



## Section **3**

## Section 3

# Existing Wastewater Collection and Conveyance System

### 3.1 Service Area

As described in **Section 2**, the City's current service area extends from the Columbia River south to the City of Damascus, west to the City of Portland and east to the cities of Fairview and Wood Village. Future service includes the Pleasant Valley, Springwater and Kelley Creek Headwaters plan areas. These are currently unincorporated areas along the southern border of the City's existing service area. The City's current and proposed service areas are illustrated on **Figure 3-1**.

The City's existing wastewater system serves 11,300 acres in seven major drainage basins within the City. Gresham also receives wastewater from the Cities of Fairview (2,258 acres) and Wood Village (610 acres). Wastewater flow from Wood Village and the vast majority of flow from Fairview is conveyed directly to the Gresham WWTP without entering the Gresham wastewater collection system. Some Fairview wastewater flow enters the collection system from the Fairview Lake Pump Station and east of SE 202nd Street along NE Glisan Street.

### 3.2 Wastewater Basins

The City's wastewater service area is divided into seven major drainage basins with some additional areas served by connections to other systems. The areas and boundaries are derived from the City's GIS data and are summarized in **Table 3-1** below and shown on **Figure 3-1**. The major basins are divided into 26 sub-basins to further define the wastewater collection areas for the hydraulic model, discussed in detail in **Section 5**. Each basin is designated with a single digit number, while the sub-basins are assigned a 2-digit number starting with the number of the basin they are within. Asset identifiers also contain the basin ID as the middle digit with dashes on either side. The major basins and the existing land use comprising them are described below.

**Table 3-1  
Basin Areas (acres) Served by Wastewater Collection System**

Basin ID	Basin Name	Industrial	Commercial	Residential	Civic	Vacant Developable	Total Area <sup>1</sup>
1	Columbia	87	299	54	22	324	786
2	Wilkes	111	283	362	48	41	845
3	Rockwood	191	297	1,136	119	72	1,815
4	Johnson Creek <sup>2</sup>	144	109	1,974	181	1,035	3,443
5	Stark Street	102	243	384	35	212	976
6	Kelly Creek	129	4	1,161	243	185	1,723
7	East	270	40	1,086	137	79	1,613
N/A	To other systems	16	0	92	6	3	117
<b>TOTAL</b>		<b>1,050</b>	<b>1,275</b>	<b>6,249</b>	<b>792</b>	<b>1,951</b>	<b>11,317</b>

Notes:

- 1 Total area excludes right-of-way, transportation, open space and undevelopable vacant lands.
- 2 Includes total service areas from Pleasant Valley, Springwater and Kelly Creek Headwaters Plan Areas.

### 3.2.1 Columbia Basin

Columbia Basin (Basin ID 1) is the City service area's smallest and most northern basin. It is bordered on the south by the Wilkes Basin and to the north by the Columbia River. The basin collects wastewater primarily from industrial and residential customers and a small number of floating home residents. The City's Wastewater Treatment Plant is located near the western border of the basin. The 185th Street Pump Station is located in the west of the basin and serves mostly those customers at elevations too low to convey directly to the treatment plant by gravity.

### 3.2.2 Wilkes Basin

Located north of the Rockwood Basin, the Wilkes Basin (Basin ID 2) is the second smallest basin in the City's service area. The basin collects flow from residential customers located primarily in the south of the basin, and commercial and industrial customers, located in the north. These flows are conveyed away from the basin by a 24-inch diameter trunk that connects to the large diameter influent treatment plant trunk at the northeast corner of the basin.

### 3.2.3 Rockwood Basin

The Rockwood Basin (Basin ID 3) is bordered on the west by the City of Portland, on the east by Stark Street and East Basins, and on the south by Johnson Creek Basin. The border with the Wilkes Basin in the north is jigsaw-like. Wastewater in this basin is primarily residential, with some commercial and industrial flows. Much of the commercially generated wastewater flows occur along East Burnside Street, which bisects the north and south halves of the basin. The Rockwood Pump Station is located near the west boundary and conveys wastewater collected in the southwest corner of the Rockwood Basin to a 30-inch diameter trunk in Stark Street.

