



GENERAL SEWER PLAN

Prepared for Lake Chelan Reclamation District

March 2024
LCR 210242.00.0007



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March 2024

Prepared by RH2 Engineering, Inc.

Prepared for Lake Chelan Reclamation District

Note: This General Sewer Plan was completed under the direct supervision of the following
Licensed Professional Engineers registered in the State of Washington.

Sincerely,
RH2 ENGINEERING, INC.



Signed:
3/13/2024

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1 | INTRODUCTION

Sewer System Ownership and Management

The Lake Chelan Reclamation District (District) was formed under Revised Code of Washington (RCW) Title 87 as an irrigation district in 1920. Irrigation was the District's primary function until both domestic water service and sanitary sewer service were added to the District's operations. The District owns and operates its sanitary sewer collection and transmission system, which primarily serves the Manson Urban Growth Area (UGA). Additional parcels in close proximity to the shores of Lake Chelan but outside the Manson UGA also are served by the District.

Overview of Existing System

Sewage collection and transmission are provided through a conventional gravity collection system with lift stations. The transmission pipelines are known as the Northshore Interceptor. The interceptor conveys wastewater along State Route (SR) 150 to the City of Chelan's (City) Transfer Station. The agreement between the City and the District, including details on ownership, operations, and maintenance of the interceptor, as well as discharge limitations, is discussed in further detail later in this General Sewer Plan (GSP). Sewage is pumped from the Transfer Station to the City's wastewater treatment plant (WWTP) in Chelan Falls. Treated effluent is discharged to the Columbia River.

The District's sewer system is comprised of 6 lift stations and approximately 14.5 miles of gravity sewer main. The District's system also includes 19.7 miles of force main, including low pressure force mains. The District's Lift Station No. 2 discharges through approximately 12 miles of the Northshore Interceptor to the City's system.

A summary of the District's sewer system is provided in **Table 1-1**.

Table 1-1
Sewer System Data (2019 Data)

Description	Data
Population (UGA)	2,338
Active Accounts	1,231
Average Annual Flow	0.201 MGD
Maximum Month Average Day Flow	0.297 MGD
Number of Lift Stations	6
Current Contribution per ERU (Maximum Month)	193 gpd
Planned Contribution per ERU (Maximum Month)	220 gpd
Total Length of Gravity Sewer Main	14.5 miles
Total Length of Sewer Force Main	19.7 miles

ERU = equivalent residential unit

MGD = million gallons per day

gpd = gallons per day

¹ Force main length includes Northshore Interceptor into the City.

Authorization and Purpose

The District authorized RH2 Engineering, Inc., (RH2) to prepare a GSP in accordance with Washington Administrative Code (WAC) 173-240-050. The previous GSP was prepared for the District in 2002. In recent years, the District has noticed increasing development pressure. Due to this trend and the age of the previous GSP, it is logical to update the District's GSP. The purpose of this updated GSP is as follows:

- To evaluate current sewer flow data and project future flows and loading.
- To identify areas where additional flow monitoring information is needed.
- To analyze the current sewer system to determine if it meets minimum requirements mandated by the Washington State Department of Ecology and the District's own policies and design criteria.
- To make an assessment of infiltration and inflow based on metered water usage, precipitation, average daily temperatures, and wastewater flows.
- To determine the overall reliability and vulnerability of the current wastewater lift stations.
- To identify existing and projected land use patterns in and adjacent to the District and their impacts on existing and potential future facilities.
- To identify sewer system improvements that will resolve current system deficiencies and accommodate future system growth or expansion.
- To prepare a schedule of improvements that meets the goals of the District's financial program.
- To confirm that the District's current rates are in line with future projects.

Summary of Plan Contents

A brief summary of the content of the chapters in this GSP is as follows:

- **Chapter 1** introduces the reader to the District's sewer system, the objectives of the GSP, and the GSP organization.
- **Chapter 2** presents the sewer service area and describes the existing sewer system.
- **Chapter 3** presents related plans, land use, and population characteristics.
- **Chapter 4** identifies existing wastewater flow and loading rates and projects future flow and loading rates.
- **Chapter 5** presents the District's operational policies and design criteria.
- **Chapter 6** discusses the sewer system analyses and existing system deficiencies.
- **Chapter 7** presents the proposed sewer system improvements, their estimated costs, and a schedule for implementation.
- **Chapter 8** discusses the District's operations and maintenance program.
- **Chapter 9** summarizes the financial status of the sewer utility and presents a plan for funding the sewer improvements.

2 | SEWER SYSTEM DESCRIPTION

INTRODUCTION

This chapter describes the Lake Chelan Reclamation District's (District) sewer service area and the current sewer system infrastructure components. The results of the evaluation and analyses of the current sewer system are presented in **Chapters 4** and **6**.

PREVIOUS PLANNING DOCUMENTS

The previous General Sewer Plan was completed in 2002. Other documents relevant to District infrastructure planning includes the following:

- 2022 City of Chelan *General Sewer Plan*, RH2 Engineering, Inc. (RH2).
- 2017 Chelan County (County) *Comprehensive Plan*.
- 2013 City of Chelan *Lord Acres Infrastructure Planning Report*, RH2.
- 2010 Lake Chelan Sewer District (LCSD) *Capital Improvement Plan*, RH2.
- 2008 City of Chelan *General Sewer Plan*, Gray & Osborne, Inc.
- 2007 *Northshore Interceptor Replacement Lift Station Capacity Analysis*, RH2.
- 2003 *Report on Site Geology for the Northshore Interceptor Replacement*, RH2.
- 2002 District *General Sewer Plan and Northshore Wastewater System Improvements Facility Plan*, RH2.
- 1991 *Lake Chelan Water Quality Plan*, R.W. Beck and Associates.

Recently Completed Projects

The following list includes the major projects that have been completed within the system since 2010.

- 2024 – Installation of third pump and upgrade electrical controls at Lift Station No. 2 (in progress).
- 2023 – Electrical transfer switches
- 2020 – Replacement of Lift Station No. 1 cover/hatch.
- 2019 – Revised Northshore Sewer Agreement including transfer of operational control for Lift Station No. 4 to the City of Chelan.
- 2017 – Extension of dual High-Density Polyethylene (HDPE) force mains at No-See-Um Roundabout to Darnell's, Washington State Department of Transportation (WSDOT) Project.
- 2015 – Replacement of all air/vacuum valves and piping on the Northshore Interceptor.
- Various – Replacement of all Lift Station controls.
- 2015 – Addition of Lords Acres Lift Station by the City of Chelan and injection into force mains.

SEWER SERVICE AREA

History

The first sanitary sewers were installed in the Manson area in 1946, beginning in the downtown business district by the Manson Sewer District. Wastewater treatment and disposal was provided by primary treatment with an outfall into Manson Bay. By 1976, the first Northshore Interceptor pipeline and lift stations were constructed to convey wastewater to an expanded regional Wastewater Treatment Plant in Chelan that has since been converted to a transfer station. The Northshore Interceptor was owned and operated by Chelan County (County) through an operating agreement with the City of Chelan (City). In 1979, the Manson Sewer District dissolved and conveyed its assets and collection facilities to the District. In the early 1990s, the County turned over the ownership and operation of the Northshore Interceptor to the District and the City of Chelan (City) with the dividing interest near Rocky Point.

The District is an irrigation district formed and governed under Revised Code of Washington (RCW) Title 87, which provides irrigation, domestic water, and sewage collection services to lands adjacent to the north shore of Lake Chelan. All sewage from the District is collected and pumped into the Northshore Interceptor.

In addition to the District's service area, the Northshore Interceptor also provides transmission for City sewage from the western portion of the City's service area. The portion of the interceptor east of Rocky Point is owned by the City, and the interceptor to the west is owned by the District, as shown in **Exhibit 2-1** in **Appendix A**.

The existing Northshore Interceptor Agreement as Amended and Stated (Agreement) between the District and the City allows the District to discharge wastewater into the City's wastewater treatment facility and provides for District maintenance of the entire Northshore Interceptor from Manson to Darnell's Lake Resort at approximately mile post 7.25 on SR150. Costs for both facilities are proportioned based on relative usage by each system. This agreement including, current flow rates and other conditions, is discussed later in this GSP. The agreement is provided in **Appendix B** and should be referenced for more specific details.

Flow from the interceptor discharges directly to the City's Transfer Station located within the City limits near the outlet of Lake Chelan. From there, combined City and District wastewater is pumped to the City's Wastewater Treatment Plant (WWTP) in Chelan Falls, which ultimately discharges treated effluent to the Columbia River. The City currently operates the WWTP under National Pollutant Discharge Elimination System (NPDES) Permit No. WA0020605.

Sewer Service Area Boundary, District Limits, and Urban Growth Area

The District is located in an unincorporated area of Chelan County on the north shore of Lake Chelan as shown in **Exhibit 2-1** in **Appendix A**. The parcels currently provided sanitary sewer service by the District generally lie within or near the Manson Urban Growth Area (UGA), as shown in the **Exhibit 2-1**.

The entire District boundary encompasses an area of approximately 23 square miles and includes all property located within the Manson UGA, as well as a region to the northwest of the City and

partially within the City limits. The District serves irrigation water to its boundary, domestic water throughout the greater Manson area, and sanitary sewer mostly within the Manson UGA and extending along the lake shore toward Rocky Point. The area provided with sanitary sewer service is a small portion of the entire District boundary.

The Manson UGA boundary encompasses an area of approximately 2.3 square miles. The District's service area includes most of the UGA, although approximately 0.3 square miles of the UGA is Wapato Tribal land that is outside the District's sewer service area. However, the District does extend water and sewer services to these parcels. Although there is no current plan to expand the service area due to the high proportion of undeveloped agricultural land, the sewer collection system is expected to grow into this boundary as necessary.

In 1989, a Water Quality Assessment (Assessment) was completed for the Washington State Department of Ecology (Ecology) by Harper Owens that concluded that on-site septic systems around the lake were a major contributor of phosphorus in the lake, which impacts long-term water quality and threatens Lake Chelan's ultraoligotrophic status. In 1991, a *Water Quality Plan* (1991 Plan) was prepared for Lake Chelan by R.W. Beck and Associates to address concerns raised by the Assessment. The 1991 Plan recommended eliminating existing septic systems and extending sanitary sewer service to new developments within 0.6 miles of the lake, as well as to areas with groundwater within 10 feet of existing grade, such as around the Wapato, Dry, and Roses Lakes. Many of these areas are outside of the District's existing service area and the Manson UGA.

The area of water quality concern for Lake Chelan, per the 1991 Plan, is shown in **Exhibit 2-2** in **Appendix A**. While it is not practical to plan to serve all parcels within this area during the planning horizon, it is prudent for the District to plan for service within this area as feasible and as necessitated by water quality needs. The District is planning service as needed to a portion of this area during the planning period. This area is referred to as the "Water Quality Planning Area" and is defined as being within the area of concern from the 1991 Plan, outside the UGA, and sufficiently close to the existing sanitary sewer system to make infrastructure extensions feasible within the planning period. The District's Sewer Planning Area for the 20-year planning period consists of the Water Quality Planning Area plus the UGA as shown in **Exhibit 2-2**.

Geology

A geological assessment of the region was provided by RH2 in the 2003 *Report on Site Geology for the Northshore Interceptor Replacement* project, which states "The bedrock of the area is primarily strongly foliated granitic gneisses. Commonly, the bedrock is overlain by unconsolidated glacial drift deposited during Pleistocene Alpine or ice-sheet glaciation. Holocene sediments include alluvium, colluvium, and loess."

Topography

Throughout the District's service area, the topography slopes toward Lake Chelan at an average of 5 to 6 percent. Slopes of approximately 50 percent exist in the region, and even steeper slopes can be found in the vicinity of some rock outcroppings to the north and east. Altitudes range from approximately 2,600 feet above mean sea level (AMSL) in the upper basin areas to approximately

1,100 feet AMSL at the north shore of Lake Chelan. The topography of the District's sewer service area is shown in **Exhibit 2-1** in **Appendix A**.

Climate

The climate of the District's service area is typically arid. Annual precipitation is approximately 10 to 11 inches per year. Summers are hot and dry, with high temperatures averaging 80 degrees Fahrenheit to 85 degrees Fahrenheit, while the winters are colder, with low temperatures averaging 20 to 25 degrees Fahrenheit.

Water Bodies and Floodplains

Lake Chelan is located along the western and southwestern edges of the District's service boundary and is the largest surface water body in the vicinity. Wapato Lake, Dry Lake, and Roses Lake also are encompassed by the District's boundary.

Critical Areas

The Growth Management Act (GMA) requires designation and protection of critical areas. Critical areas include fish and wildlife habitat, flood zones, aquifer recharge areas, streams, creeks, rivers, lakes, wetlands, and other surface waters, as well as geologic hazard areas such as steep slopes and liquefaction zones. Refer to **Exhibit 2-3** in **Appendix A** for critical areas in the District's service area. **Appendix C** contains a State Environmental Policy Act (SEPA) checklist that addresses other environmental concerns.

EXISTING SEWER FACILITIES

The District's headquarters is located at 80 Wapato Way in Manson. The District owns, operates, and maintains the collection system, lift stations, and Northshore Interceptor. The District's sanitary sewer collection system consists of approximately 34 miles of gravity and force mains and 6 lift stations. The District provides service to commercial, residential, and industrial areas.

Sewer Drainage Basins

The District's current sewer service area is comprised of several sewer drainage basins as shown in **Exhibit 2-4** in **Appendix A**. The topography is such that sewage generally flows from higher elevations in the north and east portions of the sewer service area toward Lake Chelan. All lift stations in the system ultimately discharge into the Lift Station No. 2 basin, which pumps into the Northshore Interceptor to the City.

Collection Piping

Pipe Length

The District has approximately 14.5 miles of gravity sewer collection piping. There are approximately 19.7 miles of force main throughout the system, including approximately 12 miles of the dual Northshore Interceptors to the City's system, as well as low pressure force mains.

Table 2-1 summarizes the approximate installed lengths of sewer main by diameter. **Exhibit 2-5** in **Appendix A** illustrates the sewer mains by diameter.

Table 2-1
Sewer Collection System Pipe Inventory

Gravity Mains			
Diameter (inches)	Total Length (feet)	Total Length (miles)	Percent of Piping %
4	500	0.1	0.3
6	2,100	0.4	1.2
8	67,400	12.8	37.4
10	3,900	0.7	2.2
Unknown	2,700	0.5	1.5
Total	76,600	14.5	42.5

Force Mains ^{1,2}			
Diameter (inches)	Total Length (feet)	Total Length (miles)	Percent of Piping %
3	1,000	0.2	0.6
4	20,900	4.0	11.6
8	9,700	1.8	5.4
10	41,500	7.9	23.0
14	30,700	5.8	17.0
Total	102,800	19.7	57.5

Collection System			
Diameter (inches)	Total Length (feet)	Total Length (miles)	Percent of Collection System %
Total	179,400	34.2	100.0

¹ Dual force mains run from Lift Station No. 2 to the City of Chelan (10 inch and 14 inch).

² Sewer facilities on Indian Trust Land are not included in this table.

Pipe lengths and sizes are estimated based on the best available information.

Pipe Age and Material

The 2002 GSP noted that approximately 29,000 linear feet of the collection system piping was installed prior to 1980. A small portion of this piping may have been replaced as part of routine maintenance since the 2002 GSP. At the planning level, it is assumed that approximately 30 percent of the total collection system piping will exceed 50 years of age during the planning period.

It is assumed that collection piping installed prior to 1980 is concrete, and collection piping installed in 1980 or later is largely polyvinyl chloride (PVC). Based on this assumption, it is likely that

30,000 linear feet or less of the collection system piping is concrete, whereas the majority of the collection system piping is PVC.

The majority of the force main piping is related to the HDPE dual interceptors that flow to the City's system. The materials and condition of other force mains within the system are discussed further in **Chapter 6** as part of the lift station analyses.

Lift Stations

The District currently owns, operates, and maintains six wastewater lift stations. The characteristics of each lift station are summarized in **Table 2-2**, **Table 2-3**, and **Table 2-4**, and a description of each lift station follows.

Table 2-2
Lift Station Inventory

Lift Station				Pump					
Station Name	Type	No. of Pumps	Manufacturer	Model	Design Capacity (gpm)	TDH (feet)	Horsepower (hp)	Voltage (V)	Phase
Lift Station No. 1	Submersible	2	Flygt	NP-3153X	491	87	18	460	3ø
Lift Station No. 1A	Submersible	2	Flygt	NP 3085 MT 3-Adaptive 462	120	32	3	240	3ø
Lift Station No. 2	Submersible	3	Flygt	NP460-6 105/460/3 2X65	480	250	105	460	3ø
Lift Station No. 3	Submersible	2	Flygt	Concertor DP N100-7800	115	35	10 HP VFD Concertor	460	3ø
Orchard	Submersible	2	Hydromatic	S4NX300CC	72	50	3	230	1ø
Mill Bay	Submersible	2	Flygt	MP-3068-216 HT-X	48	48	4	460	3ø

Table 2-3
Lift Station Wet Well and Force Main Characteristics

Station Name	Type	Force Main		Material	Shape	Wet Well			Year Constructed	Emergency Storage (gal)
		Size (inch)	Length (feet)			Diameter (feet)	Capacity (gal/ft)	Depth (feet)		
Lift Station No. 1	Dual	6 8	450 2,500	DI PVC	Circular	8	360	23.8	2004	6,000
Lift Station No. 1A	Single	4	1,240	PVC	Circular	6	220	17.2	2005	0
Lift Station No. 2	Dual	10 14	30,680 30,680	HDPE	Circular	12	850	21.7	2005	33,100
Lift Station No. 3	Single	4	5,300	HDPE	Circular	6	220	19.6	2005	25,070
Orchard	Single	4	640	PVC	Circular	6	220	12.0	1993	0
Mill Bay	Single	4	1,600	PVC	Circular	6	220	16.1	2004	0

DI = Ductile Iron

Table 2-4
Lift Station Electrical and Control Information

Number (Identifier)	Electrical and Control Devices				Telemetry			Back-up Power	
	Starters	Flowmeter	Level Transmitter	Floats	Remote Monitoring	PLC	HMI	Onsite Generator	Transfer Switch
Lift Station No. 1	Solid State Reduced Voltage Starter	6" Electromagnetic	Ultrasonic	Hi Low	Monitoring	NA	Multismart	NO	Manual
Lift Station No. 1A	Across the line	4" Electromagnetic	Ultrasonic	Hi Low	Monitoring	NA	Multismart	NO	Manual
Lift Station No. 2	Solid State Reduced Voltage Starter (all)	8" Electromagnetic	Ultrasonic	Hi Low	Monitoring & Control	NA	Multismart	No	Manual
Lift Station No. 3	Concertor build in VFD	4" Electromagnetic	Ultrasonic	Hi Low	Monitoring	Allen-Bradely 820	Allen-Bradley Panelview	NO	Manual
Orchard	Across the line	None	None	High Level On/Off Low Level	None	None	None	NO	Manual
Mill Bay	Across the line	4" Electromagnetic	Ultrasonic	Hi Low	Monitoring	NA	Multismart	NO	Manual

PLC = programmable logic controller

HMI = human machine interface

Lift Station No. 1

Lift Station No. 1 is located near the District's Headquarters building at the corner of Manson Boulevard and Wapato Way and was built in 2004. The station consists of an 8-foot-diameter pre-cast concrete wet well with 2 submersible centrifugal sewage pumps. This lift station discharges into collection system piping in the Lift Station No. 2 basin. Lift Station No. 1 handles most of the flow from the Manson area.

Lift Station No. 1A

Lift Station No. 1A is located near the intersection of Madeline and Hyacinth Roads and was built in 2005. The station consists of a 6-foot-diameter pre-cast concrete wet well with 2 submersible centrifugal sewage pumps. Lift Station No. 1A currently serves waterfront properties along Hyacinth Road and a portion of the Vista Del Lago subdivision south of State Route (SR) 150. This lift station discharges to Lift Station No. 2.

Lift Station No. 2

Lift Station No. 2 is located along SR 150 near the intersection with Madeline Road and was built in 2005. The station collects sewage from the entirety of the sewer service area. The station consists of a 10-foot-diameter pre-cast concrete wet well with 2 submersible centrifugal sewage pumps. The lift station pumps through dual force mains and discharges at the City's Transfer Station. Lift Station No. #2 is the primary lift station for the District system. A third bay is available for additional pumping capacity in the future.

Lift Station No. 3

Lift Station No. 3 is located along SR 150 just west of Bennett Road and was built in 2005. The station collects sewage from the Mill Bay area east to the City's collection system boundary near Rocky Point. The collection basin is residential in nature. A significant portion of the sewage collected flows through the repurposed 8-inch interceptor along SR 150 to this lift station. Lift Station No. 3 discharges to a single force main flowing to Lift Station No. 2. The station consists of a 6-foot-diameter pre-cast concrete wet well with 2 submersible centrifugal sewage pumps.

Mill Bay

The Mill Bay Lift Station is located at the south end of Wall Street, south of SR 150, serving a small collection basin that is residential in nature. The lift station was built in 2004 and consists of a 6-foot-diameter pre-cast concrete wet well with 2 submersible centrifugal sewage pumps. The lift station pumps through a single force main and discharges to the collection system along SR 150, flowing to Lift Station No. 3.

Orchard

The Orchard Lift Station is located on Sunrise Drive, south of SR 150, serving a small collection basin that is residential in nature. The lift station was built in 1993 and consists of a 6-foot-diameter pre-cast concrete wet well with 2 submersible centrifugal sewage pumps. The lift station pumps

through a single force main and discharges into the collection system along SR 150, flowing to Lift Station No. 2.

Back-up Generators

All District lift stations are currently wired for back-up generators. The district has an aging 150 Kilowatt (kW) generator that will run any of the lift stations. The District also completed a recent generator project that utilized grant money to purchase two 300 kW engine generator sets and cabling. The generators are stored indoors at the District's new shop building on Wapato Lake Road. When improvements are completed at Lift Station No. 2, one generator may be stored at that location. Additional security fencing at the main office is planned and upon completion, the other spare generator will likely be stored at this location.

Private Lift Stations

Two large private lift stations exist within the District's collection system:

- The Wapato Point Lift Station (275 gallons per minute (gpm)) is located on Wapato Point and collects domestic wastewater from the surrounding tribal lands. The lift station is owned and operated by the Confederated Tribes of the Colville Reservation. The pumps discharge to a single force main that flows into the collection system along SR 150 to Lift Station No. 2.
- The MA-8 Lift Station (100 gpm) collects wastewater from the Mill Bay Casino and is located south of SR 150 and east of Madeline Road. The lift station is owned and operated by the Confederated Tribes of the Colville Reservation. The pumps discharge to a single force main that discharges directly to Lift Station No. 2 and is monitored weekly with a magnetic flow meter.

Low Pressure Sewer Systems

The District serves low pressure sewer systems in which small grinder pumps are installed at each residence as follows:

- Willow Point – A low pressure main is routed along Willow Point Road and SR 150, west of Manson, which collects wastewater from residences along the lake. The force main discharges directly to Lift Station No. 1.
- West Wapato Way – A low pressure main is routed along Wapato Way, west of Manson Boulevard. The main collects wastewater from residences along the lake and discharges to collection system piping flowing along Manson Boulevard to Lift Station No. 1.
- Hyacinth Road – A low pressure main is routed along Hyacinth Road, west of Madeline Road. The main collects wastewater from residences along the lake and discharges to collection system piping flowing along Hyacinth Road to Lift Station No. 1A.
- Old 8-Inch Interceptor – The repurposed 8-inch interceptor along SR 150 is used to collect wastewater from residences along the lake, south of SR 150, between Mill Bay and Rocky Point. These residences use grinder pumps to discharge to slip -lined 4-inch HDPE piping in the old interceptor, which flows to Lift Station No. 3.

Currently Sewered Parcels and Septic Systems

The District currently serves parcels within the Manson UGA and some parcels outside the UGA but within the District boundary that are close to Lake Chelan and could affect water quality. **Table 2-5** provides a breakdown of parcels within the two different boundaries based on land area and number of parcels served by the District.

Table 2-5
Parcels Served by the District

	District Boundary	Manson UGA
Number of Parcels	3,722	1,473
Number of Parcels Served by the District	974	919
Percent of Parcels served by the District	26.17	62.39
Area of Parcels ¹ (acres)	13,947.5	1,622.78
Area of Parcels Served by the District ¹ (acres)	626.9	493.7
Percent of Area Served by the District	4.49	30.42

Parcels that are unbuildable or are zoned for non-developable use have not been excluded from the data.

¹Area calculations only include parcel area. Right-of-Way area has been removed from the data.

As with most urbanized areas, parcels that were developed prior to the District's establishment or before the District had established infrastructure in the area are served by traditional septic systems. **Exhibit 2-6** in **Appendix A** provides a graphic presentation of parcels that are currently served by the District. Parcels that are not served by the District are assumed to be either on private septic systems or are not developed. **Exhibit 2-6** was developed using GIS parcel data from the County and current sewer accounts in the District's billing software. **Chapter 5** outlines County, local Chelan-Douglas Health District, and District policies regarding septic systems within the District boundary and UGA.

Wastewater Treatment and Disposal Facilities

The District does not operate a treatment facility. All wastewater is treated by the City's WWTP. The WWTP has consistently and reliably met the effluent limits listed in NPDES Permit No. WA0020605 issued by Ecology. Wastewater from the District accounts for approximately 30 percent of the wastewater treated by the City. Currently, total flow and loading to the WWTP is less than 50 percent of the rated WWTP's capacity. The District's current agreement with the City (**Appendix B**) allows the District to discharge a maximum of 1.15 million gallons per day (MGD) to the City based on an annual average. As further discussed in **Chapter 4**, the District's current average annual (AA) flow is in the range of 0.20 to 0.23 MGD; therefore, the District is not likely to reach its allocated capacity in the planning period. There is no loading limitation placed on the District in the current agreement.

Table 2-6 provides the City's WWTP design criteria.

Table 2-6
WWTP Influent Flow and Loading Design Criteria

Parameter	Design Criteria	
Hydraulic Loading		
Maximum Month Average Daily Flow	2.64	MGD
Maximum Day Flow	2.94	MGD
Peak Hour Flow	4.32	MGD
Solids Loading		
Maximum Month Average Daily BOD	4,986	ppd
Maximum Month Average Daily TSS	6,315	ppd

BOD = biochemical oxygen demand

TSS = total suspended solids

ppd = pounds per day

Table 2-7 includes the current NPDES effluent permit limits in the current permit for the City's WWTP.

Table 2-7
NPDES Effluent Limitations

Parameter	Average (mg/L)		Monthly	Weekly
	Monthly	Weekly	Average (ppd)	Average (ppd)
BOD ₅	30	45	661	991
TSS	30	45	661	991
Total Residual Chlorine	0.5	0.75	NA	
pH	Minimum of 6.0 and Maximum of 9.0 Standard Units			
Parameter	Monthly Geometric Mean		Weekly Geometric Mean	
Fecal Coliform Bacteria	100 CFU per 100 miles		200 CFU per 100 miles	

mg/L = milligrams per liter

CFU = coliform forming units

Total residual chlorine is no longer measured now that ultraviolet (UV) lights utilized for disinfection at the WWTP. Additional information on the City's WWTP can be found in the City's GSP.

Wastewater Characterization

The District's wastewater is primarily residential in nature. The sewer system largely serves residential connections, with the institutional connections (schools, local government buildings, etc.) and commercial connections (restaurants, hotels, etc.) associated with a largely residential system with a high level of tourism.

The only significant industrial discharges come from a fruit packing warehouse. Manson Growers, a fruit processing facility, discharges domestic wastewater from its facility located on Manson Boulevard just past Washington Street. Process water with chlorine-based fungicides is discharged

to the sewer system from apple packing lines between November and April. The permit number is Fruit Packing General Permit No. WAG435250.

Chelan Fruit Cooperative Permit No. WAG435050 also is listed in Ecology's permit database within the District, but its fruit storage facilities send only domestic wastewater to the District's system.

There are various wineries in the Manson area that discharge to the District's system. However, none of the wineries reportedly discharge process wastewater and they are only known to discharge normal domestic-strength wastewater from restrooms and kitchens at each facility. As such, the wineries are treated as normal commercial facilities in **Chapter 4**.

ADJACENT SEWER SYSTEMS

Washington Administrative Code (WAC) 173-240-050 requires a list in the GSP of "any existing domestic or industrial wastewater facilities within twenty miles of the general plan area and within the same topographical drainage basin containing the general plan area." There are several nearby sewer systems that are within 20 miles of the District's sewer service area, including the following:

- City of Chelan – Domestic, commercial, and industrial wastewater treated via the City's WWTP and discharged to the Columbia River.
- Wapato Point – Domestic wastewater from tribal lands discharged to the District.
- Mill Bay (MA-8) – Domestic wastewater from tribal lands discharged to the District.
- LCSD – Domestic and commercial wastewater discharged to the City's system.

The District, City, and LCSD work together as a part of a regional system surrounding Lake Chelan.

OTHER AGENCY-OWNED AND OPERATED SYSTEMS

This section provides a brief overview of other public utilities in the Manson area. Further information can be found in each utility's respective comprehensive plan.

District Water System

The District also owns and operates a domestic water system on the north shore of Lake Chelan. The Water System Plan (WSP) is currently being updated by RH2.

The Group A public water system has approximately 2,028 Metered Connections. The system is comprised of 2 raw water intakes with a combined capacity of 9.0 MGD and 2 finished water reservoirs with a combined capacity of 2.25 million gallons. The water treatment plant was constructed in 1999 with a capacity of 4.0 MGD. Water is distributed to customers through more than 54 miles of distribution pipelines between 2 inches and 16 inches in diameter. **Exhibit 2-7** in **Appendix A** provides a map of the water system including sources, storage, and distribution infrastructure.

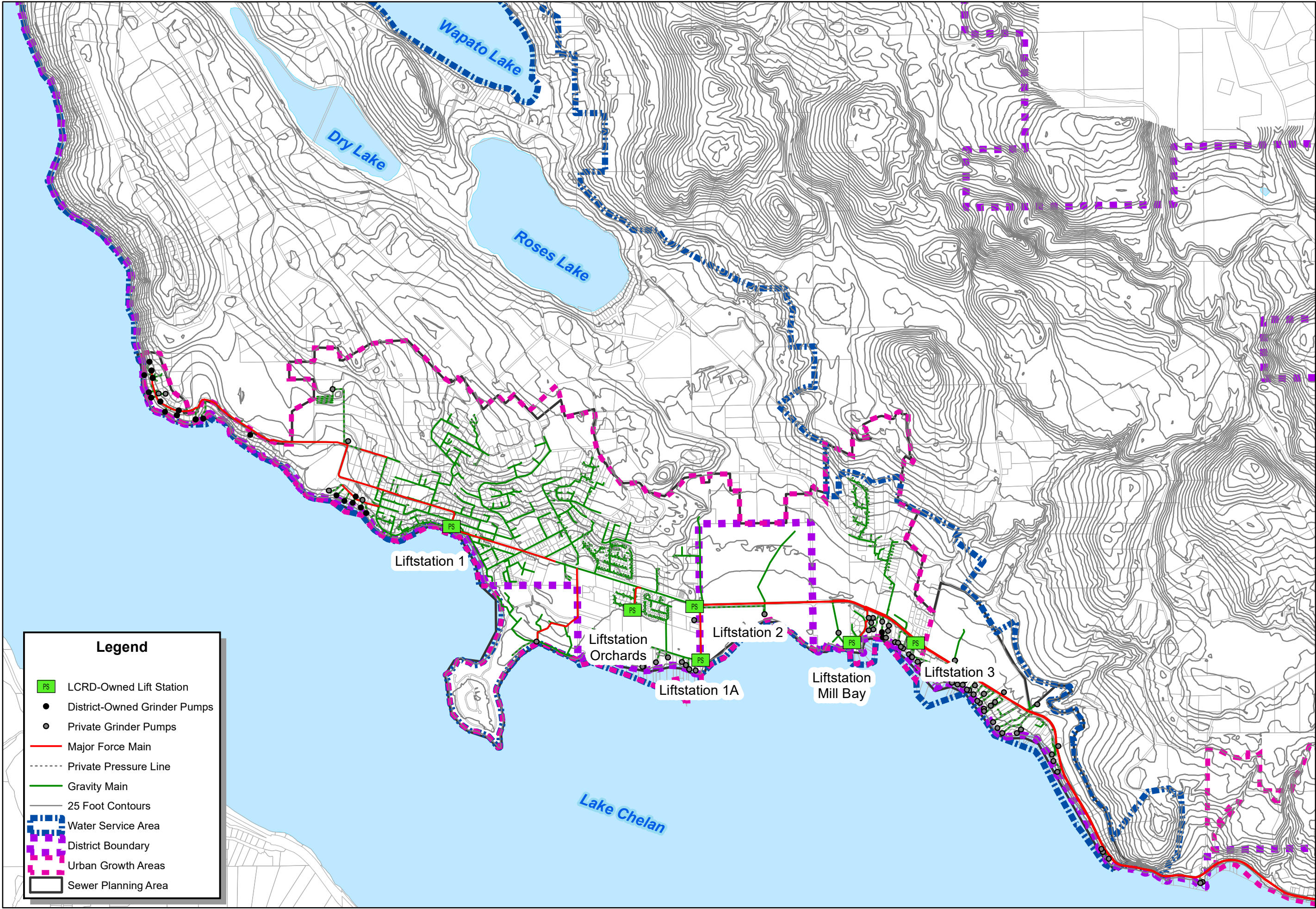
District Irrigation System

The District also operates an irrigation system on the north shore of Lake Chelan.

Chelan County Storm Sewer System

Manson Boulevard has an enclosed storm sewer system between Wapato Way and Lakeshore Drive that captures roadway runoff and is then conveyed and released into Lake Chelan. Stormwater west of Lakeshore Drive is collected in ditches and infiltrated. The storm system is maintained by Chelan County.

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Legend

PS

LCRD-Owned Lift Station

●

District-Owned Grinder Pumps

●

Private Grinder Pumps

Major Force Main

Private Pressure Line

Gravity Main

25 Foot Contours

Water Service Area

District Boundary

Urban Growth Areas

Sewer Planning Area

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Vicinity Map



Figure 2-1
Sewer System Overview
Lake Chelan Reclamation District

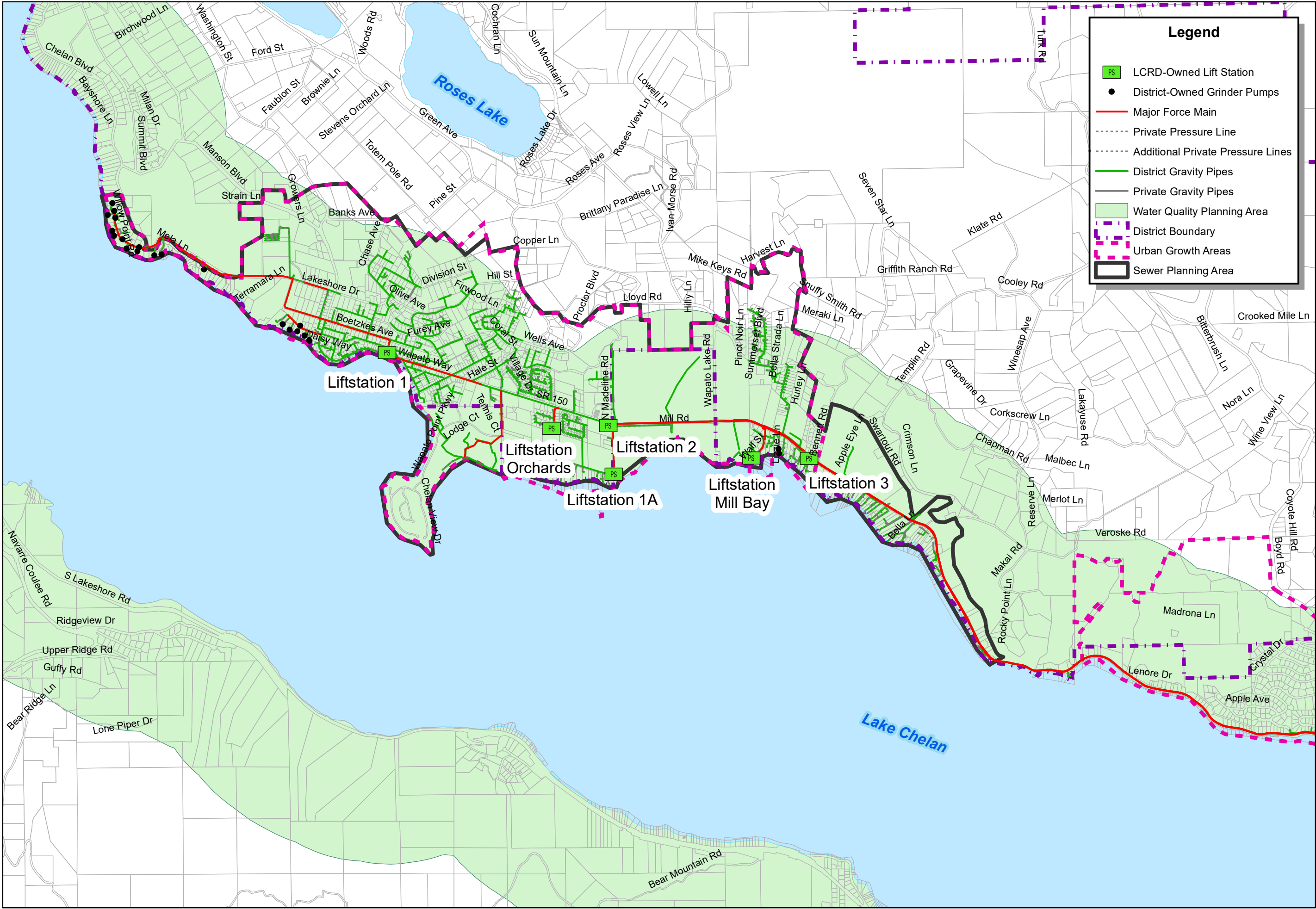


1 inch = 2,000 feet
0 500 1,000 2,000 Feet
DRAWING IS FULL SCALE WHEN BAR MEASURES 1"



J:\DATA\LCR219-012\GIS\FIG 2-1 SYSTEM OVERVIEW.MXD BY: OMARTYUSHEVA PLOT DATE: MAR 4, 2022 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET

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Legend

- PS LCRD-Owned Lift Station
- District-Owned Grinder Pumps
- Major Force Main
- - - Private Pressure Line
- · · Additional Private Pressure Lines
- District Gravity Pipes
- Private Gravity Pipes
- Water Quality Planning Area
- - - District Boundary
- - - Urban Growth Areas
- Sewer Planning Area

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HERE, Garmin, (c) StreetMap contributors.

Figure 2-2
Sewer Planning Area
Lake Chelan Reclamation District



1 inch = 2,200 feet
0 550 1,100 2,200 Feet
DRAWING IS FULL SCALE WHEN BAR MEASURES 1"



J:\DATA\LCR219-012\GIS\FIG 2-2 SEWER PLANNING AREA.MXD BY: OMARTYUSHEVA PLOT DATE: MAR 4, 2022 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET

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Vicinity Map

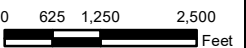


HERE, Garmin, (c)
StreetMap contributors,

Figure 2-3
Critical Areas
Lake Chelan Reclamation District



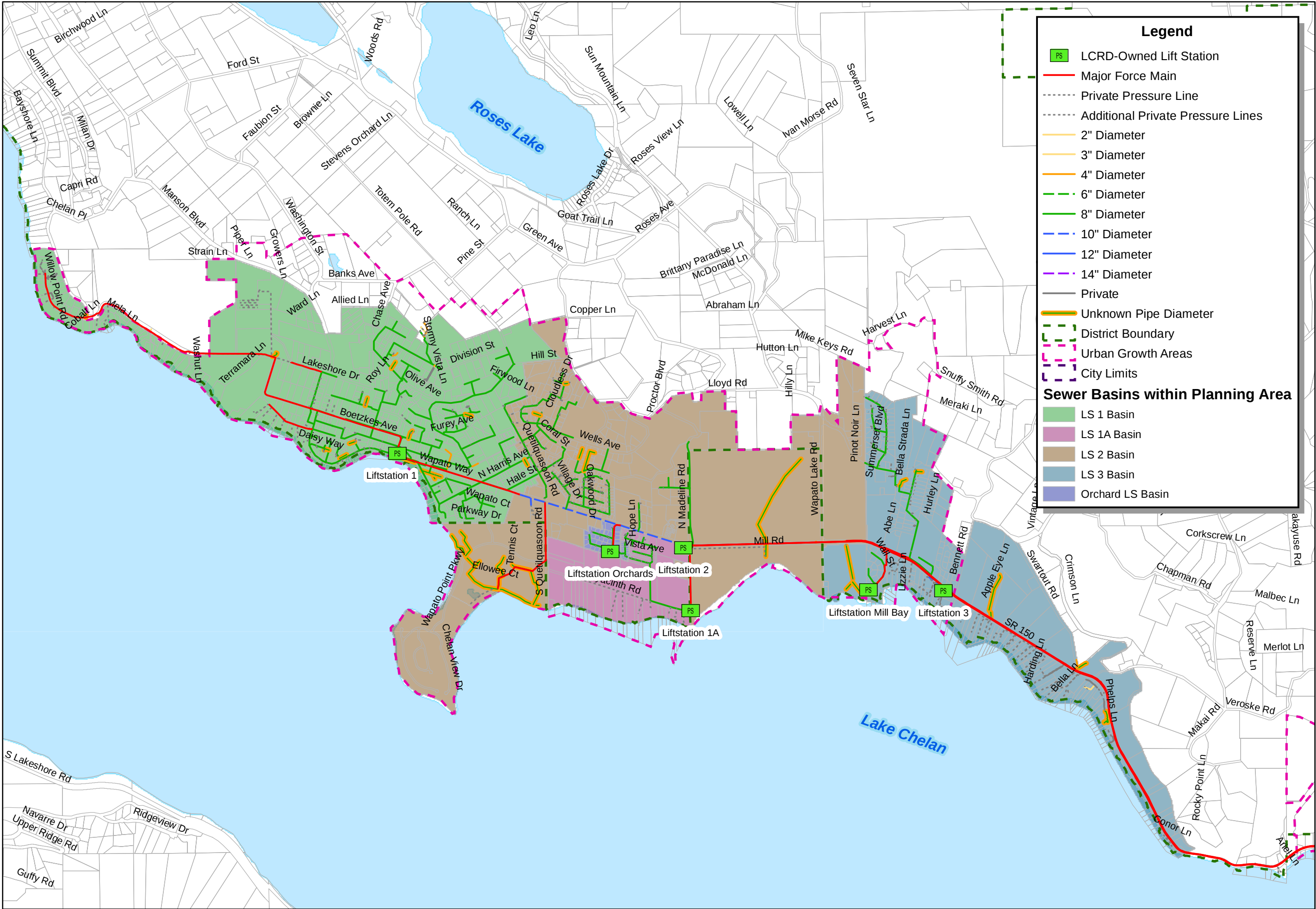
1 inch = 2,500 feet



DRAWING IS FULL SCALE
WHEN BAR MEASURES 1"



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Legend

- PS LCRD-Owned Lift Station
- Major Force Main
- Private Pressure Line
- Additional Private Pressure Lines
- 2" Diameter
- 3" Diameter
- 4" Diameter
- 6" Diameter
- 8" Diameter
- 10" Diameter
- 12" Diameter
- 14" Diameter
- Private
- Unknown Pipe Diameter
- District Boundary
- Urban Growth Areas
- City Limits

Sewer Basins within Planning Area

- LS 1 Basin
- LS 1A Basin
- LS 2 Basin
- LS 3 Basin
- Orchard LS Basin

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Vicinity Map



Map data by HERE, Garmin, (c) OpenStreetMap contributors, and the LCRD.

Figure 2-4
Existing Sewer Basins
Lake Chelan Reclamation District

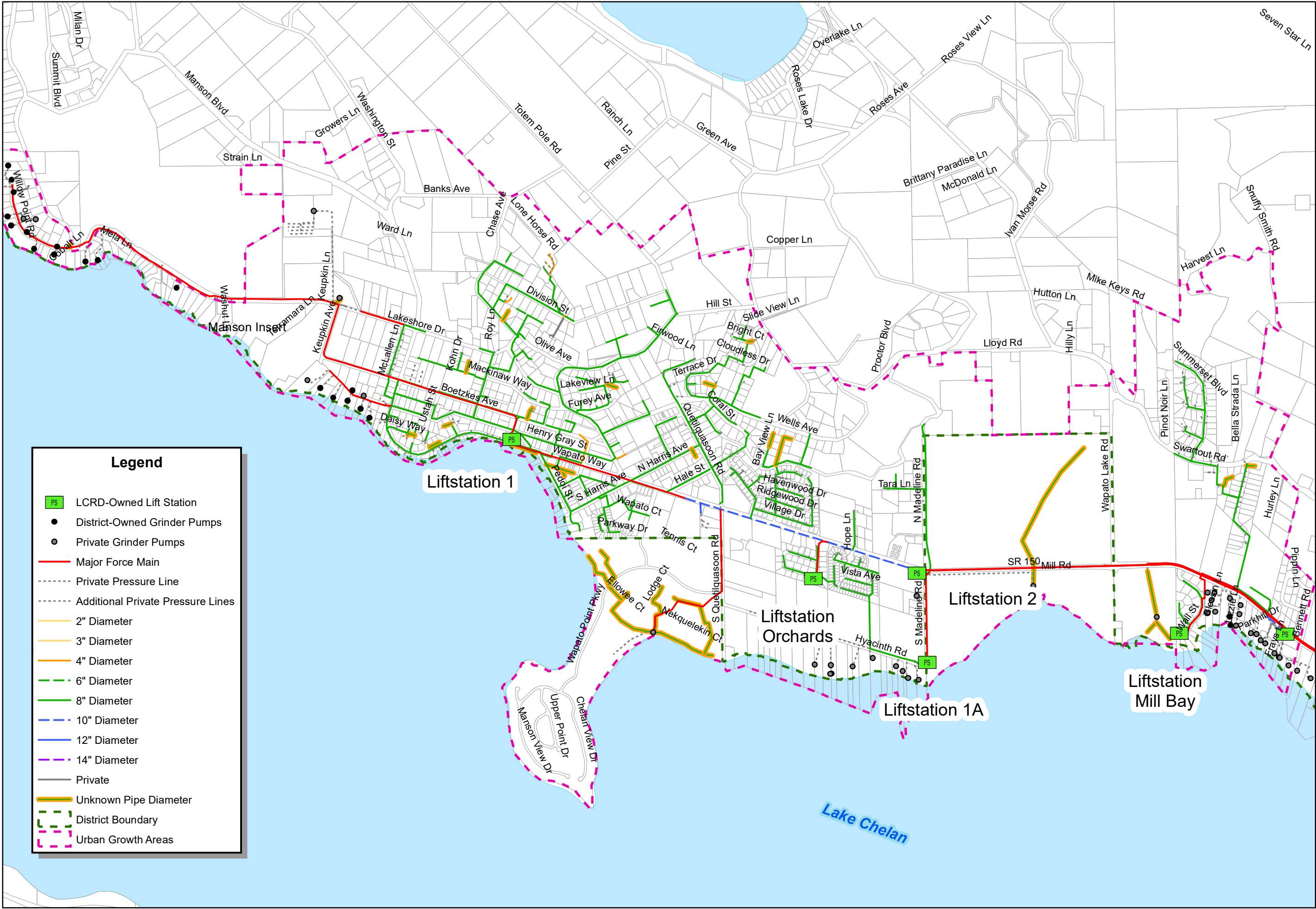


1 inch = 1,700 feet
0 425 850 1,700 Feet
DRAWING IS FULL SCALE WHEN BAR MEASURES 1"



J:\DATA\LCR219-012\GIS\FIG 2-4 EX SEWER BASINS.MXD BY: J.LAWRENCE PLOT DATE: MAR 13, 2024 COORDINATE SYSTEM: WGS 1984 WEB MERCATOR AUXILIARY SPHERE

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Legend

- PS LCRD-Owned Lift Station
- District-Owned Grinder Pumps
- Private Grinder Pumps
- Major Force Main
- - - Private Pressure Line
- - - Additional Private Pressure Lines
- 2" Diameter
- 3" Diameter
- 4" Diameter
- 6" Diameter
- 8" Diameter
- 10" Diameter
- 12" Diameter
- 14" Diameter
- Private
- Unknown Pipe Diameter
- - - District Boundary
- - - Urban Growth Areas

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Vicinity Map



Figure 2-5
Pipe Size
Lake Chelan Reclamation District

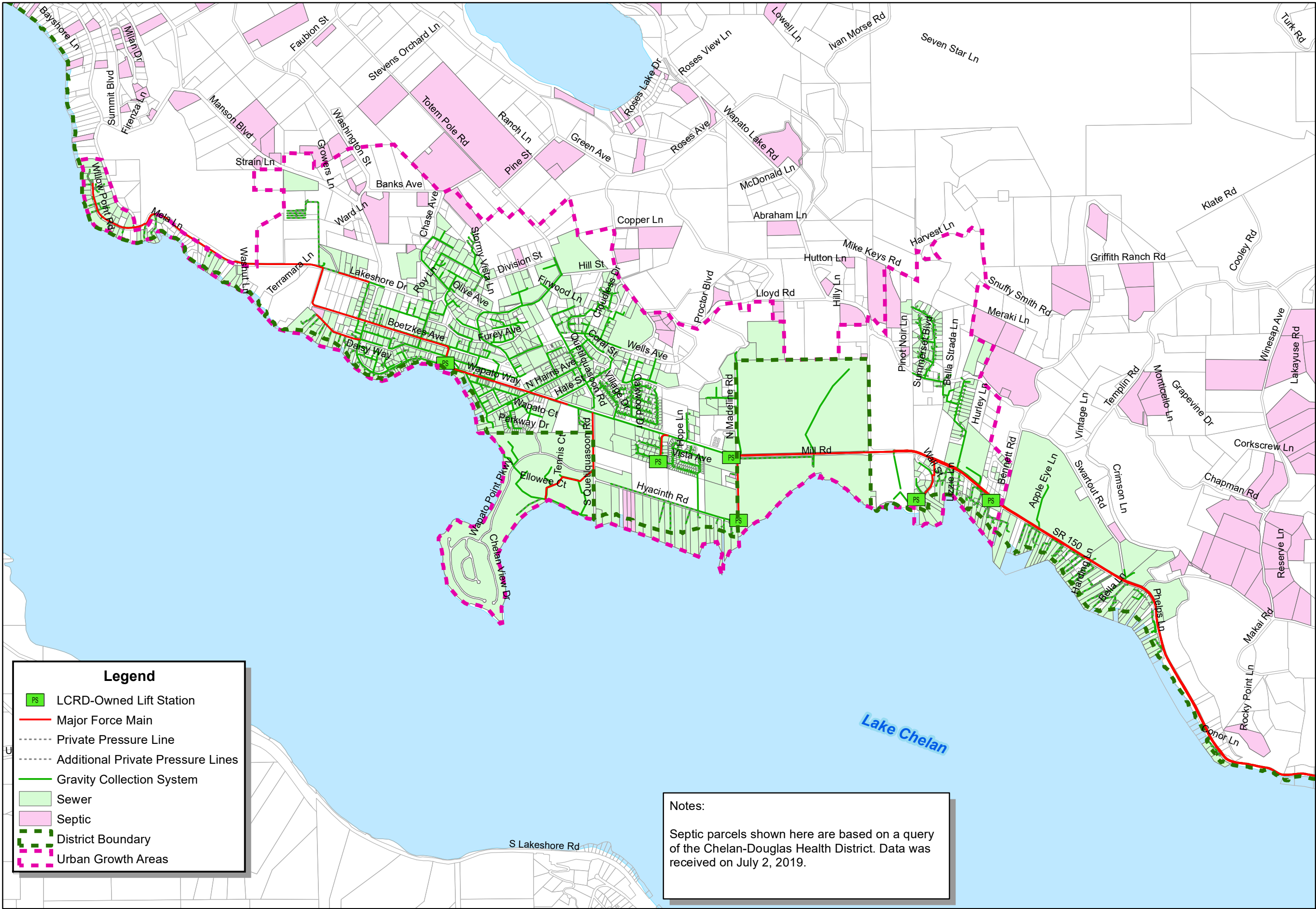


1 inch = 1,200 feet
0 300 600 1,200 Feet
DRAWING IS FULL SCALE WHEN BAR MEASURES 1"



J:\DATA\LCR219-012\GIS\FIG 2-5 PIPE SIZE.MXD BY: OMARTYUSHEVA PLOT DATE: MAR 4, 2022 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET

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Vicinity Map



HERE, Garmin, (c) nStreetMap contributors,

Figure 2-6
Septic System Areas
Lake Chelan Reclamation District

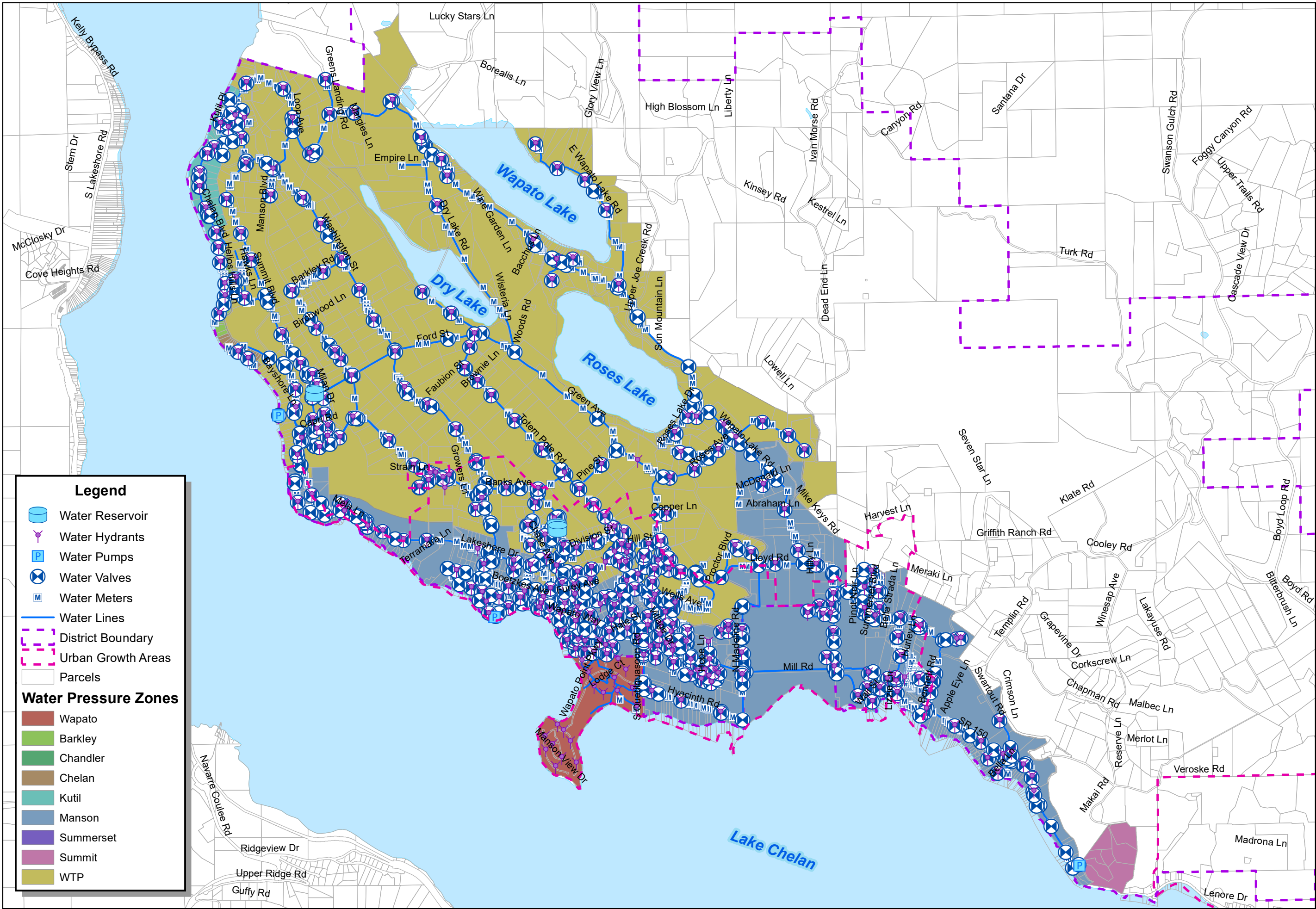


1 inch = 1,700 feet
0 425 850 1,700 Feet
DRAWING IS FULL SCALE WHEN BAR MEASURES 1"



J:\DATA\LCR219-012\GIS\FIG 2-6 SEPTIC SYSTEMS.MXD BY: OMARTYUSHEVA PLOT DATE: MAR 4, 2022 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET

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Vicinity Map



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Figure 2-7
Water System
Lake Chelan Reclamation District



1 inch = 2,450 feet
0 600 1,200 2,400 Feet
DRAWING IS FULL SCALE WHEN BAR MEASURES 1"



J:\DATA\LCR219-012\GIS\FIG 2-7 WATER SYSTEM.MXD BY: OMARTYUSHEVA PLOT DATE: MAR 7, 2022 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET

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3 | LAND USE AND POPULATION

Introduction

This General Sewer Plan (GSP) was prepared to meet Growth Management Act (GMA) requirements and guide local governments and communities with planning and asset management. The GMA requires, among other things, consistency between land use and utility plans and their implementation. This chapter discusses land use within the Lake Chelan Reclamation District's (District) boundary and presents population projections within the District's planning area.

Compatibility with Relevant Planning Documents

To ensure that the GSP is consistent with the land use policies that guide it and other related plans, the following planning documents were examined:

- State of Washington's Growth Management Act.
- 2009 Manson Subarea Plan
- 2017 – 2037 *Chelan County Comprehensive Plan*.
- 2017 *City of Chelan Comprehensive Plan*.

State of Washington's Growth Management Act

The State of Washington's Growth Management of 1990 (and its multiple amendments) defined four goals relevant to this GSP:

1. Growth should be in urban areas;
2. There should be consistency between land use and utility plans and their implementation;
3. There should be concurrency of growth with public facilities and services; and
4. Critical areas should be designated and protected.

Urban Growth Area

The GMA requires that Chelan County (County) designate an Urban Growth Area (UGA) that would accommodate projected population growth for a 20-year planning period. The Manson UGA currently consists of approximately 2.2 square miles. The current UGA is shown in **Exhibit 2-1** in **Appendix A**.

Consistency

The GMA requires that the planning and capital budget decisions of the GSP be consistent with the County's Comprehensive Plan (Revised Code of Washington (RCW) 36.70A.120).

Concurrency

Concurrency means that adequate public facilities and services are provided at the time growth occurs. To achieve this objective, the GMA encourages growth in areas already served or readily served by public facilities and services (RCW 36.70A.110). It also requires that when public facilities

and services cannot be maintained at an acceptable level of service, new development should be prohibited (RCW 36.70A.110).

2017-2037 Chelan County Comprehensive Plan

The 2017-2037 *Chelan County Comprehensive Plan* was last updated in 2017. The Land Use section of this plan guides development in rural, unincorporated Chelan County, including the unincorporated community of Manson, and designates land use in all unincorporated UGAs within the County.

Manson Subarea Plan

The County wrote the Manson Subarea Plan (MSP) in 2009 to emphasize the land use goals specific to the community of Manson. The MSP was updated in 2017. The MSP is an appendix to the 2017-2037 *Chelan County Comprehensive Plan* and provides a narrower planning area centralized around the community of Manson. The MSP describes its goal to “Protect and enhance the quality of life within the Manson community through protection of its resources, its lakes, and its environment for current and future generations, and the provision for sustainable economic growth.”

Planning Period

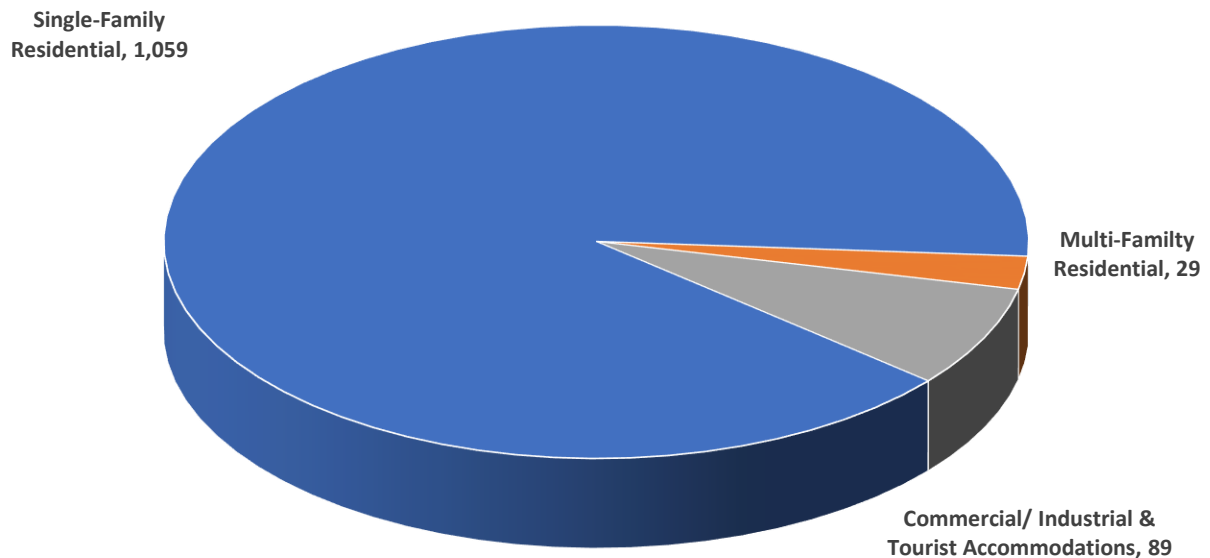
The planning period established by this GSP is defined as the 20-year period starting in 2023 and extending through 2043. As such, this GSP will extend slightly beyond the planning period proposed by the County’s Comprehensive Plan, which extends through 2037. The 20-year period proposed in this GSP is established based on the assumptions that historical data analysis will terminate with 2019 in this planning effort, the plan development will occur in 2022, and agency approval of the GSP will occur in the first half of 2023. The planning period for this GSP also will overlap the planning period of the City of Chelan’s 2020 GSP.

Existing and Projected Population

Household Trends

The Manson area is primarily a residential community comprised largely of single-family residences. In 2019, District billing records indicated that 1,177 customers were served, as shown by classification in **Chart 3-1**.

