan are consistent with and support the GMA goals and policies of both the City and Pierce County.

PROPOSED WATER SYSTEM IMPROVEMENTS AND FINANCING PLAN

Improvements to the sewer system are necessary to resolve existing system deficiencies and accommodate the increase in sewer customers from future growth. Improvements identified for the first 6 years of the capital improvement program (2018 through 2023) are estimated to cost approximately \$9.3 million, which results in an average expenditure of approximately \$1.55 million per year. Improvements in the following 14 years (2024 through 2037) are estimated to cost approximately \$27.9 million, which results in an average expenditure of approximately \$2.0 million per year.

The first 6 years of capital improvements can be funded from a combination of sources that include connection charges, sewer rates, reserves, and other funding sources if available. The City should conduct another rate analysis to ensure that City-controlled funding sources (i.e., connection charges and sewer rates) are adequate to ensure the utility is in good financial standing.

SUMMARY OF MAJOR RECOMMENDATIONS

The existing sewer system was evaluated to determine its ability to meet the policies and design criteria of the City. The results of the evaluation are summarized below.

- The City has sufficient WWTP capacity to meet the needs of its CSSA customers through 2030. However, planning efforts should begin now to determine how treatment capacity will be developed for the SSSA and more distant NSSA developments.
- Capacity improvements along SR 410 should be evaluated and implemented to accommodate future growth in the Easttown area and the WSU Forest area.
- Capacity and reliability improvements should be evaluated and implemented for Lift Station 17.
- Capacity and reliability improvements should be evaluated and implemented for Lift Station 18.
- Planning effort for an additional interceptor from the City to the WWTP should be started in increase the capacity and reliability of this critical component of the City’s system.