### 3.2.4 Johnson Creek Basin

The southern boundary of the Johnson Creek Basin (Basin ID 4) includes the Pleasant Valley, Springwater, and Kelley Creek Headwaters plan areas. The basin is characterized by elevated terrain and bound on the north by Johnson Creek. Flows originating in the residential areas in the upper, elevated areas of the basin are conveyed by gravity sewers down, towards the Johnson Creek Trunk. The residential areas are divided by steep and contiguous hills near the center of the basin, extending from Johnson Creek to the Clackamas County border. Similarly, wastewater flows from the west half of the basin, reaching the Johnson Creek Trunk by following the natural descending grades north. Hunter's Highland pump station is in the western half of the basin and serves a small number of houses near the crest of a hill near the border with Pleasant Valley. All future flows from Pleasant Valley and Kelley Creek Headwaters are expected to be conveyed by the Jenne Road - Pleasant Valley Sewer Interceptor to the Linneman Pump Station. The Jenne Road - Pleasant Valley Sewer Interceptor begins at the intersection of SE Jenne Road and SE Foster Road and follows SE Jenne Road to the Springwater Trail crossing at SE 172nd Avenue. From this intersection, the interceptor follows the Springwater Trail east, crossing under Johnson Creek and finally discharging into the large diameter pipes immediately upstream of the Linneman Pump Station's wet well. The Linneman Pump Station, located in the northwestern corner of the basin, conveys all flows from the basin to a 42-inch diameter trunk located in the southern part of the Rockwood Basin. Downstream, a larger trunk system conveys flows to Sandy Boulevard where it discharges flow directly to the Wastewater Treatment Plant.

### 3.2.5 Stark Street Basin

The Stark Street Basin (Basin ID 5) is north of the Kelly Creek, East, and Johnson Creek Basins, and east of the Rockwood Basin. It shares the north border of the service area with the Cities of Wood Village and Fairview. Wastewater generated in the basin is from both industrial and residential customers. The majority of flow from the basin is collected and conveyed in a 24-inch diameter trunk in the north of the basin. Downstream, this trunk discharges into the large diameter trunk that serves as the primary collection and conveyance of the City's wastewater to the Wastewater Treatment Plant.

### 3.2.6 Kelly Creek Basin

The Kelly Creek Basin (Basin ID 6) is the eastern boundary of the City's wastewater service area, bordering unincorporated Multnomah County, from SE Powell Valley Road at the south end to the City of Troutdale in the north. Existing wastewater flows in the Kelly Creek Basin begin in the south from residential development which straddles the east and west sides of Kelly Creek. The Kelly Creek Trunk, located within Kelly Creek, collects and conveys flows from these residential areas, joining trunks from the northeast corner of the basin. The northeast corner of the basin is comprised of Mount Hood Community College and surrounding residential development. Wastewater flow from Mount Hood Community College is conveyed by the College Pump Station, which also serves the residential area directly west of the college. Two smaller pump stations, Cascade Glenn I and II, serve the small residential community south of the college, with

pumped flow sharing the trunk that collects discharged flow from the College Pump Station. The convergence of flow from this trunk and the Kelly Creek Trunk occurs at a manhole in the residential development south of the Gresham Golf Course. Flow from the service area northwest of the college is added to the combined flow at a manhole in the Gresham Golf Course. The total flow is split into two trunks at the same manhole. These two trunks are parallel to each other and run westward, collecting and conveying wastewater from the western half of the Kelly Creek Basin, until combining immediately upstream of their discharge into a 30-inch diameter trunk.

### 3.2.7 East Basin

The East Basin (Basin ID 7) is comprised of some of the older infrastructure in the system, including downtown Gresham. There are large commercial areas near the center of the basin and schools and residences on the south and west boundaries of the basin. East Basin is comprised of three sub-basins and is bisected by HWY US 26 in the southeast half of the basin, and Johnson Creek Basin to the west and Kelly Creek Basin to the east. The East Trunk conveys basin flows from the southeast to the northwest, discharging into a 30-inch trunk at the border with Stark Street Basin.