Chart 3-1
2019 Service Connections by Customer Class



Washington State Office of Financial Management (OFM) data from the 2010 Census and reproduced in the County's Comprehensive Plan, Land Use Capacity Analysis, indicates an average number of persons per household in the Manson UGA to be 2.58, compared to an average household size in all of Chelan County of 2.67 persons per household. The average household size reported in the Census is based on an average of the household size for owner-occupied housing units and renter-occupied units. The 2010 Census data for the Manson UGA will be used for the average, owner-occupied, and renter-occupied units for this GSP.

Existing UGA and County Population

Based on populations from the OFM, the Manson UGA experienced a population growth of approximately 2.0 percent from 2000 to 2019, whereas the County population grew at an average of 0.9 percent during the same period. **Table 3-1** illustrates the historical population growth within the Manson UGA and County for reference.

Table 3-1
Historical Population

Description			2000	2005	2010	2015	2019	
Manson UGA Population ^{1,2}			1,591	1,758	1,953	2,082	2,338	
Growth (percent)			-	2.0	2.1	1.3	2.9	
Description		1980	1990	2000	2005	2010	2015	2019
Chelan County ^{1,2}	45,061	52,250	66,616	68,963	72,453	75,030	78,420	
Growth (percent)		1.5%	2.5%	0.7%	1.0%	0.7%	1.1%	
Average Rate of growth (UGA) between 2000 and 2019:				2.0%				
Average Rate of growth (County) between 2000 and 2019:				0.9%				

¹ A large portion of the area's economy is related to tourism, and as such, the population increases dramatically during summer months due to the influx of tourists and part-time residents as shown in the flow data in **Chapter 4**. The population values shown here represent full-time, year-round residents.

² The population values are provided from OFM data.

Projected UGA Population

Projections for the Manson UGA population were analyzed using three methods, including:

- County Resolution No. 2016-102 growth rates;
- The published OFM County-wide medium and high growth rates; and
- The historical average UGA growth rate from 2000 to 2019 projected forward.

Table 3-2 shows population projections and growth rates for the Manson UGA based on the projection methods analyzed.

Table 3-2
Manson UGA and County Population Projections

Chelan County Resolution No. 2015-112						
Description	2019	2020	2025	2030	2035	2040
Manson UGA Population	2,338	2,366	2,498	2,612	2,708	2,790
Growth Rate (percent)	-	1.19	1.09	0.90	0.73	0.60
OFM Chelan County Projected Growth Rates						
Description	2019	2020	2025	2030	2035	2040
Manson UGA Population	2,338	2,361	2,465	2,556	2,635	2,710
Medium Growth Rate (percent)	-	1.00	0.86	0.72	0.61	0.56
Manson UGA Population	2,338	2,393	2,619	2,835	3,052	3,279
High Growth Rate (percent)	-	2.36	1.82	1.60	1.49	1.45
Historical UGA Growth Rate (2010-2019) Projected Forward						
Description	2019	2020	2025	2030	2035	2040
Manson UGA Population	2,338	2,385	2,633	2,907	3,210	3,544
Growth Rate (percent)	-	2.00	2.00	2.00	2.00	2.00

Using Manson's 2000 to 2019 historical average rate of growth, the 2040 population is projected to be higher than the projections from Resolution No. 2015-112 and OFM growth rates. The County high growth rate conservatively projects a 2040 population of 3,279 compared to a population of 3,544 projected using the historical growth rate. The historical growth rate may over-project growth for the upcoming 20-year period. It is recommended that the District use a conservative, published growth rate to be consistent with other planning documents. For this GSP, the Manson UGA population is assumed to grow proportional to the County high growth rate, and as such, the year-round permanent population within the Manson UGA is projected to be 3,279 in 2040.

Land Use

The District currently encompasses an area of approximately 23.15 square miles (14,814 acres), which is largely driven by the District's irrigation service area. The District's sanitary sewer service area is a small portion of the total District area. **Exhibit 2-1** in **Appendix A** shows the parcels currently provided sewer service by the District. These parcels are generally located within the Manson UGA, which encompasses a total area of 2.26 square miles (1,446 acres). The District also serves sewer customers outside of the Manson UGA, near Lift Station No. 3. The District can serve parcels outside of the UGA within close proximity to the shores of Lake Chelan to address water quality concerns as discussed in **Chapter 2**.

Exhibit 3-1 in **Appendix A** and **Table 3-3** show land use designations within the UGA and District boundaries. Within the Manson UGA, approximately 70 percent of the area is designated for residential use, approximately 8 percent is designated for commercial/industrial land, approximately 18 percent is designated as Tribal land, and approximately 4 percent is designated for other uses.

Table 3-3
Land Use within the District and UGA

Land Use Type	UGA		District Sewer Service Area	
	Acreage ³	Percent of Total	Acreage ³	Percent of Total
Residential ¹	1,015	70.2	1,354	59.8
Commercial/Industrial ²	112	7.7	500	22.1
Tribal	263	18.2	257	11.4
Other ⁴	56	3.9	154	6.8
Total	1,446	100.0	2,266	100.0

¹ Residential includes Urban Residential 1, 2, and 3; Rural Residential/Resource 2.5 and 5; and Single-Family Residential.

² Commercial/Industrial includes Commercial Agriculture, Downtown Commercial, Tourist Commercial, and Manson Light Industrial.

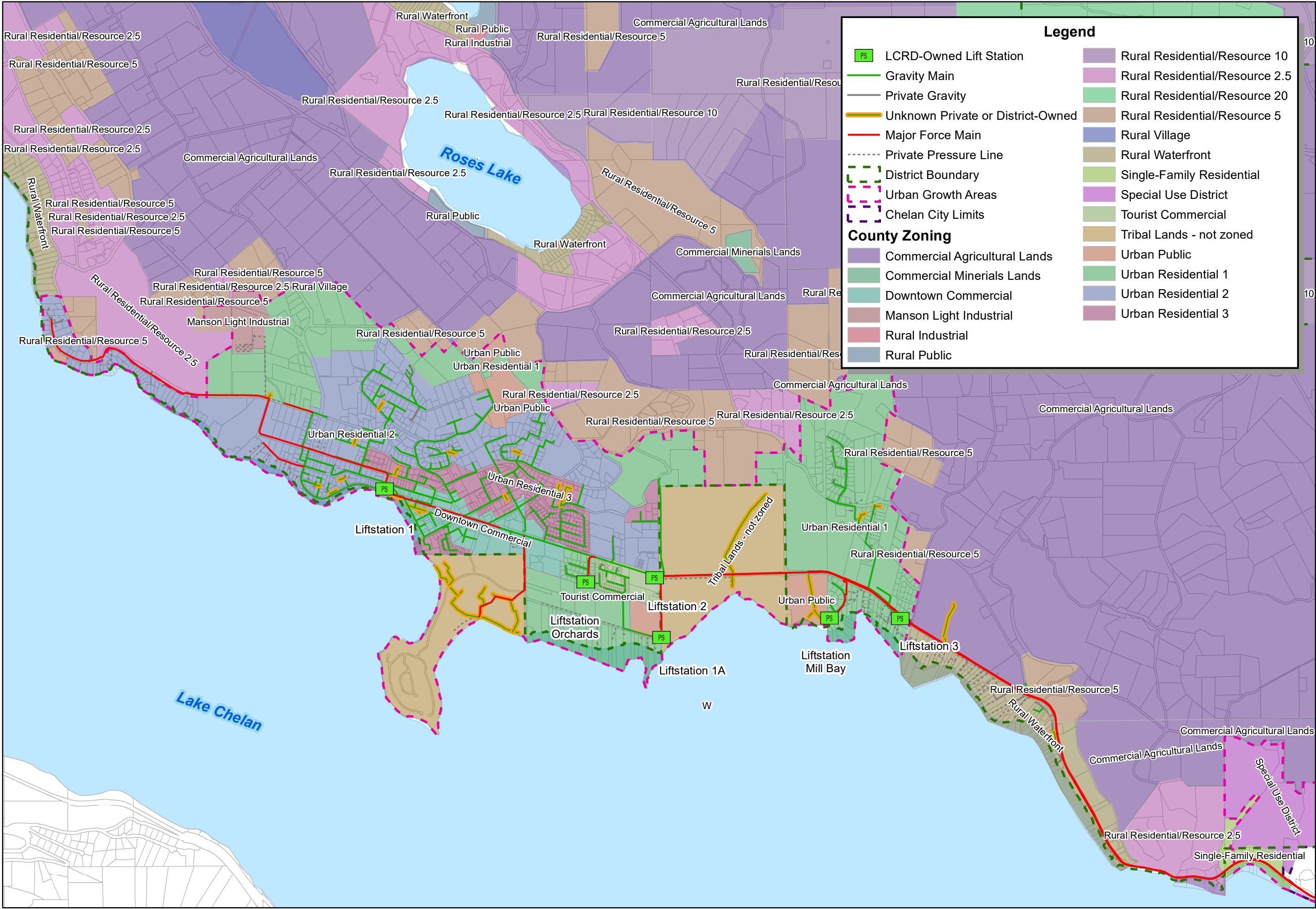
³ The acreage values include streets. The acreage values are based on land use designations as taken from GIS.

⁴ Other includes Urban Public and Rural Waterfront.

Within the District's sewer service area, approximately 60 percent is designated for residential use, as shown in **Table 3-3**. Approximately 22 percent of the area is designated for commercial/industrial use, approximately 11 percent is designated as Tribal land, and approximately 7 percent is designated for other uses.

Summary

This GSP conservatively assumes that the entire population within the Manson UGA, less a portion of those currently served by septic systems as discussed in **Chapter 4**, will be served by the District's sanitary sewer system by 2040. The residential population served by the existing system, as well as the population equivalents of commercial and industrial customers, is established in **Chapter 4**, and the projected population is estimated using the growth projections from this chapter. The locations of proposed developments, topography, and costs associated with extending infrastructure to all portions of the UGA may constrain the actual extents of the future collection system. In order to conservatively estimate potential revenue from sewer system customers, a lower rate of customer growth also is analyzed as part of the financial analyses in **Chapter 7**.



Legend

PS LCRD-Owned Lift Station	Rural Residential/Resource 10
Gravity Main	Rural Residential/Resource 2.5
Private Gravity	Rural Residential/Resource 20
Unknown Private or District-Owned	Rural Residential/Resource 5
Major Force Main	Rural Village
Private Pressure Line	Rural Waterfront
District Boundary	Single-Family Residential
Urban Growth Areas	Special Use District
Chelan City Limits	Tourist Commercial
	Tribal Lands - not zoned
	Urban Public
	Urban Residential 1
	Urban Residential 2
	Urban Residential 3

County Zoning

Commercial Agricultural Lands
Commercial Minerals Lands
Downtown Commercial
Manson Light Industrial
Rural Industrial
Rural Public

This map is a graphic representation derived from the LCRD Geographic Information System. It was designed and intended for LCRD staff use only; it is not guaranteed to survey accuracy. This map is based on the best information available on the date shown on this map.

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Vicinity Map



HERE, Garmin, (c) StreetMap contributors,

Figure 3-1
Zoning
Lake Chelan Reclamation District



1 inch = 1,800 feet
0 450 900 1,800 Feet
DRAWING IS FULL SCALE WHEN BAR MEASURES 1"



J:\DATA\LCR219-012\GIS\FIG 3-1 ZONING.MXD BY: OMARTYUSHEVA PLOT DATE: MAR 7, 2022 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET

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4 | FLOW AND LOADING

Introduction

A detailed analysis of flow and loading is crucial to the planning efforts of a sewer service provider. When analyzing a sewer system, the first step is to identify current flow and load values to determine if the existing system can provide adequate service to its existing customers under the most crucial conditions in accordance with federal and state laws. A future sewer system analysis identifies projected flow and loading to determine where the system will need to be improved to satisfy future growth while continuing to meet federal and state laws.

Flow and loading information is used to determine the size of gravity collection piping, lift stations, and force main piping. In the case of the Lake Chelan Reclamation District (District), this information also is utilized for planning by the City of Chelan (City), as the District discharges its collected sewage to the City's system.

Several different flow scenarios were analyzed in this chapter for both the existing and projected conditions of the District's sewer system, including average annual (AA), maximum month average day (MM), maximum day (MD), and peak hour (PH). An analysis of infiltration and inflow (I/I), the existing and projected service population, and equivalent residential units (ERUs) also are presented in this chapter.

System design criteria and standards have been developed in **Chapter 5**. These criteria are compared to the flow and loading determined in this chapter to ensure that a consistent minimum level of service is maintained throughout the District's sewer system. This information is used as part of the system hydraulic modeling performed in **Chapter 6** for use in identifying necessary capital improvements in **Chapter 7**.

Historical Flow and Loading

Data Collection

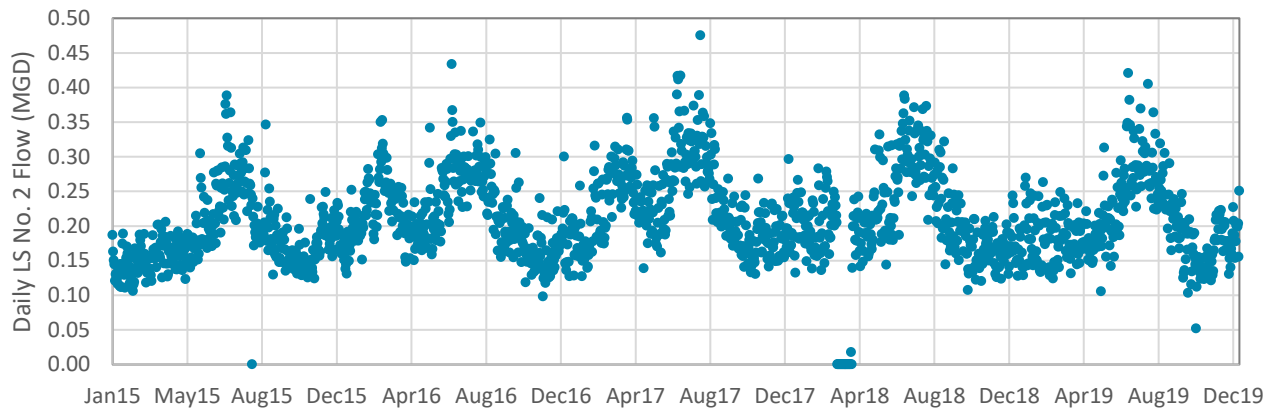
The District's sewer system discharges to the City's collection system via pumping through the Northshore Interceptors as discussed in **Chapter 2**. All flow from the District passes through Lift Station (LS) No. 2, which is metered continuously via an electronic flow meter. The City uses the totalized monthly meter data for the purposes of billing the District. This data is used herein as the basis of analysis for existing and projected wastewater flows from the District.

The term loading is used to generally refer to biochemical oxygen demand (BOD) and total suspended solids (TSS). Loading is not directly measured for the District's discharge. The City's basis for billing the District is only on flow, as the District's wastewater discharge is reasoned to be consistent with normal domestic wastewater. The City collects 24-hour composite influent samples once per week at the wastewater treatment plant (WWTP) to calculate total system loading. BOD and TSS loading is necessary for sizing treatment works. As part of the development of the City's *2020 General Sewer Plan* (GSP), RH2 Engineering, Inc., estimated District loading to be directly proportional to flow received.

Historical Flow

The total daily flow discharged from LS No. 2 is shown in **Chart 4-1**.

Chart 4-1
Historical LS No. 2 Daily Flows (2015 through 2019)



The 2015 through 2019 historical total annual and monthly flow volumes in million gallons (MG) are summarized in **Table 4-1**.

Table 4-1
Historical LS No. 2 Discharge (2015 through 2019)

Month	Month Flow (MG)				
	2015	2016	2017	2018	2019
January	4.888	5.990	6.132	5.637	5.545
February	4.042	6.278	5.273	5.490	4.679
March	5.137	8.656	8.655	7.374	6.400
April	4.768	6.563	7.261	5.699	4.920
May	5.955	6.366	6.918	6.698	6.219
June	6.569	8.387	8.162	7.376	6.282
July	9.716	7.702	9.009	9.321	9.220
August	6.001	8.549	9.208	9.673	7.983
September	5.410	6.870	6.940	5.604	6.776
October	5.673	5.836	5.459	5.379	5.144
November	4.401	4.881	5.443	4.819	5.063
December	6.020	4.883	6.283	5.255	5.230
Total	68.581	80.961	84.744	78.326	73.461

Total annual discharge volume increased from 2015 to 2017, then declined in both 2018 and 2019. The 2015 through 2019 historical average daily flows by month, and the AA, MM, and MD flow volumes are summarized in **Table 4-2**.

Table 4-2
Historical Average Daily Flow by Month (2015 through 2019)

Month	Month Flow (MG)				
	2015	2016	2017	2018	2019
January	0.158	0.193	0.198	0.182	0.179
February	0.144	0.216	0.188	0.196	0.167
March	0.166	0.279	0.279	0.238	0.206
April	0.159	0.219	0.242	0.190	0.164
May	0.192	0.205	0.223	0.216	0.201
June	0.219	0.280	0.272	0.246	0.209
July	0.313	0.248	0.291	0.301	0.297
August	0.194	0.276	0.297	0.312	0.258
September	0.180	0.229	0.231	0.187	0.226
October	0.183	0.188	0.176	0.174	0.166
November	0.147	0.163	0.181	0.161	0.169
December	0.194	0.158	0.203	0.170	0.169
Annual Average Day (MGD)	0.188	0.222	0.232	0.215	0.201
Maximum Month Average Day (MGD)	0.313	0.280	0.297	0.312	0.297
Maximum Day (MGD)	0.389	0.433	0.417	0.388	0.421

AA flows range from 0.188 million gallons per day (MGD) to 0.232 MGD during 2015 through 2019. Flows typically increase in March and April and peak in July and August before decreasing steadily through October. This trend generally aligns with the peak tourism season. The MM flows also have remained in a relatively tight range from 0.280 to 0.313 MGD over the last 5 years.

Sewer Service Customers

As discussed in **Chapter 3**, the District's sewer system provides service to residents within the Manson Urban Growth Area (UGA), as well as other parcels as necessitated to maintain the water quality of Lake Chelan. A billing value per ERU is used to equitably bill each account proportional to the flow generated by a single-family residence, which is assumed to be equal to 1 ERU. A summary of the District's accounts and billing ERUs is provided in this chapter.

Sewer Service Accounts

Table 4-3 presents the historical active sewer service accounts and billed ERUs within the District's system, which shows a steady increase in billed sewer customers over the last 5 years.

Table 4-3
Historical Active Sewer Service Accounts and Billed ERUs

	2015	2016	2017	2018	2019
Sewer Accounts	1,085	1,116	1,144	1,196	1,231
Billed ERUs	1,652	1,674	1,704	1,750	1,736

The District's accounting of active sewer accounts and billing ERUs is informational and is for comparison to the actual ERU determination and flow and loading projections provided later in this chapter.

Customer Categories

The District's current billing system includes the following customer classes for sewer service customers:

- Residential – Typical single-family residential units.
- Multi-Family – Multi-family residential units, including apartments, condominiums, etc.
- Irrigation Only – Sewer customers with irrigation service and no domestic water.
- Domestic Irrigation – Sewer customers that use domestic water for irrigation and are typically residential in nature.
- Industrial – Manson Growers and the Manson School District.
- Commercial/Business – All other sewer customers.

For the purposes of analyzing the major customer classes in this GSP, four primary categories are considered as follows:

- Single-family residences – Inclusive of the District's Residential, Domestic Irrigation, and Irrigation Only accounts.
- Multi-family residences – Inclusive of the District's multi-family accounts.
- Industrial – Inclusive of Manson Growers, for which billing ERUs are based on metered discharge to the collection system and totaled monthly.
- Commercial/Institutional – Inclusive of the District's Commercial/Business accounts. This category also includes the Manson School District, which is an institutional facility that generates sewer flow and loading typical of normal domestic wastewater. Therefore, this account is included in the Commercial/Institutional category for the purposes of this GSP.

Analysis of Wastewater Generation by Customer Category

An ERU is defined based on the flow from typical single-family residences within the collection system. In order to determine this value, the industrial component, which typically consists of metered wastewater discharges, is subtracted from the total system discharge. The remaining portion is further broken down by estimating the portions of single-family, multi-family, and

commercial flows, with the assumption that these discharges are relative to the portion of potable water consumption by these customer classes.

This section of the chapter proceeds through this analysis to determine the District's single-family residential portion of flow to define the flow per ERU.

Industrial Customers

There are currently no state waste discharge permits issued by the Washington State Department of Ecology (Ecology) allowing industries within the District's sewer service area to discharge to the District's system. There is one active industrial facility that discharges to the District's sewer collection system with coverage under the Ecology-issued Fresh Fruit Packing Industry General Permit:

1. Manson Growers (Permit No. WAG435250) is a fruit packing warehouse that discharges packing water from Outfall No. 002A to the District's system. The District meters the discharge from this facility to the collection system. The normal period of this discharge is November through April, with reduced or no discharge from May through October. The discharge typically consists of fruit packing wastewater that averages approximately 12,000 gallons per day (gpd) during November through April over the last 5 years. A MM discharge of approximately 36,000 gpd occurred in December of 2019. This value is used for estimating the potential maximum month discharge from this facility.

Table 4-4 provides Manson Growers monthly and average daily discharges to the District's collection system.

Table 4-4
Historical Manson Growers Discharge from Outfall 002 to District's Collection System

Month	Monthly Flow (gallons)*			Average Daily Flow (gpd)		
	2017	2018	2019	2017	2018	2019
January	510,000	630,000	500,000	16,452	20,323	16,129
February	270,000	380,000	460,000	9,643	13,571	16,429
March	1,040,000	580,000	600,000	33,548	18,710	19,355
April	10,000	0	60,000	333	0	2,000
May	0	0	0	0	0	0
June	0	0	0	0	0	0
July	0	0	0	0	0	0
August	0	0	0	0	0	0
September	0	0	0	0	0	0
October	0	0	0	0	0	0
November	440,000	340,000	320,000	14,667	11,333	10,667
December	450,000	400,000	1,120,000	14,516	12,903	36,129
Total	2,720,000	2,330,000	3,060,000	-	-	-

*Monthly flow volumes are approximated from wastewater meter data and rounded to the nearest 1,000 gallons.

Since Manson Growers does not typically discharge to the District's collection system during the summer months, no industrial discharge is assumed for the District during the maximum month condition.

Commercial and Residential Customers

Single-family residential, multi-family residential, and commercial sewer customers that also are served domestic water from the District were analyzed to determine the relative portions of domestic water consumption by each customer class. **Table 4-5** summarizes the domestic water consumption by customer class during the winter months for 2017 through 2019.

Table 4-5
Historical November through February Domestic Water Usage by Customer Type

Year	Units	Single Family Residential	Multi-Family Residential	Commercial	Total
2017	Gallons	10,290,000	10,890,000	1,930,000	23,110,000
	Percent	45%	47%	8%	100%
2018	Gallons	9,930,000	8,520,000	2,020,000	20,470,000
	Percent	49%	42%	10%	100%
2019	Gallons	11,470,000	8,160,000	960,000	20,590,000
	Percent	56%	40%	5%	100%

1. This table only includes customers served by both District domestic water and wastewater collection systems.

2. The single District industrial customer is removed from the table.

3. All consumption values are rounded to the nearest 10,000 gallons.

Domestic water consumption was analyzed during the winter months (November through February) to estimate the typical consumption by a single-family residential unit during the non-tourism and non-irrigation season. As shown in **Table 4-5**, the single-family residential portion of the District's total discharge is assumed to have ranged from 45 to 56 percent over the 3 years analyzed, assuming that wastewater discharge from each of these customer classes is proportional to domestic water consumption. The discharge portions identified in **Table 4-5** are used to estimate the total wastewater discharge from each customer class.

ERU and Equivalent Population Determination

The determination of the flow and loading per ERU for the equivalent population can be made for various scenarios. Two typical conditions for these determinations are AA day and MM. Systems that have relatively constant flow and loading throughout the year are well suited for an AA day analysis. Systems with high seasonal flow and loading, such as those with high I/I or large population swings, are better suited for maximum month analyses. The District is well suited for an ERU and equivalent population determination based on the MM condition due to the tourism influx in the summer months. The AA, MD, and PH flow scenarios only will be used to estimate system-wide, flow-based peaking factors as described in the **Peaking Factor Analysis** section.

Table 4-6 shows the MM flow for 2017 to 2019 and subtracts the average daily backwash from the District's domestic water treatment plant (WTP), which discharges to the wastewater collection system, in order to estimate the portions of residential and commercial sewer system discharge by customer class.

Table 4-6
District Maximum Month Sewer System Discharge by Customer Type

Parameter	Maximum Month Analysis					
	2017 (August)		2018 (August)		2019 (July)	
Total District Monthly Sewer Discharge (MG)	9.208		9.673		9.220	
District Monthly Average Sewer Discharge (MGD)	0.297		0.312		0.297	
WTP Average Daily Backwash Flow (MGD)	0.022		0.026		0.029	
Residential and Commercial Average Daily Flow (MGD)	0.275		0.286		0.268	
Distribution of Sewer Discharge By Customer Class¹	%	Flow³	%	Flow³	%	Flow³
Single-Family Residential Daily Flow (gallons)	44.5%	122,000	48.5%	139,000	55.7%	149,000
Multi-Family Residential Daily Flow (gallons)	47.1%	130,000	41.6%	119,000	39.6%	106,000
Commercial Daily Flow (gallons)	8.4%	23,000	9.9%	28,000	4.7%	13,000
Industrial Daily Flow (gallons) ²	0.0%	0	0.0%	0	0.0%	0

1. The portions of wastewater discharge by class are based on domestic water consumption.

2. Summer industrial flow is assumed to be zero as Manson Growers does not discharge to the system during these months.

3. Flow volumes are rounded to the nearest 1,000 gallons.

The portions of discharge by each customer class shown in **Table 4-6** are assumed to equal the domestic water consumption portions identified in **Table 4-5**. Based on the Chelan County estimate of dwelling units in the Manson UGA, as well as the portion served by septic systems, **Table 4-7** estimates the per ERU and per capita sewer discharge to the District for 2017 through 2019.

Table 4-7
District Maximum Month Per ERU and Per Capita Sewer System Discharge

Parameter	Maximum Month Analysis		
	2017 (August)	2018 (August)	2019 (July)
ERU and Per Capita Determination			
Single-Family Residential Units in District ¹	616	633	628
Daily Sewer Discharge per Dwelling Unit (gpd)	198	193	194
3-Year Average Daily Sewer Discharge per ERU (gpd)	195		
Capita per Dwelling Unit Estimate (capita/ERU) ²	2.58		
Per Capita Flow Contribution (gpd)	77	75	75
3-Year Average Per Capita Flow Contribution (gpd)	76		

1. Active single-family residential units during maximum month were counted based on the District's billing in 2018. 2017 and 2019 accounting of single-family residential units is estimated as proportional to total billed ERUs for those years.

2. The 2017 Chelan County Comprehensive Plan, Appendix B rate of 2.58 persons per dwelling unit for the Manson UGA is used for the Capita per Dwelling Unit Estimate.

A typical per capita design value for flow discharge is 100 gpd. This value can vary widely across systems based on demographics, system age, water use efficiency, I/I, and other factors. The estimated 3-year average of 76 gpd per capita for the District is indicative of a system with relatively high water use efficiency and low I/I.

Without historical BOD or TSS loading measurements specific to the District's discharge, it is difficult to further verify per ERU and per capita flows. The current potable water consumption by customers in the District during the winter months has been approximately 76 gpd over the last 5 years. The winter month consumption most accurately corresponds to sewer system discharge, as it generally eliminates exterior water consumption (irrigation, car washing, etc.) that is unlikely to be discharged to the wastewater collection system. As expected, the winter potable water consumption value is in-line with the estimated sewer discharge value. As such, the estimated values of per ERU and per capita sewer system discharge at the existing condition are 195 gpd and 76 gpd, respectively, based on the 3-year average. Conservatively, future per ERU and per capita rates can be estimated to be more in-line with typical values as discussed in the **Future Per Capita and ERU Flow and Loading Definition** section.

The sewer flow for each customer category can be expressed in terms of equivalent population and ERUs for forecasting and planning purposes. The number of ERUs associated with each customer class is calculated by dividing the sewer flow of each customer category by the unit demand per capita and per ERU. **Table 4-8** presents the computed equivalent population and ERUs in 2019 for the District's residential (combined single-family and multi-family), commercial/institutional, industrial customer classes.

Table 4-8
2019 Sewer Equivalent Population and ERUs

Parameter	Daily Sewer Discharge (gpd)	Equivalent Population	Equivalent ERUs
Per Unit Flow Contribution (gpd)	-	76	195
Single-Family Residential	149000	1,972	764
Multi-Family Residential	106000	1,403	544
Commercial Daily Sewer Discharge (gpd)	13,000	172	67
Industrial Daily Sewer Discharge (gpd)	36000	476	185
Total Equivalent Existing System Population and ERUs		4,023	1,559

1. ERUs shown are estimated on a 3-year flow and loading basis and do not align exactly with currently billed ERUs.

2. The industrial ERUs shown are for Manson Growers, which typically does not discharge during summer months.

3. Flow values are rounded to the nearest 1,000 gallons.

The estimated population in the Manson UGA is 2,338 for 2019, as shown in **Chapter 3**. The estimated District residential (single- and multi-family) wastewater collection system population approximately averages 3,400 during the maximum month per **Table 4-8**. This population is not expected to exactly match the Manson UGA population for the following reasons:

- The existing sewer service area does not fully cover the entire Manson UGA.
- A portion of the developed parcels within the Manson UGA are served by on-site septic systems.
- The summer influx of tourists or residents with vacation homes in the Manson area increases the effective population during the maximum month compared to winter or average annual conditions.

These factors are further analyzed in the sections that follow.

Septic Systems

It is estimated that approximately 110 parcels served by on-site septic systems in the Manson UGA. Of these, there are approximately 100 parcels that are residential in nature. This would equate to a UGA residential population served by septic systems of approximately 260 people at 2.58 people per dwelling unit. This likely overestimates the AA population served by septic systems in the UGA. For the purposes of this GSP, the UGA residential population served by septic systems is assumed to be 260 people during the maximum month. This value is utilized to project future sanitary sewer system customers as septic systems fail and residences are converted to sanitary sewer service during the planning period.

Peaking Factor Analysis

In order to establish projected flow scenarios for a sewer system, peaking factors are determined for the existing system that can then be applied to future flow rates. Peaking factors are ratios used to relate high flow conditions to average or low flow conditions. Typically, factors are derived to compare the MM, MD, and PH flows to the AA flow condition. These analyses are necessary for the analysis and design of specific system components.

The previous analyses focused on established ERUs on a maximum month basis, as it is critical to understand this condition for the District, when maximum months are driven by an influx of tourists and vacations. This section establishes the peaking factors based on historical flow and loading, with all factors related to the AA condition per standard convention.

Maximum Month and Maximum Day Analysis

Table 4-9 summarizes the historical District flows at the AA, MM, and MD flow condition, on an annual basis for 2015 through 2019. These values are used to establish the MM/AA and MD/AA peaking factors shown in **Table 4-9**.

Table 4-9
Historical Peaking Factors for the District's Total Sewer Discharge

Flow Scenario	Flow	Peaking Factor
	(MGD)	(in terms of AA)
2015 AA	0.188	1.00
2015 MM	0.313	1.67
2015 MD	0.389	2.07
2016 AA	0.222	1.00
2016 MM	0.279	1.26
2016 MD	0.433	1.95
2017 AA	0.232	1.00
2017 MM	0.297	1.28
2017 MD	0.417	1.80
2018 AA	0.215	1.00
2018 MM	0.312	1.45
2018 MD	0.388	1.81
2019 AA	0.201	1.00
2019 MM	0.297	1.48
2019 MD	0.421	2.09
Maximum MM/AA Peaking Factor		1.67
Maximum MD/AA Peaking Factor		2.09

To be conservative, the maximum peaking factor values from 2015 through 2019 are used for the projections in this GSP. This equates to a MM/AA peaking factor of 1.67 and a MD/AA peaking factor of 2.09.

Peak Hour Analysis

Ecology's *Criteria for Sewage Works Design* (Orange Book) defines the peak hour flow as the largest volume of flow anticipated to occur during a 1-hour period, expressed as a daily or hourly average. Section C1-3.3.2 of the Orange Book requires collection system piping, and subsequently lift stations and force mains, to be designed to pass the projected peak hour flow. For basins or small areas where the PH flow cannot be measured directly, a peak hour factor of 4 is typical. For larger areas, such as the entire collection system, a smaller peaking factor may be used. A peak hour factor of 2.5 is the typical minimum per Orange Book guidance. For the District, instantaneous flow data is available to determine the historical peak hour flow events at LS No. 2, which collects the entire District discharge, as shown in **Table 4-10**.

Table 4-10
Top Three LS No. 2 PH Flow Events (2017 through 2019)

Parameter	Flow / PF
2017	
AA Flow (MGD)	0.232
AA Flow	161
<i>Peak Hour Event (gpm): July 18</i>	785
<i>Peak Hour Event (gpm): June 28</i>	773
<i>Peak Hour Event (gpm): August 20</i>	759
PH Flow/AA Flow Peaking Factor	4.9
2018	
AA Flow (MGD)	0.215
AA Flow	149
<i>Peak Hour Event (gpm): July 25</i>	699
<i>Peak Hour Event (gpm): June 22</i>	688
<i>Peak Hour Event (gpm): July 12</i>	683
PH Flow/AA Flow Peaking Factor	4.7
2019	
AA Flow (MGD)	0.201
AA Flow (gpm)	140
<i>Peak Hour Event (gpm): July 2</i>	786
<i>Peak Hour Event (gpm): July 24</i>	739
<i>Peak Hour Event (gpm): August 1</i>	654
PH Flow/AA Flow Peaking Factor	5.6
Maximum 3-year PH Flow/AA Flow Peaking Factor	5.6

The peak hour condition typically occurs during the peak tourism period between Memorial Day and Labor Day. The range of peak hour events for 2017 through 2019 is 654 to 786 gallons per minute (gpm), with multiple events near 780 gpm. As such, this appears to be an expected peaking event going forward. The maximum PH to AA flow factor is 5.6. This value should be used to examine existing conditions and to project future PH flow rates to LS No. 2. Historical flow data for the other District lift stations was either unavailable or was not in a form that was useable for a basin by basin PH flow analysis. As such, it is recommended that the LS No. 2 peak hour factor of 5.6 also be used for all District basins in lieu of the Orange Book estimate of 4.0. Hydraulic modeling for collection system capacity analyses at existing and future peak hour conditions is provided in **Chapter 6**.

Summary of Existing Equivalent Service Area Population and ERUs

The estimated District residential sewer system population during the maximum month is 3,400. The MM to AA peaking factor is shown as approximately 1.67. Assuming that the per capita sewer system flow and loading rates remain relatively constant throughout the year, the AA residential sewer system population would be estimated at approximately 2,000.

As a point of comparison, the 2019 Manson UGA residential population served by septic systems is estimated at 580 people during the maximum month. Using the District's MM to AA peaking factor of 1.67, it is estimated that the average annual UGA residential population served by septic systems is approximately 350. Adding the estimated average annual UGA residential populations served by both the District and on-site septic systems equates to 2,350, which closely aligns with the estimated population in the Manson UGA of 2,338 as shown in **Chapter 3**.

Both analyses closely align for a year-round District residential sewer system population of 2,000. Therefore, it is recommended that the following rates be used as the basis for existing customers at the maximum month condition:

- Per capita: 76 gpd.
- Per ERU: 195 gpd.

Due to the difficulty in estimating the existing per capita and per ERU rates and the potential variability in future rates, more conservative values closer to standard design values can be used for projections of future rates as discussed later in this chapter.

Inflow and Infiltration Analysis

Background

I/I is the combination of groundwater and surface water that enters the sewer system. Infiltration is groundwater entering the sewer system through defects in the sewer system infrastructure, such as fractured pipes and leaking manholes and pipe joints. Inflow is surface water that enters the sewer system from sources such as roofs, street drains, and leaky manhole covers.

A sanitary sewer system must be able to carry the domestic wastewater generated by utility customers and the extraneous I/I that is a part of every sewer collection system. Excessive I/I in the sewer collection system can lead to serious issues within the collection system that may include wastewater system backups and overflows or acceleration of the structural deficiencies in the collection system. Excessive I/I also can inflate capacity requirements of the proposed collection and treatment system infrastructure.

Reducing I/I in a sewer collection system can reduce the risk of sanitary sewer overflows and the cost of treating wastewater. By reducing or eliminating I/I sources, the extraneous water that previously occupied the conveyance and treatment system can now be occupied by sewage flows. This leads to delaying conveyance and treatment projects that were needed because of the extraneous I/I water.

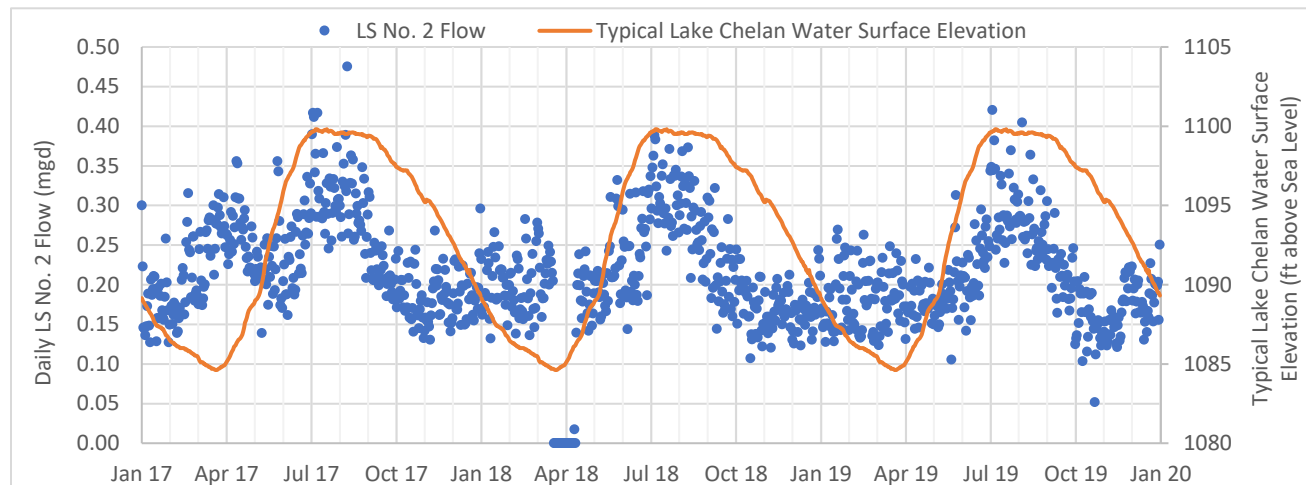
The U.S. Environmental Protection Agency (EPA) published a report in May 1985, *Infiltration/Inflow, I/I Analysis and Project Certification*, which developed guidelines to help determine what amount of I/I is considered to be excessive and what amount can be cost-effectively removed. The report established I/I flow rates that are considered normal or acceptable based on surveys and statistical evaluations of data from hundreds of cities across the nation.

Infiltration

The EPA's guidelines for determination of non-excessive infiltration were based on the national average for dry weather flow of 120 gallons per capita per day (gpcd). For infiltration to be considered non-excessive, the average daily flow must be less than 120 gpcd (i.e. a 7- to 14-day average measured during periods of seasonal high groundwater). Significant commercial and industrial customers typically are removed from the daily discharge to calculate the per capita dry weather flow.

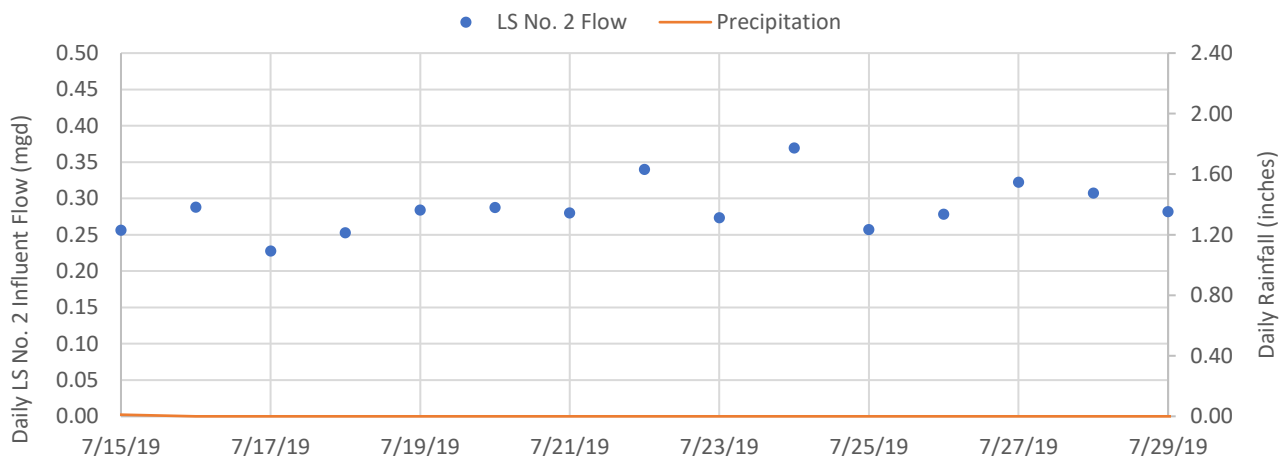
Although it can be difficult to determine how much flow is due to I/I, peak inflow will generally occur during or just after a significant rain event, while peak infiltration will occur during high groundwater. The topography of the region, with terrain sloping relatively steeply toward Lake Chelan, reduces the likelihood of high groundwater to areas nearest the lake where groundwater elevations are likely to fluctuate with the lake elevation. Public Utility District No. 1 of Chelan County (PUD) operates the Lake Chelan Dam at the outlet of Lake Chelan to manage the lake level for recreation, navigation, and water supply while producing power at a power generation facility that is located in Chelan Falls at the base of the Chelan River gorge. The lake level is maintained at approximately 1,100 feet AMSL during the summer months. The PUD releases lake water through the dam each fall, dropping the lake level about 15 feet to allow for the capture of spring snowmelt runoff. **Chart 4-2** shows the average lake level trend compared to the LS No. 2 daily flows.

Chart 4-2
Daily LS No. 2 Total Discharge and Lake Chelan Water Surface Elevation (2017 through 2019)



The period when the lake is at its highest level coincides with the peak tourism season, making it difficult to assess the impact of increased lake levels on infiltration in the District's system. As shown in **Chart 4-3**, there was no precipitation during the 14-day period from July 15, 2019 to July 29, 2019.

Chart 4-3
Daily LS No. 2 Total Discharge and Daily Precipitation (July 15, through July 29, 2019)



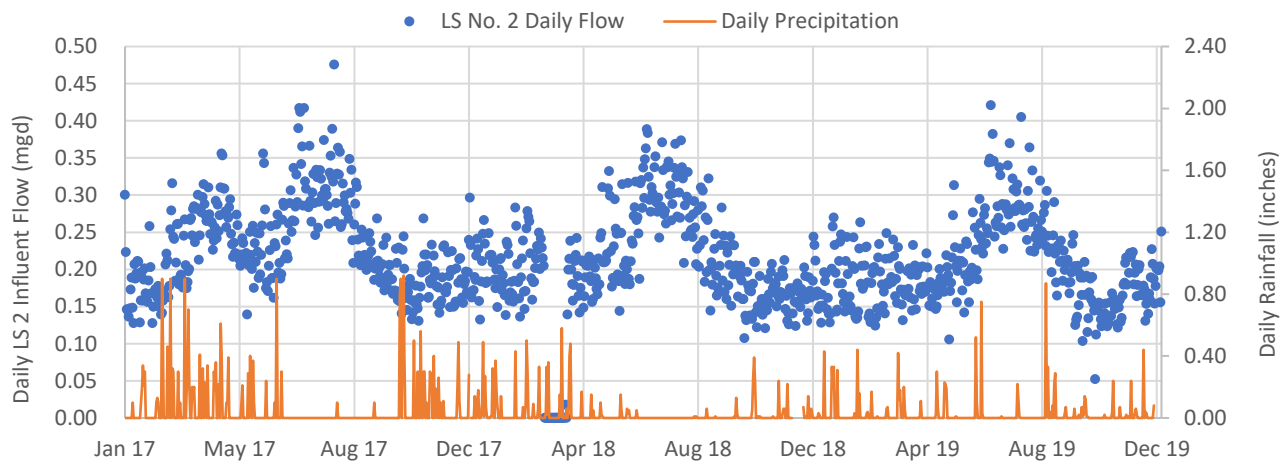
Precipitation data derived from WSU AgWeather databased, Chelan. S station.

During this period, the lake level was at its maximum and LS No. 2 discharge averaged approximately 0.29 MGD. Per the **ERU and Equivalent Population Determination** section, the District supports a residential (combined single- and multi-family) population of approximately 3,400 people during the maximum month, which equates to a dry weather flow of 85 gpcd at 0.29 MGD. This is significantly below the EPA's determination of excessive infiltration due to groundwater.

Inflow

Chart 4-4 compares LS No. 2 daily flow to daily precipitation values for 2017 through 2019. As is evidenced by the table, influent flow rate increases inversely to precipitation due to the influx of tourists during the dry summer months.

Chart 4-4
LS No. 2 Flow Single Sample Values to Daily Precipitation Values (2017 through 2019)



Precipitation data derived from WSU AgWeather databased, Chelan. S station.

Per the EPA, inflow is considered to be non-excessive if the average daily flow during periods of heavy rainfall or spring thaw (i.e. any event that creates surface ponding and surface runoff) does not exceed 275 gpcd. As shown **Chart 4-4**, the highest precipitation months occur approximately between November and April. Although snow depth data is not readily available for the District, these months also represent the period in which runoff from snow melting occurs. As shown in the **ERU and Equivalent Population** section, the estimated District residential (combined single- and multi-family) sewer service population is approximately 2,000 on an AA basis. Based on the threshold of 275 gpcd for excessive inflow, 0.688 MGD would be the threshold for excessive inflow for the District's system. This value significantly exceeds the District flow values at any time throughout the year. As such, inflow is not considered excessive for the District's collection system.

Projected Flow and Loading

With existing flow and loading rates defined, projected flow and loading can be developed for use in analyzing the system performance in future conditions. This information is used to determine the necessary capital improvements outlined in **Chapter 6**.

Flow and Loading Projection Assumptions

The projected total District flow, and the flow distribution to the various basins in the District, was developed using the following assumptions:

- The primary per capita and per ERU flow and loading is based on the maximum month condition.
- System-wide and basin-specific flow at AA, MD, and PH flow conditions are estimated based on the peaking factors previously defined in this chapter in conjunction with the per capita and per ERU definitions.
- Existing ERUs are assumed to contribute flow to the system at the existing unit rates in future conditions.
- All future ERUs are assumed to contribute flow and loading to the system at the defined future ERU rate.
- Information regarding approved and pending developments, obtained from the District, was used to allocate the projected basin-specific flow rates.

Future Customer Assumptions

The future collection system is assumed to include customers similar to the four primary existing customer categories. For planning purposes, it is assumed the District's collection system will cover the entire Manson UGA in 20 years, while additionally providing service to parcels outside the UGA as necessary to meet water quality needs. This is a conservative approximation of future conditions to ensure that the District can adequately plan infrastructure improvements. All customer growth is assumed to occur within these areas.

In order to project system flows, the following basis for growth within each primary customer category is used:

- Residential – Growth in flow and loading is based on population growth as established in **Chapter 3** using the per capita flow and loading rates established in this chapter.
 - Septic system conversions – The District should conservatively plan for new connections to the sewer system to serve on-site septic systems that fail during the planning period and can be connected to the District's system through a reasonable extension of infrastructure. For the purposes of this analysis, it is conservatively assumed that 20 percent of all septic systems within the UGA will be connected to the District's system by the end of the planning period, with connections occurring linearly through the planning period. This equates to 1 septic system conversions per year. Additionally, the District should plan to connect some parcels outside of the UGA, but within the Water Quality Planning Area, that are either currently served by on-site septic systems or represent future development that would otherwise be served by on-site septic systems.
- Commercial/Institutional – Growth in flow and loading is assumed to be directly proportional to residential growth.

- Industrial – Growth of this customer category is extremely difficult to predict due to the variety of flow characteristics by different industries. Based on a review of the City’s collection and treatment capacity in the City’s 2020 GSP, the District has decided to allocate 25 total ERUs for industrial discharge during the planning period. For projections, it is assumed that this allocation will be fully utilized in 20 years, with the allocations occurring linearly throughout the planning period up to the full allocation.

The following sections project growth within the District’s sewer service area.

Future Per Capita and ERU Flow and Loading Definition

Flow

The typical design value of 100 gpcd is shown in the Orange Book as guidance for system planning when no other data is available to determine the daily per capita sanitary sewer flow contribution. The existing system analyses estimated the current daily per capita flow contribution at 75 gpcd. As noted, is recommended that future flow contributions be conservatively estimated, even though the current per capita flow contribution is indicative of a system with low I/I, high water use efficiency, and other factors that justify a lower projected per capita rate than 100 gpcd. It is recommended that the District use a moderately conservative rate of 85 gpcd for estimating flow from future residents.

ERU Definition

Based on the projected per capita flow and loading rates, and using the Manson UGA rate of 2.58 people per dwelling unit, **Table 4-11** establishes the per capita and per ERU flow basis for future connections to the District’s system at various conditions.

Table 4-11
Future Per Capita and ERU Definition

Parameter	ERU Basis							
	AA		MM		MD		PH	
	Capita	ERU	Capita	ERU	Capita	ERU	Capita	ERU
Peaking Factor (ratio to AA)	1.00		1.67		2.09		5.60	
Flow (gpcd) ¹	51	132	85	220	106	276	-	-
Flow (gpm)	-	-	-	-	-	-	0.20	0.51

1. The value of 220 gpd/ERU at the MM condition is rounded to the nearest 10 gallons.

Projected ERU and Equivalent Population

Utilizing the growth projection methods previously established for each customer category, **Table 4-12** and **Table 4-13** show the population equivalents and projected ERUs for the 2030 and 2040 conditions compared to 2019.

Table 4-12
Equivalent Population Projections at Maximum Month

Parameter	2019	2030 (10 Years)		2040 (20 Years)	
		Growth	Total	Growth	Total
UGA Population	2,338	+ 497	2,835	+ 444	3,279
Sewer Service Area					
Residential	3,374	+ 717	4,092	+ 641	4,733
<i>Septic Conversions</i>	0	+ 258	258	+ 258	516
Commercial (Equivalent)	172	+ 37	209	+ 33	241
Industrial (Equivalent)	476	+ 407	883	+ 407	1,290
Total System (Equivalent)	4,023	+ 1,419	5,441	+ 1,338	6,780

Population equivalents estimated based on the Manson UGA rate of capita per dwelling unit of 2.58.

Table 4-13
ERU Projections at Maximum Month

Parameter	2019	2030 (10 Years)		2040 (20 Years)	
		Growth	Total	Growth	Total
Residential	1,308	+ 278	1,586	+ 248	1,834
<i>Septic Conversions</i>	0	+ 100	100	+ 100	200
Commercial	67	+ 14	81	+ 13	94
Industrial	185	+ 158	342	+ 158	500
Total System	1,559	+ 550	2,109	+ 519	2,628

Projected Flow

Assuming that the existing per ERU and per capita flow rate remains at the current level throughout the planning period, and utilizing future ERUs per **Table 4-13**, the projected District flow to the City is provided in **Table 4-14**.

Table 4-14
Projected District Flow (MGD) at Maximum Month

Parameter	2019	2030 (+ 10 Years)		2040 (+20 Years)	
		Growth	Total	Growth	Total
Residential	0.255	0.061	0.316	0.055	0.371
Septic Conversions	0.000	0.022	0.022	0.022	0.044
Commercial	0.013	0.002	0.016	0.003	0.019
Industrial	0.036	0.035	0.071	0.035	0.105
Total System	0.304	0.121	0.425	0.114	0.539

Table conservatively assumes current and future industries will discharge during the District's typical maximum month condition. Currently, there is no industrial discharge within the District during the typical maximum month.

Summary

The projected flow for the District is summarized in **Table 4-15** for AA, MM, MD, and PH flow conditions.

Table 4-15
Summary of Existing and Projected Flow

Parameter	Flow (MGD)			Flow (gpm)
	AA	MM	MD	PH
Existing (2019)	0.182	0.304	0.381	711
2030 (10-Year)	0.255	0.425	0.532	995
2040 (20-Year)	0.323	0.539	0.675	1,262

5 | POLICIES AND DESIGN CRITERIA

General

The Lake Chelan Reclamation District (District) provides sewer service within the Manson Urban Growth Area (UGA). Additionally, the District serves parcels in close proximity to the shores of Lake Chelan but outside of the Manson UGA.

The District's sewer system planning, design, construction, and operation are based on the policies, laws, and regulations that originate from several different sources listed in this chapter. This chapter provides a review of the District's standards, policies, and criteria used for wastewater collection system design and improvements.

The District provides associated sewer service to area residents and businesses per the design criteria, laws, and policies that originate from the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology). The District's Board of Commissioners (Board) adopts regulations and policies that are equal to or more stringent than those established by the federal and state governments. The District's guidance takes the form of policies, resolutions, memoranda, and operational procedures, many of which are summarized in this chapter.

These laws, design criteria, and policies guide the District's operation and maintenance of the sewer system on a daily basis, as well as the District's plan for growth and improvements. The overall objective is to ensure that the District provides high-quality sewer service at a fair and reasonable cost to its customers and to set the standards the District must meet to ensure that the sewer system is adequate to meet existing and future flows.

The system's ability to handle these flows is detailed in **Chapter 6. Chapter 7** of this General Sewer Plan recommends any improvements necessary to maintain adequate levels of service and meet future growth conditions.

Boundaries

Urban Growth Area

Boundaries

The District's current policies on the Manson UGA are as follows:

- The District is planning to serve the entire UGA where economically possible.
- The District will continue to develop in unserved areas of the UGA that meet the needs of the District first.
- The financial viability of the expansion of District infrastructure shall be considered during any expansion.
- It is at the District's discretion to determine the areas of most need and the best use of District resources for prioritizing sewer projects.

Lake Chelan Reclamation District Boundary

The Lake Chelan Reclamation District Boundary is administered by the District. The community of Manson is completely encompassed by the District boundary. Annexation into the District is governed by Chapter 87.03.560 Revised Code of Washington (RCW).

The District's current policies regarding the District boundary are as follows:

- Lands outside the service area identified in the current addition of the District Comprehensive Plan must first make written request to the District.
- Acceptance will be based upon Board approval and, as necessary, Washington State Department of Health approval, Ecology approval, compliance with Chelan County (County) land use regulations, compliance with agreements with the City of Chelan (City), and environmental compliance.
- Lands outside the District boundary also must follow the procedures outlined in RCW 87.03.560 through RCW 87.03.610 unless special service contracts are executed.
- Annexation or Waiver of Utility Local Improvement District (ULID) and No-protest for Annexation into the District is required prior to providing service.
- Annexations and expansions of the District boundary will be performed for individual parcels or groups of parcels that make economical and logical sense as determined by District staff.
- The District, at its discretion, may serve outside its boundary.
- Not all areas within the District boundary are able to be served economically.

Requesting and Requiring Sewer Service

Obtaining Sewer Service and Connection

The District will strive to provide sewer service to the residents within the District's sewer service area, provided all policies related to service can be met. Some areas in the District may be unserviceable due to physical locations or may not be economically feasible for the District to serve.

All proposed developments within the District's service boundary shall connect directly to the District's sewer system, unless deemed unavailable by the District in writing at the time of the request.

Requirement for Connection

The complete rules governing sewer connection requirements within the Manson UGA are detailed in the District's Rules and Regulations.

Connection to the sewer system is required when:

- Development of any parcel located within the UGA directly abuts a public sewer system that is located within a public right-of-way or easement. An individual pumped service will be required if gravity service is not achievable due to lot configuration;

- Development of any parcel of real property located within 500 feet of any District sanitary sewer facility is required, at his/her expense, to extend the sewer main and connect all applicable plumbing outlets from such buildings or structures directly to the public sewer. The distance between the property and the public sanitary sewer facility is measured along the usual or most feasible route of access to the nearest property line of the subject property;
- The owner of a residence or other facility served by an on-site septic system that has failed, as determined by the local health officer, must connect if the parcel is within 200 feet of a public sewer system; and
- Several exceptions apply to connection requirements that can be found in the complete Rules and Regulations, which is provided as **Appendix D**.

Sewer system extensions required to provide sewer service to proposed developments shall be approved by the District and must conform to the following:

1. The District's most recent GSP.
2. Ecology's *Criteria for Sewage Works Design* (Orange Book).
3. Chelan-Douglas Health District requirements.
4. The District's adopted design criteria, construction standards, and specifications.
5. The District's Sanitary Sewer Standard Details.
6. The District' Lift Station Standard Details.

All costs of extensions, lift stations, or associated sewer infrastructure shall be borne by the developer or applicant. The most recent adopted Sanitary Sewer Standard Details and Lift Station Standard Details are included in **Appendix E**.

- Sewer service outside of the UGA is reserved to parcels adjoining the existing sewer system whose property can be served without a sewer extension or for areas of environmental concern. Extending sanitary sewer service to areas of environmental concern must be approved by the Board, Ecology, and the Chelan County Planning Department, and must be consistent with agreements with the City and environmental compliance.
- Sewer collection system, lift station, and treatment plant capacity will be considered when providing sewer availability responses to applicants. If any type of capacity analysis is required, applicants will be required to reimburse the District for the complete or partial cost of this analysis.

Sewer Service Availability

Sewer extension availability shall be provided based on system capacity using the following priorities:

- Extensions shall first be given to applicants within District boundaries:
 - Second priority shall be given to those applicants within the UGA.
 - Extensions may be given higher priority where existing environmental problems make extension necessary (i.e. failing septic systems).
- The District Manager has the ultimate and final say on all sewer availability issues.

Sewer Service Application

- A. For single residential sewer service applications.
 - 1. Any person may request sewer service that is within the District Boundary or within the UGA. Sewer service may be requested on a District Sewer Hook Up Application at the District office.
- B. For subdivisions, short plats, planned developments, development extensions, or any other development requiring sewer service that is not a single-family residence.
 - 1. Within the District and County's Jurisdiction:
 - The District will review the availability for sewer service and provide a letter stating the results at the District's pre-application meeting. If additional studies are required for determining if sewer system availability is present, a letter stating such will be provided at the pre-application meeting, along with a best estimate of developer costs for the additional studies; and
 - Development plans shall be submitted directly to the District for review of concurrence with District standards following the District's Developer Extension Agreement. During the development plan review process, the District will address the sizing and location of the sewer extension, along with all other components of the design to meet District standards. The formal sewer service application review begins at the time of submittal of a fully completed Developer Extension Agreement and full payment of the application fee.

Permits and Fees

- A. Sewer availability shall expire 1 year after the permit is issued.
- B. No time extensions in regards to sewer availability shall be granted.
- C. Sewer Service Related Fees
 - 1. A Developer's Extension Deposit is required on all development extension reviews.
 - 2. A connection fee, based on equivalent residential units (ERUs), will be required.
 - 3. A side service lateral inspection fee is required at the time of hook-up.
- D. Industrial Users are required to submit a plan to the District and must follow the City of Chelan's Wastewater Rules and Regulations.
- E. Fees for exceeding ERUs (continued development and buildout of a property) are paid when water meter is installed.

Septic Systems

- A. Existing single-family homes with septic systems in good working condition, per the Chelan-Douglas Health District, may continue to be used within the UGA . All septic

- systems in the UGA shall be monitored per the Chelan-Douglas Health District's regulations.
- B. Property owners with a failing septic system, as determined by the local Chelan-Douglas Health District Officer, must connect to the sewer system if the parcel abuts a public sewer system.
 - C. Connection to the public sewer system is required for the development of any parcel of property that is located within 200 feet of any District facility within the UGA.
 - D. Any private residential or commercial development property that is adjacent to a public sewer location is required to connect to the public sewer system regardless of distance from the public sewer.

Collection System Policies

The State of Washington regulates the federal effluent limitations with the National Pollutant Discharge Elimination System (NPDES) program. Wastewater discharges into waters of the State shall have an NPDES wastewater discharge permit from Ecology. The District does not have an NPDES waste discharge permit because it discharges its wastewater to the City's Northshore Sewer interceptor, which conveys the wastewater to the City's wastewater treatment plant (WWTP).

The District must meet the following list of policies and requirements:

- Standards for sewer system facilities are defined by Chapter 173-240 Washington Administrative Code (WAC).
- Wastewater and reclaimed water use fees are defined by Chapter 246-272 WAC.
- To avoid costs associated with implementing a wastewater treatment plant in Manson, the District and the City signed a Northshore Sewer Interceptor (NSI) Agreement document that includes details about ownership extents, cost sharing for operation and maintenance, fees, metering, and other items pertaining to sewage conveyance and treatment from the District. The original agreement was signed in the 1970s, but it has had several updates, most recently in 2019. Refer to the **Northshore Sewer Interception Agreement** section for more information. The NSI Agreement and amendments are included in **Appendix B** of this GSP.
- Sanitary sewer collection system design must meet the requirements set by the EPA and Ecology.
- The District requires all new and existing residences with failing systems to hook up to the sewer lines if their property lies within 500 feet of a sewer collection facility.
- All septic systems in the City and within the UGA boundary shall be monitored by the Chelan-Douglas Health District.

Northshore Sewer Interceptor Agreement

The following provides an overview of the primary policies contained in the NSI Agreement.

Figure 5-1 and **Figure 5-2** show the NSI alignment beginning at the District's Lift Station No. 2 (LS No. 2) to the City's WWTP.

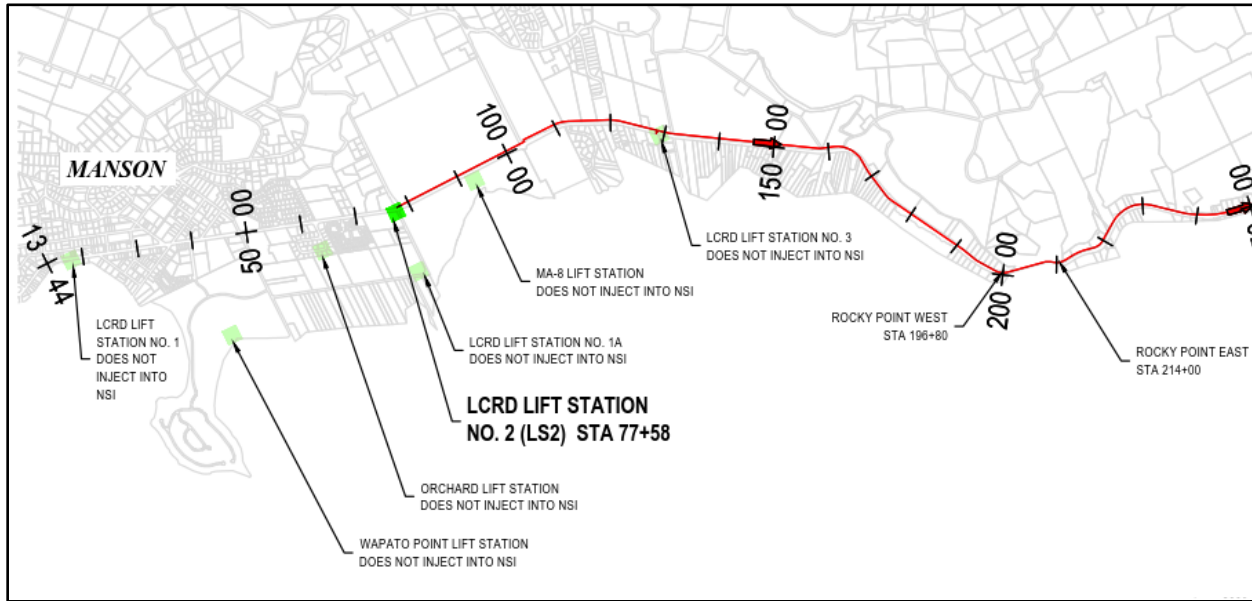


Figure 5-1 NSI Overview, Western Half

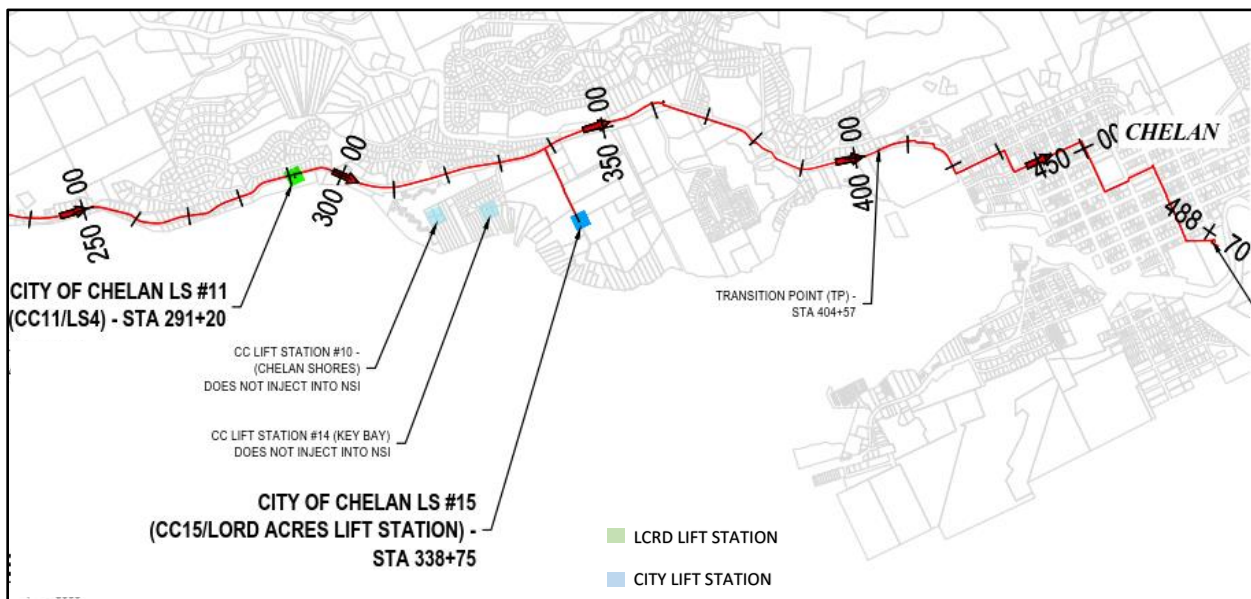


Figure 5-2 NSI Overview, Eastern Half

Ownership

- The District owns the dual pipes and appurtenances that comprise the NSI from LS No. 2 to the WWTP, as well as all collection facilities and appurtenances from Rocky Point westward.
- The City owns Lift Stations CC 11 and CC 15 and associated force mains and appurtenances, all collection facilities and appurtenances from Rocky Point eastward, the single 10-inch low pressure interceptor to the Transfer Lift Station, and the Transfer Lift Station, WWTP, and associated infrastructure.

Operations and Maintenance

- The District solely operates and maintains LS No. 2 and all pipe, appurtenances, and facilities related to the NSI west of CC 11.
- The District operates and maintains all pipe, appurtenances, and facilities related to the NSI east of CC 11 to the WWTP but equitably shares these costs with the City.
- The City operates and maintains all pipe, appurtenances, and facilities downstream of the NSI discharge to the single 10-inch low pressure interceptor, as well as the Transfer Lift Station and other downstream facilities.
- The City solely operates and maintains CC 11 and CC 15 and the associated force mains and appurtenances.

Measurement and Billing for Operations and Maintenance

- Flow in the NSI is measured by summation of the flow meters at LS No. 2, CC 11, and CC 15.
- The District's portion of flow is estimated by dividing the totalized LS No. 2 discharge by the totalized discharge from all three lift stations. The City's portion is the remainder. These portions are attributed to the costs of operations and maintenance (O&M) for the portions of shared NSI infrastructure as described previously.
- Total flow is calculated monthly and billing proportions are estimated annually but can be revised more frequently if required. Billing by either party for the other party's portion of shared O&M is invoiced monthly.

Measurement and Billing for Capital Improvements

- Capital improvement costs related to the dual force mains, low pressure interceptor, and associated facilities and appurtenances shall be allocated in the same manner as O&M costs for that infrastructure.
- Capital improvement costs related the Transfer Lift Station, the conveyance system between the Transfer Lift Station and the WWTP, and the WWTP shall be allocated equitably by calculating the District's portion by dividing the totalized LS No. 2 discharge by the totalized discharge to the WWTP.

Wastewater Composition

- Cost allocation is based entirely on hydraulic loading to the NSI and is not related to solids or organic loading. The District is required to enforce pretreatment, if necessary, to ensure wastewater strength remains similar to normal domestic strength, with biochemical oxygen demand and total suspended solids below 300 milligrams per liter.
- Odor control studies, monitoring, and improvements, as required, will be handled as O&M activities related to the NSI.

Other Policies

- New connections to the NSI can only be made with approval of both the City and the District.

- A Wastewater Management Advisory Committee was created with equal representation by both the City and the District for the purpose of reviewing operations, maintenance, capital improvements, and other items related to the NSI.
- The NSI Agreement is intended to be reviewed and re-executed annually by both parties.

Recommendations for Policies Related to the NSI Agreement

Recommendations for future policies or system changes related to the NSI Agreement are as follows:

- Consider adding flow monitoring at the Transfer Lift Station as part of a future project. Currently, the District's cost share related to O&M and capital improvements to the Transfer Lift Station and the conveyance system to the WWTP is calculated based on the LS No. 2 portion of the totalized flow at the WWTP. The additional totalization of flow at the Transfer Lift Station would allow the gravity flow discharged between the Transfer Lift Station and the WWTP to be better quantified for the purposes of both monitoring and billing.
- The addition of periodic composite sampling at LS No. 2 should be considered for the monitoring of organic and solids loading from the District to the City's system. At a minimum, this would be valuable for better understanding current and future loading to the WWTP, and if necessary, could be incorporated into billing in the future.

Sewer Collection System

Design Criteria

The following is a list of general sewer system design criteria:

- All sewer lines and facilities must be designed in accordance with good engineering practice by a professional engineer and meet minimum design criteria presented in Ecology's *Criteria for Sewage Works Design* (August 2008), or as superseded by subsequent updates. Chapter C1 of the *Criteria for Sewage Works Design* covers the requirements for the design, construction, and O&M for sanitary sewer collection and conveyance systems. Chapter C2 provides guidelines and requirements for sanitary sewer force mains and sewer pump stations.
- Wastewater sewer systems also shall be designed and constructed in accordance with the District's and City's most current design standards. The District's standards and standard design drawings are included in **Appendix E**.
- The more restrictive design standard shall be used if a conflict in standards occur.
- Written authorization for deviations can be made from the District Manager.

Design Flow Rates

- New gravity sewer systems shall be designed on the basis of an average daily per capita flow of sewage of not less than 100 gallons per day. A residential home will be considered 1 ERU.

- Sanitary sewer system flows are composed of residential, institutional, business, commercial, and industrial wastewater, along with non-permitted infiltration and stormwater inflow. Sanitary sewer systems must be capable of conveying the ultimate peak flows of these sources.
- No overflows will be permitted.

Gravity Pipe Material and Roughness

- Gravity sewer main shall be polyvinyl chloride (PVC). All materials shall be in accordance with the District's most current Design and Construction Standards and Specifications.
- The Manning equation is used to design and analyze wastewater flow characteristics of sanitary sewers. The Manning roughness coefficient "n" varies depending on the pipe material; an "n" value of 0.013 shall be used for all concrete pipe unless deemed unjustifiable on the basis of research or field data submitted.

Separation between Sanitary Sewer and Other Utilities

- A minimum horizontal separation of 10 feet shall be between sewer and water lines (edge to edge). A minimum vertical separation of 18 inches is required between the bottom of the drinking water line and the crown of the sewer line.
- The guidelines provided in Ecology's *Criteria for Sewage Works Design* should be followed for difficult spacing or other situations.

Design Period

- The design period is the length of time that a given facility will provide safe, adequate, and reliable service. The design period selected is based on the economic life of a given facility, which is determined by the structural integrity of the facility, the rate of degradation, the replacement cost, the cost of increasing the capacity of the facility, and the projected population growth rate serviced by the facility.
- Collection and interceptor sewers are designed for the peak development of a contributing area.
- The life expectancy for new sanitary sewers, using current design practices, is in excess of 50 years.

Force Main Design Criteria

- All force mains within the District shall be designed in accordance with best engineering practice by a licensed professional engineer with the minimum design criteria presented in the *Criteria for Sewage Works Design* (Ecology, August 2008) or as superseded by subsequent updates. Chapter C2 of this document contains design considerations for force mains.

- Force mains shall be designed and constructed in accordance with the District's most current Sanitary Sewer Standard Details and Lift Station Standard Details.
- Scouring velocities of 3 feet per second (fps) to 6 fps should be maintained for all force mains. Approval by the District engineer shall be required for design velocities proposed under 3 fps or over 6 fps for all force mains. Maximum velocities shall not exceed 8 fps.
- Extension layouts shall provide for the future continuation of the existing system as determined by the District. Main extensions may be extended to and through the side of the affected property fronting the main.
- Provisions to drain the force main for repair or to temporarily remove the force main from service shall be provided.

Side Sewer Design Criteria

- Side sewers shall be installed in accordance with the District's most current Design and Construction Standards and Specifications.
- A side sewer, at the discretion of the district, shall be stubbed to the existing lot(s) at the property line when a new main is installed in front or alongside existing properties.
- Gravity or pressurized side sewers are allowed to be connected to gravity mains. Gravity connections are preferred and will be the first option if physically possible to connect.

Lift Stations

- Lift stations shall be designed in accordance with the District's most current Design and Construction Standards and Specifications and Ecology's *Criteria for Sewage Works Design*.
- The design of the lift station, including layout, building, equipment, and control systems, shall be according to the District's Lift Station Standard Details.
- Lift stations shall be designed for peak design flow with a peaking factor of 5.6.
- Lift stations shall be designed for a minimum 20-year design life.
- Temporary lift stations will not be allowed.

Operational Policies

Maintenance

- Equipment breakdown is given the highest maintenance priority, and repairs should be made as soon as possible.
- A preventive maintenance schedule shall be established for all facilities, equipment, and processes.
- Spare parts shall be stocked for all equipment items whose failure will impact the ability to meet other policy standards.

- All maintenance personnel shall be trained in the procedures and techniques necessary to efficiently perform their job descriptions.
- Written records and reports will be maintained on each facility and item of equipment showing the operations and maintenance history.

Temporary and Emergency Services

- Compliance with construction standards (not quality standards) may be deferred for temporary sewer service.
- Compliance with all standards may be deferred for emergency sewer service.

Reliability

- The District shall ensure that the sewer system is constructed, operated, and maintained to protect against failures of power supply, treatment process, equipment, or structures with appropriate backup facilities.

Organizational Policies

Structure

- District Manager
 - The District Manager is responsible for overall sewer utility financial planning and management.
 - Planning, design, operations, maintenance, and construction will be accomplished or overseen by the District Manager.
 - The District Manager, along with the Board of Directors, will coordinate all sewer-related financing requirements.
 - The District Manager is responsible for employee records and salary schedules.
 - The District Manager is responsible for enforcing violations of the District's sewer policies.
- Accounting
 - The District's accounting personnel are responsible for customer billing, payment collection, and connection fees, and oversee project cost accounting.
- Field Crew
 - The District Field Crew is responsible for inspecting all connections to the sewer system.
 - The District Field Crew is responsible for digging up and severing service if a customer does not pay its sewer bill.

Staffing

- The sewer utility staffing levels are established by the District Manager based on workload with some consideration in regard to the financial resources of the District.
- Personnel certification and training will comply with state-established standards.

Relationship with Other Agencies

- Emergency responses to hazardous events at sewer system facilities will be coordinated by the on-call operator.
- Chelan Douglas Health District
- Chelan County Engineering and Planning
- City of Chelan Engineering and Planning
- Fire Department

6 | WASTEWATER COLLECTION SYSTEM EVALUATION AND DEFICIENCIES

Introduction

This chapter aims to identify improvements necessary to support growth, remedy existing deficiencies, and avoid future deficiencies during the planning period. RH2 Engineering, Inc., (RH2) created a hydraulic model of the Lake Chelan Reclamation District's (District's) sewer collection system that was used in combination with an analysis of existing lift station data to estimate the capacity of the existing infrastructure under current and projected loading conditions as described in **Chapter 4**. Deficiencies identified by the model, lift station data analysis, typical infrastructure life cycles, and operator observations were used to determine the capital improvement projects detailed in **Chapter 7**.

Sewer Hydraulic Model

Background

SewerCAD, a computer-based hydraulic modeling software developed by Bentley Systems, Inc., was used to model the gravity sewer mains of the District's sewer collection system. RH2 used the District's GIS sewer map as a starting point for collection system location data. This data provided approximate northings and eastings of items in the collection system but did not include invert elevations for structures and pipes.

In the absence of elevation data, manhole rim elevations in the sewer model were derived from Google Earth. Pipe invert elevations at each manhole along the major gravity mains were estimated based on an assumed depth at each manhole, which was held constant for all manholes. This method generally assumes that pipes follow the slope of the existing ground. For pipe segments where the existing ground appeared flat in Google Earth, the Washington State Department of Ecology's *Criteria for Sewage Works Design* (Orange Book) minimum sewer pipe slope was assumed. Lift station elevations and pump information was obtained from the District's records.

Flow Data

The most reliable historical flow data in the District records is from Lift Station (LS No.) 2, which represents the District's total flow. This data was used as the basis of analyses in **Chapter 4**. To analyze the collection system capacity, basin flow rates were estimated based on the approximate percentage of equivalent residential units (ERUs) in each respective basin compared to the total number of ERUs in the entire collection system as estimated in **Chapter 4**. The flow rate per basin is assumed to be proportional to the number of ERUs within that basin.

The major gravity main trunklines of the collection system were modeled, with the assumption that pipes serving small areas are likely to have sufficient capacity due to the relatively low flow they experience. To conservatively model the trunklines, flow rates were loaded at the farthest upstream manhole of the trunkline. Flow rates per basin were evenly distributed between the

major trunklines within each respective basin. The approximated flow rates for each basin are shown in **Table 6-1**.

Table 6-1
Sewer Model Basin Flow Rate Distribution

Collection System Basin	2019 (Current)		2040 (20-Year)	
	ERU Distribution (%)	Gravity Collection PHF (gpm)	ERU Distribution (%)	Gravity Collection PHF (gpm)
LS No. 1	45%	354	43%	543
LS No. 1A	5%	39	8%	101
LS No. 2	30%	236	28%	353
LS No. 3	15%	118	20%	252
Mill Bay LS	1%	8	1%	13
Orchard LS	4%	31	NA ⁵	NA ⁵
Total	100%	786	100%	1,262

1. ERUs at the projected 2040 condition are distributed based on the presumed distribution of system growth.
2. The estimated peak hour flow for LS Nos. 2 and LS No. 3 is only inclusive of the gravity collection system component and does not include flows from other District-owned lift stations.
3. The highest flow experienced between 2017 and 2019 (**Chapter 4**) was 786 gallons per minute (gpm); therefore, this will be used as the 2019 peak hour flow (PHF).
4. The projected system PHF for 2040 from **Chapter 4** is 1,262 gpm.
5. The Orchard LS is assumed to be removed with the basin flowing to LS No. 1A for the 2040 condition.

Model Limitations

Due to the number of assumptions used in the model, the results of the model should be considered approximate and additional investigations, such as field surveys and flow monitoring, should be performed near any proposed improvements prior to design and construction. If it is found that the input information differs significantly from actual conditions, then the model should be recalibrated accordingly and rerun to confirm the original results. Due to the lack of flow measurement devices within the collection system, the model has not been rigorously calculated against tested flow data. For the purposes of planning and analysis, the model represents a tool for making conservative approximations of the capacity of primary system components.

The modeling was performed using a steady-state analysis, which shows all flows reaching all downstream points simultaneously. This does not truly represent conditions that occur, since it takes some time for wastewater to travel downstream through the sewer system, allowing for flow attenuation. However, this method allows for conservative approximation of flow rates within the system.

Lift stations were included in the hydraulic sewer model to estimate the downstream effects on the gravity collection system. Pumps were configured in the model to operate at a fixed flow rate equal to the design pump flow rates obtained from District records to conservatively estimate pipe capacities expected as noted as follows. Lift stations with a capital improvement project (CIP) that

increases the pump rate are modeled at the proposed pump rate in the 2040 (20-Year) model. The modeled flow rates are shown in **Table 6-2**.

Table 6-2
Sewer Model Lift Station Modeled Pump Rate

Lift Station	Lift Station Model Pump Rate (gpm)	
	2019 (Current)	2040 (20-Year)
LS No. 1	490	550
LS No. 1A	50 ²	50 ²
LS No. 3	115	300
Mill Bay LS	20 ²	40 ²
Orchard LS	40 ²	NA ³

1. The Northshore Interceptors (dual force mains from LS No. 2) were not included in the hydraulic model as they do not discharge to the District's collection system. As such, the LS No. 2 flow rate is not included here. The discharge of the dual interceptors is modeled in the City of *Chelan's General Sewer Plan (GSP)*.
2. The modeled discharge rates for the LS No. 1A, Mill Bay, and Orchard Lift Stations are lower than the firm capacity. These lift stations provide substantial excess capacity and discharge for short durations during the peak hour condition. The modeled rates are nearer to the estimated collection system inflow rates and provide a better representation of the actual collection system peak conditions.
3. The Orchard LS is assumed to be removed with the basin flowing to LS No. 1A for the 2040 condition.

Collection System Capacity Analyses

Current Condition (2019)

The following potential capacity issues were identified by the hydraulic model and are shown in **Exhibit 6-1** in **Appendix A**. The capacities listed were calculated with the assumption that 100 percent of the pipe capacity occurs at a ratio of flow depth to pipe diameter of 0.80.

Lift Station No. 1 Collection Piping – Manson Boulevard to LS No. 1 Collection Manhole

The existing pipe segment running between Manson Boulevard and the collection manhole of LS No. 1 exhibits over 95-percent capacity in 2019 at peak hour flow.

Approach: Field elevation data should be obtained for this pipe to verify the assumed slope used in the current model. This data can be used to refine the capacity analysis for this pipe and better determine the recommended replacement timeline. For planning purposes, a budgetary item is included in the CIP to replace and upsize this pipe during the planning period.

Lift Station No. 2 Collection Piping – SR 150 between Hale Street and LS No. 2

Wastewater pumped from LS No. 1 discharges to the gravity collection system along State Route (SR) 150, west of Hale Street, and continues by gravity to LS No. 2. This portion of the gravity

collection system exhibits a range from approximately 50-percent capacity to 100-percent capacity at the modeled 2019 peak hour flow based on the pipe diameter and assumed pipe slope.

Approach: Field elevation data should be obtained for this pipe to verify the assumed slope used in the current model. This data can be used to refine the capacity analysis for this pipe and better determine the recommended replacement timeline. For planning purposes, a budgetary item is included in the CIP to replace and upsize this pipe during the planning period.

20-Year Projection (2040)

Lift Station No. 3 Collection Piping – SR 150 between Lizzie Lane and Parkhill Drive

The section of existing gravity main running along SR 150 from west of Lizzie Lane to Parkhill Drive exhibits between 60- and 80-percent capacity in 2019 at peak hour flow based on the pipe diameter and assumed pipe slope.

Approach: Field elevation data should be obtained for this pipe to verify the assumed slope used in the current model. This data can be used to refine the capacity analysis for this pipe and better determine the recommended replacement timeline. For planning purposes, a budgetary item is included in the CIP to replace and upsize this pipe during the planning period.

Lift Station and Force Main Analyses

Lift stations and force mains were analyzed separately from the hydraulic sewer model, as the model is configured using steady-state analyses to estimate the collection system pipe capacities, but not the lift stations or force mains. The lift station analyses herein include a simple condition assessment and capacity analyses based on a review of available historical telemetry data for pump run times and flow output from the District's supervisory control and data acquisition (SCADA) system.

Additionally, the dual interceptors from LS No. 2 into the City of Chelan (City) are analyzed thoroughly in the City's GSP that is currently underway. The interceptors are shown in the City's GSP to have sufficient capacity to support the District during the planning period; no additional analyses are included herein for these pipes. The remainder of the City collection and treatment systems that support District flow are analyzed in the City's GSP.

Generally, pumps and electrical/control equipment are expected to have a 20-year life for municipal grade lift stations. At the end of this time, pumps can be replaced or potentially be rebuilt. Electrical and control equipment typically can be incrementally upgraded as necessary or desired. Each of the District's lift stations have reached or will reach the 20-year mark during the planning period. Therefore, it is anticipated that each lift station will need some pump and/or electrical/control improvements throughout the planning period, in addition to other items identified in the following sections. A single CIP project has been included in **Chapter 7** for these improvements, termed Lift Station Short Lived Assets Replacement.

Lift Station No. 1

Preliminary Condition Assessment

Built in 2004, Lift Station No. 1 is composed of an 8-foot-diameter circular wet well with submersible pumps. A nearby structure houses the electrical gear associated with the lift station. Two pumps were installed during the original construction, each with a capacity of 491 gpm.

The existing 8-inch polyvinyl chloride (PVC) force main was constructed in 1975, prior to the current lift station. It was originally used as the force main for a lift station that has since been abandoned. The portion of the force main still in use runs from Lift Station No. 1 approximately 2,500 feet east along SR 150, where it discharges into the SR 150 gravity collection system west of Quetilquasoon Road, and then feeds into Lift Station No. 2. During construction in 2004, a second 6-inch ductile iron force main was stubbed from the lift station to the intersection of SR 150 and Pedoi Street but has not been in use since its construction. The age of the 8-inch force main makes it prudent to investigate the condition of this pipe during the planning period.

Capacity Analysis

From the data analyzed between January 2018 and October 2020, isolated high flow events were found to occur in January, a period when monthly system flow rates are typically near their lowest for the year. To date in 2020, the peak hour flow for this basin occurred in January. The likely source of the high flows is slug loading from Manson Growers. If these January peak events continue to increase, these events will drive capacity upgrades to Lift Station No. 1 sooner than the summer peak events. In 2020, the January peak hour pump run time was more than 20 percent higher than the highest summer peak hour pump run time.

High flow events also were observed during the summer months, when peak flows are typically observed in this system. The total pump run time was observed to exceed 50 minutes during a 1-hour period. The existing lift station only has two bays that do not allow for expansion. The existing pumps will need to be upgraded to increase the station's capacity.

The existing force main from Lift Station No. 1 is not anticipated to require upgrades driven by capacity during the planning period. However, a condition assessment of this pipe is prudent due to the age and significance of this piece of infrastructure.

Approach: Include a standalone CIP project during the planning period to replace the existing pumps and incrementally replace the electrical/control equipment as needed due to age.

Include a separate conditions assessment of the existing force main due to age.

Lift Station No. 1A

Preliminary Condition Assessment

This 6-foot-diameter wet well lift station was constructed in 2005. It contains 2 submersible pumps, each with a capacity of 60 gpm. Electrical gear is located inside the nearby building. Aside from

aging pump and electrical improvements discussed at the beginning of this section, there are no other known deficiencies.

The existing 4-inch-diameter force main was constructed prior to the current lift station and was used previously for a lift station that has since been abandoned. The portion of the force main still in use runs up Madeline Road from Lift Station No. 1A and discharges to the gravity collection system of Lift Station No. 2. No maintenance concerns or significant deficiencies have been observed by the District at this time that would necessitate a force main improvement project during the planning period.

Capacity Analysis

Historic telemetry data obtained from Lift Station No. 1A appears to be spotty. Based on a preliminary review of pump run data, it appears that the lift station operates less than 30 percent of the time. This generally aligns with RH2's flow estimates for the area. No capacity driven upgrades are anticipated during of the planning period.

Approach: Include pump replacement and incremental electrical/control equipment replacement due to age during the planning period as part of the Lift Station Short Lived Assets Replacement CIP item.

Lift Station No. 2

Preliminary Condition Assessment

Lift Station No. 2 was constructed in 2005 and is located near the intersection of SR 150 and Madeline Road. This lift station handles the entirety of the District's wastewater, as all of the District's flow is eventually collected here. The lift station consists of a 12-foot-diameter circular wet well with 2 large submersible pumps discharging to dual force mains. Each pump can deliver over 500 gpm when pumping to the 10-inch force main, and each pump can deliver approximately 900 gpm when pumping to the 14-inch force main. The lift station was constructed with the flexibility to add a third pump as necessary.

As discussed at the beginning of this section, pump and electrical improvements are recommended due to the age of the lift station. As an initial cost savings measure, the District has chosen to install a new third pump as one of the primary pumps and will wait to replace or rebuild the existing two pumps. Doing so would provide the District with one reliable pump and potentially give additional time to rebuild or replace the existing pumps. Installation of the third pump is under construction and will be completed in the spring of 2024.

The Northshore Interceptors, the 10-inch- and 14-inch-diameter dual force mains of Lift Station No. 2, accommodate the seasonal fluctuations in flow rates. Wastewater is pumped through either the 10-inch-diameter force main, used during periods of lower flow from approximately October to April, or the 14-inch-diameter force main, used for the remainder of the year. The Northshore Interceptors run parallel until they combine near the intersection of SR 150 and Spader Bay Road in Chelan and discharge to the City's system. These dual interceptors are less than 20 years old and should have an indefinite life.

Capacity Analysis

Based on the 2040 collection system peak hour flow projection of nearly 1,300 gpm, the third pump will need to be added to Lift Station No. 2 during the planning period to provide adequate capacity for the projected peak hour flow. It should be noted that the City analyzed the condition of the existing 10-inch PVC low pressure interceptor downstream of the dual high-density polyethylene (HDPE) interceptors in 2022. The findings of this analysis were documented in the *Analysis of Low-Pressure Portion of Northshore Interceptor Technical Memorandum* (RH2, 2022). The analysis showed that the single low pressure interceptor limits the ultimate capacity of the dual HDPE interceptors as currently configured. When Lift Station No. 2 is discharging in tandem with City lift stations to the interceptor system, pressures in the low pressure interceptor increase due to the 10-inch interceptor constricting flow through the system. However, the most significant pressure increases appear to occur for only a matter of minutes out of each year currently. These likely could be mitigated by lift station flow pacing, staging, or other means as needed. The addition of the third pump to Lift Station No. 2 is not an immediate capacity concern as these pumps are operated with variable frequency drives, allowing for discharge to closely match the influent peak hour flow. As peak flows increase, the capacity of the low pressure interceptor will become more of a concern, and in the future, replacement of the low pressure interceptor with a large capacity system will be necessary. At this time, the City has not scoped or budgeted this replacement work.

Lift Station No. 3

Preliminary Condition Assessment

Lift Station No. 3 pumps wastewater approximately 1 mile along SR 150 from the east side of the Manson Urban Growth Area near Bennett Road to Lift Station No. 2. This lift station consists of a 6-foot-diameter circular wet well and 2 submersible pumps, each with a capacity of 115 gpm. Upon start up the VFD runs around 125 gpm and lowers to around 80 gpm. This lift station was constructed in 2005.

The existing 4-inch HDPE force main was constructed concurrently with the lift station. No force main deficiencies are known at this time.

Capacity Analysis

Historic telemetry data for Lift Station No. 3 over the past 3 years is somewhat spotty, but generally shows peak hour flow conditions in which a single pump runs between 45 and 50 minutes. It appears there has been at least one recent occurrence of approximately 55 minutes of run time. Due to a combination of the long pump run times and anticipated growth in this area, the lift station pumps are projected to require replacement early in the planning period. As part of the lift station replacement planning, the location should be considered. Due to these potential complexities, a predesign report is recommended for this lift station early in the planning period that will allow for expanded historical and projected flow analyses.

The existing force main exhibits sufficient capacity during the planning period.

Approach: Include budgetary items for a lift station predesign report and lift station pump replacements due to capacity limitations.

Mill Bay Lift Station

Preliminary Condition Assessment

Constructed in 2004, Mill Bay Lift Station serves the Mill Bay lakefront subdivision. This lift station is composed of a 6-foot-diameter wet well with 2 submersible pumps, each with an original capacity of 120 gpm. Staff has noted that the original pumps were replaced with Flygt MP 3069 HT 3~256 pumps run at around 45 gpm. As discussed at the beginning of this section, improvements due to aging infrastructure will be planned for.

The existing 4-inch-diameter PVC force main also was installed in 2004. It pumps wastewater to the SR 150 gravity collection system, in turn feeding into Lift Station No. 3. The force main appears to be in good condition, and the District has not expressed any concerns or suggested improvements.

Capacity Analysis

The Mill Bay Lift Station and force main exhibit sufficient capacity over the planning period.

Approach: Include pump replacement and incremental electrical/control equipment replacement due to age during the planning period as part of the Lift Station Short Lived Assets Replacement CIP item. In 2022 the District replaced one of the pumps.

Orchard Lift Station

Preliminary Condition Assessment

The Orchard Lift Station was constructed in 1993, and now serves both the Orchard subdivision and a portion of the nearby Vista Del Lago subdivision. Wastewater is pumped approximately 640 feet through a 4-inch-diameter PVC force main to the gravity collection system along SR 150.

The lift station consists of a 6-foot-diameter wet well with 2 submersible sewage pumps. The 2 pumps were installed in 2018 with new floats and a new rail system was also installed. The capacity of the existing pumps is not known, as construction records do not display pump capacity and a drawdown test has not been completed at this time. However, based on the pump curve the District has, each pump capacity is around 250 gpm. Improvements due to the age of this lift station will need to be planned for as previously discussed and should be prioritized in the CIP as it is believed these components have not been replaced since their original installation in 1993.

As an alternative to improving the lift station, the District has expressed interest in abandoning the Orchard Lift Station and installing a gravity sewer main that runs from the site of the existing lift station and feeds into Lift Station No. 1A. For the purpose of this GSP, it is assumed that the installation of the gravity sewer main to Lift Station No. 1A will be feasible and the lift station can be abandoned.

Capacity Analysis

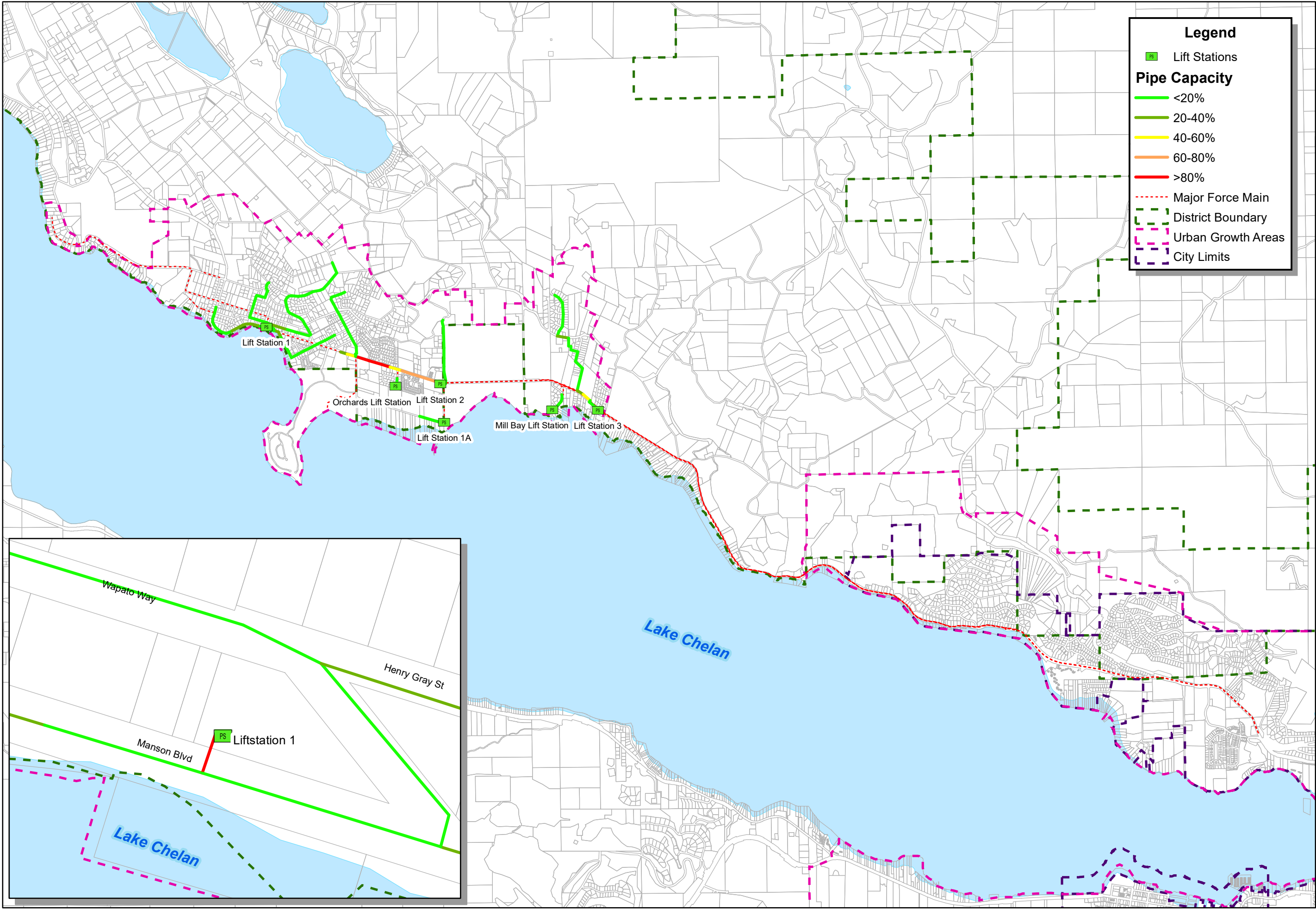
The Orchard Lift Station and associated force main were sized for the original Orchard subdivision. Use of the lift station is not planned to expand. Therefore, the lift station appears to exhibit sufficient capacity during the planning period.

Approach: Include installation of the gravity sewer main to Lift Station No. 1A as the preferred alternative and that Orchard Lift Station will be abandoned in the future.

Wastewater Treatment Plant Analyses

Wastewater treatment is provided by the City. RH2 developed the City's 2021 GSP, which includes analyses of the City's wastewater treatment plant (WWTP). Capital improvement projects identified by the City's 2020 GSP are included in **Chapter 7**, as the District is responsible for a portion of the City's wastewater treatment plant capital improvement projects. However, current flows and loading to the WWTP are known to be significantly below the rated capacity of the WWTP, and it is unlikely that improvements to the WWTP will be prompted by growth in the next 20 years. Instead, improvements will be prompted by operations and maintenance needs and/or process objectives.

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Legend

- PS Lift Stations
- Pipe Capacity**
- <20%
- 20-40%
- 40-60%
- 60-80%
- >80%
- Major Force Main
- District Boundary
- Urban Growth Areas
- City Limits

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Vicinity Map



HERE, Garmin, (c) StreetMap contributors,

Figure 6-1
2019 Peak Hour Flow Model Results
Lake Chelan Reclamation District



1 inch = 2,800 feet
0 700 1,400 2,800 Feet
DRAWING IS FULL SCALE WHEN BAR MEASURES 1"



J:\DATA\CR219-012\GIS\FIG 6-1 EXISTING MODEL PHF CAPACITY.MXD BY: OMARTYUSHEVA PLOT DATE: MAR 8, 2022 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET

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7 | CAPITAL IMPROVEMENT PLAN

Introduction

This chapter presents the proposed capital improvement projects (CIP) to the Lake Chelan Reclamation District's (District) sewer system that are necessary to resolve current deficiencies and plan for the projected growth within the sewer service area. New projects have been identified in **Chapter 6**. The sewer system improvements were sized to meet the system's projected 2040 flow. The recommended major capital improvements identified in this chapter are further discussed in **Chapter 9**.

Estimating Costs of Improvements

Project costs for the proposed improvements are presented in 2022 dollars. A factor of 4 percent per year has been added to costs beyond year 2022 to adjust for inflation and the changing construction market conditions at the actual time of project implementation. The cost estimates include the estimated construction cost of the improvement and indirect costs estimated at 30 percent of the construction cost for engineering preliminary design, final design, construction management services, permitting, and legal and administrative services. The construction cost estimates include a 20-percent contingency and Washington State sales tax of 8.3 percent. The project costs presented in the CIP are capital cost estimates and do not represent life-cycle cost estimates.

Description of Improvements

This section provides a general description for each of the improvements and an overview of the deficiencies they will resolve. Improvement projects have been given the following prefixes. Note, the number symbol will be replaced with a corresponding improvement number in the descriptions.

- LCRD LS# – Lift Station Projects
- LCRD CS# – Collection System Projects

Exhibit 7-1 in Appendix A shows a map with the proposed capital improvement projects.

Exhibit 7-1 also shows future developer-driven project areas that are further discussed in this chapter. During the process of preparing this General Sewer Plan, several areas were under development and were not included in the analysis.

Exhibit 7-2 in Appendix A shows a comparison between the 2019 and 2040 sewer models that prompted several capital improvement projects described in **Chapter 6** and the following sections.

Lift Station Projects

LCRD LS01: Lift Station No. 1 Rehabilitation

Deficiency: Lift Station (LS) No. 1 is an aging lift station. Rehabilitation work is necessary to extend the life of this lift station. High flow events increase the total pump run time. In addition, the

existing 8-inch force main requires prudent assessment due to its age, as it is a significant part of this lift station's system. The existing pipe between Manson Boulevard and the collection manhole of LS No. 1 exhibits over 95-percent capacity based on 2019 peak hour flow modeling.

Improvement: Replace two existing pumps. Provide any wet well, electrical, and control infrastructure improvements needed due to age. Assess the existing 8-inch pipe. Obtain field data to determine the existing pipe slope to refine the capacity analysis. Depending on the modeling results, replace and upsize the existing 8-inch pipe based on the determined replacement timeline.

LCRD LS02: LS No. 1A Improvements

Deficiency: This is an aging lift station. Rehabilitation work is necessary to extend the life of this lift station.

Improvement: Provide pump, electrical, and control equipment replacements over the planning period due to age.

LCRD LS03: LS No. 2 Improvements

Deficiency: This lift station receives all of the District's wastewater. Based on modeling, the future projected flow capacity in the Northshore Sewer Interceptor will be limited by the capacity of the existing 14-inch line operating independently of the 10-inch line. Once both lines are needed, the lift station capacity will be limited by the Northshore Sewer Interceptor line east of the Golf Course Road roundabout to the transfer lift station.

Improvement: A third pump was added in 2024 to help meet future projected flows and provide reliability. Replace the existing pumps, electrical, and control equipment as needed due to aging.

LCRD LS04: LS No. 3 Improvements

Deficiency: Long run times have been observed at LS No. 3. In addition, growth is anticipated in this area that will require upgrades to meet future projected flows.

Improvement: Prepare a lift station predesign report for the replacement of the pumps at LS No. 3. Consider the potential of injecting directly into the dual forcemain instead of pumping back to LS No. 2. The existing force main exhibits sufficient capacity over the planning period.

LCRD LS05: Mill Bay Lift Station Improvements

Deficiency: The District did not express any concerns or provide suggested improvements.

Improvement: Provide regular maintenance. Pump, electrical/control equipment, and other components will require replacement and upgrades as needed due to aging.

Collection System Projects

LCRD CS01: Gravity Main Annual Pipe Replacements

This CIP considers annual costs needed for the replacement of any existing pipes.

LCRD CS02: Gravity Main from Sunrise Drive to LS No. 1A

Deficiency: Lift Station No. 1A is an aging lift station with its original components.

Improvement: Orchard Lift Station is not planned to be expanded. Due to the lift station's age and original components, abandoning Orchard Lift Station and installing a gravity mainline is an easier and a lower cost alternative compared to replacing or upgrading the LS components. The new gravity main would extend from the existing Orchard Lift Station location to Lift Station No. 1A.

LCRD CS03: Division Street Sewer Extension

Deficiency: Future sewer main extension.

Improvement: This capital improvement project considers gravity main extension for any future development from Manson High School and west along Division Street. However, this capital improvement project most likely will be developer driven.

LCRD CS04: Northshore Interceptor Replacement East of Golf Course Road Roundabout

Deficiency: Future pipeline replacement and upsizing when the capacity of the 14-inch force main is exceeded.

Improvement: This project is a placeholder to plan and budget for future Northshore Interceptor replacement east of the Golf Course Road roundabout. Current growth projections in the current urban growth boundary will not trigger this improvement in the next 20 years. If a major planned unit development occurs within the service area, the capacity of the existing line will be exceeded. It was assumed that the District will be responsible for 70 percent of the cost. This capital improvement project most likely will be developer driven.

LCRD CS05: Manson Boulevard Expansion

Deficiency: Future sewer main extension.

Improvement: This capital improvement project considers gravity main extension for any future development. The proposed gravity main would extend south from the Manson Boulevard and Washington Street intersection and connect to an existing gravity system at the Lakeshore Drive intersection. However, this capital improvement project mostly likely will be developer driven.

LCRD CS06: Lift Station No. 2 Collection Piping – SR 150 Between Hale Street and LS No. 2

Deficiency: A portion of the existing system, between Hale Street and LS No. 2, shows 50- to 100-percent pipe capacity based on the modeled peak hour flow.

Improvement: Obtain field data to determine the existing pipe slope to refine the capacity analysis. Depending on the modeling results, replace and upsize the existing 10-inch pipe based on the determined replacement timeline.

LCRD CS07: Lift Station No. 3 Collection Piping – SR 150 Between Lizzie Lane and Parkhill Drive

Deficiency: The existing section of a gravity main along SR 150 and between Lizzie Lane and Parkhill Drive shows 60- to 80-percent pipe capacity based on the modeled peak hour flow.

Improvement: Obtain field data to determine the existing pipe slope to refine the capacity analysis. Depending on the modeling results, replace and upsized the existing pipe 8-inch based on the determined replacement timeline.

Prioritizing Improvements

Future projects that are not identified as part of the District's CIP may become necessary. Such projects may be required to remedy an emergency or to address unforeseen problems. Due to budgetary constraints, the completion of such projects may require modifications to the recommended CIP. The District retains the flexibility to reschedule, expand, or reduce the projects included in the CIP and to add new projects to the CIP when new information becomes available for review and analysis.

Developer Driven Projects

The District is continuing to experience growth within and outside of the Manson Urban Growth Area (UGA). **Exhibit 7-1** shows known areas anticipated for future development within the planning period. The areas outside of the UGA will need to be rezoned with the exception of Indian Trust lands which are exempt from zoning requirements. The overall build-out timing and density is hard to predict. However, these large developments can put significant pressure on portions of the collection system. The sewer system capacity analysis was based on the projected growth within each basin as described in **Chapter 6**. However, the effect of each potential development area shown in **Exhibit 7-1** was not analyzed in the hydraulic modeling. As large developments occur, they may accelerate the CIP schedule or place strain on the existing sewer system. As such, the developer should compensate the District and the City of Chelan (City) for any necessary improvements.

Recommended Capital Improvement Plan

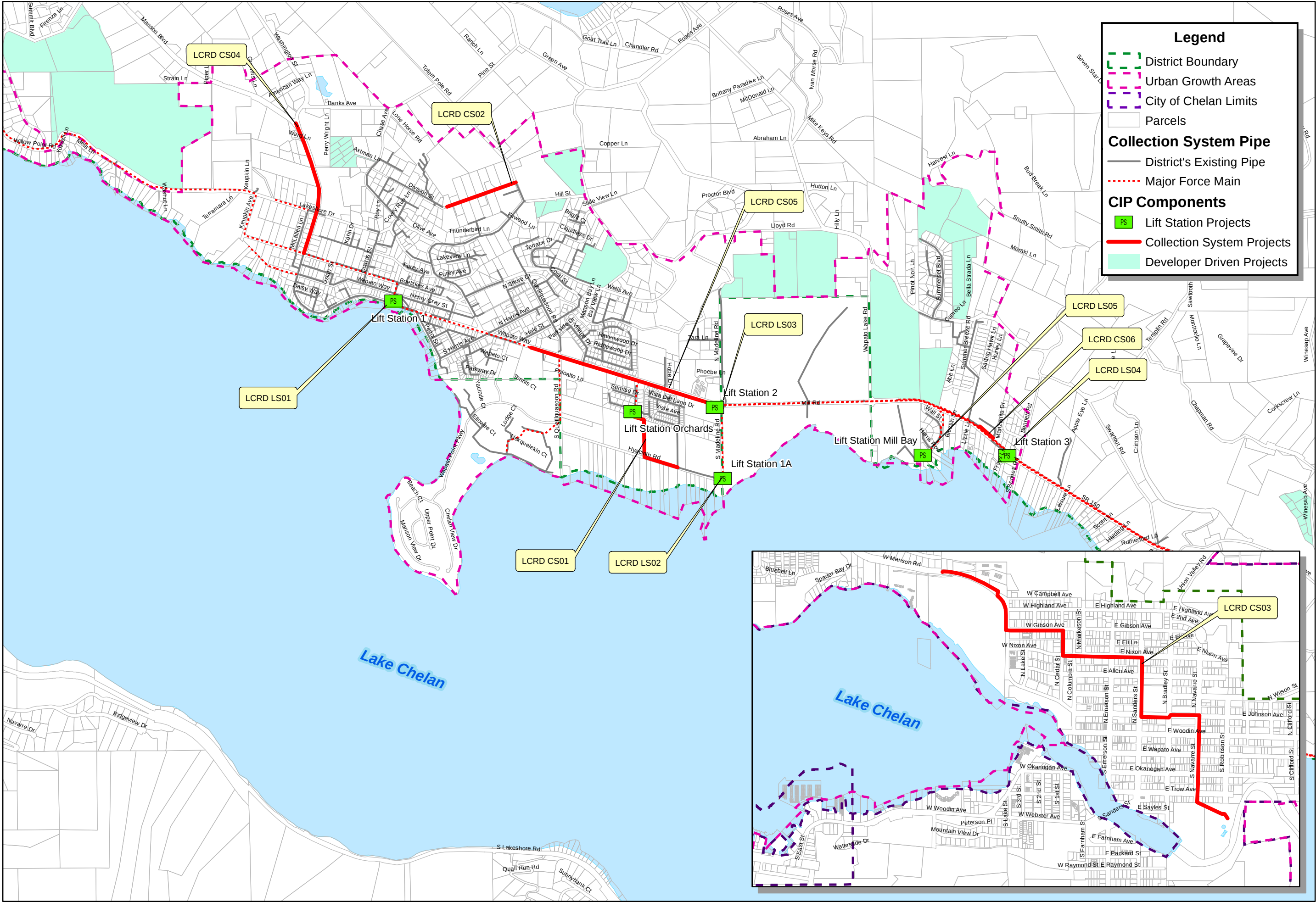
The implementation schedule for the proposed improvements is shown in **Table 7-1**. It should be noted that the implementation schedule is, to some extent, flexible. The District should review **Table 7-1** at least annually and reprioritize as necessary to match budget, growth, other priorities, and potentially coordinating with road and other projects within the same area. The cost estimates developed for each CIP system improvement have been included in **Appendix F**.

Table 7- 1
District Capital Improvements Projects List – March 12, 2024

LCRD CIP No.	Description	Project Cost			Estimated Total Cost by Improvement Year (2022 Cost Basis plus 4% annual inflation)							
					2023 (Yr. 1)	2024 (Yr. 2)	2025 (Yr. 3)	2026 (Yr. 4)	2027 (Yr. 5)	2028 - 32	2033 - 37	2038 - 42
		Indirect	Direct	Total	1.04	1.08	1.12	1.16	1.20	1.40	1.60	1.72
Lift Station, Force Main and Interceptor Improvements												
LCRD LS01	LS No. 1 Rehabilitation	\$316,000	\$1,047,000	\$1,363,000	-	-	-	-	\$189,600	\$1,687,000	-	-
LCRD LS02	LS No. 1A Improvements	\$172,000	\$570,000	\$742,000	-	-	-	-	-	-	\$1,187,200	-
LCRD LS03	LS No. 2 Improvements	\$146,000	\$972,000	\$1,118,000	\$50,000	\$810,000	-	-	-	-	-	-
LCRD LS04	LS No. 3 Improvements	\$556,000	\$1,516,000	\$2,072,000	-	\$50,000	\$283,360	\$2,081,040	-	-	-	-
LCRD LS05	Mill Bay Lift Station Improvements	\$222,000	\$738,000	\$960,000	-	-	-	-	-	-	\$1,536,000	-
Collection System Gravity Sewer Main Improvements												
LCRD CS00	Gravity Main Annual Pipe Replacements	\$200,000	\$1,000,000	\$1,200,000	-	-	\$67,200	\$69,600	\$72,000	\$396,000	\$456,000	\$516,000
LCRD CS01	Gravity Main from Sunrise Drive to LS 1A	\$204,000	\$508,000	\$712,000	-	\$130,000	\$367,360	\$294,640	-	-	-	-
LCRD CS02	Division Street Sewer Extension (Developer Driven)	\$170,000	\$563,000	\$733,000	-	-	-	-	-	-	-	\$1,260,760
LCRD CS03	Northshore Interceptor Replacement (Developer Driven)	\$1,124,200	\$3,745,000	\$4,869,200	-	-	-	-	-	-	-	\$8,375,024
LCRD CS04	Manson Boulevard Expansion (Developer Driven)	\$340,000	\$1,127,000	\$1,467,000	-	-	-	-	-	-	-	\$2,523,240
LCRD CS05	Lift Station 2 Collection Piping SR 150 - Hale Street and LS 2	\$460,000	\$1,533,000	\$1,993,000	-	-	-	\$20,000	-	\$2,762,200	-	-
LCRD CS06	Lift Station 3 Collection Piping SR 150 - Lizzie Lane and Parkhill Dr	\$72,000	\$238,000	\$310,000		-	-	-	\$20,000	\$406,000	-	-
Lake Chelan Reclamation District CIP Totals:					\$50,000	\$990,000	\$717,920	\$2,465,280	\$281,600	\$5,251,200	\$3,179,200	\$12,675,024
Lake Chelan Reclamation District Portion of City's CIP Projects Total:					\$39,079	\$797,514	\$26,656	\$115,420	\$30,940	\$1,142,370	\$619,820	\$4,088,320
Lake Chelan Reclamation District Yearly Total:					\$458,053	\$1,787,514	\$744,576	\$2,580,700	\$312,540	\$6,393,570	\$3,799,020	\$16,763,344



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Legend

District Boundary

Urban Growth Areas

City of Chelan Limits

Parcels

Collection System Pipe

District's Existing Pipe

Major Force Main

CIP Components

PS

Lift Station Projects

Collection System Projects

Developer Driven Projects

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Vicinity Map



HERE, Garmin, (c) StreetMap contributors,

Figure 7-1
Capital Improvement Projects Map
Lake Chelan Reclamation District

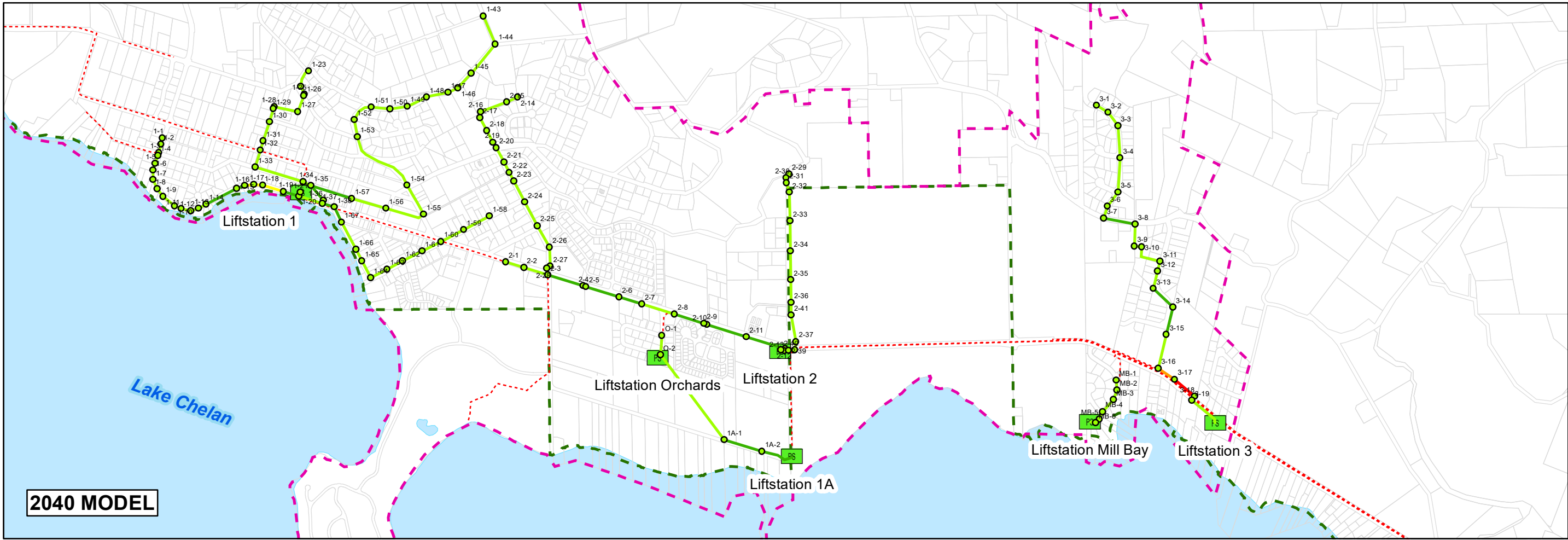
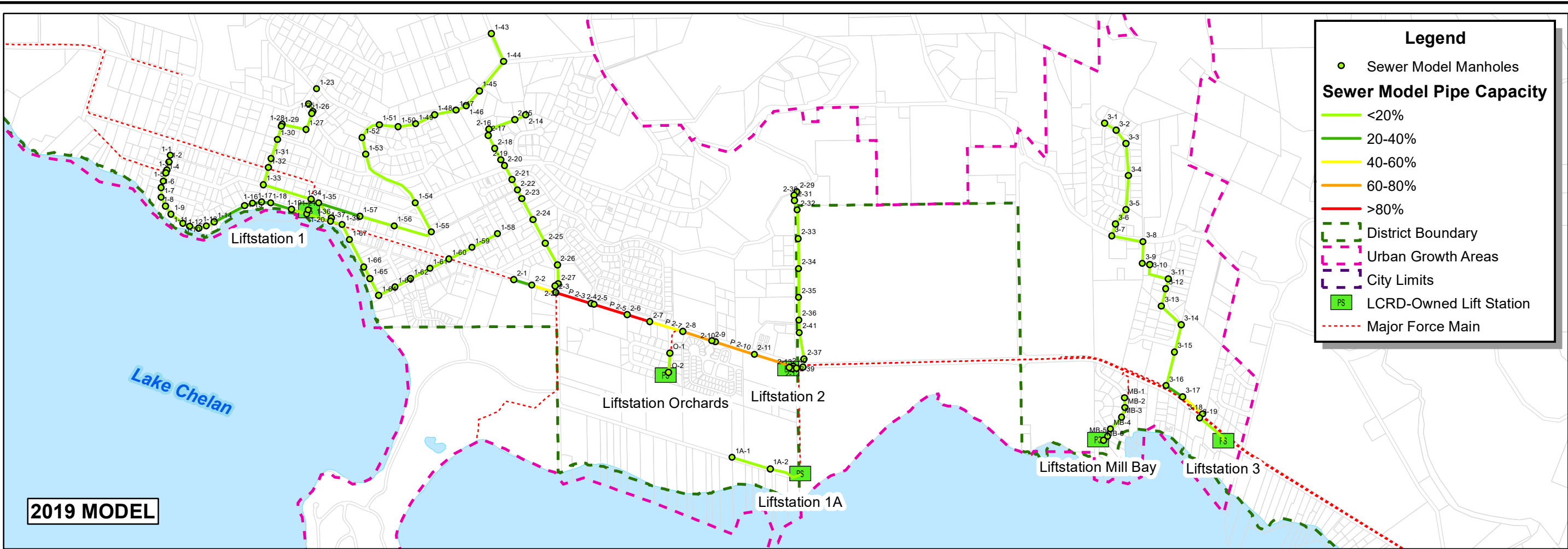


1 inch = 1,500 feet
0 375 750 1,500 Feet
DRAWING IS FULL SCALE
WHEN BAR MEASURES 1"



J:\DATA\LCR219-012\GIS\FIG 7-1 COLLECTION CIP.MXD BY: J.LAWRENCE PLOT DATE: MAR 13, 2024 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET

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Vicinity Map



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Figure 7-2 2019 and 2040 Peak Hour Model Results Lake Chelan Reclamation District



1 inch = 1,200 feet
0 300 600 1,200 Feet
DRAWING IS FULL SCALE
WHEN BAR MEASURES 1"



J:\DATA\CR219-012\GIS\FIG 7-2 2019 AND 2040 PHF COMPARISON.MXD BY: OMARTYUSHEVA PLOT DATE: JUN 3, 2022 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET

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8 | OPERATION AND MAINTENANCE

Introduction

It is important for sewer utilities to have a program in place that ensures successful operation of the wastewater collection system and continuous reliability of critical system components. This chapter discusses the operation and maintenance (O&M) components for the Lake Chelan Reclamation District's (District) wastewater collection system. This chapter addresses responsibility and authority, normal system operation, routine and preventive maintenance, staffing and equipment requirements, new construction, records, safety, and emergency response procedures.

An O&M program allows the District to maintain design functionality, restore the system components to their original condition, or maintain their current condition. Added benefits of a comprehensive O&M program include increased reliability, superior customer service, and lower maintenance costs.

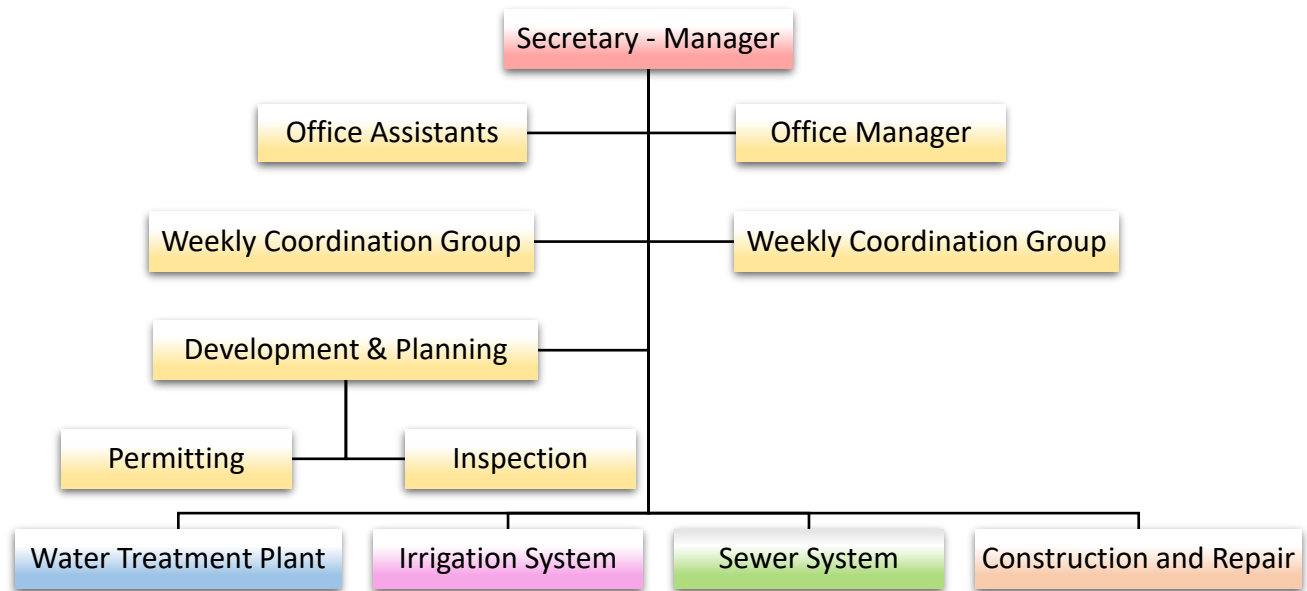
District Personnel

The District oversees the water system, irrigation system, and sewer system. The District's staff shares the responsibilities between these three systems. **Chart 8-1** shows the District's organization chart. Currently, the District is organized into following groups:

- Office Manager
- Office Assistants (responsible for Bookkeeping and Accounting)
- Weekly Coordination Group
- Development and Planning
 - Inspections
 - Permitting

The sewer system O&M personnel consists of a field crew of District Input Needed that perform general inspection and maintenance, as well as a mechanical and communication systems inspector.

Chart 8-1
Lake Chelan Reclamation District Organization Chart



Normal Operations

The current sewer collection system consists of lift stations, force mains, and gravity sewer lines within the District's service area shown in **Exhibit 2-1** in **Appendix A**. All wastewater collected by the District's collection system is conveyed to the City of Chelan (City) sewer system. The City also is responsible for wastewater treatment.

In **Chapter 2**, lift station information is listed in **Table 2-2**, while the lengths of sewer pipe are listed in **Table 2-1**. The field crew is responsible for O&M for all seven lift stations, pressure mains, and associated valves and gravity sewer pipes. Operating instructions for several of the lift stations are provided in the equipment supplier O&M manuals, which are on file at the District.

Overall, the lift stations and collection system piping are in good working order and operate without significant maintenance issues. District staff should perform routine preventive maintenance of the pump stations and collection system to keep the system in good working order. Recommended preventive maintenance techniques to be employed by the collection system staff are described in subsequent sections.