## 3.3 System Overview

The seven major drainage basins of Gresham's existing wastewater service area described above are served by approximately 290 miles of gravity sewer piping, 16 diversions, seven pump stations and five miles of force mains. Together, these facilities convey wastewater to the City's WWTP located between NE Sandy Boulevard and NE Fairview Lake Way, west of NE 201st Avenue. The existing drainage basins and wastewater conveyance facilities are illustrated on **Figure 3-1**.

### 3.3.1 Gravity Piping

Gravity sewers are generally classified as either laterals, trunks or interceptors. Laterals serve a local area and are typically eight inches in diameter or less. Laterals flow into trunks and interceptors, which are typically ten inches in diameter and greater. Trunks and interceptors form the backbone of the collection system. The Gresham collection system includes ductile iron, concrete, PVC, and HDPE piping. The City's gravity sewer piping is summarized in **Table 3-2**.

**Table 3-2**  
**Length of Gravity Piping by Basin (linear feet)**

Nominal Diameter	Columbia	Wilkes	Rockwood	Johnson Creek	Stark Street	Kelly Creek	East	To External System
8	9,490	67,970	193,870	330,820	84,650	223,050	222,650	26,370
10	6,570	9,430	24,890	14,840	1,740	5,940	9,030	340
12	5,210	4,890	14,010	8,640	6,210	10,120	13,720	
14				210				
15	1,650	15,170	4,670	2,420	2,720	20,310	1,610	
16				410			2,730	
18	1,650	5,280	5,050	1,140	1,100	3,840	18,830	
20					1,120			
21	1,190	2,470		3,470	1,670	920	180	
22							710	
24	3,530	220	9,780	4,690	7,500	4,090	820	
27	3,750				2,800	5,890	1,020	
30	250		8,930	6,920	3,380	450	4,530	
36	740		7,990	11,040	2,920		2,110	
42	4,980		4,700	2,000				
48	4,820	130	7,410					
54	1,080			90				
<b>TOTAL</b>	<b>44,910</b>	<b>105,560</b>	<b>281,300</b>	<b>386,690</b>	<b>115,810</b>	<b>274,610</b>	<b>277,940</b>	<b>26,710</b>

### 3.3.2 Diversions

Diversion structures in the City's collection system are intended to maximize capacity by balancing peak flows. The diversions occur when the flow reaches a certain HGL, thereby bypassing into a secondary route in the collection system and reducing excessive surcharging in the primary route. Diversions are configured either without flow controls or with structures that control overflow, such as weirs, restrictor plates and elevated overflow pipes. **Figure 3-1** illustrates the 17 diversions in the collection system.

The type and purpose of key diversions in the system are provided in **Appendix A**.

### 3.3.3 Pump Stations and Force Mains

Gresham owns and operates eight wastewater pump stations. The City completed a Wastewater Pump Station Master Plan (PSMP) in September 2008 to evaluate and recommend improvements to these facilities. Some of the recommendations in the PSMP have been completed or are currently underway, such as improvements to the College Pump Station. Wastewater pump stations, their respective force mains and design capacity in gallons per minute (GPM) are listed in **Table 3-3** and locations shown on **Figure 3-1**.

**Table 3-3  
Pump Stations and Force Mains Summary**

Pump Station Name	Basin	Date Built	No of Pumps	Design Capacity (GPM/pump)	TDH (feet)	Force Main		
						Material	Diameter (inches)	Length (feet)
185th Street	Columbia	2014 <sup>1</sup>	2	485	160	PVC	8 6	2,900 2,300
Rockwood	Rockwood	2014 <sup>1</sup>	2	1,330	24	DI	12	1,914
College	Kelly Creek	2011 <sup>1</sup>	2	410	59	PVC and DI	6	830
Cascade Glen I	Kelly Creek	1993	2	94	74	PVC	4	1,628
Cascade Glen II	Kelly Creek	1996	2	50	50	PVC	3	540
Hunters Highland <sup>2</sup>	Johnson Creek	1993	2	74	134	PVC	4	550
Linneman	Johnson Creek	2008 <sup>1</sup>	2	1,800	34	DI	18	5,070
Brookside <sup>3</sup>	Johnson Creek	2014	2	372	148	HDPE	6	2,514

Note:

- 1 Date of recent upgrade.
- 2 Abandoned in June 2019 by the McKinley Sewer Extension project 315000.
- 3 Temporary pump station to be abandoned when gravity system extended to serve Pleasant Valley.