Routine and Preventive Maintenance

Planning for future maintenance of wastewater system facilities is crucial to a healthy system. If maintenance efforts are not expanded proportionately to system expansion, the reliability and efficiency of the system will be diminished. The District's goals for its collection system maintenance program should be to preserve the value of the physical infrastructure and ensure that all wastewater is conveyed safely, efficiently, and reliably. To accomplish these goals, a planned preventive maintenance program provides the most cost-effective method for performing the optimum level of maintenance activities at the lowest cost. In addition to

the actual maintenance tasks for system facilities, scheduling, administration, inventory, and recordkeeping should be key components of the District's maintenance program.

A preventive maintenance program involves defining the tasks to be performed, scheduling the frequency of each task, and providing the necessary staff to perform the tasks. An example preventive maintenance schedule is presented in **Table 8-1**.

Table 8-1
Example Preventive Maintenance Schedule

Component	Visitation Schedule	Maintenance Schedule
Gravity Sewer and Manholes	As necessary	As necessary
Lift Stations	Weekly	- Inspected 3 times per week - Site cleaned monthly - Wet well vacuored out 2 or 4 times per year depending on station needs
Generators	Weekly	- Exercised automatically by the telemetry system on a weekly basis - Fuel storage tanks are checked for fuel level and refilled monthly - Preventive maintenance checks by in-house mechanics twice per year - Annual services by generator manufacturer
Gravity Sewer and Manholes	Every Year	- Pipelines cleaned - Video inspected as required - Lines identified as potential problem areas are maintained on a quarterly basis - Manholes inspected
Force Mains	As necessary	As necessary

Lift Station and Generator Maintenance

An inventory of the mechanical equipment at each of the District's lift stations should be summarized in the O&M Manual for each lift station. Maintenance data sheets should be kept at each lift station to record pumping equipment alarms or errors and the action taken to resolve them. This data sheet is an important piece of information for tracking maintenance and overall equipment condition. Additionally, District staff should record pump run times to track operation of the lift stations.

Table 6-1 from the *Wastewater Collection Systems Management: Manual of Practice 7* (Water Environment Federation (WEF), 2004) is duplicated as **Table 8-2** and summarizes recommended preventive maintenance tasks for lift stations. The WEF table is extensive but can be used as a guideline for the scheduling of maintenance tasks. Current District procedures should be compared to those recommended in this table and revised wherever needed.

Table 8-2
Typical Maintenance Tasks Record for Sewage Lift Stations¹

Item	Weekly	Monthly	Quarterly	Yearly
Lift Station	Write down hours	Clean floats	Pump out and clean wet well	Paint interior and piping (5 years)
	Check pump cycle counter	Clean and sanitize dry well	Grease all pumps	Check all force mains that discharge to manholes
	Check wet well ventilation	Drain air compressors	Clean check valves	Check all electric panels
	Check for leaks in dry well	Clean out drain sumps		Inspect pump impellers
	Check sump pump			<u>Twice Per Year:</u> Use portable generator to test transfer switches and proper electrical transfer at stations without onsite generators
	Check Telemetry in lift stations			
Generators	Test run exercise	Check and top off fuel level	<u>Twice Per Year:</u> Check oil filter Check air filter Check battery fluid level and fan belts Check battery terminals for corrosion Check alternator output volts Check RPM	
	Check oil			
	Check coolant level			

¹ From *Wastewater Collection Systems Management: Manual of Practice 7*, WEF, 2004.

Portable generators function as key backup systems for the lift stations. No lift stations are equipped with on-site generators. All District lift stations are equipped with a portable generator connection. The District has two 300 kilowatt (kW) portable generators that are stored at its new shop building on Wapato Lake Road until either is needed.

Maintenance of portable generators should be conducted as recommended in the O&M manuals for the individual generator units. Maintenance for the generators entails weekly tests to ensure the operational ability during a power outage. Fuel, water, and oil levels should be checked and recorded as part of routine maintenance tasks. Mechanical maintenance should include service at regular intervals of approximately 6 months. Collection system staff should run each auxiliary generator for approximately 15 minutes each week.

The District's crew inspects lift stations and all residential grinder pumps that it is responsible for on a weekly basis. These weekly inspection reports are used to schedule any work necessary to address any issues.

Collection System Inspection

The major maintenance activities with respect to gravity sewers and manholes are periodic inspections and flushing. Inspections typically are done through visual investigation or closed circuit

television (CCTV) technology. During the summer months, the District's crew flushes the gravity sewer system. This flushing addresses the accumulation of debris or other matter within pipes and manholes, thus limiting the potential for surcharging or flooding. The District makes sure to flush out any potential problem locations such as downtown restaurant areas.

Structural conditions that should be evaluated during the inspections include collapsed pipes, cracked pipes with or without deflection, pipe sags, cracked or open joints, holes in pipes, root intrusion, signs of pipe corrosion, protruding joint material, protruding lateral sewers, pipes with excessive debris, and side sewers with active infiltration and inflow (I/I). Manholes should be inspected and cleaned along with the pipe inspection. Deteriorating or non-functioning manholes should be replaced as soon as possible to prevent further system damage and I/I.

A primary maintenance issue with regards to a wastewater collection system is the accumulation of fats, oils, and grease (FOG). These contaminants are prevalent in the waste streams of restaurants, laundromats, and other commercial entities, and to a lesser extent, residential connections. The District does not have a FOG policy. The District defers to the City's requirements since the City is responsible for wastewater treatment. Because the City is responsible for wastewater treatment, the District does not require its employees to obtain wastewater certification.

Cleaning the collection system typically includes flushing/jetting with high pressure water. Cleaning is performed more often than inspection because it addresses the accumulation of debris that can occur randomly and cause hydraulic disruptions in a short period of time. The older portions of the District's sewer collection system should be given special attention, because the potential for breaks in sewer lines or accumulated solids is higher in these areas. Odor complaints from residents can help identify areas in need of more frequent flushing or other maintenance. The deterioration of the older areas within the sewer collection system can be tracked through accurate maintenance records. Maintenance records also can be used to budget necessary repair and replacement projects.

Lift Station and Collection System Staffing Requirements

Lift station staffing requirements vary greatly depending on the size and complexity of the station as well as the scheduled maintenance routine. Inspection and maintenance staffing needs typically range from 0.05 to 0.5 full-time employees (FTE) per station. The District's lift stations are operated and maintained by any of the 10 field staff employee(s) as needed. Small lift Stations require 0.05 FTEs each while Lift Stations 1, 2 and 3 require 0.075 FTEs (50 percent more time) each. A total of 0.8 FTEs should be devoted to the lift stations from a budgeting perspective. In addition, it is recommended that 1 additional FTE be dedicated to provide a supervisory and support role.

Inspection and cleaning rates of sewer collection systems vary between 1,000 to 1,200 feet per day. The amount of sewer pipe that can be inspected each day varies depending on work schedules, the amount of cleaning required, time of day, and other physical limitations. Although there is no industry standard for cleaning intervals, a review of general sewer O&M literature suggests that cleaning between 5 and 40 percent of the collection system per year is acceptable. An inspection and cleaning rate of 125 feet per hour with a 2-man crew (truck driver and jet operator) and a target interval of 3 years was assumed to determine staffing requirements. An FTE is

assumed to be equal to 1,768 hours in a year, assuming 10 holidays, 12 sick days, 2 training days, and an average of 15 vacation days. The required number of man hours is 204 for each crew member, which equates to 2 crew members at 0.12 FTEs devoted to the inspection and cleaning of the sewer collection system.

To summarize, a total of 0.8 FTE should be shown as dedicated to the wastewater collection system with the understanding that crew sizes from 3 to 6 employees may be needed for particular O&M tasks. The District is fortunate to have a large field crew available to work on irrigation, water and sewer that can be cross trained and available for necessary tasks on a seasonal basis.

Maintenance Personnel Training

A well-trained staff is an essential part of an effective O&M program. Maintenance personnel should be familiar with maintenance equipment and procedures, as well as safety requirements and regulations. Training and certification criteria should be established for each job description and training conducted accordingly. Training activities should be considered as important as any other maintenance activity, and included and budgeted into the regularly scheduled tasks. It is recommended that annual training and education be included in the annual budget amount.

New Construction

A major step towards preventing problems within the sewer collection system is proper installation at the time of construction. The District should provide a full-time inspector on site for all new construction. The importance of having an inspector on site cannot be overemphasized in reducing future problems. The District has adopted the Washington State Department of Ecology's *Criteria for Sewage Works Design*, latest edition, in its Standard Details for Sanitary Sewer.

Sanitary sewer standards for the wastewater system are discussed in **Chapter 5** and standard details are located in **Appendix E** of this General Sewer Plan. These standards should be continually reviewed and updated by engineering and maintenance personnel. Standard designs should be developed to minimize total life-cycle costs, which include capital, O&M, and financing costs. As the system becomes more complex, special attention should be given to its ability to function during emergency situations.

Recordkeeping

The implementation of an effective and efficient O&M program requires accurate recordkeeping. Accurate maintenance records provide many benefits to the District, including the following:

- Identifying recurring problems and problem areas.
- Tracking lift station mechanical components.
- Estimation of man-hours required for various maintenance tasks.
- Identification of collection system components that are nearing capacity or the end of their useful life.

- Diagnosing and addressing I/I issues.

Inventory

The District owns the following equipment to maintain its existing sewer infrastructure:

- 2003 Freightliner Vactor Truck
- 1979 International Water Tank Truck
- 2017 Sewer Jetter Model 747

Safety

An important consideration of any successful maintenance program is the safety and wellbeing of its employees. The District's safety program addressing accidents, fall protection, confined spaces, and lockout/tagouts should include the standards of the Washington State Department of Labor and Industries (L&I). The safety program addresses the situations that employees may encounter during the performance of O&M tasks. Field employees should meet monthly for safety meetings, which include training and discussion of safety issues.

The following sections include applicable recommended and required safety provisions for confined spaces, electrical and mechanical equipment, fire hazards, and health hazards.

Confined Spaces

L&I has established regulations governing entrance into confined spaces in Chapter 296-809 Washington Administrative Code (WAC). The regulations include the completion of a Confined Space Entry Permit, the establishment of Safe Operating Procedures, and the completion of a Confined Space Pre-entry Checklist.

The principal hazards associated with confined spaces, including wet wells, sewer manholes, and sewage lift stations, are oxygen deficiency, explosions, and toxic gases. Oxygen deficiency occurs whenever air is displaced by some other gas, which may or may not be toxic.

District confined space procedures should be reviewed with maintenance personnel on a regular basis and revised as new regulations and equipment evolve.

Electrical and Mechanical Equipment

The presence of electrical and mechanical equipment at the sewage lift stations may present hazards to personnel during the performance of O&M tasks. Precautions should be taken whenever working on or near the lift station mechanical and electrical equipment.

Rubber mats should be placed on the floor in front of all electrical control panels. When working on any piece of electrical equipment, the operator should ensure that all switches are opened and tagged, all electrical equipment is grounded, and all exposed wire is taped. All portable power tools, extension cords, and lights should be of the three-wire grounding type.

Exposed shafts and belts are hazardous mechanical equipment items that can be found in sewage lift stations. Belts and shafts should be enclosed in sheet metal or wire guards. When work is being

conducted on any piece of equipment with exposed shafts or belts, the item of equipment should be taken offline so that it will not start.

Other safety precautions that should be observed by District personnel are: to avoid contact with energized circuits or rotating parts; to avoid bypassing or rendering inoperative any safeguards or protective devices; and to avoid extended exposure in close proximity to machinery with high noise levels.

Fire Hazards

Fires are possible in any area of a sewage lift station if debris is allowed to accumulate. Precaution should be taken to reduce the possibility of a fire. Oily rags should be kept in a tightly sealed metal can, preferably at a location away from the sewage lift station. All areas should be kept free of clutter or debris, especially if flammable in nature. Gasoline or solvents should only be used in well-ventilated areas, away from sources of ignition. A carbon dioxide type dry chemical or foam fire extinguisher should be permanently mounted at each sewage lift station. The extinguisher should be tagged and checked semi-annually to ensure that it is operational.

Health and Safety

The possibility exists that any particle of wastewater may contain disease-causing bacteria. Operators should take precaution to avoid disease at all times. Principle waterborne diseases include typhoid fever, dysentery, *Giardia*, *Cryptosporidium*, infectious jaundice, and tetanus. Immunization against some of the diseases is possible and all operators should be vaccinated periodically. Operators should take individual precautions to avoid disease, including the following:

- Keep hands below collar when working at sewer facilities.
- Wear rubber gloves whenever directly handling sewage.
- Disinfect hands with hot water and soap or hand sanitizer before eating.
- Treat minor cuts and wounds immediately.

Additionally, an emergency first aid kit should be kept in each District vehicle and other convenient locations, so as to be readily available to operators.

Emergency Response

The operation of the sewer system under emergency conditions is an important responsibility of the District's staff. All employees need to be up to date in first-aid, CPR, and confined space training. Emergency response procedures should be rehearsed and reviewed by personnel on a regular basis.

It is important to estimate the degree in which system facilities may be vulnerable to various types of emergency situations to identify system weaknesses. The District's Emergency Response Plan also should include information regarding which facilities would be vulnerable to various types of emergency events and recommended actions that District staff could take to help mitigate the problem.

9 | FINANCIAL PLAN

INTRODUCTION

The purpose of this chapter is to provide a financial plan for the Lake Chelan Reclamation District (District) in order to meet its capital improvement projects identified in **Chapter 7**.

PAST FINANCIAL PERFORMANCE

Operations

Table 9-1
Operations and Maintenance Fund

Revenue	2017	2018	2019	2020	2021	2022
Base Charges	\$1,025,102	\$1,130,678	\$1,189,790	\$1,176,301	\$1,248,038	\$1,318,468
City Reimbursed Services	\$40,011	\$37,927	\$38,393	\$34,017	\$33,850	\$26,594
Hookup Fees	\$119,300	\$213,200	\$216,300	\$245,150	\$236,050	\$201,752
Interest (LGIP)	\$10,231	\$22,173	\$27,806	\$8,854	\$1,956	\$35,004
Interest (Bond)	\$2,830	\$4,521	\$15,718	\$15,250	\$16,450	\$10,051
Willow Point LID	\$61,717	\$0	\$0	\$0	\$0	\$0
Reimbursable Services	\$12,697	\$10,798	\$18,002	\$11,748	\$14,175	\$18,894
Tsfr from Capital Reserves	\$168,190	\$0	\$0	\$0	\$0	\$0
Annual Domestic Reimbursement	\$2,324	\$1,800	\$2,822	\$10,292	\$7,018	\$3,728
Total	\$1,442,402	\$1,421,097	\$1,508,831	\$1,501,612	\$1,557,537	\$1,614,491

Expenses	2017	2018	2019	2020	2021	2022
Salaries & Wages	\$104,130	\$86,685	\$87,236	\$80,318	\$90,976	\$81,461
Overtime	\$9,090	\$6,855	\$9,048	\$7,530	\$8,486	\$7,490
Payroll Expenses	\$59,497	\$50,503	\$52,840	\$50,289	\$57,288	\$48,790
Unemployment	\$0	\$571	\$44	\$0	\$0	\$0
Office Supplies	\$13,637	\$7,405	\$8,785	\$7,396	\$7,580	\$6,828
Operations and Maintenance	\$362,307	\$338,953	\$304,394	\$329,699	\$373,526	\$375,624
Overhead	\$82,340	\$56,259	\$74,541	\$67,711	\$89,783	\$93,870
Capital Purchases (Sewer)	\$72,000	\$0	\$0	\$0	\$0	\$0
Capital Purchases (Shared)	\$2,187	\$2,494	\$0	\$962	\$3,247	\$1,551
Equipment Fund	\$0	\$0	\$1,893	\$0	\$0	\$0
Construction Fund	\$183,729	\$39,200	\$155,818	\$44,181	\$214,265	\$216,628
Vehicle Purchases	\$7,965	\$5,883	\$11,868	\$0	\$6,865	\$0
City of Chelan Capital Sewer Impr	\$99,596	\$0	\$0	\$0	\$0	\$0
City WWTP Loan (Phase 1)	\$42,538	\$42,326	\$42,114	\$41,902	\$41,691	\$0
City WWTP Loan (Phase 2)	\$69,353	\$68,987	\$57,086	\$56,951	\$56,817	\$56,682
NSS Pre-Con Loan	\$40,366	\$40,169	\$39,972	\$39,775	\$39,578	\$0
NSS Construction Loan	\$293,667	\$292,248	\$290,829	\$289,411	\$287,992	\$286,573
Tsfr to Capital Reserves	\$0	\$382,559	\$372,363	\$485,487	\$279,443	\$438,994
Total	\$1,442,402	\$1,421,097	\$1,508,831	\$1,501,612	\$1,557,537	\$1,614,491

Construction/Capital Projects

Table 9-2
Construction and Capital Budget

Revenue	2017	2018	2019	2020	2021	2022
Transfer from O&M Fund	\$183,729	\$39,201	\$155,818	\$44,181	\$214,265	\$216,628
Chelan Co Economic Dev Grant	\$0	\$0	\$0	\$0	\$0	\$0
Capital Reserves	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$183,729	\$39,201	\$155,818	\$44,181	\$214,265	\$216,628

Expenses	2017	2018	2019	2020	2021	2022
Salaries & Wages	\$570	\$0	\$0	\$0	\$0	\$48
Overtime	\$161	\$0	\$0	\$0	\$0	\$0
Payroll Expenses	\$392	\$0	\$0	\$0	\$0	\$27
Manhole/Wetwell Replacements	\$0	\$0	\$0	\$0	\$0	\$0
NSI Pump Repairs	\$42,442	\$4,602	\$12,639	\$0	\$0	\$0
NSI Air Vacs, Flushing	\$0	\$0	\$0	\$0	\$0	\$0
NSI SCADA-HMI and Telemetry	\$173	\$32,253	\$986	\$0	\$0	\$0
E-One Pumps	\$0	\$0	\$0	\$0	\$0	\$0
LS No. 2 Upgrades	\$0	\$0	\$0	\$0	\$214,265	\$151,276
Sewer Comprehensive Plan	\$0	\$0	\$38,036	\$32,268	\$0	\$53,159
NSI Extension/Maintenance	\$139,991	\$0	\$104,157	\$0	\$0	\$0
Richardson Sewer Line	\$0	\$0	\$0	\$0	\$0	\$12,119
Miscellaneous	\$0	\$2,346	\$0	\$11,913	\$0	\$0
Total	\$183,729	\$39,201	\$155,818	\$44,181	\$214,265	\$216,629

FUNDING SOURCES

The District may fund the sewer CIP from a variety of sources. In general, these sources can be summarized as: 1) governmental grant and loan programs; 2) publicly issued debt (tax-exempt or taxable); 3) cash resources; and 4) connection fees (Capital Facilities Charges). Each source is described as follows.

Government Programs

Historically, federal and state grant programs were available to local utilities for capital funding assistance. However, these assistance programs have been mostly eliminated, substantially reduced in scope and amount, or replaced by loan programs. Remaining grant programs generally are underfunded and extremely competitive. Nonetheless, the benefit of even the very low-interest loans makes the effort of applying worthwhile. State programs identified as potential funding sources for the utility improvements set forth in this General Sewer Plan (GSP) are discussed next.

Public Works Trust Fund (PWTF) – The PWTF is a commonly used, low-cost revolving loan fund established by the 1985 State Legislature to provide financial assistance to local governments for public works projects. Eligible projects must improve public health and safety, respond to environmental issues, promote economic development or upgrade system performance.

Community Economic Revitalization Board – Managed by the Department of Commerce, this program provides grants and loans to fund public facilities that support specific private-sector business growth and expansion. Eligible projects include water, sewer, and other public improvements. A committed private partner would need to be identified to provide approximately 20 percent of the project costs.

Community Development Block Grant – Managed by the Department of Commerce, this program provides grants for low income communities for planning, engineering and construction.

Chelan County Economic Development Grant – Managed by Chelan County (County), the District has received pass-through grants from the County in the past to assist with the District's share of larger capital improvement costs generated by growth in Manson's urban growth area.

Department of Ecology – The Washington State Department of Ecology's (Ecology) Water Quality Financial Assistance Program sponsors one grant or loan program that could apply to the District's wastewater system: the State Revolving Fund Loan program. While some of these funding sources go to wastewater programs, projects such as the development and implementation of groundwater and wellhead protection programs, also are included.

Ecology also has hardship grants and loans available for distressed areas in their Integrated Water Quality Funding program with 50 percent grant funding and 50 percent loans for planning, engineering and construction. The District's wastewater system would not likely be eligible for hardship classification, but an extension to the community of Murdock might be.

Rural Development – Managed by the United States Department of Agriculture (USDA), this program provides grants and loans for planning, engineering and construction. The District's wastewater system would not likely be eligible for grants unless rates increased to above 2.5-percent higher than the median household income.

Economic Development Administration (EDA) – Managed by the United States Department of Commerce, this program provides grants and loans where a cost share is provided by the applicant for up to 50 percent of total project costs. EDA grants are very competitive and not likely available for the District's wastewater system.

Public Debt

Revenue Bonds – Revenue bonds are commonly used to fund utility capital improvements. The debt is secured by the revenues of the issuing utility, and the debt obligation does not extend to the District's other revenue sources. With this limited commitment, revenue bonds typically require security conditions related to the maintenance of dedicated reserves (a bond reserve) and financial performance (added bond debt service coverage). The District agrees to satisfy these requirements by ordinance as a condition of the bond sale.

Revenue bonds can be issued in Washington State without a public vote. There is no bonding limit, except perhaps the practical limit of the utility's ability to generate sufficient revenue to repay the debt and provide coverage. In some cases, poor credit might make issuing bonds problematic. In the case of the District, strong historical financial performance bodes well for this form of financing. For the most part, tax-exempt bonds may be issued by a governmental agency for its capital projects, with the exception of funding needs that serve private sector or non-governmental

interests, such as mutual water companies and homeowner’s associations (which are classified as 501c corporations). Generally speaking, if more than 10 percent of a capital project provides direct benefit and service to the private sector (e.g., a business or company receiving wholesale sewer service), the associated revenue bonds likely will be taxable. It is important that each agency perform due diligence in this regard where there is a question of private versus public benefit.

District Cash Reserves

The District has sewer reserves shown in its three investment accounts; Sewer O&M Investments, Sewer Bond Investments and Sewer Construction Investment account. The Sewer O&M Investment account is the District’s cash flow account and emergency reserves. The Sewer Bond and Sewer Construction Investment accounts are intended primarily for capital construction projects and provides for some diversification of investments to avoid sole reliance upon the Washington State’s Local Government Investment Pool. **Table 9-3** shows a summary of the starting balances at the end of 2023.

Table 9-3
Cash Balance Summary for Sewer Investment Accounts

	Ending Balance December 31, 2023
Sewer O&M Investments	\$1,795,241
Sewer Bond Investments	\$1,950,227
Sewer Construction Investments	\$1,892,453
Total	\$5,637,921

Sewer Hookup Fees

Sewer Hookup Fees, also known as Capital Facilities Charges (CFCs) are legal sources of funding provided through development and growth in customers and typically used by utilities to support capital needs. CFCs are a form of connection charges as authorized in Revised Code of Washington (RCW) 35.92.025. CFCs are imposed on new customers as a condition of service. Typically, the basis for the CFC is the total original capital cost the utility will or has incurred to provide the sewer system. The underlying premise of the CFC is that growth (i.e., future customers) will pay upfront for growth-related costs that would not have been necessary absent the increase in customer base.

The purpose of the CFC is two-fold: 1) to provide funding sources for capital financing; and 2) to recover an equitable level of investment in the system from new customers. In the absence of such a charge, growth-related costs would be borne, in large part, by existing customers. In addition, the current customers’ net investment in the utility would be diluted by the addition of new customers absent a CFC. This dilution, if allowed, would in effect be a subsidy to new connections.

A brief description of the components that can be included in the CFC is provided as follows.

Existing Cost Basis – Legal interpretations of state statutes have provided guidelines for connection charges (CFCs). CFCs should reflect the actual original cost of the utility system and can include interest on that cost at the rate of interest applicable at the time of construction for up to a 10-year period, not to exceed 100 percent of the construction costs. This cost is net of donated facilities

and non-utility cash payments, whether from grants, developers, or Local Improvement District assessments. Although not required by state law, outstanding debt principal (net of existing cash balances) is then subtracted from this cost basis to avoid double-charging, in recognition that debt service is repaid through rates.

Future Cost Basis – Legal interpretations also suggest that future facilities needed to serve growth, as well as regulatory system improvements, can be included in the connection charge. The future cost basis can include utility capital projects planned for construction and identified in an approved comprehensive system planning document that are intended to increase the system to meet increasing demands from growth. Projects directly funded by developers, grants, or special property assessments are not included in the calculation. Replacement projects are most often excluded from the calculation unless needed to increase the size of the system. The original cost of replacement projects is already included in the existing cost basis. Further, replacement costs typically are recovered through user rates.

Customer Base/System Capacity – The sum of the existing cost basis and future cost basis is then divided by the total customer base to determine the maximum allowable connection charge. The customer base represents the equivalent residential units (ERUs) that can be supported by the planned system capacity.

The District's 2023 sewer hookup fee is \$8,000 per ERU. **Table 9-4** summarizes the CFC analysis using future projects identified in **Chapter 7**. It is beyond the scope of this report to analyze the impact of forgone interest earnings from past investments (allowable for 10 years) and future WWTP and lift station capacity improvements identified beyond the near-term improvements through 2032. Total capital project costs are estimated to be 25% growth related with the balance being replacement related. The estimated additional capacity generated by the improvements is 500 ERU. This study indicates that the current hookup fee is still representative, and annual increases of at least 3 percent are recommended unless the District prefers a lower subsidized rate.

Table 9-4
Summary of the CFC Analysis

	Cost Basis (Increased by Inflation Less Depreciation)	Percent for Growth	2023 ERU	Cost Basis per ERU
Utility and Plant	\$712,237	100%	1,884	\$378.05
Machinery and Equipment	\$71,560	100%	1,884	\$37.98
Pipelines	\$6,269,372	100%	1,884	\$3,327.69
City of Chelan WW Projects (LCRD Share)	\$1,429,305	100%	1,884	\$758.65
	-	-	-	\$4,502.37
Inflation Factor	\$4,282,381	100%	1,884	\$2,273.03
	-	-	-	\$6,775.40
LCRD Capital Projects (2023-2032)	\$2,736,600	25%	500	\$1,368.30
Chelan Capital Projects (2023-2032)	\$2,151,979	25%	500	\$1,075.99
Sewer Cash Reserves (Less Hookup Fees)	\$5,637,921	50%	1,884	\$1,496.26
2023 Total	-	-	-	\$10,715.95

PROJECTED OPERATIONS AND CONSTRUCTION BUDGETS

Projected Sewer Operations and Maintenance Budgets

The District sewer customers benefit greatly by the sharing of facilities, staff and overhead costs of both the irrigation and domestic systems. Expenses based upon 2022, were increased by 4% for 2023, 3% for 2024 and were estimated at 2% for 2025-2027. **Table 9-5** provides a projected balanced budget for Sewer O&M from 2023-2027.

Table 9-5
Sewer O&M Revenue and Expense

Revenue	2023	2024	2025	2026	2027
ERU	1884	1922	1960	1999	2039
Base Charge	\$61.25	\$63.00	\$66.15	\$67.47	\$68.82
Hookup Fee	\$8,000	\$9,000	\$9,500	\$10,000	\$10,500
Base Charges	\$1,371,051	\$1,452,790	\$1,555,938	\$1,618,798	\$1,684,198
City Reimbursed Services	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
Hookup Fees	\$160,000	\$200,000	\$225,000	\$250,000	\$275,000
Interest (LGIP)	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
Interest (Bond)	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000
Reimbursable Services	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000
Tsfr from Capital Reserves	\$0	\$0	\$0	\$0	\$0
Annual Domestic Reimbursement	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Total	\$1,620,051	\$1,741,790	\$1,869,938	\$1,957,798	\$2,048,198

Expenses	2023	2024	2025	2026	2027
Salaries & Wages	\$95,137	\$97,991	\$99,951	\$101,950	\$103,989
Overtime	\$5,625	\$5,794	\$5,910	\$6,028	\$6,148
Payroll Expenses	\$50,419	\$51,932	\$52,970	\$54,030	\$55,110
Unemployment	\$900	\$927	\$946	\$964	\$984
Office Supplies	\$7,852	\$8,088	\$8,249	\$8,414	\$8,583
Operations and Maintenance	\$390,000	\$401,700	\$409,734	\$417,929	\$426,287
Overhead	\$100,000	\$103,000	\$105,060	\$107,161	\$109,304
Capital Purchases (Sewer)	\$0	\$0	\$0	\$0	\$0
Capital Purchases (Shared)	\$8,100	\$8,343	\$8,510	\$8,680	\$8,854
Equipment Fund	\$0	\$0	\$0	\$0	\$0
Construction Fund	\$62,341	\$1,007,603	\$793,076	\$1,196,497	\$484,800
Vehicle Purchases	\$11,367	\$0	\$0	\$0	\$0
City of Chelan Capital Sewer Impr	\$0	\$0	\$0	\$0	\$0
City WWTP Loan (Phase 1)	\$0	\$0	\$0	\$0	\$0
City WWTP Loan (Phase 2)	\$56,547	\$56,413	\$56,279	\$56,145	\$56,012
NSS Pre-Con Loan	\$0	\$0	\$0	\$0	\$0
NSS Construction Loan	\$285,155	\$0	\$0	\$0	\$0
Tsfr to Capital Reserves	\$546,608	\$0	\$329,254	\$0	\$788,127
Total	\$1,620,051	\$1,741,790	\$1,869,938	\$1,957,798	\$2,048,198

Projected Sewer Construction Budgets

The District sewer customers also benefit from being served by an Irrigation District. Irrigation Districts have much fewer constraints on the type and size of capital projects that it can perform with its own forces than most other forms of local government. Expenses based upon on-going repairs of pumps, air vac and SCADA system items were estimated to remain constant for 2023-2027 due primarily to the upgrades that have occurred to this system in recent years. **Table 9-5** provides a projected balanced budget for Sewer Construction from 2023-2027.

Table 9-6
Sewer Construction Revenue and Expense

Revenue	2023	2024	2025	2026	2027
Transfer from O&M Fund	\$62,341	\$1,007,603	\$793,076	\$1,196,497	\$484,800
Chelan Co Economic Dev Grant	\$100,000	\$0	\$0	\$0	\$0
Capital Reserves	\$0	\$828,411	\$0	\$1,432,703	\$0
Total	\$162,341	\$1,836,014	\$793,076	\$2,629,200	\$484,800

Expenses	2023	2024	2025	2026	2027
Salaries & Wages	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Overtime	\$500	\$500	\$500	\$500	\$500
Payroll Expenses	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Manhole/Wetwell Replacements	\$0	\$0	\$0	\$0	\$0
NSI Pump Repairs	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000
NSI Air Vacs, Flushing	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
NSI SCADA-HMI and Telemetry	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
E-One Pumps	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
LCRD CIP Totals	\$50,000	\$990,000	\$717,920	\$2,465,280	\$281,600
LCRD Portion of City CIP	\$39,079	\$797,514	\$26,656	\$115,420	\$30,940
Sewer Comprehensive Plan	\$13,841	\$0	\$0	\$0	\$0
NSI Extension/Maintenance	\$0	\$0	\$0	\$0	\$0
Richardson Sewer Line	\$10,921	\$0	\$0	\$0	\$0
Miscellaneous	\$0	\$0	\$0	\$0	\$0
Total	\$162,341	\$1,836,014	\$793,076	\$2,629,200	\$361,040

PROJECTED FINANCIAL PERFORMANCE

Current Rates and Charges

The Board of Directors has authority to set rates and charges for the sewer utility. The monthly sewer service rate is a flat rate per dwelling unit for sewer service. The District Bylaws, Rules and Regulations include how ERUs are established for new customers.

2023 sewer rates are \$61.25 per ERU with new hookups at \$8,000 which is also charged on an ERU basis.

Sewer Rate Hardship

The current estimated median household income (MHI) for the Manson Area is \$64,700, based on data from the U.S Census Bureau. A sewer rate of 1.5 percent of MHI is a typically accepted

minimum threshold for rate hardship. Ecology and other agencies evaluate hardship created by sewer rates in order to rank capital projects for potential grant funding. The 2023 monthly sewer rate of 61.25 per ERU would equate to 69.9 percent of the current estimated hardship threshold for the District. The current monthly sewer rate is significantly below this level, and future rate adjustments are unlikely to cause rates to exceed this threshold. As such, the District's rate structure does not meet the minimum threshold for rate hardship.

Table 9-7
Sewer Rate Affordability

	MHI	Maximum Affordable Cost	Actual	Percent Maximum
2014	\$50,825	\$63.53	\$50.00	78.7%
2015	\$53,068	\$66.34	\$50.00	75.4%
2016	\$55,109	\$68.89	\$50.00	72.6%
2017	\$60,791	\$75.99	\$50.00	65.8%
2018	\$60,747	\$75.93	\$55.00	72.4%
2019	\$59,838	\$74.80	\$55.00	73.5%
2020	\$61,546	\$76.93	\$56.50	73.4%
2021	\$64,700	\$80.88	\$58.00	71.7%
2022	\$68,016	\$85.02	\$59.50	70.0%
2023	\$70,056	\$87.57	\$61.25	69.9%
2024	\$72,158	\$90.20	\$63.00	69.8%
2025	\$74,323	\$92.90	\$66.15	71.2%
2026	\$76,553	\$95.69	\$67.47	70.5%
2027	\$78,849	\$98.56	\$68.82	69.8%

Projected Rates and Charges

As shown in **Table 9-5**, relatively modest increases in sewer rates are anticipated between 2023 and 2027. This projection is based on an estimated growth rate of 2% per year. Annual rate increases of approximately 2% per year are shown for 2023-2024. Significant capital improvements by the District and the City of Chelan are estimated to occur in 2024 so a larger increase of 5% was estimated for 2025 when the District plans to move from bimonthly to monthly billing. Cash reserves are sufficient to cover most of those costs, but adding a more significant increase appears to be necessary.

Table 9-8
Projected Rates and Charges

Year	2022	2023	2024	2025	2026	2027
Rate	\$ 59.50	\$ 61.25	\$ 63.00	\$ 66.15	\$ 67.47	\$ 68.82

Projected Cash Reserves

The District has sewer reserves shown in its three investment accounts; Sewer O&M Investments, Sewer Bond Investments and Sewer Construction Investment account. The rate revenue needs analysis for sewer must consider reserves available to the sewer utility. Allocation of the reserve balances were made based on specific CIP spending for the given year. **Table 9-9** shows a summary of the starting balances at the end of 2023 and the projected balances through 2027. The table anticipates the need for revenue bonds in 2028-2032 when major improvements are required at the Chelan WWTP. This will be evaluated as capital projects change or other funding sources become available, such as low interest rate loans.

Table 9-9
Projected Cash Balance Summary for Sewer Investment Accounts

Sewer O&M Investment Fund

Beginning Balance	\$1,380,575.87	\$1,795,240.88	\$1,056,591.93	\$1,438,675.52	\$63,519.55
Revenue	2023	2024	2025	2026	2027
Trsf from O&M	\$546,608	\$0	\$329,254	\$0	\$788,127
Trsf from Bond Fund					
Other Revenue	\$69,029	\$89,762	\$52,830	\$57,547	\$1,906
Total	\$615,637	\$89,762	\$382,084	\$57,547	\$790,033
Expenses	2023	2024	2025	2026	2027
Trsfr to Bond Fund	\$200,972				
Trsfr to Constr Fund	\$0	\$828,411	\$0	\$1,432,703	\$0
Other Expenses					
Total	\$200,972	\$828,411	\$0	\$1,432,703	\$0
Ending Balance	\$1,795,240.88	\$1,056,591.93	\$1,438,675.52	\$63,519.55	\$853,552.13

Sewer Bond Investment Fund

Beginning Balance	\$1,691,119.17	\$1,950,227.14	\$2,028,236.22	\$2,109,365.67	\$1,571,109.26
Revenue	2023	2024	2025	2026	2027
Tsfr from O&M Inv	\$200,972				
Tsfr from Sewer Constr	\$0				
Other Revenue	\$67,645	\$78,009	\$81,129	\$84,375	\$62,844
Total	\$268,617	\$78,009	\$81,129		\$62,844
Expenses	2023	2024	2025	2026	2027
Trsfr to O&M Fund for Constr	\$0	\$0	\$0	\$538,256	\$0
Other Expenses	\$9,509				
Total	\$9,509	\$0	\$0	\$538,256	\$0
Ending Balance	\$1,950,227.14	\$2,028,236.22	\$2,109,365.67	\$1,571,109.26	\$1,633,953.63

Table 9-9 (Continued)
Projected Cash Balance Summary for Sewer Investment Accounts

Sewer Construction Investment Fund

Beginning Balance \$1,851,251.91 \$1,892,453.29 \$1,987,075.95 \$2,066,558.99 \$1,601,222.53

Revenue	2023	2024	2025	2026	2027
Other Revenue	\$92,563	\$94,623	\$79,483	\$61,997	\$48,037
Total	\$92,563	\$94,623	\$79,483	\$61,997	\$48,037

Expenses	2023	2024	2025	2026	2027
Trsfr to Bond Fund	\$51,361				
Trsfr to O&M Fund for Constr	\$0	\$0	\$0	\$527,333	\$0
Other Expenses					
Total	\$51,361	\$0	\$0	\$527,333	\$0

Ending Balance \$1,892,453.29 \$1,987,075.95 \$2,066,558.99 \$1,601,222.53 \$1,649,259.20

Appendices

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Appendix A

Northshore Sewer Interceptor Agreement

RETURN ADDRESS

Lake Chelan Reclamation District
P.O. Box "J"
Manson, WA 98831

Document Title(s) or (transactions contained therein):

1. REPLACED NORTH SHORE INTERCEPTOR AGREEMENT

Reference Number(s) of Documents assigned or released:
(on page __ of document(s))

Grantor(s) (Last name first, then first name and initials)

1. CITY OF CHELAN
2. LAKE CHELAN RECLAMATION DISTRICT

☐ Additional names on page __ of document.

Grantee(s) (Last name first, then first name and initials)

1. CITY OF CHELAN
2. LAKE CHELAN RECLAMATION DISTRICT

☐ Additional names on page __ of document.

Legal Description (abbreviated: i.e. lot, block, plat or section, township, and range)

☐ Additional legal is on page __ of document.

Assessor's Property Tax/Account Number

☐ Additional parcel numbers on page __ of document.

Washington State County Auditor/Recorder's indexing form (cover sheet)

The Auditor/Recorder will rely on the information provided on the form. The staff will not read the document to verify the accuracy or completeness of the indexing information provided herein.

**EMERGENCY NONSTANDARD REQUEST – SIGN ONLY WHEN RECORDING AS
NONSTANDARD**

I am requesting an emergency nonstandard recording for an additional fee of \$50.00 as provided in RCW 36.18.010. I understand that the recording processing requirements may cover up or otherwise obscure some part of the text of the original document.

SIGNATURE

DATE

REPLACED NORTH SHORE INTERCEPTOR AGREEMENT

This REPLACED NORTH SHORE INTERCEPTOR AGREEMENT hereby replaces in its entirety the March 28, 1994 NORTH SHORE INTERCEPTOR AGREEMENT, as amended, by and between the CITY OF CHELAN (hereinafter “City”) and the LAKE CHELAN RECLAMATION DISTRICT (hereinafter “District”), sometimes individually referred to as a “Party” or collectively as the “Parties.”

RECITALS

WHEREAS, the City and the District are specifically authorized by RCW Chapters 35A.11, 39.34, and 87.03 to enter into agreements enabling them to provide services and facilities in a manner that will best serve the needs of the local communities; and

WHEREAS, the Parties entered into the March 28, 1994, North Shore Interceptor Agreement (the “March 28, 1994 Agreement”) which was recorded in the Chelan County Auditor’s Office in Book 1020 page 2475 under No. 9405190070 for the purpose, among other things, of identifying the respective rights and obligations associated with the sewer line running from the District’s facilities through to the City and to the City operated waste water treatment plant (“WWTP”) (referred to herein as the “Original North Shore Interceptor Project” as constructed in 1975). A map of the North Shore Interceptor Project with stationing created in the 2004 “North Shore Interceptor (NSI) Project” is attached hereto as Exhibit “A” and incorporated herein by this reference;

WHEREAS, the Parties amended the March 28, 1994 Agreement regarding Article 2.12, the term of the agreement, with “Amendment to the Northshore Interceptor Agreement” on April 27, 1994.

WHEREAS, the Parties amended the March 28, 1994 Agreement regarding administrative and operational procedures set out in Article II, with “Contract Amendment No. 1” on January 3, 2001, recorded in the Chelan County Auditor’s Office under No. 2086188 and further with the “Cost Share Interlocal Agreement” on July 8, 2002, recorded in the Chelan County Auditor’s Office under No. 2120550; and

WHEREAS, the Parties desire to further replace the March 28, 1994 Agreement in its entirety, together with all amendments, and establish their respective rights and obligations regarding the North Shore Interceptor Projects of 1975 and 2004.

NOW, THEREFORE, for and in consideration of the mutual promises, covenants and conditions hereinafter set forth and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the Parties agree as follows:

AGREEMENT

1. Abbreviations and Description of Terms.

1.1 Abbreviations:

NSI	Northshore Sewer Interceptor as depicted in RH2 Engineering plan set “Lake Chelan Reclamation District and City of Chelan Northshore Interceptor Replacement – Forcemains -Volume III of III - Revised To Conform to Construction Records 12/2/2004” and RH2 Engineering plan set “Lake Chelan Reclamation District and City of Chelan Northshore Interceptor Replacement – Schedule A: Lift Stations #2, #3, #4 -Volume III of III - Revised To Conform to Construction Records 9/1/2005” and those portions not replaced as shown in the Parametrix Engineering 1975 “Lake Chelan Northshore Sewer Interceptor” Job # 23-308-18 drawings dated January 15, 1975.
LS2	NSI lift station #2 located at Station 77+58 per NSI record drawings (coordinates: 47d52’51.50”N, 120d08’25.22”W)
LS3	NSI lift station #3 located at Station 129+30 per NSI record drawings (coordinates: 47d52’42.76”N, 120d07’12.61”W)
CC11/LS4	City of Chelan Lift Station #11 (AKA – NSI lift station #4, The Willows Lift Station) located at Station 291+20 per NSI record drawings (coordinates: 47d51’33.39”N, 120d04’05.30”W)
CC15	City of Chelan Lift Station #15 (AKA Lord’s Acres Lift Station, 2017 construction plans incorrectly label CC15 as CC12.) connection point located at approximately NSI Station 338+75 (coordinates: 47d51’17.70”N, 120d03’02.09”W)
TP	Transition Point from dual NSI forcemains as extended in 2017 to existing 10” PVC forcemain at NSI Station 404+57 (coordinates: 47d50’51.10”N, 120d01’41.86”W)
WMAC	Wastewater Management Advisory Committee
WWTP	City owned and operated Waste Water Treatment Plant at approximately NSI Station 488+70 (coordinates: 47d50’07.52”N, 120d00’32.80”W)

- 1.2 Stationing: All stationing called out in “Station x+xx” format is referencing the NSI stationing as shown in the RH2 Engineering plan set “Lake Chelan Reclamation District and City of Chelan Northshore Interceptor Replacement Volume III of III - Revised To Conform to Construction

Records 12/2/2004". All stationing referencing another source such as 2017 WSDOT No-Sec-Um Intersection Realignment will be specifically noted.

2. Identification and Allocation of Responsibilities for City Owned Facilities.

2.1 The City is the owner of the following:

- a. CC11/LS4, including the CC11 flow meter, located at Station 291+20. The lift station includes all sewage works up to the two valves prior to entering the forcemains. The two valves (operational valves for switching between 10" and 14" forcemains) shall be owned by the District. A graphic in the top left corner from Sheet 34, Drawing No. M40 of the Lake Chelan Reclamation District & City of Chelan Northshore Wastewater System Improvements Volume III of III – Lift Stations #2, #3, #4 – Revised to Conform to Construction Records 9/01/05 is attached hereto as Exhibit "B" and incorporated herein by this reference.
- b. CC15, including the CC15 flow meter, located at Station 338+75. The lift station includes all sewage works up to the two valves prior to entering the forcemains. The two valves (operational valves for switching between 10" and 14" forcemains) shall be owned by the District. Sheet 12, Drawing No. SS08 of the City of Chelan Lords Acre Lift Station No. 12 and Associated Gravity Forcemains - Revised to Conform to Construction Records 4/27/17 is attached hereto as Exhibit "B" and incorporated herein by this reference.
- c. All sewer collection systems including low pressure lines and gravity lines from Station 214+00 East (Rocky Point East). This includes the abandoned and repurposed portions of the 1975 - 10" forcemain East of Rocky Point to the TP at Station 404+57.
- d. The existing (10") forcemain as constructed in 1975 and all associated appurtenances from the TP at Station 404+57 to the aerated grit chamber and transfer pump station near Station 488+70 at the WWTP.
- e. The aerated grit chamber at Station 488+70, transfer pump station, forcemains and all appurtenances feeding to the gravity collection system that flows to the treatment plant. The City is the sole owner of the grit chamber, transfer pump station, and gravity collection system to the WWTP, no other entities own any portion of this infrastructure.
- f. The entire and complete WWTP including the gravity main system feeding to it. The City is the sole owner of the treatment plant, no other entities own any portion of the plant.

2.2 One hundred percent (100%) of the cost of ownership and operation of the facilities described in Section 2.1 above shall be the responsibility of the City except as where noted in Section 5 Shared Maintenance, of this agreement.

2.3 The City shall be responsible for collecting customer service fees for all portions of the North Shore Interceptor Project east of Station 214+00.

3. Identification and Allocation of Responsibilities for District Owned Facilities.

3.1 The District is the owner of the following:

- a. A dual sewer forcemain system including appurtenances from Station 77+58 at LS2, valves described in Sections 2.1.(a) and 2.1.(b), to the TP at Station 404+57 tying into the existing 1975 - 10" forcemain. Sheet 80, Drawing No. SD01 of the WSDOT SR150 No-See-Um Road Intersection Realignment for the City of Chelan is attached hereto as Exhibit "B" and incorporated herein by this reference.
- b. LS2, including the LS2 flow meter, located at Station 77+58 and LS3 located at Station 129+30.
- c. All sewer collection facilities including low pressure lines and gravity lines from Station 196+80 West (Rocky Point West). This includes abandoned and repurposed portions of the 1975 - 10" forcemain West of Rocky Point collecting sewage from only District customers.
- d. All air vacuum vaults, flushing stations, and cleanouts associated with said system between and including Station 77+58 and TP at Station 404+57 and identified by the following descriptions with stationing:
 1. Cleanouts - Station 102+00
 2. Cleanouts - Station 126+50
 3. Air and Vacuum valves - Station 132+27
 4. Cleanouts - Station 141+50
 5. Air and Vacuum valves - Station 159+49
 6. Cleanouts - Station 178+26
 7. Flushing Station - (10") Station 213+99, (14") Station 214+04
 8. Air and Vacuum valves - Station 214+14
 9. Cleanouts - Station 237+40
 10. Cleanouts - Station 250+48
 11. Air and Vacuum valves - Station 269+40
 12. Air and Vacuum valves - Station 290+18
 13. Cleanouts - Station 295+79
 14. Cleanouts - Station 324+67

15. Air and Vacuum valves - Station 337+51
16. Cleanouts - Station 345+67
17. Flushing Station - (10") Station 377+68, (14") Station 377+72,
- Note: Facility was capped and removed during No-See-Um Intersection Realignment (WSDOT Station 397+75N)
18. Air and Vacuum valves - Station 380+57 (No-See-Um Intersection Realignment Station 400+70N)
19. Air and Vacuum valves - Station 387+06 (No-See-Um Intersection Realignment Station 6+93S)
20. TP - Station 404+57 (No-See-Um Intersection Realignment Station 24+44S)

- e. For future - 3" odor control pipe between air and vacuum vaults located at Station 380+57 (No-See-Um Intersection Realignment Station 400+70N) and Station 404+57 (No-See-Um Intersection Realignment Station 24+44S).

- 3.2 One hundred percent (100%) of the cost of ownership and operation of the facilities described in Section 3.1 above shall be the responsibility of the District except as where noted in Section 5 – Shared Maintenance, of this agreement.

- 3.3 The District shall be responsible for collecting customer service fees from Station 77+58 to Station 196+80.

4. There are no services planned between Station 196+80 and 214+00.

5. Shared Maintenance Responsibilities and Allocation of Costs.

- 5.1 The District and the City agree to share, prorated based on use, the responsibilities for and the costs of operating, maintaining, repairing and upgrading the NSI from Station 291+20 East to the WWTP. It is agreed that any costs of operation and maintenance of the NSI from Station 291+20 East to the WWTP, of whatsoever nature and kind, shall be included in this Agreement as allocated below. The District operates and maintains at their own cost the NSI forcemains from 291+20 west. More specifically, the District and the City agree as follows:

- a. The District operates and maintains the dual forcemain from Station 291+20 to the TP at Station 404+57. The City shall pay for a portion of the costs of operation, maintenance, repair and upgrading of this section of the NSI Project based on the following calculation:

1. The City percentage of O&M and replacement costs will be calculated as the total flow from CC11 and CC15 (measured

at the CC11 and CC15 flow meters) divided by the total flow measured at LS2, CC11, and CC15.

- b. The City operates and maintains the existing 10" forcemain from the TP to the City's Grit Chamber. The District shall pay for a proportion of the costs of operation, maintenance, repair, and upgrade of this section of the NSI Project based on the calculations outlined below. The costs of the operation and maintenance of the City operated and maintained section of the NSI Project based on the following calculation:
 1. The District's percentage of O&M and replacement costs is calculated as the total flow from LS2 (measured at the LS2 flow meter) divided by the total flow measured at LS2, CC11, and CC15.
- c. All operations and maintenance costs associated with air vacuum vaults and flushing stations appurtenant to the dual forcemain system between Station 291+20 and TP at Station 404+57 will be conducted by the District and cost shared using the percentages outlined in Section 5.1.(a).(1) above.
- d. The District has historically operated and maintained CC11 for the City. All operations and maintenance costs associated with CC11 have been performed by the District at one hundred percent (100%) cost to the City. As soon as is practicable, but not later than ninety (90) days from the signing and acceptance of this Agreement, all responsibility for CC11 shall be transferred to the City as outlined in Section 2.1(a). This time frame, up to 90 days will be referred to as the "Transfer of Responsibility Timeframe". The following known items shall be required for transfer (others may arise during the transition):
 1. The District agrees to provide training and support during the Transfer of Responsibility Timeframe;
 2. The District agrees to provide the City with all maintenance records and all O&M manuals during the Transfer of Responsibility Timeframe;
 3. The City and District shall provide an agreed upon date to re-core all locks on the station for final handover during the Transfer of Responsibility Timeframe. The City shall cover the cost of re-coring locks;
 4. The District shall provide all passwords to the PLC's at the station;
 5. The City shall add CC11 to their alarm chain and remove all call out alarms to District staff on an agreed upon date;
 6. A final meter read on the flow meter will be documented;
 7. Pump hour meters will be recorded and documented;

8. Pump serial numbers will be documented and transferred; and
 9. A final sign off from both the District and City, stating all items have been completed per this Agreement and that the City has complete operational control of the lift station.
- e. The District and the City shall have operational meters at all Lift Stations and WWTP appurtenant to the calculations which will be used to determine the volume of District and City sewage being treated by the City. See Section 5.1(f) in the event of failure. The District and the City agree to calibrate and test the following four (4) meters; LS2 meter, CC11 meter, CC15 meter, and the WWTP influent meter, once every 2 years. The cost of this testing will be split according to Sections 5.1 and 5.2.
 - f. In January of each year, the total annual flow for the District (LS2) and the total annual flow from the City (CC11 and CC15) shall be recorded from the three individual flow meters (recordings shall be taken on the same date from all three meters) and reported to both the City and District. The meter readings will be used to calculate total flow from the prior year. From the total flow volumes reported reimbursement percentages as outlined in Sections 5.1(a)(1) and 5.1(b)(1) will be calculated for the upcoming year. The percentages calculated in January will be effective through January of the upcoming year. The calculation shall be agreed to by the City and the District, or at the request of either shall be performed by RH2 Engineering or such other engineering firm as agreed to by the District and the City. If such calculations are unavailable or, due to malfunctioning flow meter(s), are suspected to be incorrect, the City and District agree to cooperate in good faith to estimate the amount of unmetered flow. This estimate shall be based on such considerations as pump run time, historical readings, and the average daily flow for the thirty (30) day period immediately following the repair or installation of a new meter. The District and City agree to immediately work to replace any malfunctioning flow meter as soon as an issue is discovered.
 - g. The District will be in charge of switching over the dual forcemain operations from 10" forcemain to 14" forcemain, twice per year, as currently operated. The District owns and operates the controlling valves at each lift station and will be the only operators of these valves. The District shall provide the City with forty-eight (48) hour written notice of the yearly pipeline change prior to it occurring. Emergency situations or construction situations may arise and necessitate the use of either forcemain not consistent with typical use. The District will have operational control of the lines and shall be requested to switch the forcemains.

- h. In the event of an emergency situation associated with the NSI, the District upon request by the City, or the City upon request by the District, shall send personnel to aid in responding to the emergency situation. Costs allocations depending on area aid is required shall be as agreed to as delineated in Sections 5.1(a)(1) and 5.1(b)(1) of this agreement Notification of costs for emergencies assumed to exceed \$50,000 shall be provided to the Designated Representative, as defined in Section 11, no later than 5 calendar days from the emergency event.
- 5.2 The City owns, operates and maintains aerated grit chambers, a transfer lift station, a conveyance system from the transfer lift station to the WWTP, and a WWTP. The costs of operation, maintenance, repair and upgrading these facilities is based on a percentage of use between the City and the District. The City and the District agree to share O&M, replacement, and upgrade costs based on the following calculation:
- a. The District percentage is calculated for O&M, replacement, and upgrade purposes based upon total annual District flow (measured at the LS2 flow meter) divided by the total annual flow at the WWTP influent weir.
 - 1. At this time no meter exists at the transfer lift station to more accurately pro-rate the intermediate flows from grit chamber to gravity conveyance system (Section 5.2(a) will be utilized for calculations). However, once a meter is installed at the transfer lift station the percentage of flow from the aerated grit chambers through the transfer lift station and to the gravity conveyance system will be prorated based upon total annual District flow (measured at the LS2 flow meter divided by total intermediate flow meter readings at the transfer lift station). Costs will be allocated for these intermediate systems accordingly.
 - b. The City percentage for O&M purposes is one hundred percent (100%) less the District percentage. The average cost per gallon of treated flow shall be estimated at the first of each calendar year by the City for the entire upcoming year. Adjustments reflecting the difference between the actual annualized cost per gallon of the previous year and the estimated cost per gallon of the previous year shall be made by the end of the first quarter of the following calendar year.
 - c. It is further specifically agreed that the fees provided for in Sections 5.2 and 5.3 is for operation and maintenance, replacement and upgrade costs for use of the City's facilities. The District or any other party paying such fees shall not acquire by the payment thereof any property right of any nature whatsoever in and to the City's sewage treatment plant, transfer lift station, or grit chambers.

5.3 Calculations of Operations, Maintenance and Administration Costs

- a. The party operating and maintaining a component part of the facilities will calculate the costs of O&M based upon documented direct costs including wages and fringe benefits for employees, the documented and reasonable rental value of owned equipment used, and the actual cost of all materials, supplies, and equipment, used, consumed, or installed in the system. Capital expenses that are paid for on the same basis as other O&M expenses shall be allowed only if the expensed item is used only at the component part at issue. All other equipment shall be billed at a rental rate established by the party for allocating the equipment to the specific work item. Administrative costs shall be limited to ten percent (10%) of the O&M costs or thirty percent (30%) of direct labor costs whichever is less.
- b. Debt service payments and matching funds on capital loans and bonds are to be allocated at the same percentages as any replacement project except that the percentages allocated at the start of the project shall remain fixed for the duration of the loan or bond repayment schedule. The allocated percentages shall remain fixed even if a loan or bond is refinanced at a later date.
- c. The allocation of O&M shall be reviewed annually as described in detail in Sections 5.1 and 5.2 following analysis of flow contributed to the system by the District and the City. The updated analysis shall be used for allocation of O&M expenses as described in detail in Section 5.1 and 5.2. The analysis may be completed by an engineering firm as is agreed to by the District and the City.
- d. The City shall bill the District at the end of each month for the District's share of costs incurred during that month, as set forth in Sections 5.1 and 5.2, together with an amount sufficient to compensate the City for its normal overhead attributable to the sewage collection and as stated in 5.3(a). The District shall, upon receipt of the statement, promptly reimburse the City for the amount billed.
- e. The District shall bill the City at the end of each month for the City's share of costs incurred during that month, as set forth in Sections 5.1, together with an amount sufficient to compensate the District for its normal and customary overhead attributable to the sewage operations of the NSI and as stated in 5.3(a). The City shall, upon receipt of the statement, promptly reimburse the District for the amount billed.

5.4 Odor Control and Sewage Composition

- a. Odor control and sewage composition is considered an O&M activity for the term of this Agreement. The City and District agree to implement a base odor control and sewage composition analysis. The City shall select a consultant to facilitate implementation of the following steps. The District shall reimburse the City for consultant costs based upon flow proportions outlined in Section 5.1(b)(1).
 1. Develop a desktop model review of sewage being collected and transported by the NSI. This will include flow rates, travel time, and volumes;
 2. Review all data that has historically been collected by the City and District regarding odor and sewage chemical characteristics;
 3. The consultant will provide recommendations from the desktop model of where the best locations for sampling should occur. It is assumed for this Agreement that sampling would occur at LS2, CC11, CC15, and the grit chamber where the forcemain discharges. Other areas may be identified from the desktop model and will be implemented as deemed necessary and cost effective;
 4. A sample period during a relevant high peak, or low flow season shall be established and recommended by the consultant. Monitoring would occur during this time and this time will be known as the "Baseline Sampling Period;"
 5. Once the Baseline Sampling Period is concluded, the resultant information will be recorded, documented in report format, and analyzed. A baseline analysis and report providing solutions for addressing odor problems and sewage chemical composition, if any, will be provided to both agencies;
 6. Phase 1 Implementation – Mutually agreed upon recommendations will be installed for a trial period (Phase 1 Trial Period). Both agencies agree to implement recommendations and share the cost of the recommendations based on the total flow proportions outlined in Section 5.1(b)(1). Recommendations shall be kept in place for one year, or a mutually agreed upon time, during which additional monitoring shall occur to provide effectiveness of the treatment improvements (Phase 1 Monitoring Period);
 7. Once the Phase 1 Monitoring is concluded, the resultant information shall be recorded, documented in report format, and analyzed. Additional analysis and report providing solutions for further modifying odor problems and sewage chemical composition, if any, will be provided by the consultant;

8. Phase 2 Implementation - Mutually agreed upon recommendations will be installed. Both agencies would agree to implement recommendations and share the cost of the recommendations based on the total flow proportions outlined in Section 5.1(b)(1);
9. Phase 2 Monitoring – Final monitoring of all improvements shall be documented, and a final report of all findings shall be provided to both agencies; and
10. The agreed upon conditions and requirements of Phase 2 shall be incorporated into this Agreement via an amendment within six (6) months of the completion of Phase 2. The requirements shall be specific and measurable regarding odor control and wastewater composition for sewage from the District. Penalties shall also be identified in the event the District does not meet the established requirements.

5.5 High Strength Wastewater

- a. The City and District shall monitor and enforce all actions for their own customer base. Additionally, any known High Strength Wastewater customer discharges shall be required to follow all pre-treatment requirements as set forth by the Washington State Department of Ecology. Unwanted treatment plant improvement costs are a burden to both the City and District. Both entities shall require pre-treatment facilities for known industries or discharges that will negatively affect the WWTP current operations.
- b. The burden to meet all requirements of the National Pollutant Discharge Elimination System (NPDES) State Discharge permit ultimately falls on the City as the operator of the Publicly Owned Treatment Works (POTW) and the named permit holder on the NPDES permit.
 1. The City shall require the District to sample sewage at LS2 on an annual basis (minimum) to verify that the characteristics of sewage being discharged into the NSI is considered to be typical of domestic sewage and not High Strength Wastewater. For the purposes of this Agreement “High Strength Wastewater” means wastewater having a BOD₅ and/or TSS strength exceeding 300 mg/L. The City will physically run the required laboratory tests for BOD₅ and TSS at the City’s treatment plant lab. This analysis shall be performed by the City and be fully reimbursed by the District. The District may take additional samples at one hundred percent (100%) District expense for analysis at an external lab. At a minimum, the City will take grab samples

- of raw sewage from LS2. The District shall allow City staff access to the lift station wetwell for sampling purposes.
2. The City may take additional samples or test for additional prohibited substances (prohibited substances as specified by the Washington State Department of Ecology) at any time from LS2 or any upstream discharge location in the District's system. The District shall facilitate the City's sampling requirements as necessary within the District's collection system. The City shall provide the District twenty-four-hour (24-hour) notice requesting access to the District's sewage collection facilities. The District shall provide one staff member to assist the City with access to the District's facilities.
 3. In the event that the District is found to have a High Strength Wastewater discharge to the NSI, the District shall be subject to additional random testing and analysis on at least a monthly basis. The City may request the District to install a suitable automatic sampling device at LS2. The cost associated with acquiring and installing the sampling device shall be borne by the District. Additional analysis shall be performed by the City and be fully reimbursed by the District. The analysis shall evaluate the relative costs of treating High Strength Wastewater as compared to wastewater discharged by a typical Equivalent Residential Unit (ERU). If two consecutive tests provide results indicating High Strength Wastewater, the rates indicated by this analysis, and any other relevant terms dealing with the conveyance, discharge, and treatment of the High Strength Wastewater, will be set out in a service agreement between the City and the District. The City may adjust the cost per gallon for treatment according to a formula or agreement which shall be negotiated and agreed between the City and District in good faith and consistent with standard engineering practices. All costs associated with assembling the service agreement shall be reimbursed by the District.
 4. In the event that the District is found to have prohibited substances in their discharge, the District shall take immediate action to isolate the issue. Costs for plant disruption, permit violation, or other actions that are found to be caused by a District discharge will be passed on one hundred percent (100%) to the District. The District shall work to eliminate the source of prohibited discharge within a reasonable time frame.
 5. In the event the waste strength or banned substances outlined above is exceeded in sewage flows attributable to the District's customers or the District fails to comply with the

applicable local, state or federal regulations, and notwithstanding any other remedy provided by law, the City shall have the immediate right to seek injunctive relief to prevent further violations in sewage strength.

6. The District shall enforce all permit requirements as related to industrial users, wineries, breweries, distilleries, fruit processing and packing industries as required by the City's NPDES permit and as required by the Washington State Department of Ecology. The District shall obtain City approval for any new discharge connections that may adversely affect the WWTP.
7. The District and City shall specifically prohibit the direct discharge to its collection facilities of any waste having a strength in excess of 300 ppm BOD₅, or 300 ppm suspended solids without corrective pre-treatment.

6. City and District Connections to the North Shore Interceptor Project.

- 6.1 The City's current connections to the NSI Project are at CC11/LS4 and CC15. All City customer generated sewage shall enter into the dual forcemains only at CC11/LS4 and CC15.
 - a. Both the City and District reserve the right to connect additional lift stations onto the NSI, with only the unanimous approval of both parties and an amendment to this Agreement. The connecting party shall verify through engineering study that capacity exists and that the new connection will not be detrimental to any system or operation from LS2 to the WWTP. Individual homes, residences, or structures shall not be allowed to connect to the NSI under any circumstances. Connections shall only be made at a District or City operated Lift Station. An amendment to this Agreement shall be required to add a lift station and update calculations for billing purposes.
- 6.2 The District's current connection to the NSI Project is at Station LS2. All District customer generated sewage will enter into the dual forcemains only at LS2. Additional connections shall only be made pursuant to Section 6.1(a).
- 6.3 The capacity of the existing 1975 - 10" PVC forcemain and the 2004 - 10" and 14" HDPE dual forcemains are finite. Flow meters shall be calibrated and kept in accurate working order at LS2, CC11, CC15, and the WWTP influent, in order to evaluate yearly cost allocation calculations and also to monitor increases in flows over time per Section 5.1(e). Capacity of the sewage interceptor shall be monitored by both agencies. When the capacity of any component of the NSI sewage system reaches 80%, planning shall be required by the owner of that component for upgrades and replacement.

Moratoriums for additional connections due to non-action or delayed action may be invoked when systems have reached 95% capacity.

- a. At the time of this agreement it was known by both parties that monitoring and analysis of the remaining original 1975 forcemain through the City needs to start occurring. Both agencies agree that action to monitor pressure and start making assessments of the pipelines capacity and condition is required. Both parties agree to diligently work on a plan to start assessment of this portion of the interceptor.
- 6.4 All connections in the District service area between Station 77+58 and Station 214+00 shall be installed in the converted low-pressure collector sewer lines and gravity lines to be introduced to the dual forcemains only at LS2. All connections in the City service area between Station 214+00 and Station 404+57 shall be installed in the converted low-pressure collector sewer lines and gravity lines to be introduced to the dual forcemains only at CC11 or CC15. Additionally, no connections will be allowed on the 10" PVC forcemain from Station 404+57 to the grit chamber. There shall be no exceptions to this Section 6.4, unless, pursuant to Section 6.1(a), both parties agree to amend this Agreement.
 - 6.5 The District shall have the ability to monitor and test all lines located within the City or owned/controlled by the City and through which sewage attributable to the District's customers flows. The District shall have a reasonable right of access for such monitoring or testing. Twenty-four-hour (24-hour) notice shall be provided for a "request to access" any component of the NSI that is not operated or owned by the requesting entity.
 - 6.6 The City shall notify the District of any plans for maintenance or repairs needed or to be conducted on lines located within the City or owned/controlled by the City that impact sewer transmission by the District. The District and the City shall cooperate in good faith to develop a plan for such maintenance or repairs. In the event of an emergency, the City may undertake repairs immediately without consultation with the District, but shall immediately notify the District so that the District may have personnel on site to assist and consult as needed.
 - 6.7 The District shall notify the City of any plans for maintenance or repairs needed or to be conducted on lines located within the District or City or owned/controlled by the District that impact sewer transmission by the City. The District and the City shall cooperate in good faith to develop a plan for such maintenance or repairs. In the event of an emergency, the District may undertake repairs immediately without consultation with the City but shall immediately notify the City so that the City may have personnel on site to assist and consult as needed.

7. Wastewater Management Advisory Committee.

- 7.1 For the purpose of reviewing the capital improvements plans and to foster cooperation between the City and the District under this Agreement, a Wastewater Management Advisory Committee (WMAC) shall be created. The WMAC shall consist of one representative each from the City and the District. The members shall be the District's Secretary-Manager and the City's Public Works Director unless otherwise designated by the respective agency.
- 7.2 Each Party shall submit to the WMAC annually, and at all other times when requested, all data pertaining to waste flow measurements and projections and other information related to the WWTP. All members of the WMAC shall have access to the consultants and adequate review time to provide input to the process. The WMAC shall review and provide written recommendations to the agencies of the following:
- a. The five-year (5) capital improvement programs for both the WWTP and the System;
 - b. Monitoring systems in place for all components of the NSI Project;
 - d. Annual expenses and operating procedures, together with proposals for capital equipment needs for the WWTP, and any or all shared collection facilities;
 - e. Odor control concerns and strategies to address;
 - f. Annual dates for switchover of forcemains;
 - g. Efforts to evaluate the long-term viability of existing 10" forcemain from TP station 404+50 to WWTP station 488+70 by installing pressure recording stations;
 - h. The sharing of telemetry information between the City and the District pertaining to pump runs, volumes, flow meter measurements, and wet well levels for LS2, CC11/LS4, and CC15, and total treated at the WWTP;
 - i. When capital projects are underway, review preliminary cost estimates, engineering contracts, fifty percent (50%) and ninety percent (90%) review drawings; and
 - j. Any other aspect of the WWTP and the NSI Project which the WMAC deems necessary, appropriate, or in the best interests of the parties.

- 7.3 The City representative shall chair the WMAC and shall call meetings at least every six (6) months, or as agreed upon by both parties to facilitate good communications. Records shall be kept of all WMAC proceedings. Each Party shall receive written recommendations of the WMAC as appropriate. When the WMAC cannot come to a consensus on recommendations, the City Administrator shall act as a mediator between the representatives to facilitate a consensus. If no consensus can be reached, resolution of issues shall be pursuant to Section 12 of this Agreement. Expenses incurred by each Party to participate in the WMAC and to provide the required information shall be borne solely by the respective Party.

8. Acceptance and Treatment of Sewage at the WWTP.

- 8.1 The City shall accept from the District all sewage collected by the District and transported to the WWTP, on the terms and conditions contained in this Agreement that;
- a. Meets the requirements of the City's NPDES wastewater permit and;
 - b. Meets the requirements of state and federal laws for sewage allowed to be discharged to a POTW as defined by the Washington State Department of Ecology and EPA.
- 8.2 In the event any permitted levels are exceeded by the sewage flow attributable to the District's customers or the District fails to comply with applicable local, state, or federal regulations, and notwithstanding any other remedy provided by law, the City shall have the immediate right to seek injunctive relief to prevent further violations.
- 8.3 The District shall adopt, enforce, and comply with all existing or future City, state or federal regulations relating to or affecting the discharge of sewage into the System.

9. Indemnity and Hold Harmless Agreement.

- 9.1 The District shall indemnify and hold the City, its elected officials, officers, employees, agents, and volunteers harmless from any and all claims, suits, demands, losses, actions, and liabilities (including costs and all attorney fees) arising out of, resulting from, or in any way connected to the NSI Project west of Station 196+80 except to the extent that the claims, suits, demands or judgment arise from the negligent, reckless or intentional misconduct of the City. The District shall have the duty to indemnify and hold the City harmless from any and all claims, suits, demands, or judgments arising out of or in any way connected the District's negligent,

reckless or willful misconduct in the use, maintenance or repair of the dual forcemain east of Station 196+80 to Station 404+57. .

- 9.2 The District has no duty to indemnify and hold the City harmless for the converted low-pressure collector sewer lines and direct appurtenances from Station 214+00 to Station 291+20 at CC11/LS4, or for the converted low-pressure collector sewer lines from Station 291+20 to Station 404+57 nor for CC11/LS4 or CC15 or for any direct appurtenances of these City facilities except to the extent that claims, suits, demands, judgments arise from the negligent, reckless or intentional misconduct of the District.
- 9.3 The City shall indemnify and hold the District, its elected officials, officers, employees, agents, and volunteers harmless from any and all claims, suits, demands, losses, actions, and liabilities (including costs and all attorney fees) arising out of, resulting from, or in any way connected to the converted low-pressure collector sewer lines and appurtenances from Station 214+00 to Station 291+20 at CC11/LS4, and for the converted low pressure collector sewer lines from Station 291+20 to Station 404+57 and for CC11/LS4 or CC15 and for any appurtenances of these City facilities except to the extent that claims, suits, demands, judgments arise from the negligent, reckless or intentional misconduct of the District.
- 9.4 The provisions of this Section 9 shall survive the expiration or termination of this Agreement with respect to any event occurring prior to such expiration or termination.

10. Assignment.

Neither the City nor the District shall have the right to assign this Agreement, or any of its rights or obligations hereunder, or to terminate its obligations hereunder by dissolution, without first securing the written consent of the other. This Agreement shall be binding upon and shall inure to the benefit of the respective successors and assigns of the City and the District.

11. Designated Representatives.

The Parties agree the Designated Representatives for administration of this Agreement shall be the Public Works Director for the City and the Secretary/Manager of the District.

12. Dispute Resolution and Attorney's Fees.

- 12.1 Any dispute arising out of this Agreement shall be decided as provided in this Section 12. Except as provided below, the dispute shall first be submitted to the Designated Representatives of the Parties. The Designated Representatives shall attempt to resolve the dispute within thirty (30) days. If the Designated Representatives do not resolve the matter, each Party shall

appoint a representative to a dispute panel. The panel representatives shall mutually agree on a third person to chair the dispute panel. In the event the panel representatives are unable to agree upon a suitable third person within ten (10) days, then the presiding Judge of the Superior Court of Chelan County shall make such appointment. Each party shall bear the cost of its appointed panel representative and equally share the costs of the third party. The dispute panel shall thereafter decide the dispute with the majority prevailing. The decision of the dispute panel shall be binding on the Parties

- 12.2 In the event it is necessary for any Party to utilize the services of an attorney to enforce any provisions of this Agreement, or because of a dispute, breach, default, or misrepresentation in connection with any of the provisions of this Agreement, such enforcing Party shall be entitled to compensation for its reasonable attorney's fees and costs. If any legal proceeding is brought for the enforcement of this Agreement, or because of a dispute, breach, default, or misrepresentation in connection with any of the provisions of this Agreement, the prevailing party shall be entitled to recover from the other party, in addition to any other relief to which such party may be entitled, reasonable attorney's fees and other costs incurred in that action or proceeding, including an appeal.

13. Agreements with Third Parties.

- 13.1 It is understood that the District may contract with third-parties. The District hereby covenants and agrees to include all applicable provisions of this Agreement in its contracts with any third-party. Additionally, the District hereby covenants and agrees to include a provision in its contract with any third-party which will bind the third-party to the provisions of this Agreement.
- 13.2 In furtherance of the provisions of Section 13.1, the District agrees to insert a provision in new third-party contracts that will require the third-party to operate and maintain their sewer collection systems in accordance with all applicable rules and regulations of all regulatory agencies having jurisdiction over the City treatment plant.
- 13.3 It is understood and agreed that where a condition exists which is contrary to the aforesaid rules and regulations, that the City will notify the District or third-party, as the case may be, in writing of the corrective action which is necessary. If the party so notified fails to perform whatever maintenance and/or corrective work, within a reasonable time, which time shall be stated in the notice, then the City will request the appropriate agency to review the situation. If such agency, or agencies agree, after review, that such work is required, the District or third-party as the case may be, will be so notified, in writing, and requested to complete the work within a time specified.

Should the party so notified then fail to perform the required work, the City shall have the right to do the work or cause it to be done and will bill the District or third party for all costs so incurred.

14. Term of Agreement.

This Agreement between the City and the District shall be for a term of thirty (30) years, commencing on the date of execution of this Agreement. This Agreement shall automatically renew for successive terms of 5 years each upon the expiration of any preceding term.

Notwithstanding the above, after the first ten (10) years of operation under this Agreement, either the City or the District may terminate this Agreement by delivery to the other written notice of termination on or before June 1, in which case the Agreement will terminate as of the following December 31.

15. Notices.

Any notice, demand, or request authorized or required by this Agreement shall be deemed to have been given when mailed, postage prepaid, or delivered personally to the Designated Representatives identified in Section 11.

16. Captions and Constructions.

The titles to sections of this Agreement are not part of this Agreement and shall have no effect upon the construction and interpretation of a part of this Agreement.

17. Incorporation of Recitals.

The Recitals of this Agreement are incorporated herein by this reference.

18. Savings Clause.

Nothing in this Agreement shall be construed so as to require the commission of any act contrary to law, and wherever there is any conflict between any provisions of this Agreement and any statute, law, public regulation or ordinance, the latter shall prevail, but in such event, the provisions of this Agreement affected shall be curtailed and limited only to the extent necessary to bring it within legal requirements.

19. Entire Agreement.

This Agreement constitutes the entire Agreement between the parties pertaining to the subject matter hereof and supersedes all prior and contemporaneous agreements, understandings, negotiations, and discussions, whether oral or written, of the Parties.

20. Amendment, Modification, or Waiver.

No amendment to this Agreement shall be binding upon either party unless set forth in writing or confirmation signed by both parties hereto. No purported oral modification, wavier or rescission of this Agreement by an employee or agent of the Parties shall operate as a modification, waiver, or rescission of any of the provisions of this Agreement. No course of prior dealing, usage of trade or course of performance shall be used to modify, supplement or explain any terms of this Agreement.

21. Interpretation.

This Agreement has been submitted to the scrutiny of both Parties and their counsel, if desired, and it shall be given a fair and reasonable interpretation in accordance with its words, without consideration to or weight given to its being drafted by any Party or its counsel. All words used in the singular shall include the plural; the present tense shall include the future tense; and the masculine gender shall include the feminine and neuter genders.

22. Severability.

If a court of competent jurisdiction finds any provision in this Agreement to be invalid or unenforceable as to any person or circumstance, such finding shall not render that provision invalid or unenforceable as to any other persons or circumstances. If feasible, any such offending provision shall be deemed modified to be within the limits of enforceability or validity; however, if the offending provision cannot be so modified, it shall be stricken and all other provisions of this Agreement in all other respects shall remain valid and enforceable.

23. Governing Law; Venue.

This Agreement is governed by the laws of the state of Washington. The jurisdiction of any action hereunder shall be in the Superior Court, Chelan County, Washington.

LAKE CHELAN RECLAMATION
DISTRICT:

CITY OF CHELAN:

David Clark, President

Mike Cooney, Mayor

ATTEST:

ATTEST:



Rodney Anderson, Secretary-Manager

ATTEST:

Peri Gallucci
Peri Gallucci, Clerk

STATE OF WASHINGTON)

County of Chelan) SS
)

On this 13th day of June, 2019, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared David Clark and Rodney Anderson, known to me to be the President and Secretary of the Board of the Lake Chelan Reclamation District, a municipal corporation, that executed the within and foregoing instrument, and acknowledged the same instrument to be the free and voluntary act of Lake Chelan Reclamation District, for the uses and purposes therein mentioned, and on oath stated that he was authorized to execute said instrument, and that the seal affixed is the seal of Lake Chelan Reclamation District.

In witness whereof, I have here unto set my hand and affixed my seal the day and year first-above written.




NOTARY PUBLIC in and for the State of
Washington, residing in Chelan
My Commission Expires: 8/1/21

STATE OF WASHINGTON)
) SS
 County of Chelan)

On this 11th day of June, 20 19, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared Mike Cooney and Peri Gallucci, known to me to be the Mayor and Clerk of the City of Chelan, a municipal corporation, that executed the within and foregoing instrument, and acknowledged the same instrument to be the free and voluntary act of the City of Chelan, for the uses and purposes therein mentioned, and on oath stated that he was authorized to execute said instrument, and that the seal affixed is the seal of City of Chelan.

In witness whereof, I have here unto set my hand and affixed my seal the day and year first-above written.



Patricia A. Michajla
 NOTARY PUBLIC in and for the State of
 Washington, residing in Orondo
 My Commission Expires: 12-15-22

EXHIBIT A

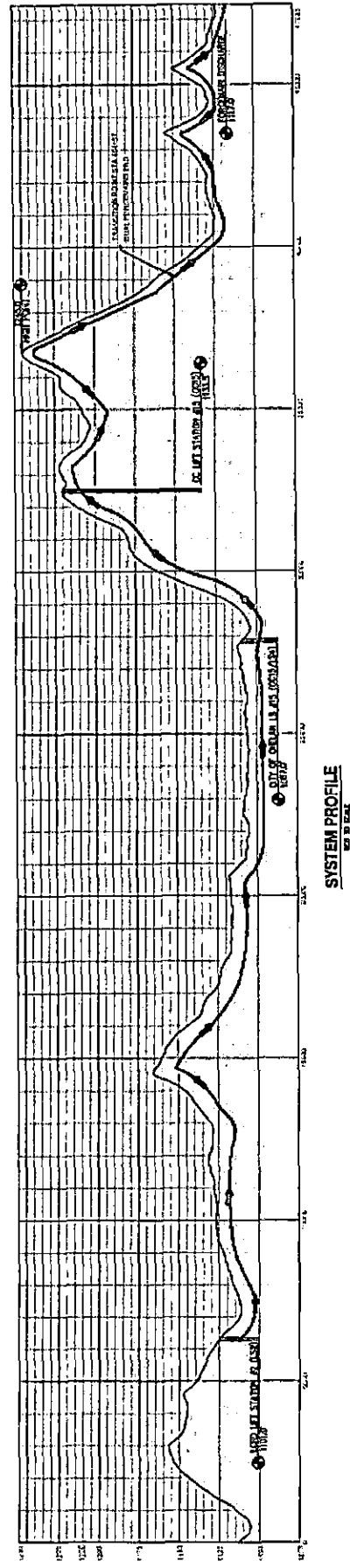
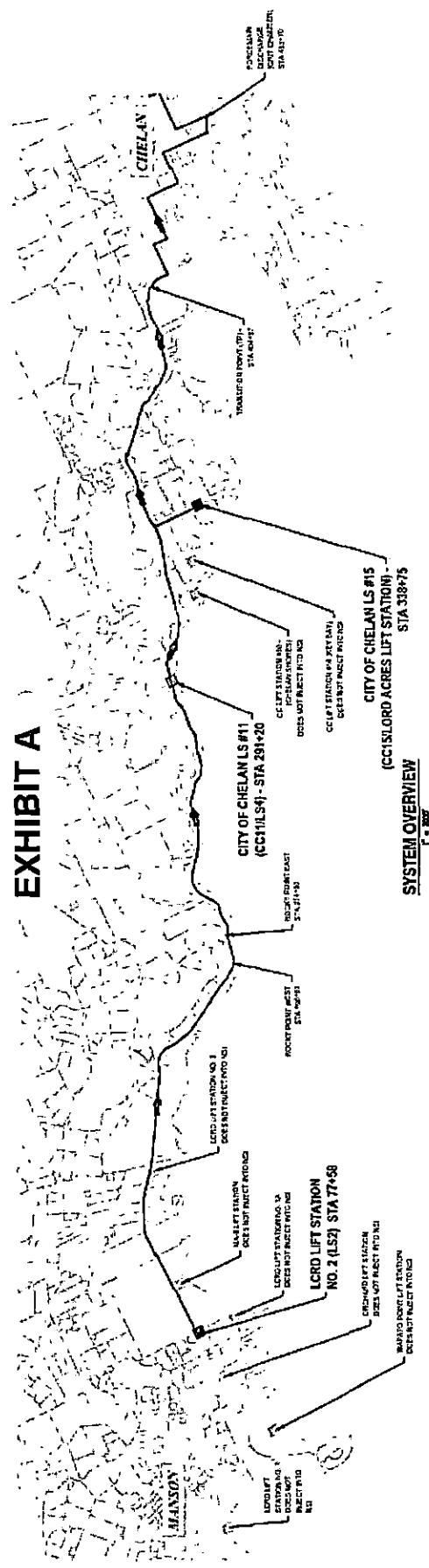


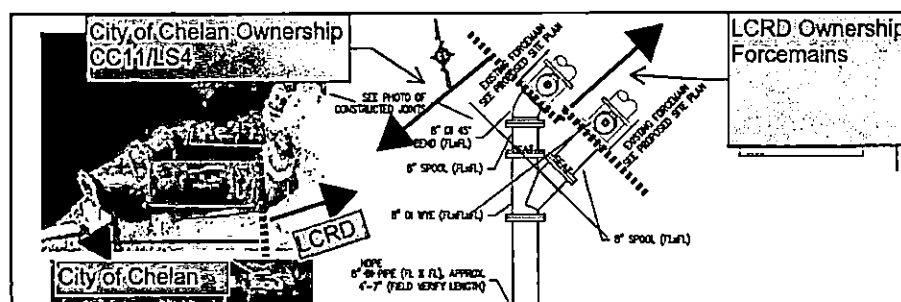
EXHIBIT A NORTHSORE INTERCEPTOR OPERATIONS

CITY OF CHELAN AND LCRO

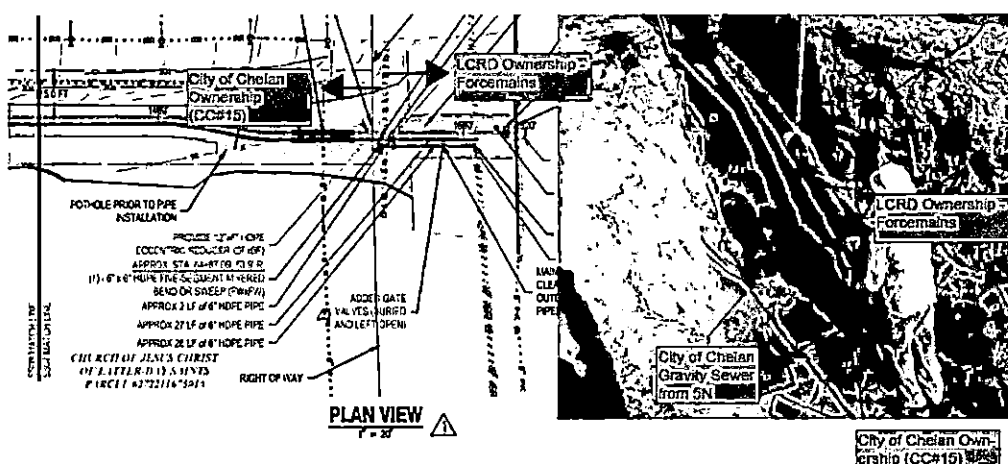


RH2
ENGINEERING
22 YEARS
EAST ROCKAWAY, NJ
201 SPECIALTY ADVERTISING, PUBL. 1

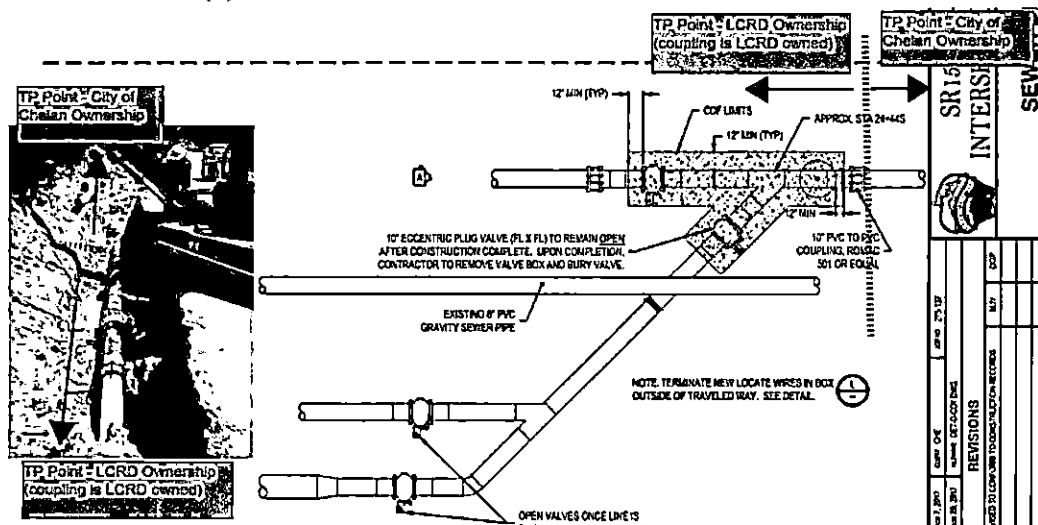
EXHIBIT 'B'



1. Chelan Lift Station #11 – STA 291+20 - Delineation of Ownership. As defined in section 2.1.(a).



2. Chelan Lift Station #15 – STA 338+75 - Delineation of Ownership. As defined in section 2.1.(b).



3. Transition Point (TP) – STA 404+57 - Delineation of Ownership. As defined in section 3.1.(a).

Appendix B

SEPA Checklist

Placeholder - SEPA checklist to be completed

Appendix C

Lake Chelan Reclamation District Rules and Regulations

LAKE CHELAN RECLAMATION DISTRICT

RULES AND REGULATIONS

Lake Chelan Reclamation District has operated the Manson Domestic Water System since the District was formed on May 8, 1920. The domestic system was in operation as a private enterprise prior to its conveyance to the District. The District has operated the Manson Sewer System since the merger with and dissolution of the Manson Sewer District on January 2, 1979. Title 87 of the Revised Code of Washington enables irrigation districts to be domestic water purveyors and to provide sewerage collection services within their boundaries.

A. DEFINITIONS.

1.1 RESIDENCE: A single family dwelling or trailer home. Only one residence is allowed per meter.

1.2 APARTMENT: Multi-family residential units built for two residences or more.

1.3 ERU: An equivalent residential unit (ERU) is a unit of measure that compares all users to the typical use patterns of an average single-family household.

1.4 ADU: An Accessory Dwelling Unit as defined by Chelan County code. An ADU with livable floor area of 1,000 square feet or less will qualify for one-half (1/2) of an ERU for allotment and assessment purposes. An ADU with livable floor area greater than 1,000 square feet will be treated as a full residence.

1.5 GUEST INN: A Guest Inn operates with a total (main structure and bedrooms) of six lodging units or less for rent all within the same structure. The guest inn shall be the principal residence of the owner/operator and the units cannot have more than two bedrooms. The main residence would be 1 ERU and each unit would be .25 ERU's.

1.6 STR'S – Short term rentals will be classified per the County as follows:

- a. Tier 1: Owner-occupied short-term rental will be 1 ERU (6 person occupancy)
- b. Tier 2: Non-owner-occupied unit up to a 12 person occupancy will be 1 domestic water ERU and 1.5 sewer ERU's.
- c. Tier 3: Non-owner-occupied unit up to a 16 person occupancy will be 1 domestic water ERU and 2 sewer ERU's.

1.7 ORCHARD CABIN: A temporary dwelling occupied for six months per year or less, for agricultural workers. Orchard cabins can be on their own meter, with a residence, or with other cabins. An Orchard Cabin is treated as One-Half (1/2) of an ERU for allotment and assessment purposes.

- a. If an orchard cabin is on its own meter and has usage for more than six months per calendar year, it then becomes a residence.
- b. If a cabin is on the same meter as a residence and has usage more than six months per calendar year or if a residence has excess for more than six months per year, than the cabin becomes an apartment.

- c. If two or more cabins are on the same meter and has usage more than six months per calendar year the cabins become a residence plus apartment for each additional cabin.
- d. Once a cabin changes categories it cannot change back until the most recent twelve months show usage during only six months or less.

1.8 **SHARES AND ELECTORS**: Shares in the District are assigned based on assessable lands, assessed land and ERU's. Each acre of assessable land within the District's boundaries is entitled to one share. Each acre of assessed land is entitled to one share (i.e., an acre of assessed land receives two shares, one for being assessable and one for being assessed. An acre assessable but not assessed receives one share). Each ERU receives two shares. All shareholder shall be entitled to participate in the election of District directors as "Electors." (See voting rules under **General Terms** 1.6, below).

B. DOMESTIC SYSTEM

I. Allotments, Assessments and Payments

1.1 **Allotment**: The basic allotment of domestic water per ERU is 700 cubic feet per month at the base rate. There is no credit or carry-over for use less than the base allotment for each two-month billing cycle.

1.2 **Assessments**: The basis for assessing domestic charges shall be the ERU. The rate per ERU is set by the Board of Directors. Domestic service shall be billed for every two months, shall be combined with the sewer service charges on one invoice, and shall be due when rendered, net 30 days. Domestic service charges may be attached to the irrigation assessment as a special assessment.

1.3 **Excess Rates**: All excess water will be billed at the rate as designated by the District Board of Directors.

1.4 **Connection Charges**: The connection charge for new users to the domestic system is based upon a pro-rata share of all joint use facilities plus physical appurtenances. Rates are set by the Board of Directors and are payable on a per ERU basis. Water availability will not be guaranteed within the District until applicable service fees for water are paid.

1.5 **Payments**: Bills are due when delivered and delinquent when 30 days past due.

II. System Operations

2.1 **Service Requirements**: Any District property owner may be served by the District's domestic water system if they are located within the domestic retail service area, are located at or below the elevation 1250' pressure zone, and pay all applicable fees. Any potential new customer must fill out a 'Request for Letter of Availability' form and if the requirements are met for service, an 'Application for Water Service' form is to be completed and submitted with applicable fees. Any property not adjoining an existing domestic water main may be required to extend existing mainlines and/or obtain easements for utility access. See 'Meter Location' section for additional information. If a service will provide water beyond the pressure zone, a private booster pump

system may be required. Providing service beyond the pressure zone is at the discretion of the Secretary-Manager.

2.2 Meter Size and Installation: The District establishes the available meter sizes for residential and commercial users. The District provides a 3/4" x 5/8" meter as a part of a residential hookup purchase. For meters 1" and larger, when deemed appropriately sized by the District, the customer shall be responsible for an additional costs associated with the larger meter installation. In addition to the meter assembly, the District will provide a customer shut off valve and backflow device on the customer's side of the meter. The customer is responsible for the protection and maintenance of the shut off valve and backflow device.

2.3 Meter Location: The District delivers water to the meter. For a property to be eligible for District service, the property must border on a right-of-way containing a domestic mainline or within 150' from a mainline. If the property to be served is not adjoining the right-of-way, then the owner must obtain legal easement access for utilities to cross parcel(s) between the meter location and parcel to be served. Owners/developers with properties over 150' from a right-of-way containing a District mainline will be required to install a domestic mainline extension to District standards and specifications. Any exceptions to this 150' maximum distance from a mainline must first be reviewed and approved by the District Board of Directors. All materials between the main and the meter remain the property of the District, and all other materials after the meter are the responsibility of the property owner.

2.4 Meter Testing: Water users may request to have their domestic meters tested for accuracy by District personnel on the District meter testing equipment. Such requests may be subject to a testing fee established by the District board unless the results show the meter to have an error margin of 5% or more.

2.5 Shared Meters: Domestic meters may not be shared between two or more residences or between a residence and cabins or between cabins unless they are pre-existing and in the same ownership. On new meter installations, each residence must be on a separate meter. On new connections, cabins may cluster onto one meter but must be separated from residences.

2.6 Extensions: All domestic extensions shall be subject to the latest version of the District's Standards, Conditions and Specifications for Water Main Extensions. Developer must enter into a Developer Extension Agreement and pay the required deposit to cover the District's costs associated. The Developer is required to pay all legal fees, third-party engineering review fees, surveying fees (if any), plot fees as well as other miscellaneous material and out-of-pocket costs the District may incur.

2.7 District-Initiated Extensions: From time to time, the District may choose to extend domestic main lines into lands within the Urban Growth Boundary that do not presently have service. In these cases, the costs of the domestic extension will be documented and customers that connect to the extension shall reimburse the District on a pro-rata basis for the total cost of construction in addition to the regular service fees.

2.8 Disconnects: Water users may request to discontinue service, if service is no longer needed. Disconnects will only be considered for properties that do not have any residence on them. All requests for disconnection must be made by the owner. If service is later requested to

be reinstated, the user will be subject to a full connection charge as if services had never been provided.

2.9 Irrigation Delivery through Domestic System: Lands retaining irrigation water rights but served through the domestic system will receive three-acre feet per acre additional allotment during the months of March through October. There shall be an inter-company transfer from irrigation to domestic for all assessments collected including parcel fees for all parcels receiving irrigation water through the domestic system. The irrigation system shall reimburse the domestic system the assessment rate per acre plus the parcel fee collected for all parcels receiving irrigation water through the domestic system. Irrigation use served through the domestic system in excess of the three-acre feet per acre shall be billed at the domestic excess rate and credited to the domestic system. The irrigation allotment will not be credited to the meter until the irrigation assessment is paid in full. "Irrigation only" meters on the domestic system will be converted to domestic meters by paying the applicable domestic connection charges.

2.10 Leaks: Leaks that occur in the private underground service lines or lines under the floor or within the walls of the residence or business that cannot be readily seen are eligible for a water charge rebate. Leaks within an irrigation system do not qualify. The rebate will be limited to 50% of billed water in excess of average consumption and shall not exceed two billing periods. The District must inspect and approve repairs for correction of all leaks prior to processing a rebate. If the water user has a second leak on the same line within one year, the District may at its discretion, require the entire line to be replaced before a third rebate will be processed. This policy applies only to lands within the District boundary and not to users outside the boundary served by special contracts. Leaks do not include hose bibs, drain valves and fixtures that are left on or leak in a manner that is avoidable or detectable. Leaks also do not include overuse where a leak cannot be identified unless the water user chooses to replace the entire line in lieu of searching for the individual leak.

2.11 Non-Use by Existing Customers: An existing user whose home has been removed and/or have had their water meter removed by the District may qualify for a reduced bill calculated at 75% of the full O&M rate at the request of the customer and at the discretion of the Secretary-Manager.

2.12 Illegal Connection: Any person or entity intentionally making connection to the District domestic distribution system without prior consent shall be subject to a \$500 fine plus costs of disconnection, in addition to possible criminal prosecution.

2.13 Recreational Vehicle Parks: RV Parks may have a single ownership or spaces may be sold individually. Where a single ownership exists, the park may be metered by master meters measuring all spaces collectively. The first pad shall be one equivalent residential unit (ERU) and each pad thereafter equal to 0.25 ERU's. Where individual spaces may be sold, each pad shall be metered and shall be billed per the domestic classification.

2.14 Trailer Parks and Mobile Home Parks: Every pad available at trailer and mobile home parks shall be metered either individually or by a master meter for the entire property. This determination is at the discretion of the Secretary-Manager.

2.15 Cross Connections: Domestic customers are expected to be familiar with the District's Cross Connections Control Policy and Procedures, as adopted by the board per board resolution number 2014-03 and attached, Washington State Department of Health and regulations or the Washington Code of Administrative Regulations.

2.16 Inspection Authority: The District reserves the right to enter all properties served by the domestic water system in order to inspect, observe, measure, test all processes directly correlated to waste discharges. All District employees and agents shall notify the property owner in advance and observe all safety rules.

C. SEWER SYSTEM

I. Assessments and Payments

1.1 Assessments: The basis for assessing sewer charges shall be the ERU. The rate per ERU is set by the Board of Directors. Sewer service shall be billed for every two months, shall be combined with the water service charges on one invoice, and shall be due when rendered, net 30 days. Sewer service charges may be attached to irrigation bills as a special assessment.

1.2 Connection Charges: The connection charge for new users to the sewer system is based upon a pro-rata share of all joint use facilities plus physical appurtenances. Rates are set by the Board of Directors and are payable on a per Equivalent Residential Unit (ERU) basis. Sewer availability will not be guaranteed within the District until applicable service fees for sewer are paid.

1.3 Sewer Connection Loan Program: A program to promote existing residences within the sanitary sewer service area and with failing septic systems to convert to the District sanitary sewer.

1.3.1 Conditions of Eligibility: As adopted by the District Board of Directors, Resolution 2022-06 states the Conditions of Eligibility are based on the following terms and limitations:

- a. Property location must be within the sewer service boundaries as outlined in the District's latest edition of the General Sewer Plan.
- b. Maximum of 24 month loans are available for existing residential properties currently on septic systems only. Longer duration must be approved by the District's Board of Directors.
- c. Property owner must have good payment history with current District utility accounts.
- d. Loan only available to pay sewer connection fees defined as Sewer Hook Up Fee, Tap Fee, and Road Crossing Fee as set by the District Board of Directors.
- e. Complete and return the Loan Application form to District office and pay Chelan County Recording fee and District application fee of \$150.
- f. After Loan Application acceptance, Loan Agreement signed by applicant, notarized, and recorded at Chelan County.
- g. Monthly billing for loan commences within 30 days from date agreement is executed.
- h. Customer must pay 10% down up front.
- i. Loan use limited to 90% of the estimated connection costs and does not include customer's side sewer costs (on property).

- j. Loans must be secured by a sufficient promissory note and mortgage (lien) on the residential property.
- k. Cost of releasing property lien when loan is satisfied will be the customer's responsibility in final payoff.
- l. Rate of interest for loan is prime rate plus 1%. Prime rate is established as published by the Wall Street Journal on January 1st of each year.

II. System Operations

2.1 Service Requirements: All new single-family residences on existing lots and existing single or multi-family residences with failing on site systems whose property lies within five hundred feet of planned gravity or low pressure sewerage collection facilities and within the Chelan County urban growth boundary shall extend gravity collection or low pressure collector mains if needing service to District facilities. Pumped services are not allowed except within planned low pressure collection service areas or when gravity collection mains are over 500 feet away, and then only on a temporary basis until gravity service is available. New short plats within the Chelan County urban growth boundary are required to extend gravity collection mains or low pressure collection mains for service as identified in the District planning areas. Pumped services are not allowed for short plats except within planned low pressure collection service areas or when gravity collection mains are over 1,000 feet away, and then only on a temporary basis until gravity service is available. Short plats allowed to temporarily pump must provide easements and make provisions for gravity service in the plat covenants. New plats or developments larger than 4 lots or 4 ERU and within the Chelan County urban growth boundary are required to extend gravity collection mains or low pressure collection mains for service as identified in the District planning areas. Pumped services are not allowed. Sanitary sewer service is not allowed outside of the urban growth area except as identified in the comprehensive sewer plan and allowed by the Chelan County land use plan. Any deviation from this policy is at the discretion of the Secretary-Manager.

Sewer service outside of the urban growth area is reserved to parcels adjoining the existing sewer system whose property can be served without a sewer extension or for areas of environmental concern. Extending sanitary sewer service to areas of environmental concern must be approved by the Board of Directors, by the Washington State Department of Ecology, by the Chelan County Planning Department and must be consistent with agreements with the City of Chelan and environmental compliance.

2.2 Side Sewers: Side sewers shall be installed by and at the expense of the owner. The District shall inspect the side sewer installation prior to trench backfill. Side sewers shall be a minimum of four inch. The District shall approve sizes for all commercial or industrial customers. The owner shall be responsible for any or all damages associated with side sewer construction. Side sewers shall be installed to all applicable state codes including but not limited to Chelan County building and plumbing code, ASTM specifications, WPCF Manual 9, and the pipe manufacturer's specifications. Side sewers shall be gas and watertight. No roof drains or other gray water discharges are allowed without prior written approval. No side sewer shall be extended to serve more than one ownership except at District's Discretion.

2.3 Connection Permit: A “Sewer Hook Up Application” must be filed and approved by the District prior to physical connection to the sewerage collection system. Any connection done without written approval shall be considered an illegal connection.

2.4 Connections: The applicant shall notify the District when connection is to be made. All connections will be made under the supervision of District personnel or its agents.

2.5 Domestic Wastewater: Only water carrying human wastes, including kitchen, bath, and laundry wastes from residences, buildings, industrial establishments or other places, together with such ground water infiltration or surface waters as may be present, is permitted. Property runoff including gutter and storm water collection systems, and pool discharges, are expressly prohibited from being introduced to the sewer system. Discharges shall be limited to those allowed by the City of Chelan Wastewater Treatment Plant rules and regulations: Sewer System. Certain discharges requiring special monitoring, sampling, measurement or treatment may be subject to special assessments as determined by the District. Wastewater strength in terms of BOD5 and TSS shall not exceed 300 mg/l without written approval of the District.

2.6 Industrial Wastewater: Water or liquid-carried waste from industrial or commercial processes, are distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities. All discharges shall be limited to those allowed by the City of Chelan Wastewater Treatment Plant Rules and Regulations.

2.7 Inspection Authority: The District reserves the right to enter all properties served by the sewerage collection system in order to inspect, observe, measure, test all processes directly correlated to waste discharges. All District employees and agents shall notify the property owner in advance and observe all safety rules.

Measurement, sampling, tests and analysis of industrial wastewater shall be performed in accordance with APHA standard methods. The District may at its discretion require an on-site inspection manhole to inspect, observe, measure, sample or test the industrial wastewater discharge. The District may also conduct testing on the next available sewerage manhole downstream.

2.8 Disconnects: Sewer users may request to discontinue service, if service is no longer needed. Disconnects will only be considered for properties that do not have any residence on them. All requests for disconnection must be made by the owner. If service is later requested to be reinstated, the user will be subject to a full connection charge as if services had never been provided.

2.9 Non-Use by Existing Customers: An existing user whose home has been removed and/or have had their water meter removed by the District may qualify for a reduced bill calculated at 75% of the full O&M rate at the request of the customer and at the discretion of the Secretary-Manager.

2.10 Illegal Connection: Any person or entity intentionally making connection to the District sewer collection system without prior consent shall be subject to a \$500 fine plus costs of disconnection, in addition to possible criminal prosecution.

2.11 Extensions: All sewer extensions shall be subject to the latest version of the District's Standards, Conditions and Specifications for Sewer Main Extensions. Developer must enter into a Developer Extension Agreement and pay the required deposit to cover the District's costs associated. The Developer is required to pay all legal fees, third-party engineering review fees, surveying fees (if any), plot fees as well as other miscellaneous material and out-of-pocket costs the District may incur.

2.12 District-Initiated Extensions: From time to time, the District may choose to extend sewer main lines into lands within the Urban Growth Boundary that do not presently have service. In these cases, the costs of the sewer extension will be documented and customers that connect to the extension shall reimburse the District on a pro-rata basis for the total cost of construction in addition to the regular service fees.

D. IRRIGATION SYSTEM

I. Assessments, Allotments and Payments

1.1 Classification: All lands receiving irrigation water from the District must be classified as irrigable and be assessed. Lands within the District boundary that have never been classified or are class 6 lands that may be irrigable can petition to be reclassified. Reclassifications must be done and approved by USBR agronomists at the landowner expense.

1.2 Assessable Lands: All lands within the District Boundary are assessable. Lands within the District Boundary are presently assessed only for direct services received. Assessable lands are measured by the number of shares. The number of shares or fraction thereof is equivalent to the number of acres of assessable land.

1.3 Assessments: The District assessments shall be due in full on April 1st of each year and shall be payable prior to receiving District water. Interest charges of one percent (1%) shall be charged after April 30th, and shall accrue at one percent (1%) per month simple interest thereafter until paid in full. Assessments shall be delinquent on May 1st, unless one-half of the assessment is paid on or before April 30th. If one-half of the assessment is paid on or before April 30th, the remaining balance shall be due on or before the following October 31st and shall be delinquent after that date. Assessments are based upon the number of shares in the system. The number of shares or fraction thereof is equivalent to an equal number of units of benefit.

1.4 Allotments: The base allotment for irrigation supplies shall be 36 acre-inches per season. If water supplies are available, excess water may be purchased. The excess rate shall be calculated based upon the annual O & M rate per acre-inch exclusive of construction repayment costs. The first six acre-inches of excess usage shall be at 100% of the excess rate. Any excess above 42 acre-inches per acre shall be at 120% of the excess rate. No credit shall be given for use less than the base allotment.

1.5 Irrigation Meter Capacity: Maximum delivery through any meter shall be the manufacturers recommended meter capacity. Users exceeding meter capacity shall be shut off and reminded of the meter capacity on the first offense. Repeat offenders shall be subject to some or all of the following: reduced pressures, flow restricting devices, meter repair costs and possible turnoffs.

1.6 Meter Testing: Water users may request to have their irrigation meters tested for accuracy by District personnel on the District testing equipment. Such requests may be subject to a testing fee as set by the District board unless the results show the meter to be over-reading.

1.7 Rationing: System capacity allows for approximately 6.5 gallons per minute per acre. The District will endeavor to provide higher rates of flow if they are available. During periods of high demand, rationing will occur on certain laterals or individual systems. The basis for rationing shall be irrigable acreage. Turnouts exceeding current rationing levels shall be turned off and reminded of current levels. Repeat offenders will be subject to some or all of the following: reduced pressures, flow restricting devices and possible turnoffs.

1.8 Short Water Supplies: In the event water supplies are limited due to drought, transmission or mechanical failure, the District assumes no liability for crop damages. The District will endeavor to supply an equitable, proportionate share of the total water supplies available.

1.9 Water Conservation: Lake Chelan Reclamation District promotes water conservation. The District encourages water users to have their distribution systems designed by qualified persons. Growers should utilize modern application and scheduling techniques as encouraged by the local conservation district. All irrigation water use must be beneficially used. Excess use that results in runoff, ponding, deep percolation or other effects of misapplication may be subject to some or all of the following: reduced pressures, flow restricting devices and possible turnoffs.

1.10 Segregation of Assessments: After an assessment roll has been filed, the Board of Directors may, at their discretion, allow the segregation of the assessments against any tract or parcel in accordance with the provisions of 87.03.285 through 87.03.305. The party making the request may be required to pay all costs associated with these procedures including but not limited to advertising costs, research and title costs, mailing costs and filing fees.

1.11 Shared Meters: District will consider all acreage as one farm when rationing or determining excess. Separate ownership may install their own internal metering system but any readings or monitoring must be done between parties.

1.12 Water Right Requests: The District will accept requests for additional water rights. These requests will be held with priority amongst the written requests given to agricultural lands with the earliest date of request. Requests retain their priority over time only for the person and land requesting additional water. The request and its priority may stay with the land under a change in ownership only if specified in the sales contract. As water rights become available, they will go first to lands on the same pump system as those relinquished by entering into a contract for Reclassification of Land and Transfer of Water Allotment. Any lands requesting water rights must be classified as irrigable by the Secretary of Interior. The District reserves the right to establish overall priorities for new water rights and to change priorities when in the best interest of the

District. The Board of Directors shall set the per acre rate of new water rights offered. Requests from lands outside of the District boundary will not be accepted until all requests from inside the boundary are satisfied. All requests outside the boundary will be separately held with priority among outside requests given to those lands with the earliest date of request. Annexation of properties outside the District will be a prerequisite to a water right offer.

1.13 Water Right Relinquishments: Water rights are appurtenant to the land. Any water user within the District who desires to relinquish their right to irrigation water must apply in writing to the District. The District reserves right to grant or deny the request solely at their own discretion. If the request is granted an agreement for permanent release of water allotment is executed and the water right is kept in trust by the District to be made available to other lands or kept as the District deems appropriate. Once lands have relinquished their water right they lose all priority to that right, and will become equal to all other lands requesting additional rights.

1.14 Water Right Sales: Water rights are not personal property rights of the water user. The District does not recognize any attempt of landholders to sell the water right from their land. The District reserves the right to sell water rights as allowed by the repayment contract with the U.S.B.R.

1.15 Water Right Transfers: Water rights are appurtenant to the land. Any water user within the District who desires to transfer the water right from one landholding to another must first apply in writing to the District. The landowner must own both properties fee title and provide evidence thereof. No transfers will be allowed from a lower system to a higher system. Any lands requested for transfer must be classified as irrigable by the Secretary of Interior. The District reserves the right to grant or deny the request solely at their own discretion. Two contracts must be executed to validate the transfer. First an agreement for Permanent Release of Water Allotment followed by a contract for Reclassification of Land and Transfer of Water Allotment.

II. System Operations

2.1 Domestic Use: District irrigation water absolutely may not be used as domestic supply or supplemented drinking water. Any person drinking District irrigation water do so at their own risk and is prohibited.

2.2 Unauthorized Use: Only lands classified as irrigable and assessed for District water may use District water. Any user found to be overplanted or otherwise using District water outside of its intended use will be notified and steps to resolve the issue will be determined by the District. The user will be responsible for resolving the unauthorized use.

2.3 Irrigation Season: The regular irrigation season shall be from April 1st to October 15th. The Board of Directors reserves the right to forward or extend the season at their discretion. Emergency situations may arise to alter the regular irrigation season.

2.4 New Irrigation Service: All irrigable lands entitled to water through the irrigation system and not currently connected may hook up to their assigned turnout. It is the responsibility of the new user to obtain easements or permits to cross other private or public properties.

2.5 Turnouts: All irrigable lands within the District have an assigned turnout on either the irrigation system or the domestic system. The District responsibility extends through the turnout to and including the outside valve. The outside valve, also referred to as the customer valve, may be operated by the customer. All other valves, piping, and fixtures, associated with the turnout are to be operated by authorized District personnel only. Any damages associated with unauthorized persons operating these devices will be subject to repair costs. The outside valve may not be used for regulating flow. Measurement of flow is by the District meter. Turnouts with upstream pressures in excess of one hundred psi will normally include a pressure regulator at the discretion of the District. Water user systems shall be designed to operate normally at the downstream pressures but to withstand pressures equal to the upstream pressure plus potential surge pressure caused by air entrapment. Customer must connect to the designated customer valve with a removable coupler to allow for District personnel to perform maintenance on the customer valve. Failure to do so will result in District personnel cutting the connecting pipe and notifying customer to repair.

2.6 New Turnouts: The District will install new turnouts only for ownerships of five (5) acres or larger, or at the discretion of the Manager. The acreage left on the existing turnout must also be five (5) acres or larger. The materials and labor costs of the new turnout must be borne solely by the parties requesting.

2.7 Spray Water: District water may be used for spray water at the users risk. Backflow prevention such as an air gap must be utilized to insure no contamination can enter the irrigation system at times of potential negative pressure. Irrigation use is the only recognized beneficial use of District water. The irrigation season will not be extended or forwarded to supply District water for spray uses.

2.8 Herbi-Fertigation: Herbigation or fertigation is allowed only on the users side of the turnout. It is the users responsibility to insure that District approved backflow prevention devices have been installed prior to beginning applications unless the District's Board of Directors authorizes an exception. Any damages caused to adjacent users or other users due to backflow or chemical trespass will be the sole responsibility of the user. Any person practicing herbigation or fertigation without District approved backflow prevention will be subject to discontinuation of District water use. Any deviation from this policy must be first approved by the District's Board of Directors in writing on a case by case basis. The user must also take responsibility in writing for any damages and agree to indemnify the District from damages that could be attributed to their use of unprotected fertigation. The irrigation season will not be extended or forwarded to supply water for herbigation or fertigation purposes. The cost for a District installed back flow shall be set by the Board of Directors.

2.9 Frost Protection: District water will not be provided for frost protection. Irrigation use is the only recognized beneficial use of District water. The irrigation season will not be extended or forwarded as a frost protection measure.

2.10 Fruit Cooling: District water will not be provided for fruit cooling. Irrigation use is the only recognized beneficial use of District water.

2.11 Cross-Connection: Farm irrigation lines shall not be connected to a secondary source of water without a District approved backflow prevention device. Cross-connections to the District domestic system will not be allowed under any circumstances.

2.12 System Alterations: Should any alterations to the existing irrigation system become necessary, the property owner will pay a deposit to the District to initiate any such project. The property owner/developer will be required to pay all legal fees, third-party engineering review fees, surveying fees (if any), plot fees as well as other miscellaneous material and out-of-pocket costs associated with design services. Should the costs exceed the deposit amount, the remaining balance will be billed to the property owner/developer and paid within 30 days.

2.13 Access to Lands: District employees, representatives and authorized agents shall receive free access at all hours to any and all tracts supplied with District water. The purposes of such access shall include but not be limited to making records, reading and observations on usage of District water. Water users refusing free access to said lands will be subject to a severance of water delivery until free access is granted.

2.14 Drainage: The District assumes no responsibility for drainage problems outside the operation and maintenance of USBR designated drains. The responsibility for other drainage problems may be assumed by the District on their own merits and at the discretion of the District.

2.15 Encroachment: All District facilities are held in title by the U.S. Bureau of Reclamation. No facilities within right of ways, easements, or Act of 1890 easements shall be encumbered in any way so as to restrict the District's ability to operate and maintain those facilities.

2.16 Free Water for Community Interest: No water will be available for community irrigation projects through the irrigation system. Approved air valve cans may be fitted for fire hose adapters and water withdrawn for emergency fire-fighting purposes.

2.17 Reclamation Reform Act: Lake Chelan Reclamation District has current repayment obligations with the U.S. Bureau of Reclamation. The District has conformed to the discretionary provisions of the Reclamation Reform Act. All qualified recipients who hold title and/or lease a total of 240 acres west wide in Bureau projects must file annual reporting forms with the District. All limited recipients who hold title and/or lease a total of 40 acres west wide in Bureau projects must also file annual reporting forms with the District. Failure to follow the requirements of the Reclamation Reform Act could lead to disqualification of water eligibility and/or penalties and full cost assessments.

2.18 Obligation to Repayment Contract: Lake Chelan Reclamation District has current repayment obligations and contractual obligations with the U.S. Bureau of Reclamation. All landowners of assessable lands shall be tied individually and collectively to those obligations.

E. GENERAL TERMS

1.1 Delinquent Accounts: A delinquency notice will be sent with a fifteen-day allowance to pay without further notice. If no payment is made within that fifteen day grace period, the District shall have the right to shut off or disconnect the customer from domestic water service. Delinquent accounts will be subject to a late fee as determined by the District Board of Directors

or 1% per month of the outstanding balance, simple interest, whichever is greater. Additional posting and turn-off fees will be added for those whose service is posted and/or disconnected as a result of nonpayment and a reconnect fee will be charged for those whose services are reconnected following a nonpayment disconnect. The posting fee, turn off and reconnect fees will be set by the District Board of Directors.

Accounts delinquent over six months may be formally certified as a lien against the real property and recorded with Chelan County. Such liens shall not be removed until the assessment and plus all applicable fees are paid in full.

This policy does not preclude the District from bringing suit in foreclosure by civil action after one year as allowed by RCW 87.03.445 if it is in the best interest of the District. It only attempts to establish a methodology for collection of charges that provides for the maximum notice and the minimum additional costs to the property owners.

1.2 Transaction Process Fees: The Secretary-Manager may choose to accept forms of payments allowed under RCW 87.03.277 for the following specific transactions without adding the cost of the transaction if it is in best interest of the District: payment transactions made for a specific category of payments due the District, including, but not limited to, assessments, fines, interest, penalties, special assessments, fees, rates, tolls and charges.

1.3 Damage to District Facilities: Any person or entity doing damage to District facilities either intentional or non-intentional will be responsible for the costs of repairs. All repairs will be done with District materials by District personnel or its agents and shall be due and payable in full within 30 days. Interest penalties on delinquent invoices shall be at the rate of 1% per month.

1.4 Annexation: Lands outside the service area identified in the current addition of the District comprehensive plan must first make written request to the District. Acceptance will be based upon Board approval, and, as necessary, Washington State Department of Health approval, Washington State Department of Ecology approval, compliance with Chelan County land use regulations, compliance with agreements with the City of Chelan, and environmental compliance. Lands also outside of the District boundary must follow the procedures outlined in RCW 87.03.560 through RCW 87.03.610 unless special service contracts are executed.

1.5 District ROW/Property: Unauthorized use of District right of way or property is not allowed. Authority to use District right of way or property can be revocably granted by the Board of Directors at their discretion or through the Bureau of Reclamation for Bureau of Reclamation rights of way. Sale of District right of way or property shall be in accordance with state and/or federal laws regarding surplus properties, typically the Assessed value plus costs for adjacent owners.

1.6 Elections: Elections for District Directors shall take place by vote of the Shareholders. Each shareholder ("elector") shall be entitled to two votes for each five shares or fraction thereof. The total number of shares is the aggregate total of shares received from assessable lands, units of benefits for irrigation purposes, ERU's for domestic purposes and equivalent residential units for sewer purposes. There shall be no additional votes for ADU's. The division of votes for

community properties or properties having multiple ownerships will follow the provisions of RCW 87.03.051.

1.7 Severability: If any provision of these rules and regulations or its application to any person or circumstance is held invalid, the remainder of the rules and regulations or the application of the provision to other persons or circumstances is not affected.

1.8 Disputes: In the event a customer has a dispute regarding any aspect of the District's operations, including assessments, a complaint shall be filed with the District manager. In the event that the District manager is unable to resolve the dispute, the customer may present the complaint to the District Board of Directors.

1.9 Locates: Customer shall have the responsibility to call the District in the event any activity occurs on their property that would potentially disturb District infrastructure. This includes making all calls necessary to properly locate underground utilities, "Call Before You Dig 811 Utility Notification Center" as required by State or local laws or regulations. Damages incurred during digging without proper locates shall be subject to up to treble damages and repairs as provided by RCW 19.122.070.

1.10 Cross-Connection Control: RCW 87.03.015 establishes that irrigation districts have the authority to provide domestic water service. The pumps, pipes and treatment facilities that make up the domestic system are defined as a community public water system. Chapters 70.119 and 70.119A RCW require that public water systems like the Lake Chelan Reclamation District system conform to the rules and regulations adopted by the secretary of the department of health. WAC 246-290-490 was adopted by the secretary and requires that all community water systems comply with the cross-connection control requirements specified.

The District will be responsible for provisions as outlined in WAC 246-290-490 for premise isolation. Chelan County Building Department will be responsible for in-premise isolation. Backflow devices will be required on all premises that are assessed by a certified cross-connection specialist as posing a degree of hazard for backflow contamination. All backflow devices must be inspected and tested on an annual basis by a certified backflow assembly tester, and repaired or replaced if necessary. The backflow assembly tester shall certify the test as complete on a form provided by the District. If the water user with a backflow device fails to contract for the annual test, the District will perform inspections, testing and repairs to all backflow devices at the owner's expense. If any water user should fail to test their devices and in turn deny the District reasonable access to the backflow device, the District shall shut off water service until the water user complies.

1.10.1 Conditions for Service: As adopted by the District board, Resolution 2014-03 states the Conditions for Providing Service are based on the following terms and limitations:

- a. The customer agrees to take all measures necessary to prevent the contamination of the plumbing system within his/her premises and the District's distribution system that may occur from backflow through a cross connection. These measures shall include the prevention of backflow under any backpressure or back siphonage condition, including the disruption of the water supply from the Districts' system

that may occur during routine system maintenance or during emergency conditions, such as a water main break.

- b. The customer agrees to install, operate, and maintain at all times his plumbing system in compliance with the current edition of the Uniform Plumbing Code having jurisdiction as it pertains to the prevention of contamination and protection from thermal expansion, due to a closed system that could occur with the present or future installation of backflow preventers on the customer's service and/or at plumbing fixtures.
- c. For cross-connection control or other public health-related surveys, the customer agrees to provide for the District's employees, or agents, free access to all parts of the premises during reasonable working hours of the day for routine surveys and at all times during emergencies. Where agreement for free access for the District's survey is denied, the District may supply water service provided that premises isolation is provided through a DOH- approved reduced-pressure principle backflow assembly (RPBA).
- d. The customer agrees to install all backflow prevention assemblies requested by the District and to maintain those assemblies in good working order. The assemblies shall be of a type, size, and make approved by DOH and acceptable to the District. The assemblies shall be installed in accordance with the District's construction standards and specifications.
- e. The customer agrees to:
 - i. Have all assemblies (e.g., RPBAs and/or DCVAs) that the District relies upon to protect the public water distribution system tested upon installation, annually thereafter and/or more frequently if requested by the District, after repair, and after relocation;
 - ii. Have all testing done by a District-approved and currently DOH-certified Backflow Assembly Tester (BAT);
 - iii. Have the RPBA or DCVA tested in accordance with DOH-approved test procedures; and
 - iv. Submit to the District the results of the test(s) on District-supplied test report forms within the time period specified by the District.
- e. The customer agrees to bear all costs for the aforementioned installation, testing, repair, maintenance and replacement of the RPBA, RPDA, DCVA or DCDA installed to protect the District's distribution system.
- f. At the time of application for service, if required by the District, the customer agrees to submit to the District plumbing plans and/or a cross-connection control survey of the premises conducted by the District's Cross-Connection Control Specialist (CCS). The cross-connection control survey shall assess the cross-connection hazards and list the backflow preventers provided within the premises. The results of the survey shall be submitted prior to the District turning on water service to a new customer. The cost of the survey shall be borne by the customer.

- g. For classes of customers other than single-family residential, when required by the District, the customer agrees to periodically submit to a cross-connection control re-survey of the premises by the District's CCS. The District may require the re-survey to be performed in response to changes in the customer's plumbing or water use, or performed periodically (annually or less frequently) where the District considers the customer's plumbing system to be complex or subject to frequent changes in water use. The cost of the re-survey shall be borne by the customer.
- h. Within 30 days of a request by the District, a residential customer shall agree to complete and submit to the District a "Water Use Questionnaire" for the purpose of surveying the health hazard posed by the customer's plumbing system on the District's distribution system. Further, the residential customer agrees to provide within 30 days of a request by the District access for a cross-connection control survey of the premises by the District's CCS.
- i. The customer agrees to obtain the prior approval from the District for all changes in water use, and alterations and additions to the plumbing system, and shall comply with any additional requirements imposed by the District for cross-connection control.
- j. The customer agrees to immediately notify the District and the local health jurisdiction of any backflow incident occurring within the customer's premises (i.e., entry of any contaminant/pollutant into the drinking water) and shall cooperate fully with the District to determine the reason for the backflow incident.
- k. The customer acknowledges the right of the District to discontinue the water supply within 72 hours of giving notice to the customer, or a lesser period of time if required to protect public health, if the customer fails to cooperate with the District in the survey of premises, in the installation, maintenance, repair, inspection, or testing of backflow prevention assemblies or air gaps required by the District, or in the District's effort to contain a contaminant or pollutant that is detected in the customer's system. Without limiting the generality of the foregoing, in lieu of discontinuing water service, the District may install an RPBA on the service pipe to provide premises isolation, and recover all costs for the installation and subsequent maintenance and repair of the assembly, appurtenances, and enclosure from the customer as fees and charges for water. The failure of the customer to pay these fees and charges may result in termination of water service in accordance with the District's water billing policies.
- l. The District will require premises isolation for a customer that is of the high-hazard type or category requiring "Mandatory Premises Isolation" established by the DOH regulations (Table 9, WAC 246-290-490).
- m. Where the District imposes mandatory premises isolation in compliance with DOH regulations, or agrees to the customer's voluntary premises isolation through the installation of a RPBA immediately downstream of the District's water meter, the customer acknowledges his obligation to comply with the other cross-connection control regulations having jurisdiction (i.e., Uniform Plumbing Code). Although the District's requirements for installation, testing, and repair of backflow

assemblies may be limited to the RPBA's used for premises isolation, the customer agrees to the other terms herein as a condition of allowing a direct connection to the District's service pipe.