### 3.3.4 Wastewater Treatment Plant

The City's WWTP is located in the Columbia Basin, north of Sandy Boulevard at NE 201st Street. The plant treats wastewater from the cities of Gresham, Wood Village and Fairview. It is owned by the City and operated under city contract by Jacobs. Following the plant's construction in 1955, it was updated in 1970, 1979, 1987, and 1999. According to the March 2011 WWTP Master Plan Update, the plant's maximum hydraulic capacity is 58,000 GPM (75 million gallons per day (MGD)). Treated effluent is discharged to the Columbia River through a 42-inch diameter outfall. The WWTP Master Plan Update includes an evaluation of plant capacity and treatment processes as well as recommended improvements.

## 3.4 Collection System Operations

City staff conduct regular video inspection of the entire collection system (pipes up to 24 inches in diameter) on a three-year cycle. Problems identified are catalogued and prioritized into the City's asset management software and resources are allocated according to the problem encountered. For example, sags in pipes may require engineering support but grease buildup may only need maintenance personnel inspection.

## 3.5 System Maintenance

Maintenance Issues -- Fats, oils, and grease (FOG) discharged by commercial, institutional and industrial users present a significant problem to the wastewater collection and treatment systems and can cause sewer blockages. To address this problem, the City has established a FOG Program and regulates Food Establishments (FE) that discharge into the public sewer system. Commercial facilities defined as Food Establishments are required to pre-treat their wastewater using grease interceptors to remove FOG prior to discharge into the public sewer. The City conducts regular inspections of FEs to confirm compliance with the FOG program.

Areas of High I&I -- the City is currently rehabilitating manholes known to have significant leaks. Rehabilitating methods employed include chemical grouting. The City intends to expand this program to include reconstructing deteriorating channels on the flow path of manholes.

Cleaning -- The City routinely cleans the collection system on a five-year cycle. Cleaning includes injecting pressurized water onto the walls of the pipe and manholes to remove sediment and grease.

## 3.6 Intergovernmental Agreements

The City has intergovernmental agreements with adjacent municipalities to address interconnections between services. The City's intergovernmental agreements related to wastewater service are described below.

### 3.6.1 Gresham - Wood Village

The City has an intergovernmental agreement with the City of Wood Village for wastewater treatment. The current agreement includes provisions for Gresham to provide treatment capacity of 580,000 gpd average dry weather flow from the City of Wood Village. This was recently amended from a 375,000 gpd allowance. An amendment dated June 29, 1989 made changes to the agreement to address federal pretreatment requirements.

### 3.6.2 Gresham – Fairview

The City established an intergovernmental agreement with the City of Fairview in 1991 related to sanitary sewage service and transmission.