- n. The customer agrees to indemnify and hold harmless the District for all contamination of the customer's plumbing system or the District's distribution system that results from an unprotected or inadequately protected cross connection within the customer's premises. This indemnification shall pertain to all backflow conditions that may arise from the District's suspension of water supply or reduction of water pressure, recognizing that the air gap separation otherwise required would require the customer to provide adequate facilities to collect, store, and pump water for his/her premises.
- o. The customer agrees that, in the event legal action is required and commenced between the District and the customer to enforce the terms and conditions herein, the substantially prevailing party shall be entitled to reimbursement of all incurred costs and expenses including, but not limited to, reasonable attorney's fees as determined by the Court.
- p. The customer acknowledges that the District's survey of a customer's premises is for the sole purpose of establishing the District's minimum requirements for the protection of the public water supply system, commensurate with the District's assessment of the degree of hazard. It shall not be assumed by the customer or any regulatory agency that the District's survey, requirements for the installation of backflow prevention assemblies, lack of requirements for the installation of backflow prevention assemblies, or other actions by the District's personnel constitute an approval of the customer's plumbing system or an assurance to the customer of the absence of cross connections therein.
- q. The customer acknowledges the right of the District, in keeping with changes to Washington State regulations, industry standards, or the District's risk management policies, to impose retroactive requirements for additional cross-connection control measures.

F. FISCAL OPERATIONS

1.1 Capitalization Policy: In general, costs meeting the following criteria will be capitalized as fixed assets:

- a. Generally, an individual purchase cost must exceed \$5,000. Grouping of individual costs less than \$5,000 is not appropriate unless the costs are individual components of an entire project (e.g. machine components purchased with the machine as a unit).
- b. The expected useful life must exceed five years.
- c. Expenditures must result in something of physical existence or substance supporting District operations; or expenditures must benefit future years through increased revenues or reduced expenses.

In addition, “small attractive assets”, such as personal computers and peripherals and certain shop equipment and radios, which the District wishes to track, are capitalized for tracking purposes as determined by the Secretary-Manager.

1.1.1 Guidelines: All costs associated with obtaining a fixed asset (land, buildings, landscaping and paving, equipment) and getting it ready for its intended use are capitalized.

- a. In general, costs incurred to achieve greater future benefits are capitalized, whereas expenditures that simply maintain a given level of services are expensed. In order for costs to achieve greater future benefits, one of three conditions must be met: (1) the useful life of the asset must be increased from its original estimated life and not restoring an asset in poor condition to its original estimated life; (2) the quantity of services produced from the asset must be increased; (3) the quality of the units or services provided must be enhanced. If costs do not meet this criteria or are less than \$5,000 then they are expensed.
- b. Generally, existing facilities have the following three major types of costs: additions, improvements and replacements, and repairs/maintenance.
- c. Commissions owed on leases shall be capitalized at the inception of the lease, and amortized over the term, excluding any options to renew or extend the lease.
- d. Studies, master plans, strategic plans, development plans, updates to plans and other such costs may be capitalized as an intangible asset and amortized over the period of usefulness, generally for not more than 5 years.

Asset lives, for depreciation purposes, are assigned by the accounting assistant or internal auditor.

Depreciation begins in the accounting year following purchase or year after placed in service. If costs are incurred with original capitalization intent, and the decision is later made to abandon the project, costs incurred will be expensed in the current period.

1.2 Capital Purchases: The Secretary-Manager is responsible for approving all capital purchases over \$250. A capital purchases budget will be developed each year outlining the overall approved expenditures. The Secretary-Manager has authority to make any and all capital purchases under \$20,000 and within the overall capital purchases budget. Any purchases over \$20,000 or over the capital purchase budget shall be approved by the Board of Directors. The Secretary-Manager shall determine which purchases will be capitalized along with its depreciation schedule.

1.3 Deposits Policy and Procedures

1.3.1 Policy: Reconcile all cash receipting for the District and ensure proper balancing of all types of payments (i.e. cash, checks, money orders, cashier’s checks, electronic funds transfers, and credit card payments). Reconcile and prepare for deposit all cash deposits while ensuring appropriate internal controls and safeguards are adhered to. Ensure all checks have been scanned to the District’s banking institution. Hold all scanned checks in the vault for a minimum of one month before destroying. Initiate all electronic funds transfers (EFT) as

approved by the Secretary-Manager and/or Board of Directors. Reconcile all credit card transactions with bank statements and CBSW Gateway Report.

1.3.2 Procedures: This process is done by counting all cash on a daily basis. At the end of the cash count, the Imprest Fund shall be maintained at the monetary level stated in Resolution 17-07 'Revolving Fund' or it's replacement. If at any time the cumulative amount of cash exceeds \$2,500, it is the District's policy to make a deposit by taking the cash deposit to the bank. Additional deposits may be made at the discretion of District employees. At the end of the day, all checks and cash remaining are secured.

All funds received are verified to be in balance and posted to the Revenue spreadsheet. All customer transactions billed through CBSW are posted to the individual customer accounts in the CBSW billing system, while all miscellaneous revenue is posted to the Revenue Ledger spreadsheet.

At the end of the month, the Bookkeeper reconciles the two checking accounts using the Bank Statements and matching reports from CBSW, the Gateway report, the Revenue spreadsheet, and the Revenue Ledger spreadsheet. The LGIP Statement is also reconciled monthly using a spreadsheet. Adjustments are reconciled with CBSW and journal entries are posted in QuickBooks to balance Accounts Receivables with the individual CBSW accounts (i.e. irrigation, irrigation excess, domestic, and sewer).

1.4 Small Works Roster Process

1.4.1 Cost: The District need not comply with formal sealed bidding procedures for the construction, building, renovation, remodeling, alteration, repair, or improvement of real property where the estimated cost does not exceed Three Hundred Thousand Dollars (\$300,000), which includes the costs of labor, material, equipment and sales and/or use taxes as applicable. Instead, the District may use the small works roster procedures for public works projects as set forth herein. The breaking of any project into units or accomplishing any projects by phases is prohibited if it is done for the purpose of avoiding the maximum dollar amount of a contract that may be let using the small works roster process.

1.4.2 Number of Rosters: The District may create a single general small works roster or may create a small works roster for different specialties or categories of anticipated work.

1.4.3 Contractors on Small Works Roster(s): The small works roster(s) shall consist of all responsible contractors who have requested to be on the roster(s), and where required by law are properly licensed or registered to perform such work in this state. Contractors desiring to be placed on a roster, or rosters, must keep current records of all applicable licenses, certifications, registrations, bonding, insurance, or other appropriate matters on file with the District.

1.4.4 Publication: At least once a year, the District shall publish in a newspaper of general circulation within the jurisdiction a notice of the existence of the roster or rosters and solicit the names of contractors for such roster or rosters. Responsible contractors shall be added to the

roster, at any time they submit an application and necessary records. The District may require master contracts to be signed that become effective when a specific award is made using a small works roster. An interlocal contract or agreement between the District and other local governments establishing a small works roster or rosters to be used by the parties to the agreement or contract must clearly identify the lead entity that is responsible for implementing the small works roster provisions.

1.4.5 Electronic Rosters: In addition to paper and/or electronic rosters kept on file, the District may also use the state wide electronic database developed and maintained jointly by the Daily Journal of Commerce and the Municipal Research and Services Center of Washington.

1.4.6 Telephone or Written Quotations: The District shall obtain telephone, written or electronic quotations for public works contracts from contractors on the small works roster to assure that a competitive price is established and to award contracts to the lowest responsible bidder, as defined in RCW 43.19.1911(9) as follows:

- a. A contract awarded from a small works roster need not be advertised. Invitations for quotations shall include an estimate of the scope and nature of the work to be performed as well as materials and equipment to be furnished. However, detailed plans and specifications need not be included in the invitation. This paragraph does not eliminate other requirements for architectural or engineering approvals as to quality and compliance with building codes.
- b. Quotations may be invited from at least five, or all, appropriate contractors on the small works roster in a manner that will equitably distribute the opportunity among the contractors on the roster. If the estimated cost of the work is from one hundred-fifty thousand dollars (\$150,000) to three hundred thousand dollars (\$300,000), the District may choose to solicit bids from less than all the appropriate contractors on the appropriate small works roster but must also notify the remaining contractors on the appropriate small works roster that quotations on the work are being sought. The District has the sole option of determining whether this notice to the remaining contractors is made by:
 - i. publishing notice in a legal newspaper in general circulation in the area where the work is to be done;
 - ii. mailing a notice to these contractors; or
 - iii. sending a notice to these contractors by facsimile or other electronic means.
- c. For purposes of this resolution, "equitably distribute" means that the District may not favor certain contractors on the small works roster over other contractors who perform similar services. At the time bids are solicited, the District representative shall not inform a contractor of the terms or amount of any other contractor's bid

for the same project;

- d. A written record shall be made by the District representative of each contractor's bid on the project and of any conditions imposed on the bid. Immediately after an award is made, the bid quotations obtained shall be recorded, open to public inspection, and available by telephone inquiry.

1.4.7 Limited Public Works Process: If construction, alteration, repair, or an improvement project is estimated to cost less than thirty-five thousand dollars (\$35,000), the District may award such a contract using the limited public works process provided under RCW 39.04.155, subsection (3). The District will solicit electronic or written quotations from a minimum of three contractors from the small works roster and shall award the contract to the lowest responsible bidder as defined under RCW 43.19.1911(9).

1.4.8 Determining Lowest Responsible Bidder: The District shall award the contract for the public works project to the lowest responsible bidder provided that, whenever there is a reason to believe that the lowest acceptable bid is not the best price obtainable, all bids may be rejected and the District may call for new bids. RCW 43.19.1911(9) states:

In determining 'lowest responsible bidder', in addition to price, the following elements shall be given consideration:

- a. The ability, capacity, and skill of the bidder to perform the contract or provide the service required;
- b. The character, integrity, reputation, judgment, experience, and efficiency of the bidder;
- c. Whether the bidder can perform the contract within the time specified;
- d. The quality of performance of previous contracts or services;
- e. The previous and existing compliance by the bidder with laws relating to the contract or services;
- f. Such other information as may be secured having a bearing on the decision to award the contract.

1.4.9 Award: The Secretary Manager or his/her designee shall present all telephone quotations/bids and recommendation for award of the contract to the lowest responsible bidder to the Board of Directors. However, for public works projects under twenty-five thousand dollars (\$25,000) the Secretary Manager shall have the authority to award public works contracts without Board of Directors approval, provided that the Board of Directors shall ratify the Secretary Manager's approval at the next scheduled Board of Directors meeting. For public works projects over twenty-five thousand dollars (\$25,000) the Board of Directors shall award all public works contracts by resolution.

1.5 Investment Policy:

- a. It is the policy of the Lake Chelan Reclamation District to invest public funds in a manner which will provide maximum security with the highest investment return while meeting the daily cash flow demands of the District and conforming to all state and local statutes governing the investment of public funds.
- b. The purpose of this Investment Policy is to establish the investment objectives, delegation of authority, standards of prudence, eligible investments and transactions, internal controls, reporting requirements, and custodial procedures necessary for the prudent management and investment of the funds of Lake Chelan Reclamation District.

1.5.1 Scope: This investment policy applies to all financial assets of the Lake Chelan Reclamation District and include all monies in the General Fund or any new fund created by the Lake Chelan Reclamation District Board of Directors, unless specifically exempted.

1.5.2 Prudence: Investments shall be made with judgement and care, and in the context of managing an overall portfolio. Investments are not for speculation, but for investment, considering the probable safety of the capital as well as the probable outcome to be derived. The investment officer shall act in accordance with the investment policy.

- 1.5.3 Objective: The primary objectives in the District's investment activities shall be:
- a. Safety: Safety of the principal is the foremost objective of the investment program. Investments shall be undertaken in a manner that seeks to ensure the preservation of capital in the overall portfolio.
 - b. Liquidity: The District's investment portfolio will remain sufficiently liquid to enable the District to meet all operating requirements that might be reasonably anticipated.
 - c. Return on Investment: The District's investment portfolio shall be designed with the objective of attaining a market rate of return throughout budgetary and economic cycles.

1.5.4 Delegation of Authority: Authority to manage the Lake Chelan Reclamation District's investment program is hereby delegated to the Secretary-Manager-Treasurer. The Secretary-Manager-Treasurer shall be responsible for all transactions undertaken and shall establish a system of controls to regulate the activities of subordinate officials.

1.5.5 Authorized and Suitable Investments: The Lake Chelan Reclamation District is empowered to invest in the following types of securities:

- a. Savings on time accounts, including certificates of deposit, in designated qualified public depositories, commercial banks, savings and loan associations, and mutual savings banks doing business in this state in accordance with RCW 39.58, in an amount not in excess of FDIC or FSLIC insurance coverage.
- b. Certificates, notes, or bonds of the United States, or other obligations of the U.S. government or its agencies.

- c. Federal home loan bank notes and bonds and land bank bonds.
- d. Bonds of the state of Washington and any local government in the state of Washington that carry one of the three highest ratings of a nationally recognized rating agency.
- e. Shares of money market funds with portfolios consisting of securities otherwise authorized by law for investment by local governments.
- f. Washington State Local Government Investment Pool.

1.5.6 Safekeeping and Custody: All security transactions entered into by the District shall be conducted on a delivery-versus-payment basis. Securities purchased by the entity will be delivered against the payment and held in a custodial safekeeping account. The Secretary-Manager-Treasurer will designate a third party custodian and safekeeping receipts will evidence all transactions.

1.5.7 Maximum Maturities: To the extent possible, the District will attempt to match its investments with anticipated cash flow requirements. The District will not directly invest in securities maturing more than five (5) years from date of purchase.

1.5.8 Internal Controls: The transactions will be audited by the Washington State Auditor's Office, in accordance with its biennial audit of the District.

1.5.9 Reporting: The Secretary-Manager-Treasurer shall provide the District's Board of Directors with periodic accurate and meaningful reporting of the investment portfolio. The reporting will include, but not limited to, average life and final maturity of each investment, earnings rate, par and market value.

1.6 Small and Attractive Assets:

1.6.1 Purpose: The following policy and procedure documents a small and attractive assets system designed to ensure control over items that may not be noticed immediately after their disappearance. The intent of this policy is to obtain accountability over items that do not meet the criteria of a fixed asset and would NOT be noticed immediately upon disappearance or replacement.

1.6.2 Policy: It is the policy of the Lake Chelan Reclamation District to maintain accountability over all tangible items that may have the likelihood of disappearing without being noticed. The Deputy Treasurer shall maintain records to be verified by the Field Supervisor, or his designee, with a physical inventory. The Deputy Treasurer will monitor and record differences between years.

- a. General: A small and attractive item is an item that is priced under the \$5,000 criteria for fixed assets, that is priced over \$500, and has a life expectancy of more than one year. This item also is not likely to be missed immediately upon disappearance and could be replaced without suspicion. Examples include, but are not limited to: projectors, shop tools, laptops, mobile power equipment, etc. This

would not include more permanent fixtures such as desks, tables and shelving, and specifically excludes small tools and minor equipment such as shovels, hand tools, supplies, etc.

- b. Asset Identification: The asset list will contain the serial number, model or other identifying information. Each piece of property will be tagged with the District's name, city and telephone number. Tags will be removed only when the item is sold, scrapped, or otherwise disposed of.

1.6.3 Procedures:

- a. Additions: Lake Chelan Reclamation District may acquire property via purchase, construction, donation, or lease. Regardless of how it is acquired, when the property is received, either at date of acquisition or within the same calendar year, the Deputy Treasurer will add it to the Small & Attractive Assets Inventory List and mark the item with the District's name, city and telephone number tags.
- b. Deletions: Items previously acquired will eventually be disposed of and need to be deleted from the District's list. Deletions may be required due to a sale of the asset, scrapping, mysterious disappearance (lost), or involuntary conversion (fire, flood, theft, etc.) The Field Supervisor, or his designee, will determine when an asset is to be removed from the list. If an item is deleted, the Field Supervisor, or his designee, will note the reason and/or means of disposal and inform the Deputy Treasurer to have the reason added to the Notes section of the Small & Attractive Assets Inventory List.

1.7 Financial Management Policies – adopted July 14, 2020

1.7.1 Statement of Purpose: The financial integrity of Lake Chelan Reclamation District (the "District") is of utmost importance. To discuss, write, and adopt a set of financial management policies is a key element to maintaining this integrity. The set of policies within this document serve as a central reference point of the most important of our policies, which are critical to the continued financial health of our local government.

Written, adopted financial management policies have many benefits, such as assisting the elected officials and staff in the financial management of the municipality, saving time and energy when discussing financial matters, engendering public confidence, and providing continuity over time as elected officials and staff members change. While these policies will be amended periodically, they will provide the basic foundation and framework for many of the issues and decisions facing Lake Chelan Reclamation District. They will promote sound financial management and assist in the District's stability, efficiency, and effectiveness.

1.7.2 Financial Goals

Our financial goals seek to:

- Ensure the financial integrity of the municipality

- Manage the financial assets in a sound and prudent manner
- Improve financial information for decision makers at all levels:
- Policy makers as they contemplate decisions that affect the municipality on a long- term basis
- Managers and staff as they implement policy on a day-to-day basis
- Maintain and further develop programs to ensure the long-term ability to pay all costs necessary to provide the level and quality of service required by the citizens
- Maintain a spirit of openness and transparency while being fully accountable to the public for the District's fiscal activities

1.7.3 Financial Policies

Lake Chelan Reclamation District financial management policies address the following major areas:

- | | |
|--------------------------------|--|
| I. General Policies | VII. Debt Policies |
| II. Revenue Policies | VIII. Communication Policy |
| III. Expenditure Policies | IX. Compliance Policy |
| IV. Operating Budget Policies | X. Investment & Cash Management Policies |
| V. Capital Management Policies | XI. Reserve Policies |
| VI. Accounting Policies | |

These policies may be addressed in this policy or separate policies, including but not limited to a Post-Issuance Compliance Policy for Bonds.

I. General Policies

1. Lake Chelan Reclamation District may adopt resolutions to set financial policies to assure the financial strength and accountability of the District.
2. The Secretary-Manager shall develop administrative directives and general procedures for implementing the Board of Directors' financial policies.
3. All Departments will share in the responsibility of meeting policy goals and ensuring long-term financial health. Future service plans and programs will be developed to reflect current policy directives, projected resources, and future service requirements.
4. To attract and retain employees necessary for providing high quality services, the District shall establish and maintain a competitive compensation and benefit package.
5. Efforts will be coordinated with other governmental agencies to achieve common policy objectives, share the cost of providing governmental services on an equitable basis, and support favorable legislation at the state and federal level.
6. Initiate, encourage, and participate in economic development efforts to create job opportunities and strengthen the local economy.
7. The District will strive to maintain fair and equitable relationships with its contractors and suppliers.

II Revenue Policies

Design, maintain, and administer a revenue system that will assure a reliable, equitable, diversified, and sufficient revenue stream to support desired services.

General Revenues

1. Current expenditures will be funded by current revenues. The District will try to maintain a diversified and stable revenue system to protect programs from short-term fluctuations in any single source.
2. Budgeted revenues will be estimated conservatively.
3. Operations and Maintenance Funds and other unrestricted revenues will not be earmarked for specific purposes, activities or services unless otherwise authorized by the Board of Directors or required by law, or the accepted accounting practices stated in the BARS manual prescribed by the Washington State Auditor's office. All non-restricted revenues will be deposited into the Construction Fund and utilized by the District in accordance with the approved budget and/or Board of Directors approval.
4. If revenues from "one-time" or limited duration sources are used to balance the annual operating budget, it is to be fully disclosed and explained at the time the budget is presented. It is the District's goal to not rely on these types of revenues to balance the operating budget.
5. The District will not use deficit financing and borrowing to support on-going operations in the case of long-term (greater than one year) revenue downturns. Revenue forecasts will be revised, and expenses will be reduced to conform to the revised long-term revenue forecast or revenue increases will be considered.
6. The District will follow an aggressive and professional policy of collecting revenues. When necessary, discontinuing service, foreclosure, liens and other methods of collection, such as imposing penalties and late charges, may be used.

Fees and Charges

1. Enterprise operations will be self-supporting.
2. The District will maximize the use of service users' charges and subsidies from other District funds, for services that can be identified and where costs are directly related to the level of service provided.
 - a. Charges for providing utility services shall be sufficient to finance all operating, capital outlay, and debt service expenses of the District's enterprise funds, including operating contingency, planned capital improvements, and reserve requirements.
 - b. Other reimbursable work performed by the District (labor, contracted services, equipment and other indirect expenses) shall be billed at actual or estimated actual cost.

- c. Charges for services shall accurately reflect the actual or estimated cost of providing a specific service. The cost of providing specific services shall be recalculated periodically, and the fee adjusted accordingly. The District shall maintain a current schedule of fees and charges, showing when the fees were last reviewed and/or recalculated. Fees and charges, and utility rates will be reviewed annually.
- d. The District will consider market rates and charges levied by other municipalities for like services in establishing rates, fees, and charges.
- e. Certain fees, such as rental fees, will be based upon market conditions and are not subject to the limitations of cost recovery

Grants and Gifts

1. Grant funding for programs or items which address the District's current priorities and policy objectives should be considered to leverage District funds. Inconsistent and/or fluctuating grants should not be used to fund on-going programs.
2. Before accepting any grant, the District shall thoroughly consider the implications in terms of ongoing obligations that will be required in connection with acceptance of said grant.
3. All grants and other federal and state funds shall be managed to comply with the laws, regulations, and guidance of the grantor, and all gifts and donations shall be managed and expended in accordance with the wishes and instructions of the donor.

Proprietary Funds

Operations and Maintenance Funds: The Operations and Maintenance Funds are the primary operating accounts and are used for the payment of operating and maintenance expenses, including labor costs related to the day-to-day operation of the District.

Construction Funds: The Construction Funds are used for the construction of capital projects and may be used for debt payments as approved by the Board of Directors.

Debt Service Funds: Revenue Bond Accounts are maintained to pay the principal and interest payments associated with bond issues. Monies are transferred from the Operations & Maintenance Funds in the amount of the debt service payment(s) to the related Revenue Bond Account when required by Bond documents.

Bond Reserve Funds: The Bond Reserve Fund is maintained to meet bond covenants and to provide an additional source to draw upon if an unforeseen revenue decrease occurs when required by Bond documents.

Cash Drawer: The District's Cash Drawer shall be balanced, and funds deposited to the Depository Account when the cumulative amount exceeds \$2,500. Additional deposits may be made at the discretion of the District employees. Any out-of-balance conditions (Cash Over/Short) shall be immediately reported to the Secretary-Manager, reviewed, and posted. Cash

over/short conditions of more than \$100 shall be reported to the Board of Directors no later than the next regular Board meeting.

Depository Account: All monies collected from customers are receipted and deposited into the Depository main account at the District's Bank. All District funds received shall be deposited within one business day of receipt, except when staffing levels are inadequate to timely make such deposits, but in such event such deposits shall be made as soon as possible.

Fund Balance and Maintenance of Minimum Reserve Levels: The District shall strive to maintain adequate fund balances (reserves) in order to provide sufficient cash flows to meet operating and capital expenses, while also providing the financial ability to address economic downturn and system emergencies. Operating expenditures shall include salaries, benefits, supplies, professional services, intergovernmental and interfund expenses, capital outlays and transfers.

1. Unrestricted Cash Reserve – The District's goal is to maintain an unrestricted cash reserve that is equivalent to 6 months of operating expenditures or greater. (The Unrestricted Cash Reserve goal of 6 months or greater, include the Operations & Maintenance Funds and the Construction Funds).
2. Bond Reserve Fund – The Bond Reserve Fund is a restricted fund and may be legally required for specific debt issues subject to the determination by the Secretary-Manager. Bond Reserve Funds will be established in accordance with the legal covenants of the debt issue. The Bond Reserve Fund may be funded from bond proceeds, purchase of a Surety Policy from a bond insurance company, or surplus cash that is available.

Parity Debt Service Coverage Ratio of 2.00X or higher

The District shall strive to maintain a minimum target goal for “parity debt service coverage ratio” (gross revenue of the utilities less operating and maintenance expenses (not including depreciation, taxes and debt payments) of 2.00 times or higher on the combined parity annual debt service payments.

Use of General Accepted Rate Setting Methods

The analysis associated with “generally accepted” rate-setting techniques includes the following:

1. Revenue Requirement Analysis – Establishes the overall level of financial and rate needs of the District.
2. Cost of Service Analysis – Design rates to collect the appropriate level of revenue and to meet the goals and policies of the District.
3. The water and sewer rate structure shall be designed to work toward encouraging conservation and efficient use of resources and discourage excessive or wasteful usage.

4. As appropriate, the connection charges shall be established at a level to ensure that all customers seeking to connect to the District's system shall bear their equitable share of the cost of the system.
5. Rates and connection fees shall be reviewed annually to ensure sufficient revenues.
6. Updates to the District's internal rates and fees study will be reviewed annually to update assumptions to ensure long-term solvency and viability of the District's utilities.
7. The District shall track and maintain asset records for all new additions, replacements or retirement of assets on a yearly basis. This information shall be maintained on an on-going basis in an asset management spreadsheet and report.

III. Expenditure Policies

Identify priority services, establish appropriate service levels, and administer the expenditure of available resources to assure fiscal stability and the effective and efficient delivery of services.

1. The District will strive to adopt an annual budget in which current expenditures do not exceed current projected revenues. Capital expenditures may be funded from one-time revenues.
2. Department managers are responsible for managing their budgets within the total appropriation for their department.
3. The District will take immediate corrective actions if at any time during the fiscal year expenditure and revenue re-estimates are such that an operating deficit is projected at year-end. Corrective actions can include a hiring freeze, expenditure reductions, fee increases, or use of contingencies. The District may approve a short-term interfund loan or use of one-time revenue sources to address temporary gaps in cash flow, although this will be avoided if possible.
4. Long-term debt or bond financing shall not be used to finance current operating expenditures.
5. The District will assess funds for services provided internally by other funds. Interfund service fees charged to recover these costs will be recognized as revenue to the providing fund.
6. Emphasis will be placed on improving individual and work group productivity rather than adding to the work force. The District may invest in technology and other efficiency tools to maximize productivity. The District may hire additional staff only after the need for such positions has been demonstrated and documented.
7. All compensation planning will focus on the total costs of compensation which includes direct salary, health care benefits, pension contributions, and other benefits which are a cost to the District.

8. Periodic comparisons of service delivery will be made to ensure that quality services are provided to our citizens at the most competitive and economical cost. Privatization and contracting with other governmental agencies will be evaluated as alternatives to service delivery where appropriate. Programs that are determined to be inefficient and/or ineffective shall be reduced in scope or eliminated.
9. The District will make every effort to maximize any discounts offered by creditors/vendors.

IV. Operating Budget Policies

1. The District will adopt and maintain a balanced annual operating budget.
2. The District will strive to adopt a budget where current annual operating revenues will be equal to or greater than current operating expenditures.
3. Balanced revenue and expenditure forecasts will be prepared to examine the District's ability to absorb operating costs due to changes in the economy, service demands, contractual obligations, and capital improvements. The forecast will encompass six years and will be updated annually.
4. In the event a balanced budget is not attainable, and the cause of the imbalance is expected to last for no more than one year, the planned use of reserves to balance the budget is permitted. In the event that a budget shortfall is expected to continue beyond one year, the planned use of reserves must be developed as part of a corresponding strategic financial plan to close the gap through revenue increases or expenditure decreases.
5. Any year-end operating surpluses will revert to unappropriated balances for use in maintaining reserve levels set by policy and will be available for capital expenditures and/or "one-time" only expenditures.
6. The District will provide for adequate maintenance and the orderly replacement of capital assets and equipment.
7. The operating budget shall serve as the annual financial plan for the District. It will serve as the policy document of the District for implementing the Board of Directors' goals and objectives. The budget will provide the staff and resources necessary to accomplish the determined service levels.
8. The Secretary-Manager shall present a draft annual operating budget to the Directors by the November board meeting. The Board of Directors must adopt a final balanced budget no later than December 31.
9. Funds may not be expended or encumbered for the following fiscal year until the budget has been adopted by the Board of Directors.
10. Budget control and accountability is maintained at the departmental level.

11. The Secretary-Manager has the authority to approve appropriation transfers between programs or departments within a fund. In no case may total expenditures of a particular fund exceed that which is appropriated by the Board of Directors without a budget amendment. Amendments to the budget are approved by the Board of Directors.

V. Capital Management Policies

Review and monitor the state of the District's capital equipment and infrastructure, setting priorities for its replacement and renovation based on needs, funding alternatives, and availability of resources.

Capital Improvement Plan:

1. The District may develop a Capital Improvement Plan (CIP) which is consistent with the District's Water & Sewer Comprehensive Plan. The CIP Plan shall be for a period of 6 to 10 years.
2. The CIP will include all projects to maintain public capital facilities required to maintain service levels at standards established by the District. It may also include for consideration such other projects as requested by the Directors.
3. The CIP will provide details on each capital project plan including estimated costs, sources of financing and a full description of the project.
4. The District will finance only those capital improvements that are consistent with the adopted CIP and the District's priorities. All capital improvement, operating and maintenance costs will be included in operating budget forecasts.
5. A status review of the CIP will be conducted annually, and a report will be presented by the Secretary-Manager or his/her designee to the Directors.

Capital Asset Management

1. The District will maintain its capital assets at a level adequate to protect the capital investment and to minimize future maintenance and replacement costs. The budget will provide for adequate maintenance and orderly replacement of capital assets from current revenues where possible.
2. The capitalization threshold used in determining if a given asset qualifies for capitalization is \$5,000 per item with a useful life in excess of five years. All small and attractive assets under the \$5,000 threshold shall have an assigned asset number when placed into service and shall be listed on the Small and Attractive Asset Inventory List, during its useful life.
3. The Secretary-Manager and/or the Deputy Treasurer will conduct an annual physical count/inspection of all capital assets.

4. Adequate insurance will be maintained on all capital assets consistent with the results of the annual physical count/inspection.

VI. Accounting Policies

Comply with prevailing federal, state, and local statutes and regulations. Conform to a comprehensive basis of accounting in compliance with Washington State statutes and BARS Manual.

1. The District uses a basis of accounting allowed within the Washington State BARS Manual.
2. The District will maintain expenditure categories according to state statute and administrative regulation. The District will use the "Budgeting, Accounting & Reporting System" (BARS) prescribed by the State Auditor for its revenue and expenditure classification.
3. Monthly budget reports showing the current status of revenues and expenditures will be prepared and presented to the Directors. Board approved budgets will be available for public inspection on the District's website.
4. Monthly financial updates will be presented to the Directors.
5. Electronic financial systems will be maintained to monitor revenues, expenditures, and program performance on an ongoing basis.
6. The Annual Financial Report will be prepared and submitted to the State Auditor's Office no later than 150 days from the end of the preceding fiscal year.
7. The Annual Financial Report will be prepared in compliance with Washington State statutes and the BARS manual prescribed by the State Auditor. The report will provide full disclosure of all financial activities and related matters.
8. A financial and accountability audit (i.e., accountability for public resources and compliance with state laws and regulations and its own policies and procedures) shall be performed at least once every two years by the Washington State Auditor's Office, which will issue an official opinion on the comparative financial statements, as currently performed.
9. The District's budget should satisfy criteria as a financial and programmatic policy document, as a comprehensive financial plan, as an operations guide for all organizational units, and as a communications device for all significant budgetary issues, trends and resources.

VII. Debt Policies

Establish guidelines for debt financing that will provide needed capital equipment and infrastructure improvements while minimizing the impact of debt payments on current revenues.

Purpose and Overview: The Debt Policy for the District is established to help ensure that all debt is issued both prudently and cost effectively. The Debt Policy sets forth comprehensive guidelines for the issuance and management of all financings. Adherence to the policy is essential to ensure that the District maintains a sound debt position and protects the credit quality of its obligations.

Capital Planning: The District shall integrate its debt issuance with its Capital Improvement Program (CIP) spending to ensure that planned financing conforms to policy targets regarding the level and composition of outstanding debt. This planning considers the long-term horizon, paying particular attention to financing priorities, capital outlays and competing projects. Long term borrowing shall be confined to the acquisition and/or construction of capital improvements and shall not be used to fund operating or maintenance costs. For all capital projects under consideration, the District shall set aside sufficient revenue from operations to fund ongoing normal maintenance needs and to provide reserves for periodic replacement and renewal. The issuance of debt to fund operating deficits is not permitted.

Legal Governing Principles: In the issuance and management of debt, the District shall comply with the state constitution and with all other legal requirements imposed by federal, state, and local rules and regulations, as applicable.

1. State Statutes – The District may contract indebtedness as provided for by State law, subject to any limitations on indebtedness.
2. Federal Rules and Regulations – The District shall issue and manage debt in accordance with the limitations and constraints imposed by federal rules and regulations including the Internal Revenue Code of 1986, as amended; the Treasury Department regulations there under; and the Securities Acts of 1933 and 1934.
3. Local Rules and Regulations – The District shall issue and manage debt in accordance with the limitations and constraints imposed by local rules, policies, and regulations.

Roles & Responsibilities

The Board of Directors shall:

1. Approve indebtedness;
2. Approve appointment of the bond underwriter and bond counsel;
3. Approve the Financial Management Policy, including the section on the Debt Policy;
4. Approve budgets sufficient to provide for the timely payment of principal and interest on all debt; and

The Secretary-Manager and/or Deputy Treasurer in consultation with the Directors shall:

1. Assume primary responsibility for debt management
2. Provide for the issuance of debt at the lowest possible cost and risk;

3. Provide for the issuance of debt at appropriate intervals and in reasonable amounts as required to fund approved capital expenditures;
4. Recommend to the Directors the manner of sale of debt;
5. Monitor opportunities to refund debt and recommend such refunding as appropriate.
6. Comply with all Internal Revenue Service (IRS), Securities and Exchange (SEC), and Municipal Securities Rulemaking Board (MSRB) rules and regulations governing the issuance of debt.
7. Provide for the timely payment of principal and interest on all debt and ensure that the fiscal agent receives funds for payment of debt service on or before the payment date;
8. Provide for and participate in the preparation and review of offering documents;
9. Comply with all terms, conditions and disclosure required by the legal documents governing the debt issued;
10. Submit to the Directors all recommendations to issue debt;
11. Provide for the distribution of pertinent information to rating agencies;
12. Comply with undertakings for ongoing disclosure pursuant to SEC Rule 15c2-12
13. Apply and promote prudent fiscal practices.

Ethical Standards Governing Conduct: The members of the District staff will adhere to the standards of conduct as stipulated by the Public Records Act, RCW 42.56, and Ethics in Public Service, RCW 42.52, as applicable.

Types of Debt Instruments:

The District may utilize several types of municipal debt obligations to finance long-term capital projects.

1. Revenue Bonds – The District shall use Revenue Bonds as permitted under State law for the purpose of financing construction or improvements to facilities of enterprise (i.e., utility) systems operated by the District in accordance with the Capital Improvement Plan.
2. Special Assessment/Utility Local Improvement District Bonds – The District shall use Special Assessment Bonds as permitted under State law for the purpose of assuring the greatest degree of public equity in place of general obligation bond where possible.
3. Utility Local Improvement District (ULID) Bonds represent debt that is repaid by the property owners who specifically benefit from the capital improvements through annual assessments paid to the District. ULID's are formed by the District after a majority of property owners agree to the assessment. No taxing power or general fund pledge is provided as security, and ULID Bonds are not subject to statutory debt limitations. The debt is backed by the value of the property within the LID and a LID Guaranty Fund, as required by State Law.
4. Short Term Debt – The District may use short term debt as permitted by State law for the purpose of meeting any lawful purpose of the municipal corporation, including the

immediate financing needs of a project for which long term funding has been secured but not yet received. The District may use inter-fund loans rather than outside debt instruments to meet short-term cash flow needs for the project. Inter-fund loans will be permitted only if an analysis of the affected fund indicates excess funds are available and the use of the funds will not impact the fund's current operations. All inter-fund loans will be subject to Director approval and will bear interest at prevailing rates.

5. Leases – The District is authorized to enter into capital leases under State law, subject to the approval of the Directors.
6. Public Works Trust Fund Loans – The District shall use Public Works Trust Fund Loans as provided under State law for the purpose of repairing, replacing or creating domestic water systems and sanitary sewer systems.

General Requirements

1. The District will not use long-term debt to pay for current operations. The use of bonds or certificates of participation will only be considered for significant capital and infrastructure improvements.
2. The term of the debt shall never extend beyond the useful life of the improvements to be financed.
3. The general policy of the District is to establish debt repayment schedules that use level annual principal and interest payments.
4. Interest earnings on bond proceeds will be limited to 1) funding the improvements specified in the authorizing bond resolution, or 2) payment of debt service on the bonds.
5. Proceeds from debt will be used in accordance with the purpose of the debt issue. Funds remaining after the project is completed will be used in accordance with the provisions stated in the bond resolution that authorized the issuance of the debt.
6. The District will use the most prudent methods of acquiring capital outlay items, including the use of lease-purchase agreements. In no case will the District lease-purchase equipment whose useful life is less than the term of the lease.
7. The District will maintain its bond rating at the highest level fiscally prudent, so that future borrowing costs are minimized and access to the credit market is preserved. The District will encourage and maintain good relations with financial bond rating agencies and will follow a policy of full and open disclosure.
8. The District shall use refunding bonds in accordance with the Refunding Bond Act, RCW 39.53. Unless otherwise justified, the District will refinance debt to achieve true savings as market opportunities arise. Refunding debt shall never be used for the purpose of avoiding debt service obligations. A target 5% cost savings (discounted to its present value) over the remainder of the debt must be demonstrated for any “refunding”, unless otherwise justified.

9. With Director approval, interim financing of capital projects may be secured from the debt financing marketplace or from other funds through an inter-fund loan as appropriate in the circumstances.

VIII. Communication Policy

1. It is the policy of the District to remain as transparent as possible.
2. The District shall manage relationships with the rating analysts assigned to the District's credit, using both informal and formal methods to disseminate information.
3. The District's Basic Financial Statements and Management's Discussion & Analysis shall be a vehicle for compliance with continuing disclosure requirements. The Management's Discussion & Analysis may be supplemented with additional documentation as required.
4. The District shall seek to maintain and improve its current bond rating.

IX. Compliance Policy

Investment of Proceeds: The District shall comply with all applicable Federal, State and contractual restrictions regarding the investment of bond proceeds. This includes compliance with restrictions on the types of investment securities allowed, restrictions on the allowable yield of invested funds as well as restrictions on the time period over which some of the proceeds may be invested.

Legal Covenants: The District shall comply with all covenants and conditions contained in governing law and any legal documents entered into at the time of a bond offering.

Periodic Policy Review: At a minimum, the Debt Policy and the Post Issuance Compliance Policy (for Bonds) will be reviewed and updated every five years.

X. Investment and Cash Management Policies

Manage and invest the District's operating cash to ensure its legality, safety, provide for necessary liquidity, avoid imprudent risk, and optimize yield.

1. Cash and Investment programs will be maintained in accordance with District regulations and will ensure that proper controls and safeguards are maintained. District funds will be managed in a prudent and diligent manner with an emphasis on safety of principal, liquidity, and financial return on principal, in that order.
2. The District will develop and adopt an investment policy. Currently the Local Government Investment Pool (LGIP), which is an investment vehicle maintained by the State Treasurer's Office to help local governmental entities achieve higher rates of return by pooling local funds for economies of scale, is the only authorized investment vehicle available to the District.
3. The District will maintain written guidelines on cash handling, accounting, segregation of duties, and other financial matters.

4. Monthly investment reports will be prepared, reviewed and distributed to the Directors showing cash position, and year-to-date budgeted and actual expenditures.
5. The District will conduct bi-annual reviews of its internal controls and cash handling procedures.

XI. Reserve Policies

Maintain the reserves, contingencies, and ending fund balances of the various operating funds at levels sufficient to protect the District's credit as well as its financial position from emergencies.

1. At each fiscal year end the remaining dollars left in each fund that are undesignated and unencumbered constitute available reserves of the District.
2. The District will include all fund balances in the annual budget.

The District will maintain the following:

Unrestricted Cash Reserve - The District's goal is to maintain an unrestricted cash reserve that is equivalent to 6 months of operating expenditures or greater. (The Unrestricted Cash Reserve goal of 6 months or greater include the Operations & Maintenance Funds and Construction Funds).

Operations and Maintenance Funds - The Operations and Maintenance Funds are the primary operating accounts and are used for the payment of operating and maintenance expenses, including labor costs related to the day-to-day operation of the District.

Construction Funds - The Construction Funds are used for the construction of capital projects and may be used for debt payments as approved by the Board of Directors.

Debt Service Funds - Revenue Bond Accounts are maintained to pay the principal and interest payments associated with bond issues. Monies are transferred from the Operations & Maintenance Funds in the amount of the debt service payment(s) to the related Revenue Bond Account when required by Bond documents.

Bond Reserve Funds - The Bond Reserve Fund is maintained to meet bond covenants and to provide an additional source to draw upon if an unforeseen revenue decrease occurs when required by Bond documents.

Additional Reserves - Additional reserve accounts may be created by the District to be set aside for specific purposes or special projects, for known significant future expenditures, or as general operational reserves.

XII. Related Party Transactions Policy

1. PURPOSE/OBJECTIVE. The LCRD Board of Directors (the "Board") recognizes that transactions involving LCRD Board members or employees and parties related to them present an increased risk of conflicts of interest and/or the appearance of

conflict. The Board has adopted this Related Party Transactions Policy which shall be followed in all instances of related party transactions involving the LCRD.

2. DEFINITIONS.

(a) For purposes of this policy, a “relative” or “related party” is defined as:

1. Parent or step-parent
2. Child or step-child
3. Adopted or foster child
4. Daughter-in-law or son-in-law
5. Grandchild
6. Niece or nephew
7. Sibling or step-sister or step-brother
8. Spouse
9. Domestic partner
10. Mother-in-law or father-in-law
11. Grandparent
12. Aunt or Uncle
13. First cousin
14. Domestic partner’s relatives
15. Brother-in-law or sister-in-law

Gender references shall recognize individual identity preferences.

(b) “Related Party Transaction” is any transaction, arrangement or relationship or series of similar transactions, arrangements or relationships with the LCRD (including any indebtedness or guarantee of indebtedness) in which a relative or a party related to an LCRD Board member or employee is involved, including employment relationships.

3. APPROVAL PROCEDURES. Prior to entering into a Related Party Transaction, the Board should review the material facts of such transaction and either approve or disapprove of the entry into such transaction. If advance Board approval of a Related Party Transaction is not feasible, then such transaction should be considered and ratified (if the Board determines it to be appropriate) at the Board’s next regularly scheduled meeting. In determining whether to approve or ratify a Related Party Transaction, the Board will take into account, among other factors it deems appropriate;

- (a) whether the Related Party Transaction is on terms no less favorable than terms generally available to an unaffiliated third-party under the same or similar circumstances;
- (b) the extent of the Related Party’s interest in the transaction; and
- (c) whether the Related Party Transaction is material to the LCRD.

In addition, the Board has delegated to the LCRD Manager the authority to pre-approve or ratify (as applicable) any Related Party Transaction with a Related Party in which the aggregate amount involved is expected to be less than \$1,000. In connection with each regularly scheduled meeting of the Board, a summary of each new Related Party Transaction approved by the Manager, in accordance with this paragraph, should be provided to the Board for its review.

A Board Member shall not participate in any discussion or approval of a Related Party Transaction for which he or she is a Related Party, except that the Board Director should provide all material information concerning the Related Party Transaction to the Board.

If a Related Party Transaction will be ongoing, the Board may establish guidelines for the LCRD's management team to follow in its ongoing dealings with the Related Party. Thereafter, the Board, at least annually, should review and assess ongoing relationships with the Related Party to confirm that they are in compliance with the Board's guidelines and that the Related Party Transaction remains appropriate.

4. ANNUAL REVIEW. A log of approved related party transactions, if any exist, shall be maintained by the LCRD manager and reviewed by the Board periodically, but no less than annually.

XII. Lease Policy

1. DEFINITIONS

- 1.1. **LEASE** – A lease is a contract that conveys control of the right to use another entity's nonfinancial asset (i.e., building, equipment, land) for a period of time for consideration.
- 1.2. **TERM** – The term is the period during which the lessee has a non-cancelable right to use the asset, including extensions that the lessee is reasonably certain to exercise.
- 1.3. **SERVICE COMPONENT** – A service component is an amount of the lease payment paid for services to be provided by the vendor in support of the nonfinancial asset being leased (for example, copier maintenance in a copier lease).

2. GENERAL

- 2.1. **Purpose:** The purpose of this policy is to provide guidelines and procedures to ensure compliance with state and federal requirements surrounding leases. Procedures aim to provide all pertinent information and decision-making input to the finance department so that accounting and reporting may be accomplished according to applicable governmental accounting standards.
- 2.2. **Scope:** The following guidelines apply to operating leases of equipment, buildings, land or any other tangible physical property which the District leases

from a third party. The BARS manual requires accounting for and reporting lease activity on the District's Schedule 09 beginning January 1, 2021.

3. RESPONSIBILITY FOR POLICY

- 3.1. It will be the District's responsibility to review and update this lease policy as needed. Review will include confirming compliance with all related state and federal laws and governmental accounting standards, and compatibility with other District policies.

4. LEASE CRITERIA AND APPROVAL

- 4.1. Approval of lease contracts by Board of Directors: All new lease agreements or lease term extensions shall be reviewed by the District's Board of Directors before approval.
- 4.2. Lease criteria:
 - 4.2.1. The initial term, extensions, and cancellation clauses shall be clearly stated in the lease contract.
 - 4.2.2. For the purpose of determining the term of the lease at inception for accounting purposes, the Manager will make a judgment on whether the total term of the lease should include options to extend (extensions are more likely than not to be exercised by the District or the counterparty). Factors to consider in the likeliness of exercising lease extensions are:
 - 4.2.3. District specific (degree of changing needs, prior pattern of execution of extensions)
 - 4.2.4. Market based (competitive pricing, budget and economy)
 - 4.2.5. Contract based (economic incentives or penalties), and
 - 4.2.6. Underlying asset (obsolescence, aging of asset, new features available).
5. When a service component is part of a lease contract, the vendor shall provide the portion of lease payments that pertains to services.
 - 5.1. Extensions: For leases with extension provisions, the decision authority to extend or terminate each lease will rest with the Manager and District Board of Directors.
 - 5.2. Procurement Standards: The Manager will ensure each lease complies with procurement standards subject to state law and federal uniform grant guidance, if applicable.

CLASSIFICATION OF DOMESTIC USERS

<u>CLASSIFICATION</u>	<u>EQUIVALENT RESIDENTIAL UNITS</u>
1. Single Family Residential Units (on-site, manufactured or modular Construction) – For Accessory Living units see classification #3.	1 ERU
2. Churches	1 ERU
3. Multi-Family Residential Units (duplex, triplex residential dwelling units or condominiums)	1 ERU per dwelling unit, excepting additional living space designated as ‘accessory living’ units and under 1,000 sq. ft shall be 0.5 ERU for hookups and billing
4. Motels (without Restaurants)	1 ERU for the first unit <u>plus</u> 0.5 ERU for each additional unit
5. Commercial Units (on-site, manufactured or modular construction)	1 ERU
6. Nursing Homes, Rest Homes, or Convalescent Homes	1 ERU
7. Offices, Small Retail Establishments and Home Businesses (without food services)	1 ERU
8. Coin Operated or self-service Laundromats	1 ERU
9. Schools; public, parochial and preschools	1 ERU
10. Service Stations	1 ERU <u>plus</u> 1 ERU for trailer/camper sewage dump stations
11. Car Wash	1 ERU
12. Orchard Cabins	0.5 ERU if used less than 6 months per year for agricultural purposes, <u>plus</u> 0.5 ERU if used more than 6 months. Multi- unit used more than 6 months for agricultural purposes are 1.0 ERU for first unit <u>plus</u> 0.5 per each additional unit
13. Worker Housing and H-2A	1 ERU per 10 person occupancy
14. Bowling Alleys	1 ERU
15. Restaurants, Cafes, Taverns, Bakeries, Pizza Parlors and Delicatessens	1 ERU
16. Drive-in Eating Places	1 ERU
17. Shopping Centers	1 ERU

18. Supermarkets and Grocery Stores	1 ERU
19. Small Markets and Convenience Stores	1 ERU
20. Conference Centers and Club Houses	1 ERU
21. Large retail businesses (no food svc)	1 ERU
22. Swimming Pools	1 ERU
23. Apartments	1 ERU for first unit, <u>plus</u> 0.5 ERU for each additional unit
24. Recreational Vehicle or Travel Trailer Courts (Individually Metered)	1 ERU for first pad, <u>plus</u> 0.25 ERU per pad for each additional pad with no more than 1 BR and 400 sq. ft. (without laundry facilities or garbage disposal units); <u>plus</u> 0.25 ERU per pad if used more than 6 months per year or if 2 BR or more, or if more than 400 sq. ft., or with garbage disposal <u>plus</u> 0.5 ERU if with laundry facilities or if used more than 6 months and either 2 BR or more than 400 sq. ft. or garbage disposal
25. Multi-Unit Industrial Parks	1 ERU for first unit <u>plus</u> 0.5 ERU for each additional unit
26. Multi-Office Commercial Buildings	1 ERU for first business, <u>plus</u> 0.5 ERU for each additional business
27. Legion Halls and Grange Halls	1 ERU
28. Boat Moorage Water Service	1 ERU for first slip <u>plus</u> 0.06 ERU for each additional slip if for a marina
29. Mobile Home or Travel Trailer Courts (Master Metered)	1 ERU per dwelling unit <u>plus</u> a \$25 turn-on fee and \$50 refundable deposit

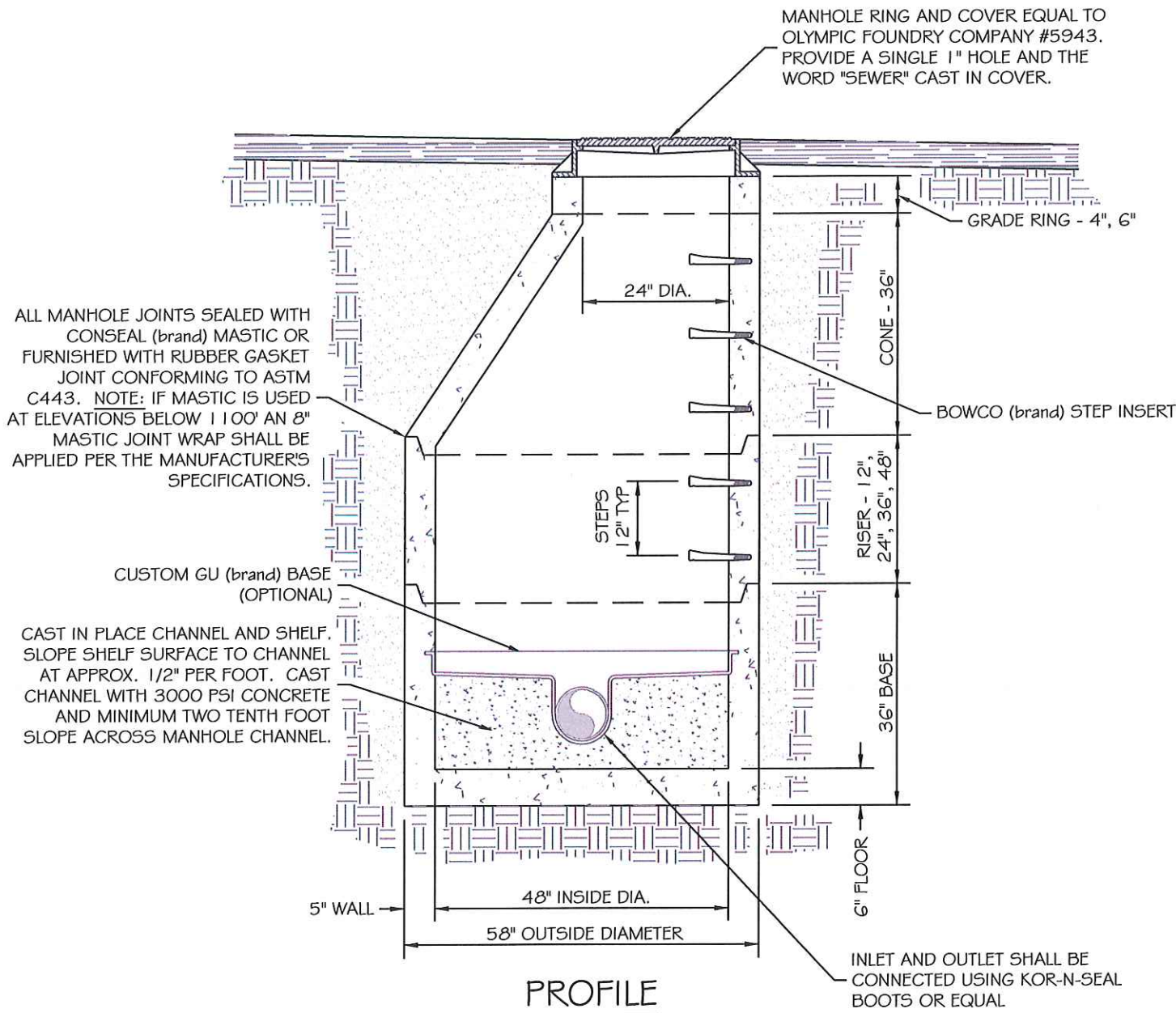
CLASSIFICATION OF SEWER USERS

<u>CLASSIFICATION</u>	<u>EQUIVALENT RESIDENTIAL UNITS</u>
1. Single Family Residential Units (on-site, manufactured or modular Construction) – For Accessory Dwelling units see classification #3.	1 ERU
2. Churches	1 ERU
3. Multi-Family Residential Units (duplex, triplex residential dwelling units or condominiums)	1 ERU per dwelling unit, excepting additional living space designated as 'accessory dwelling' units and 1,000 sq.ft. or less shall be 0.5 ERU for hookups and billing
4. Motels (without restaurants)	1 ERU for the first unit <u>plus</u> 0.5 ERU per for each additional unit
5. Commercial Units (on-site, manufactured or modular construction)	1 ERU
6. Nursing/Rest/Convalescent Homes	2 ERU's <u>plus</u> 0.5 ERU per month
7. Offices, Small Retail Establishments and Home Businesses (w/o food svcs)	1 ERU
8. Coin operated or self-service Laundromats	0.05 ERU per pound of washing machine capacity
9. Schools; public, parochial, and preschools	2 ERU's <u>plus</u> : (Grade Schools) + 0.04 ERU per Pupil and employed personnel; (Jr/Sr High Schools) + 0.06 ERU per pupil and employed personnel
10. Service Stations	1 ERU <u>plus</u> 1 ERU for trailer/camper sewage dump stations
11. Car Wash	3 ERU if properly filtered and recycled, 1 ERU per 5,200 gallons if not
12. Orchard Cabins	0.5 ERU if used less than 6 months per year for agricultural purposes
13. Worker Housing and H-2A	1 ERU per 10 person occupancy
14. Bowling Alleys	2 ERU up to 8 lanes <u>plus</u> 0.5 ERU per lane additional <u>plus</u> 0.015 ERU per seat of seating capacity of restaurant or bar
15. Restaurants, Cafes, Taverns, Bakeries Pizza Parlors and Delicatessens	1 ERU <u>plus</u> 0.015 ERU per seat measured by max seating capacity
16. Drive-in Eating Places	1 ERU <u>plus</u> 1 ERU if restrooms are available for Customers
17. Shopping Centers	2 ERU <u>plus</u> 0.07 ERU per 1000 sq. ft. for retail space over 1000 sq. ft.
18. Supermarkets and Grocery Stores	2 ERU <u>plus</u> 0.07 ERU per 1000 sq. ft. for retail space over 1000 sq. ft. <u>plus</u> 0.5 ERU per garbage disposal
19. Small Markets and Convenience Stores	2 ERU <u>plus</u> 0.07 ERU per 1000 sq. ft. for retail space over 1000 sq. ft. <u>plus</u> 0.5 ERU per garbage disposal. ERU's can be reduced to 1 ERU subject to verification that average monthly water use is at or below 700 cubic feet per month and no garbage disposal units are used

20.	Conference Centers and Club Houses	1.2 ERU's <u>plus</u> 0.6 ERU per kitchen <u>plus</u> 0.5 ERU per garbage disposal <u>plus</u> 0.025 ERU per seat measured by max seating capacity of the conference center or club house
21.	Large retail businesses (no food service)	1 ERU per <u>plus</u> 0.14 ERU per employee per 8-hour shift over 7 employees
22.	Swimming Pools	0.5 ERU per 1500 sq. ft. if tied into sewer
23.	Apartments	1 ERU for first unit, <u>plus</u> 0.5 ERU for each additional unit, <u>plus</u> 0.5 ERU for each additional unit with laundry facilities <u>plus</u> 0.05 ERU per pound of washing machine capacity of commercial laundry facilities
24.	RV or Travel Trailer Court	1 ERU for first pad, <u>plus</u> 0.25 ERU per pad for each additional pad with no more than 1 bedroom and 400 sq. ft. (w/o laundry facility or garbage disposal units) <u>plus</u> 0.25 ERU per pad if used more than 6 months per year or if 2 bedrooms or more or if more than 400 sq. ft. or with garbage disposal <u>plus</u> 0.5 ERU if with laundry facilities or if used more than 6 months and either 2 bedroom or more than 400 sq. ft. or garbage disposal
25.	Multi-unit Industrial Parks	1 ERU for first unit plus 0.5 ERU for each additional unit
26.	Multi-office Commercial Buildings	1 ERU per toilet
27.	Legion Halls and Grange Halls	1 ERU
28.	Trailer/Camper Sewage Dump or Boat Pump-out Sewage Dump	1 ERU
29.	Boat Moorage Sewage Service	1 ERU for first slip <u>plus</u> 0.06 ERU for each additional slip if for a marina.
30.	Industrial Sewage – Off Season (Nov. 1 st to Apr. 20 th only)	ERU's shall be based upon total metered off-season wastewater quantity averaged over a 12-month period calculated on an averaged of 85,775 gallons per ERU per year. Industrial strength shall be limited to a max of 300 ppm BOD ₅ and TSS. O&M fees shall be estimated at the start of each off season and the billing adjusted for the actual flow at the end of each off season. The initial ERUs for hookup fees shall be estimated for the first year and adjusted for billing once at the end of the first season.

Appendix D

Lake Chelan Reclamation District Sanitary Sewer and Lift Station Standards and Details



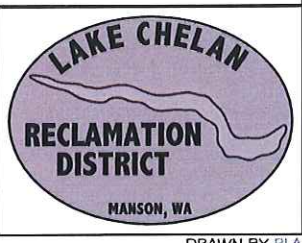
NOTE:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

TYPE I MANHOLE SUPPLIED BY H2 PRE-CAST INC. OR EQUAL.

MANHOLE ASSEMBLY MUST CONFORM WITH WSDOT/APWA STANDARD SPECIFICATIONS.

BACKFILL AND SURFACE RESTORATION SHALL CONFORM TO THE REQUIREMENTS OF THE AGENCY HAVING JURISDICTION OVER THE ROAD RIGHT-OF-WAY.

TITLE	
TYPE I MANHOLE	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
1 OF SET	NO SCALE



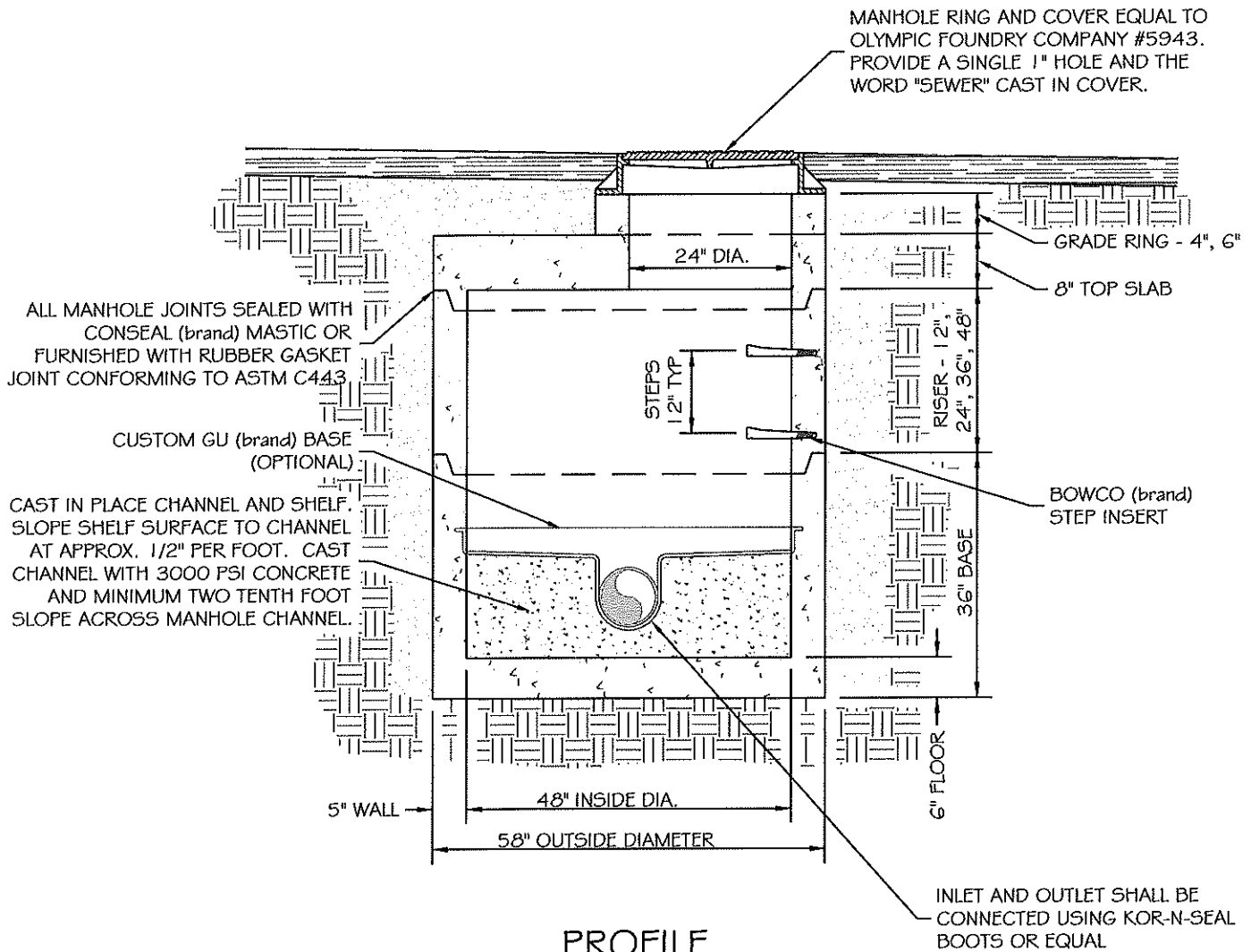
DRAWN BY RIA

03.29.05 SewerDetailsType I manhole.dwg (REV B)



Sewer Details Home II manhole duals (REV A)

03 29 06



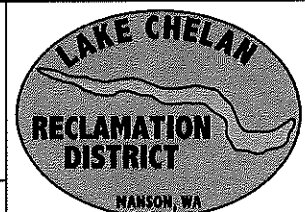
NOTE:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

TYPE III MANHOLE SUPPLIED BY H2 PRE-CAST INC. OR EQUAL.

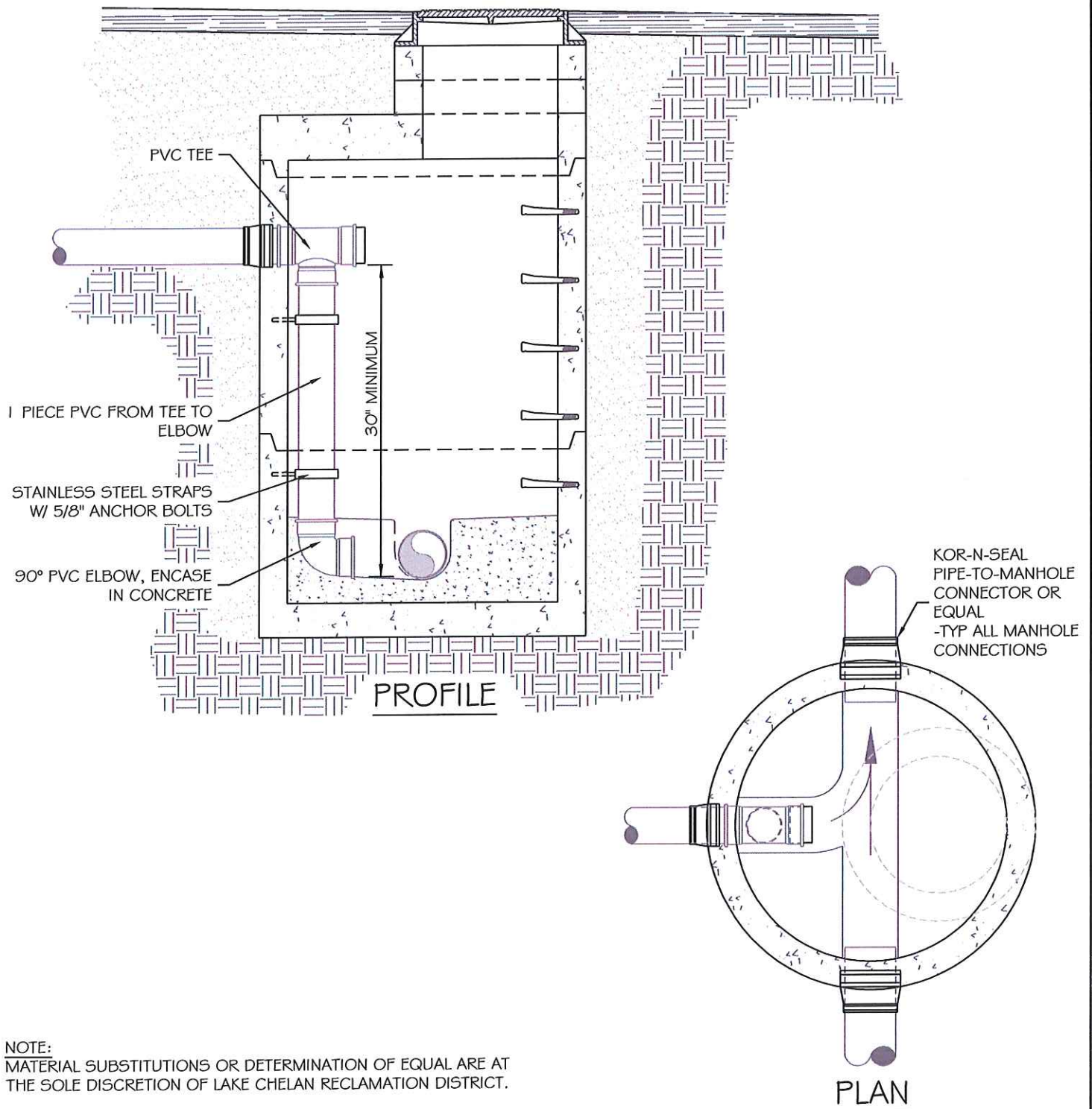
MANHOLE ASSEMBLY MUST CONFORM WITH WSDOT/APWA STANDARD SPECIFICATIONS.

BACKFILL AND SURFACE RESTORATION SHALL CONFORM TO THE REQUIREMENTS OF THE AGENCY HAVING JURISDICTION OVER THE ROAD RIGHT-OF-WAY.

TITLE	
TYPE III MANHOLE	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
3 OF SET	NO SCALE



DRAWN BY R1A



NOTE:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

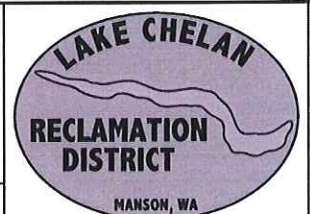
ALL PIPE AND FITTINGS TO BE D3034 GASKETTED SEWER PIPE.

TYPE III MANHOLE SUPPLIED BY H2 PRE-CAST INC. OR EQUAL.

MANHOLE ASSEMBLY MUST CONFORM WITH WSDOT/APWA STANDARD SPECIFICATIONS.

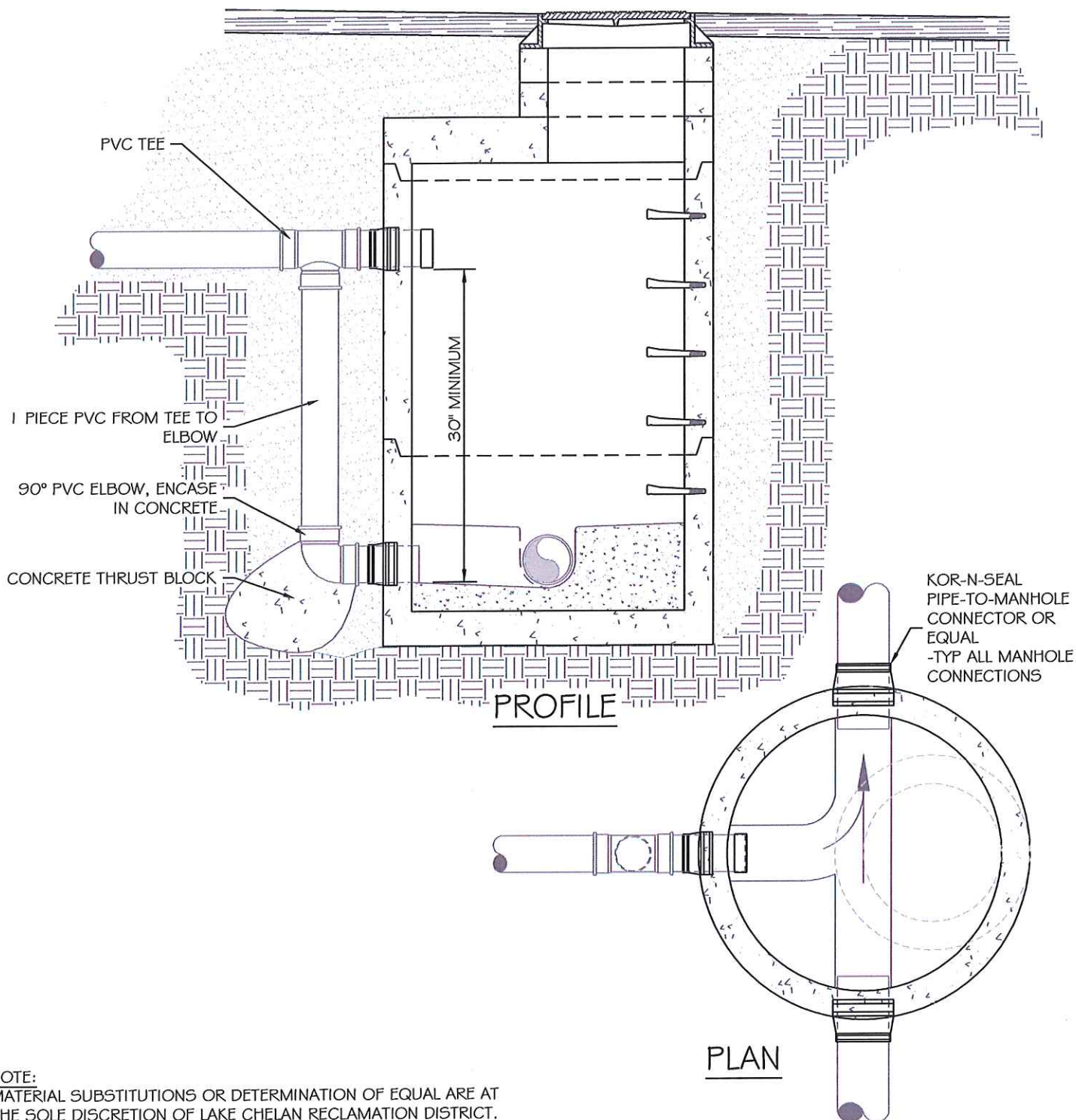
BACKFILL AND SURFACE RESTORATION SHALL CONFORM TO THE REQUIREMENTS OF THE AGENCY HAVING JURISDICTION OVER THE ROAD RIGHT-OF-WAY.

TITLE	
INSIDE DROP MANHOLE	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
4 OF SET	NO SCALE



DRAWN BY R1A

03.28.05 SewerDetailsinside drop manhole.dwg (REV F)



NOTE:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT
THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

ALL PIPE AND FITTINGS TO BE D3034 GASKETTED SEWER PIPE.

TYPE III MANHOLE SUPPLIED BY H2 PRE-CAST INC. OR EQUAL.

MANHOLE ASSEMBLY MUST CONFORM WITH WSDOT/APWA
STANDARD SPECIFICATIONS.

BACKFILL AND SURFACE RESTORATION SHALL CONFORM TO THE
REQUIREMENTS OF THE AGENCY HAVING JURISDICTION OVER THE
ROAD RIGHT-OF-WAY.

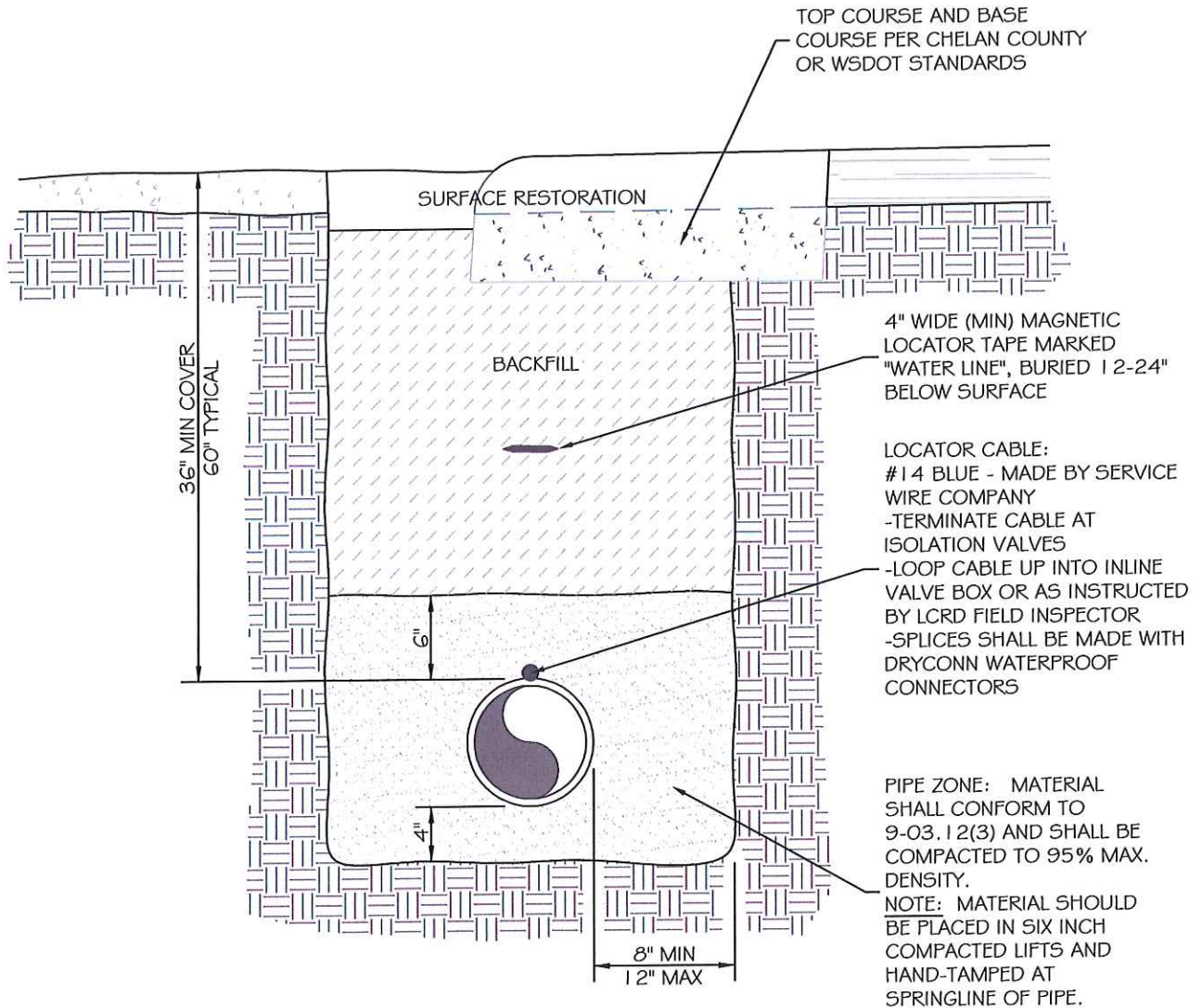
TITLE	
OUTSIDE DROP MANHOLE	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
5 OF SET	NO SCALE



DRAWN BY RIA

03.29.05 SewerDetails\outside drop manhole.dwg (REV F)

CALL 48 HOURS
BEFORE YOU DIG:
Northwest Utility Notification Center
1-800-553-4344

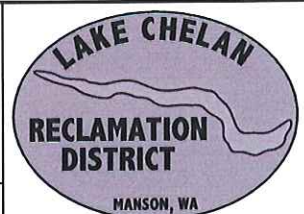


PROFILE

NOTES:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

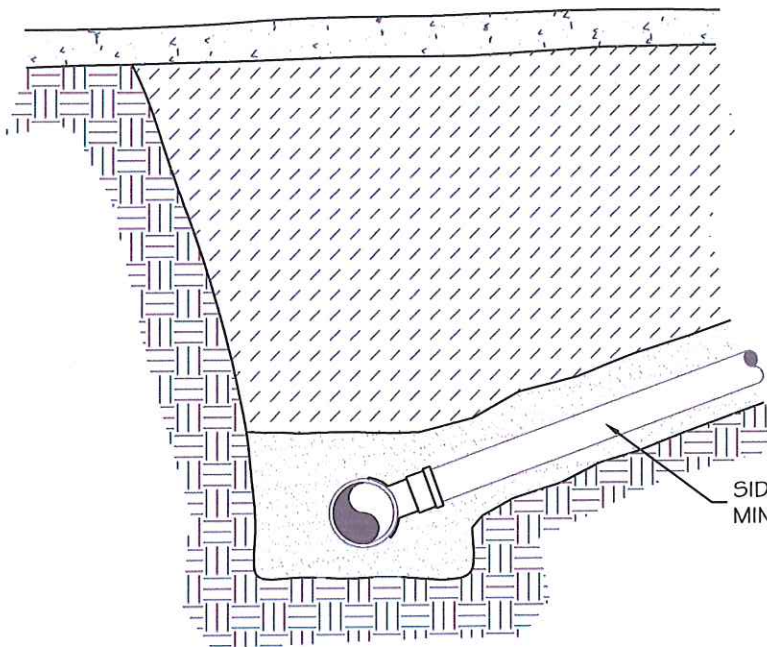
BACKFILL, SURFACE RESTORATION, AND MINIMUM PIPE DEPTH SHALL CONFORM TO THE REQUIREMENTS OF THE AGENCY HAVING JURISDICTION OVER THE ROAD RIGHT-OF-WAY.

TITLE	
TYPICAL TRENCH SECTION	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
6 OF SET	NO SCALE

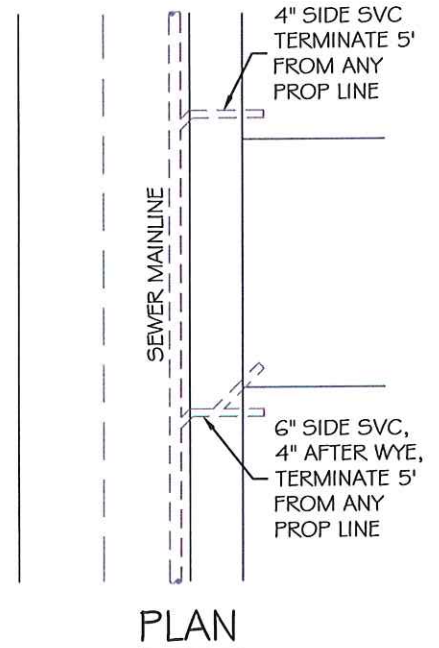


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03.27.06 Domestic\Details\sewer\section.dwg (RFV B)

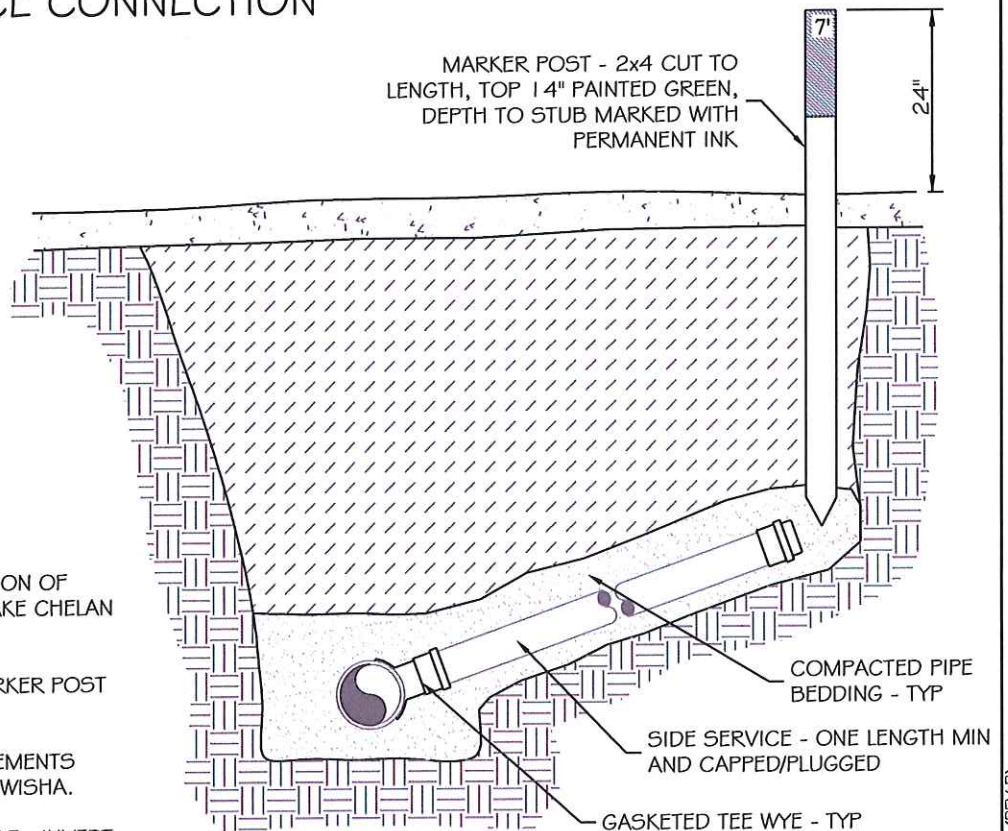


PROFILE - SERVICE CONNECTION



PLAN

MARKER POST - 2x4 CUT TO LENGTH, TOP 14" PAINTED GREEN, DEPTH TO STUB MARKED WITH PERMANENT INK



PROFILE - SERVICE STUBOUT

NOTES:

MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

4" PVC MAY BE SUBSTITUTED FOR 2x4 MARKER POST AND PAINTED AS INDICATED.

DITCH SIDE SLOPES AND SHORING REQUIREMENTS SHALL BE IN COMPLIANCE WITH OSHA AND WISHA.

WHERE SIDE SEWER CONNECTS TO MANHOLE: INVERT OF SIDE SEWER SHALL BE EQUAL TO OR ABOVE MAIN SEWER CROWN, BUT NOT TO EXCEED 18" ABOVE INVERT OF MAIN SEWER.

UNLESS OTHERWISE INDICATED ON PLAN, SIDE SEWER SHALL BE MIN. OF 6' DEEP AT PROPERTY LINE, OR 5' LOWER THAN THE LOWEST HOUSE ELEVATION, WHICHEVER IS LOWER.

BACKFILL, SURFACE RESTORATION, AND MINIMUM PIPE DEPTH SHALL CONFORM TO THE REQUIREMENTS OF THE AGENCY HAVING JURISDICTION OVER THE ROAD RIGHT-OF-WAY.

TITLE

SIDE SEWERS

STANDARD SEWER DETAIL

SHEET

7 OF SET

DWG SCALE

NO SCALE

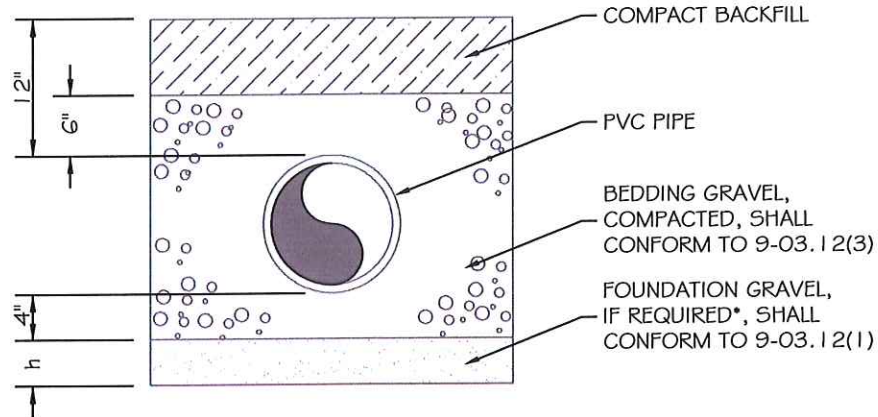


DRAWN BY RIA

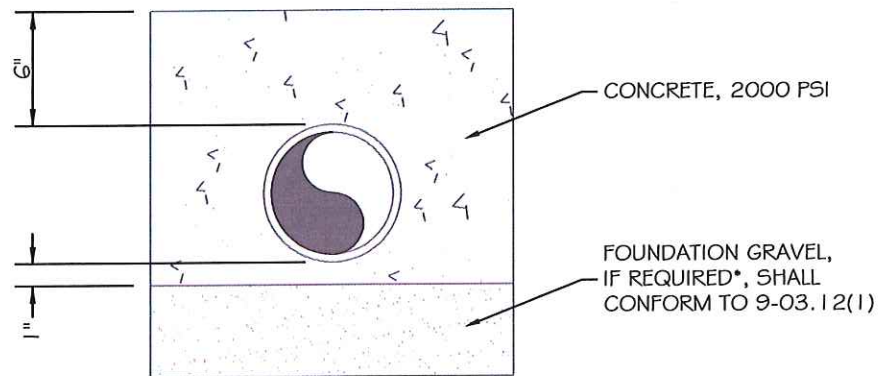
03.29.06 V:\sewer\detail\side sewers.dwg (REV B)

PIPE BEDDING CLASSES

ORDINARY PIPE BEDDING



CONCRETE ENCASEMENT



NOTES:

- * - EXCAVATE UNSUITABLE MATERIAL DOWN TO FIRM SOIL AND REPLACE WITH TYPE A BACKFILL.

MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

TITLE

PIPE BEDDING AND
CLEANOUTS

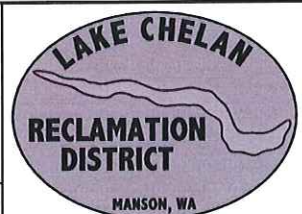
STANDARD SEWER DETAIL

SHEET

8 OF SET

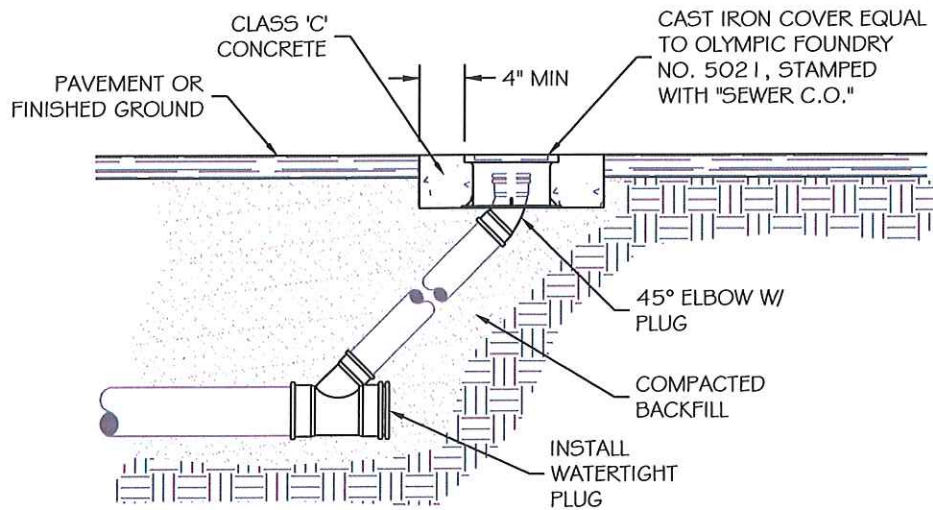
DWG SCALE

NO SCALE

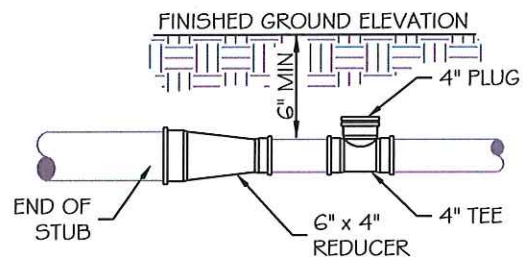


DRAWN BY RJA

03.29.06 SewerDetailPipe bedding and cleanouts.dwg (REV F)



CLEANOUT



TESTING TEE

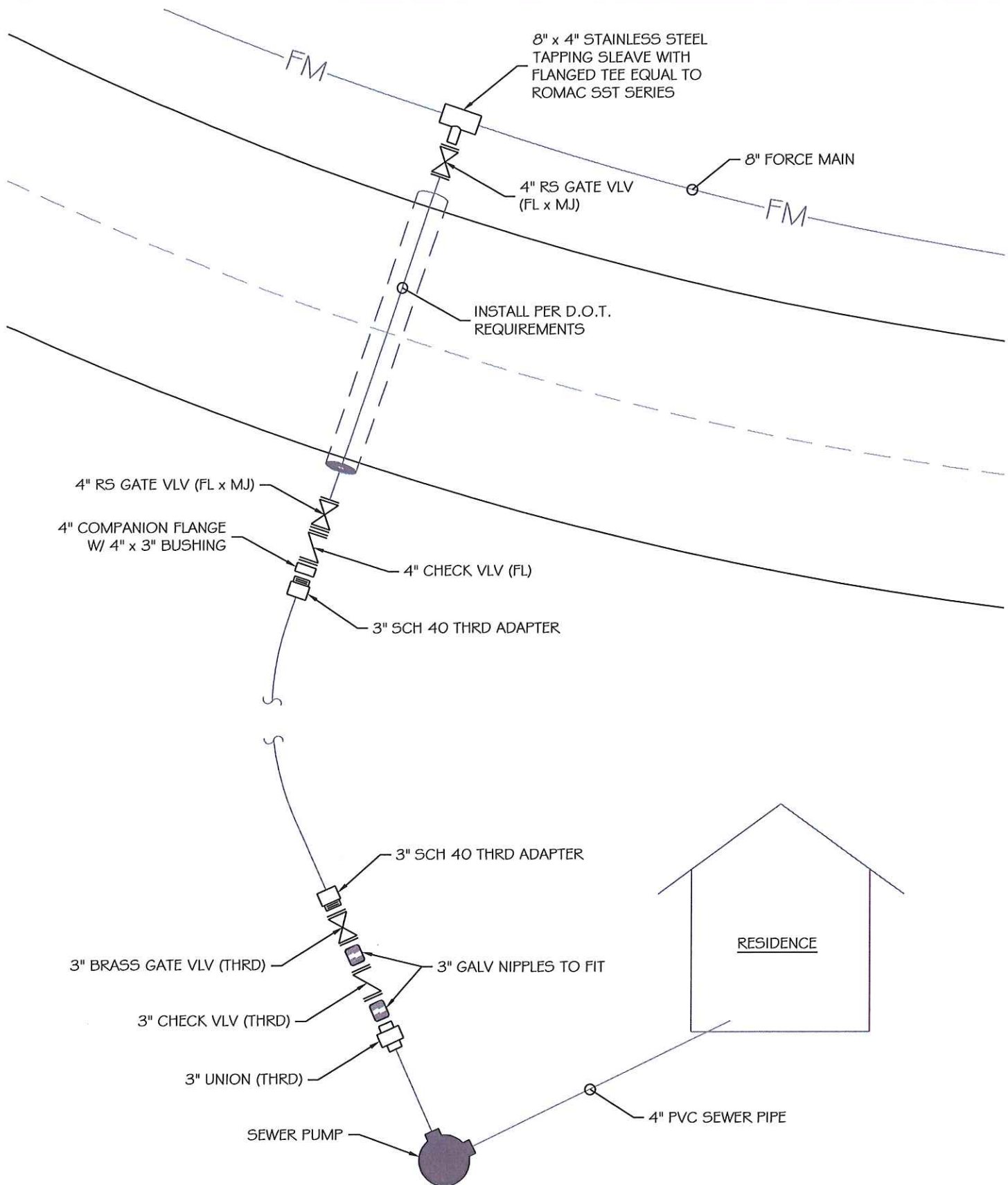
NOTES:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

TITLE	
CLEANOUT AND TESTING TEE	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
9 OF SET	NO SCALE



DRAWN BY R1A

04.20.01 SewerDetailCleanout and testing tee.dwg (R1V A)



NOTES:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

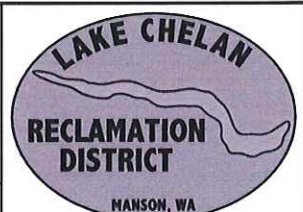
ALL 3" PIPE AND FITTINGS MAY BE SUBSTITUTED WITH 2" IF A GRINDER PUMP IS TO BE USED.

TITLE
FORCEMAIN SEWER CONNECTION I

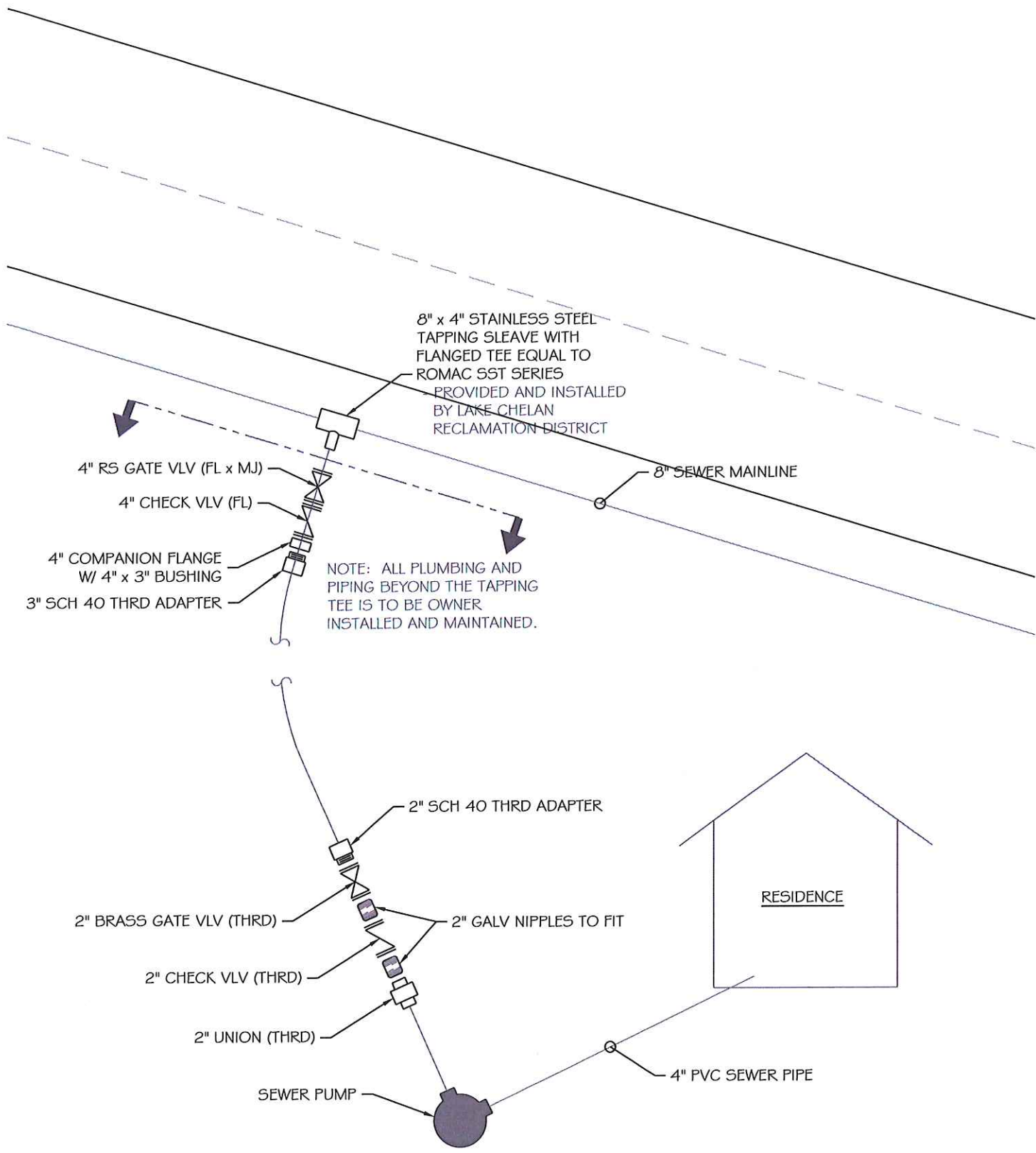
STANDARD SEWER DETAIL

SHEET
10 OF SET

DWG SCALE
NO SCALE



DRAWN BY R1 A



8" x 4" STAINLESS STEEL
TAPPING SLEEVE WITH
FLANGED TEE EQUAL TO
ROMAC SST SERIES
PROVIDED AND INSTALLED
BY LAKE CHELAN
RECLAMATION DISTRICT

4" RS GATE VLV (FL x MJ)

4" CHECK VLV (FL)

4" COMPANION FLANGE
W/ 4" x 3" BUSHING

3" SCH 40 THRD ADAPTER

NOTE: ALL PLUMBING AND
PIPING BEYOND THE TAPPING
TEE IS TO BE OWNER
INSTALLED AND MAINTAINED.

8" SEWER MAINLINE

2" SCH 40 THRD ADAPTER

2" BRASS GATE VLV (THRD)

2" CHECK VLV (THRD)

2" UNION (THRD)

SEWER PUMP

2" GALV NIPPLES TO FIT

RESIDENCE

4" PVC SEWER PIPE

NOTES:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT
THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

TITLE	
FORCEMAIN SEWER CONNECTION II	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
11 OF SET	NO SCALE



DRAWN BY R1A

03.28.06 SewerDetailLakeChelan sewer connection - alt 1.dwg (RFV R)

VERTICAL BLOCKING
FOR 11-1/4°, 22-1/2°, 45° BENDS

PIPE SIZE	VB	CU FT	S	d	L
4"	11-1/4°	8	2.0'	3/4"	1.5'
	22-1/2°	11	2.2'	3/4"	2.0'
	45°	30	3.1'	3/4"	2.0'
6"	11-1/4°	11	2.2'	3/4"	2.0'
	22-1/2°	25	2.9'	3/4"	2.0'
	45°	68	4.1'	3/4"	2.5'
8"	11-1/4°	16	2.5'	3/4"	2.0'
	22-1/2°	47	3.6'	3/4"	2.0'
	45°	123	5.0'	3/4"	2.0'
12"	11-1/4°	32	3.2'	3/4"	3.0'
	22-1/2°	88	4.5'	7/8"	3.0'
	45°	232	6.1'	3/4"	2.5'
16"	11-1/4°	70	4.1'	7/8"	3.0'
	22-1/2°	184	5.7'	1-1/8"	4.0'
	45°	478	7.8'	1-1/8"	4.0'
20"	11-1/4°	91	4.5'	7/8"	3.0'
	22-1/2°	225	6.1'	1-1/4"	4.0'
	45°	560	8.2'	1-1/4"	4.0'
24"	11-1/4°	128	5.0'	1"	3.5'
	22-1/2°	320	6.8'	1-3/8"	5.5'
	45°	820	9.4'	1-3/8"	4.5'

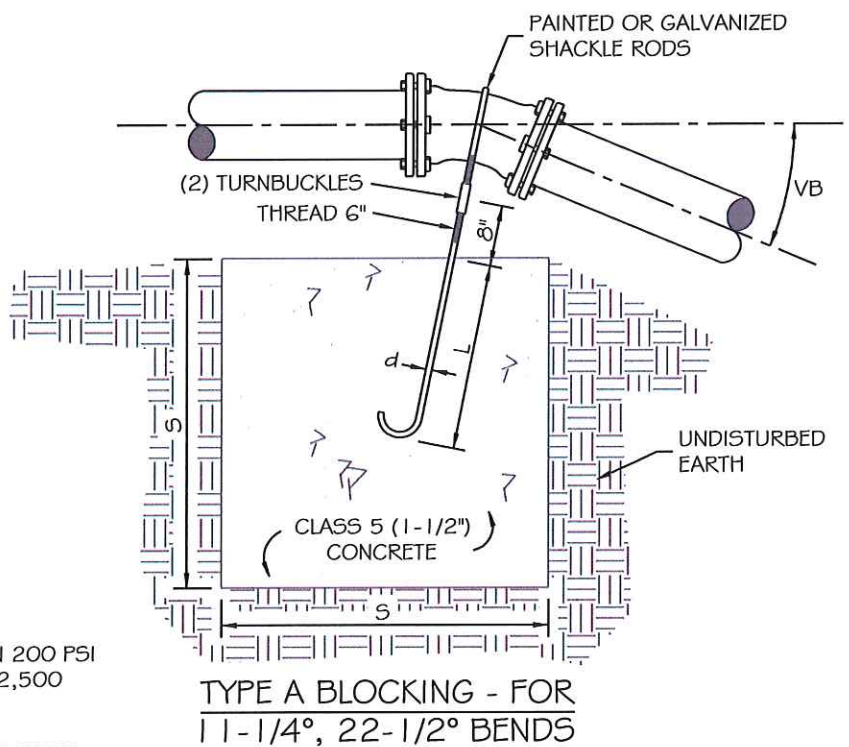
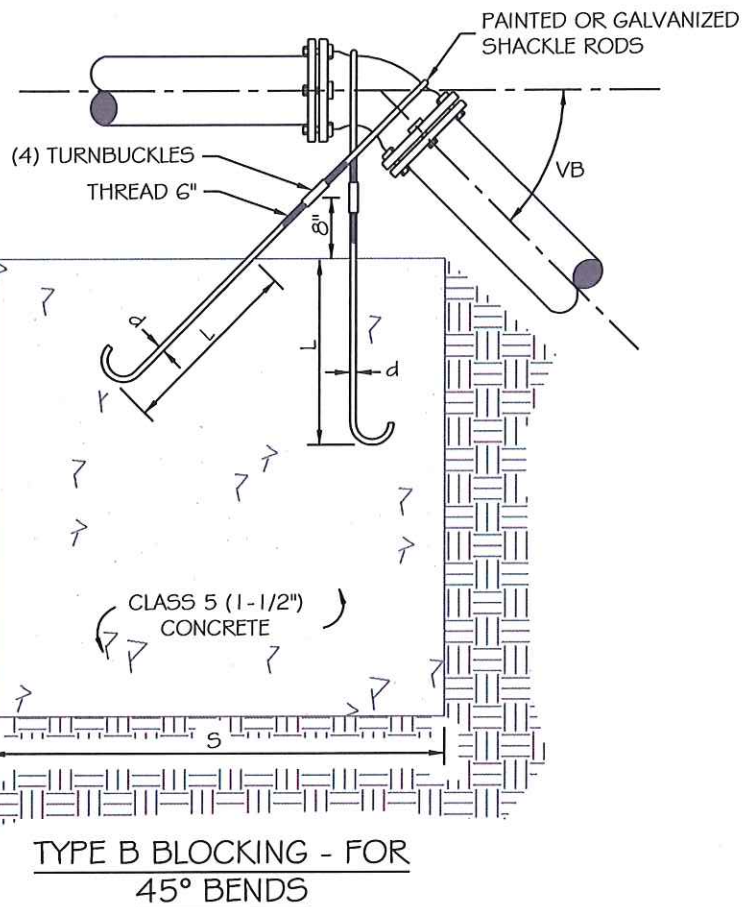
NOTES:

BEARING AREA OF CONCRETE THRUST-BLOCK BASED ON 200 PSI MAINLINE PRESSURE AND SAFE SOIL BEARING LOAD OF 2,500 POUNDS PER SQUARE FOOT.

AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZES, PRESSURES AND SOIL CONDITIONS.

CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATION PRESSURE UNDER ALL CONDITIONS OF SERVICE.

MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.



TITLE

CONCRETE BLOCKING
FOR VERTICAL BENDS

STANDARD SEWER DETAIL

SHEET

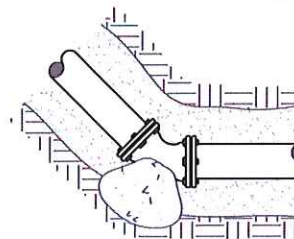
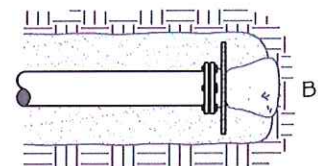
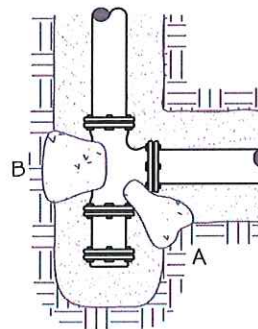
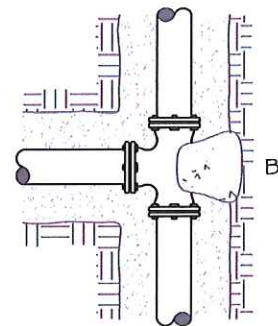
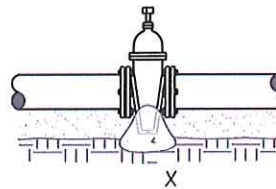
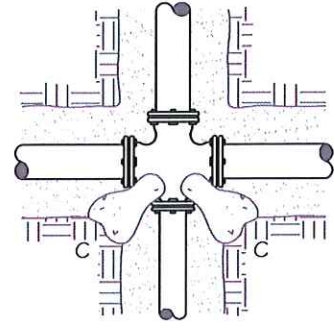
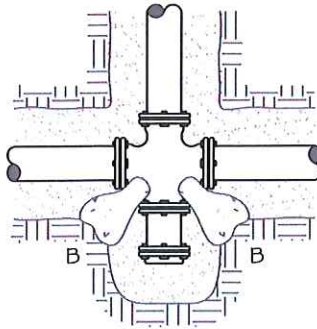
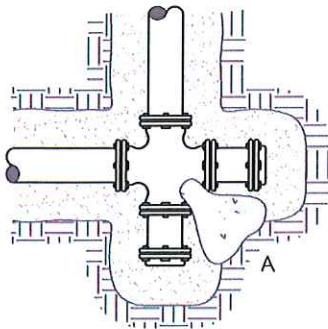
12 OF SET

DWG SCALE

NO SCALE



DRAWN BY R1A



A FOR 90° BEND
C FOR 45° BEND
D FOR 22-1/2° BEND
E FOR 11-1/4° BEND

THRUST BLOCK TABLE
MIN. BEARING AREA AGAINST UNDISTURBED SOIL
(FT²)

PIPE SIZE	A	B	C	D	E	X
4"	3	1	1	1	1	NONE
6"	4	4	2	1	1	NONE
8"	7	6	4	2	1	4
10"	11	10	6	3	2	6
12"	16	14	9	5	3	9
14"	22	19	12	6	3	12
16"	29	25	16	8	4	16
18"	36	31	20	10	5	20
20"	45	39	24	13	6	24
22"	54	47	29	15	8	29
24"	64	56	35	18	9	35
28"	87	76	48	24	12	48
30"	101	87	55	28	14	55
36"	145	125	78	40	20	78
42"	197	171	107	55	27	107
48"	257	223	140	71	36	140

NOTES:

BEARING AREA OF CONCRETE THRUST-BLOCK BASED ON 200 PSI PRESSURE AND SAFE SOIL BEARING LOAD OF 2,000 POUNDS PER SQUARE FOOT.

AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZES, PRESSURES AND SOIL CONDITIONS.

CONCRETE BLOCKING SHALL BE CAST IN PLACE AND HAVE A MINIMUM OF 1/4 SQUARE FOOT BEARING AGAINST THE FITTING.

BLOCK SHALL BEAR AGAINST FITTINGS ONLY AND SHALL BE CLEAR OF JOINTS TO PERMIT TAKING UP OR DISMANTLING OF JOINT.

CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATION PRESSURE UNDER ALL CONDITIONS OF SERVICE.

MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

TITLE	
CONCRETE BLOCKING	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
13 OF SET	NO SCALE



DRAWN BY R1A

04.09.01 15sewerDetailConcreteBlocking.dwg (REV A)

ALUMINUM ACCESS HATCH, 4'-0"W x 5'-0"L WITH SPRING ASSISTED DOUBLE LEAF H-20 LOAD RATED DOORS THAT LOCK IN THE VERTICAL POSITION, PROVIDE REMOVABLE SAFETY CHAINS, LADDER RUNGS ON UNDERSIDE OF DOOR WITH PIN LOCK, RECESSED LOCKING HASP COVERED WITH HINGED LID, 1-1/2"Ø FRAME.
DRAIN ROUTED TO SUMP.
IF VAULT IS WITHIN TRAVELED ROADWAY, PROVIDE (2) 30"Ø MANHOLE COVERS IN LIEU OF HATCH.

ELECTROMAGNETIC FLOW METER (FLxFL) WITH TRANSMITTER AND REMOTE INDICATOR, SPARKING TIGERMAG MODEL 655 OR APPROVED EQUAL, REDUCE FORCE MAIN SIZE AT METER AS SHOWN

ALUMINUM ACCESS LADDER WITH 3/4"Ø LADDER RUNGS AT 12" O.C., 2"x1/2" STRINGERS, AND SUPPORTS AT TOP AND BASE

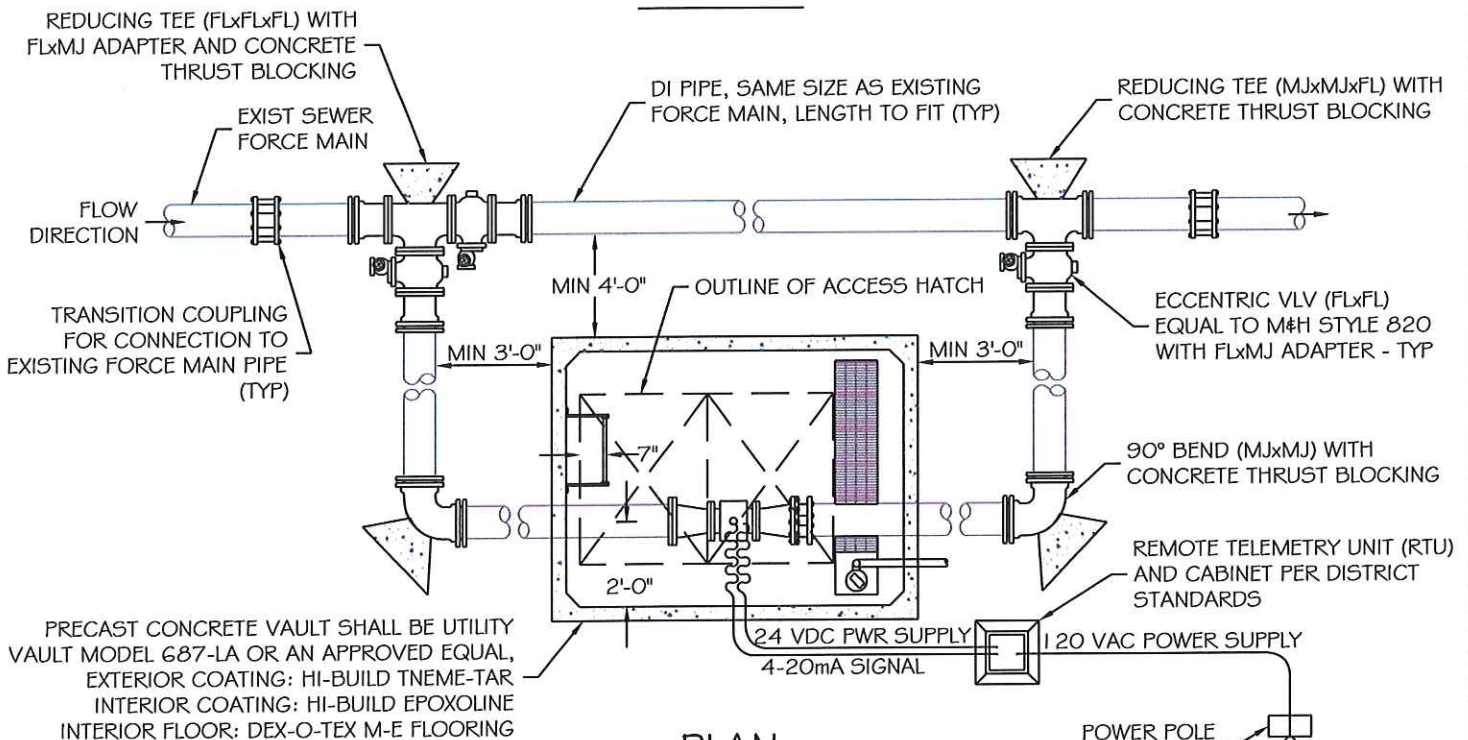
ROTATE BEND AND DEFLECT PIPE AS NECESSARY TO KEEP TOP OF METER ELEVATION BELOW INVERT OF FORCE MAIN

ADJUSTABLE PIPE SUPPORT, AQUAL TO STANDON PIPE SUPPORT MODEL S-89 WITH 2-1/2"Ø STEEL PIPE, LENGTH TO FIT

SUMP PUMP IF REQUIRED, PROVIDE ISOLATION VALVE AND (2) SWING CHECKS ON DISCHARGE PIPE

MIN 6" COMPACTED CRUSHED ROCK ON FIRM SUBGRADE

PROFILE



PLAN

FLOW RATE RANGE (gpm)	MAG-METER DIA. (inches)
25-175	3
50-300	4
125-700	6
250-1250	8
* IF FLOW RATE IS NOT WITHIN RANGES SHOWN, CONSULT ENGINEER	

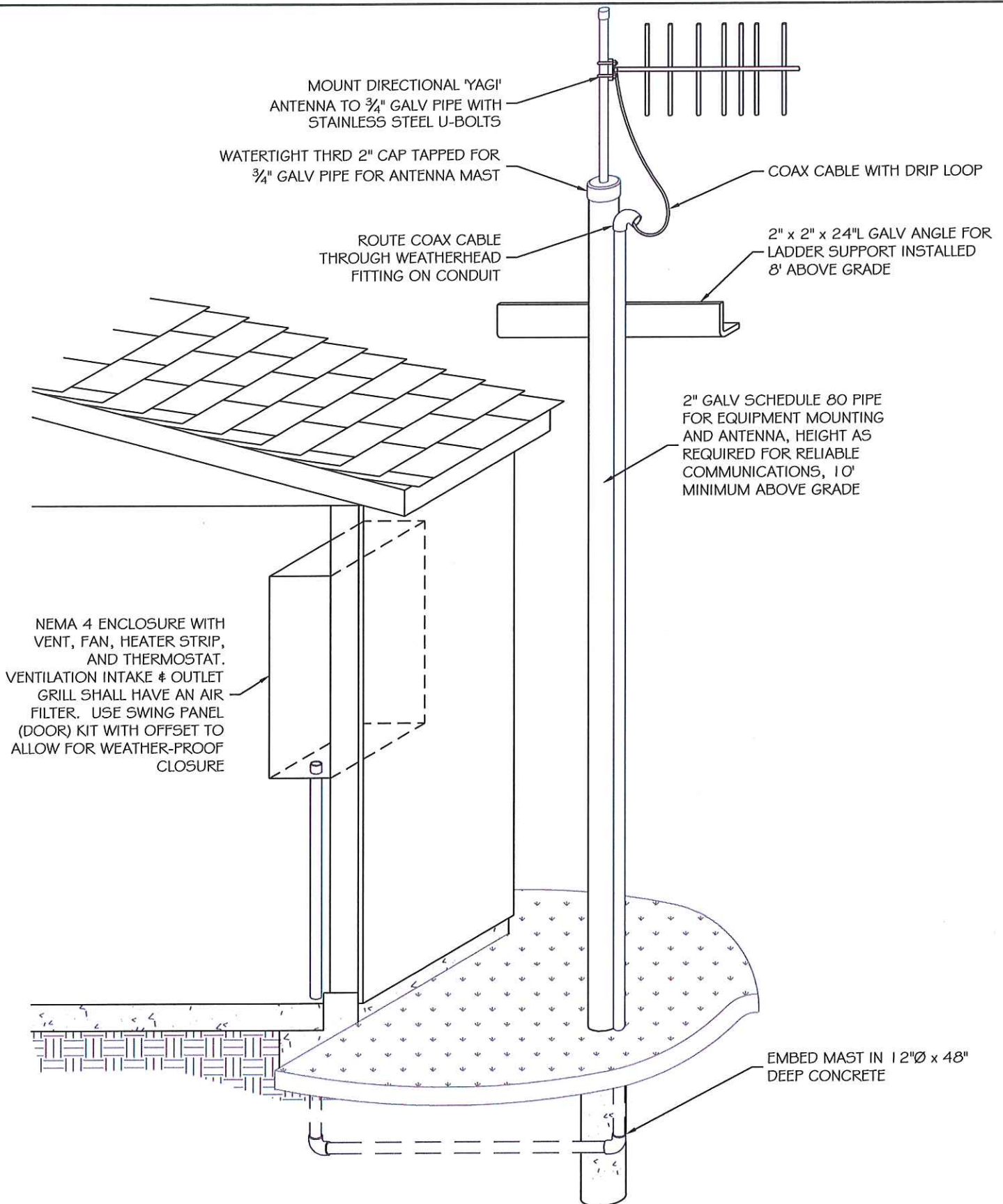
NOTES:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

TITLE	
FLOW METER VAULT	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
14 OF SET	NO SCALE



DRAWN BY RIA

01.15.02 SewerDetailsFlow meter vault.dwg (RFV A)



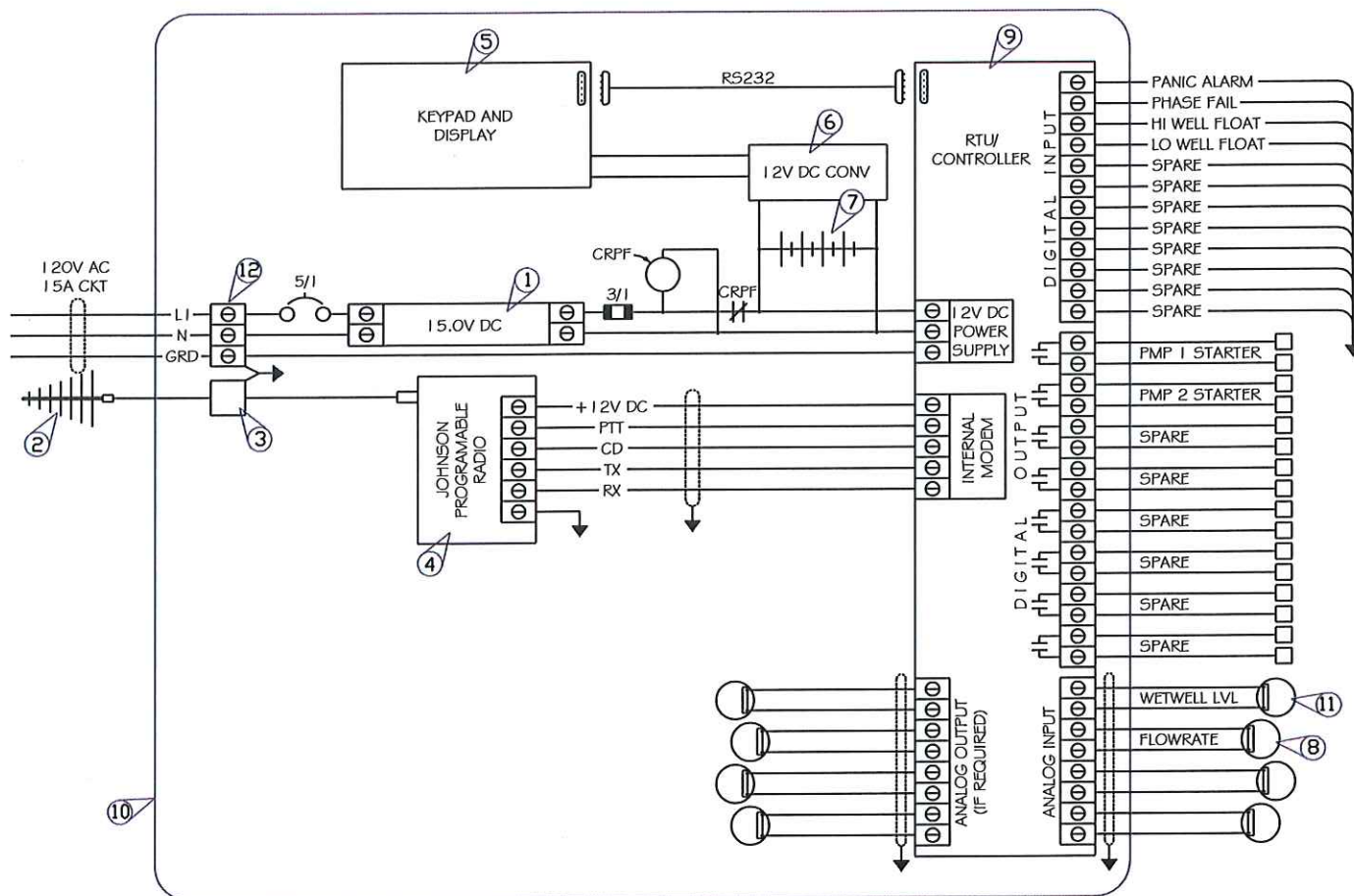
NOTES:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

TITLE	
TELEMETRY EQUIPMENT	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
15 OF SET	NO SCALE



DRAWN BY RIA

05.29.02 G:\water\details\telemetry\equipment.dwg (RFV A)



① 15V REGULATED POWER SUPPLY EQUAL TO 'POWER ONE' MODEL HN28-3-A.

② YAGI ANTENNA EQUAL TO 'LARSEN' YA-2, WITH DRIP LOOP AND MAST.

③ LINE PROTECTION UNIT - 'POLYPHASE' MODEL B50LNC-2 (BULKHEAD MOUNT).

④ R/F TRANSCEIVER EQUAL TO EF JOHNSON PROGRAMMABLE RADIO MODEL DL 3472, TWO CHANNEL, FREQUENCIES 453.1875 & 458.1875.

NOTES:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

POSITION ENCLOSURE FACING NORTHERLY DIRECTION AND PROVIDE EITHER AN EXTERIOR SUN SHIELD OR INTERIOR FAN UNIT TO VENTILATE.

COMPLETE PANEL SHALL BE UL-913 APPROVED.

WETWELL LEVEL TRANSDUCER AND FLOATS SHALL BE CONNECTED WITH INTRINSICALLY SAFE RELAY BARRIERS.

ALL WIRES BETWEEN PANEL-MOUNTED EQUIPMENT AND OTHER FIELD EQUIPMENT SHALL BE TERMINATED AT TERMINAL BLOCKS.

ALL FIELD WIRE CONNECTING INSTRUMENTATION LOCATED IN THE FIELD TO THE RTU SHALL HAVE A LINE PROTECTION UNIT EQUAL TO 'MCG' MODEL DLP-20-25VZ.

OPERATOR INTERFACE DEVICES (SWITCHES, LIGHTS, BUTTONS, ETC.) ARE NOT SHOWN ON RTU DETAIL. SEE LOGIC DIAGRAM FOR REQUIRED DEVICES. OPERATOR INTERFACE DEVICES SHALL BE MOUNTED ON THE SWING PANEL.

⑤ FRONT PANEL OPERATOR INTERFACE WITH KEYPAD AND LCD DISPLAY. PART OF 'RUGID' RUG-9 UNIT - MOUNT TO SWING PANEL.

⑥ 12V REGULATED POWER SUPPLY EQUAL TO 'CDI' MODEL 512524, 12V DC OUTPUT.

⑦ SEALED BATTERY, 12V DC NOMINAL, SERIES CONNECTED, EQUAL TO MAGNUM CFM12V6.2L.

⑧ ELECTRO-MAGNETIC FLOWMETER EQUAL TO FOXBORO, RANGE 0 TO _____ GPM, _____ DIA PIPE.

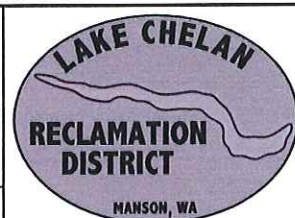
⑨ REMOTE TELEMETRY UNIT (RTU) EQUAL TO 'RUGID', RUG-9, MODBUS COMPATIBLE - I/O AS SHOWN.

⑩ NEMA 4X GASKETED ENCLOSURE 'HOFFMAN' SIZE 24L x 24W x 21D W/ BACK PANEL (SHOWN) SIZE 21" x 21" WHITE ENAMEL FINISH, ENCLOSURE HEATER, COOLING FAN.

⑪ WETWELL LEVEL TRANSMITTER EQUAL TO 'CONSOLIDATED' A-1200, RANGE: _____.