### 3.6.3 Gresham – Portland

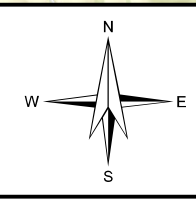
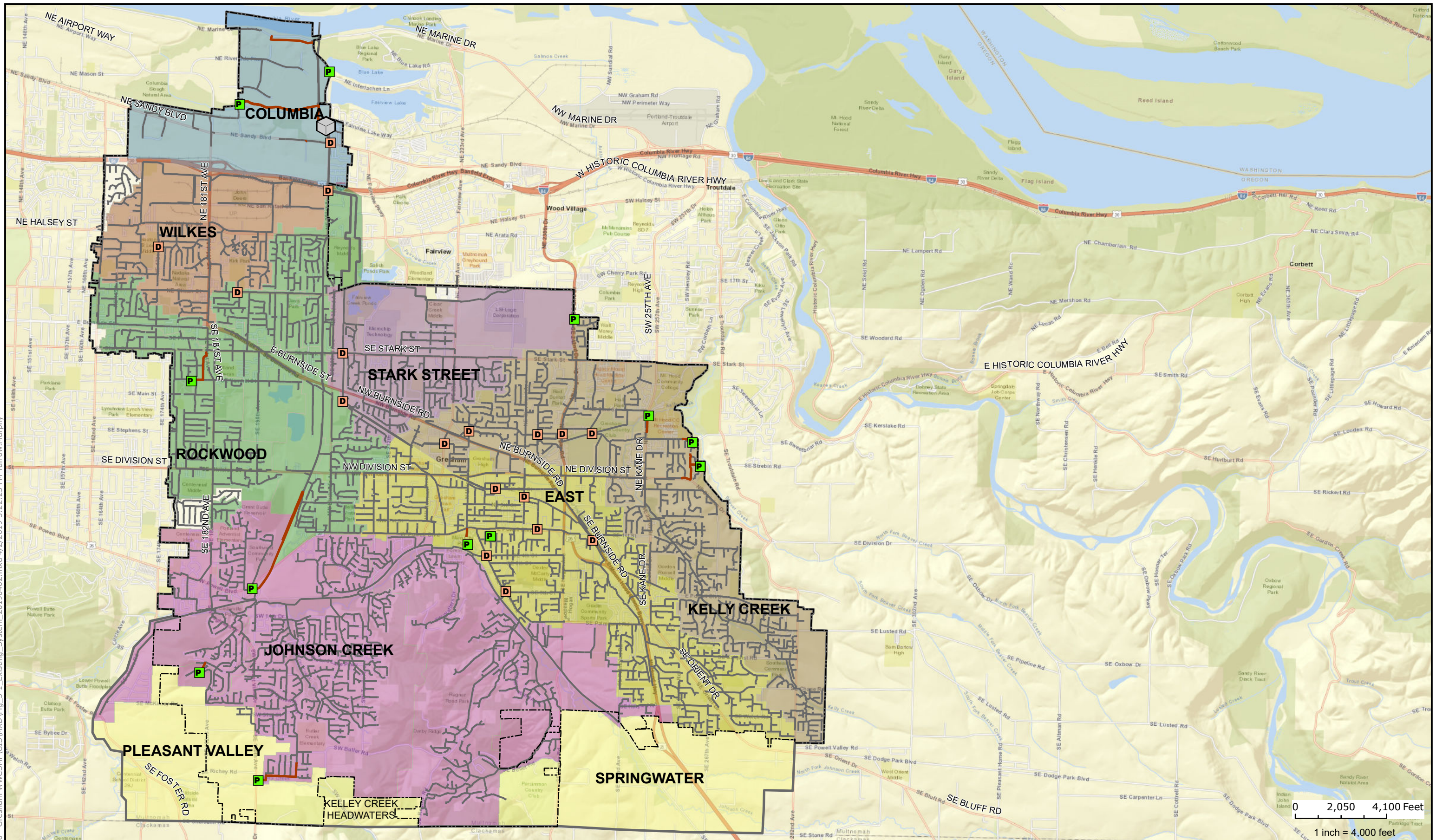
The cities of Portland and Gresham have agreements that describe the transfer of wastewater services between the two cities to residents along the common border. Agreements also describe future wastewater service by the City of Gresham to a small number of residents in unincorporated Multnomah County adjacent to SE Jenne Road and near the intersection of SE Jenne Road and the Springwater Trail.



## 3.7 Summary

The City's existing service area is approximately 11,300 acres and is comprised of seven major basins: Columbia, Wilkes, Rockwood, Johnson Creek, Stark Street, Kelley Creek, and East. The system has approximately 300 miles of piping and seven pump stations. The wastewater flows from the City are conveyed to the WWTP on NE Sandy Boulevard. The City conducts operations and maintenance of the system including regular video inspections, cleaning, and I&I reduction repairs. The existing system configuration and characteristics are used in the process for modeling the system described in **Section 5**.

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## City of Gresham, Oregon Wastewater System Facility Plan

<ul style="list-style-type: none"> <li> WWTP</li> <li> Pump Station</li> <li> Diversion</li> </ul>	<ul style="list-style-type: none"> <li> Sewer Mains</li> <li> Force Main</li> <li> Study Area</li> <li> City Limits</li> </ul>	<p><b>Basins</b></p> <ul style="list-style-type: none"> <li> 1</li> <li> 2</li> <li> 3</li> <li> 4</li> <li> 5</li> <li> 6</li> <li> 7</li> <li> Future Service Areas</li> <li> Connects to Other System</li> </ul>
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### Figure 3-1 Existing System