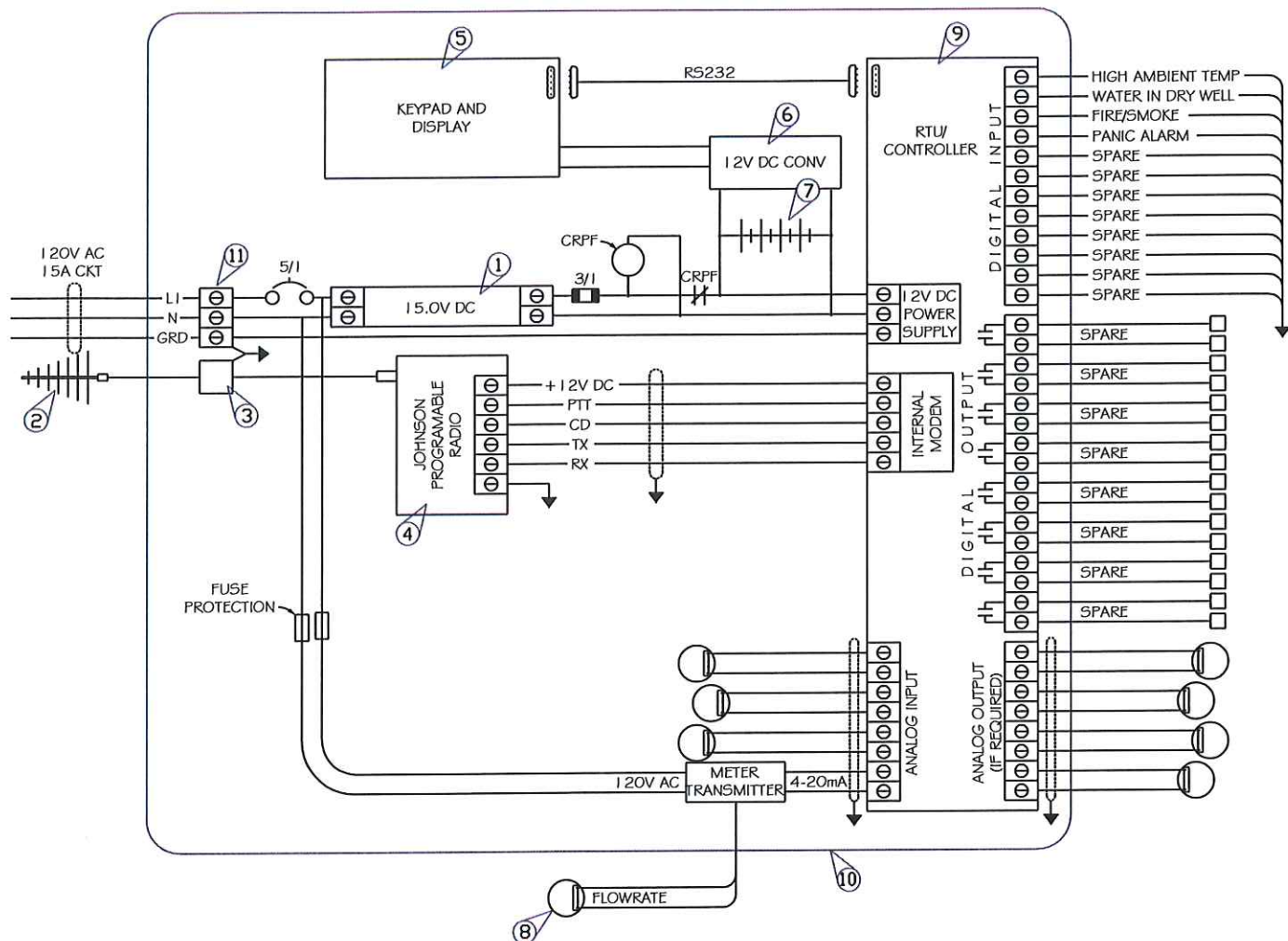
⑫ SURGE SUPPRESSOR - 'EFI ELECTRONICS CORP.' MODEL HWM120.

TITLE	
LIFT STATION RTU DETAIL	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
16 OF SET	NO SCALE



DRAWN BY R1A

05.29.02 SewerDetailStation.rvt detail.dwg (REV A)



- ① 15V REGULATED POWER SUPPLY EQUAL TO 'POWER ONE' MODEL HN28-3-A.
- ② YAGI ANTENNA EQUAL TO 'LARSEN' YA-2, WITH DRIP LOOP AND MAST.
- ③ LINE PROTECTION UNIT EQUAL TO 'POLYPHASE' MODEL B50LNC-2 (BULKHEAD MOUNT).
- ④ R/F TRANSCEIVER EQUAL TO EF JOHNSON PROGRAMMABLE RADIO MODEL DL 3472, TWO CHANNEL, FREQUENCIES 453.1875 & 458.1875.
- ⑤ FRONT PANEL OPERATOR INTERFACE WITH KEYPAD AND LCD DISPLAY - PART OF 'RUGID' RUG-9 UNIT MOUNTED ON SWING PANEL.

- ⑥ 12V REGULATED POWER SUPPLY EQUAL TO 'CDI' MODEL 512524, 12V DC OUTPUT.
- ⑦ SEALED BATTERY, 12V DC NOMINAL, SERIES CONNECTED, EQUAL TO MAGNUM CFM 12V6.2L.
- ⑧ ELECTRO-MAGNETIC FLOWMETER EQUAL TO FOXBORO, RANGE 0 TO _____ GPM, _____ DIA PIPE.
- ⑨ REMOTE TELEMETRY UNIT (RTU) EQUAL TO 'RUGID', RUG-9, MODBUS COMPATIBLE - I/O AS SHOWN.
- ⑩ NEMA 4X GASKETED ENCLOSURE 'HOFFMAN' SIZE 24L x 24W x 21D W/ BACK PANEL (SHOWN) SIZE 21" x 21" WHITE ENAMEL FINISH, ENCLOSURE HEATER, COOLING FAN.
- ⑪ SURGE SUPPRESSOR - 'EFI ELECTRONICS CORP.' MODEL HWM120.

NOTES:
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POSITION ENCLOSURE FACING NORTHERLY DIRECTION AND PROVIDE EITHER AN EXTERIOR SUN SHIELD OR INTERIOR FAN UNIT TO VENTILATE.

COMPLETE PANEL SHALL BE UL-508 APPROVED.

ALL WIRES BETWEEN PANEL-MOUNTED EQUIPMENT AND OTHER FIELD EQUIPMENT SHALL BE TERMINATED AT TERMINAL BLOCKS.

ALL FIELD WIRE CONNECTING INSTRUMENTATION LOCATED IN THE FIELD TO THE RTU SHALL HAVE LINE PROTECTION UNIT EQUAL TO 'MCG' MODEL DLP-20-25VZ.

TITLE	
FLOW STATION RTU DETAIL	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
17 OF SET	NO SCALE



DRAWN BY RJA

05.29.02 SewerDetailFlow station rtu detail.dwg (RJV A)

PRIMARY LEVEL CONTROLS

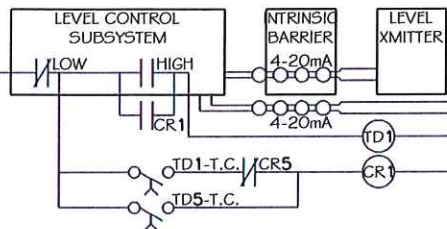
BACKUP FLOAT CONTROLS

CONTROL MODE

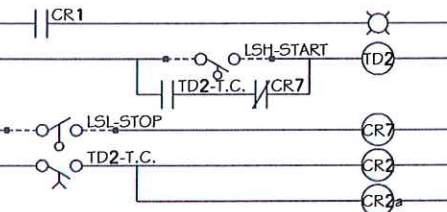
ALTERNATOR CONTROL

PUMP REQUIRE & FAIL CONTROL

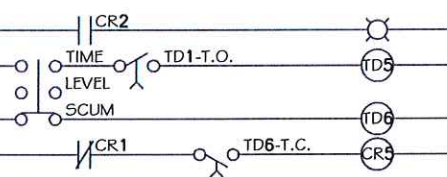
120V AC FROM DEDICATED BREAKER



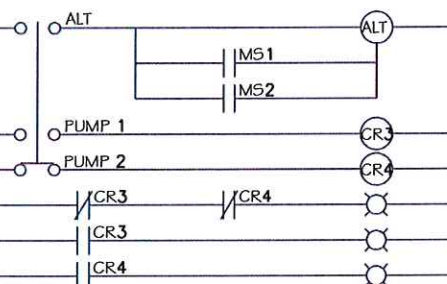
LEVEL TO DISPLAY
PUMP RUN LATCH TIMER
PUMP RUN LOCAL AUTO



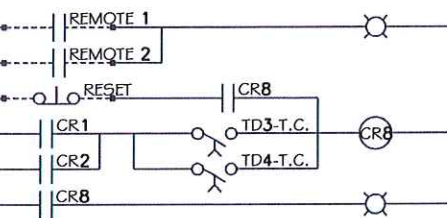
PUMP REQUIRED
EMERGENCY START FLOAT
EMERGENCY STOP FLOAT
LOCAL EMERGENCY PUMP REQ'D
REMOTE EMERGENCY PUMP REQ'D



EMERGENCY PUMP REQ'D
TIME CONTROL
SCUM CONTROL REPEAT TIMER
SCUM CONTROL RELAY

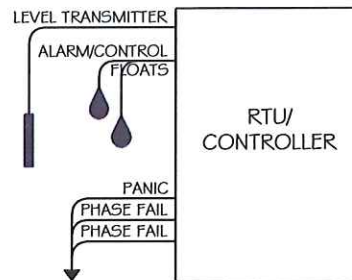


ALTERNATE PUMPS
PUMP 1 LOCKED ON
PUMP 2 LOCKED ON
ALTERNATOR ACTIVE
PUMP 1 LOCKED
PUMP 2 LOCKED

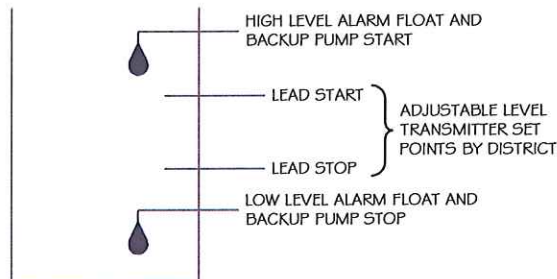


LEAD PUMP REQUEST FROM REMOTE CONTROL
PUMP FAILED RELAY
PUMP FAILED

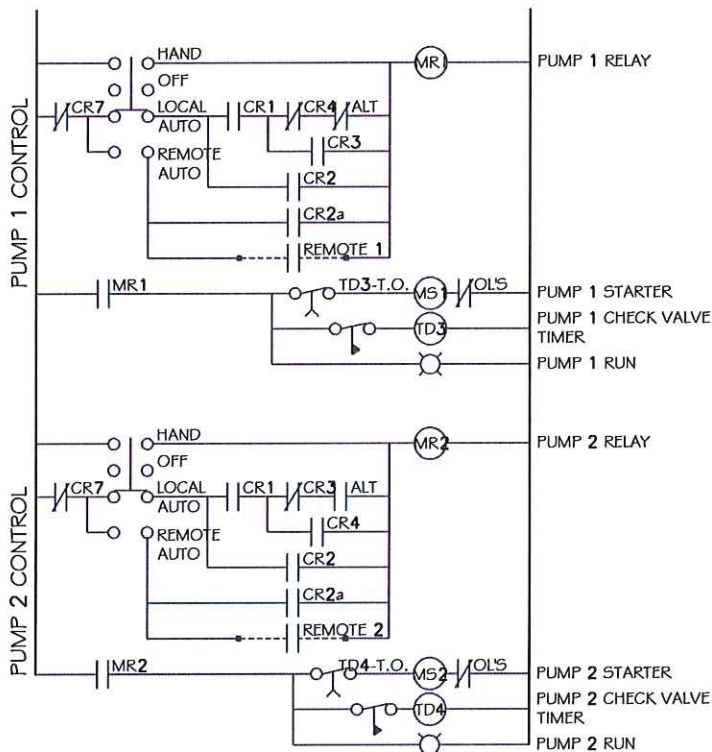
LOGIC DIAGRAM



I/O REQUIREMENTS



WET WELL LEVEL SETTINGS



PUMP 1 CONTROL

PUMP 2 CONTROL

PUMP 1 RELAY

PUMP 1 STARTER
PUMP 1 CHECK VALVE
TIMER
PUMP 1 RUN

PUMP 2 RELAY

PUMP 2 STARTER
PUMP 2 CHECK VALVE
TIMER
PUMP 2 RUN

NOTES:

TITLE

TYPICAL LIFT STATION LOGIC DIAGRAM

STANDARD SEWER DETAIL

SHEET
18 OF SET

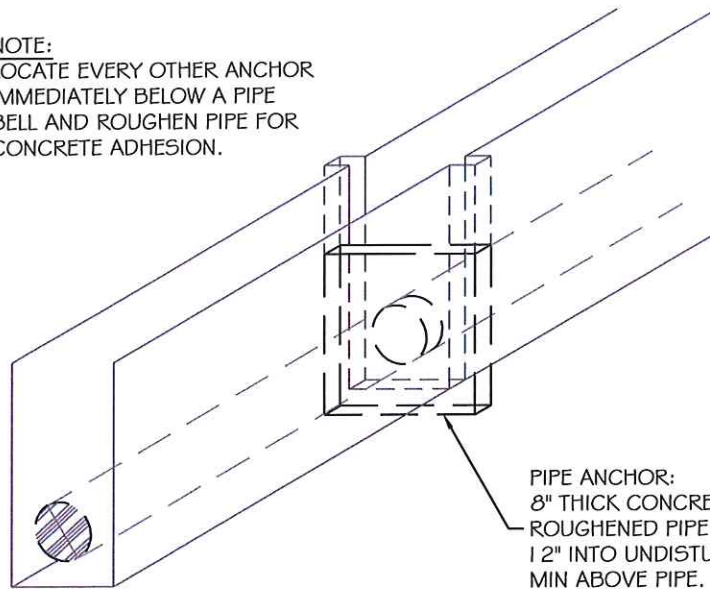
DWG SCALE
NO SCALE



DRAWN BY R1A

05.28.02 SewerDetail.sht: station logic diagram.dwg (R1A)

NOTE:
LOCATE EVERY OTHER ANCHOR
IMMEDIATELY BELOW A PIPE
BELL AND ROUGHEN PIPE FOR
CONCRETE ADHESION.

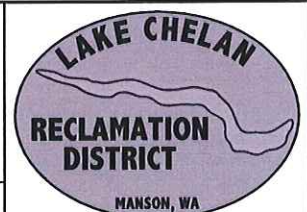


PIPE ANCHOR:
8" THICK CONCRETE FORMED AROUND
ROUGHENED PIPE AND EMBEDDED MIN
12" INTO UNDISTURBED SOIL WITH 12"
MIN ABOVE PIPE.

PIPE ANCHOR

NOTES:
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT
THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

TITLE	
PIPE ANCHOR	
STANDARD SEWER DETAIL	
SHEET	DWG SCALE
19 OF SET	NO SCALE



DRAWN BY R1 A

09.12.02 SewerDetail\pipe_anchor.dwg (REV A)

SEWERAGE
MAIN EXTENSIONS
CHECKLIST

1. Developer submits legal description of proposed development.
2. District provides standards, conditions and specifications.
3. Developer submits collection plan designed by a licensed, Professional Engineer.
4. Developer signs Agreement by the Friday prior to the Regular Board of Director's meeting on the second Tuesday of each month.
5. Board of Directors reviews plans and either accepts plan, modifies plan, asks for additional information or rejects plan.
6. After plan is accepted, District enters into Agreement with Developer for sewer main extension.
7. Sewerage main extension constructed by licensed and bonded contractor to District Standards as certified by licensed Professional Engineer.
8. District inspects and observes testing of sewerage extension prior to approval.
9. Developer posts a one-year maintenance bond for the materials and workmanship if applicable.
10. Developer submits reproducible copy of as-built drawings and easements certified by the licensed Professional Engineer.
11. Developer conveys system to District for operation and maintenance and certifies the extension costs.
12. District notifies Chelan County, if applicable, that utility provisions for plat have been completed.
13. All services off of sewerage main extension are hooked up by individual builders as applicable hook-up fees are paid by individual lot owners.

STANDARDS, CONDITIONS & SPECIFICATIONS

SEWER MAIN EXTENSIONS

I. GENERAL:

A. The items herein contained are the sewerage system Standards, Conditions, and Specifications of the Lake Chelan Reclamation District. These are minimums only and may be increased or altered to fit particular situations.

B. Definitions:

1. District - Lake Chelan Reclamation District, a quasi-municipal corporation organized and operating pursuant to Title 87, Laws of the State of Washington.
2. Developer(s) - The landowner, land developer, or agent responsible for installation of the sewerage collection system.
3. Sewer Main - A pipe designed to collect sewerage from two users or more to properties over 150 feet from an existing sewer main.
4. Sewer System User - Any person, firm, or corporation having a right to sewer service within the District; this also includes the holders of title or evidence of title to land to which sewer service is furnished.
5. Side Sewer line - The pipe, valves, and necessary accessories designed to convey sewerage from each lot to the sewer main, unless said lot is over 150 feet from the sewer main.
6. Sewerage Collection System - The collection of sewer mains and sewer service lines required to provide sewer service to each customer in a development.

II. STANDARDS AND CONDITIONS:

- A. When extensions of the existing sewer system is required for service, an Agreement for Sewer Main Extensions shall be entered into between the Developer and the District.
- B. To initiate the developer extension process the Developer shall submit a sewer plan prepared by a professional engineer licensed in the State of Washington. Plan / profile drawings shall be produced on reproducible copy.
- C. The Developer shall be responsible for any and all incurred costs with the District's consultants due to, but not limited to, pre-construction conference, review of draft plans, inspections during construction, inspection of pressure test, final inspection, re-inspection of deficient work, final review of submitted extension documents, legal services, recording fees, and any other work reasonably required by the District in conjunction with this application and/or administration of this extension.

D. The licensed professional engineer shall certify the design and construction of the sewerage collection system meets or exceeds the applicable standards set forth herein.

E. Obtaining necessary permits will be the responsibility of the Developer.

F. Where franchises, easements or deeds to property are required it shall be the responsibility of the Developer to provide same and submit appropriate documentation to the District.

G. Easements for sewer mains shall be a minimum of 10-feet wide. Easement legal descriptions shall be prepared by a surveyor or engineer licensed to practice in the State of Washington. Easement legal descriptions shall be reviewed and approved by the District prior to acceptance.

H. The Developer shall supply an "as-built" drawing on reproducible copy certified by the licensed Professional Engineer.

I. The Developer is required to guarantee the materials and workmanship for a period of one year after the date of acceptance by the District for operations and maintenance. On projects whose certified costs are greater than \$50,000, the Developer is to supply cash or a maintenance bond for an amount outlined below covering materials and workmanship for a period of one year after the date of acceptance by the District for operation and maintenance.

Labor and Material Cost	Bond or Cash
Greater than \$50,000	10% of Labor and Material Cost but not less than \$12,500

J. Connection between the District's existing system and the new sewerage collection system shall be made by the District at the expense of the Developer as calculated by the District.

K. All main lines must be designed to provide for proper collection of sewerage from all lands served by the development. Extensions shall be required through and to the extremes of the property for future service as determined by the District.

L. Pressure and leakage testing shall be accomplished before final acceptance.

M. Final acceptance shall not constitute acceptance of any unauthorized or defective work or material. The District shall not be barred from requiring the Developer to reimburse the District for the removal, adjustment, replacement, repair or disposal of any unauthorized or defective work or material or from recovering costs for any such work or material.

N. Sewer hook-ups shall be made by or with the approval of the District. Sewer service shall not begin prior to payment by sewer system user of all applicable hook-up fees.

N. Sewer Main Extension projects shall be certified as to their costs and conveyed to the District for operation and maintenance by Conveyance Agreement.

O. The District may enter into Agreements with Developers who have installed sewer mains and appurtenances in order to provide for the reimbursement to Developers for a pro-rata share of the cost of construction thereof by the sewer users of any real estate who have not contributed to the original cost of such facilities and who subsequently connect to the sewerage collection system or use same. Pursuant to such agreement, the District may charge a fifteen percent (15%) fee for administrative costs of collecting the latecomer fees. Latecomer fees will be collected at the time of application for service.

III. SPECIFICATIONS:

A. EXTENSIONS: All extensions to the sewer system must conform to the design standards of the District. The system must be capable of future expansion, if required, and be constructed of permanent materials. The following are required:

1. Plans and Specifications. The installation of sewer extensions shall be in accordance with construction plans and specifications approved by the District.
2. Gravity sewer pipes shall be PVC, HDPE or ductile iron. District shall approve type.
3. Manholes shall be precast, 48" I.D. and shall generally conform to ASTM specification for equivalent size reinforced concrete sewer pipe. Outside drop structures or inside drop structures may be constructed of ductile iron or PVC pipe and fittings.
4. Pressure mains shall be HDPE, ductile iron or PVC.
5. All joints for sewers or pressure mains shall be of the rubber gasket type if applicable.
6. Pipe sizes shall be selected as is indicated by good engineering practice and shall conform to the overall General Sewer Plan.
7. Minimum depth of sewer main and side sewer stubs shall be 5 feet over the top of pipe in the public right-of-way. Building pad elevations shall be shown or approximated on the plans.
8. The sewer grades shall be sufficient to maintain a minimum velocity of 2 feet per second at design flow. Minimum grade shall be five-tenths of one percent (0.005).

9. Manholes shall be placed at each grade and direction change. Distances between manholes shall not exceed 400 feet. Manholes shall be used at the termination of each sewer unless specified otherwise.

10. Manhole covers shall be equal to Olympic Foundry Company, No. 5943, solid lid with one one-inch pick hole and are to read "SEWER".

B. GRAVITY SEWER PIPE (GENERAL):

1. All material shall be new and undamaged. Unless otherwise approved by the District, the same manufacturer of each item shall be used throughout the work.

2. Where reference is made to an ASTM, AWWA or APWA designation, it shall be the latest revision at the time of construction, except as noted on the plans or special provisions of the plans.

C. PVC PIPE: PVC pipe shall conform with the provisions of ASTM D-3034, SDR35 unless otherwise specified. Rubber gaskets for PVC pipe shall conform with ASTM 3034.

D. DUCTILE IRON PIPE:

1. Ductile iron pipe shall be standard thickness Class 50 with a 40-mil dry film thickness ceramic epoxy lining for sewer applications unless otherwise specified and shall conform to the standards of USA Standard A-21.51 (AWWA C-151).

2. Rubber gasket pipe joints to be push-on-joint (Tyton) or mechanical joint (MJ) in accordance with USA Standard A21.11 (AWWA C-111), unless otherwise specified.

3. Flanged connection shall conform to USA standard B16.1.

4. The Contractor shall furnish certification from the manufacturer of the pipe and gasket being supplied that the inspection and all of the specified tests have been made and the results thereof comply with the requirements of this standard.

E. HIGH DENSITY POLYETHYLENE PIPE: High density polyethylene pipe (HDPE) shall be a minimum of SDR 17, PE 3408 pressure pipe as specified in AWWA C906-99. All fittings shall have the same pressure rating as the pipe they are being connected with. HDPE fittings shall be Central Plastics or approved equal.

F. CAST IRON FITTINGS:

1. Cast iron fittings shall be short body for pressure rating of 150 psi, unless otherwise noted. Metal thickness and manufacturing process shall conform to applicable portions of USA Standard A21.10, A21.11, B16.2 and B16.4.

2. Epoxy ceramic lining of fittings for sewer application in accordance with USA Standard A21.4 (AWWA C-104).
3. Rubber gaskets for push-on-joint (Tyton) or mechanical joint (MJ) in accordance with USA Standard A21.11 (AWWA C-111).
4. Gasket material for flanges shall be neoprene, Buna N chlorinated butyl, or cloth-inserted rubber. Type of ends shall be specified as push-on-joint (Tyton), mechanical joint (MJ), plain end (PE), flanged (FL), or (TH) threaded.

G. GATE VALVES:

1. The minimum requirements for all gate valves shall, in design, material and workmanship, conform to the Standards of AWWA C-509.
2. Buried gate valves shall be iron body, bronze mounted, resilient wedge, nonrising stem, operating stems equipped with standard two (2) inch operation nut, and O-ring stem seals, suitable for installation with the type and class of pipe being installed. Ends to be as specified.
3. Valves not buried shall be specified.

H. CHECK VALVES: Check valves shall conform to AWWA C508 and shall be rated for 200 psi working pressure, unless otherwise specified. Valve shall have adjustable tension lever and spring to provide nonslamming action under all conditions unless otherwise specified.

I. ECCENTRIC VALVES: Plug valves shall be eccentric plug valves unless otherwise specified. Valves shall be of the non-lubricated eccentric type with resilient faced plugs. Ends to be specified.

J. BOLTS IN PIPING: Bolts shall be cast iron, zinc or chromium plated or stainless steel.

K. BEDDING AND BLOCKING CONCRETE: Concrete shall be mixed from materials acceptable to the District and shall have a 30-day compressive strength of not less than 1,500 psi. The mix shall contain four (4) sacks of cement per cubic yard and shall be of such consistency that the slump is between 1 inch and 5 inches.

L. IDENTIFYING TAPE AND TRACER WIRE: Identifying tape shall be installed twenty-four (24") below finished grade over all sewer pipelines in all locations. Pipe locator ribbon shall be two inches (2") wide, plastic coated aluminum and shall be clearly marked, "CAUTION BURIED SEWER LINE" continuously along the length of the ribbon with minimum 1 ½ inch letters. The ribbon shall be green in color. Tracer wire shall be installed along all non-metallic forcemains. Wire shall be 12-gage and shall terminate in valve boxes or at a maximum of 1,000 feet into electrical pull boxes. Wire

splices shall be made with DryConn water proof connectors by King Innovation. Tape wire to pipe prior to backfill operations.

M. METHODS OF CONSTRUCTION:

1. PIPE LAYING:

- a. Pipe Laying shall be in accordance with the latest edition of APWA Construction Manual for Municipal Public Works and the pipe manufacturer's recommendations. Gravity pipe must be laid with a properly adjusted pipe laser set to the design grade.
- b. The first section of pipe not less than 300 feet in length installed by each crew shall be tested in order to qualify the crew and/or material. Successful installation of this section shall be a prerequisite to further pipe installation of said crew.
- c. Each pipe shall be laid with bells up grade with the invert of the pipe to the alignment and grade shown on the plans. Care shall be exercised to insure close concentric joints and a smooth invert. Open ends of pipe or fittings shall be temporarily blocked and covered when laying is not in progress.
- d. Water shall not be allowed in the trench during the pipe laying, joint making and as long thereafter as is necessary, in the judgment of the District for the type of joint being used.
- e. Adjustment to the line and grade shall be done by scraping away or filling in and tamping approved pipe-bedding material under the body of the pipe. Adjustment to the line and grade by wedging and blocking shall not be permitted.
- f. The pipe shall be lowered into the trench by means of ropes, tripod, crane or any other suitable means. The pipe shall not be dropped or handled roughly. The pipe shall be checked for cracks and defects prior to use, and any defective pipe laid aside.
- g. Tees and wyes shall be installed as shown on the standard details and at such locations as are shown on the plans or as otherwise directed by the District. These items shall not be covered until the District has recorded their exact location.
- h. Pipe laying shall start from the lowest point unless otherwise approved by the District.

2. PRESSURE SEWER PIPE (GENERAL):

- a. All materials shall be new and undamaged. Unless otherwise approved by the District, the same manufacturer of each item shall be used throughout the work.
- b. Where reference is made to an AWWA, APWA or ASTM designation, it shall be the latest revision at the time of construction, except, as noted on the plans or special provisions of the plans.

3. PRESSURE SEWER PIPES:

- a. P.V.C. pressure pipe shall conform to AWWA C-900. Joints shall be made up as recommended by the pipe manufacturer for pressure pipe.
- b. High density polyethylene pipe (HDPE) shall be a minimum of SDR 17, PE 3408 pressure pipe as specified in AWWA C906-99. All fittings shall have the same pressure rating as the pipe they are being connected with. HDPE fittings shall be Central Plastics or approved equal. Sections of HDPE pipe shall be joined into a continuous length on the job site above ground by the thermal butt fusion-welding method in strict accordance with the manufacturer's requirements.
- c. Pressure sewer mains shall be laid so that no high point exists except at the discharge manhole or an air release assembly. Valves with O-ring seals shall be set vertically and shall be opened and shut under pressure to check operation without leakage. Two-piece cast iron valve boxes shall be set as directed by the District.

4. JOINTS:

- a. Joints shall not be covered until examined and approved by the District. Only pipe layers experienced with the type of gasket being used shall be allowed to lay the pipe. The District may demand proof of such experience before pipe laying may begin or be continued.
- b. Joint material shall be used in accordance with the recommendations of the manufacturer. Pipe handling after the gasket has been affixed shall be carefully controlled to avoid bumping the gasket and thus knocking it out of position or loading it with dirt or other foreign material. Any gasket so disturbed shall be removed and replaced, cleaned and relubricated, if required, before the joint is attempted.
- c. Care shall be taken to properly align the pipe before joints are forced home. During insertion of the tongue or spigot, the pipe shall be partially supported by hand, sling or crane as required to minimize lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned. Pipe deflection and straightening shall be held to a very minimum once the joint is home to prevent creep of the joint.

d. Sufficient pressure shall be applied in making the joint to assure that the joint is home as defined in the standard installation instructions provided by the pipe manufacturer. Sufficient restraint shall be applied to the line to assure the joints once home are held so, by tamping approved pipe bedding material under and alongside the pipe or otherwise. At the end of the day's work, the last pipe shall be blocked in such a manner as may be required to prevent creep during down time.

5. ALIGNMENT TOLERANCE OF GRAVITY LINES:

a. The maximum tolerance from true line and grade shall be as follows:

1. Maximum deviation from established line and grade shall not be greater than one thirty-second ($1/32$) inch per inch of pipe diameter and not to exceed one-half ($1/2$) inch per pipe length.
2. No adverse grade in any pipe length will be permitted.
3. The difference in deviation from established line and grade between two successive joints shall not exceed $1/3$ of the amounts specified above.

6. TRENCH EXCAVATION:

a. Trenches shall be excavated to the line and grade designated by the District. Except for unusual circumstances where approved by the District, the trench sides shall be excavated vertically and the trench width shall be excavated only to such width as is necessary for adequate working space. The maximum trench width at the top of the pipe shall be 30 inches for pipe up to and including 12 inch inside diameter and the outside diameter of the pipe barrel plus 16 inches for pipe larger than 12 inch inside diameter. The top width of the trench shall not exceed the outside diameter of the pipe plus 36 inches. The trench shall be kept free from water until jointing has been completed. Surface water shall be diverted so as not to enter the trench. The Developer shall maintain sufficient pumping equipment on the job to insure that these provisions are carried out. Unsuitable material below the depth of the proposed pipe shall be removed and replaced with satisfactory materials as determined by the District. Excavation for precast manholes shall be sufficient to provide a minimum of 12 inches between the manhole and the side of the excavation.

b. Trenching operations shall not proceed more than 200 feet in advance of pipe laying without written approval of the District. The Developer shall provide trench boxes or other approved sheeting as necessary to

protect workmen, the work, existing utilities and other properties in accordance with OSHA / WISHA standards.

7. JACKING OR BORING - ROADWAY CROSSINGS: The Developer may use any method which provides satisfactory results and is acceptable to the governmental agency having control of the road and to the District, provided that the Developer restores the crossing to its original condition. Normally, these crossings require the placing of steel, cast iron or concrete pipe casing by jacking or tunneling and laying the sewer line within the casing.

8. PIPE BEDDING:

a. Except where excavation in pure sand where imported bedding material will not be required, the pipe shall be placed on a prepared subgrade of imported bedding material four inches under the pipe for all pipe sizes of 27 inches diameter and smaller and six inches for all pipe sizes 30 inches and larger. Bedding material shall consist of clean, granular, unfractured material of which 100 percent will pass the U.S. Standard 3/4-inch opening; not more than 3 percent will pass the U.S. No. 200 (wet sieve). Bell holes shall be excavated so the pipe, when laid, will have a uniform bearing under the full length of the pipe. The Developer shall be responsible for adequate support and bedding for the pipe. The trench shall be backfilled from the spring line of the pipe to six inches above the top of the pipe as shown in the Standard Detail. The material shall be placed in four-inch layers and compacted to no less than 95 percent of the maximum theoretical density as measured by the modified Proctor method prior to placement of the next layer.

b. Where the undisturbed trench below the four-inch bedding is unstable, the unstable material shall be removed and backfilled with foundation gravel and/or bedding gravel as necessary to produce a stable foundation upon which to place the bedding. The Contractor shall be responsible for providing a stable foundation for placing of the bedding.

c. Boulders, rocks, roots and other obstructions shall be entirely removed or cut out to the full width of the trench and to a depth six inches below the pipe. In solid rock, the trench shall be excavated six inches below the pipe bottom and backfilled as provided above.

d. Whenever the trench is excavated below the depth required for proper bedding, it shall be backfilled with bedding gravel and compacted, as provided above.

e. Furnishing of required foundation and bedding material and/or bedding concrete shall be done to secure proper bedding condition.

9. CONCRETE BLOCKING AND ENCASEMENT: Blocking shall be installed at changes in direction and in a manner acceptable to the District. Encasement of pipe shall be as shown in standard details or as otherwise directed by the District.

10. FOUNDATION GRAVEL: Foundation gravel shall be coarse graded gravel or crushed rock passing a 3-inch mesh. Pit run passed through a 3-inch screen thoroughly compacted may be used provided that it is, in the opinion of the District, properly graded and otherwise suitable.

11. MANHOLES:

a. Manholes shall be constructed as shown in standard details for standard manholes and drop manholes. Manholes shall be of precast reinforced concrete and shall be a uniform thickness. Close tolerances are required between sections. Manhole ring and covers shall be level and adjusted to the elevation required by the Sewer Plan prior to final acceptance of the work.

b. The manhole base slab shall be placed on firm soil. If the foundation material is inadequate, the Developer shall use foundation gravel, bedding gravel or concrete under the normal base to support the manhole.

c. All joints and connections to manholes shall be made with cement mortar or other approved jointing material and shall be watertight. Joints and connections shall be finished on interior and exterior of manhole. There shall be 3/4-inch thick smooth plaster finish on inside and outside on leveling concrete blocks at top of manholes.

d. Where manholes are installed over an existing sewer main, the manhole base shall be poured in-place on firm soil or foundation material as described above. Sewer main inside manhole will not be cut away until approved by District.

12. INSTALLATION STAKING: The Developer shall furnish grade, cut and finish staking for the excavation for an installation of sanitary sewer mains, manholes and appurtenances.

13. CLEANING AND FLUSHING:

a. Prior to pipe testing, all pipes shall be cleaned and flushed with a Vac Truck at the expense of the Developer. This procedure may be required to be repeated if manhole lids, rings or covers are disturbed during street paving operations.

b. All debris flushed out shall be removed at the first manhole where its presence is noted. In the event cemented or wedged debris or a damaged

pipe exists, the Contractor shall remove the debris or replace the damaged pipe.

14. TESTING OF GRAVITY SEWERS:

a. Method of testing gravity sewers shall be at the option of the Developer unless otherwise specified.

1. WATER TEST:

a. Tests for water tightness shall be made by the Developer in the presence of the District. A test shall be made of every section of the sewer, including the side sewers, after completion of backfill. Where the groundwater table is so high as to preclude a proper exfiltration test, an infiltration test may be used.

b. The exfiltration test shall be made by plugging the inlets of the lower manhole and filling the test section with water to a height of six (6) feet above the crown of the sewer at the upper end of the sewer being tested.

c. In no case shall the static level be less than six (6) feet above the water table at the upper end of the sewer being tested. Where the static pressure on the lower manhole would exceed 15 feet, the Developer shall test the sewer between manholes in two or more sections. The Developer shall provide for sectional testing by installing tees in the main line. The tees shall be of a type that permit plugging of both the upper and lower run of the tee. The required static water head shall be obtained by installing vertical lengths of pipe in the tee or from the upper end of the sewer pipe being tested at shallow manholes.

d. The Developer shall provide a groundwater observation well at each manhole for determining the level of groundwater during the test. The observation well shall consist of one-inch plastic pipe installed vertically adjacent to the manhole. The lower end of the test well shall be placed in a one-(1) cubic yard pocket of wash gravel and shall be at the same elevation as the invert of the manhole. The upper end of the test well shall be a maximum of two (2) feet below the finished grade elevation and shall be plugged and exposed until completion of the test.

e. The time of exfiltration tests shall be a minimum of one (1) hour. The leakage during the test shall not exceed the following allowances:

Allowable Leakage / Exfiltration:

Allowable leakage in gallons per 100 linear feet per hour.
Head above crown on lower end of test section.

Pipe	6 ft.	8 ft.	10 ft.	12 ft.	14 ft.	16 ft.
6	0.6	0.7	0.7	0.8	0.8	0.9
8	0.8	0.9	1.0	1.0	1.1	1.2
10	1.0	1.1	1.2	1.3	1.4	1.5
12	1.2	1.3	1.4	1.6	1.7	1.8
15	1.5	1.7	1.8	2.0	2.1	2.3
18	1.8	2.0	2.2	2.3	2.5	2.7
24	2.4	2.6	2.9	3.1	3.4	3.6

Repair by chemical grouting will not be allowed.

f. For static head above the basic six feet at the crown of the sewer at the lower end of the test section, the allowable leakage shown above shall be increased at a ratio of 5 percent per foot increase.

g. Where the groundwater exceeds a height of six feet above the crown of the sewer at the upper end of the test section, the section shall be tested by infiltration. The infiltration test shall be conducted by placing a plug in the inlet sewer at the upper manhole and inserting an approved measuring device in the inlet sewer at the lower manhole. Prior to making measurements, care shall be taken to assure that the flow over or through the measuring device is constant. A minimum of four measurements shall be made over a period of one hour.

2. AIR TESTING:

- a. The Developer may use a low-pressure air test at his option. The following procedures shall be used in conducting the low-pressure air test. The Developer shall furnish all facilities and personnel for conducting the test under the observation of the District. The equipment and personnel shall be subject to the approval of the District.
- b. The Developer may desire to make an air test prior to backfilling for his own purposes. However, the acceptance air test shall be made after backfilling has been completed and compacted.
- c. All wyes, tees, or end of side sewer stubs shall be plugged with flexible joint caps, or acceptable alternate, securely fastened to withstand the internal test pressures. Such plugs or caps shall be readily removable and their removal shall provide a socket suitable for making a flexible jointed lateral connection or extension. No double plugs shall be allowed.
- d. Immediately following the pipe cleaning, the pipe installation shall be tested with low-pressure air. Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches 4.0 pounds per square inch greater than the average back pressure of any groundwater that may submerge the pipe. At least two minutes shall be allowed for temperature stabilization before proceeding further.
- e. The requirements of this specification shall be considered satisfied if the time required in seconds for the pressure to decrease from 3.5 to 2.5 pounds per square inch greater than the average back pressure of any groundwater.

Size of Pipe	Seconds per Lineal Foot of Pipe
4 inch	0.11
6 inch	0.25
8 inch	0.46
10 inch	0.72
12 inch	1.04
15 inch	1.63

18 inch 2.35

21 inch 3.20

24 inch 4.18

f. The use of air pressure for testing sewer lines creates hazards that must be recognized. The Developer shall be certain that all plugs are securely blocked to prevent blowouts. A supply air regulator shall be installed on the air supply line to the sewer that shall permit a maximum of 10 psi in the line to be tested. All pressure shall be relieved from the sewer section being tested prior to removal of test plugs.

15. VIDEO INSPECTION OF GRAVITY SEWERS:

- a. All gravity sewer lines shall be video inspected at the cost of the developer after completion of flushing, cleaning and testing, but prior to paving.
- b. Any sags or ponding of water along the pipe will be repaired by excavation of the pipe, realigning and compacting the subgrade or relaying the non-conforming section of pipe if necessary.

16. TESTING OF PRESSURE SEWER MAINS: Prior to acceptance of the project, the pressure line shall be subjected to a hydrostatic pressure test equal to three times the maximum working pressure at the high point of the line. Any leaks or imperfections developing or occurring under the test pressure shall be remedied by the Developer before final acceptance of the project. Leakage shall be measured by approved means. Test pressure shall be maintained while the entire installation is inspected. The Developer shall provide all necessary equipment and shall perform all work connected with the tests. Insofar as is practical, test shall be made with pipe joints and fittings exposed for inspection. Maximum leakage allowable shall be 0.05 gallons per hour per inch of pipe diameter per 100 feet of pipe or no more than a 10 psi drop in pressure, which ever is least.

N. SIDE SEWERS:

1. General. Developers of subdivisions located within the sanitary sewer services area with conventional gravity service available shall be required to extend the side service from the sewer main to the property line.
2. Before construction of a side sewer on public right-of-way or private property, the Developer is required to receive permission from the District. Connection to

the home or business shall not occur prior to payment of the applicable hookup fees.

O. SEPTIC TANKS: In areas within the urban growth area of the District where it is determined by the District that conventional gravity sanitary sewer service is not available, septic tank systems may be installed upon approval and issue of permit by the Chelan-Douglas Health Department.

P. PUMP STATIONS:

1. Pump stations shall only serve those properties which cannot otherwise be served by conventional gravity sewers or septic tanks.
2. Pump stations to be maintained by the District shall be approved for design by the District.
3. Pump station wet and dry wells shall be watertight concrete vaults or approved alternates. The walls shall be a uniform thickness and sections shall fit together with close tolerances. Lids shall fit air tight and shall be true with the vaults.

Appendix E

CIP System Improvement Cost Estimates

Lake Chelan Reclamation District

LCRD CS01- Gravity Main from Sunrise Drive to L.S. 1A

Engineer's Estimate - Conceptual Level

February 15, 2022

Prepared by: Andi Zontek

Bid Item	Description	Quantity	Unit	Engineer's Estimate		Notes and Assumptions:
				Unit Price	Total	
1	Mobilization/Demobilization	1	LS	\$36,000	\$36,000	10%
2	Project Temporary Traffic Control	1	LS	\$13,400	\$13,400	Minor traffic control required on Hyacinth
3	Construction Survey	1	LS	\$7,500	\$7,500	
4	Shoring or Extra Excavation Class B	1600	LF	\$2	\$3,200	
5	Temporary Erosion and Sedimentation Control	1	LS	\$5,000	\$5,000	
6	Removal of Structures and Obstructions	1	LS	\$5,000	\$5,000	Assume removal of Lift Station
7	Temporary Pumping	1	LS	\$5,000	\$5,000	Assumed cost
8	8-inch PVC Sewer Pipe	1600	LF	\$100	\$160,000	Assumes no ground water / medium digging conditions
9	48-inch Manhole with CI Frame & Cover (8') Depth	7	EA	\$5,000	\$35,000	
10	Connection to Existing Manhole	1	EA	\$3,000	\$3,000	
11	Rock Excavation	100	CY	\$150	\$15,000	
12	Select Trench Backfill	670	TON	\$35	\$23,450	
13	Crushed Surfacing	460	TON	\$50	\$23,000	
14	Asphalt Pavement	200	TON	\$200	\$40,089	Assumes 12 foot wide lane repair
15	Landscape, Mitigation and Misc. Restoration	1	LS	\$15,000	\$15,000	

Subtotal (Construction Costs)	\$390,000
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WSST (8.3%)	\$33,000
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Total (Construction Costs with WSST)	\$423,000
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Total with 20% Construction Contingency	\$508,000
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Easement	\$50,000
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Design Engineering and Bidding Services (15%)	\$77,000
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Construction Engineering and Administration (15%)	\$77,000
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\$204,000

Project Cost Including Const. and Indirect Costs	\$712,000
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Lake Chelan Reclamation District
LCRD CS02 - Division Street Sewer Expansion
Engineer's Estimate - Conceptual Level
February 15, 2022

Prepared by: Olga Powers

Bid Item	Description	Quantity	Unit	Engineer's Estimate		Notes and Assumptions:
				Unit Price	Total	
1	Mobilization/Demobilization	1	LS	\$40,000	\$40,000	10%
2	Project Temporary Traffic Control	1	LS	\$5,000	\$5,000	
3	Shoring or Extra Excavation Class B	1510	LF	\$9	\$13,590	
4	Temporary Erosion Control	1	LS	\$5,000	\$5,000	
5	Landscape, Mitigation and Misc. Restoration	1	LS	\$5,000	\$5,000	
6	8-inch Sewer Pipe	1300	LF	\$100	\$130,000	Connection to existing manhole D-8-2
7	6-inch Sewer Pipe	210	LF	\$100	\$21,000	
8	Cleanout	14	EA	\$2,500	\$35,000	
9	48-inch Manhole with CI Frame & Cover (8') Depth	5	EA	\$4,500	\$22,500	
10	Connection to Existing Manhole	1	EA	\$3,000	\$3,000	
11	Rock Excavation	90	CY	\$250	\$22,500	Assumes 12 foot wide lane repair; shoulder crushed surfacing
12	Select Trench Backfill	630	TON	\$15	\$9,450	
13	Crushed Surfacing	840	TON	\$50	\$42,000	
14	Asphalt Pavement	390	TON	\$200	\$78,000	

Subtotal (Construction Costs)	\$433,000
WSST (8.3%)	\$36,000
Total (Construction Costs with WSST)	\$469,000
Total with 20% Construction Contingency	\$563,000
Design Engineering and Bidding Services (15%)	\$85,000
Construction Engineering and Administration (15%)	\$85,000
	\$170,000
Project Cost Including Const. and Indirect Costs	\$733,000

Lake Chelan Reclamation District

LCRD CS03 - North Shore Interceptor Replacement - Darnell's to Transfer Station (Through City)

Engineer's Estimate - Conceptual Level

February 22, 2022

Prepared by: Olga Powers

Bid Item	Description	Quantity	Unit	Engineer's Estimate	
				Unit Price	Total
1	Mobilization	1	LS	\$375,000	\$375,000
2	Removal of Structures and Obstructions	1	LS	\$121,000	\$121,000
3	Roadway Excavation Incl. Haul	1340	CY	\$40	\$53,600
4	Temporary Forcemain Bypass System	1	LS	\$100,000	\$100,000
5	10-inch Sewer Force Main	8610	LF	\$100	\$861,000
6	14-inch Sewer Force Main	8610	LF	\$150	\$1,291,500
7	Connection to Existing - Dual Forcemains	1	LS	\$6,000	\$6,000
8	Connection to Existing - Transfer Station	1	LS	\$6,000	\$6,000
9	Sewer Cleanout	4	EA	\$2,000	\$7,000
10	Abandonment of Terminated Sewer Facilities	1	LS	\$50,000	\$50,000
11	Gate Valve 10 In.	3	EA	\$3,000	\$9,000
12	Gate Valve 14 In.	3	EA	\$5,000	\$15,000
13	Comb. Air Release/Air Vacuum Assembly	4	EA	\$5,000	\$17,500
14	Casing Sleeve	360	LF	\$150	\$54,000
15	Rock Excavation	420	CY	\$150	\$63,000
16	Bank Run Gravel for Trench Backfill	2910	CY	\$20	\$58,200
17	Crushed Surfacing	5850	TON	\$45	\$263,250
18	HMA Cl. 1/2 In. PG 64-28	2160	TON	\$130	\$280,800
19	Temporary Erosion and Sediment Control	1	LS	\$50,000	\$50,000
20	Lawn/Landscaping	1	AC	\$20,000	\$20,000
21	Paint Line	17200	LF	\$2	\$34,400
22	Permanent Signing	1	LS	\$25,000	\$25,000
23	Project Temporary Traffic Control	1	LS	\$100,000	\$100,000
24	Shoring or Extra Excavation Class B	1	LS	\$20,000	\$20,000
25	Controlled Density Fill	50	CY	\$150	\$7,500
26	Contractor Surveying	1	LS	\$91,300	\$91,300
27	As-Constructed Drawings	1	LS	\$15,000	\$15,000
28	Adjust Monument Case and Cover	10	EA	\$2,000	\$20,000
29	Unknown Utility Repair	50000	DOL	\$1	\$50,000
30	Cement Conc. Sidewalk	50	SY	\$200	\$10,000
31	Cement Conc. Traffic Curb and Gutter	200	LF	\$100	\$20,000
32	Roadside Cleanup	1	LS	\$20,000	\$20,000

Subtotal (Construction Costs)	\$4,116,000
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WSST (8.3%)	\$342,000
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Total (Construction Costs with WSST)	\$4,458,000
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Total with 20% Construction Contingency	\$5,350,000
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Design Engineering and Bidding Services (15%)	\$803,000
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Construction Engineering and Administration (15%)	\$803,000
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\$1,606,000

Project Cost Including Const. and Indirect Costs	\$6,956,000
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	District (70%)	City (30%)
Total with 20% Construction Contingency	\$3,745,000	\$1,605,000
Design Engineering and Bidding Services (15%)	\$562,100	\$240,900
Construction Engineering and Administration (15%)	\$562,100	\$240,900
	\$1,124,200	\$481,800
Project Cost Including Const. and Indirect Costs	\$4,869,200	\$2,086,800

Lake Chelan Reclamation District
LCRD CS04 - Manson Blvd. Expansion
Engineer's Estimate - Conceptual Level
February 15, 2022

Prepared by: Andi Zontek

Bid Item	Description	Quantity	Unit	Engineer's Estimate		Notes and Assumptions
				Unit Price	Total	
1	Mobilization/Demobilization	1	LS	\$79,000	\$79,000	10%
2	Project Temporary Traffic Control	1	LS	\$49,000	\$49,000	
3	Shoring or Extra Excavation Class B	2350	LF	\$9	\$21,150	
4	Temporary Erosion Control	1	LS	\$25,100	\$25,100	
5	Temporary Pumping	1	LS	\$5,000	\$5,000	
6	Landscape, Mitigation and Misc. Restoration	1	LS	\$5,000	\$5,000	
7	Sewer main Pipe	2350	LF	\$100	\$235,000	
8	Cleanout	5	EA	\$2,500	\$12,500	
9	6-inch Side Sewer Pipe	150	LF	\$100	\$15,000	
10	48-inch Manhole with CI Frame & Cover (8') Depth	8	EA	\$4,500	\$36,000	
11	Connection to Existing Manhole	1	EA	\$3,000	\$3,000	
12	Rock Excavation	150	CY	\$250	\$37,500	
13	Select Trench Backfill	1050	TON	\$15	\$15,750	
14	Crushed Surfacing	2360	TON	\$50	\$118,000	
15	Asphalt Pavement	1050	TON	\$200	\$210,000	Assumes 15 foot wide lane repair

Subtotal (Construction Costs)	\$867,000
WSST (8.3%)	\$72,000
Total (Construction Costs with WSST)	\$939,000
Total with 20% Construction Contingency	\$1,127,000
Design Engineering and Bidding Services (15%)	\$170,000
Construction Engineering and Administration (15%)	\$170,000
	\$340,000
Project Cost Including Const. and Indirect Costs	\$1,467,000

Lake Chelan Reclamation District

LCRD CS05 - Lift Station No. 2 Collection Piping - SR 150 between Hale Street and Lift Station 2

Engineer's Estimate - Conceptual Level

February 15, 2022

Prepared by: Olga Powers

Bid Item	Description	Quantity	Unit	Engineer's Estimate		Notes and Assumptions
				Unit Price	Total	
1	Mobilization/Demobilization	1	LS	\$108,000	\$108,000	10%
2	Project Temporary Traffic Control	1	LS	\$232,000	\$232,000	
3	Shoring or Extra Excavation Class B	3350	LF	\$10	\$33,500	
4	Temporary Erosion Control	1	LS	\$33,500	\$33,500	
5	Temporary Pumping	1	LS	\$40,000	\$40,000	
6	Sewer Pipe	3350	LF	\$100	\$335,000	
7	Sewer Manhole	3	EA	\$5,000	\$15,000	
8	Connection to Existing Manhole	1	EA	\$3,000	\$3,000	
9	Select Trench Backfill	1400	TON	\$15	\$21,000	
10	Misc. Roadway Items	1	LS	\$7,000	\$7,000	
11	Crushed Surfacing	2530	TON	\$50	\$126,500	Assumes 12 foot wide lane repair
12	Asphalt Pavement	1120	TON	\$200	\$224,000	

Subtotal (Construction Costs)	\$1,179,000
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WSST (8.3%)	\$98,000
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Total (Construction Costs with WSST)	\$1,277,000
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Total with 20% Construction Contingency	\$1,533,000
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Design Engineering and Bidding Services (15%)	\$230,000
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Construction Engineering and Administration (15%)	\$230,000
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\$460,000

Project Cost Including Const. and Indirect Costs	\$1,993,000
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Note:

- Item 7 - Sewer Manhole: assumes three (3) new manholes along the sewer main line to be upsized.

- Item 10 - Misc. Roadway Items: includes miscellaneous items such as striping, roadside clean up.

Lake Chelan Reclamation District

LCRD CS06 - Lift Station No. 3 Collection Piping - SR 150 between Lizzie Lane and Parkhill Drive

Engineer's Estimate - Conceptual Level

February 15, 2022

Prepared by: Olga Powers

				<i>Engineer's Estimate</i>		Notes and Assumptions:
Bid Item	Description	Quantity	Unit	Unit Price	Total	
1	Mobilization/Demobilization	1	LS	\$17,000	\$17,000	10%
2	Project Temporary Traffic Control	1	LS	\$50,000	\$50,000	
3	Shoring or Extra Excavation Class B	300	LF	\$20	\$6,000	
4	Temporary Erosion Control	1	LS	\$3,000	\$3,000	
5	Temporary Pumping	1	LS	\$5,000	\$5,000	
6	Sewer Pipe	300	LF	\$100	\$30,000	
7	Connection to Existing Manhole	2	EA	\$5,000	\$10,000	
8	Select Trench Backfill	130	TON	\$15	\$1,950	
9	Misc. Roadway Items	1	LS	\$20,000	\$20,000	
10	Crushed Surfacing	230	TON	\$50	\$11,500	
11	Asphalt Pavement	110	TON	\$200	\$22,000	Assumes 12 foot wide lane repair
12	Landscape, Mitigation and Misc. Restoration	1	LS	\$5,000	\$5,000	

Subtotal (Construction Costs)	\$182,000
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WSST (8.3%)	\$16,000
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Total (Construction Costs with WSST)	\$198,000
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Total with 20% Construction Contingency	\$238,000
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Design Engineering and Bidding Services (15%)	\$36,000
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Construction Engineering and Administration (15%)	\$36,000
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\$72,000

Project Cost Including Const. and Indirect Costs	\$310,000
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Note:

- Item 7 - Connection to Existing Manhole: assumes connections to existing manholes at inlet and outlet end of pipe.

- Item 9 - Misc. Roadway Items: includes miscellaneous items such as striping, roadside clean up.

Lake Chelan Reclamation District
LCRD LS01 - LS No. 1 Rehabilitation
Engineer's Estimate - Conceptual Level
February 15, 2022

Prepared by: Olga Powers

				<i>Engineer's Estimate</i>		Notes and Assumptions:
Bid Item	Description	Quantity	Unit	Unit Price	Total	
1	Mobilization/Demobilization	1	LS	\$74,000	\$74,000	10% Replace two existing pumps
2	Manson Boulevard to LS 1 Pipe Replacement	1	LS	\$120,450	\$120,450	
3	Electrical and Telemetry Control Upgrades	1	LS	\$200,000	\$200,000	
4	Pumps	1	LS	\$200,000	\$200,000	
5	Valving Upgrades	1	LS	\$50,000	\$50,000	
6	Temporary Pumping	1	LS	\$100,000	\$100,000	
7	Manhole Coating	1	EA	\$50,000	\$50,000	
8	Odor Control	1	EA	\$10,000	\$10,000	

Subtotal (Construction Costs)	\$805,000
WSST (8.3%)	\$67,000
Total (Construction Costs with WSST)	\$872,000
Total with 20% Construction Contingency	\$1,047,000
Design Engineering and Bidding Services (15%)	\$158,000
Construction Engineering and Administration (15%)	\$158,000
	\$316,000
Project Cost Including Const. and Indirect Costs	\$1,363,000

Lake Chelan Reclamation District
LCRD LS02 - LS 1A Improvements
Engineer's Estimate - Conceptual Level
February 15, 2022

Prepared by: Olga Powers

				<i>Engineer's Estimate</i>	
Bid Item	Description	Quantity	Unit	Unit Price	Total
1	Mobilization/Demobilization (Assumes 10%)	1	LS	\$40,000	\$40,000
2	Telemetry Control Upgrades	1	LS	\$30,000	\$30,000
3	Electrical Upgrades	1	LS	\$100,000	\$100,000
4	Pump Upgrades	1	LS	\$150,000	\$150,000
5	Valving Upgrades	1	EA	\$50,000	\$50,000
6	Temporary Pumping	1	LS	\$50,000	\$50,000
7	Coating Upgrades	1	EA	\$16,000	\$16,000
8	Odor Control	1	EA	\$2,000	\$2,000

Subtotal (Construction Costs)	\$438,000
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WSST (8.3%)	\$37,000
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Total (Construction Costs with WSST)	\$475,000
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Total with 20% Construction Contingency	\$570,000
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Design Engineering and Bidding Services (15%)	\$86,000
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Construction Engineering and Administration (15%)	\$86,000
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\$172,000

Project Cost Including Const. and Indirect Costs	\$742,000
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Lake Chelan Reclamation District
LCRD LS03 - LCRD L.S. No. 2 Improvements
KRCI Bid - February 3, 2022

Bid Item	Description	Quantity	Unit	Feb 3, 2022 KRCI Estimate	
				Unit Price	Total
1	Mobilization, Demobilization, Site Preparation and Cleanup	1	LS	\$42,800	\$42,800
2	Staking and Project Control	1	LS	\$7,000	\$7,000
3	Temporary Sedimentation and Erosion Control	1	LS	\$2,000	\$2,000
4	Removal of Structures and Obstructions	1	LS	\$8,000	\$8,000
5	Excavation Safety and Shoring	1	LS	\$500	\$500
6	Temporary Bypass Sewage Pumping	1	LS	\$50,000	\$50,000
7	Replace Wet Well Lid, Hatch, and Safety Grate	1	LS	\$57,400	\$57,400
8	Replace Flow Meter Vault	1	LS	\$42,000	\$42,000
9	Phase 1 Mechanical Work	1	LS	\$26,000	\$26,000
10	Phase 2 Mechanical Work	1	LS	\$14,000	\$14,000
11	Phase 3 Mechanical Work	1	LS	\$17,000	\$17,000
12	Mechanically Stabilized Earth (MSE) Retaining Wall	1620	SF	\$68	\$110,160
13	Contractor Designed Wall Shoring	1	LS	\$7,000	\$7,000
14	Gravel Borrow for Geosynthetic Retaining Wall	1540	TON	\$25	\$38,500
15	Fence	205	LF	\$120	\$24,600
16	Electrical	1	LS	\$196,000	\$196,000
17	Automatic Control	1	LS	\$170,000	\$170,000
18	Testing, Start-up, and Training	1	LS	\$74,000	\$74,000
19	Force Account	5000	DOL	\$1	\$5,000
20	Project Record Documents	1	EA	\$5,000	\$5,000

Construction Costs

Subtotal (Construction Costs)	\$896,960
WSST (8.3%)	\$75,000
Total (Construction Costs with WSST)	\$971,960

KRCI Total bid >>>> \$972,000

New added Indirects

Design Engineering and Bidding Services (15%)	\$146,000
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Total Indirects \$146,000

Total Project Costs \$1,118,000

Lake Chelan Reclamation District

LCRD LS04 - LS No. 2 Odor Control

Engineer's Estimate - Conceptual Level

February 15, 2022

Prepared by: Olga Powers

				<i>Engineer's Estimate</i>	
Bid Item	Description	Quantity	Unit	Unit Price	Total
1	Mobilization/Demobilization (Assumes 10%)	1	LS	\$10,000	\$10,000
2	Odor Control	1	LS	\$100,000	\$100,000

Subtotal (Construction Costs)	\$110,000
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WSST (8.3%)	\$10,000
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Total (Construction Costs with WSST)	\$120,000
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Total with 20% Construction Contingency	\$144,000
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Design Engineering and Bidding Services (15%)	\$22,000
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Construction Engineering and Administration (15%)	\$22,000
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\$44,000

Project Cost Including Const. and Indirect Costs	\$188,000
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Lake Chelan Reclamation District**LCRD LS05 - LS No. 3 Improvements****Engineer's Estimate - Conceptual Level****February 15, 2022****Prepared by: Olga Powers**

				<i>Engineer's Estimate</i>	
Bid Item	Description	Quantity	Unit	Unit Price	Total
1	Mobilization/Demobilization (Assumes 10%)	1	LS	\$106,000	\$106,000
2	Wet well and Appurtenances	1	LS	\$500,000	\$500,000
3	Electrical and Mechanical Equipment	1	LS	\$350,000	\$350,000
4	Lift Station Site Building	1	LS	\$150,000	\$150,000
5	Pipe, mics restorations; connections?	1	LS	\$50,000	\$50,000
6	Traffic Control	1		\$10,000	\$10,000

Subtotal (Construction Costs)	\$1,166,000
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WSST (8.3%)	\$97,000
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Total (Construction Costs with WSST)	\$1,263,000
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Total with 20% Construction Contingency	\$1,516,000
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Design Engineering and Bidding Services (15%)	\$228,000
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Construction Engineering and Administration (15%)	\$228,000
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	\$456,000
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Relocation/Property Acquisition	\$50,000
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Pre-Design Report	\$50,000
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	\$556,000
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Project Cost Including Const. and Indirect Costs	\$2,072,000
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Lake Chelan Reclamation District
LCRD LS06 - Mill Bay Lift Station
Engineer's Estimate - Conceptual Level
February 15, 2022

Prepared by:

				<i>Engineer's Estimate</i>	
Bid Item	Description	Quantity	Unit	Unit Price	Total
1	Mobilization/Demobilization (Assumes 10%)	1	LS	\$52,000	\$52,000
2	Telemetry Control Upgrades	1	LS	\$75,000	\$75,000
3	Electrical Upgrades	1	LS	\$200,000	\$200,000
4	Pump Upgrades	1	LS	\$150,000	\$150,000
5	Valving Upgrades	1	EA	\$20,000	\$20,000
6	Temporary Pumping	1	LS	\$50,000	\$50,000
7	Coating Upgrades	1	EA	\$10,000	\$10,000
8	Odor Control	1	EA	\$10,000	\$10,000

Subtotal (Construction Costs)	\$567,000
WSST (8.3%)	\$48,000
Total (Construction Costs with WSST)	\$615,000
Total with 20% Construction Contingency	\$738,000
Design Engineering and Bidding Services (15%)	\$111,000
Construction Engineering and Administration (15%)	\$111,000
	<u>\$222,000</u>
Project Cost Including Const. and Indirect Costs	\$960,000